

# FUTURE TRANSPORT STRATEGY 2056



## **NSW Common Planning Assumptions**

Common Planning Assumptions are used across agencies to ensure alignment and understanding of the relevant data, policies and assumptions to underpin planning decisions and policy analysis for government strategies and investment decisions. This supports consistency in the advice provided to Government and the community.

The Common Planning Assumptions represent a consistent baseline or a starting point, and are developed based on current and past trends and agreed policies and plans. They are not targets or scenarios.

This strategy and supporting analysis are based on the agreed Common Planning Assumptions as at March 2018.

Details of the Common Planning Assumptions used are set out in the Common Planning Assumptions Book version 3.1



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## Ministers' Message

Transport is critical to the future of NSW. Our transport system serves every one of our state's 7.5 million residents, 800,000 businesses and 30 million visitors – and today, it is undergoing rapid change, making us more mobile than ever before, and our lives more interconnected.

By 2056, NSW will have more than 12 million residents. Sydney, will become a global city similar in size to London or New York. Regional NSW will grow by around 400,000 people by 2036 and then a further 300,000 by 2056. This growth will mean our networks will need to handle 28 million trips a day and double the current metropolitan freight loads.

These challenges and opportunities highlight the importance of our choices today and call for bold, new ideas that ensure the productivity, liveability and sustainability of our communities.

The Future Transport Strategy is an update of the [2012 Long Term Transport Master Plan for NSW](#). It is a 40 year strategy, supported by plans for regional NSW and for Greater Sydney. It is the first transport plan in Australia to harness technology to improve customer and network outcomes, and it starts with a long term vision for

our communities. For the first time, we are aligning how we plan the future of the transport network with how we land use by working closely with the [Greater Sydney Commission](#), [Infrastructure NSW](#), the [Department of Premier and Cabinet](#) and the [Department of Planning and Environment](#).

Future Transport builds on the achievements of the Long Term Transport Master Plan, which has unlocked unprecedented local and international investment in the NSW transport network and placed our customers at the centre of everything we do.

The Strategy also continues our program of innovation – starting with the [Future Transport Technology Roadmap](#), the [Smart Innovation Centre](#), automated vehicle and on-demand services pilots, and our development of contactless payment systems.

Continued planning is critical if NSW is to have a world-class transport system with infrastructure investments that support growth and meet our aspirations for how we want to travel and live.

We want to thank everyone who provided feedback on the draft Future Transport Strategy. We are encouraged by the overwhelming interest from industry and the community which reflects the importance of planning for tomorrow's transport network.

In releasing Future Transport 2056, we are making a commitment to keep talking to our customers and stakeholders and involving them as we make decisions on infrastructure and service initiatives. The best transport network will be the one we design together and we encourage everyone who uses or is affected by the transport system to get involved.



**The Hon Andrew Constance MP**  
Minister for Transport and Infrastructure



**The Hon Melinda Pavey MP**  
Minister for Roads, Maritime and Freight

# Executive Summary

Future Transport 2056 is an overarching strategy, supported by a suite of plans to achieve a 40 year vision for our transport system

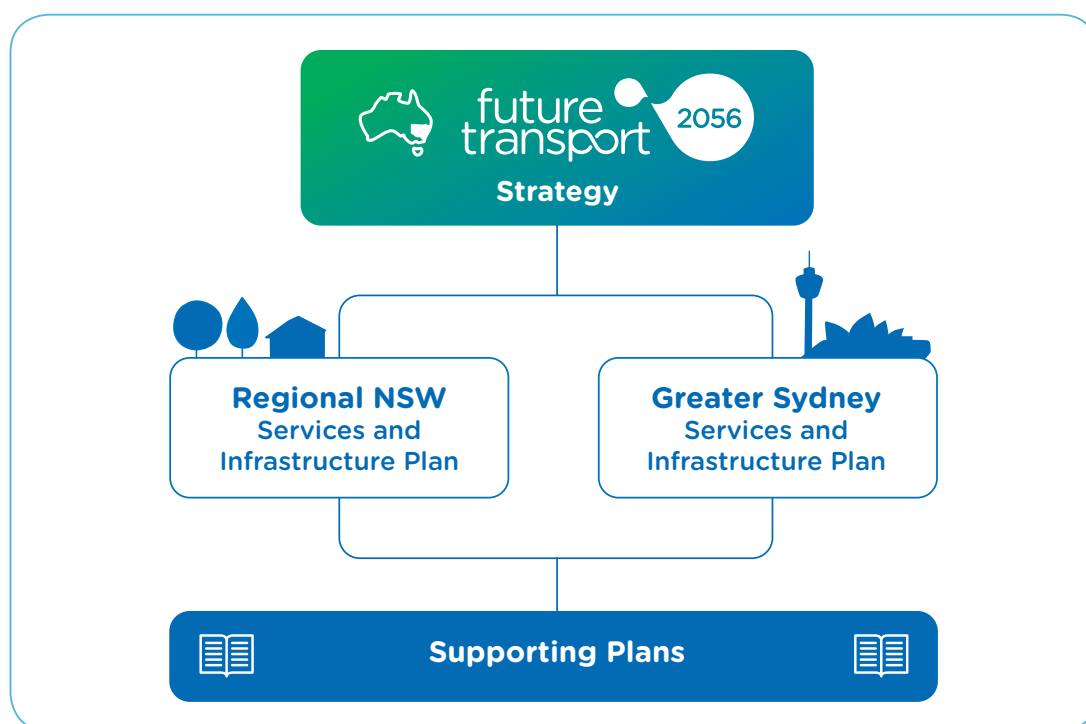


Figure 1: Overview of Future Transport 2056

Transport is in a period of immense growth, change and disruption. We are more mobile than ever and our lives more interconnected. Technology presents opportunities – new ways to travel and plan journeys, and new ways to deliver cutting-edge services to our customers.

Future Transport 2056 ensures that we are prepared for rapid changes in technology and innovation to create and maintain a world class, safe, efficient and reliable transport system over the next 40 years.

Just like the 2012 Master Plan, Future Transport 2056 places the customer at the centre of everything we do. It outlines a vision, strategic directions and customer outcomes, with infrastructure and services plans underpinning the delivery of these directions across the state.

Future Transport 2056 acknowledges the vital role transport plays in the land use, tourism, and economic development of towns and cities. It includes issue-specific and place-based supporting plans that shift the focus away from individual modes of transport, toward integrated solutions.

The Strategy and Plans also focus on the role of transport in delivering movement and place outcomes that support the character of the places and communities we want for the future.

Technology and innovative service models are providing opportunities to change the way transport solutions are provided. For example, 37 per cent of customers reported using a rideshare service in the past 12 months<sup>1</sup> – a service type that relies heavily on technology and did not exist in Australia five years ago.

Future Transport 2056 is the first plan to unpack how we can harness rapid advancements in technology and innovation to transform the customer experience and boost economic performance across NSW.

Planning for 40 years is bold when rapid technological innovation is the new norm and there is uncertainty as to what the future will look like. Our population set to increase to 12 million people by 2056, freight volumes are estimated to double in the Greater Sydney area and increase by 25 per cent in regional NSW and the passenger network preparing for 28 million trips a day – this means planning for the future has never been more important.

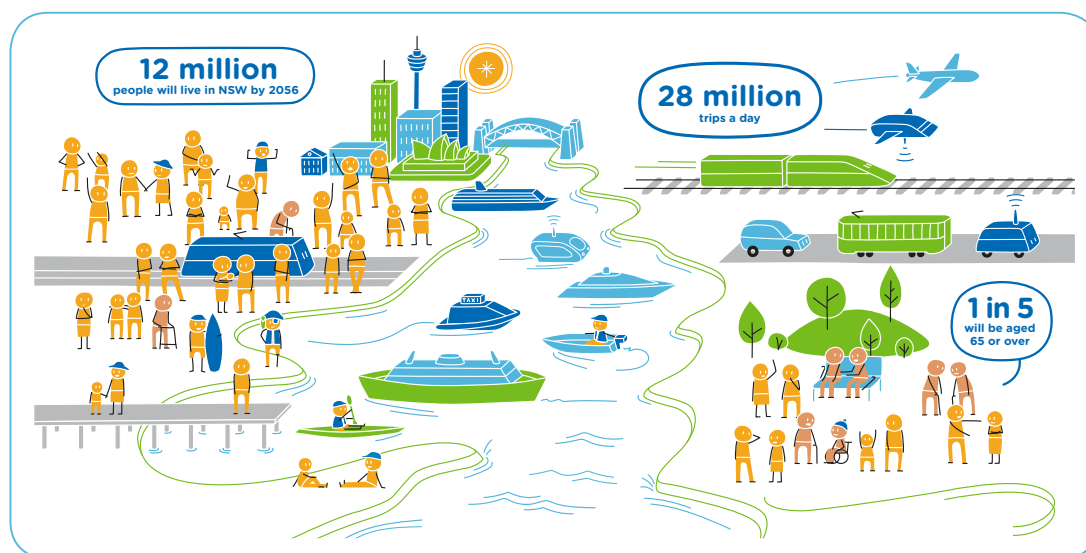


Figure 2: NSW's growing population

1 IPART report on comparing surveys on point to point use – November 2014 to February 2017



## Why planning transport for 40 years is critical

Transport matters to every person, business and visitor in the state, and supports economic, social and environmental outcomes

### The importance of our choices today

Change is occurring rapidly, which presents challenges when predicting future technologies and customer trends. While it is impossible to predict the future, the options and plans we put in place today can benefit NSW for generations to come.

Economic and population growth, with inevitable constraints on our resources, mean that we face 'fork in the road' decisions with long term impacts. This brings with it the opportunity to reshape future travel behaviours, revitalise regional areas, improve safety and reduce the cost of providing infrastructure. We will do this through long term, agile transport planning that supports a productive economy, liveable communities and more sustainable transport solutions.

### A productive economy

An efficient transport system, results in greater economic performance. Transport enables businesses to reach new markets, attract new investment, while presenting more job and training opportunities. By contrast, congestion and network inefficiency increase costs, constrain growth, and stifle economic development and the mobility of services and labour.

The long term, vision-led and place based planning introduced by Future Transport will support the economy by giving industry and communities the certainty they need for their own plans – decisions about where to invest, locate and live.

### Liveable communities

Liveable communities promote social inclusion and the health and wellbeing of the people who live in them. Transport is vital to mobility as a 'placemaker'. It can transform the public domain, activate centres and unlock new commercial and housing developments, renewing existing neighbourhoods and spaces.

The best places take time and strong partnerships to develop and flourish. Integrated land use and transport planning can activate public spaces, corridors and networks, and positively impact the delivery of health, education and local government services. Transport can improve the liveability and character of places across the state, achieve wider benefits from investment and encourage more desirable patterns of development.

## A sustainable society

Transport accounts for over 42 per cent of the state's\* total energy consumption<sup>2</sup> and a growing share of total public infrastructure investment.

While growing transport investment is critical to the wellbeing of our communities, unsustainable investment decisions risk deteriorating the government's budget position and its ability to respond to community needs in health, education, and other critical services.

As a significant emitter of greenhouse gases, transport also has a role in operating in a more sustainable way to limit environmental impacts and contribute to the NSW Government's aspirational target to achieve net-zero emissions by 2050.

Long term planning ensures the delivery of more with less, while we maximise the benefits of planned investment, and improve the emissions intensity and environmental costs.

## Building on our achievements

### The journey so far...

The 2012 Long Term Transport Master Plan responded to a period of underinvestment and poor planning of transport infrastructure in NSW. It undertook a comprehensive analysis of transport problems and generated an unprecedented pipeline of investment.

In total, over 700 projects are linked to the 2012 Plan, with 485 completed, 168 in progress and the remainder in the planning stage. These include game-changing projects such as [Sydney Metro](#), [Sydney CBD & South-East Light Rail](#) and [WestConnex](#) as well as much needed infrastructure in our regions through programs such as [Fixing Country Roads](#) and [Fixing Country Rail](#). The 2012 Plan also extended state-wide programs like the [Transport Access Program](#) and delivery of the [Disability Action Plan](#).

The projects set out by the 2012 Plan align with State Priorities to deliver better infrastructure and services, create safer communities, reduce road fatalities by more than 30 per cent by 2021 and improve road travel reliability and on time running.

Since 2012, other government initiatives have also improved alignment across Government to integrate strategic planning and join up service delivery. The Government's metropolitan plan identifies opportunities for urban renewal and new housing development around major transport investments, while the Greater Sydney Commission's [Growth Infrastructure Compacts](#) bring together service and infrastructure planning to better meet the place-based needs of communities.

<sup>2</sup> NSW Environment Protection Authority (EPA) State of the Environment Report 2015  
\* Includes Australian Capital Territory (ACT)

The NSW Government and local Councils, in collaboration with industry, are also completing Regional Economic Development Strategies (REDS) which will cover all regions in NSW. The REDS identify a range of projects and other initiatives, including transport projects and initiatives, which can be undertaken to support and stimulate regional growth. Where these strategies identify state-wide transport projects or initiatives they have been considered in Future Transport. Region-specific or local projects and initiatives will be considered during the development of region-level plans.

#### **Status of 2012 Long Term Transport Masterplan Projects**

### **Commencing the next phase of transport improvement**

Improvements resulting from the 2012 Long Term Transport Master Plan have created a solid foundation for the deployment of new technology and innovative service models.

Outside of planning and service delivery, the last six years have also seen rapid advances in technology and mobility services, effectively altering the transport landscape. The advent of ridesharing services, the introduction of on-demand services, and the widespread use of technology have demonstrated how quickly innovation can reshape transport.

Through Future Transport 2056, NSW will maximise the benefits of emerging technologies and innovation in delivering outcomes for customers and the community, enhancing the productivity, liveability and sustainability of our state.

## **What change is Future Transport responding to?**

The next 40 years will see more technology-led transformation than the past two centuries

### **Technology is changing how we travel – and how we deliver transport**

Transport is a technology business.

Rapid innovation is changing traditional modes of travel. Buses, trains, cars and trucks are increasingly automated, safer, and will gradually need connection to a smarter network. But the changes we are witnessing come not just from the hardware but from the new operating models technology can support.

Data sharing and mobile technology give customers smarter ways to choose and buy services, and allow providers to respond to customer needs flexibly. Customers have more choices about where they want to go and how they want to get there – not necessarily which mode they use. The future will see more mobility services delivered to reflect customers' personal preferences.

The uptake of ridesharing indicates our customers are early adopters of technology-enabled services. In the two years following the introduction of rideshare services, new service models were extending to outer metropolitan areas, and driver authorities for hire car and rideshare drivers grew ten-fold.

In regional NSW, new technologies could transform transport services, with data-driven models matching demand with a range of service and vehicle types meaning more personalised and economically sustainable transport.

Our approach to technology-enabled mobility is underpinned by the Future Transport Technology Roadmap, delivered in 2016, which set out five strategies:

1. Personalise customer interactions: moving to customised, integrated service systems, smart digital mobility platforms, and frictionless access and payments
2. Transform the mass transit network: incorporating automation to improve safety, service frequency and travel times and attract customers from private car use
3. Foster shared, demand-responsive services: enabling flexible, shared use service models
4. Enable connected and automated vehicles (CAVs): supporting vehicles and enabling infrastructure that improves mobility services, efficiency, reliability and safety
5. Create intelligent transport networks, managed with data: installing technologies and building networks that actively gather data, using Artificial Intelligence and real time analytics to optimise capacity and planning.

Future Transport 2056 draws on the Roadmap strategies with an aim to be ready to harness the opportunities created by technology – not to pre-empt future developments.

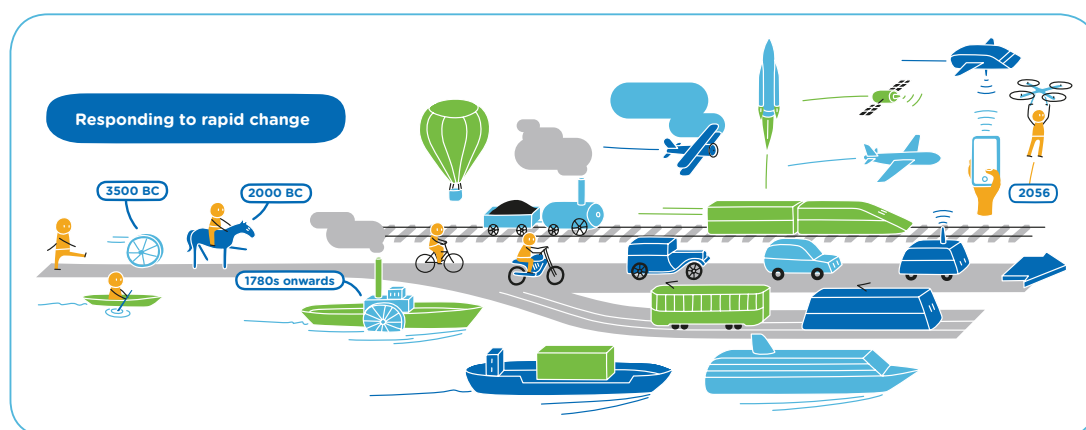


Figure 3: Responding to rapid change

## A new way of planning transport

Future Transport 2056 is a new approach to planning where we closely engage with our customers, industry and communities through 'co-operative design', or simply – 'co-design'.

Co-design means early involvement in the design process and ongoing collaboration with all of our stakeholders – customers, transport staff, the transport supply chain, industry, other government agencies and the wider community. This approach is designed to deliver an end result that meets stakeholders' needs and ensures that the people who use or are affected by the transport network have a place at the table in making planning decisions.

We used the co-design approach by involving stakeholders as we finalised the Future Transport Strategy and Plans. The Future Transport team visited over 60 regional and metropolitan locations to talk to the community, industry and local councils and directly seek their input. The Future Transport campaign also led to 10,000 website reactions to the Strategy and Plans, 2,000 comments and more than 500 submissions. We also used new ways of engaging young people, including a social media campaign that reached 1.2 million people.

### Future Transport phase 3 engagement tour

102 engagement sessions in 53 locations across NSW (23 October – 3 December 2017)

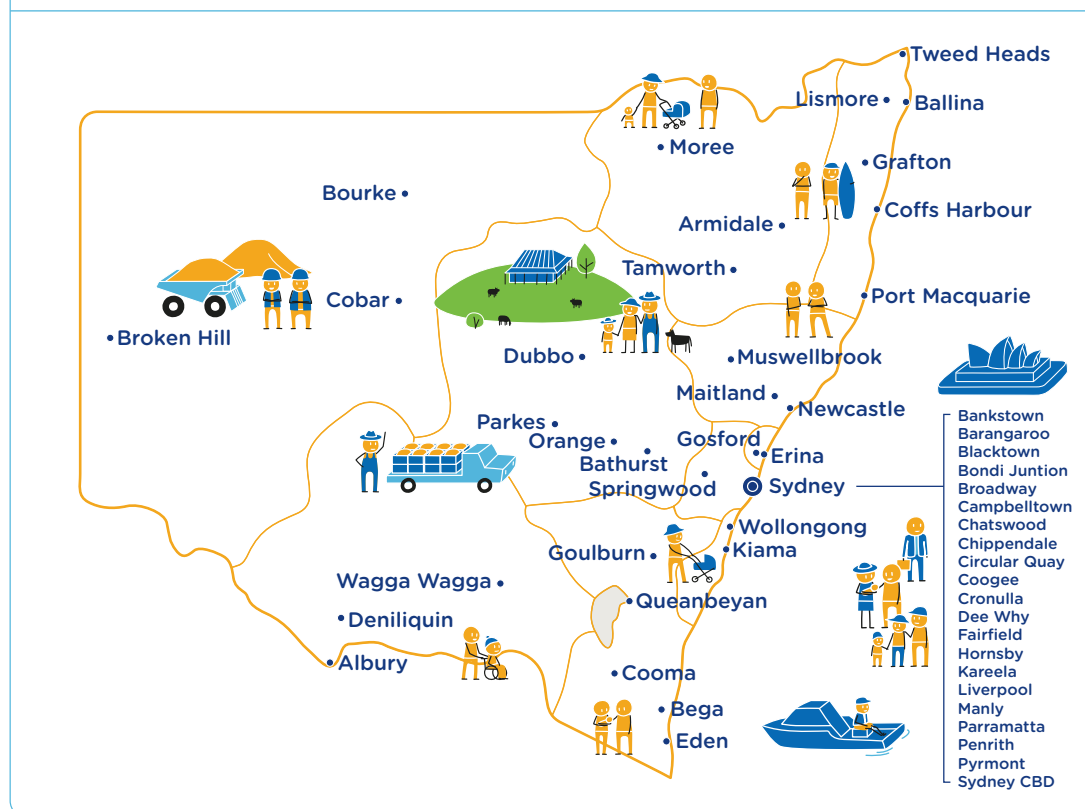


Figure 4: Locations of Future Transport 2056 visits



By consolidating and considering all feedback we have refined our plans so Future Transport 2056 truly reflects what our customers want. For example, we have heard that more needs to be done to explain the benefits of our proposed initiatives, so a comprehensive list of initiatives and their proposed benefits is now included in each of the Greater Sydney and Regional NSW Services and Infrastructure Plans.

We heard that more cycling and walking infrastructure needs to be delivered sooner, so we have changed our plans to reflect that too.

### How will we work in the future?

Transport for NSW already uses co-design to plan for many new initiatives. The on-demand service trials across the state and the call for [Expressions of Interest for a regional Connected and Automated Vehicle \(CAV\) trial](#) are examples of how we are getting better at involving our customers and communities at the initial stages of projects.

In the coming months, Transport for NSW will develop a set of co-design principles specific to our transport system that will be introduced and embedded across all agencies in the transport cluster.

Transport for NSW will also introduce processes to ensure regional communities have access to planners and decision makers for all aspects of transport including roads, public and active transport and new technologies and service models.

The lessons learned from Future Transport 2056 will influence how we will work differently in the future by:

- ▶ Enhancing current partnerships and creating new ones and better engaging customers
- ▶ Embracing new methods of planning to respond to changing technology and customer trends
- ▶ Changing our workplace culture and the way we do business internally.

### Maintaining our 'living' document

Future Transport 2056 is not a static document to be placed on the shelf and updated every few years. Its purpose is to guide future transport planning in an unpredictable environment and help us respond and adapt to changes as they arise.

The strategy and plans identify a number of strategic directions and visionary initiatives. How these are incorporated into transport planning is not yet determined as their delivery is subject to business case processes, funding availability, the developing network and changing customer needs.

This is why we need to continue to update the Strategy and Plans and constantly monitor and report on our progress in delivering on outcomes.

Information on how we will measure and report on our progress in line with Future Transport outcomes is included at Chapter 10.

## Forging the future together

The level of community and stakeholder involvement that Future Transport promotes is unprecedented in transport planning in NSW. We are looking forward to continuing to work with our industry and community partners to deliver an innovative and modern transport system that meets the needs of our customers and supports growth across the state.



Figure 5: Engaging our customers on Future Transport 2056

CHAPTER

# 1

A Vision for  
Transport

Transport is an enabler of economic and social activity and contributes to long term economic, social and environmental outcomes.

The vision is built on six outcomes:

- 1 Customer Focused
- 2 Successful Places
- 3 A Strong Economy
- 4 Safety and Performance
- 5 Accessible Services
- 6 Sustainability

**This chapter sets out the long term vision for mobility and transport provision in NSW.** It explains how the customer experience of transport will change and what this means for Greater Sydney and regional NSW.

Future Transport 2056 outlines six state-wide outcomes to guide investment, policy and reform and service provision. They provide a framework for planning and investment aimed at harnessing rapid change and innovation to support a modern, innovative transport network.

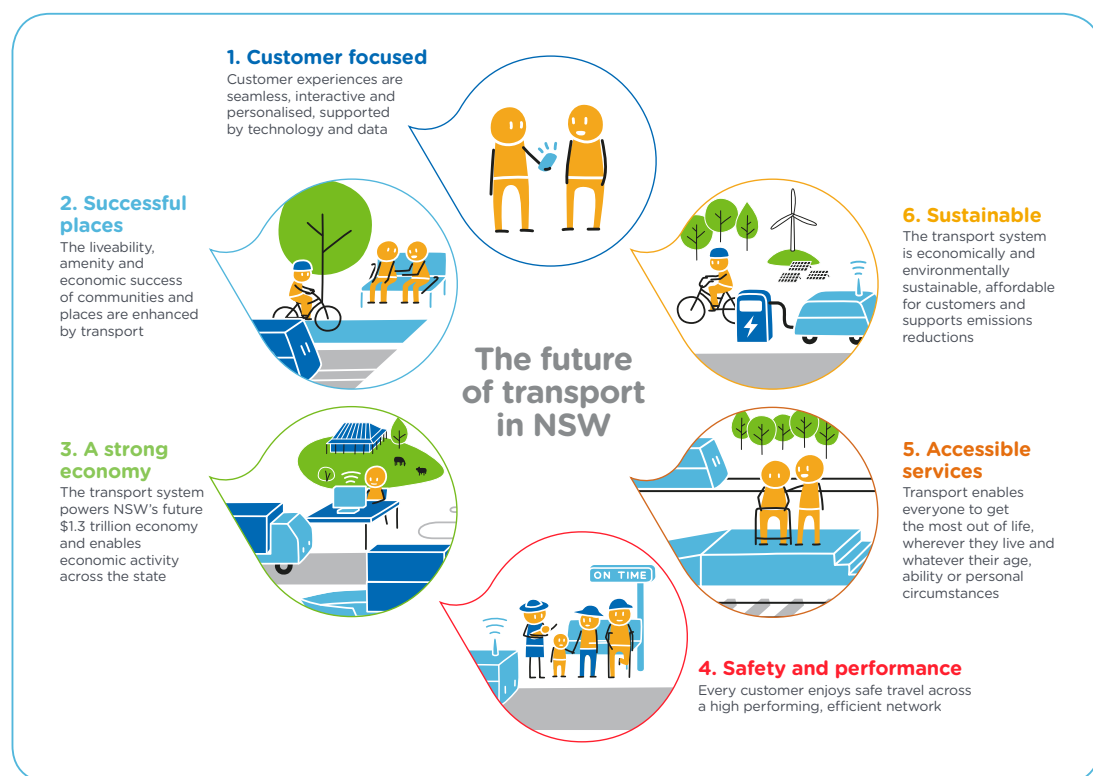


Figure 6: Future Transport's six state-wide outcomes

## Customer Focused

Customer experiences are seamless, interactive and personalised, supported by technology and data

### Moving to 'Mobility as a Service' (MaaS) and beyond

The future of mobility is customer-focused, data-enabled and dynamic. In the future, personal mobility packages will bundle traditional 'modes' with technology platforms and new service offerings like on-demand, car share, rideshare and smart parking. The NSW Government is already trialling an early form of this technology on the Northern Beaches where [carparks at some B-Line bus stops are activated by Opal cards](#).



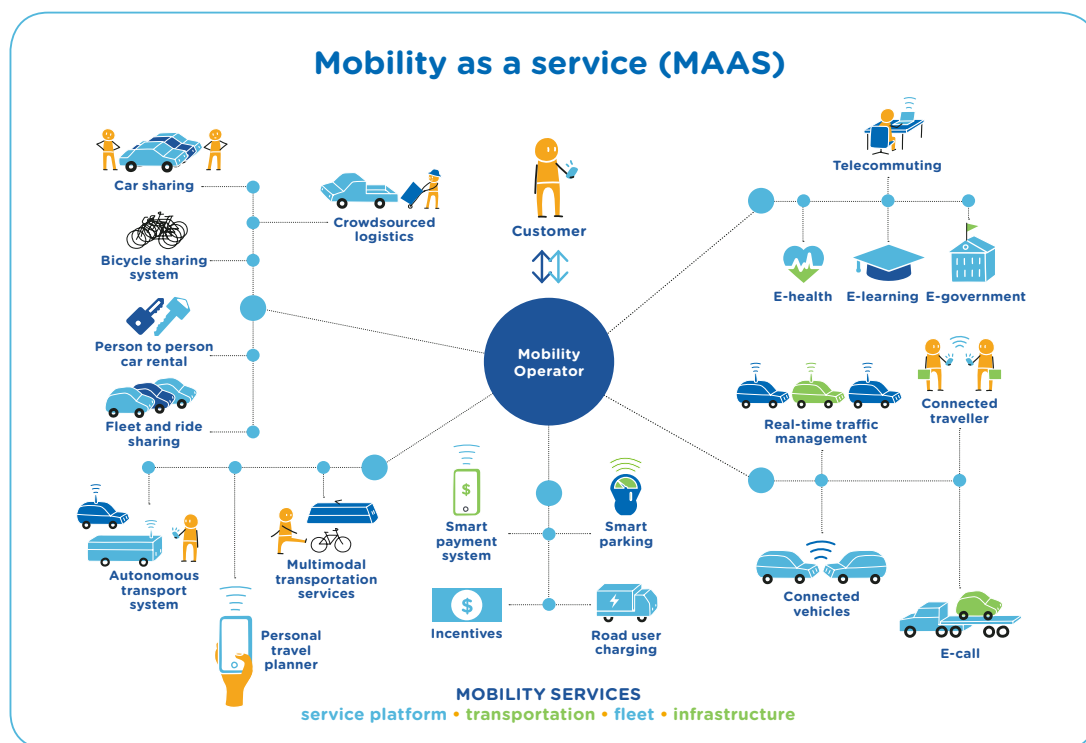
In the not too distant future our smartphones will be the gateway for each journey. Customers will make travel choices based on factors that matter most to them – service frequency, cost, emissions, comfort, or travel time.

MaaS is a service model that enables customers to plan and pay for their journeys using a range of services via a single customer interface. It has the potential to enable customers to access integrated, easy-to-understand journeys in a broad market of transport services. In a fully operational service model, the MaaS provider would sell seamless multimodal journeys, offer convenient payment methods such as subscription services, and communicate directly with customers.

Big data refers to the extremely high volume of data we receive each day from the transport network that can be analysed to reveal travel patterns and trends. This information in addition to new technologies will enable service providers to connect with customers, know their preferences, and tailor service offerings in real time.

The investments we make in whole of network information management systems will enable real-time and innovative regional service responses that better use the network. For example, regional customers will access innovative, on-demand services that aggregate similar trips quickly for more efficient travel, connecting them with a range of public, private, and community transport providers offering a mix of services.

Seamless experiences will also connect customers to facilities for active transport such as walking routes, bike paths and bike hire services.



Source: Telematics Wire, 10 February 2016 <http://telematicswire.net/mobility-as-a-service-maas-launches-first-on-demand-mobility-service-in-finland/>

Figure 7: Example of the Mobility as a Service (MaaS) concept

## Successful Places

The liveability, amenity and economic success of communities and places are enhanced by transport

### Activating centres with a new Movement and Place framework

Successful places include attractive spaces where people can meet and enjoy their leisure time, such as town squares, libraries and community centres, parks, sportsgrounds and waterways. Being able to access these spaces easily by active or public transport encourages people to be more physically active and increases social interactions in communities.

Centres, both in metropolitan and regional areas, are the places where the majority of jobs and services are located as well as attractions like shops, restaurants and parks. Roads through and around these centres serve an important movement purpose, allowing people travel to and from the centre and move around easily within it. They also serve a place function by operating in a way that allows attractive places for people and strong local economies to develop and thrive.

The Movement and Place framework provides a tool to manage the road network in a way that supports safe, efficient and reliable journeys for people and freight while enhancing the liveability and amenity of places.

The Framework will guide specific corridor and place plans to be developed as supporting plans of Future Transport 2056. A Movement and Place Practitioners Toolkit will be made available to provide guidance to stakeholders involved in planning, designing and operating the road network.

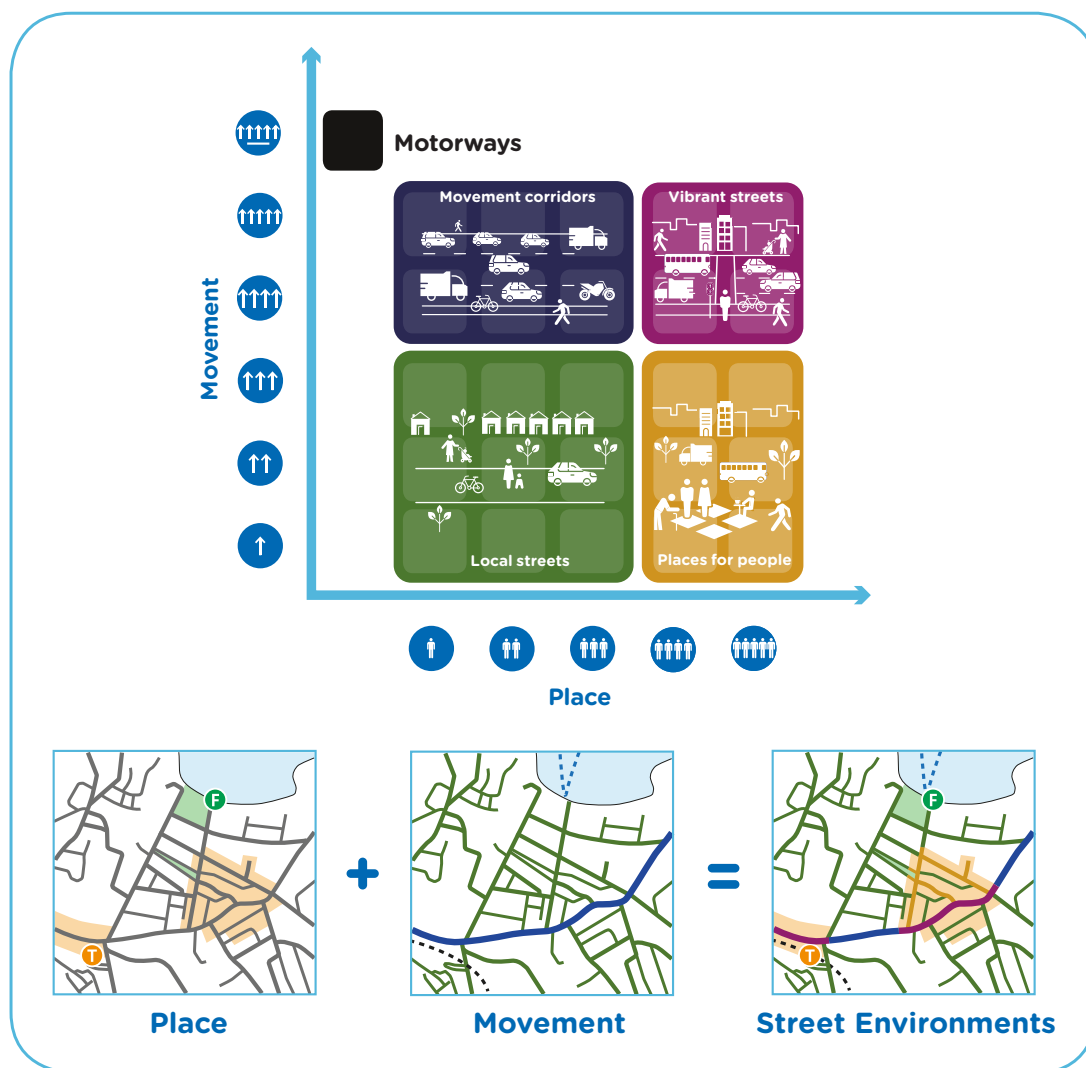


Figure 8: Movement and Place

## Encouraging active travel (walking and cycling) and using public transport

To encourage more people to use public transport we need to provide better connections, improve service frequency out of peak hours and offer more flexible services. We need to continue expanding the reach and responsiveness of services, while addressing pain points such as overcrowding and congestion.

The delivery and modernisation of infrastructure to allow greater access for people with disabilities and those with limited mobility will also assist in encouraging public transport use by providing a more seamless public transport experience, particularly at interchanges.

One in 8 NSW residents ride a bicycle in a typical week<sup>3</sup>. More people traveling by active transport will improve network outcomes overall in addition to delivering positive health, wellbeing and environmental outcomes. Increasing the number of people using active transport for short trips to their local and city centres will require us to look at safe, well connected infrastructure such as bike paths and walking routes.

We know that we need to look at initiatives that support people using active transport for short trips including the provision of safe and accessible footpaths, designed for all ages and abilities with frequent seating and shade. Other factors that encourage active transport include safe pedestrian crossings, lower traffic speeds, safe, separated cycling paths and before and after trip facilities such as secure bicycle storage.

Transport for NSW is already delivering initiatives to increase active transport. As part of [Sydney's Cycling Future](#) program, secure bike storage is being rolled out across the network providing undercover storage at selected railway stations.



Information in addition to  
new technologies will enable  
service providers to connect with  
customers, know their preferences,  
and tailor service offerings  
in real time.

<sup>3</sup> Australian Bicycle Council 2017 National Cycling Participation Survey, available at <http://www.bicyclecouncil.com.au/publication/national-cycling-survey-2017>

## Strengthening local partnerships

A strong vision supported by sound development and planning decisions will sustain a long term focus on growing the vitality of places and activating emerging cities. The vision will help us improve the accessibility of local communities in Western Sydney and in the regions to areas of major economic opportunity.

The NSW Government will work with local councils and communities on integrated transport and land use planning and investigate the potential to develop 20 year precinct plans for all strategically important centres and places. The plans will focus on balancing the transport movement needs of the community with high quality urban design that supports community safety, health and wellbeing and enhances community assets and local character.

As part of this, Transport for NSW will proactively work with its service delivery partners, supply chain and local communities to identify ways to reuse or re-purpose assets that are life expired to address social challenges in the community, such as homelessness and Aboriginal health and education.



Figure 9: Successful places supported by transport, Barangaroo Ferry Wharf



## A Strong Economy

The transport system powers NSW's future \$1.3 trillion economy and enables economic activity across the state

### A transport system that powers our future \$1.3 trillion economy<sup>4</sup>

By 2056, increased automation, freelancing and 'virtualisation' and a strong services economy will enable a vibrant, modern economy that creates and supports new industries and jobs.

In the future, NSW will be Australia's first trillion dollar state economy. Economic productivity will grow as the network moves people more efficiently to jobs centres and provides firms with access to the right workers, skills and customers. Future technology will also enable productivity-enhancing flexibility in the way people work and the times of day they travel.

Technology will drive new industries – with the World Economic Forum predicting that some 65 per cent of children entering primary school today will hold jobs in the future that do not yet exist.<sup>5</sup>

At the same time, today's substantial freight task will continue to expand. Our primary industries, which today contribute around \$14 billion to State Gross Value Product<sup>6</sup>, will continue to grow, strengthening links to global export markets.



Figure 10: Freight to port

<sup>4</sup> NSW Intergenerational Report 2016

<sup>5</sup> The Future of Jobs, Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution, World Economic Forum, 2016

<sup>6</sup> NSW Primary Industries Performance Data and Insights 2016, Department of Primary Industries

By 2056, the state will be served by high performing container ports, with Port Botany and Port Kembla servicing our growing population centres and the Newcastle Port continuing to be our primary coal export facility as it diversifies to enable the export of other commodities. Integrated road and rail logistics chains supported by intermodal terminals and dedicated, high performing freight pathways will connect Greater Sydney with the regions.

'First and last mile' freight will be transformed by technology delivering efficiencies in logistics and small parcel movements, incorporating innovative direct-to-consumer deliveries and supporting 'freight as a service' models. Advances in technology relating to drones and 3D printing also have the potential to impact supply chains.

### **Strengthening our Global Gateways and Satellite Cities**

Over the next 40 years, Greater Sydney will grow as a global tourist and skilled worker destination, and as Australia's gateway to Asia. It will be supported by growth in its three cities – the Eastern Harbour City, the Central River City and the Western Parkland City.

By 2056, economic and housing growth around Greater Sydney will drive integration across the city's hinterland, establish Gosford and Wollongong as 'satellite cities' and Newcastle, Canberra and the Gold Coast as 'global gateway cities' – the key entry points to NSW. Population and economic growth in these areas will require fast transit connections to Greater Sydney.

### **Connecting people to jobs, goods and services in our cities and regions**

The vision for Greater Sydney as a metropolis of three cities will guide planning, investment and deliver customer outcomes including faster, convenient and reliable travel times to one of the three cities or to the nearest strategic centre.

The 30 minute city will be one where people can conveniently access jobs and services within 30 minutes by public or active transport, 7 days a week. The vision is based on research that indicates that if people are required to travel more than 90 minutes a day, their quality of life and the liveability of their city is impacted.

Regional cities and centres will be connected to outlying towns and centres by a 'hub and spoke' network. They will be centres for health, education, and justice services as well as providing access to employment opportunities and air transport connections.

Towns and villages will offer employment and housing and will continue to be important in attracting domestic and international visitors, bringing job opportunities and economic benefits to rural communities.

## Safety and Performance

Every customer enjoys safe travel across a high performing, efficient network

### Safety, security and performance are interlinked

Reducing road fatalities is a [State Priority](#). The NSW Government is committed to making NSW roads the safest in the country. However, sadly, the 2017 road toll saw 392 lives lost on our roads<sup>7</sup>, 12 more than in 2016. Almost 70 per cent of lives lost happened in regional NSW. Unfortunately, the start to 2018 has seen a number of horrific crashes which further highlights the need to improve the safety of our roads for all customers.

With the release of the [NSW Road Safety Plan 2021](#), we have set a State Priority Target to reduce fatalities by at least 30 per cent on 2008–2010 levels by 2021. In addition to short to medium term goals, we are also setting ambitious long term goals for the safety of the network. Towards 2056, NSW will approach a trauma-free transport network, saving up to 350 lives and 12,000 serious injuries each year and cutting the cost of road trauma to the community by over \$7 billion a year in today's dollars.

The Road Safety Plan is based on leading expert advice and evidence, as well as broad community consultation, on the best ways to prevent and reduce the impact of crashes and reflects the internationally recognised [Safe System](#) approach to improving road safety.

Over the next five years the NSW Government will take coordinated action to improve the safety of roads and vehicles, set safer speeds and to ensure safer road user behaviour across six priority areas including:

- ▶ Delivering a new [Saving Lives on Country Roads](#) program
- ▶ Strengthening penalties and enforcement to tackle drink and drug driving behaviour, including doubling mobile drug testing to 200,000 tests by 2020
- ▶ Increasing safety for vulnerable road users by providing pedestrian crossings and working with councils to extend 40km/h zones in high pedestrian and local areas
- ▶ Working with the heavy vehicle industry to improve operational safety and increase uptake of safety technology
- ▶ Adopting a new purchasing policy to help make Government fleet vehicles the safest in the country
- ▶ Implementing legislative changes to allow camera based technology to enforce mobile phone use offences, and further analyse the role of distraction in the road toll.

Achieving our safety vision will mean ensuring the majority of road travel occurs on 4–5 star roads, the standard informed by Safe System assessments and design principles. These principles identify key safety measures known to reduce road trauma including median and roadside safety barriers, wide centreline audio tactile line marking and traffic calming methods such as 2+1 treatments, which incorporate two lanes in one direction and one lane in the opposite direction, separated by a flexible safety barrier.

New vehicles and smart infrastructure will design trauma out of the network through greater automation and technologies such as Intelligent Speed Adaption (ISA). For example, connected and automated vehicles (CAVs) are expected to reduce rates of road trauma caused by human error, improve traffic flow and efficiently manage higher traffic volumes.

City-shaping passenger and road corridors will help deliver a safer, more reliable, high performing network. Corridors will be built and upgraded with automated mobility and smart networks, including all NSW Motorways, and will be supported by a developing market of flexible and convenient first and last-mile service providers that enable rapid and seamless connections to these corridors.

Greater separation of major traffic flows will support higher performance and safety with freight bypasses of major regional cities and centres. Improved separation of transport modes will remove interactions that raise both unnecessary safety risks and negative impacts upon efficiency (for example, level crossings).

Transport for NSW will continue to set and influence safety policy and practices through investment and planning decisions as well as industry guidance and standards. It will also continue to articulate safety, security and performance levels through contracts with operators, suppliers and other stakeholders.



Figure 11: The Safe System approach

## A secure network in the 'Digital Age'

In alignment with the [NSW Digital Government Strategy](#), Transport for NSW is developing strategies to shape the most customer-centric, innovative, digitally-enabled transport system in Australia. This will create exciting opportunities for more digital, interconnected, intelligent, and automated services for our customers.

These transformational changes bring tremendous opportunities and also a greater responsibility and need to protect our transport critical infrastructure and services from evolving cyber threats to keep the network safe and reliable.

Transport is implementing a cluster-wide cyber uplift program focusing on people, processes and technology which takes into account learnings from the safety culture and governance already in place. The program will continue to evolve to address the highest risk priorities as we go through cluster-wide cyber risk identification activities.

With up to 95% of cyber incidents related to human error, Transport is taking steps to strengthen our human firewall, by engaging across the cluster on cyber security, ensuring everyone understands the role they play in protecting customers and services, and training all staff in how to prevent, recognise, and respond to cyberattacks.

Recognising that a joined up approach is needed to address cyber threats landscape, a cross-cluster Cyber Leadership Board has been formed to govern cyber security initiatives.



The NSW Government is  
committed to making NSW  
roads the safest in the country.

## Accessible Services

Transport enables everyone to get the most out of life, wherever they live and whatever their age, ability or personal circumstances

Access to transport is fundamentally important for all people in NSW. Yet one in five people who responded to an online survey reported that they cannot travel by private vehicle, and more than two in five reported that they cannot access public transport because they are living with disability, are elderly or live in areas with low or no public transport services.

The NSW Government recognises the importance of delivering high quality transport services to all customers. A set of three supporting plans for Future Transport 2056 will provide details about how we are improving the accessibility of transport services, infrastructure and products.

The first of these to be released is the [Disability Inclusion Action Plan 2018 to 2022](#) which explains the achievements and forward actions that are improving access to transport services for people living with disability.

The ways in which our transport services will be tailored to better suit the needs of our older customers so they can maintain active and independent lives will be explained in an Older Persons Transport and Mobility Plan. This plan will set out actions that Transport for NSW will undertake to contribute to the state-wide goals of the [NSW Ageing Strategy](#).

Other barriers to accessing transport include having limited transport options available, especially in remote areas of regional NSW; affordability of services for some individuals and families on low incomes; and difficulty accessing the network for people from some cultural and language groups.

A Social Access Plan will explain ways to increase equitable transport access and reduce transport disadvantage, especially for Aboriginal communities. It has been developed with extensive community consultation throughout NSW and will provide guiding principles aimed at successfully connecting people to opportunities that promote social inclusion.

### A fully accessible network that enables barrier-free travel for all

An accessible network will mean more choice for people with mobility constraints and make travel easier for everyone.

The [Transport Access Program](#) is an example of the Government working to improve accessibility of the rail network and increase compliance with the federal [Disability Discrimination Act \(1992\)](#) and accompanying disability standards.

In regional NSW, [NSW Trainlink](#) services will use a new fleet of accessible trains for intercity and regional travel. In addition, the [Country Public Transport Infrastructure Grant Scheme](#) will continue assisting councils with the renewal of the state's bus stops to provide accessibility and shelter.

In metropolitan areas, new ferries will replace some of the current fleet as they are retired and the [Sydney Metro](#) and [Sydney Light Rail](#) will be among the first projects to deliver a fully accessible fleet and assets.

All Sydney Metro stations will have safety doors on the edge of platforms and there will be level access between platforms and trains. Carriages will include wheelchair spaces, priority seating and emergency intercoms, as well as multi-purpose areas for prams, luggage and bicycles. The delivery of Sydney Metro will progressively upgrade the 122-year-old railway line transforming stations, like Dulwich Hill, with new lifts and level access between platforms and trains. Customers on the Bankstown Line will see the benefits of station upgrades from 2020.

Over time, the whole transport network will be accessible through the delivery of new assets or by upgrading or repurposing existing assets. The accessibility of new infrastructure projects is being assured through compliance with relevant standards and through extensive user testing and ongoing consultation with peak disability groups.

### Inclusive customer service and information

Technology that provides customer information, travel planning and wayfinding, such as websites, real time information at transport facilities, on board trains, buses and ferries and trip planning apps are progressively becoming more accessible. In particular, there have been significant advances in smart phone apps that provide specialised assistance for people with disability. As technology advances, we will seek opportunities to improve the accessibility of transport information and the way we gather feedback from all customers.

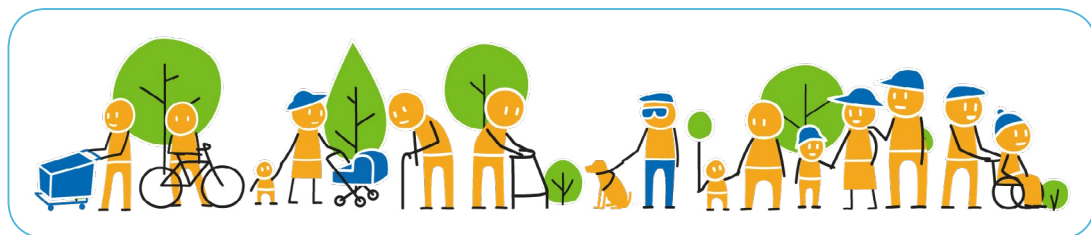


Figure 12: Empowering every customer

## Sustainability

The transport system is economically and environmentally sustainable, affordable for customers and supports emissions reductions

### An affordable network that is responsive to change

As the public transport network grows, new services and infrastructure will be needed to meet demand. Investing in the future network, while maintaining our current investment program, will require a financially sustainable transport system which shares operational and capital costs equitably across users, taxpayers, investors and other beneficiaries.

NSW will need to consider a range of approaches to secure revenue sources and deliver continued efficiencies through improved operations and maintenance, innovation and a commercial focus on asset management.

### Supporting more environmentally sustainable travel

Moving people from private vehicles to more sustainable transport modes will reduce congestion and the transport sector's emissions intensity, improve air quality and support better health and wellbeing.

Well planned centres and cities, will enable a shift from private cars to public transport and active transport modes such as walking and cycling. In Sydney, the key to this will be the delivery of three 30 minute cities, supported by reliable 'turn up and go' mass transit services.

Managing the transport system's cost-effective transition to a low emissions environment and managing its climate change risks will also help deliver the Government's [Climate Change Policy Framework](#) and its aspirational target of zero net emissions by 2050.

The transport network's physical assets will be built and maintained to a standard to withstand extreme weather and sea-level rise with minimal damage and disruption to network functionality.



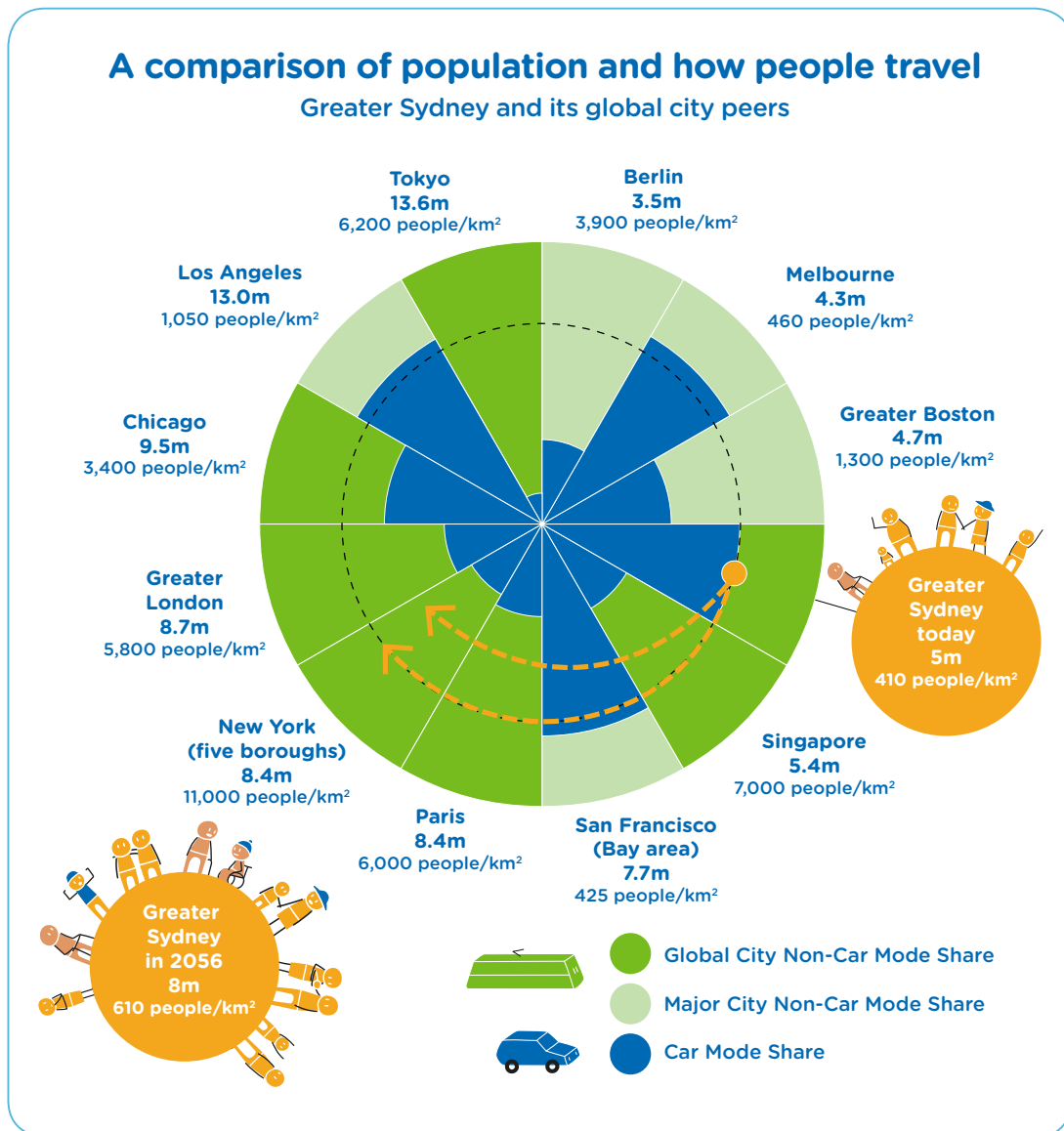


Figure 13: Private vehicle mode share – international comparison

CHAPTER

# 2

Future Transport  
in regional NSW

## A 'hub and spoke' network of services in regional areas will provide better connections between communities and improved access to regional cities and centres

The Future Transport Regional Infrastructure and Services Plan explains how we will provide people and businesses with safe and reliable travel options.

Future investment in regional NSW will provide manufacturers and producers with the opportunity to participate in the global economy by connecting them to domestic and international consumer markets.

Connections in regional NSW will focus on a 'hub and spoke' network model radiating out from regional cities rather than a network focused on Sydney. This will capitalise on the role that regional cities and centres play as hubs for employment and services such as retail, health, education and cultural activities.

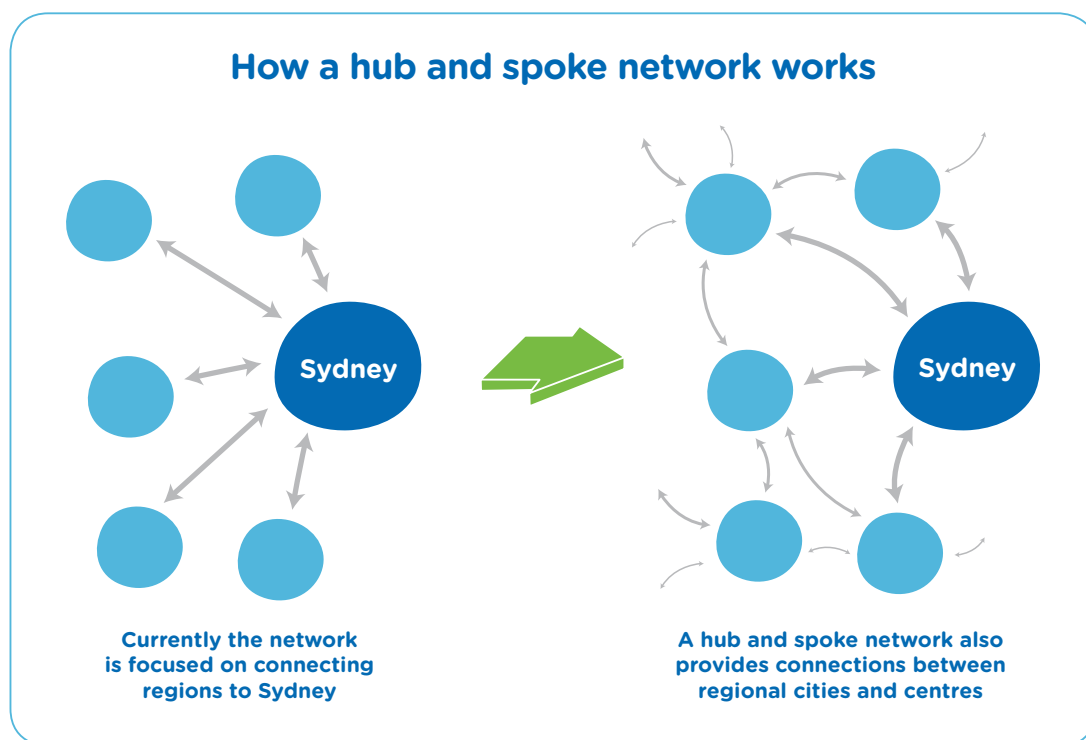


Figure 14: Moving from a Sydney-focused network to a focus on your local regional city

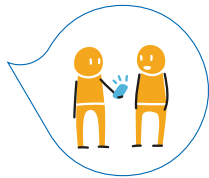
To ensure that we maintain our customer focus in the future we have developed ten customer outcomes for regional customers that directly link to the Future Transport 2056 outcomes.

## Regional NSW Customer Outcomes

### Future Transport Statewide outcomes

### Regional NSW transport customer outcomes

#### Customer Focused



#### Convenient and responsive to customer needs

1. Flexible services are an integral part of the transport system helping to deliver reliability
2. A transport system that adapts to and embraces new technology

#### Successful Places



#### Sustaining and enhancing the liveability of our places

3. The appropriate movement and place balance is established enabling people and goods to move efficiently through the network whilst ensuring local access and vibrant places
4. Supporting centres with appropriate transport services and infrastructure

#### A Strong Economy



#### Connecting people and places in the growing city

5. Changes in land use, population and demand, including seasonal changes, are served by the transport system
6. Economic development is enabled by regional transport services and infrastructure

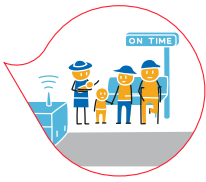
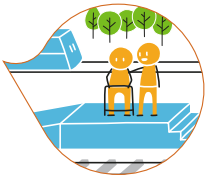

Future Transport Statewide outcomes	Regional NSW transport customer outcomes
<b>Safety and Performance</b> 	<b>Safely, efficiently and reliably moving people and goods</b> <ol style="list-style-type: none"><li>7. A safe transport system for every customer with zero deaths or serious injuries on the network by 2056</li><li>8. A transport system that is resilient to significant weather events including floods, fog and bush fires</li></ol>
<b>Accessible Services</b> 	<b>Accessible for all customers</b> <ol style="list-style-type: none"><li>9. Accessibility to employment and services such as health, education, retail and cultural activities within Regional Cities and Centres</li></ol>
<b>Sustainability</b> 	<b>Makes the best use of available resources and assets</b> <ol style="list-style-type: none"><li>10. Customers enjoy improved connectivity, integrated services and better use of capacity</li></ol>

Figure 15: Future Transport 2056 regional NSW transport customer outcomes

CHAPTER

# 3

Future Transport  
in Greater Sydney

## A metropolis of three cities, where people can access the jobs, education and services they need within 30 minutes by public or active transport

Sydney will grow as a global metropolis driven by major placed-based planning and investment around the new Western Sydney Airport and Badgerys Creek Aerotropolis. New technology and innovation will make the network far more responsive to demand and better able to manage congestion.

Planning and investment for Greater Sydney will focus around the three cities concept – the Western Parkland City, the Central River City and the Eastern Harbour City. Customers will be able to travel to one of these cities or to their nearest strategic centre within 30 minutes of where they live by public or active transport. This will give people better access to jobs, education and essential services.

An integrated network of corridors will support the efficient movement of people and goods throughout Greater Sydney. Future Transport 2056 is focused on three types of corridors that have been developed to align with the land use vision and to guide service levels (capacity, function and service frequencies) and infrastructure investment.

The hierarchy of corridors in Greater Sydney include:

- ▶ **City-shaping corridors** – major trunk road and public transport corridors providing higher speed and volume connections between our cities and centres that shape locational decisions of residents and businesses.
- ▶ **City-serving corridors** – higher density corridors within 10km of metropolitan centres providing high frequency access to metropolitan cities/centres with more frequent stopping patterns.
- ▶ **Centre-serving corridors** – local corridors that support buses, walking and cycling, to connect people with their nearest centre and transport interchange.

The road and rail network, including dedicated and shared freight corridors and connections to regional NSW are fundamental parts of this future transport system.

The initiatives in the Greater Sydney Services and Infrastructure plan over the next forty years will deliver 12 customer outcomes aligned to the Future Transport outcomes.

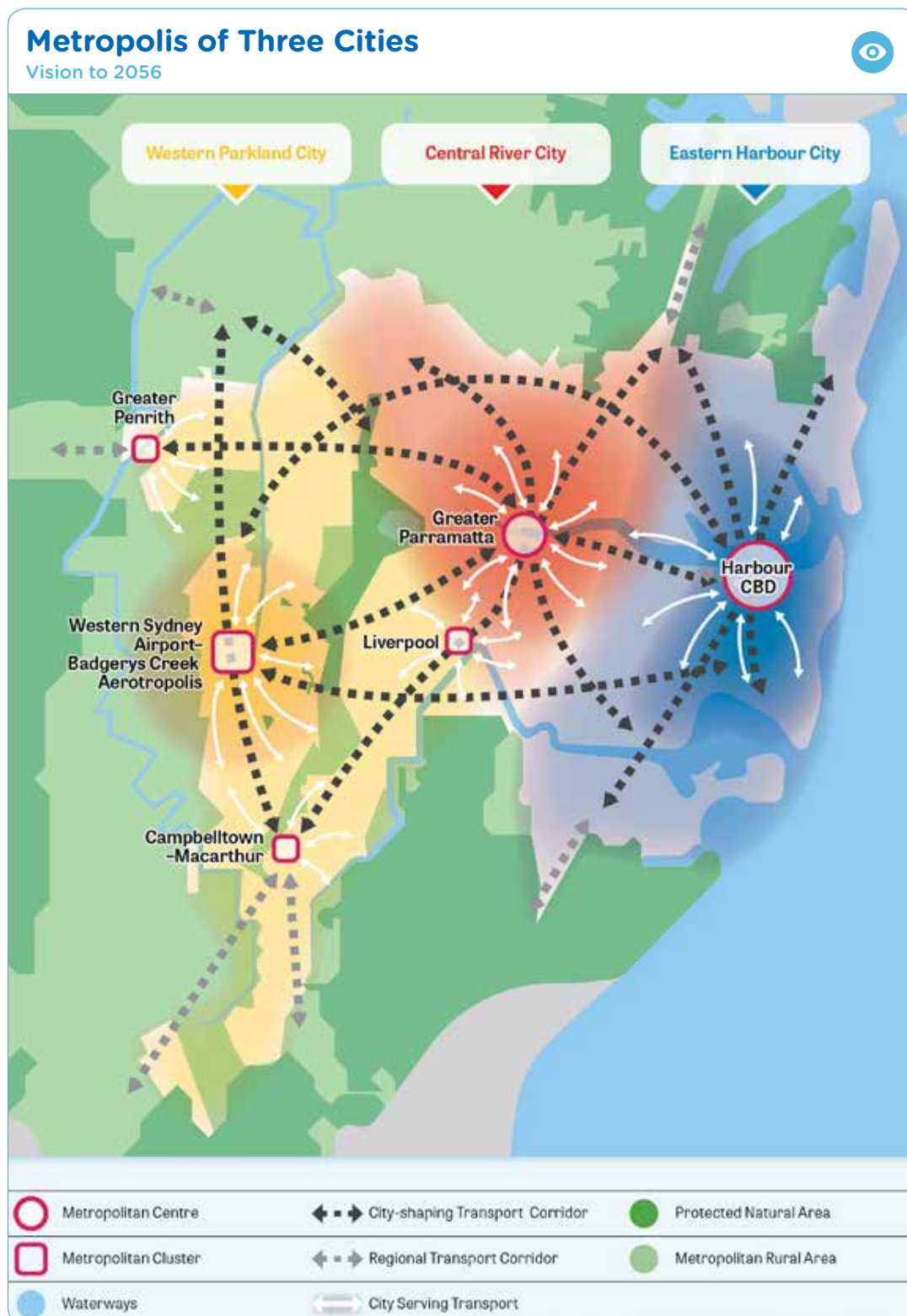


Figure 16: A metropolis of three cities

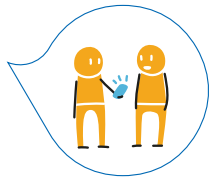


## Greater Sydney Customer Outcomes

### Future Transport Statewide Outcomes

### Greater Sydney transport customer outcomes

#### Customer Focused



#### Convenient and responsive to customer needs

1. New technology is harnessed to provide an integrated, end-to-end journey experience for customers
2. Future forms of mobility are made available to customers and integrated with other modes of transport

#### Successful Places



#### Sustaining and enhancing the liveability of our places

3. Walking or cycling is the most convenient option for short trips around centres and local areas, supported by a safe road environment and suitable pathways
4. Vibrant centres supported by streets that balance the need for convenient access while enhancing the attractiveness of our places

#### A Strong Economy



#### Connecting people and places in the growing city

5. 30 minute access for customers to their nearest metropolitan centre and strategic centre by public transport seven days a week
6. Fast and convenient interchanging, with walking times of no longer than five minutes between services


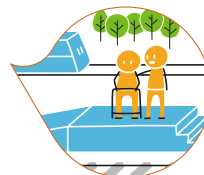

Future Transport Outcomes	Greater Sydney transport customer outcomes
<b>Safety and Performance</b>	<b>Safely, efficiently and reliably moving people and goods</b>
	<ol style="list-style-type: none"> <li>7. Efficient, reliable and easy-to-understand journeys for customers, enabled by a simple hierarchy of services</li> <li>8. Efficient and reliable freight journeys supported by 24/7 rail access between key freight precincts with convenient access to centres</li> <li>9. A safe transport system for every customer with the aim for zero deaths or serious injuries on the network by 2056</li> </ol>
<b>Accessible Services</b>	<b>Accessible for all customers</b>
	<ol style="list-style-type: none"> <li>10. Fully accessible transport for all customers</li> </ol>
<b>Sustainability</b>	<b>Makes the best use of available resources and assets</b>
	<ol style="list-style-type: none"> <li>11. Transport services and infrastructure are delivered, operated and maintained in a way that is affordable for customers and the community</li> <li>12. A resilient transport system that contributes to the NSW Government's objective of net-zero emissions by 2050</li> </ol>

Figure 17: Future Transport 2056 Greater Sydney transport customer outcomes

CHAPTER

# 4

Our  
Customers

Placing the customer at the centre of everything we do is at the heart of our transport service and infrastructure decisions.

**This chapter explains who our customers are, what they value and how their priorities will shape the plans we make and execute.** The chapter also looks at how we can improve services to attract more people onto public transport and considers the major priorities for key customer groups.

These groups include:

- › Public transport customers
- › Road customers
- › Freight customers
- › People who require greater access to the transport network to support inclusion and participation
- › Aboriginal and Torres Strait Islander communities
- › Visitors and tourists

## Our customers rely on us everyday

Our customers are at the centre of everything we do

### Who are our customers, and what do they value?

The reliability of transport services will always be a key contributor to customer satisfaction. However, our customers are also increasingly expecting greater technology-enabled personalisation, flexibility and ease of use.

Mobile phone technology is prompting a culture of immediacy, evident in the growth of tech-enabled point to point services, flexible on-demand services and applications of shared mobility. In the future, our customers will expect to shape service provision in real time, based on their immediate needs.

The way people use the network is also changing. Our future customers are less likely to have a driver's licence or own a car. Their travel patterns will also be different from today because they are more likely to be flexible about where and what hours they work, and to consider walking and cycling as part of their journey.

A successful transport system that encourages greater active and public transport can deliver positive outcomes in terms of physical and mental health, social capital and social and economic participation.

At Transport for NSW we are increasingly using "co-design" approaches, aimed at identifying factors that impact the customers travel experience and assessing, testing and validating solutions with customers. This collaborative approach has a high rate of success in providing solutions that address the root cause of customer pain points.



Mobile phone technology  
is prompting a culture  
of immediacy.



Figure 18: Transport customers

## Growing customer satisfaction and responding to changing customer needs and attitudes

Each year, our customers take 328 million trips on Sydney, intercity and regional trains, 250 million trips on metropolitan and outer metropolitan buses and 4 million trips on rural and regional buses. People in metropolitan areas also undertake 3.5 million walking-only trips and 448,000 cycling trips on an average week day.

To gain an insight into what our customers value, we have developed a [Customer Satisfaction Index](#), which reflects the voices of over 17,000 customers. In listening to their feedback, we have achieved average annual increases in customer satisfaction of 9 per cent with buses and trains.

Service innovation has played a key role in increasing customer satisfaction. The introduction of the [Opal Card](#) significantly improved satisfaction levels by enabling greater convenience and ease of connection between modes. However, customers tell us that barriers to using public transport still exist that relate to availability, frequency, reliability and areas serviced.

Improving service levels and matching demand is being aided by web-based customer interactions and electronic transactions which generate data about travel patterns that can be used to better understand customer needs. Mobile phone apps have already been adapted to provide real time service information and planning tools to public transport customers.

As these new systems evolve we will be able to capture customers' satisfaction levels throughout their journey experience. We will continue to personalise interactions, moving to customised, integrated service systems, smart digital mobility platforms, and frictionless access and payments, as set out in the Future Transport Technology Roadmap for NSW.

## Future directions to investigate

Customer satisfaction will be enhanced, and more people will choose to travel by public transport, walking and cycling.

- › Deploy the latest technologies to personalise customer interactions
- › Provide safe, quick and convenient services that offer journey times competitive with private cars.

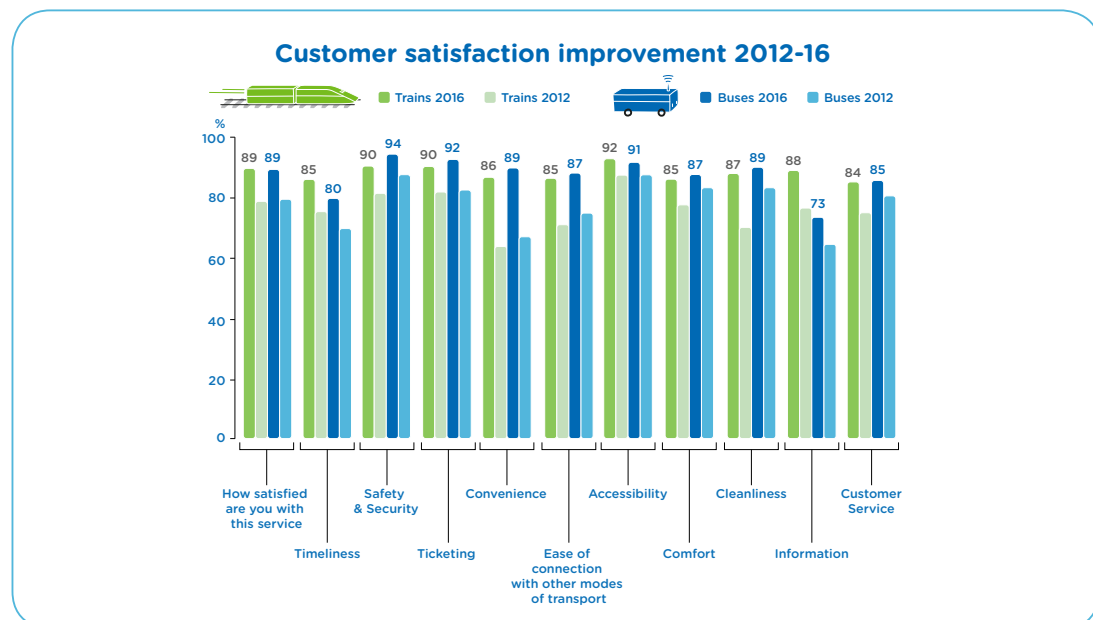


Figure 19: Public transport customer satisfaction improvement

## Our road customers

### We will meet the changing needs of road customers to ensure safe, direct and timely journeys

Our road network is the state's largest asset, carrying the majority of passengers and freight. To move the increasing number of people and goods, we must respond to the changing needs of road customers. We also need to provide safe roads for our customers and the community as we move towards a zero trauma network by 2050 through initiatives under the [NSW Road Safety Plan 2021](#).

The development and introduction of connected and automated vehicles (CAVs) over the coming years will bring about different opportunities for customers and service providers. Automation is expected to increase safety and reduce congestion and environmental impacts, particularly if used for shared vehicles.

'Smart' motorways will also improve congestion for road users, including users of city-shaping bus services, as real time data is used to manage the network and help customers avoid pinch points, disruptions and scheduled maintenance.

For further information on road safety, see ["A safely operated network"](#).

### Future directions to investigate

Road customers will have access to a safe, world class network that supports private journeys, high capacity public transport services and high productivity freight vehicles.

- ▶ Provide better road connections between key centres, particularly in regional NSW
- ▶ Prioritise efficient vehicles, taking into account the type of corridor, customer mix and the importance of local spaces
- ▶ Physically separate different road user groups with an expanded network of bus lanes and freight priority where possible
- ▶ Deliver safer roads that support optimum speeds and are resilient to extreme weather events in line with the NSW Road Safety Plan 2021
- ▶ Deliver 'smart' motorways and work with industry and innovators on new technologies that can improve the road user experience
- ▶ Incorporate safety measures at the planning and design and construction stage for all new and re-purposed road asset projects
- ▶ Apply the 'movement and place' approach to match road function with user groups and create better places and communities.



Figure 20: Many types of people use our roads – not just drivers



## Our freight customers

A market for freight pathways will benefit our freight customers and support innovation

### We will enable innovation across the freight network and encourage new service models

With freight worth \$66 billion to the NSW economy each year, our freight customers are major partners in securing the future of our State. The importance of the freight sector will continue to grow with volumes expected to double in Greater Sydney and increase by 25 per cent in regional NSW over the next 40 years.

Freight customers value reliability, efficient travel, and certainty to maximise productivity and reduce costs and energy intensity.

Network inefficiency, inconsistent regulation, and poor planning decisions, particularly around trade gateways and freight land, impose operational constraints, extra costs, and slower or unreliable delivery times, which can reduce the competitiveness of the state's businesses. Consideration of land use compatibility and the physical separation of particularly land uses from trade gateways and freight lands may be required to facilitate the efficient movement of freight.

Freight customers will increasingly harness data and analytics to achieve efficiencies that make them competitive on a local and international level. Load sharing applications will combine freight loads from different network users to maximise capacity and reduce delivery timeframes.

Direct business-to-consumer delivery models and on-demand service models will blur the lines between traditional freight companies and retail businesses, and lead to innovative partnerships. For example, Toll and eBay now offer a business-to-consumer logistics solution to connect Asian businesses to Australian customers purchasing products online. Uber and Amazon are new entrants to the freight market for 'last mile' and on-demand deliveries. In the future, drones could also alter the way deliveries are made.

With more 'last mile' deliveries as well as a growing traditional container and bulk freight task, we will need an efficient, 'smart' freight network. More effective freight corridor planning, including physical separation where appropriate, and support for intelligent transport systems (ITS), cooperative-ITS technology and connected and automated vehicles (CAVs) will be increasingly important to freight customers and essential to growing the NSW economy.

Australian governments are currently investigating heavy vehicle road reforms aimed at turning the provision of heavy vehicle road infrastructure into an economic service, where feasible. This would see a market established that links the needs of heavy vehicle users with the level of service they receive and the charges they pay and how this revenue is invested back into road services.

Heavy vehicle road reform will provide a basis for comparing road and rail freight pricing – a stepping stone towards the development of a market for freight where technology, data and analytics could support innovative ways of providing dynamic priority, and freight-as-a-service multimodal offerings.

The [Inland Rail](#) project, linking Melbourne and Brisbane, is also a major focus of Australian governments. The project, being delivered by the Australian Rail Track Corporation (ARTC), will mean major infrastructure changes to rail track in regional NSW including:

- › 37km of new track from Illabo to Stockinbingal
- › 107km of upgraded track from Parkes to Narromine
- › 307 km of new track from Narromine to Narrabri
- › 183km of upgraded track and 3km of new track from Narrabri to North Star
- › 52km of new track from North Star to the NSW/Queensland border.

Together with industry, and government partners, we will need to ensure that Inland Rail optimises the movement of freight in NSW through efficient links to ports and economically sustainable freight hubs.



Freight customers value reliability, efficient travel, and certainty to maximise productivity and reduce costs and energy intensity.

The NSW Government has released a [draft Freight and Ports Plan](#) for consultation with industry stakeholders. Following this period of consultation, the release of final Freight and Ports Plan will address key issues for the safe, efficient and sustainable movement of freight across NSW, including:

- › Effective planning and corridor protection for future freight infrastructure and growth
- › Balancing freight and passenger movements
- › Improved cross-border harmonisation
- › The facilitation and introduction of technologies to improve safety and efficiency

The final Freight and Ports Plan will align with the Future Transport Strategy and Plans as well as plans and strategies across all levels of Government. In particular, the importance of Local Government involvement in last mile issues will be further explored.

The final Freight and Ports Plan will also closely align with the [National Freight and Supply Chain Strategy](#) and seek to identify those areas where Transport for NSW can work together with the Commonwealth Government on improved harmonisation across state borders.

### Future directions to investigate

Freight will be technology-enabled, offering dynamic, tailored services with high volume freight pathways, new service models, and more last-mile deliveries.

- › Deliver a comprehensive Freight and Ports Plan to provide investment planning guidance and give industry direction on initiatives and reforms that encourage collaboration in decision making
- › Create 'smart' networks that support integrated 'freight as a service' offerings with a unified access and pricing framework, that reflects the quality of service
- › Continue to work with the Commonwealth, the [National Transport Commission](#) (NTC) and other jurisdictions on road pricing as part of the [Heavy Vehicle Road Reform program](#)
- › Integrate transport and land use planning to separate freight and passenger traffic on major freight corridors and efficiently plan collection points in centres and at network interchanges (e.g. around Moorebank and Inland Rail)
- › Maximise the long term capacity and performance of the state's three ports, expand intermodal rail capacity in Western Sydney, and improve east-west connections to support the regional export task.



### The Cooperative Intelligent Transport Initiative in the Illawarra

The Cooperative Intelligent Transport Initiative (CITI) is a testing facility for heavy vehicles based in the Illawarra region. It is the largest test facility in the Southern Hemisphere. Around 60 trucks and 11 buses are fitted with CITS so far, with three intersections equipped to provide red traffic signal information. More than 1 billion records have been collected for analysis.

A roadside transmission station broadcasts speed limit information to heavy vehicles about the 40km/h truck and bus zone down the Mount Ousley descent on the 5.9GHz radio spectrum. Drivers in participating vehicles see the following messages:

- › Intersection collision warning
- › Heavy braking ahead warning
- › Traffic signal phase information
- › Speed limit information.

Figure 21: [Cooperative Intelligent Transport Initiative \(CITI\)](#)

## Better transport to support access, inclusion and participation

Customers who experience mobility constraints need affordable, accessible and personalised services

### We will improve transport access and inclusion

Access and inclusion are important outcomes for all our customers regardless of their age, ability, where they live or their personal circumstances.

Integrated planning for safe and accessible travel by walking, catching public or flexible transport, or using assisted transport services will be essential to support older people, people living with disability and others with mobility constraints. Accessible transport helps these people to remain healthy, active and independent.

Children and young people are another group of customers who need better access to safe, accessible and affordable transport. School bus travel is subsidised but many children are unable to participate in excursions and sporting, social and cultural activities that can supplement their education and promote their health.

In addition to integrating access and inclusion outcomes into the Greater Sydney and Regional NSW Services and Infrastructure Plans, Future Transport 2056 will be supported by a set of three plans that address access, inclusion and participation with a focus on people with disability, older people and people who experience transport disadvantage:

- ▶ The Disability Inclusion Action Plan – released 2017
- ▶ The Older Persons Transport and Mobility Plan – to be released in 2018
- ▶ The Social Access Plan – to be released in 2018.

The Regional NSW Services and Infrastructure Plan highlights that the cost of travel can also impact transport access and inclusion. Following recommendations by the [Independent Pricing and Regulatory Tribunal \(IPART\) bus fares in regional NSW](#) have been reduced by almost 30 per cent on average. More affordable fares provide equity across NSW and encourage social inclusion.

Significantly, for the first time people in regional NSW are now able to purchase a Daily Ticket that provides them with unlimited travel within certain sections. Eligible concession holders will pay half the adult fare for the Daily Ticket and the Regional Excursion Daily ticket for pensions will remain at \$2.50.

This new fare structure also provides an opportunity to introduce a next generation ticketing system.

Other recommendations from the IPART review will continue to be investigated such as restructuring services to better match emerging needs, including on-demand services.

As technology advances, there will remain a need to offer information to customers who do not have access to mobile or internet technologies. Face to face customer service will continue to be important in this regard for customers to who need assistance with using transport.

New technologies and big data will also be used to better understand changing travel needs across customer groups, target concessions and subsidies more effectively, and develop new services to provide Government support where it is most needed.

### Future directions to investigate

Our customers will have access to simpler, better services regardless of their level of mobility, where they live or their personal circumstances.

- › Ensure all infrastructure and vehicles are physically accessible by applying inclusive design principles and standards to all infrastructure and service upgrades and new investments
- › Continue to work with the Commonwealth on the modernisation of [Disability Standards for Accessible Public Transport](#) and support the transport industry to become more accessible and inclusive
- › Improve service provision for people with little or no access to transport through the development of flexible, on-demand and personalised service models
- › Review fares and concession policies to ensure support is provided where it is most needed and there is fare parity between metropolitan and regional services
- › Improve direct, customer-based assistance, information and wayfinding products
- › Provide alternative booking, planning and payment methods for people without access to digital platforms, such as smartphones and the internet.



Figure 22: Designing fully accessible infrastructure - [Sydney Metro](#)



## A transport vision built on respect for the first Australians

### Supporting strong and connected Aboriginal communities

#### Honouring Aboriginal connection to the land

In looking four decades ahead, Future Transport 2056 acknowledges the more than 40,000 years of continuous Aboriginal connection to the land that has brought NSW to where it is today.

As the world's oldest living culture, the Aboriginal and Torres Strait Islander traditional owners and custodians of Australia's continent and adjacent islands share a unique bond to Country. This has been forged through thousands of years of travelling across lands and waterways for the purposes of ceremony, religion, trading and seasonal migration.



Figure 23: Strengthening Aboriginal communities

The Future Transport Strategy and its Plans acknowledge that many transport networks developed in NSW since European settlement have been guided by Aboriginal peoples' patterns of movement. Australia's oldest city-to-city highway, Parramatta Road, connects sections of track long used by Aboriginal peoples of the Greater Sydney basin across the Eora nation.

Future Transport honours this history as the foundation for NSW's way ahead. With transport networks continuing to use and connect the traditional lands of Aboriginal peoples across the state, the NSW Government will improve the transport network in a way that respects the traditional owners of the land including the protection of Aboriginal cultural heritage items.

#### Supporting reconciliation and strengthening Aboriginal communities

Future Transport supports [OCHRE](#) (Opportunity, Choice, Healing, Responsibility and Empowerment), the NSW Government's plan to improve outcomes for Aboriginal peoples. Future Transport also acknowledges the special role to be played by the transport sector in strengthening Aboriginal communities.

Under Future Transport, respecting and embracing the culture and values of our first nations at every stage of investment will realise the power of transport projects to make great places, as part of the broader move towards reconciliation.

Future Transport recognises Aboriginal peoples' need for strong connections to social, professional, sporting, medical, education and employment activities. Using innovative technology and service delivery models, Transport for NSW will aim to improve access to these activities and reduce isolation.

An Aboriginal community consultation and protocols guide has been created to develop understanding across the cluster and assist in building partnerships with Aboriginal communities.

Other initiatives such as the [NSW Aboriginal Participation in Construction](#) policy will bring more Aboriginal people into the business of transport, and share in the economic and other benefits of the state's growth.

### Future directions to investigate

NSW will use transport improvements to deliver better outcomes for Aboriginal communities.

- ▶ Use transport planning and social procurement to help achieve [Closing the Gap](#) targets by better connecting Aboriginal communities to employment, education and health services
- ▶ Continue implementing the [Aboriginal Road Safety Plan](#), which includes training for child car seat installation, driver licensing access programs, provision of more transport options and developing and implementing an Aboriginal community engagement and capacity building program to support road safety in Aboriginal communities.
- ▶ Improve opportunities for people in Aboriginal communities to access sporting, cultural and social events as well as meet family and community obligations.

## A world-class travel experience for visitors

Improvements that make it easier for visitors to travel will also benefit the whole community

### A visitor-friendly network connecting our most beautiful places

NSW is Australia's top performing state for tourism. In 2015-16, the sector was worth \$38.1 billion a year and employed more than 260,000 people, or one in every 14 jobs, in the state<sup>8</sup>. Tourism is especially important to regional NSW, which accommodated 46 per cent of overnight stays in NSW in 2015-16, generating \$10.5 billion in visitor expenditure.<sup>9</sup>

In the year ending 2016, camping and caravan tourism, which relies on a safe and efficient road network, continued to be popular in NSW, with 4 million domestic caravan and camping visitors contributing an estimated \$3 billion.<sup>10</sup>

Customers from overseas and interstate expect services that are accessible, comfortable, easy to find and well connected to popular destinations. They also value wayfinding signage and access to mobile apps that help them plan and pay for seamless journeys.

8 NSW Satellite Accounts 2015-16, Tourism Research Australia

9 International Visitor Survey and National Visitor Survey YE June 2016 Tourism Research Australia

10 National Visitor Survey, YE December 2016, Tourism Research Australia



In the future, tourists will increasingly expect connections between airports, cruise ship terminals, mass transit services, on-demand services and car and bike rentals.

Intrastate aviation will also be important in connecting Greater Sydney with our regions. The intrastate air routes that connect the North Coast holiday destinations of Ballina, Coffs Harbour and Port Macquarie are currently the busiest on the [NSW air network](#).

Creating attractive and vibrant places that are well connected to the transport network will support the liveability of centres and also boost tourism. An example is Circular Quay Precinct Renewal, where the Government is exploring opportunities to leverage Government investment to partner with private capital. This will potentially allow a whole-of-precinct renewal that integrates a renewed and vibrant waterfront destination with a modern transport interchange.

### Future directions to investigate

NSW will enable visitors to move around the network seamlessly and enjoy transport connections to attractions and tourist precincts.

- › Improve public transport connections to arrival and departure points such as airports and cruise terminals
- › Facilitate the development of new smartphone apps that provide a single point of information and allow tourists to purchase products that bundle travel with cultural activities and tourist attractions
- › Provide clear wayfinding to assist visitors and infrequent transport users to navigate the network easily and seamlessly
- › Promote accessible tourism opportunities, including rural rail journeys, and provide accessible roadside facilities.



**Figure 24: Transport connects visitors to our world-class tourist attractions**

For more information about how we are improving transport for visitors, see the Tourism and Transport Plan

CHAPTER

# 5

Future  
Mobility

Emerging technologies will continue to evolve and to change customer trends in ways that are difficult to predict. With technology becoming integral in transport planning, we need to be nimble, and plan for a wider range of options.

**This chapter considers opportunities and challenges posed by a number of technology developments** and how these could change customer mobility, and the capabilities of transport providers.

These include:

- › Technology enabled mobility
- › World-class mass transit for our customers
- › More service possibilities with connected and automated vehicles (CAVs)
- › New personalised devices for short trips
- › Using drones to support the future transport task
- › Transport powered with alternative fuels

## Technology enabled mobility

Technology brings new service possibilities and government has a role as an 'enabler'

### Raising customer standards through technology

Mobility is increasingly technology-led, where data sharing and smartphone apps are enabling more flexible models to develop by matching customer demand with services. Mobile technology is also improving the customer interface, by providing a single platform for trip planning, payment and service information.

The rise of ridesharing in NSW is an example of how service models have been disrupted by technology through advances in GPS navigation devices, smartphones and networks that can coordinate drivers, customers and payment systems.

As the speed of innovation increases, so has the unpredictability of technology adoption. However, predictions can vary wildly. For example, by 2036, estimates of the take up of driverless vehicles range from 30 per cent to 100 per cent of total vehicles.

This uncertainty has implications for planning.

While customers – and markets – ultimately determine whether a technology is widely used, governments play a key role in enabling the use of new technology, through regulation, service provision, and collaboration with customers, the private sector and the research and design community.

An important step in automated vehicle technology was the NSW Government passing legislation in 2017 to enable the Minister for Roads, Maritime and Freight to approve trials of automated vehicles. This gives us an opportunity to properly assess these vehicles' ability to meet our policy outcomes of improving safety, boosting service frequencies and reducing congestion.



As the speed of innovation increases, so has the unpredictability of technology adoption.

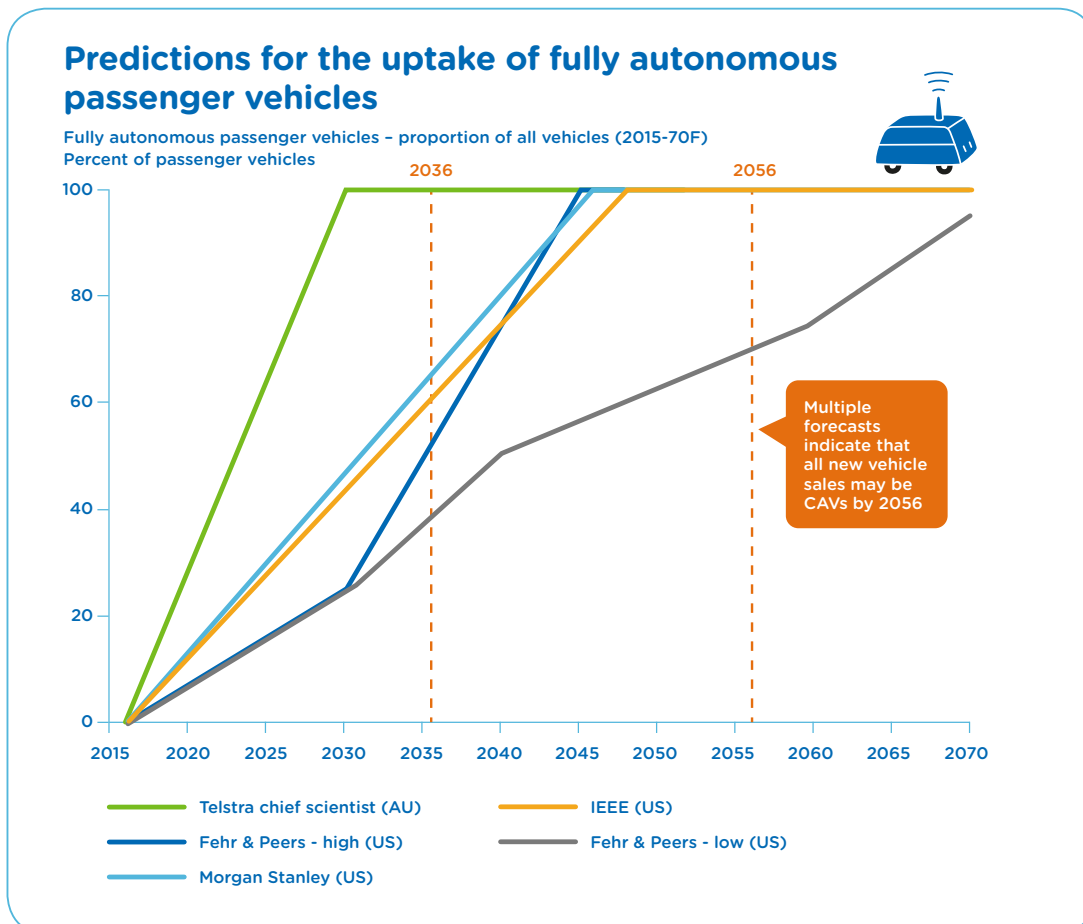


Figure 25: Predictions of the uptake of connected and automated vehicles (CAVs)

### Transport Legislation Amendment (Automated Vehicle Trials and Innovation) Act 2017

- › Automated vehicles cannot be used on NSW roads as vehicle standards and driver laws require a steering wheel and a driver.
- › Under the Act, the Minister can approve applications to conduct trials of automated vehicles by order which specifies the trial area and roads used, the time period of the trial and any other necessary conditions.
- › The Act also sets out insurance and vehicle supervision requirements and contains penalties for improper vehicle use or interference.

## World-class mass transit for our customers

Automation makes the emergence of more responsive, capable, 'smart' systems possible

### Automated metro systems around the world will double by 2020

Customers can already use apps to receive information in real time and plan their trips. They can also use electronic ticketing via the Opal card, which provides a seamless journey across transport modes in areas covered by [Opal](#).

While the network will continue to require employees to physically manage and attend systems and deliver customer services, greater automation will deliver safety benefits by reducing the risk of human error and using computerised failure detection and response systems. Automated systems also offer more predictable running times and energy optimisation.

The Sydney Metro will be Australia's first fully-automated rail network, reflecting global trends. China will soon deliver two new automated systems and several European cities are planning to convert existing metro lines.

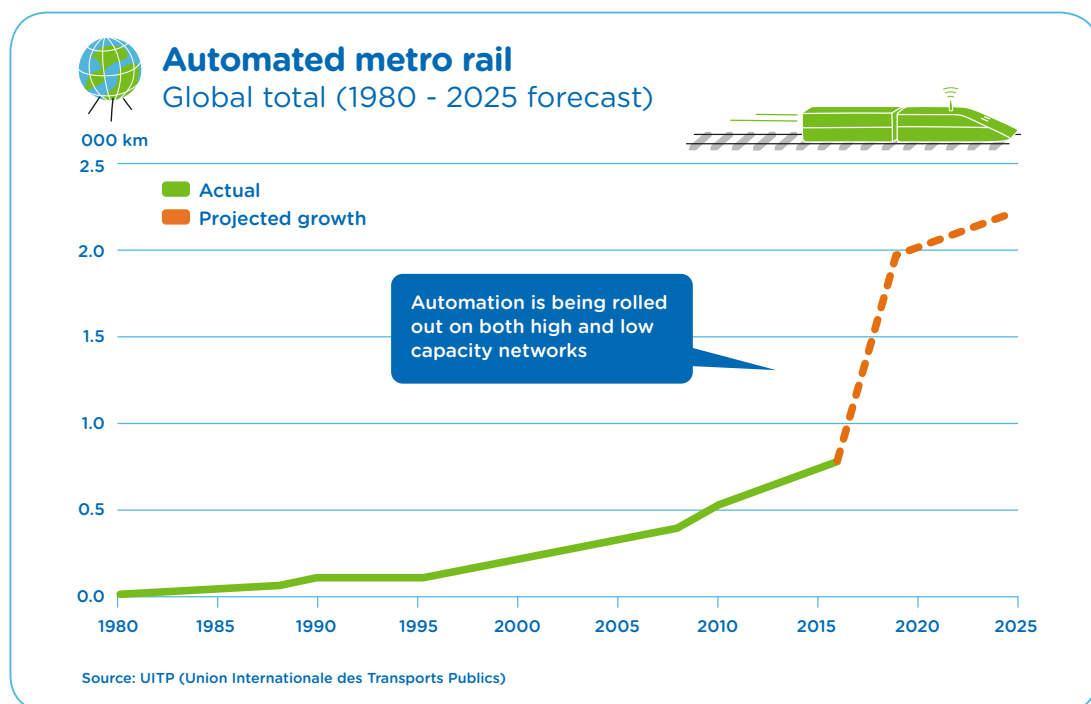


Figure 26: Increasing automated metro rail projects

## Being prepared for new technology

### As technology continues to improve and change, we need to be prepared to adapt and respond

Advances in communications and control systems will create opportunities to further improve capacity on our existing network, an approach expected to be more cost effective than building additional infrastructure.

We need to be in a position to ensure the safe and effective adoption of new technologies, ensuring they contribute to our overall vision for transport.

The NSW Government will investigate the introduction of high capacity services across 210km of the network over the life of this Strategy. Many of these will incorporate technology to improve safety, efficiency and productivity.

To improve efficiency and reduce travel times on the road network, we are also investing in “smart motorways” which use complementary technologies to monitor traffic conditions, manage congestion and respond to incidents in real time. An investment of \$470 million has been committed to the [M4 Smart Motorway project](#), with a view to rolling out smart networks on all NSW motorways in the future.

In response to growth in automated passenger vehicles, NSW is currently conducting a [two year trial of a driverless shuttle bus](#) at Sydney Olympic Park with delivery partners HMI Technologies, NRMA, Telstra and IAE.

Expressions of interest have also been requested to run NSW’s first regional CAV trial. The trial will test emerging technologies in a regional setting and assess the potential for these vehicles to improve road safety outcomes and provide more flexible services for regional communities.

The trials will provide sound evidence to enable Government to consider the associated benefits and risks of CAVs, including the cost of transitioning to automated systems, cybersecurity and upskilling our workforce.

## Future directions to investigate

NSW will continue to explore automation as a means to achieve safety and efficiency benefits and service improvements for customers.

- › Enable new and upgraded physical and digital assets to support new technologies and adapt to future developments
- › Identify road infrastructure and furniture required to support automated vehicles
- › Implement intelligent traffic management methods to improve road network efficiency
- › Deliver “smart motorways” on all NSW motorways
- › Support the NSW Innovation Strategy to manage workforce transition as automation increases.

## More service possibilities with CAVs

Driverless vehicles are the next big game-changer in terms of safety, efficiency and unlocking new service models

### Could driverless vehicles help deliver our vision for Future Transport?

CAVs have the potential to provide our customers with a broader range of more flexible travel options, and safer, smoother and faster journeys. If CAVs are predominantly used to run shared services, they could also help reduce congestion and get more people out of their cars by extending the catchment of traditional public transport systems.

A wholly automated vehicle fleet could dramatically improve safety on our network by removing the risk of human error which is estimated to cause 90 per cent of vehicle crashes. [Austroads](#) has previously estimated that full deployment of connected vehicles with collision avoidance applications could prevent 25–35 per cent of fatal crashes.<sup>11</sup>

The benefits promised by CAVs are highly dependent on the cost and rate of take up, the degree to which they attract users away from public transport, and the ownership models that develop. Future Transport modelling shows that widespread CAV use for private trips could reduce metropolitan public transport use to around 18 per cent. This would have significant negative impacts across the network, with increased traffic volumes, an increase in vehicle kilometres travelled, and higher greenhouse gas emissions.

The NSW Government is working with industry partners to undertake testing of technologies, to better understand the risks and benefits and better engage with customers on what these vehicles will mean for the network.

### Future directions to investigate

NSW will be proactive and prepare for the emergence of CAVs, and work with the Federal Government and other jurisdictions to develop national standards and road rules.

- ▶ Develop and release the NSW CAV Innovation Action Plan
- ▶ Identify infrastructure enhancements needed to support CAV operations including CAV drop off facilities at railway stations, road signage and high contrast road markings
- ▶ Work with other jurisdictions to identify and implement the digital and physical infrastructure needed to support CAVs
- ▶ Continue working with our CAV Stakeholder Reference Group engaging industry and universities to help us guide and manage the transition to CAVs

<sup>11</sup> Austroads (2011), *Evaluation of the potential safety benefits of collision avoidance technologies through vehicle to vehicle Dedicated Short Range Communications (DSRC) in Australia*



- › Conduct passenger and freight CAV trials across NSW testing a series of possible uses, from immediate applications and service trials to investigating longer term uses in challenging operating environments
- › Engage and educate the public on CAVs
- › Identify appropriate policy and regulatory mechanisms to ensure CAVs support our Future Transport customer outcomes.



### Smart Shuttle Trial – Sydney Olympic Park

The NSW Government is partnering with HMI Technologies, NRMA, IAG and Sydney Olympic Park Authority to trial an autonomous shuttle bus.

The Pilot, which commenced in August 2017, is the first, precinct based trial of an automated shuttle in Australia and is the first trial of vehicle automation to take place in NSW. With a focus on testing automated vehicle technology, the trial presents a unique opportunity to develop a research platform that improves customer mobility.

The trial aims to understand what supporting technology and infrastructure is needed to operate an automated shuttle in this environment, how it interacts with other precinct users (pedestrians, cyclists, etc.) and how it integrates with the broader transport network.

We will also better understand passengers' responses to this type of vehicle and the services it can enable, like on-demand transport in off-peak times.

Figure 27: [Smart Shuttle Trial – Sydney Olympic Park](#)

## New personalised devices for short trips

### Transforming personal mobility and boosting active transport in centres

#### By 2056, two-thirds of us will live within 2km of a centre

Assisted mobility devices, such as e-bikes or motorised scooters, have the potential to move people out of single occupant cars for first mile and last mile trips, freeing up capacity on the roads for people who need to travel further.

These devices are appealing because they are faster and require less physical effort than walking or cycling and people can use them for longer trips and over more difficult terrain, even with a lower fitness level. The cost of the devices also makes them appealing with upfront and operating costs significantly lower than owning and operating private vehicles. Costs are even further reduced when sharing schemes are available.

E-bikes are one of the most popular types of assisted mobility devices. Australian and international trials and research shows the take up of e-bikes is growing significantly. An e-bike trial conducted in Western Australia showed a decrease from 61 per cent to 32 per cent of participants commuting by car either as a driver or passenger<sup>12</sup>. E-bike sharing at interchanges also has the potential to grow public transport use by better connecting people to the mass transit network.

Other devices such as mobility scooters can enable people with mobility constraints to access public transport and local centres from their homes.

To realise the potential benefit of assisted mobility devices, we need to create an environment where they can be used safely and can help deliver a more efficient network.



Figure 28: e-bikes for shorter trips and connecting people to public transport

### Future directions to investigate

NSW will enable assisted mobility devices to be used safely on the network to assist with short journeys within centres and to connect people to public transport.

- ▶ Deliver complete cycling networks, pedestrian space and interchanges that safely support a wider range of devices
- ▶ Enable shared use service models in key centres (e.g. E-bike hire)
- ▶ Develop and adopt safety standards for new devices entering the market and review existing regulatory frameworks

## Using drones to support future transport

Rapid point-to-point services that could transform emergency services and deliveries

### Automated aerial mobility could be in use by 2056

Australia's safety laws for drones currently depend on whether the operator is flying commercially or recreationally, with recreational and very small commercial operations generally exempt as long as they pose no risk or hazard to the public, property or another aircraft.

If the use of drones expands to include routine freight delivery and point to point transport for people, standardised regulations and access arrangements will need to be implemented to ensure safe operations. Investments in infrastructure to support drone use would also be needed.

Amazon has already proposed how airspace could be segregated to ensure safe and efficient drone use. In this model, the area between 200 and 400 feet is reserved as a "drone highway" where drones operate autonomously and are equipped with "sense and avoid" technologies that allow them to dodge other vehicles and potential hazards like birds and tall buildings.

If properly introduced, drones could be used for last mile freight delivery as well as the surveillance and rapid deployment of emergency personnel, maintenance crews or equipment.

There are a number of issues that would need to be resolved if drones or other aerial mobility devices were to be used more widely, including safety, noise impacts and landing infrastructure.

### Future directions to investigate

The NSW Government will develop and review policies around the management of airspace and air safety to enable a potential future of aerial mobility.

- ▶ Work with the Federal Government and other jurisdictions on a national regulatory response around air space, safety and aircraft standards
- ▶ Investigate the role drones may play in first and last mile freight delivery and emergency response transport
- ▶ Investigate future land use options for aircraft take-off and landing infrastructure in line with the [National Airports Safeguarding Framework](#).

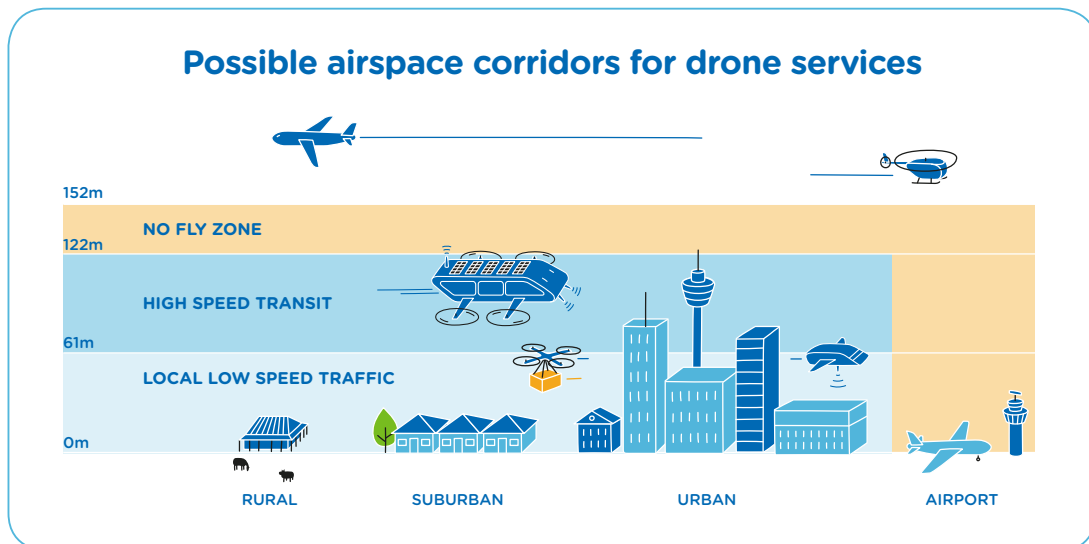


Figure 29: Amazon's proposal for segregated airspace below 500ft for the operation of drones  
(Forbes Magazine, July 2015)

## Transport powered by alternative fuels

Early signs point to the beginning of a transition away from internal combustion engines

### Alternative fuels will benefit the environment, improve energy security and reduce costs

Alternative fuels have several benefits, including:

- ▶ Lower costs for users – running costs are one third to one quarter of traditional vehicles (although up-front costs are currently higher)
- ▶ Reduced air pollution and lower greenhouse gas emissions compared to internal combustion engine vehicles
- ▶ Health benefits from air quality improvements
- ▶ Reduced noise from vehicle operations (particularly buses), which improves the amenity and liveability of places
- ▶ Improved energy security through reduced reliance on non-renewable imported fuels.

Electric vehicles are a wide class that includes hybrid, plug-in hybrid, all-electric, hydrogen fuel cell, and solar powered vehicles.

Electric vehicles can currently cost around \$15,000 more than a comparable car with an internal combustion engine which impacts the rate of take up. However, with improving battery functionality and falling battery prices, some manufacturers are now pricing hybrids at the same level as petrol vehicles to encourage take-up and create a market. Stockholm Environment Institute researchers expect cost parity with internal combustion engine vehicles will be reached when batteries cost \$150 US per kWh. This could be achieved by 2025.

NSW is already paving the way for more fuel efficient vehicles through:

- ▶ Supporting the Federal Government's proposal for more stringent standards for fuel efficiency, vehicle emissions and fuel quality for light vehicles
- ▶ Trialling the State's first automated, electric passenger shuttle at Sydney Olympic Park in partnership with industry
- ▶ Providing a lower rate of motor vehicle tax for hybrid and electric vehicles in line with the Commonwealth's [Green Vehicle Guide](#)
- ▶ Recommending that 'conveniently located charging stations' be included into apartment designs under the Department of Planning and Environment's [Apartment Design Guide](#).

### Future directions to investigate

NSW supports an industry-led response to the development and take up of electric vehicles and alternative fuels.

- ▶ Investigate the opportunities and challenges of electric vehicle use in NSW
- ▶ Deliver an Electric and Hybrid Vehicle Plan that outlines NSW Government actions to facilitate the take up of low emission, fuel efficient vehicles and maximise their benefits for passenger and freight mobility, productivity and liveable communities.

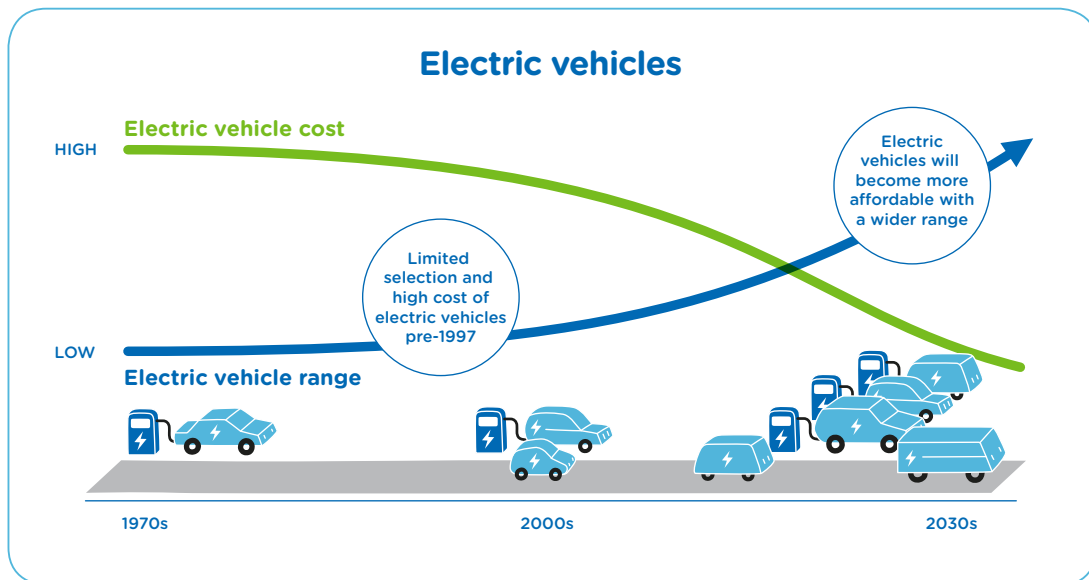


Figure 30: Affordability of Electric Vehicles, Interpreted from data sources Toyota; caranddriver.com, Mitsubishi; BMW; Cars Guide; motoring.com.au



Electric vehicles are a wide class that includes hybrid, plug-in hybrid, all-electric, hydrogen fuel cell, and solar powered vehicles.

CHAPTER

# 6

Future of  
Services



Services are increasingly being delivered by a market of providers, including community groups, businesses, automobile and technology companies, and recreational or tourism planners.

**This chapter considers six ways the future of transport services will change for the better.**

These include:

- › A focus on service outcomes for customers
- › Technology catalysing new services
- › Providing customers with integrated information, pricing and trip planning
- › Customer-led services
- › The role of government in enabling new services
- › A service hierarchy for the future

## A focus on service outcomes for customers

New service models and competition are giving customers more choice and making transport outcomes-focused

### New services should improve the customer experience and help us achieve our vision

Technology is transforming the transport services market. Where market entry previously required significant capital investment, mobile apps are allowing smaller companies and individuals to enter the market with lower upfront costs.

The emergence of rideshare companies has significantly changed the point to point market, with new online service providers emerging and being embraced by customers. The NSW Government has harnessed the potential of new point to point models through changes to legislation. However, this experience has taught us that the pace of change can be swift and unpredictable.

Today, we are at a 'tipping point' with more companies developing or operating innovative transport services. Unlocking the potential of new services for the benefit of customers requires us to set clear customer outcomes for transport services, engage closely with industry and the community and ensure our infrastructure can support new services.

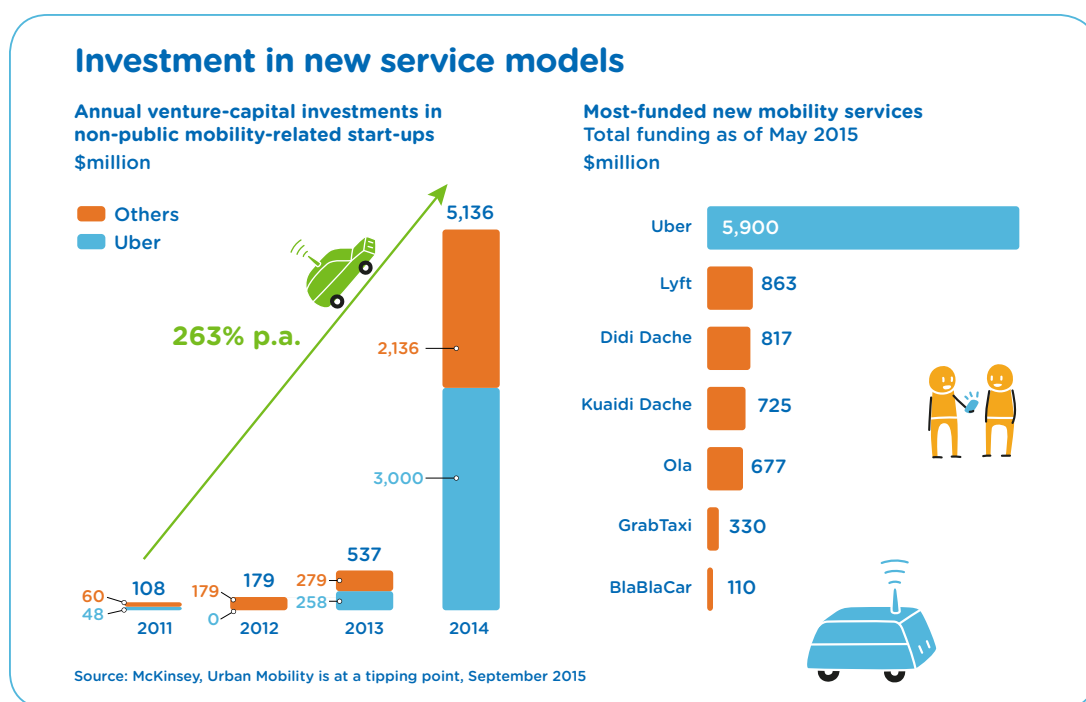


Figure 31: Investment in new service models

## Technology is unlocking new service models

Technology empowers new service providers and breaks the nexus between asset ownership and service delivery

### A marketplace for innovation

Traditionally, transport services were strictly the operation of transport infrastructure and fleets. This meant that service providers were dependent on their control or ownership of the physical assets or network. Today, mobile technology is increasingly enabling a new class of customer value by connecting providers directly to customers.

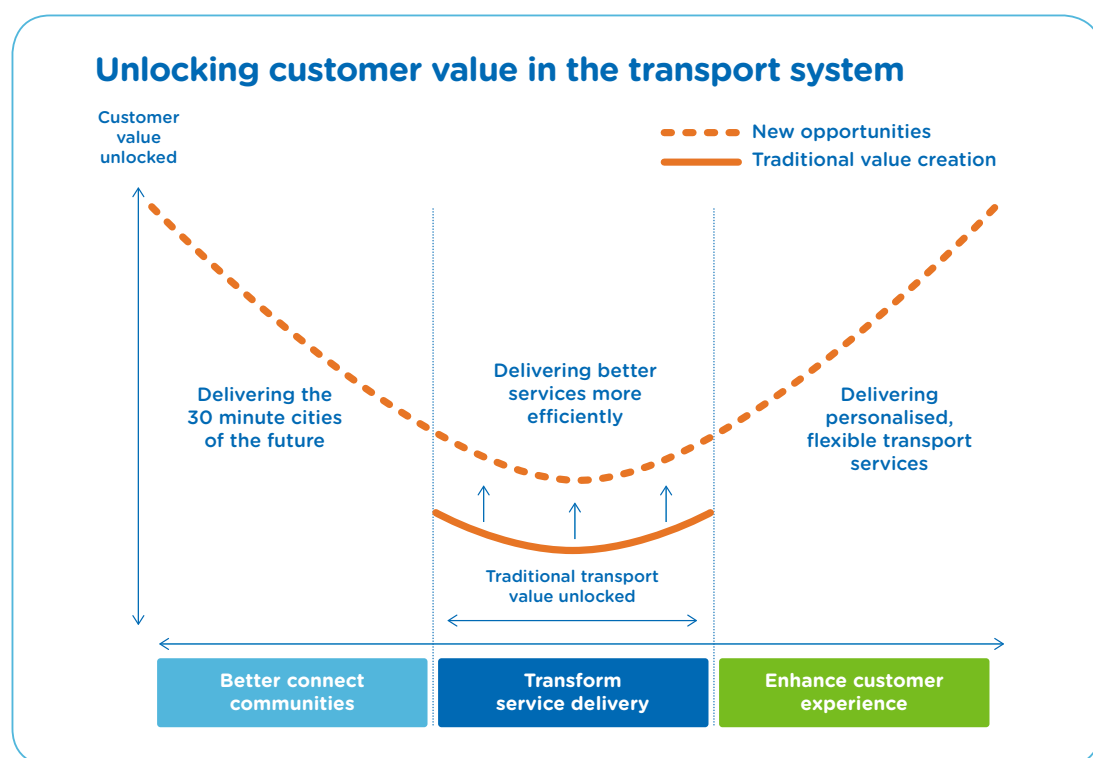
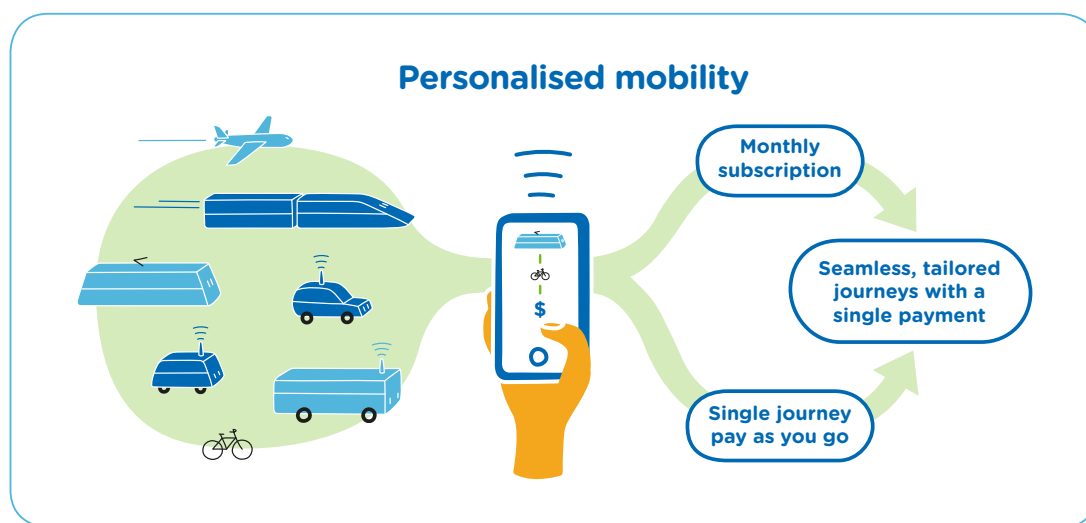


Figure 32: New ways of unlocking customer value

The emergence of new services enabled by technology has a number of significant implications for government. It places greater importance on the availability and sharing of data as markets operate most efficiently and deliver better customer outcomes when people and service providers have access to information.

A new market of service providers also highlights the need for integration of payment systems and information. With so many transport services potentially on offer, government has a critical role in ensuring network integration.



**Figure 33: Smartphone technology supporting transport**

As outlined in the Future Transport Technology Roadmap, a new market for service providers requires clear information to be made available to customers in real-time so that the transport system is simple to understand, easy to use and can deliver personalised services relevant to individual needs and preferences. For transport customers, this means being able to compare travel times and prices across different transport modes in real-time to make the best choice about how to reach their destination. It also means that in times of disruption or major incidents, we are able to communicate and re-route customers to minimise impact on the network.

### Future directions to investigate

NSW will work with service providers and technology companies on the sharing and innovative use of data, to better match services with customer needs.

- Expand open data and data exchange initiatives to improve customisation of services and journey planning across providers
- Resolve issues relating to privacy, data protection and liability and adopt a set of principles to ensure any data collected from customers will be appropriately used to benefit the transport network
- Lead innovation nationally, with a [Data Science Incubator and Open Data policies](#) across public and private services to enable safe and effective use of technology.

## Mobility as a Service (MaaS)

Customers will access a market of mobility services in a simple, easy-to-understand way

MaaS is a service model that enables customers to plan and pay for their journeys using a range of services via a single customer interface, such as a mobile phone app. MaaS will enable customers to access integrated, easy-to-understand journeys in a broad market of transport services that gives them more choice in how they travel.

MaaS relies on sharing real time information across different transport service providers to help customers optimise their journeys through a single MaaS provider. It enables customers to plan and purchase their end-to-end journey from a retailer (most likely via an app) choosing from a range of travel options, such as travelling by public transport, rideshare or bike hire. In real time, the app then guides the customer through their journey.

Data drawn from customers via a MaaS platform helps providers offer more personalised services and can also link customers to non-travel related products such as restaurant delivery, event ticketing and retail.

MaaS platforms are already being used in other countries. An example of a recent roll out of MaaS was in Turku, Finland. Under this MaaS system, passenger journeys increased by 20 per cent and 98 per cent of surveyed customers said the attractiveness of public transport had improved. The system also engaged new customers, with 9 per cent of customers on regional lines reporting they had previously not considered themselves to be public transport users.<sup>13</sup>

A trial of MaaS in Sweden also indicated positive results for public transport use, with patronage increasing from 35 per cent before the trial to 45 per cent during the trial<sup>14</sup>.

<sup>13</sup> Intelligent Transport magazine (formerly Eurotransport)

<sup>14</sup> UbiGo: trial participant – Chalmers University of Technology in Sweden

## Customer-led services

Customers will have even greater input into transport services, including where they go, how much they cost and even how they are packaged with other services

### Customers influencing service provision

Personalisation of many transport services means customers will have more choice of where services go, their price and even how they are packaged with other services, such as events and shopping.

As technology unlocks new service possibilities, transport will increasingly resemble a retail industry, where individual service providers can tailor offerings to individual customer needs. This presents an opportunity for customers to have unprecedented input into how transport services are delivered.

The emergence of on-demand bus services and other forms of shared transport will allow customers to directly influence where their local services travel on a day-to-day basis. For example, if few customers happen to board a local, on-demand bus service in the evening, a more direct route may be taken to ensure each customer arrives home sooner.

An example of an innovative development in packaging transport and other products together is the “virtual shopping wall.” The first wall combining travel and shopping experiences was set up in Seoul in 2011, and allows customers to view, purchase and arrange the delivery of groceries at the train station. China plans to roll out 1,000 virtual supermarkets across the country in the near future.

Other opportunities might include the ability to, take into account public transport use in health insurance premiums or package public transport into rents in high density areas.

## Future directions to investigate

Customers will have unprecedented input into service planning enabled by digital platforms that connect customer needs to service provision.

- › Transform the customer experience and service interface, with integrated digital channels, contactless payment and seamless interchanges
- › Develop and introduce customised service models shared services and on-demand models, with priority roll out in regional centres and for people who find it harder to access transport services.
- › Identify opportunities and challenges in supporting data platforms for Mobility as a Service models.

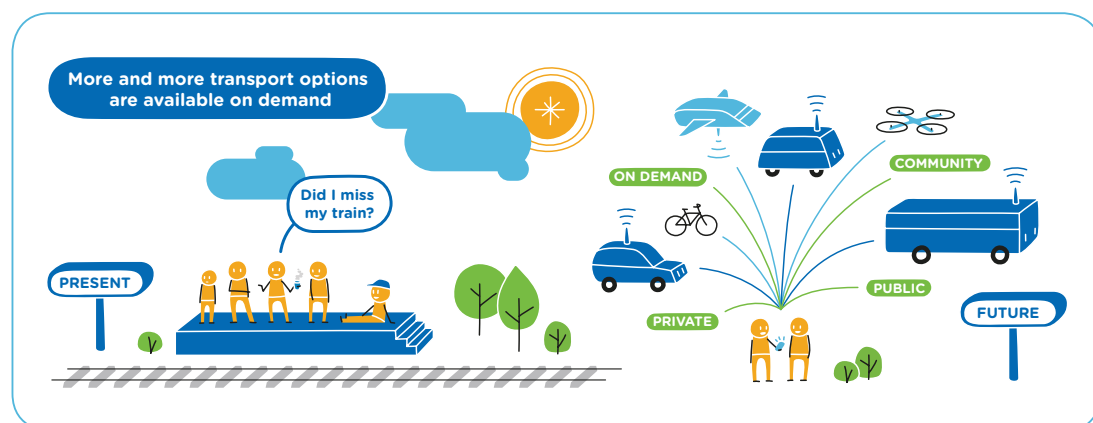


Figure 34: Customers directly influencing service providers

## The role of government in enabling new services

Government sets the right environment to get the best from a growing market

### Creating the right environment for quality service provision

Typically, government has been the default provider of transport services. However, the emergence of new services is changing this role, with the private sector becoming increasingly involved in transport service delivery and operating in environments that are traditionally the domain of governments alone.

The future role of government will be to focus on setting network and customer outcomes and ensuring policy and regulatory frameworks are in place to support new service models. This will likely involve reducing regulatory burden and setting safety and service standards to ensure positive outcomes for our customers and the community.

In some instances, the role for government will be to get out of the way and allow the market to deliver services. This may be the case where demand for services is high or where the private sector is better equipped to meet customer needs. This aligns with the NSW Government's position on regulatory frameworks to ensure unnecessary restrictions on competition are removed unless the community benefits of the restriction outweigh the costs and the objectives of the regulation.

A recent example of government creating a more contestable market is its response to the emergence of rideshare companies. Many customers were quick to embrace ridesharing but regulation did not reflect the "shared economy" approach, meaning rideshare companies were unable to operate legally. Similar services like taxis and hire cars were able to operate legally but were heavily regulated in a way that hampered innovation and created unnecessary barriers to new market entrants.

In response, the NSW Government removed 50 unnecessary regulations on the point to point industry and allowed rideshare companies to operate legally, while continuing to regulate on issues in the public interest such as safety and consumer protection.

### Future directions to investigate

NSW will create a service ecosystem where government enables service innovation and is no longer the default service provider.

- ▶ Conduct or facilitate pilots of new service models
- ▶ Support industry partners in service delivery and engaging communities
- ▶ Review regulation governing road, rail and bus operations to provide new arrangements that can pre-empt or respond quickly to market disruptions.

### Introducing an element of competition to smaller markets

The NSW Government takes an integrated approach to services where the customer outcome drives delivery choice, regardless of organisational boundaries and constraints. Where government has traditionally had to directly provide public services to meet its obligations to the community, it is now able to play a more sophisticated role in developing a marketplace for services and purchasing high quality, innovative services – where these deliver better outcomes for customers.

In markets with lower contestability, such as some areas in regional NSW and customer segments where disadvantage exists, we will need to look to more innovative procurement practices, where services that better respond to customer needs, and deliver better value for money for government, are purchased.



A recent example of a new procurement approach is the awarding of a contract to a private entity to operate bus, ferry and new light rail services, as well as manage interchanges in the [Newcastle](#) area.

The contract is outcomes-based and sets minimum service levels but provides a greater level of autonomy to the service provider to plan and reshape the network. The contract also contains provisions for incentive payments for patronage growth above the base contract rate.

This approach introduced a level of competition in the Newcastle transport service market that has not existed before as the government went out to competitive tender before appointing the service provider.

The new network is expected to increase the quantity and quality of services in Newcastle within a more efficient cost structure for government.

### Future directions to investigate

Government service delivery and procurement will focus on achieving the market and service outcomes – not prescribing fixed service levels.

- ▶ Go to open market tenders when procuring services, to introduce competition in markets with low contestability
- ▶ Include arrangements that reward innovation and patronage growth into service contracts
- ▶ Continue creating a workplace culture where Transport for NSW is equipped to achieve best value for money outcomes from private sector providers.



Figure 35: Newcastle – artist's impression

## A service hierarchy for the future

New providers entering the market will result in more personalised services, which will complement ‘turn up and go’ services on trunk corridors

### An easily understood and efficient network

The emergence of new service providers will result in customers having more choice than ever. However, it is important that the transport system also remains easy-to-understand. In high demand areas including Greater Sydney, the global gateway city of Newcastle and the satellite cities of Gosford and Wollongong, frequent, high capacity, city-shaping corridors will be provided to move the majority of people. These will be complemented by more flexible or on-demand services on city-serving and local corridors.

In regional NSW, the focus will be on services that operate on more localised networks radiating from regional cities rather than Sydney. Services will include scheduled public transport services such as in town bus services, [NSW TrainLink](#) rail, and coach services connecting towns and cities. Communities will also be supported by flexible or on-demand services that better personalise journeys in service areas where traditional public transport is harder to provide and access.

The NSW Government has already launched a program to identify and pilot creative new ways to deliver flexible services in regional NSW and in less dense metropolitan areas so people can reach their destinations quickly, safely and efficiently and at a time that suits them. Expressions of interest to run pilots were sought between December 2017 and February 2018 and all pilots are expected to be underway in the near future.

The service hierarchy in NSW will evolve towards:

- ▶ **‘Turn up and go’ services on city-shaping and city-serving corridors in metropolitan areas.** These will include city-city and centre-centre corridors in Greater Sydney and on major trunk road and public transport corridors within Greater Newcastle, the Central Coast and Wollongong. Services will carry large numbers of customers on predictable and reliable services without timetables – customers will ‘turn up and go’.
- ▶ **Frequent and reliable services in regional areas.** Services will operate on a ‘hub and spoke’ network and provide reliable services on certain routes allowing same day returns between regional cities and centres. Modes may include rail, coach, bus or air services, determined by journey length and demand.

- › **Flexible or on-demand services.** These services support both metropolitan city-shaping services and regional services. They will operate as on-demand services on centre-serving corridors in metropolitan areas, such as between local train stations and residential areas, and in less densely populated areas where customers' travel patterns are more disperse. In regional NSW, they will provide more personalised, end to end journeys by connecting transport hubs in cities and centres to smaller towns and villages, providing efficient transport in areas that currently have few or no services.

### Future directions to investigate

Transport planning will focus on city-shaping corridors and major regional transport routes, supported by flexible or on-demand service offerings.

- › Prioritise investment in city-shaping corridors including automated systems to support 'turn up and go' services in high demand areas
- › Conduct pilots of flexible services in rural and regional areas and investigate government support to run these services
- › Move towards dynamic scheduling for some transport services, so routes and timetables can be altered to better match demand
- › Improve multimodal interchanges, particularly in regional NSW, so customers can more easily connect to flexible services and experience seamless and reliable journeys.

CHAPTER

# 7

The Future  
Network

The infrastructure network – the physical corridors, road and rail infrastructure, and surrounding land uses – are the backbone upon which technology and services operate.

To meet future challenges, network development must be flexible and embed future optionality, maximise capacity and re-use of assets, and support innovative service and technology provision.

**This chapter looks at network issues that we will need to address as part of Future Transport for the improvement, use and management of the network over the next 40 years.**

These include:

- › Planning tomorrow's network
- › Promoting sustainable development and healthy lifestyles
- › Developing the digital network
- › A safely operated network
- › Optimising the network and better using existing infrastructure
- › Growing the Greater Sydney and regional NSW networks to deliver our vision for places

## Planning tomorrow's networks

Building our way out of congestion is not the only solution – network optimisation through technology and more responsive service can help tackle congestion more flexibly in the short term

### Planning a more dynamic network

The infrastructure network in NSW is made up of fixed assets and corridors that form the backbone for service provision. The network consists of over 185,000 kilometres of road infrastructure for private, commercial and freight use and annually supports:

- ▶ 385 million rail trips
- ▶ 315 million bus trips
- ▶ 16 million ferry trips
- ▶ 10 million light rail trips each year.

Once built, fixed assets are difficult and costly to alter. Large infrastructure projects also have long lead-times and are disruptive to communities during construction. As a result, the infrastructure network has often lagged behind the rapidly changing needs of communities.

While the course or footprint of a corridor is fixed, its capacity is not. Different modes of transport have different carrying capacities when using equivalent 'space'. For example, a bus carrying 60 passengers uses one-twentieth of the road space of the cars needed to carry the same number of people.

Planning for the future means preserving suitable options for future uses and travel behaviours. It also means better management and utilisation of all transport assets to optimise performance and maximise carrying capacity, as passenger and freight traffic volumes grow.

Technological advances such as driverless trains and road vehicles will allow these vehicles to operate closer together increasing capacity on the network. Technologies available today, such as Smart motorway systems and ICT, can also benefit the existing network by improving incident response and congestion outcomes and managing growing car volumes.

These more agile solutions should be our first response to congestion and performance variability.



Figure 36: Capacity on the Sydney Harbour Bridge

## Applying Movement and Place principles to create successful places

The success of our cities and regional towns depends on our network supporting attractive and healthy places

The Movement and Place Framework underpins Future Transport 2056 and aims to allocate road space in a way that improves the liveability of places. This framework is an integrated land use and transport planning tool that sets customer focused outcomes and delivers wider benefits for the health and wellbeing of the community.

Some of the most challenging decisions we face in managing transport arise when trying to balance different uses of the road network. Historically, many of our most vibrant eating and shopping districts grew alongside our busiest road corridors that today suffer acute congestion during peak periods.



By engaging across government with those bodies responsible for transport, land use and roads in NSW, desired street environments can be agreed upon and the Movement and Place Framework can become a common platform for road planning, based on an integrated view of the strategic significance of:

- › Roads and streets in their role in moving people and goods
- › Land use adjacent to roads and streets.

This more collaborative and integrated approach, will enable greater transparency, collaboration and a tool to provide better clarity to communities and the public about how the NSW Government plans, designs and operates the road network.

The guiding principles within the framework acknowledge that the needs and expectations of transport customers and communities change for different street environments. Similarly, there is the need to prioritise different customer groups, depending which street environment they are travelling in:

- › **Places for people** are the heart of communities and are more people orientated street environments. To support Places for People, the Movement and Place Framework identifies the need to better prioritise public transport, pedestrians, cycle and freight access whilst limiting through traffic with no destination in the centre.
- › **Local Streets** set the frame for our communities, amenity and the need for local access as a priority. The Movement and Place Framework identifies the need for local streets that are safe environments, encouraging road users to modify behaviours to respect one another and acknowledge the need to share road space. Local Streets are supported by lower vehicle speeds that better align with the need to prioritise walking and cycling within local communities.
- › **Vibrant Streets** are some of the most active areas in our cities with activity and movement at all hours of the day. The need to balance high pedestrian activity and densities, attracted by significant commercial, tourism, leisure and entertainment venues, along with the need to move high numbers of people and goods is challenging for both Local and State Government. Time of a day management and achieving a better balance between movement and place needs are facilitated through the Movement and Place Framework.
- › **Movement Corridors and Motorways** are highly important for the movement of people and goods with little interaction with adjacent land use, as such there is a low priority and need for provision for pedestrians or access to land use. However, some Movement Corridors pass through local centres and in these cases provision for place, supporting freight, public transport and active transport will support the centre or high streets' role in providing for the local community.

Broader, long-term network planning and investment in new city-shaping infrastructure is sometimes required to reduce the need for movement through important centres to improve movement within centres, create great places and deliver community outcomes.



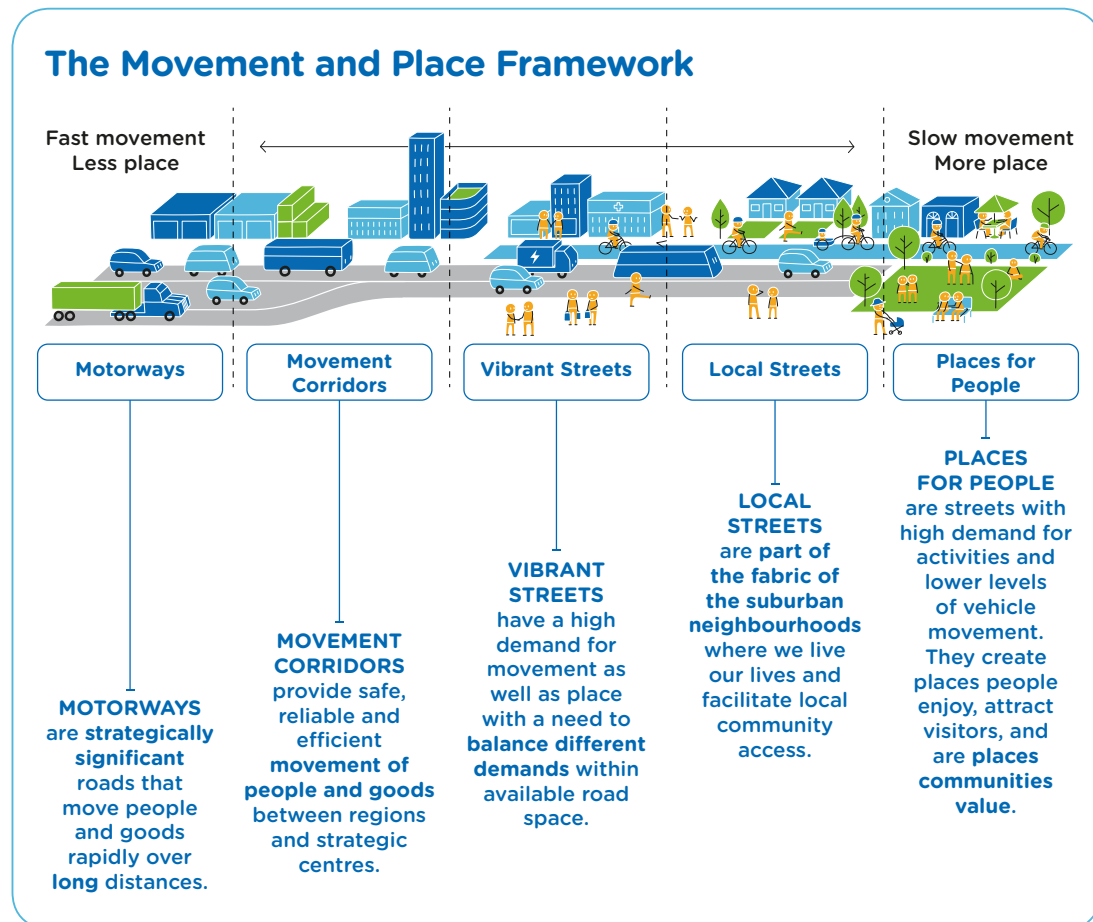


Figure 37: Movement and place framework

The application of the Movement and Place framework also has road safety benefits. Areas that are considered Places for People will need lower speed limits, set in accordance with the [NSW Speed Zoning Guidelines](#) and international best practice. Lower speeds in Place for People environments will ensure the safety of road users, particularly vulnerable users such as pedestrians and cyclists. This will continue to create better and safer street environments in addition to programs under the NSW Road Safety Plan 2021 such as the extension of 40km/h limits in high pedestrian activity areas.

## Next steps for implementing the Movement and Place framework



Figure 38: Movement and place - next steps

## Encouraging more customers to use active and public transport

Moving more people by active and public transport has benefits for all

Initiatives to improve service levels and increase patronage on public transport will be delivered through the investments outlined in both the Greater Sydney and regional NSW Services and Infrastructure plans.

### Expanding the public transport networks

In Greater Sydney, public transport services will be enhanced by establishing efficient and reliable corridors:

- ▶ **City-shaping corridors** – major trunk road and public transport corridors providing higher speed and volume links between cities and centres that shape locational decisions of residents and businesses
- ▶ **City-serving corridors** – higher density corridors concentrated within 10km of metropolitan centres providing high frequency access to metropolitan cities/centres with more frequent stopping patterns
- ▶ **Centre-serving corridors** – local corridors that support, buses, walking and cycling, to connect people with their nearest centre and transport node
- ▶ **Outer metro and regional services** – connecting Greater Sydney with outer metropolitan areas and regional NSW.

In regional NSW, the transport network will enable seamless and affordable inter-regional and cross-border travel. The emphasis for the future regional network will be creating a transport system that provides greater coverage across NSW including day return regional centre connectivity for an expanded geographical catchment and same day connectivity to global gateway cities or capital cities for all locations in NSW either directly, by air or rail services or indirectly, by bus/coach, air or rail.

## Integrating walking and cycling networks

Walking and cycling have significant benefits for customers and the wider city. As well as supporting active and healthy lifestyles that prevent chronic illnesses, walking and cycling are efficient and community-centred ways to travel that can extend public transport catchments, reduce congestion and lower carbon emissions and air pollutants.

Transport for NSW has produced a guide on integrating green infrastructure which helps identify opportunities for green space during planning and design of assets and promote green infrastructure at interchanges. Coordinated investment to connect green corridors and spaces will support compact development across the city and promote a more resilient urban environment. This 'green grid' will support walking and cycling around and between centres and thereby help to reduce obesity and inactivity.

## Future directions to investigate

The NSW transport network will support healthy communities and encourage active transport like walking and cycling.

- › Provide safe, quick and convenient public transport services that offer journey times competitive with private cars
- › Incorporate multimodal network improvements and place based planning in the design of all major transport projects
- › Plan centres with a greater focus on walking and cycling as well as public transport priority options.
- › Complete walking and cycling networks to and within centres and invest in safe, direct and continuous green corridor connections
- › Continue rolling out Sydney's Cycling Future program which provides secure bike storage across the network at selected railway stations
- › Encourage workforce planning that gives employees an option to work near home and the ability to commute using active transport.



Figure 39: Artist's impression of George Street, Sydney

## Developing the digital network

Digital infrastructure will overlay the physical network and reduce network complexity

### Smart devices and intelligent vehicles will need a smarter network

Transport services in the future will require an extensive and increasingly sophisticated technology enabled network. This will be particularly important for city-shaping corridors, including motorways, where 'smart' technology will be built into the network.

The [Transport Management Centre](#) is currently developing a system under the [Intelligent Congestion Management Program](#) that will use the most up to date and predictive data to monitor and manage performance in real time across all modes and networks. The NSW Government is investing \$470 million to upgrade the M4 to a '[smart](#)' motorway. In the future, all motorways in NSW will be 'smart.'

Freight customers will also harness data and analytics to improve efficiency and competitiveness. Load sharing applications and platforms will combine freight loads from different network users to maximise capacity and utilisation of each vehicle.

Increasing automation technology at delivery centres and around intermodal terminals will help freight customers reduce dwell times in the supply chain. As technologies evolve, the freight industry will also be able to re-organise their businesses to provide customers quicker and more convenient deliveries matched to their individual needs.

Rapid technological innovation and big data has the potential to deliver much broader digital applications for customers. New developments in machine learning and artificial intelligence are likely to emerge in the near term and NSW will need to be ready to incubate new applications, trial new uses and become early adopters of technology.

Embedding sensors and intelligent transport systems technologies across key assets such as bridges, cameras, car parks, streets, traffic lights and toll booths, will generate enormous volumes of new data on road conditions and traffic patterns. This information will be conveyed in real time to serve the customer and help personalise their journey.



## Future directions to investigate

NSW will ensure the digital network is fit for purpose and has the capacity to support future technologies.

- › Embed flexibility and optionality into network design to support changes in technology systems
- › Work with industry partners and tech companies to incubate and trial new technologies
- › Identify new ways for intelligent systems to bring together services and assets on the network to deliver better connections and integration between services
- › Support the development, prototyping and deployment of “smart networks” including a road network that connects to smart vehicles
- › Apply the [NSW Government's Digital Strategy](#).



Figure 40: NSW Transport Management Centre

## A safely operated network

Our highest priority is getting our customers home safely

### Technology is critical for working towards a zero trauma network

As part of the [NSW Road Safety Plan 2021](#), NSW has set a target of zero trauma on the transport system by 2056, committing to significant reductions in absolute and per capita rates of trauma across road, rail, waterway and air transport infrastructure and service delivery.

Our commitment to working toward zero trauma starts with a target to reduce fatalities on our roads by at least 30 per cent on 2008–2010 levels by 2021, which is a State Priority.

To work Towards Zero, we will apply the Safe Systems approach which involves designing a transport system integrated with human behaviour to ensure users are not harmed. It involves all elements of the system (infrastructure, vehicles, speeds and user behaviour) working together and interacting with the system itself to ensure safety. It also requires the right mix of conditions in place to keep different users safe within the system – for example, pedestrian safety measures in shared use areas or car and truck safety treatments on movement corridors.

There are several guiding principles to the Safe Systems approach:

- ▶ All parts of the system must be strengthened, so if one part fails, transport users are still protected
- ▶ The transport system must be designed to account for human error
- ▶ The human body has limited ability to tolerate crash forces
- ▶ Transport planners, designers, and users must all contribute to safe networks – there must be shared responsibility for preventing crashes.

A safe transport system has important benefits to the overall performance of the transport system. In particular, it minimises disruptions caused by incidents, improves the wellbeing of the broader community and protects people who operate and maintain services.

In addition, safety by design ensures the network is resilient to adverse or significant weather events, and can safely support optimal speeds.

Safety is one of the key factors that can influence technology take up. In terms of safety, technology has the potential to be highly impactful, through measures such as advanced safety systems, removal of trackside equipment, and use of equipment that uses 'self-healing' materials such as polymers and composites.



A number of individual automated vehicle safety technologies are already available or being developed that can deliver safety benefits in the immediate term. These technologies include electronic stability control, intelligent speed adaptation, adaptive cruise control, autonomous emergency braking, collision avoidance and hazard protection systems (including forward collision and lane departure warning), road signage detection, vehicle-to-infrastructure communication, post-crash notification systems, fatigue detection, and blind spot monitoring.

Technology will also play an increasing role in network security, particularly with regards to, data authentication within the safety system and best-practice frameworks to better predict and manage tension across the network.

It will be particularly important to implement safety technology and safe system principles in regional NSW, which accounts for 40 per cent of the state's population, but experiences two-thirds of fatalities each year. A person is around four times more likely to lose their life on a country road than on a metropolitan road.

Transport for NSW works nationally and internationally to ensure that vehicle safety technologies are taken up as quickly as possible to improve outcomes for customers. World class products are sourced against industry benchmarks so as to obtain best practice. Consequently, industry is becoming more willing to not only utilise these technologies but also to be able to innovate towards safe and efficient outcomes.

Transport for NSW's Centre for Road Safety is developing and researching emerging road safety technologies, including intelligent safety systems such as GPS, wireless communications and video detection systems. Current initiatives include:

- › The [Speed Adviser](#) which is a smartphone app designed to reduce speeding and save lives by providing free access to accurate speed zone information and warnings covering the NSW road network
- › The [naturalistic driving study](#) which gathers data from cameras and sensors in about 360 vehicles to help us develop new and innovative ways to prevent crashes on our roads
- › The [FleetCAT trial](#) which involves 35 vehicles in the NSW state fleet to assess the safety benefits of collision avoidance technology systems.

The Centre for Road Safety also assesses [ideas from the public for new road safety concepts](#) and evaluates the potential of safety systems to reduce road trauma, including:

- › [Cooperative intelligent transport systems](#)
- › [Intelligent Speed Adaptation](#)
- › [Smart signs](#)
- › Smart camera crash prevention
- › Roadside collision avoidance
- › Night vision
- › Driver fatigue detection and warning
- › [Collision avoidance technology systems.](#)

## Future directions to investigate

By 2056, technology and safety will be in-built to all networks, delivering zero trauma on all parts of the transport system.

- › Deliver a 30 per cent reduction in road fatalities or serious injuries by 2021
- › Conduct Safe System assessments and incorporate safety measures at the design and construction stages of all new and re-purposed transport assets and infrastructure
- › Ensure infrastructure supports fully automated vehicles on high volume and dedicated freight and city-shaping corridors, including connected vehicle technology options to support safe travel for all user groups
- › Incorporate safety technologies on shared road space and interchanges for pedestrians and cyclists, and on waterways
- › Prioritise separation of road users to reduce risk, including median barrier separation on all key road corridors with high traffic volumes
- › Continue leading safety improvements on the network through the NSW Government's fleet purchasing policy that requires all vehicles to have a 5-star Australasian New Car Assessment Program (ANCAP) rating
- › Ensure all new passenger vehicles are fitted with highly automated or fully automated systems
- › Ensure all new roads are designed to 4 or 5 star standard, and that investment is prioritised to achieve majority of customer travel on 5 star roads
- › Continue to have an evolving and robust research program that includes research into new vehicle technologies, behavioural and policy reform, trials of road and roadside safety products and program evaluation and safe system analysis



Figure 41: The safety of our customers is our highest priority

- Continue providing education campaigns for:
  - Drivers using our roads that target behaviours such as speeding, drink and drug driving, driver distraction and mobile phone use and managing fatigue, as well as programs for new and older drivers
  - People on our waterways that encourage safe behaviours such as the wearing of a lifejacket and the proper use of personal watercraft
  - Public transport users that target behaviours around rail corridors and level crossings, school student travel, safe travel for older or less mobile passengers and travel training across the network
  - Cyclists and pedestrians that encourage behaviours such as wearing helmets when cycling and safely crossing roads, especially for children and families.

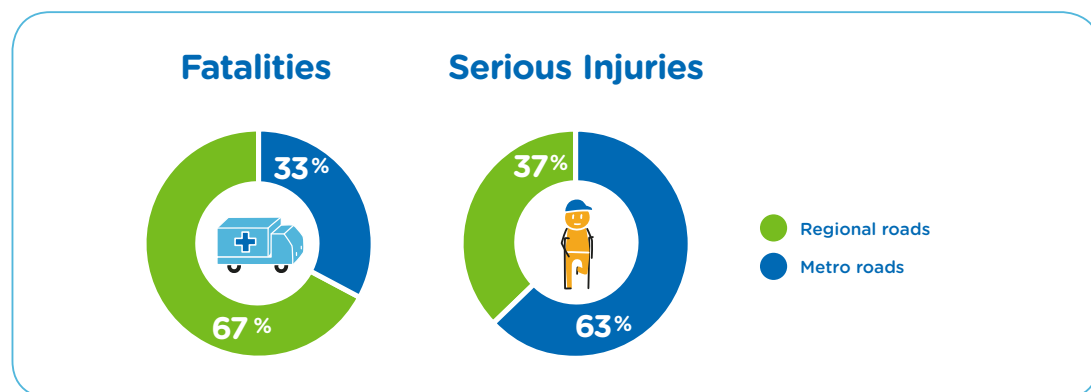


Figure 42: Road trauma on metropolitan and country roads

For more information about how we are improving transport for visitors, see the

[NSW Road Safety Plan 2021](#)



Our commitment to working toward zero trauma starts with a target to reduce fatalities on our roads by at least 30 per cent on 2008–2010 levels by 2021, which is a State Priority.

## Optimising the network and better using existing infrastructure

### Congestion and under-use: two symptoms of the same problem

A major focus when planning the network is mitigating the costs and impacts of congestion. Congestion and crowding occur when demand for travel reaches or exceeds capacity, resulting in increased travel times, reduced reliability and a poorer customer experience.

While congestion is a major driver of new investment particularly in metropolitan areas, its concentration in relatively short peak periods conceals significant capacity and underuse in off-peak hours, or in the counter-peak direction.

The NSW Government is currently addressing congestion through a number of programs:

- ▶ [Travel Choices](#) – a tool to help people avoid delays when navigating the network by choosing the most efficient transport modes, routes and travel times
- ▶ The Intelligent Congestion Management Program – a program that integrates business processes and systems that support data gathering, analysis, decision support and information exchange around congestion management
- ▶ Easing Sydney's Congestion Program – a program that incorporates several initiatives relating to bus priority, pinch points, 'smart motorways' and clearways.

While congestion is an issue in some regional areas, network design needs to focus more on connectivity. Historically, network connections have been focused on access to capital cities, an approach which does not necessarily reflect the places people in the regions want to go to.

Planning for regional NSW over the next 40 years will be delivered under a 'hub and spoke' network model. This model will connect regional towns and villages to their nearest regional centre, providing services and ease of access to other destinations.

Planning the freight network will also be critical to regional NSW, where there are already a number of nationally significant transport corridors, in particular the Hume, Newell and Pacific Highways. Collaborative planning will also be done with the Federal Government on the new Inland Rail, which will support intermodal hubs in regional NSW.

Access to the trade gateways of Newcastle Port and Port Kembla from inland NSW will continue to be important for the next 40 years as will inland connectivity to the future international airport in Western Sydney.

## Future directions to investigate

NSW will optimise the use of the current network in Sydney and regional NSW, and invest in projects that improve connectivity and tackle congestion.

- › Dynamic, real time management of the network to improve performance and reduce the impact of incidents, events and planned maintenance
- › Design a 'hub and spoke' network that better serves regional communities
- › Plan and manage transport networks for the best use and optimum movement of people and goods along and across transport corridors and within precincts, whilst creating better places and amenity for communities
- › Progressively review roads and road space allocated on best use to achieve better customer outcomes and better places
- › Encourage customers to use the transport system differently by shifting to walking, cycling or public transport and traveling outside the peaks to reduce congestion and channel demand where there is capacity
- › Continue to manage private vehicle congestion in high demand areas through the [Parking Space Levy](#)
- › Reserve corridors for future network development.

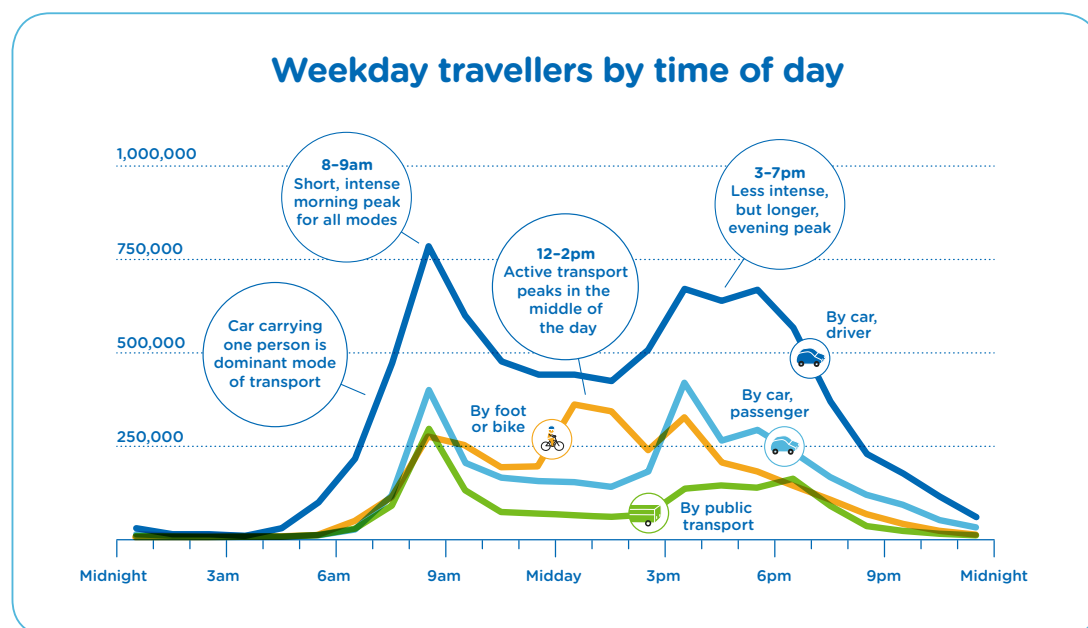


Figure 43: Weekday peaks

## A flexible, agile investment approach

Our staged investment approach is designed to be flexible, responding to change and uncertainty.

The timeframes are indicative, based on preliminary evidence, of when potentially these initiatives may be need to be implemented or committed. Capital constraints will mean that initiatives will need to be prioritised and all may not be able to be delivered within indicative timeframes.

Further investigation of all initiatives in the Strategy and Plans will be undertaken within the next 10 years to ensure any major impacts in growth patterns or use are considered.

Initiatives have been divided into the following categories:

- 1. Committed / funded initiatives (0-10yrs)** – initiatives that either have committed funding, are committed/contractually committed, are for immediate detailed planning, or are part of key maintenance, renewal or safety programs. Some initiatives subject to a final business case and funding.
- 2. Initiatives for investigation (0-10, 10-20yrs)** – intended to be investigated for potential commitment or implementation within the next 20 years. Those listed in 0-10 year horizon will be prioritised for more detailed investigation to determine if they are required in the next decade.
- 3. Visionary initiatives (20+ years)** – longer term initiatives that may be investigated within the next 10 years, but are unlikely to require implementation within 20 years.

## Growing the Greater Sydney Network

The vision for Greater Sydney as a Metropolis of Three Cities, where people can access the majority of jobs and services within 30 minutes, will require a sustained and staged investment program to protect corridors and then develop an integrated transport system that includes city-shaping, city-serving, centre-serving and strategic freight networks.

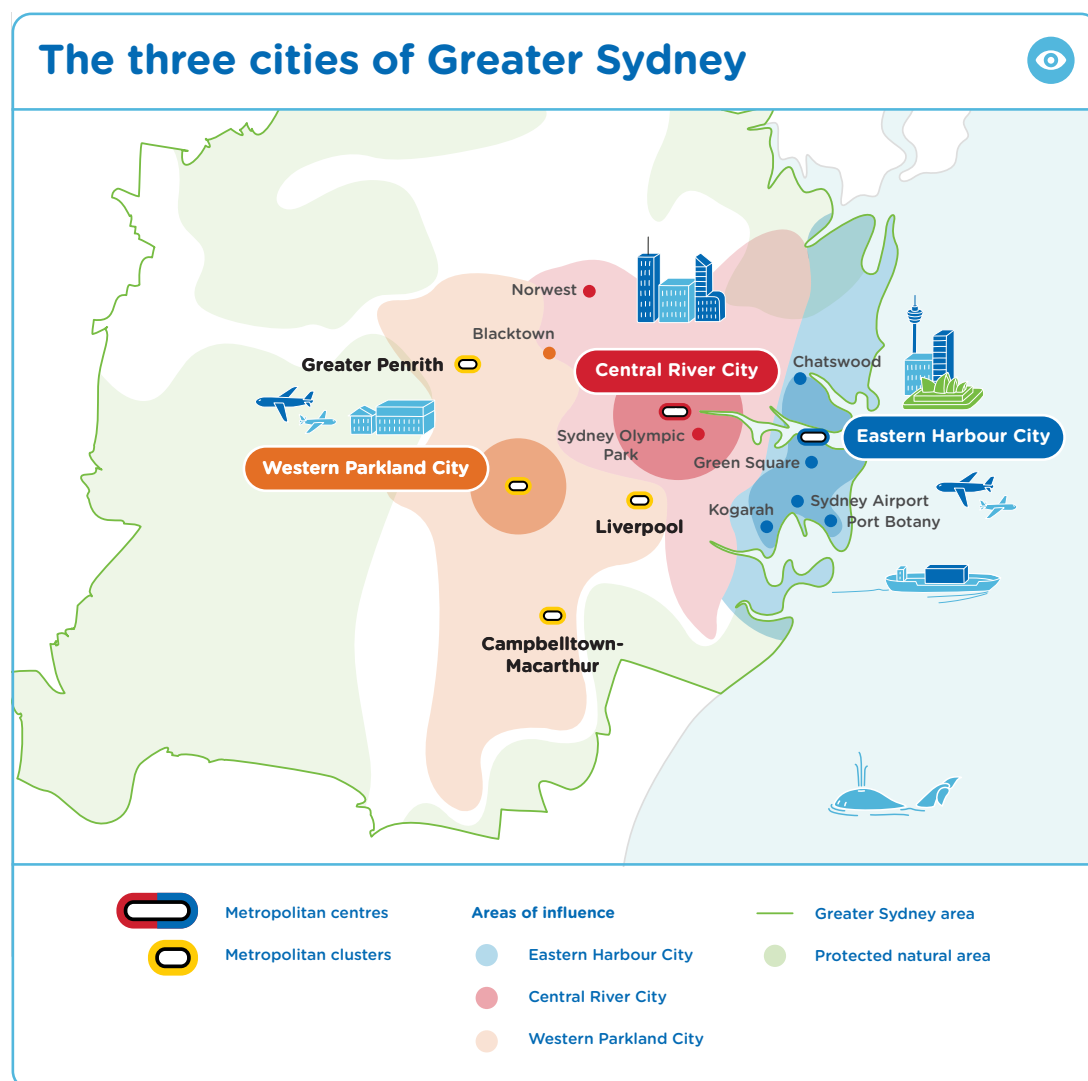


Figure 44: Three cities of Greater Sydney

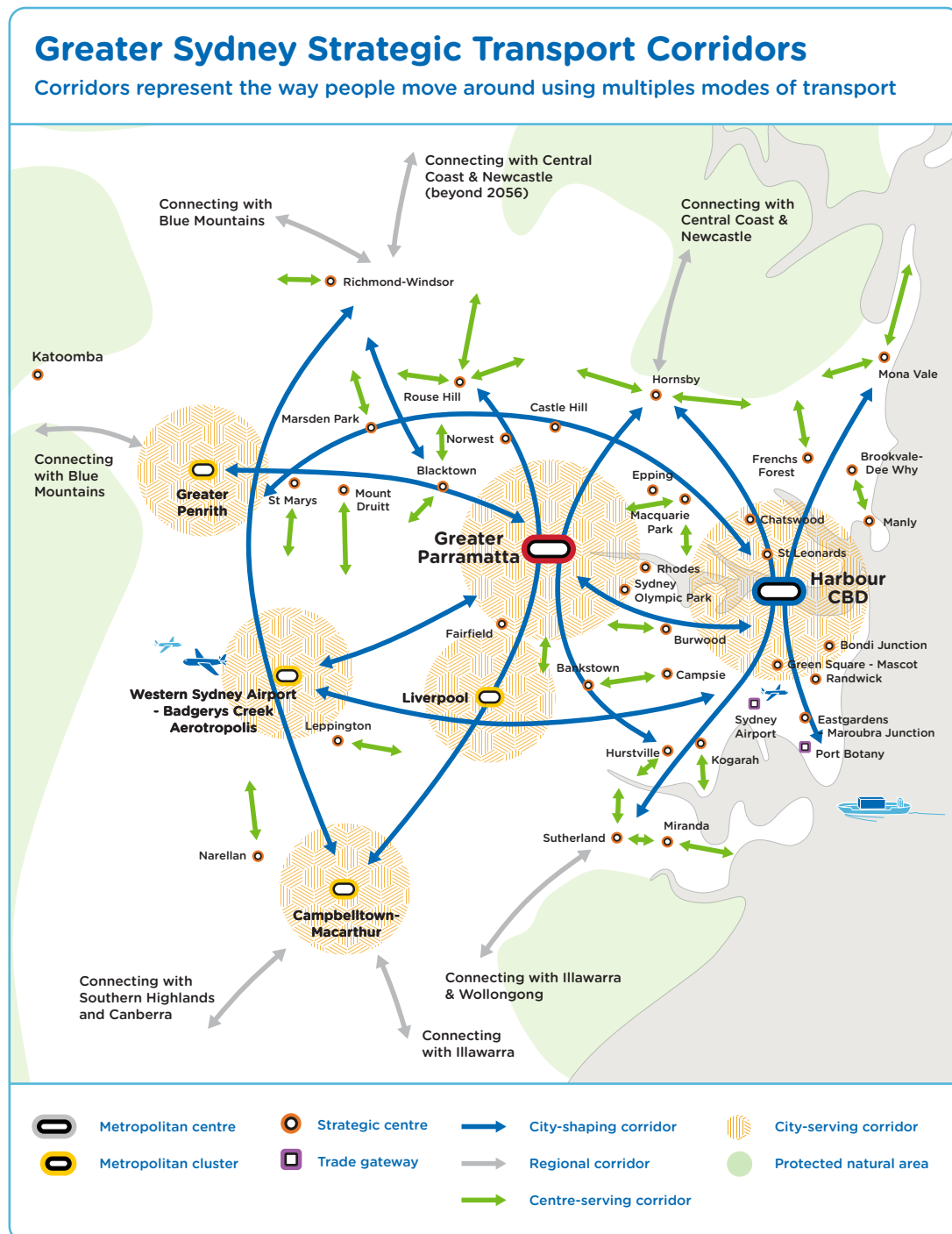


Figure 45: Greater Sydney Strategic Corridors



The transport networks will need to expand to provide improved access to each metropolitan centre, particularly Greater Parramatta and the metropolitan cluster of centres in the Western Parkland City and safe, reliable movement of freight. These networks will be progressively developed through a range of infrastructure investments that will make key improvements to the city-shaping and road networks as well as upgrade local roads, walking and bicycle paths, as detailed in the [Greater Sydney Services and Infrastructure Plan](#).

Current investments are focused on city-shaping and radial connections to centres in the Eastern Harbour City. These support improved public transport, congestion management and urban renewal outcomes, unlocking capacity on existing road and rail corridors and supporting renewal and walkability by drawing traffic away from centres. Long term, mass transit network extension will support densification in the south-east and the Bays Precinct.

The development of the Central River City will require improved 30 minute public and active transport access to Greater Parramatta. To support this, the focus will be on new city-shaping connections, particularly from the north and south. A new light rail network for Greater Parramatta will also support local access and urban renewal.

The developing Western Parkland City will require investment in the mass transit network to shape a sustainable urban form and grow jobs, in the longer term, support 30 minute access to centres by public and active transport. To support this, we will investigate a north-south train link through the Western Sydney Airport-Badgerys Creek Aerotropolis and east-west connections to the Central River City, in collaboration with the Commonwealth.

Integration with Gosford and Wollongong as future satellite cities will require improvements to existing connections and, in the longer term, consideration of higher speed rail.

To effect long term change and deliver a financially sustainable network, we need to prioritise our investments. The Greater Sydney Services and Infrastructure Plan includes a number of initiatives for delivery or investigation in the short to medium term as well as visionary initiatives.

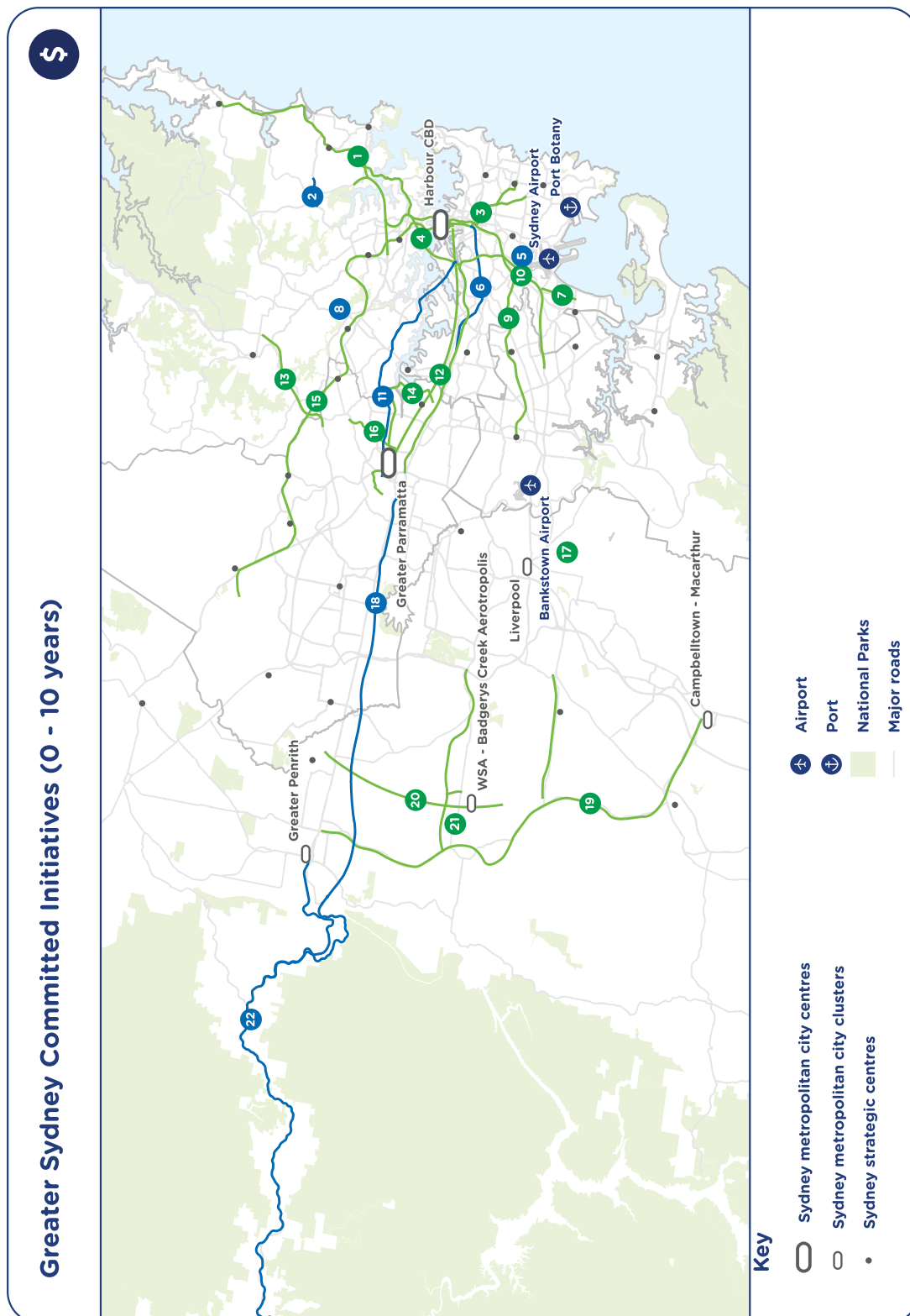


Figure 46: Greater Sydney committed initiatives (0-10 years)

## Greater Sydney Committed Initiatives (0 – 10 years)



### New Infrastructure

- 1. Northern Beaches B-line
- 3. CBD & South East Light Rail
- 4. Western Harbour Tunnel and Beaches Link\*
- 7. F6 Extension – Stage 1 West Connex to President Ave, Kogarah\*
- 9. Sydney Metro City and Southwest
- 10. WestConnex
- 12. Sydney Metro West\*
- 13. NorthConnex
- 14. Parramatta Light Rail – Stage 2\*
- 15. Sydney Metro Northwest
- 16. Parramatta Light Rail – Stage 1
- 17. Access to Moorebank Intermodal Terminal†
- 19. Western Sydney Infrastructure Plan including the new M12°

- 20. North-south Rail link in Western Parkland City: St Marys – Western Sydney Airport – Badgery's Creek Aerotropolis°
- 21. Western Sydney Growth Roads Program

### Major Infrastructure upgrades

- 2. Northern Beaches Hospital road upgrade
- 5. Sydney Airport road upgrades
- 6. Parramatta Road public transport improvements
- 8. Macquarie Park Interchange and precinct improvements†
- 11. Victoria Road public transport improvements
- 18. M4 Smart Motorway
- 22. Upgrade to Blue Mountains Line

### Sydney-wide projects/programs

- Priority Cycleway links in the Central River City
- Ferry Fleet Replacement Program, including upgraded services on Parramatta River Ferries
- Priority Cycleway links in inner Sydney
- New Intercity Fleet
- Priority Cycleway links in the Western Parkland City
- New and replacement buses

### Sydney-wide projects/programs

- Transport Access Program (Improve access to train stations and ferry wharves)
- Cycling and Pedestrian Infrastructure
- Public Transport passenger service improvements
- Pinch Point Program
- Council partnership program to improve local walking and cycling connections
- Safer Roads Program
- Bus Priority Infrastructure Program

\* Subject to final business case and funding

° Subject to final business case and funding in collaboration with the Commonwealth

† In collaboration with the Commonwealth

‡ For priority planning in collaboration with the Commonwealth

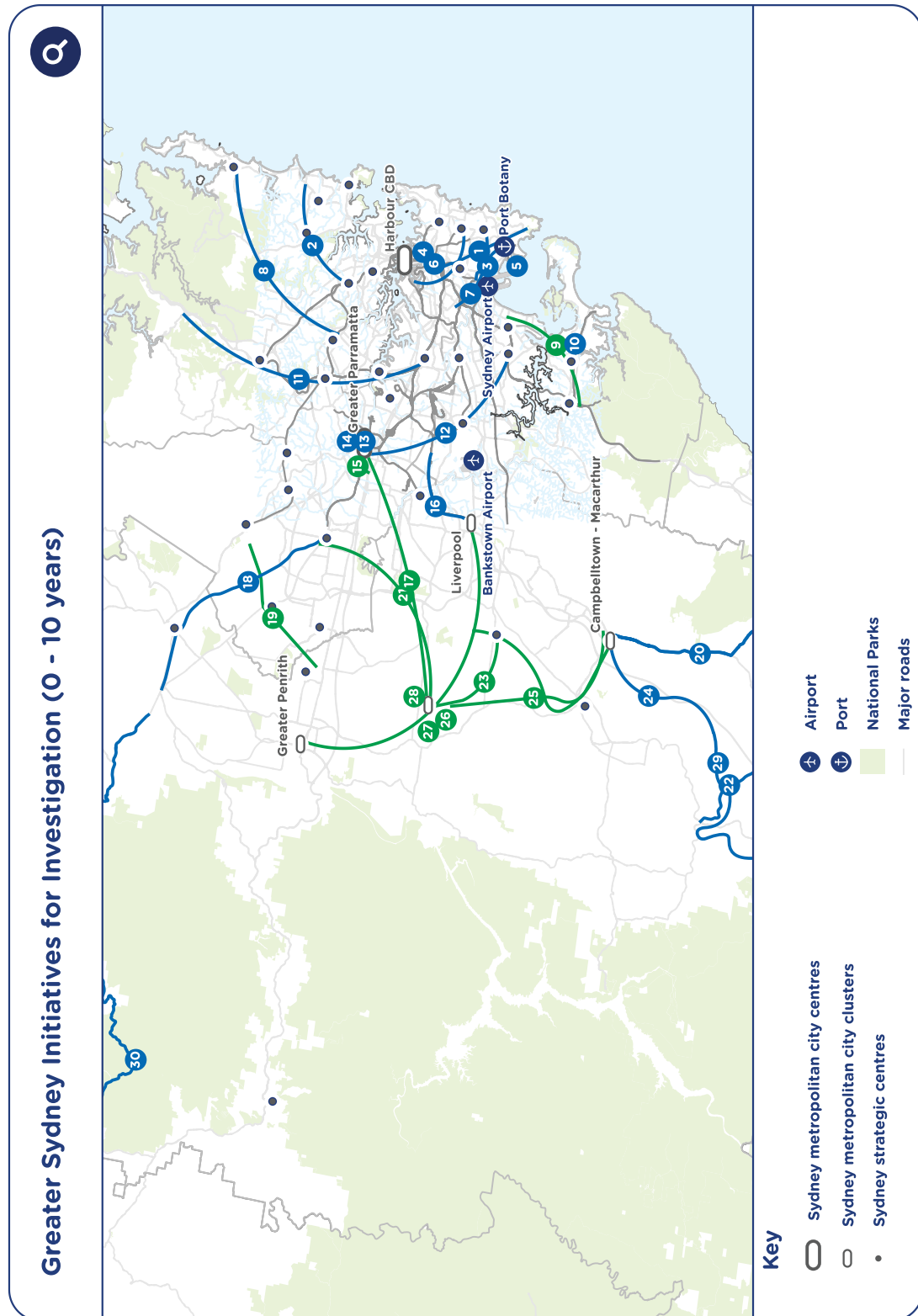


Figure 47: Greater Sydney initiatives for investigation (0-10 years)

## Greater Sydney Initiatives for Investigation (0 – 10 years)



### New Infrastructure

- 9. F6 Extension – Kogarah to Loftus
- 15. T-way to T-way Link
- 17. Western Sydney Airport – Badgerys Creek Aerotropolis – Parramatta Rail Link†
- 19. North-south Rail Link in Western Parkland City: Cudgegong Road – St Marys‡
- 21. Infrastructure to support Rapid Bus Connections and Improved Bus Connections between Western Sydney Airport – Badgerys Creek Aerotropolis and Penrith, Liverpool, Blacktown and Campbelltown – Macarthur
- 23. Leppington to Western Sydney Airport – Badgerys Creek Aerotropolis Rail Link†
- 25. North-south Rail Link in Western Parkland City: Western Sydney Airport – Badgerys Creek Aerotropolis – Campbelltown-Macarthur†
- 26. Western Sydney Airport – Badgerys Creek Aerotropolis CAV zone
- 27. Western Sydney Fuel Pipeline
- 28. Western Parkland City Bus Interchange

### Major Infrastructure upgrades

- 1. Green Square to La Perouse Rapid Bus Link
- 2. Improved bus services between Northern Beaches and Chatswood
- 3. Duplication of Port Botany freight rail line†
- 4. More Trains, More Services program
- 5. Foreshore Road Upgrade†
- 6. Harbour CBD to Green Square Mass Transit Link
- 7. Eastern Suburbs to Inner West Rapid Bus Links
- 8. East-west public transport connection from Mona Vale to Macquarie Park
- 9. Sutherland to Cronulla Active Transport Link
- 10. Northern Sydney Freight Corridor Stage 2
- 11. Parramatta to Bankstown to Hurstville / Kogarah Rapid Bus Link
- 12. Parramatta Inner Ring Road
- 13. Improved bus services between North of Parramatta and centres to the south of Parramatta

- 14. Southern Sydney Freight Line improvements†

- 18. Improved services on the Richmond Line

- 20. Improved bus connections between South-west Sydney and Illawarra

- 22. Appin and Picton Road improvements

- 24. Sydney-Canberra Faster Rail Improvements

- 29. Passenger train improvements to support growth at Wilton

- 30. Bells Line of Road Improvements

### Sydney-wide projects/programs

Roll-out of electric vehicles charge points

Identification and protection of corridors for future transport links

### Sydney-wide projects/programs

Safe cycleway network within 10km of Parramatta

Additional cruise ship capacity

Heathcote Road improvements

Inner Sydney Regional Bike Network within 10km of the Harbour CBD

Bus priority access program for centres

Bus priority infrastructure to support new services

Centres and Placemaking Enhancement Package

Cycling improvements around metropolitan and strategic centres and on the Principal Bicycle Network

Investment in Smart Roads

Walking improvements around metropolitan and strategic centres

Precinct Improvement Program

Expanded 40km/h High Pedestrian Activity Area Program

'Pedestrian Safe System' Program

\* Subject to final business case and funding

° Subject to final business case and funding in collaboration with the Commonwealth

+ In collaboration with the Commonwealth

‡ For priority planning in collaboration with the Commonwealth

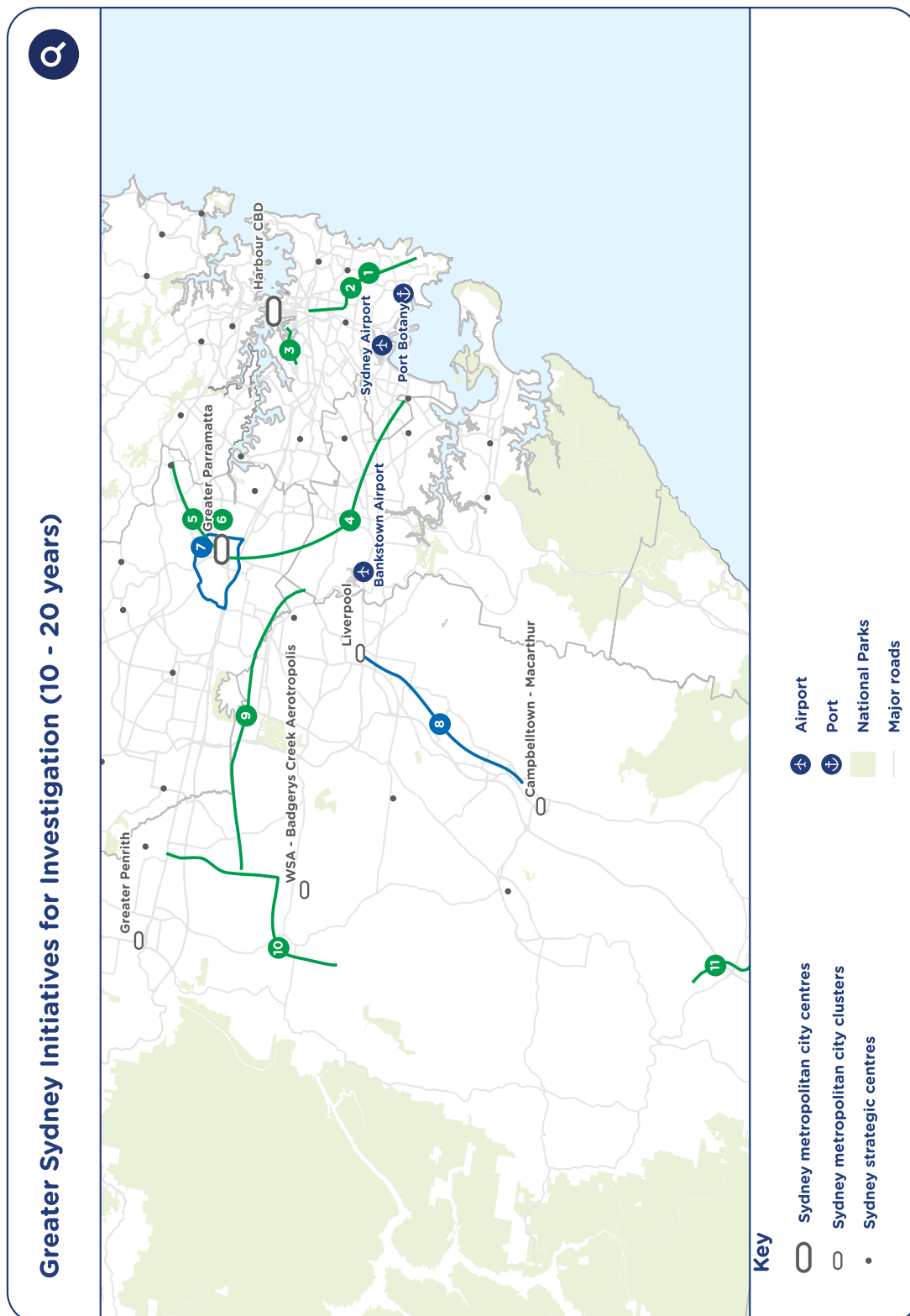


Figure 48: Greater Sydney initiatives for investigation (10-20 years)



## Greater Sydney Initiatives for Investigation (10 – 20 years)

New Infrastructure		Major Infrastructure upgrades	
1.	Light Rail Extension to Maroubra Junction	7.	Parramatta Outer Ring Road
2.	Mass transit / train link to South East	8.	Additional capacity on Southern Sydney Freight Line <sup>†</sup>
3.	Light Rail to Bays Precinct	●	<b>Sydney-wide projects/programs</b>
4.	Parramatta to Kogarah Mass Transit / Train Link		Further investment in cycling connections within 5km of strategic centres
5.	Parramatta to Eppin Mass Transit / Train Link		Major cycleway connections between centres on the Principal Bicycle Network
6.	Parramatta Light Rail Extensions		Safe cycleway network within 10km of Greater Penrith, Liverpool, Campbelltown-Macarthur and WSA Badgerys Creek Aerotropolis
9.	Western Sydney Freight Line		Corridor protection for higher speed connections
10.	Outer Sydney Orbital from Great Western Highway to Western Sydney Airport – Badgerys Creek Aerotropolis		
11.	Completion of Maldon to Dombarton railway line		

\* Subject to final business case and funding

° Subject to final business case and funding in collaboration with the Commonwealth

<sup>†</sup> In collaboration with the Commonwealth

<sup>‡</sup> For priority planning in collaboration with the Commonwealth

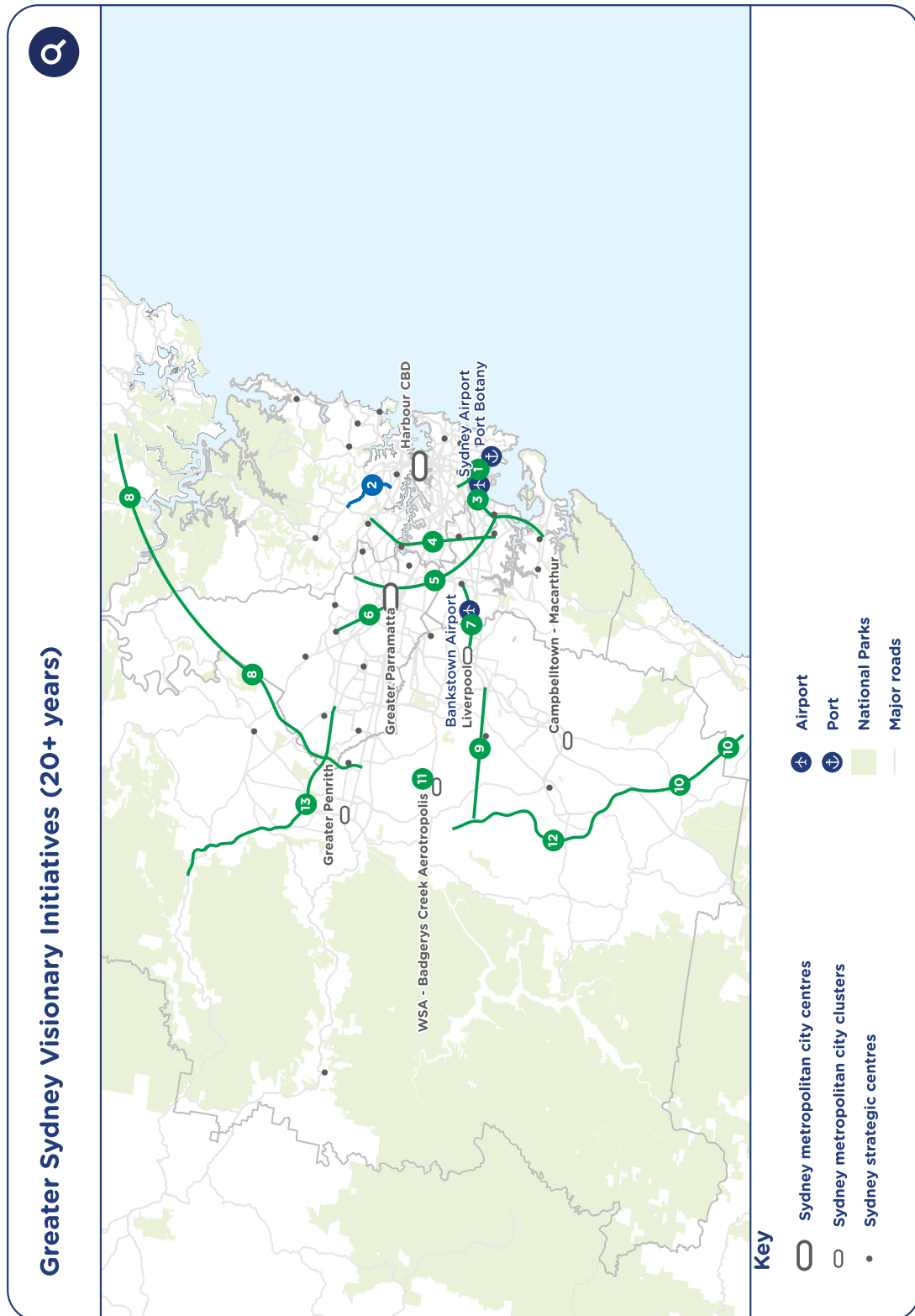


Figure 49: Greater Sydney visionary initiatives (20+ years)





## Greater Sydney Initiatives for Investigation (20+ years)

### New Infrastructure

- 1. Address long term capacity constraints to Port Botany and South East
- 3. Extension of South East Mass Transit / Train Link to Miranda
- 4. Train / Mass Transit Link Macquarie Park to Hurstville via Rhodes
- 5. Central City Strategic Road Corridor (North Connex to Southern Sydney)
- 6. Parramatta to Norwest Mass Transit / Train Link
- 7. Sydney Metro City and Southwest Extension to Liverpool
- 8. Outer Sydney Orbital from Great Western Highway to Central Coast
- 9. M5 motorway extension from Liverpool to Outer Sydney Orbital
- 10. Outer Sydney Orbital from Hume Motorway to Illawarra
- 11. Western Sydney Airport - Badgerys Creek Aerotropolis Inner and Outer Ring Roads
- 12. Outer Sydney Orbital from Western Sydney Airport - Badgerys Creek Aerotropolis to Hume Motorway
- 13. Bells Line of Road - Castlereagh Connection

\* Subject to final business case and funding

° Subject to final business case and funding in collaboration with the Commonwealth

† In collaboration with the Commonwealth

‡ For priority planning in collaboration with the Commonwealth

### Major Infrastructure upgrades

- 2. Address long term capacity constraints on the Pacific Highway
  - Sydney-wide projects/programs
- Further investment in cycling connections within 5kms of strategic centres and key connections to the Principal Bicycle Network

## The Greater Sydney City-shaping network

The city-shaping network includes higher capacity, high frequency services providing access to metropolitan centres as well as connecting the three cities. The function of this network is to enable people living in any of the three cities to access their nearest metropolitan centre within 30 minutes and to be able to travel efficiently between these metropolitan centres.

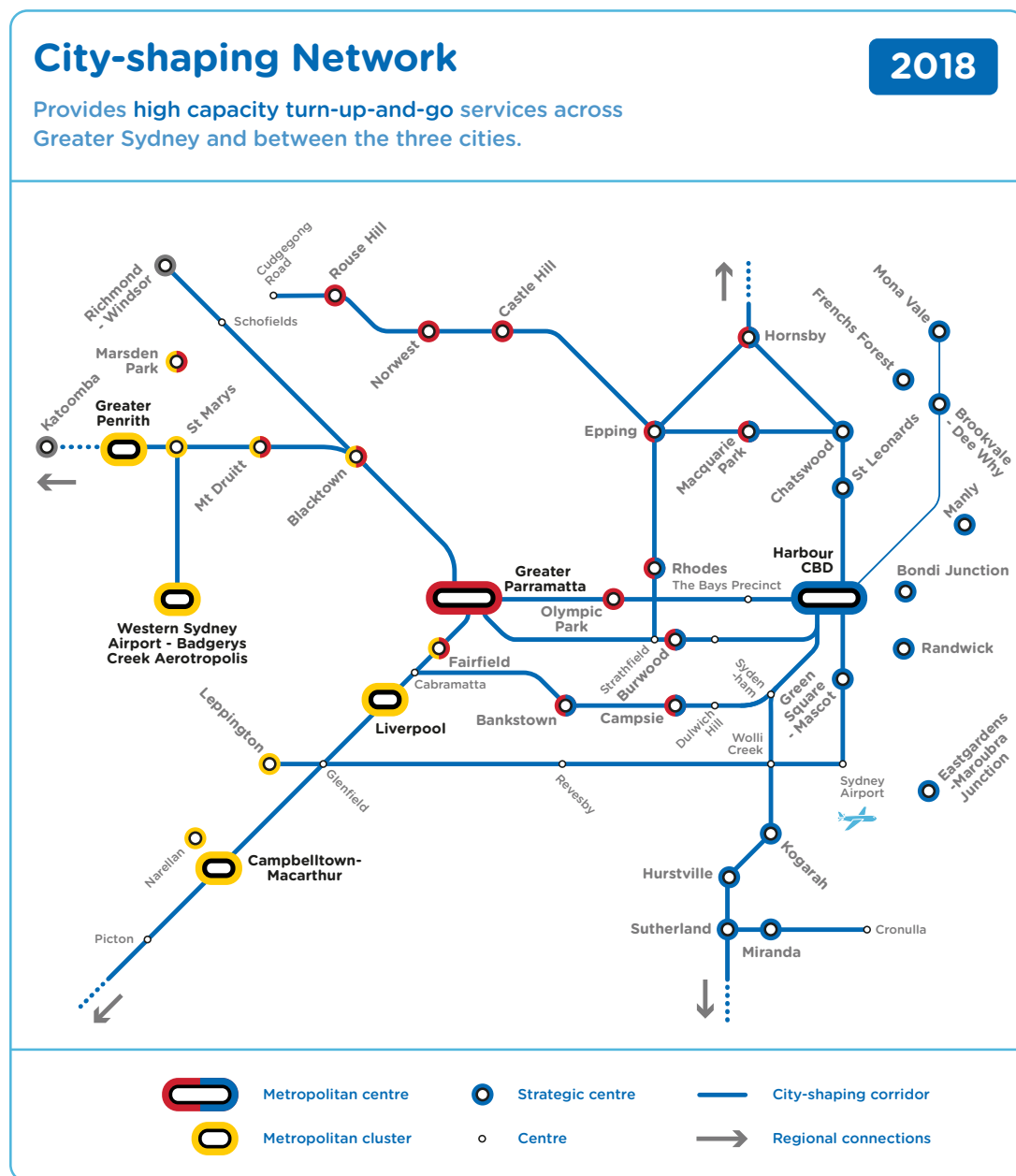


Figure 50: Greater Sydney Mass transit/train Network (committed and existing)

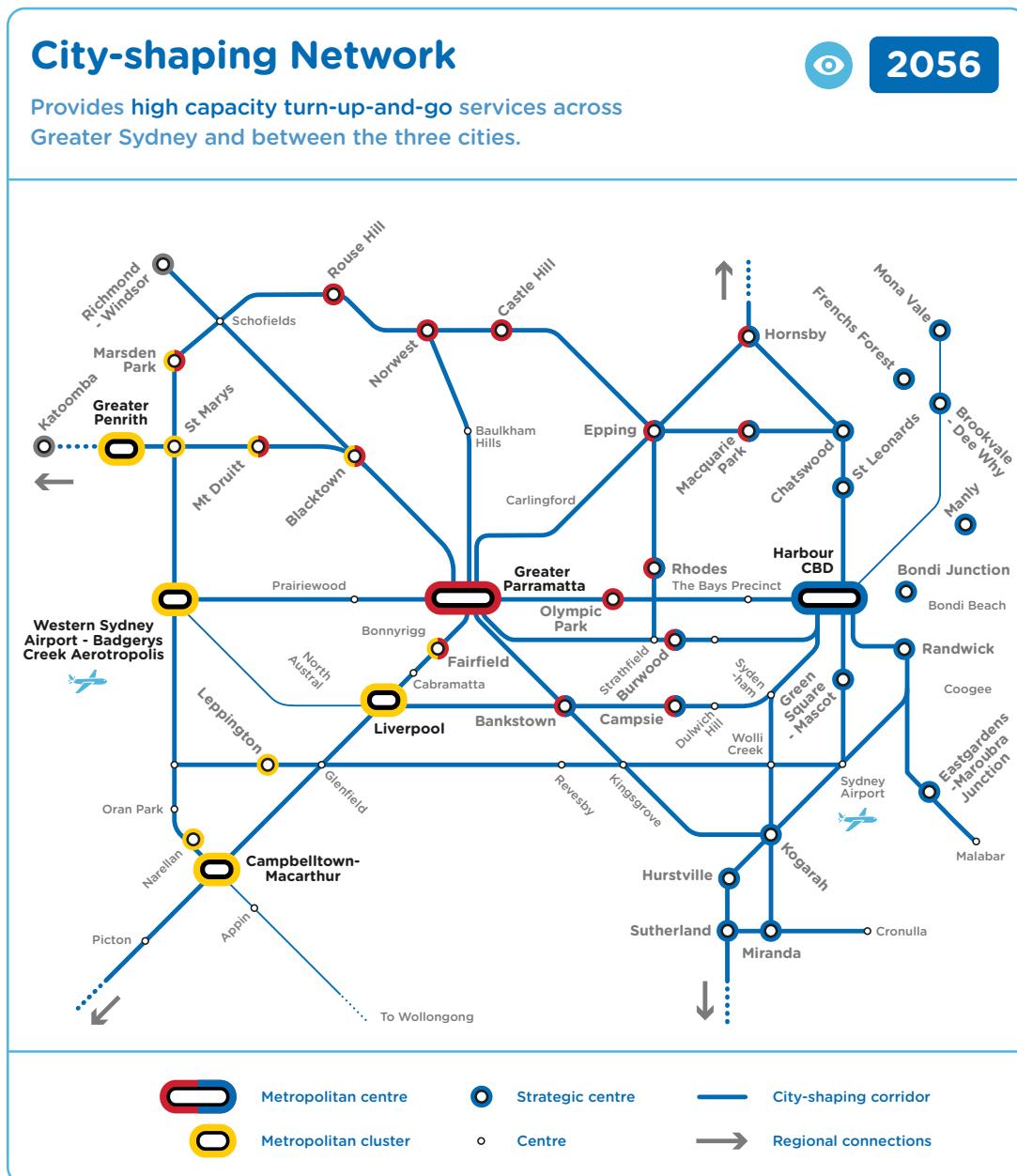


Figure 51: Greater Sydney Mass transit/train Network (visionary)

## Future strategic road network in Greater Sydney

The future strategic road network for Greater Sydney will support key movements by road, including public transport, private vehicles and freight. The strategic freight network will use major city-shaping corridors and increasingly rely on dedicated freight rail corridors for movements between ports and intermodal terminals in the Central and Western Cities. The introduction of connected and automated vehicles (CAVs) and 'smart' infrastructure will increase the efficiency of the road network.

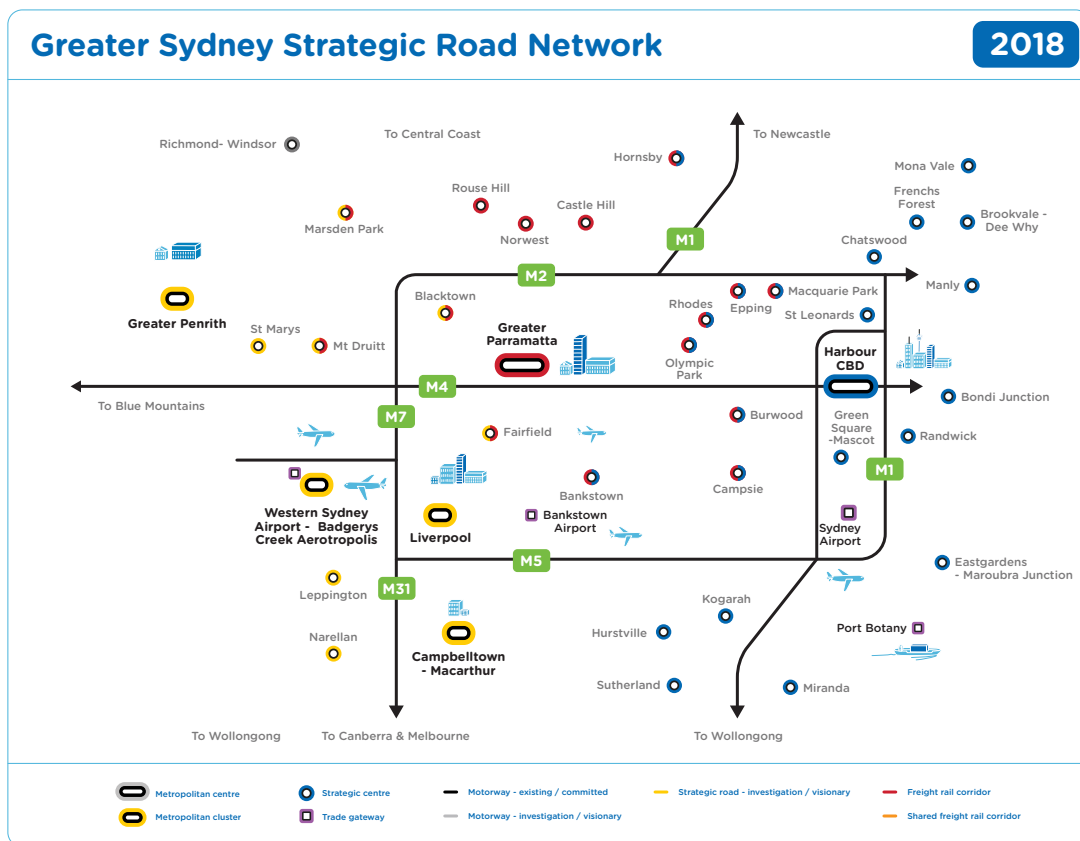


Figure 52: Greater Sydney Road Network 2018 (existing and committed)

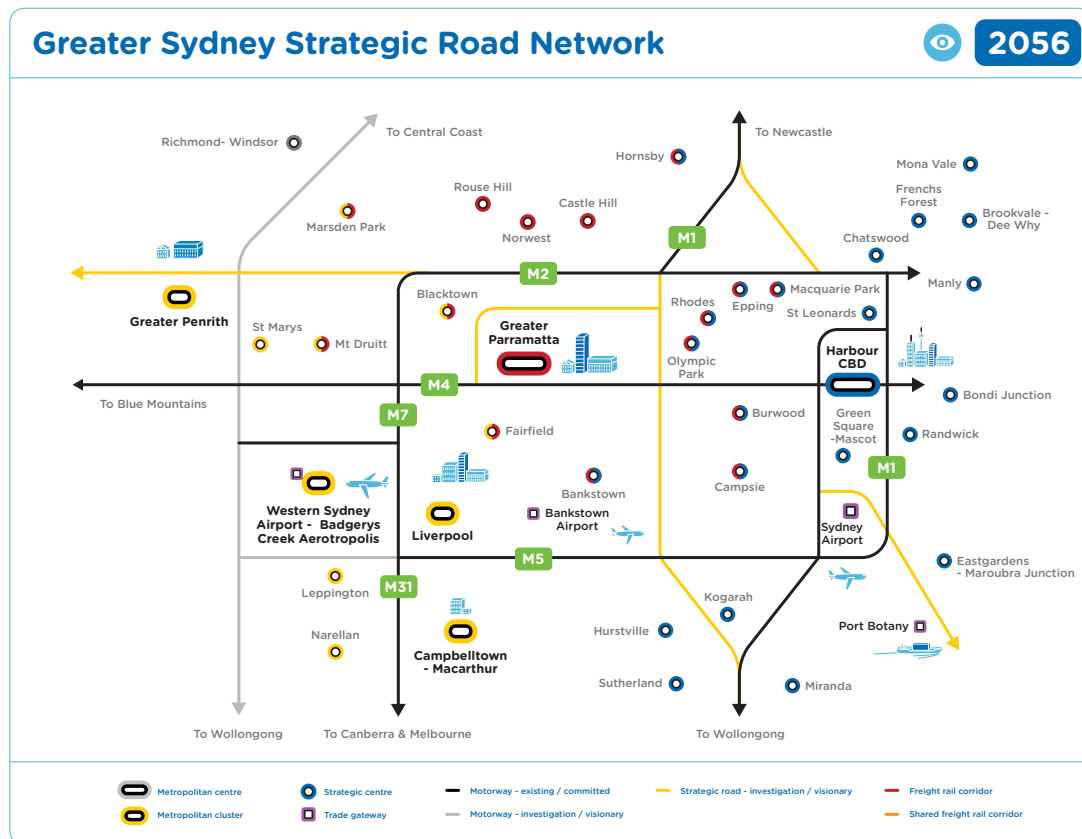


Figure 53: Greater Sydney Road Network 2056 (visionary)

## City-serving network in Greater Sydney

The city-serving network will provide high-frequency or turn-up-and-go services within less than 10km of the three metropolitan centres. This will support access within some of the densest land use in Greater Sydney where demand for travel is most concentrated. As these inner urban areas in each of the three cities develop, we will improve priority for on-street public transport services and invest in higher frequency services.

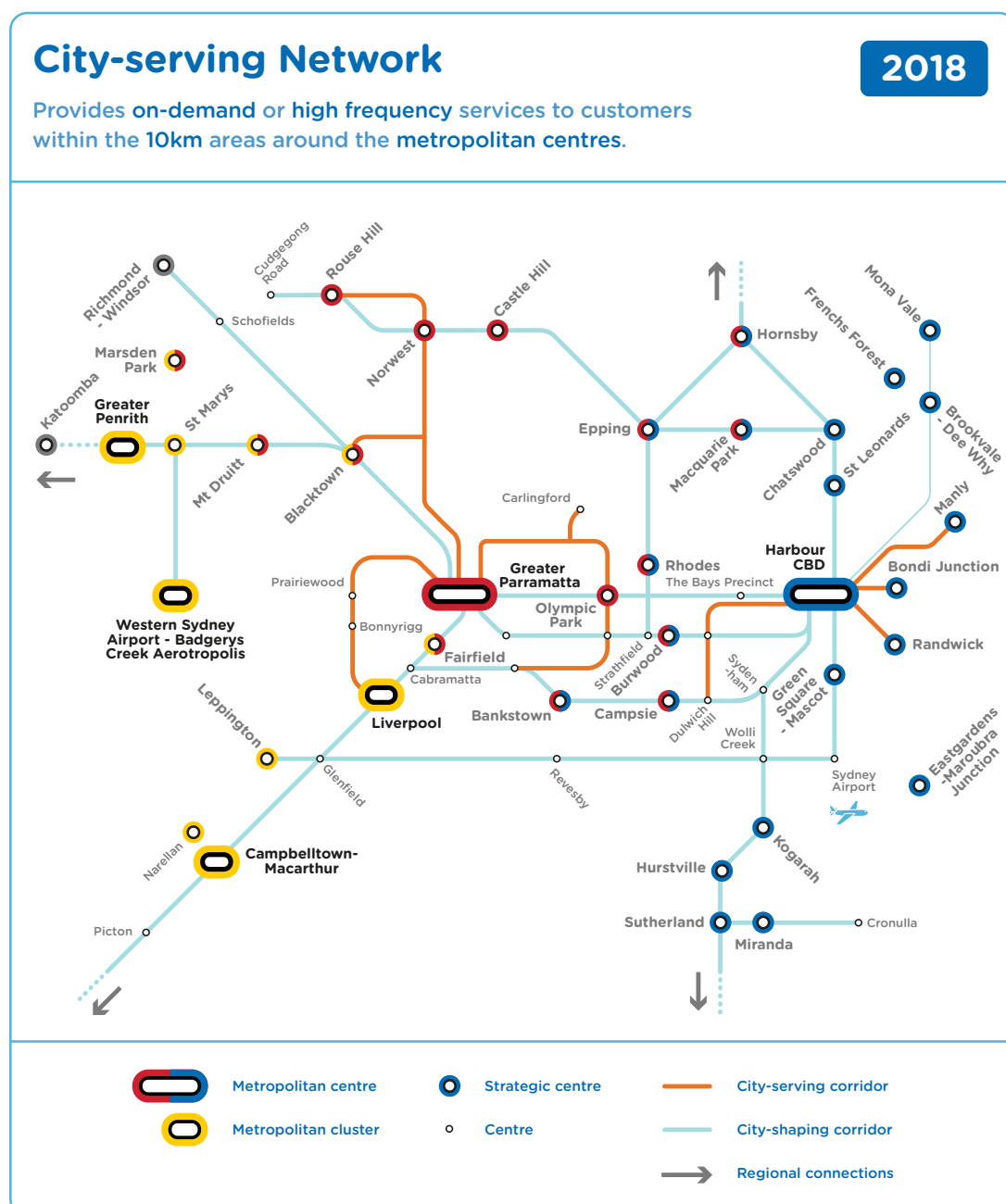


Figure 54: Greater Sydney Intermediate Transit Network 2017 (existing and committed)

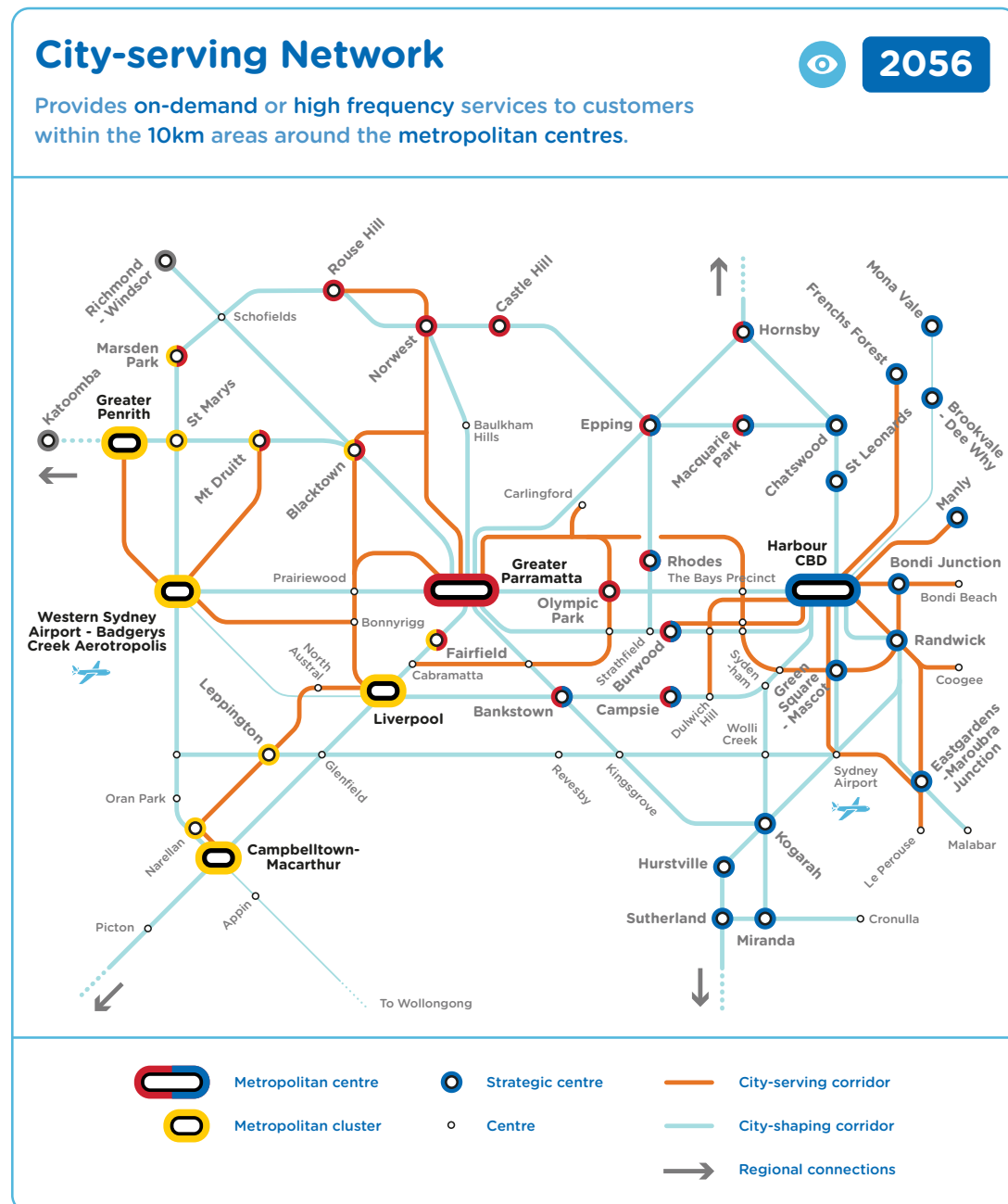


Figure 55: Greater Sydney Intermediate Transit Network 2056 (visionary)

## Centre-serving network

The centre-serving network connects local areas with strategic centres. It enables customers living in typically lower density areas across Greater Sydney to access jobs, education and services in strategic centres and to access city-shaping corridors, such as train, metro and high frequency bus services. On-demand transport and walking and cycling will play a greater role in the future centre-serving network to improve convenience, harness innovation and promote healthy lifestyles.

## Freight network

The strategic freight network includes the most significant corridors that support the movement of goods. This includes corridors connecting trade gateways, freight precincts and centres across Greater Sydney as well as corridors that connect the region with outer metropolitan areas and regional NSW. Supporting the safe, efficient and reliable movement of goods around Greater Sydney will require a high capacity network for movement between trade gateways and convenient access to service centres.

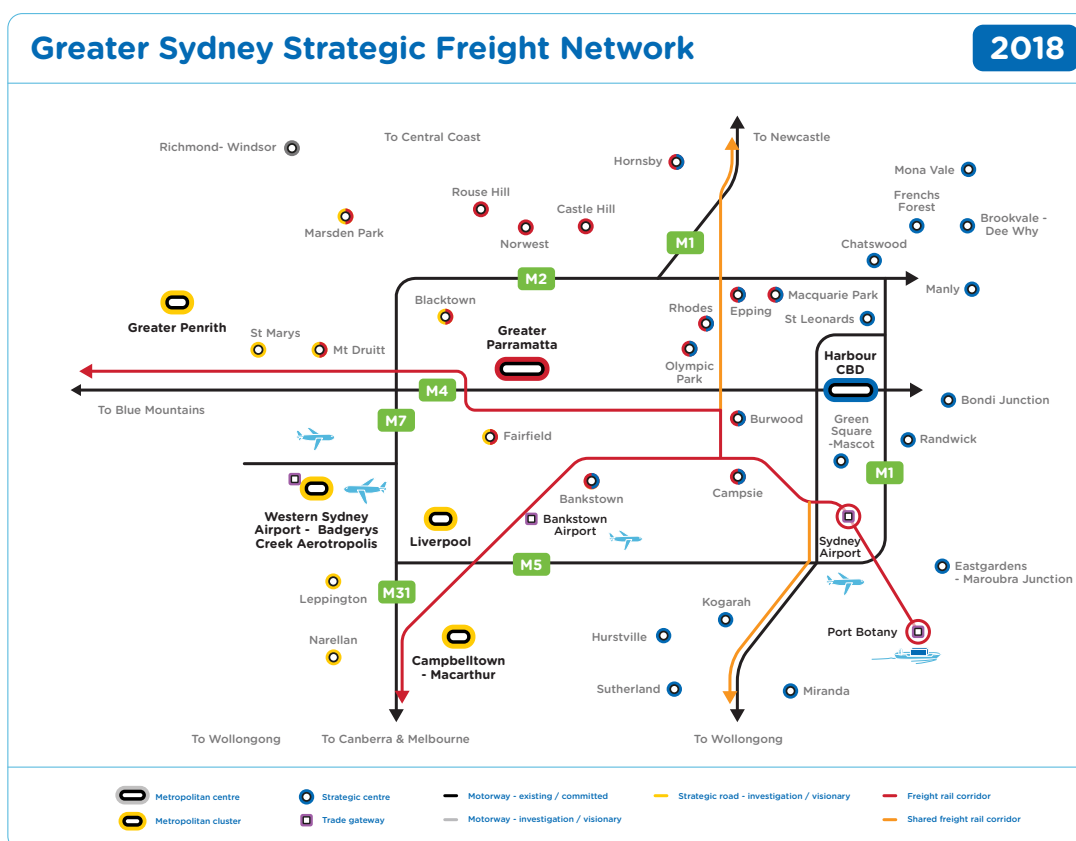


Figure 56: Greater Sydney strategic freight network (existing and current)



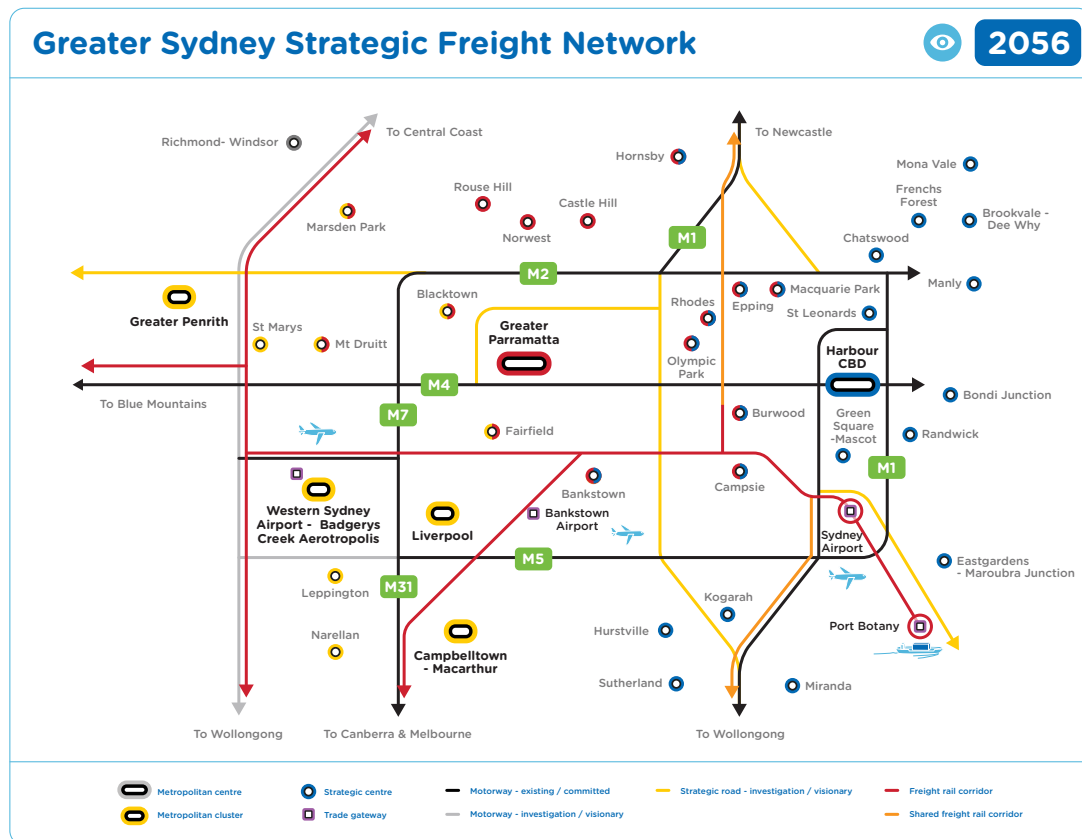


Figure 57: Greater Sydney strategic freight network vision

## Growing Greater Sydney's Bicycle network

More than 11 million weekday car trips in Greater Sydney are less than 10km. Two in five bus trips are less than 5km. These short trips contribute to congestion on already constrained parts of the transport network.

Encouraging cycling could help relieve congestion and could more than double the number of people who can reach our three cities within 30 minutes.

Cycling also has a health payback by preventing chronic disease through increasing physical activity and improved wellbeing. It creates better places, lowers carbon emissions and improves access to public transport services.

In the future, cycling connections will form part of the Principal Bicycle Network, allowing customers to travel between centres across Greater Sydney. The network will also form part of [Greater Sydney's Green Grid](#) – connecting open spaces with centres and residential areas.

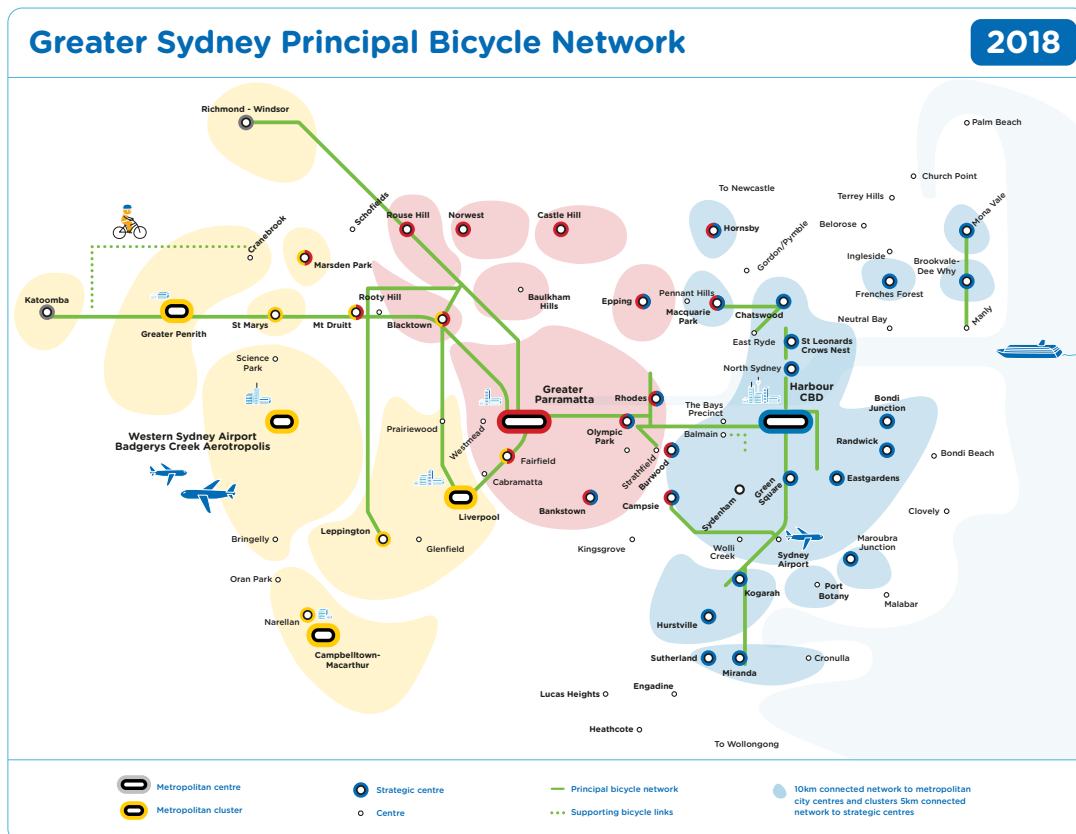


Figure 58: Growing Sydney's bicycle network (committed and existing)

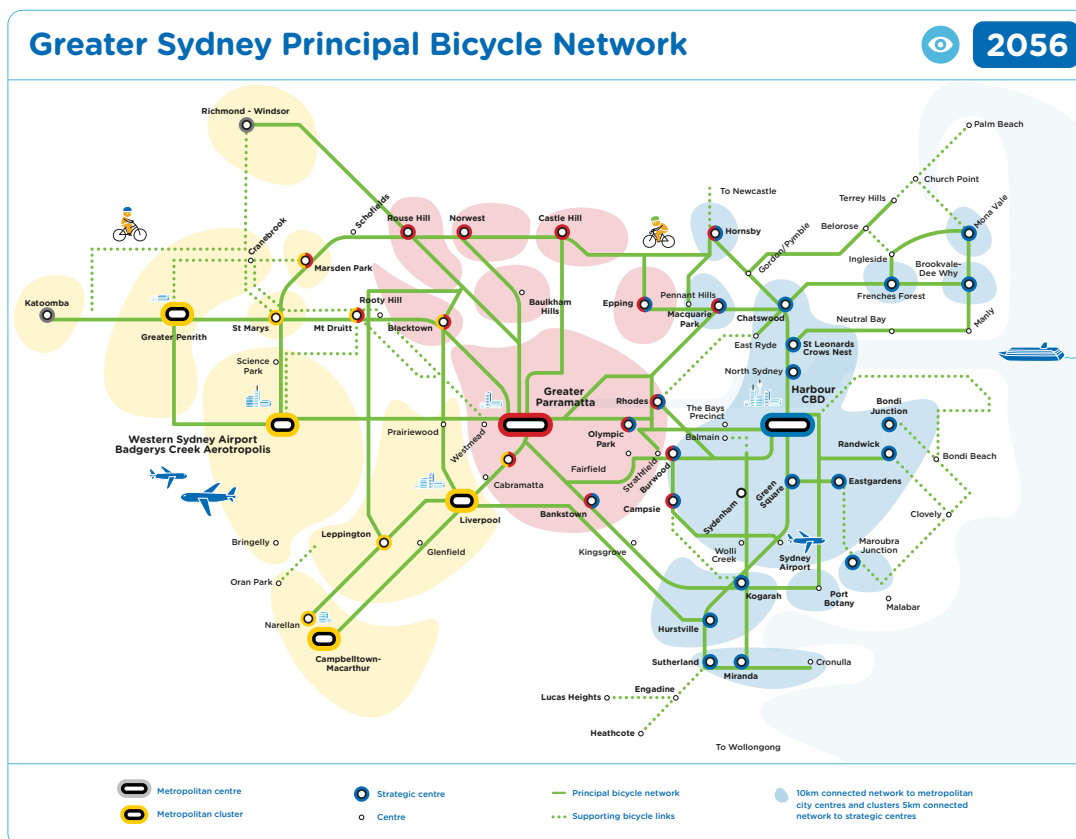


Figure 59: Growing Sydney's bicycle network (visionary)

## Growing the network in regional NSW

### Staged investments that develop economic centres and corridors in regional NSW

The Department of Planning and Environment has identified around 20 regional cities and over 30 regional centres in their recently released [Regional Plans](#). Of these regional cities, three global gateways have been identified, including Canberra, Greater Newcastle and Gold Coast-Tweed Heads. These global gateways serve extended catchments, supporting the surrounding regional cities, centres and villages. Wollongong and Gosford have been nominated as satellite cities as the outer metropolitan area grows.

NSW Government will develop a long term vision for regional roads to deliver a safe and productive network that supports the 'hub and spoke' model. The long term vision will guide investments in road upgrades and bypasses to improve liveability and road safety, and expand the regional public transport network.

Regional precincts will be first candidates for technology roll out, with a focus on CAV readiness in the first decade. City-shaping corridors will be upgraded in stages, with emphasis transitioning from high volume north-south corridors towards improving critical east-west movements. In the medium term, a corridor will be secured for the development of high speed travel on the eastern seaboard.

Road and rail network improvement and development to serve anticipated freight growth and the need for an overflow port once Port Botany reaches capacity.

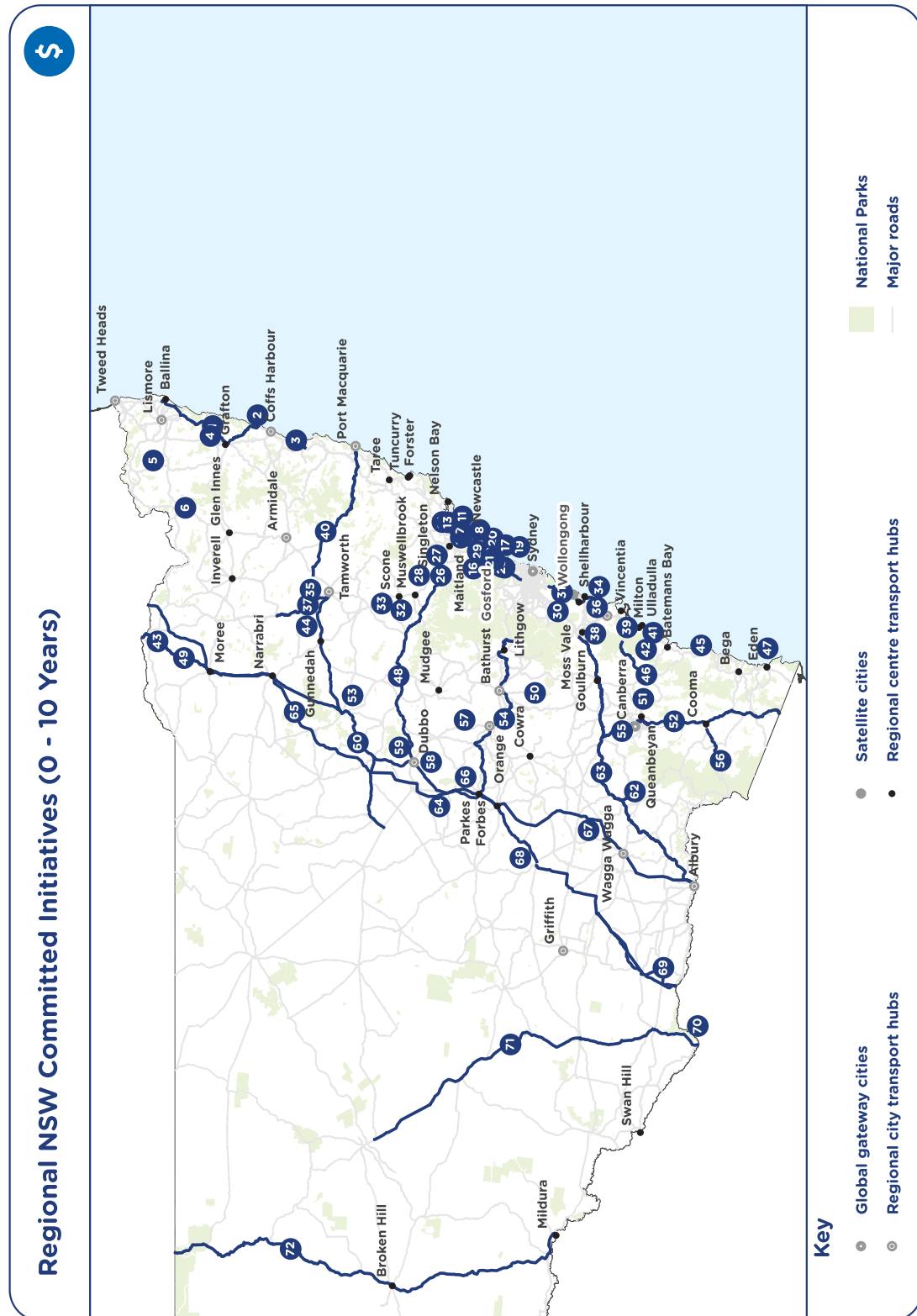


Figure 60: Regional NSW committed initiatives

## Regional NSW committed Initiatives (0-10 years)



Committed initiatives are shown on the previous map, and the detail of each is provided in Appendix. Some are subject to final business case and funding.

- |                                                                                      |                                                                                                                 |                                                                                                         |                                                                                                                                   |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| ● 1. Woolgoolga to Ballina (State and Federal funded)                                | ● 13. Hunter Pinch Points                                                                                       | ● 24. Manns Road, Central Coast Highway to Narara Creek Road (Planning)                                 | ● 34. Albion Park Rail Bypass (Planning and Preconstruction)                                                                      |
| ● 2. Coffs Harbour Bypass (Subject to final business case and Federal funding)       | ● 14. M1, Hexham, Raymond Terrace upgrades                                                                      | ● 25. Pacific Motorway Widening, Kariong Interchange to Somersby Interchange (State and Federal Funded) | ● 35. Tamworth Rail Freight Centre                                                                                                |
| ● 3. Warrell Creek to Nambucca Heads (State and Federal Funded)                      | ● 15. Wyong Road, Mingara Drive to Tumbl Road Upgrade                                                           | ● 26. New England Highway, Belford to Golden Highway Upgrade (Planning)                                 | ● 36. Berry to Bomaderry Upgrade                                                                                                  |
| ● 4. Summerland Way, Additional Clarence River Crossing (Grafton Bridge)             | ● 16. Warnervale Link Road, Albert Warner Drive to Pacific Highway (Planning)                                   | ● 27. New England Highway, Singleton Bypass (Planning)                                                  | ● 37. Barraba Branch Line                                                                                                         |
| ● 5. Bruxner Highway, Replacement Bridge over Clarence River                         | ● 17. Pacific Highway, Wyong Town Centre (Planning)                                                             | ● 28. New England Highway, Gowrie Gates, Widen Rail Underpass                                           | ● 38. Nowra Bridge over Shoalhaven River (Planning) (State and Federal Funded) subject to final business case and Federal funding |
| ● 6. New England Highway, Bolivia Hill Upgrade (State and Federal Funded)            | ● 18. Pacific Motorway Widening and Reconstruction, Wyong Road to Doyalson Link Road (State and Federal funded) | ● 29. New Intercity Fleet                                                                               | ● 39. Burrill Lake Bridge Replacement                                                                                             |
| ● 7. Nelson Bay Road improvements – Fern Bay to Williamtown                          | ● 19. Empire Bay Drive, The Scenic Road and Cochrone Street Intersection Upgrade                                | ● 30. Princes Motorway, Interchange at Base of Mount Ousley (Planning)                                  | ● 40. Oxley Highway Safety and Realignment Works (Planning)                                                                       |
| ● 8. Newcastle Cruise Terminal                                                       | ● 20. Kangy Angy Train Maintenance Facility for New Intercity Fleet                                             | ● 31. Princes Motorway Improvements, Bulli Tops to Picton Road (Planning) (State and Federal Funded)    | ● 41. Batemans Bay Bridge (Planning)                                                                                              |
| ● 9. Newcastle Light Rail                                                            | ● 21. Pacific Highway, Ourimbah Street to Glen Road                                                             | ● 32. New England Highway, Muswellbrook Bypass (Planning)                                               | ● 42. Kings Highway, Replacement Clyde River Bridge                                                                               |
| ● 10. Cormorant Road, Industrial Drive to Stockton Bridge (State and Federal funded) | ● 22. Pacific Highway, Parsons Road to Ourimbah Street (Planning)                                               | ● 33. New England Highway, Scone Bypass (State and Federal Funded)                                      | ● 43. Newell Highway, Mungie Back Creek to Boggabilla Heavy Duty Pavement (State and Federal Funded)                              |
| ● 11. Lower Hunter Freight Corridor Protection                                       | ● 23. Pacific Highway and Manns Road, Narara Creek Road to Parsons Road (Planning)                              |                                                                                                         | ● 44. Oxley Highway, Gunnedah Bridge over Rail                                                                                    |
| ● 12. Newcastle Inner City Bypass, Rankin Park to Jesmond                            |                                                                                                                 |                                                                                                         | ● 45. Dignams Creek Realignment                                                                                                   |

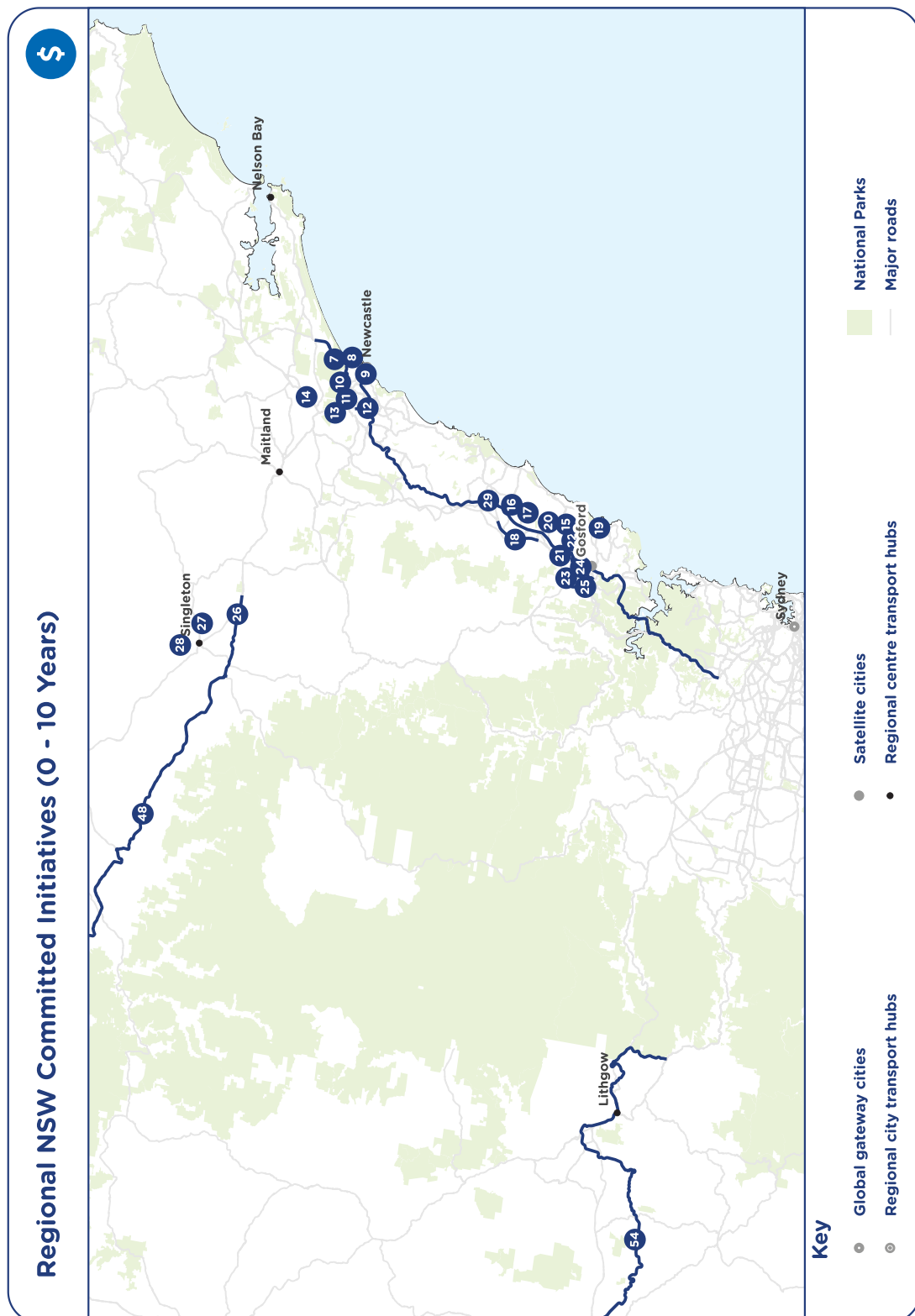


Figure 61: Initiatives committed (0-10 years)



## Regional NSW committed Initiatives (0-10 years) continued

Committed initiatives are shown on the previous map, and the detail of each is provided in Appendix. Some are subject to final business case and funding.

- 46. MR92 Nerriga Road improvements
- 47. Eden cruise facilities development
- 48. Golden Highway Safety and Productivity Works (State and Federal Funded)
- 49. Newell Highway Heavy Vehicle Pavement Upgrades - Narrabri-Moree, North of Moree (Planning)
- 50. Main Road 54 (Goulburn to Bathurst) Initial Sealing
- 51. Queanbeyan Bypass (Ellerton Drive Extension) (State, Federal and Local Government Funded)
- 52. Monaro Highway Overtaking Lanes and Safety Improvements
- 53. Newell Highway, Improvements through Coonabarabran (Planning)
- 54. Upgrades to Main West Line
- 55. Barton Highway Improvements (State and Federal Funded)
- 56. Kosciuszko Road Overtaking Lanes and Safety Improvements
- 57. Mitchell Highway, Guanna Hill Realignment
- 58. Regional Rail Maintenance Facility (Dubbo subject to planning approval)
- 59. Newell Highway, New Dubbo Bridge (Planning)
- 60. Newell Highway Overtaking Lanes
- 62. Gocup Road Upgrade
- 63. Hume Highway Heavy Duty Pavement (State and Federal Funded)
- 64. Newell Highway, Trewilga Realignment
- 65. Inland Rail (Federally funded)
- 66. Newell Highway, Parkes Bypass (Planning)
- 67. Junee North Triangle
- 68. Newell Highway, West Wyalong Heavy Vehicle Bypass
- 69. Narrandera - Tocumwal Railway Reactivation
- 70. Cobb Highway, New Bridge at Echuca - Moama
- 71. Cobb Highway seal extension
- 72. Silver City Highway seal extension

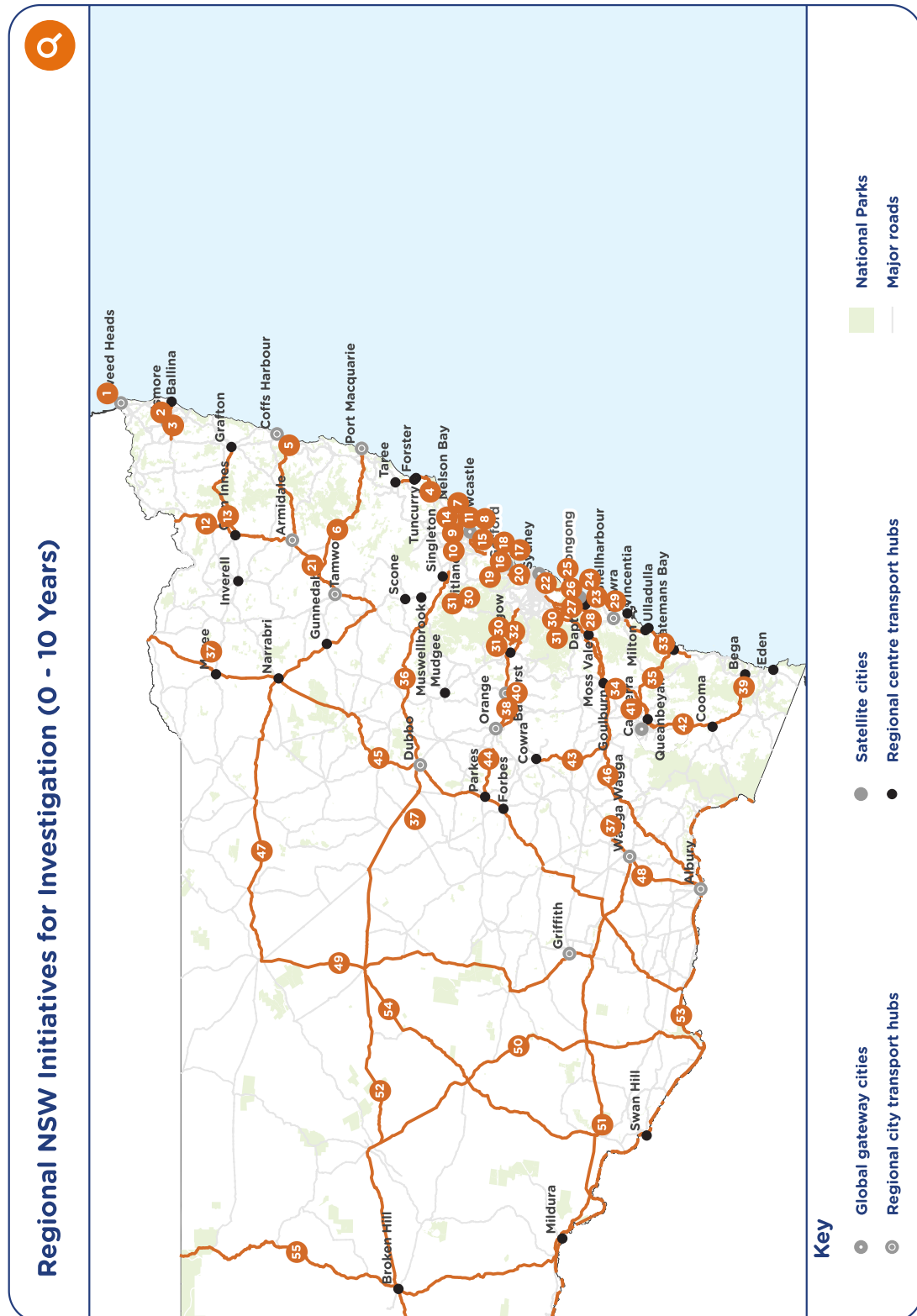


Figure 62: Regional NSW initiatives for investigation (0-10 years)



## Regional NSW Initiatives for investigation (0-10 years)



Initiatives for investigation for potential commitment within 10 years are shown on the previous map, and the detail of each is provided in Appendix.

- |                                                                                                                                |                                                                                |                                                                                                                    |                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| ● 1. Tweed Transport Network Plan (encompassing the potential for light rail extension from Gold Coast Airport to Tweed Heads) | ● 13. Gwydir Highway Improvements (between Grafton and Glen Innes, Jackadgery) | ● 28. Moss Vale to Unanderra and Coniston Junction rail improvements                                               | ● 41. Investigate extension of light rail from Canberra to Queanbeyan          |
| ● 2. Upgrade of Bangalow Road between Bangalow and Lismore                                                                     | ● 14. M1, Hexham, Raymond Terrace upgrades                                     | ● 29. Princes Highway Nowra Bridge replacement                                                                     | ● 42. Monaro Highway improvements                                              |
| ● 3. Bruxner Highway Improvements (Ballina-Casino)                                                                             | ● 15. Greater Newcastle Place Plans                                            | ● 30. Great Dividing Range long term solution study                                                                | ● 43. Lachlan Valley Way improvements                                          |
| ● 4. The Lakes Way Corridor Improvements                                                                                       | ● 16. Sydney-Central Coast-Newcastle Faster Rail Improvement                   | ● 31. Great Dividing Range long term solution corridor preservation                                                | ● 44. Henry Parkes Way improvements                                            |
| ● 5. Waterfall Way corridor improvements                                                                                       | ● 17. Bus Headstart for Central Coast                                          | ● 32. Bells Line of Road improvements                                                                              | ● 45. Newell Highway Improvements (in addition to those committed)             |
| ● 6. Oxley Highway Improvements                                                                                                | ● 18. Central Coast Rapid Bus package                                          | ● 33. Duplication of Princes Highway (Jervis Bay Road Intersection to Moruya) including bypass of Milton-Ulladulla | ● 46. Hume Highway Improvements                                                |
| ● 7. Nelson Bay Road improvements – Williamtown to Bobs Farm                                                                   | ● 19. Central Coast Place Plans                                                | ● 34. Sydney-Canberra Faster Rail improvement                                                                      | ● 47. Kamilaroi Highway Improvements                                           |
| ● 8. Improvements to Newcastle Port                                                                                            | ● 20. M1 Motorway improvements (Hawkesbury River – Mt White)                   | ● 35. Kings Highway improvements                                                                                   | ● 48. Main South Freight Rail Capacity Enhancements in collaboration with ARTC |
| ● 9. Bus headstart for Greater Newcastle                                                                                       | ● 21. New England Highway Improvements (Willow Tree to Armidale)               | ● 36. Golden Highway improvements (continuation)                                                                   | ● 49. Kidman Way improvements                                                  |
| ● 10. Greater Newcastle Rapid Bus Package                                                                                      | ● 22. Sydney-Wollongong Faster Rail Improvement                                | ● 37. Inland Rail Intermodal Facility investigations                                                               | ● 50. Cobb Highway sealing missing links                                       |
| ● 11. Newcastle Light Rail network extension                                                                                   | ● 23. Wollongong Rapid Bus package                                             | ● 38. Mt Victoria to Orange road corridor improvements to achieve travel time savings and road safety outcomes     | ● 51. Sturt Highway improvements                                               |
| ● 12. New England Highway Improvements (Armidale to border)                                                                    | ● 24. Wollongong Place Plans                                                   | ● 39. Snowy Mountains Highway improvements (including Brown Mountain)                                              | ● 52. Barrier Highway improvements (Dubbo-Broken Hill)                         |
|                                                                                                                                | ● 25. Bus headstart for Wollongong                                             | ● 40. Extending Bathurst commuter rail to Orange                                                                   | ● 53. Murray River Bridges Program                                             |
|                                                                                                                                | ● 26. Bus priority measures on Appin Road                                      |                                                                                                                    | ● 54. The Wool Track sealing (Balranald – Ivanhoe -Cobar)                      |
|                                                                                                                                | ● 27. Picton Rd/Appin Rd Improvements                                          |                                                                                                                    | ● 55. Silver City Highway sealing missing links                                |

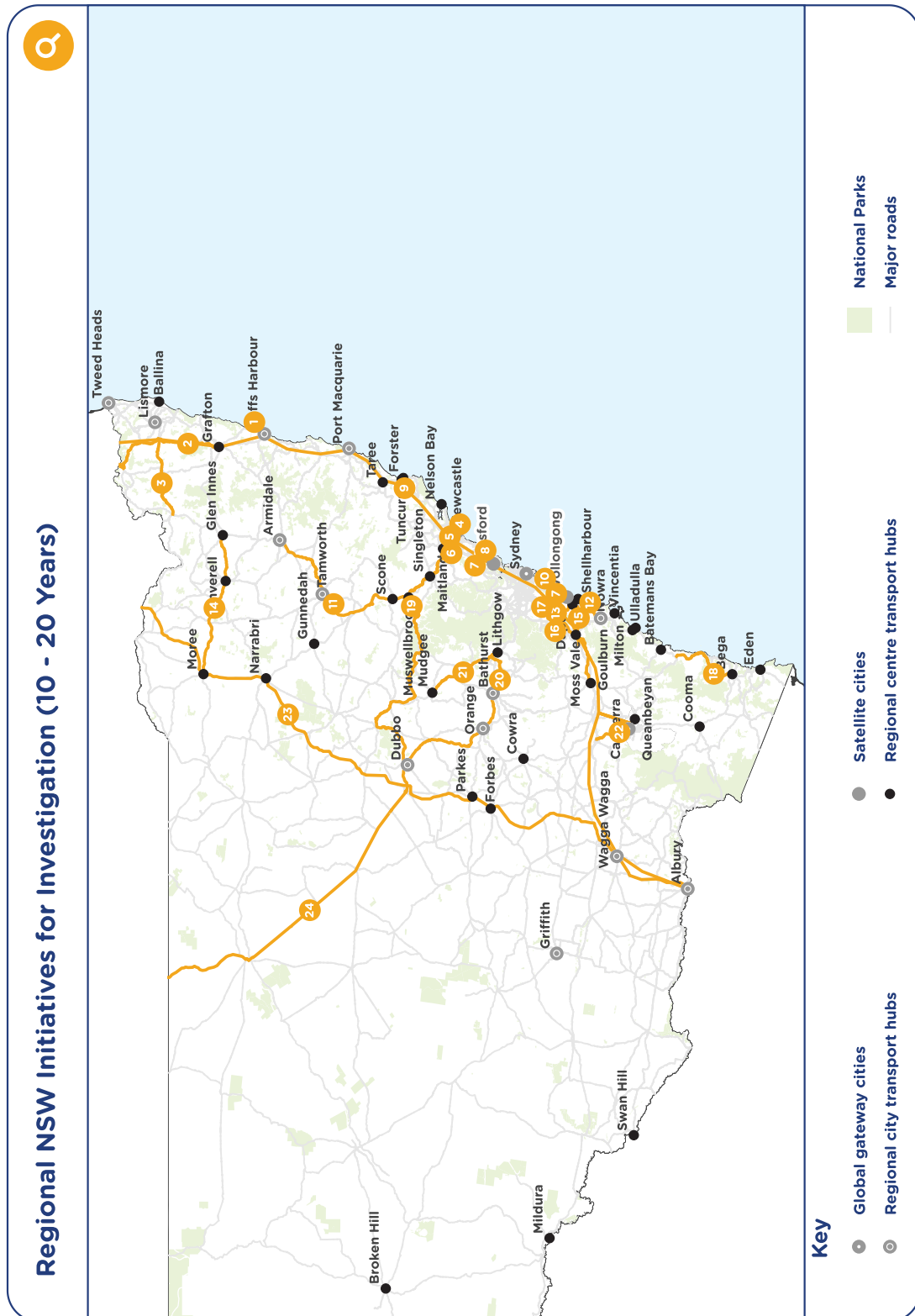


Figure 63: Regional NSW initiatives for investigation (10-20 years)

## Regional NSW Initiatives for investigation (10-20 years)



Initiatives for investigation for potential commitment within 10 to 20 years are shown on the previous map, and the detail of each is provided in Appendix.

- |                                                                |                                                                 |                                                         |
|----------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------|
| ● 1. MR92 Nerriga Road improvements                            | ● 11. M1 Princes SMART Motorway                                 | ● 21. Electrification of intercity to Bathurst          |
| ● 2. North Coast cruise infrastructure development             | ● 12. Main Northern Line – improvements to address pinch points | ● 22. Castlereagh Highway Improvements (Mudgee-Lithgow) |
| ● 3. Summerland Way Improvements (Grafton-QLD border)          | ● 13. Electrification of intercity to Bomaderry/Nowra           | ● 23. Completion of Barton Highway duplication          |
| ● 4. Bruxner Highway Improvements (Casino-Tenterfield)         | ● 14. Completion of Maldon to Dombarton railway line            | ● 24. Support the delivery of Inland Rail               |
| ● 5. Newcastle Ferry Network extension                         | ● 15. Gwydir Highway Improvements (Inland)                      | ● 25. Mitchell Highway improvements                     |
| ● 6. Tomago Road Improvements – Pacific Highway to Williamtown | ● 16. Illawarra Hwy/Macquarie Pass improvements                 |                                                         |
| ● 7. Lower Hunter Freight Corridor                             | ● 17. M31 Hume SMART motorway                                   |                                                         |
| ● 8. Outer Metro Roads Program                                 | ● 18. Electrification of intercity to Goulburn                  |                                                         |
| ● 9. M1 – Newcastle SMART Motorway                             | ● 19. Duplication of Princes Highway (Moruya to Bega Bridge)    |                                                         |
| ● 10. Corridor Preservation for Higher Speed Connections       | ● 20. Dubbo to Newcastle rail connection                        |                                                         |

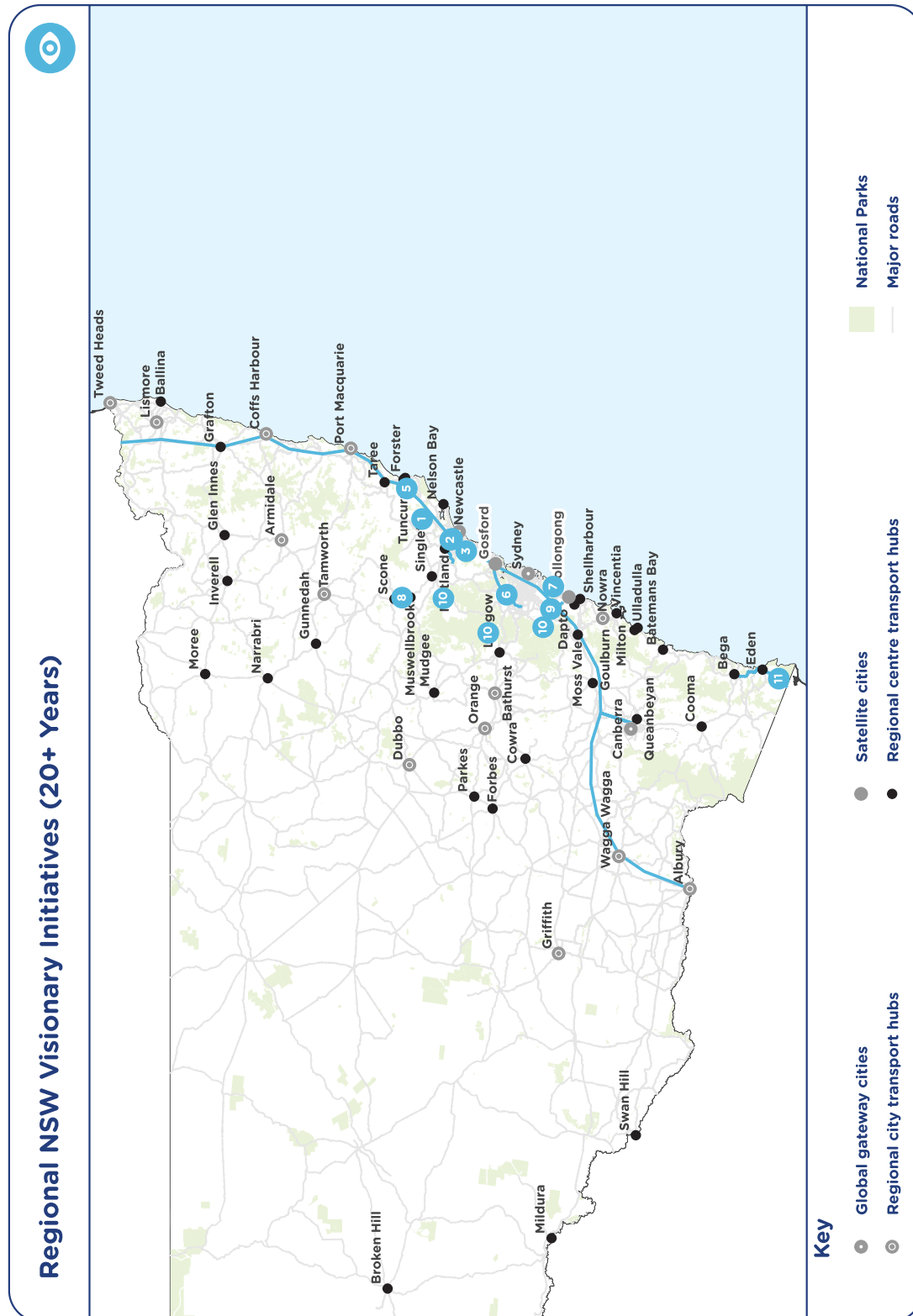


Figure 64: Regional NSW visionary initiatives (20 years+)



## Regional NSW Visionary Initiatives (20+ years)

Visionary initiatives for investigation for potential commitment beyond 20 years are shown on the previous map, and the detail of each is provided in Appendix.

1. New rail alignment of North Coast Line between Newcastle and Stroud Road - investigation corridor
2. Electrification of the Hunter Line to Telarah
3. New suburban type rail service for Greater Newcastle
4. Cessnock to Newcastle rail services via Kurri Kurri
5. Higher Speed Connections (east coast)
6. Outer Sydney Orbital from Great Western Highway to Central Coast
7. Illawarra Escarpment long term solution
8. Duplication of New England Highway Muswellbrook to Scone
9. Outer Sydney Orbital (motorway) from Hume Motorway to Illawarra
10. Delivery of Great Dividing Range long term solution
11. Duplication of Princes Highway (Bega to Victoria)

## The regional NSW network – a ‘hub and spoke’ model connecting cities and centres

The future regional transport network will be planned around a ‘hub and spoke’ model within a strategic framework of servicing principles allowing for local adaptation and interpretation. Servicing principles include connectivity, flexibility and efficiency, access and equity, legibility and timeliness, provision of accurate information and safety. The network will support local towns and regional cities and centres and help make them better places to live, visit and do business.

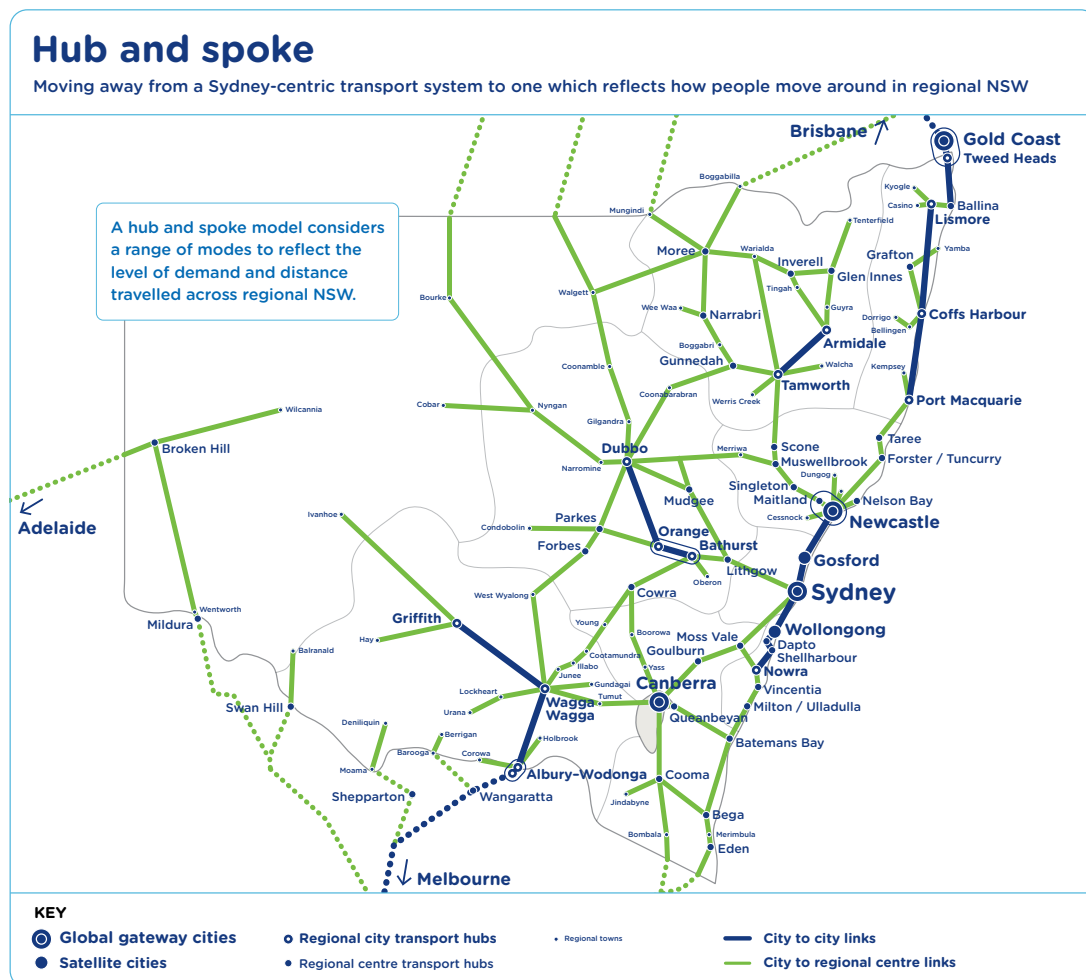


Figure 65: Regional NSW ‘hub and spoke’ network

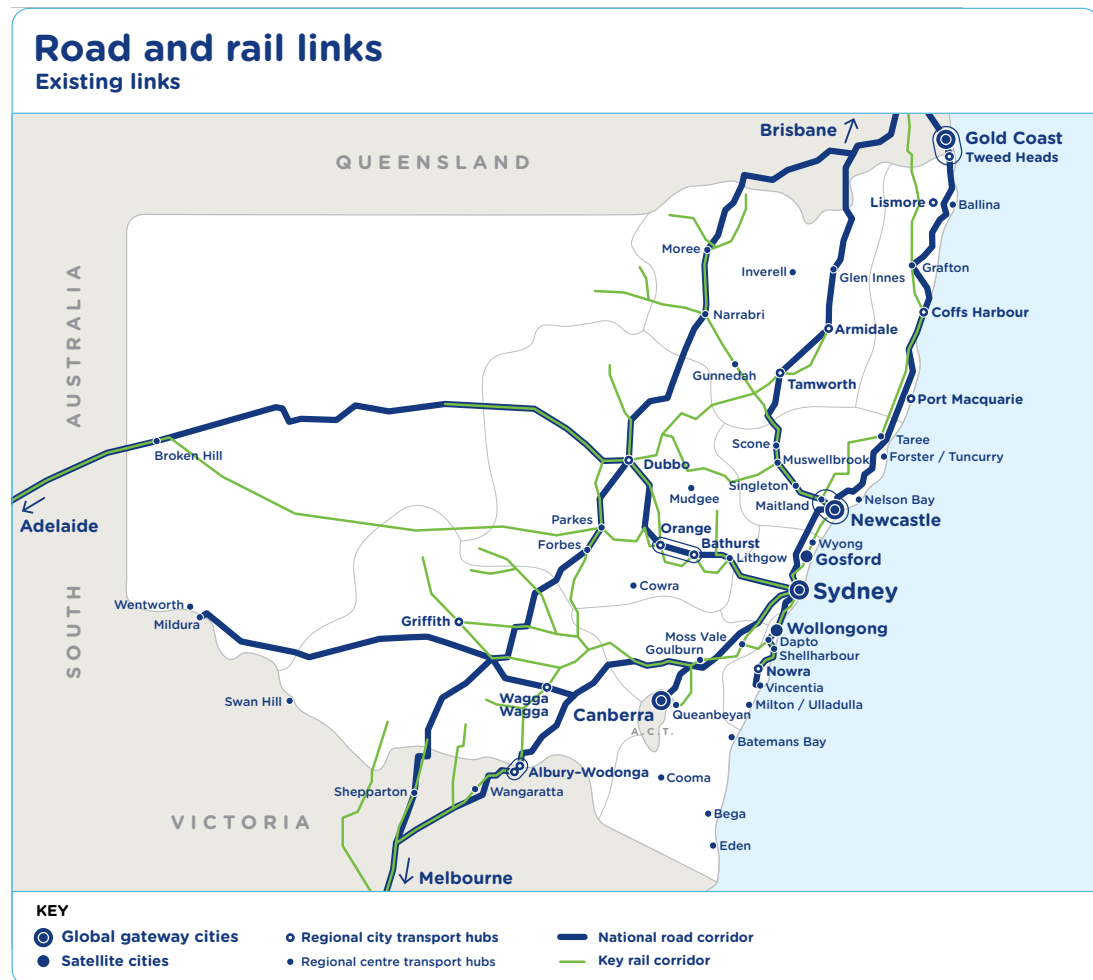


Figure 66: Regional NSW current road and rail links



Figure 67: Regional NSW new improved regional links



CHAPTER

# 8

Delivering  
Sustainably

The NSW Government must achieve more sustainable and equitable transport funding, and set future directions to support emissions reduction and mitigate significant weather events.

**This chapter examines how we will deliver a transport system in a fiscally and environmentally sustainable manner.**

Through:

- › Moving towards sustainability
- › Sustainable and equitable transport funding
- › Striking the balance between user contributions and taxpayer subsidies
- › A continued focus on spending efficiency
- › Transport's role in working towards environmental sustainability
- › Securing energy reliability and affordability
- › Managing a resilient transport system

## Moving towards sustainability

Decisions we make today will build a future system that is sustainable and affordable for both customers and the community

### Funding our network now and in the future

Greater financial sustainability in transport will help us deliver a modern network that is affordable for both customers and taxpayers. This is essential to deliver the transport services and ongoing improvements customers expect.

Today, the overall cost recovery from public transport users is 21.3 per cent<sup>15</sup>, based on revenue from customers and the cost to government of providing services.

Transport for NSW is continuing to grow its asset base with over \$50 billion worth of construction planned over the next ten years on our \$119 billion network. This will mean significantly higher whole of life costs for the transport network – capital, operating, maintenance and disposal.

To achieve a financially sustainable network we will need to factor critical whole-of-life considerations into all transport decisions including the balance of investment and cost recovery; access, affordability and equity; better land use outcomes and reduced impact on the environment.

### Transport's role in environmental sustainability

The transport sector, particularly private cars, contributes significantly to greenhouse gas (GHG) emissions and it is important that we work with industry to achieve reductions in emissions.

Transport has a significant role in contributing to a more environmentally sustainable community by providing travel that is more efficient, productive, quieter and cleaner compared to private car use – public and active transport.

The Future Transport Strategy aims to increase the mode share of public transport services and reduce the use of single occupant vehicles. Apart from reducing emissions through more efficient shared vehicles, this will also have positive benefits for congestion.

The Strategy also aims to work with industry to encourage the take up of Electric and Hybrid vehicles and other more fuel efficient vehicles.

We are also considering how active transport can play more of a role in our everyday journeys through providing better facilities and a more extensive network of bicycle paths and safer networks for cyclists and pedestrians where they share road space with vehicles.

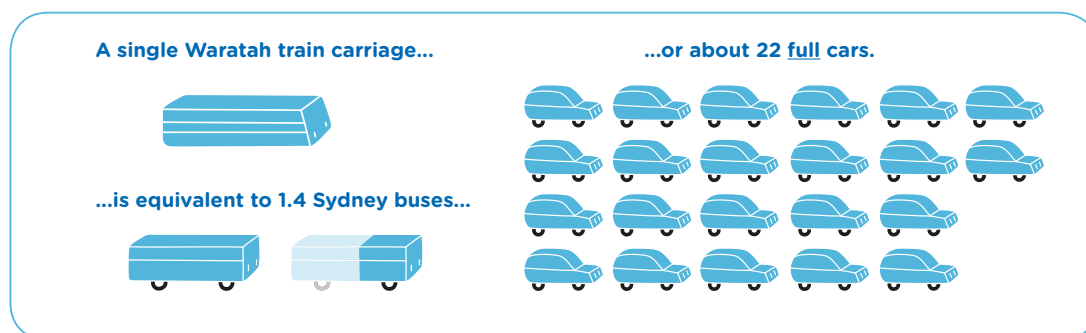


Figure 68: Efficiency of public transport

## Sustainable and equitable transport funding

There has for many years been a difference between who pays for investment in the network and those who directly benefit from using the network

### The cost to the community is growing

Since 2012, the level of taxpayer funding to transport has increased on average by 4.5 per cent per annum and is anticipated to reach \$5.7 billion per annum by 2026 (\$2 billion above today's level). This is despite efficiency initiatives that have reduced operating costs by more than \$1 billion since 2011. To maintain current levels of transport investment we will need to make greater efficiency savings and identify new revenue sources.

In the future, a slower rate of NSW and Federal Government revenue growth is expected to occur, impacting the Government's resources for service provision. This is in part a result of the ageing population, which reduces workforce participation, lowers taxation revenue growth and contributes to increasing pressures on other sectors, particularly health.

In addition, transport operational expenses are projected to be the third largest component of the growth in the NSW Government's expenditure for services. Continued increases in funding requirements for transport will compete with the need to resource other vital services such as education and health.

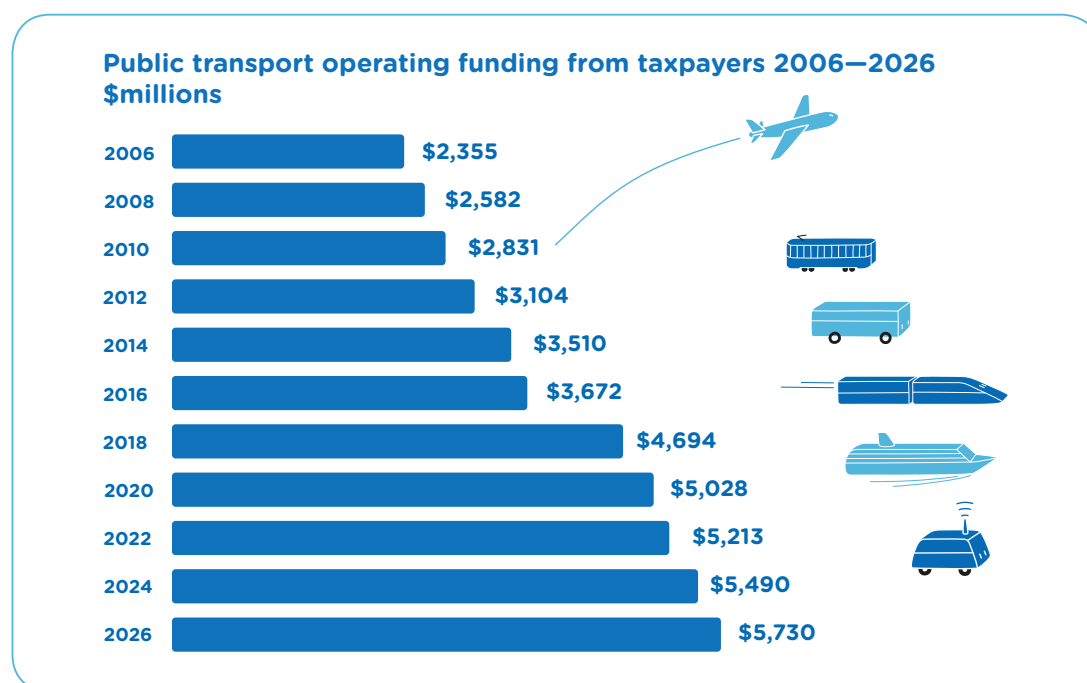


Figure 69: Taxpayer funding of public transport

## Striking a fair balance on who pays

Improved network efficiency delivers more economic productivity for land and business owners through better access to markets and a more efficient supply chain. Direct users are also key beneficiaries through improved service levels, shorter journey times and safer systems.

Taxpayers who do not directly benefit from transport investments still contribute to the costs of the network. This is because public transport services deliver wider economic, health and environmental benefits to the community. While such benefits do justify a level of taxpayer funding, the imbalance between those who directly benefit from transport investments and those who pay for them should be considered and addressed.

Alternative sources of funding and approaches to service delivery need to be explored as part of delivering a sustainable funding model.

## Striking the balance between user contribution and taxpayer subsidies

Sources of revenue for transport funding are limited and the funding available from those sources is constrained

### Patronage is growing, but revenues are in long term decline

Public transport fares in NSW are regulated by the [Independent Pricing and Regulatory Tribunal \(IPART\)](#), which limits the amount fares can increase within a given year. The Government does not always increase fares to the amount allowed by IPART.

Sydney public transport fares are relatively low compared to other jurisdictions. Fare rates in London and Munich are more than double compared to Sydney. Brisbane, Milan and Chicago are up to 20 per cent higher, depending on the distance travelled.

While most recent figures show an increase of 7 per cent in passenger revenue and patronage, over the long term fare box recovery has decreased even as patronage grow and as services and customer satisfaction improve.

For example, cost recovery for rail has been in long term decline from around 50 per cent in the early 2000s to less than 20 per cent today.

Other jurisdictions have set specific targets for fare-box recovery. For example, Chicago's target fare-box recovery is 50 per cent, whilst Singapore and London's target is 100 per cent. London has set a long-term price path to reach this target over the period of a decade, increasing fares by CPI plus 1 per cent each year.

Sources of revenue from roads may also be impacted by the introduction of connected and automated vehicles (CAVs) and a move to car-sharing. Additionally, funding from federal sources for roads may also be at risk with Commonwealth fuel excise revenue declining from \$13.5 billion in 1997-98 to \$11 billion in 2014-15.

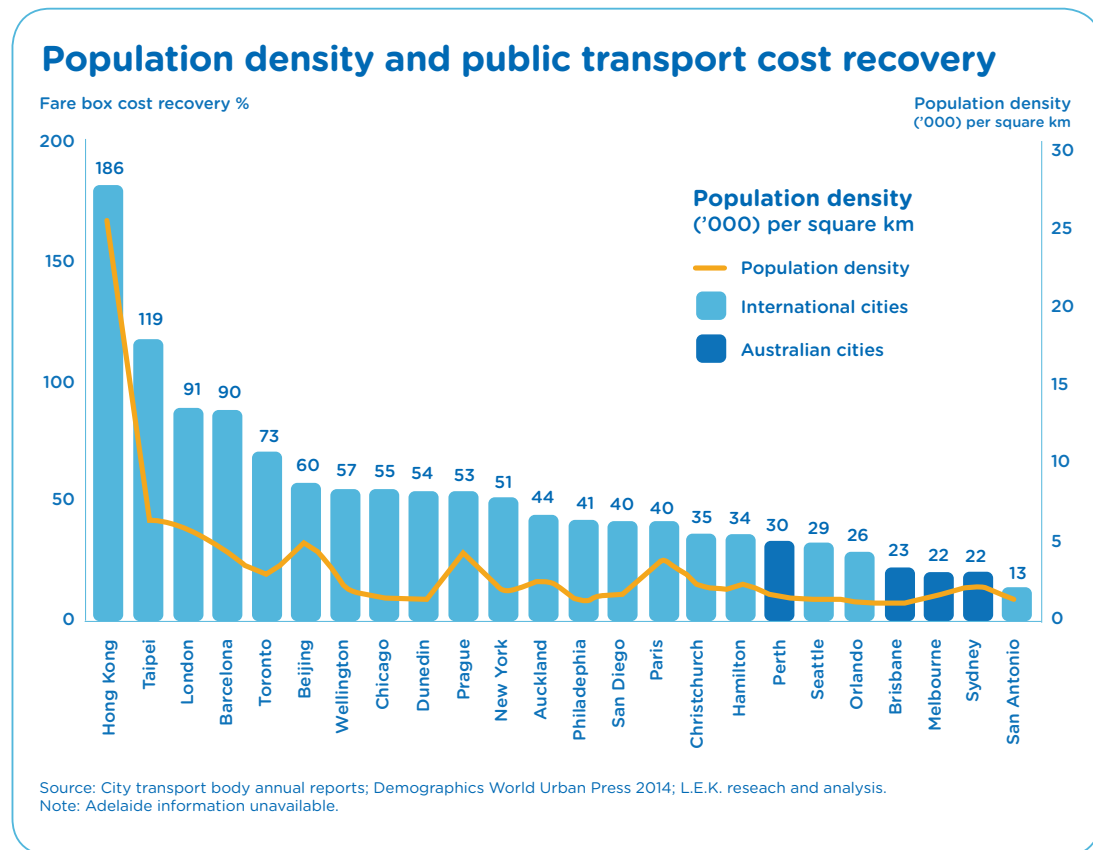


Figure 70: Population density cost recovery

## Sources of other revenue are constrained

Transport for NSW works with public transport asset managers to grow revenue from third party sources such as advertising on assets, retail leasing and customised number plates. These activities provide a useful supplement that can offset operating costs by a couple of percentage points.

There are also opportunities to fund new and expanded interchanges and stations through developments of airspace on the transport estate, and by playing a more active role in transport-led development.

While a commercial approach will be taken to leveraging these opportunities to finance costs by finding third party sources of funding, this will not materially change the nature of the long term funding challenges the transport system faces.



Figure 71: Commercial opportunities in transport interchanges, Chatswood Interchange

### Future directions to investigate

NSW will establish funding arrangements for transport infrastructure and services that strike a balance between taxpayer contributions and the beneficiaries of these investments, to create a financially stable and equitable network.

- › Monitor cost recovery levels and review measureable service quality and quantity improvements
- › Identify balanced beneficiary models including value sharing and developer contributions aligned with improved land use planning
- › Investigate road network access charges for commercial users with revenue hypothecated for related network improvements
- › Identify supplementary sources of revenue across the portfolio including commercial revenues through internal advertising, commercial leasing and airspace use, particularly at new interchanges.



### A case for value sharing

- › Sometimes known as value capture, value sharing is the process of identifying and quantifying the higher economic productivity and higher land values created as a result of Government planning decisions and infrastructure investments.
- › This process seeks to share value with those who have benefited from the decisions and investments Government makes.
- › When new or upgraded infrastructure is provided in an area, increases in local land values can reflect the market's willingness to pay for the benefits catalysed by the investment.
- › Value sharing enables the Government, as the funder of the infrastructure, to share in the market uplift in value which can be immediate, or may take time to be realised.
- › Implementing a value sharing approach to some of the initiatives and planning decisions outlined in Future Transport 2056 has the potential to deliver the following benefits:
  - Unlocking new funding and financing options to make economically beneficial infrastructure more affordable
  - Spreading the costs of new infrastructure more equitably among its beneficiaries
  - Providing the opportunity to secure funding which contributes to the protection of long-term major infrastructure corridors.
- › Value sharing can take many forms, and the available options will vary depending on the particular circumstances of the infrastructure being provided.
- › The NSW Government will continue to assess opportunities for value sharing as investment projects are developed.

## A continued focus on spending efficiency

### We need greater efficiency to meet the increases in operational costs and our significant investment program

Operational and maintenance costs are continuing to grow as our transport network expands, and becomes safer and more efficient. As an indication, operating costs have grown at 3.4 per cent on average over the last five years, against average growth CPI in the period June 2011 – June 2016 of 1.8 per cent.

Fuel is a significant portion of the cost of operating transport services. This means we will have to continue to evaluate the fleet seeking alternatives that are more environmentally and financially sustainable.

We are continuing to drive efficiencies across the transport cluster when it comes to operating practices. However, as service levels increase and new assets such as [Sydney Metro](#) and the new [Sydney CBD and South East Light Rail](#) come into service, these costs are expected to continue increasing above CPI in the short to medium term.

In addition to operational costs, we are constantly improving the network for our customers, with public transport capital investment growing at 13 per cent each year on average since 2012. A total of \$32 billion has been invested in the network over the last five years, with more than \$50 billion planned for the next ten years.

There are significant challenges ahead for maintaining and enhancing the transport system, including:

- ▶ Addressing the road maintenance backlog reported by the Audit Office as \$5.3 billion (June 2015)
- ▶ Upgrading existing transport infrastructure to enable new technologies that support a 'smart' network that optimises traffic flow, enhances maintenance regimes to extend asset lives and creates a universally accessible system
- ▶ Meeting the increasing demand for services resulting from a growing and ageing population.

A growing burden on the NSW taxpayer means the transport system will need to be funded in an efficient, sustainable and equitable way, to ensure our investments provide value for money for the whole community now and for generations to come.

## Future directions to investigate

NSW will consider options to recover more of what we spend and keep our spending efficient as we build, manage and operate the network.

- ▶ Introduce commercial approaches to asset ownership that involve a greater level of scrutiny of funding arrangements and tighter budgeting, performance and efficiency targets and cost constraints
- ▶ Ensure that in making all future capital investment decisions we consider and pursue opportunities to deliver commercial returns on new assets beyond their core transportation uses
- ▶ Improve capital investment and upgrading practices to reduce whole of life costs
- ▶ Continued transition to partnering and service commissioning models for delivery of services
- ▶ Inclusion of tangible targets and benchmarks in planning, construction, operation and maintenance contracts.

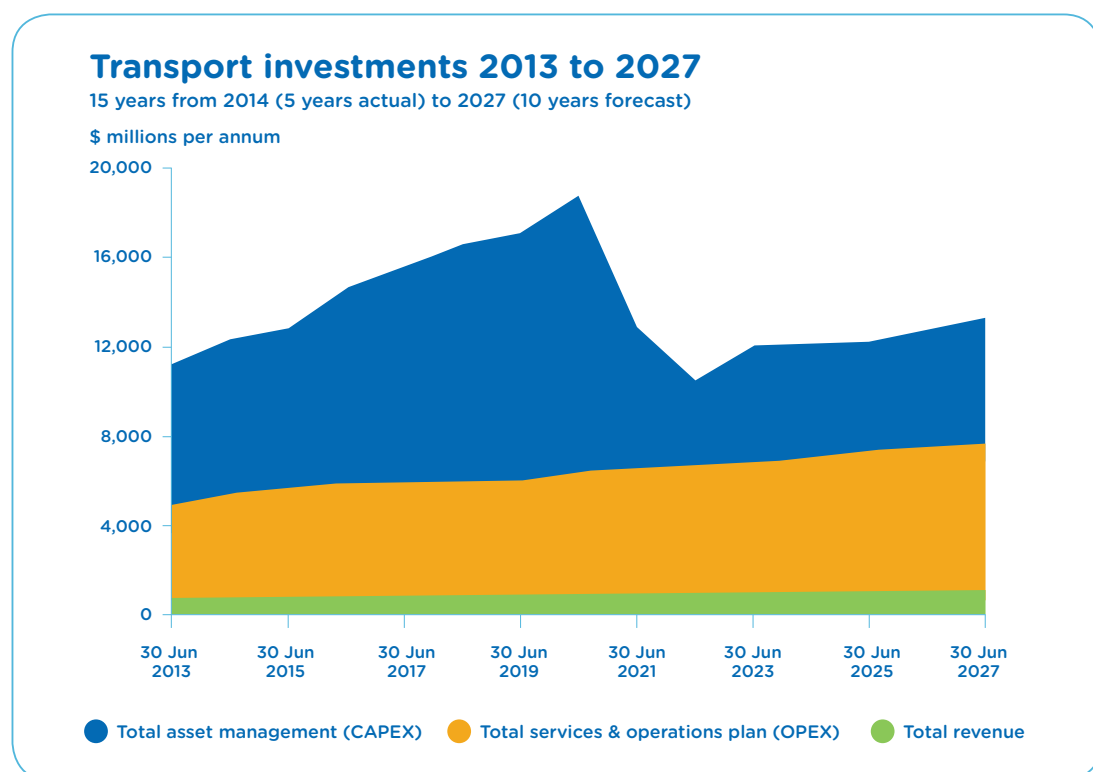


Figure 72: Transport investments in NSW, actual and projected, 2017 to 2027

## Transport's role in working towards environmental sustainability

Decisions we make today will build a future system that supports the liveability and sustainability of our communities

### Public and active transport lower environmental impacts

Addressing the environmental sustainability of the transport system is essential to minimise direct and indirect impacts on the natural environment. Direct impacts include noise, waste and urban stormwater runoff. Indirect impacts include air pollution, reduced liveability of urban environments and the environmental impacts of materials used by the transport system.

To minimise the impact of the transport network, all investments across the transport cluster will improve the resilience of the network in a changing climate and support the NSW Government's aspirational target to achieve net-zero GHG emissions by 2050.

New technologies that deliver vehicle efficiencies are expected to reduce emissions over time. Future Transport places government in a position to work with industry to encourage the take up of these technologies, particularly electric vehicles.

Improving the accessibility and attractiveness of public transport also has significant potential to reduce GHG emissions and road congestion.

There is an opportunity to consider innovative and creative ways to encourage greater use of active and public transport. This would reduce the amount of vehicle kilometres travelled per person, which in turn would reduce the carbon intensity of each trip. Essential to this will be reducing private passenger vehicle trips, which produce ten times more GHG emissions than rail and light rail, and thirty times more GHG emissions than buses in NSW.

To encourage more people out of their cars we need to make public transport, walking and cycling more attractive options. This will include designing infrastructure that better caters to customers' needs, improving the amenity and comfort of public transport vehicles and providing fast and frequent connections to the places people want to go. It will also include the provision of a safe system that allows pedestrians and cyclists to confidently travel the network.

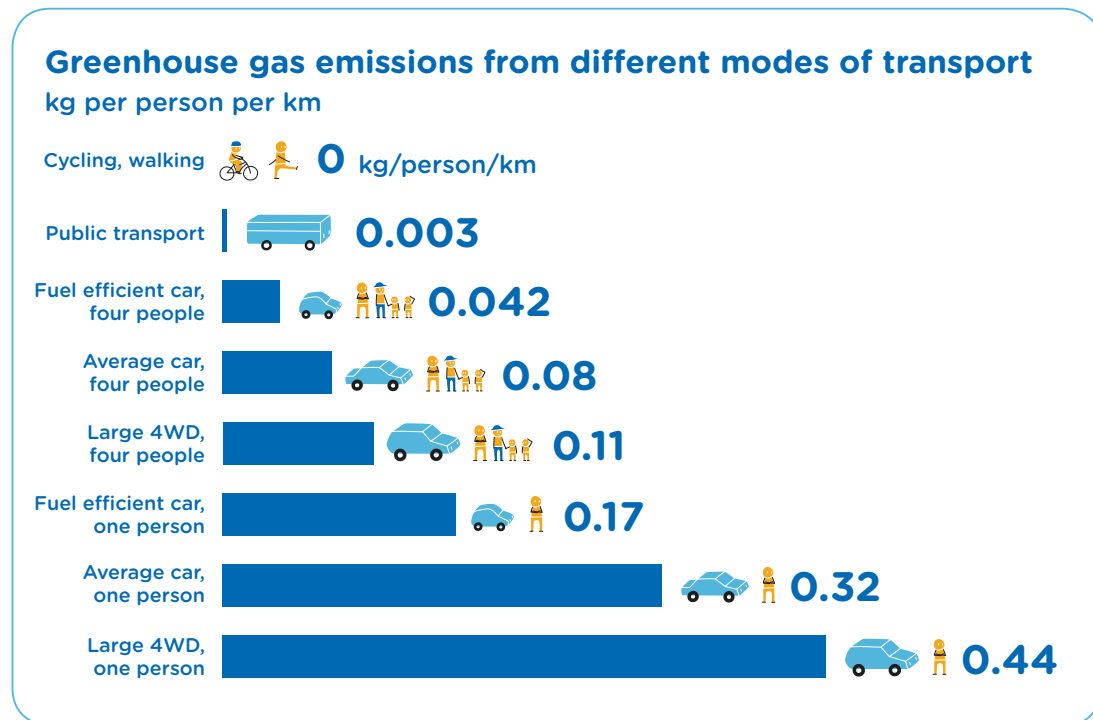


Figure 73: Energy efficiency of transport modes

## Securing energy reliability and affordability

Uncertainty around energy supply and future energy costs are long term risks to the transport network

### A transport sector with reduced emissions

As we build more infrastructure and increase service levels to meet demand over the next 40 years, our energy requirements will continue to grow.

Over the same time period, the NSW Government is working towards achieving a [target of net-zero emissions by 2050](#). To meet this target, while meeting increasing energy requirements, we will need to rethink how we power transport.

Today, transport energy consumption is dominated by non-renewable coal-fired electricity and petroleum fuels, which create GHG emissions. The transport sector is a major contributor to GHG emissions in NSW, and these emissions are growing.

Effective policies and programs are needed to provide information, tools and incentives for businesses and consumers to switch to cleaner and more fuel-efficient vehicles, reducing emissions and generating positive health impacts due to improved air quality.

A current Transport for NSW initiative is participating in the whole of government program to embed climate change in government decision making. This is evidenced by Sydney Metro's Sustainability Strategy for the North West Metro which commits to offsetting 100% of electricity needs during the operational phase of the project, and 20% during the construction phase.

Sydney Metro City and Southwest Sustainability Strategy also commits offsetting 100% of GHG associated with operational electricity. This commitment is being progressed via the procurement of electricity from a new renewable energy source.

In addition, [Transport for NSW's Sustainable Design Guidelines](#) require:

- › All projects with a Capital Expenditure greater than \$15 million to reduce construction related GHG emissions by a minimum 5% from the project baseline GHG footprint which is established using the Carbon Estimate and Reporting Tool.
- › Buildings to be designed and built to reduce energy consumption.

### Future directions to investigate

The NSW Government has an objective to achieve net-zero emissions by 2050.

- › Encourage a shift from private car use to public transport
- › Promote low emission vehicles
- › Transition to a cost-effective, low emission energy supply, using power purchase procurement to increase renewable energy mix
- › Work with industry partners on new fuel efficient vehicle technologies and transition to a low emissions passenger vehicle fleet.

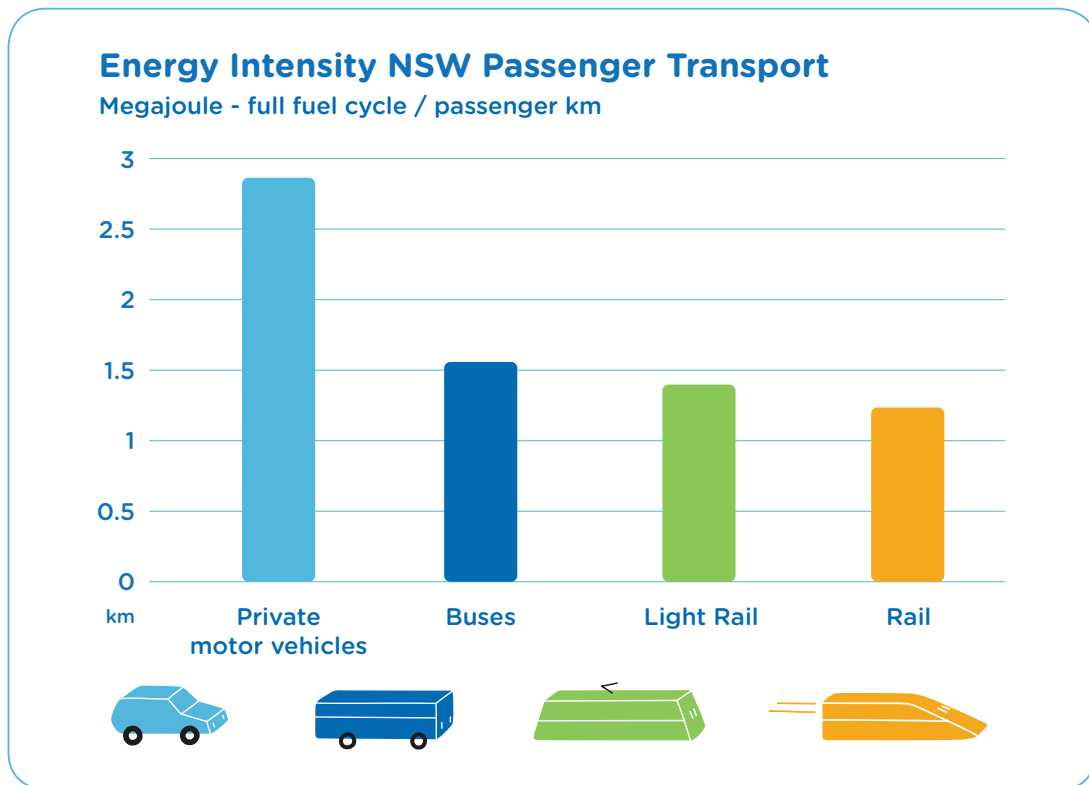


Figure 74: Energy intensity of passenger transport (prepared using data from NSW Transport Facts 2015 prepared by The Centre for Transport, Energy and Environment and Pekol Traffic and Transport)<sup>16</sup>

16 Full fuel cycle refers to emissions resulting from end-use energy consumption plus those resulting from feed stock extraction and refining, power generation and energy distribution.



To encourage more people out of their cars, we need to make public transport, walking and cycling more attractive options.

## Managing a resilient transport system

Transport assets have long economic lives and are vulnerable to the direct impacts of climate change

### Preparing for extreme weather events

In June 2016, weather events along the NSW coast caused widespread rainfall, damaging winds, and flash flooding, and many roads, bridges and wharfs were significantly damaged as a result. The Insurance Council of Australia estimated costs from this event to be in excess of \$304 million.

Severe weather could increasingly impact the environment and communities in every part of the state, including transport infrastructure and services essential in moving people and goods around NSW.

To maintain a reliable transport system and meet passenger and freight needs, weather related risks to transport assets and services and interdependencies of other types of transport, energy, water and telecommunications infrastructure need to be understood and managed.

### Future directions to investigate

NSW will ensure the transport network is more resilient to significant weather events in an unpredictable climate.

- ▶ Identify and quantify the probabilities of significant weather events and other impacts on transport, to determine a risk profile for existing and planned infrastructure assets
- ▶ Continue to work with the [Office of Emergency Management](#) (OEM) on State Level Emergency Risk Assessments as well as mitigation, prevention, preparedness, response and recovery activities
- ▶ Identify the interdependencies amongst transport, water, energy and telecommunications infrastructure during significant weather events, to inform future asset management and emergency response
- ▶ Develop a model to illustrate the effect of extreme weather events to inform planning and asset design.



CHAPTER

# 9

An Agile  
Planning  
Approach

Transport and land use plans must be integrated with our vision for places, to deliver long term social and economic outcomes:

Including:

- › Long term planning with flexibility
- › Planning for uncertainty and change
- › Co-design – collaborative problem solving
- › A new blueprint for developing our workforce
- › Applying customer insights
- › Measuring our progress

## Long term planning with flexibility

Delivering our vision for the future will involve adapting our plans to changing circumstances

### An agile planning framework

The need for government to be increasingly agile and responsive is the hallmark of our approach to vision-led planning.

We are already looking at ways to embed flexibility and strategic readiness into our activities:

- › **Optionality** – as projects are planned, business case processes can test possible disruptive scenarios, embed flexibility into the design of infrastructure projects, and anticipate triggers for when decision-makers should make project commitments
- › **Short term goals for long term change** – the focus would be on changes of services, policy, demand management or technology – which all have shorter lead times – to meet dynamic customer needs and to improve levels of service without significant capital investment
- › **Collaborating with our customers and stakeholders** – we can embed continuous and close consultation with industry, the technology sector, customers and communities to maximise the benefits of future developments
- › **Committing to continuous improvement** – the Future Transport Strategy and Plans will be ‘living’ online documents, which allow for adjustment and incorporation of changes as needed
- › **Planning for outcomes** – transport planning will move away from individual modes and focus on delivering flexible, integrated solutions for customers and the broader community.

## Planning for uncertainty and change

An integrated program of options with ‘triggers’ to identify when major investment is needed

### Using scenarios to test when new investment is needed

For any given challenge, there is a range of potential solutions. For example, when it comes to road congestion, we can build wider roads, encourage mode shift to public transport, deploy smart road infrastructure to manage congestion ‘hot spots’ or encourage road users to re-time discretionary travel.

Future Transport’s planning framework will deliver major investments according to performance-based or need-based ‘triggers’, rather than rigid timeframes, and coordinate a range of solutions to meet the needs of infrastructure customers. This flips the emphasis from infrastructure provision and capital investment to more nimble responses, in the short term, that deliver more flexible solutions when there is uncertainty over how much infrastructure capacity is required.

Short term options	Long term options
Service changes, demand management, regulation and technology are quicker to deploy, can be implemented with low capital investment, and should be the ‘first responders’ to changing demand and customer preferences	Infrastructure construction and repurposing has longer lead times, is less flexible, takes longer to implement and requires significant capital investment

## Co-design – collaborative problem solving

To be a leader in transport we need continuous innovation, new ways to solve problems and deliver value, and a culture that applies learnings from other industries

### Working with our customers to solve problems

The Future Transport Strategy and Plans introduce new ways of problem solving that fit within our vision-led approach to planning. One of the key differences in this new approach, compared to more traditional methods, is that the NSW Government has set a vision and outcomes across several agencies even before we start identifying problems. This gives us a clear picture about the outcomes we want for our customers and the community and lets us identify obstacles to realising these outcomes.

A key feature of this approach is co-design – a high level of collaboration and decision making. From the first stages of planning we will engage all levels of government, customers and industry, to test our understanding of the problem and harness their innovation to develop the best possible solutions.

Some of the ways Transport for NSW is already doing this include:

- ▶ Regulatory sand boxing, which allows pilots to be undertaken in a restricted setting, such as the [pilot of a driverless shuttle bus in Sydney Olympic Park](#)
- ▶ The call for proposals for regional NSW's first pilot of a connected and automated vehicle (CAV)
- ▶ The on-demand transport pilots across NSW with a particular focus on regional areas
- ▶ The preschool travel trial in Condong and Tenterfield in partnership with the [Department of Education](#)
- ▶ The [Open Data Hub](#), which to date has generated new customer apps and led to more than 1,000 registered applications, and 275 million hits
- ▶ Working with BlueChilli CityConnect on the [Smart City Open Innovation Challenge](#)
- ▶ Testing the benefits of crowdsourced solutions to key transport challenges using structured incubator and accelerator programs.

In developing solutions, we are also using a new approach based on intensively testing problems from a customer perspective – understanding what drives their preferences, and impacts their travel experiences.

This new way of thinking represents a new era in transport planning, where we emphasise the importance of involving people in the conversation who use or are affected by the transport network as well as learning by doing and experimentation. We will review our internal processes frequently and work towards continuously improving our skills and capabilities as we build new collaborative partnerships with customers, the community and industry.

### **Tottenham to Dubbo On-demand pilot**

- › In May 2017, a trial of a pre-booked, on-demand bus service between Tottenham and Dubbo commenced.
- › The service offers a return bus service providing Tottenham, a township of around 300 people, with a weekly service connecting them to the communities of Albert, Narromine and the regional city of Dubbo.
- › The bus stops at important destinations such as local hospitals, shops and the Dubbo railway station and airport.
- › The service offers air-conditioning, storage for cold products and equipment including wheelchairs and prams. The vehicle used will depend on the number of people travelling.
- › Fares for the service are capped at \$15 return for adults and \$2.50 for eligible concession holders.
- › The Tottenham to Dubbo pilot will help shape how the NSW Government works with regional communities to deliver local transport solutions that meet their needs.

## Co-design and collaborative problem solving

To deliver future transport outcomes and adapt to changing needs, we need to find new ways of working, continuously innovate, and involve everyone that benefits from, or is impacted by, transport and land use planning decisions.

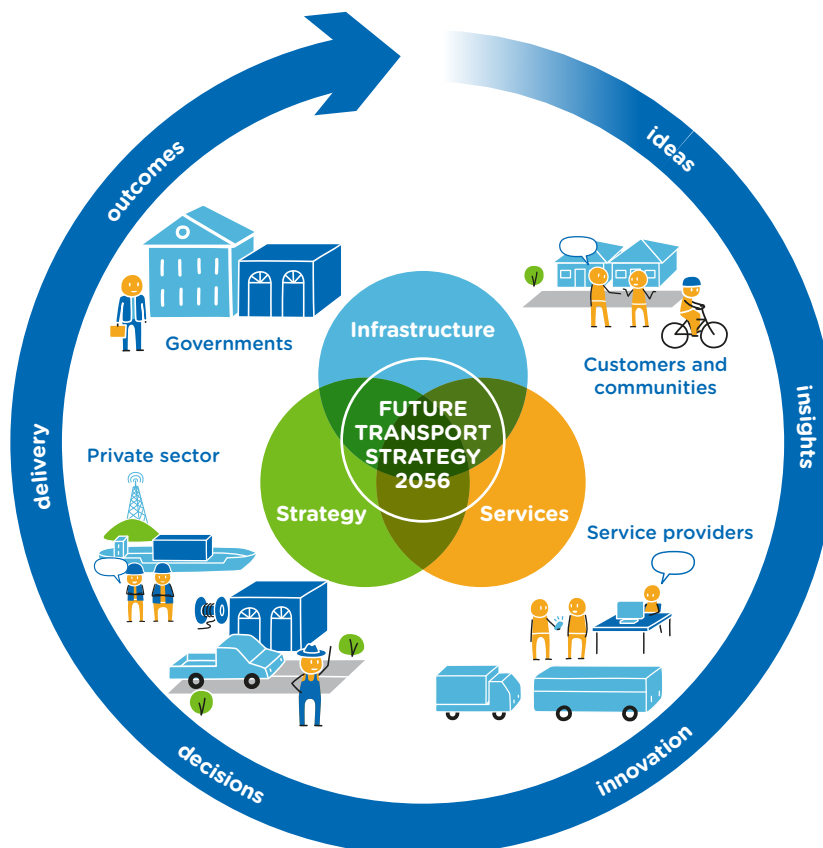


Figure 75: Collaborative problem solving and delivery

## Future directions to investigate

The way we collaborate with communities and industry to deliver the Future Transport outcomes will need to both be flexible and fit for purpose and will vary between Greater Sydney and the Regions.

- Enhance the availability of open data tools that support innovative solutions and collaborative planning
- Introduce a new approach to planning where we collaborate with our stakeholders early in planning and design processes in the delivery infrastructure, services and place-making initiatives.

CHAPTER

# 10

Monitoring  
and Reviewing  
Our Progress



## A focus on measurable customer outcomes

### Improving customer outcomes with clear goals and accountability

Measuring the performance of our transport system is not straightforward or easy. The NSW transport system is a complex one which caters to road, public transport and freight customers. Existing indicators and data cannot adequately measure all intended outcomes, but with the advent of open data and GPS technology, we can access extensive and accurate information to use as evidence in making decisions. Better data will also help us report on metrics in a way that paints a more meaningful picture of how well our transport system is delivering for customers.

As advances in data capture and analysis continue we will develop more sophisticated measures to better understand changing patterns of movement for people and goods, particularly in rural and regional areas where many data gaps exist. We are exploring opportunities to work with telecommunications data and other emerging data sources to access near time insights on the movement of people, including information on their origin and destination, purpose, travel patterns, times and demographics.

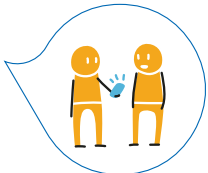

The Future Transport performance measures (below) provide a framework for us to monitor and report on how our activities are contributing to the six state-wide Future Transport outcomes.

We will undertake supporting research to further refine and develop these initial measures and align them more closely with customer expectations of an effective and integrated transport system.

## Future Transport Outcomes – Performance Focus Areas and Measures

**Performance focus:** When assessing our performance against Future Transport outcomes we will focus on these areas

**Measures and indicators:** We will use existing measures and continue to develop more refined methods of monitoring progress

Future Transport Statewide Outcomes	Performance focus	Measures and indicators
<b>Customer Focused</b> 	<b>Maintain or improve customer satisfaction levels</b>	<b>Customer Satisfaction</b> <ul style="list-style-type: none"> <li>› Monitor % of customers satisfied or highly satisfied using the Transport for NSW Customer Satisfaction Index</li> </ul>
<b>Successful Places</b> 	<b>Deliver transport initiatives that improve the liveability of places</b>	<b>Liveability of places</b> <ul style="list-style-type: none"> <li>› Monitor the application of Movement and Place principles to new or redesigned centres</li> <li>› Increase the number of people able to access centres by walking, cycling and using public transport</li> <li>› Develop indicators for transport enabled health and liveability outcomes</li> </ul>

Future Transport Statewide Outcomes	Performance focus	Measures and indicators
<b>A Strong Economy</b> 	<b>Provide efficient public transport and road connections for passengers and freight</b>	<b>Metropolitan 30 minute city</b> <ul style="list-style-type: none"> <li>Monitor the % of population within Greater Sydney with 30 minute or less access to their nearest strategic centre by public or active transport</li> </ul> <b>Regional centre connectivity</b> <ul style="list-style-type: none"> <li>Monitor the % of towns and centres with day return public transport services to the nearest regional city</li> </ul> <b>Freight movement efficiency</b> <ul style="list-style-type: none"> <li>Develop efficiency and productivity measurements for freight under the Freight and Ports Plan.</li> </ul>
<b>Safety and Performance</b> 	<b>Deliver a safe and reliable network with zero trauma</b>	<b>Reduction in fatalities and serious injuries</b> <ul style="list-style-type: none"> <li>Monitor fatalities and serious injuries across the road and transport network</li> </ul> <b>Journey time reliability</b> <ul style="list-style-type: none"> <li>Benchmark travel times for each mode</li> </ul> <b>Public transport travel time competitiveness</b> <ul style="list-style-type: none"> <li>Compare public transport travel times to private vehicle travel times on major metropolitan and regional corridors</li> </ul>

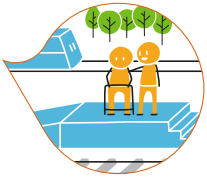

Future Transport Statewide Outcomes	Performance focus	Measures and indicators
<b>Accessible Services</b> 	<b>Provide whole of journey accessibility for customers regardless of age or ability</b>	<b>Public and active transport accessibility to education, jobs, health and community services</b> <ul style="list-style-type: none"> <li>Develop new measures for active and public transport accessibility to education, jobs and services along with regional and metro service affordability and fare parity</li> </ul> <b>Physical accessibility of infrastructure, vehicles and services</b> <ul style="list-style-type: none"> <li>Monitor infrastructure and service compliance with national disability standards</li> </ul> <b>Services used and satisfaction of customers with specific needs</b> <ul style="list-style-type: none"> <li>Measure use and satisfaction by age, people with disability, people from Culturally and Linguistically Diverse (CALD) backgrounds and Aboriginal people</li> </ul>
<b>Sustainability</b> 	<b>Improve financial sustainability of transport in NSW and its contribution to net zero emissions</b>	<b>Cost effectiveness</b> <ul style="list-style-type: none"> <li>Measure cost per service kilometre and overall cost recovery for public transport</li> <li>Measure cost effectiveness of road expenditure</li> </ul> <b>Carbon emissions</b> <ul style="list-style-type: none"> <li>Measure energy efficiency of the vehicle fleet</li> <li>Measure mode shift to active and public transport and electric vehicle use</li> <li>Monitor transport-related greenhouse gas emissions and energy intensity</li> </ul>

Figure 76: Measuring our progress

CHAPTER

# 11

Glossary

## Glossary for Future Transport Strategy

Term	Definition
<b>NSW Long Term Transport Master Plan</b>	NSW's first integrated transport plan, which brought together planning for freight and passenger movements across all modes of transport. Future Transport builds upon the 2012 Long Term Transport Master Plan and the commitments it has delivered.
<b>30 minute city</b>	A planning concept for a city in which people can easily access the places they need to visit on a daily basis within 30 minutes travel from where they live. In the Greater Sydney context the focus is on access to the nearest centre within 30 minutes by public transport, walking or cycling.
<b>Accessibility</b>	The ability for everyone, regardless of age, disability or special needs or where they live, to use and benefit from the transport system.
<b>Active transport</b>	Transport that is human powered, such as walking or cycling.
<b>Aerial mobility technology</b>	The use of aerial technology such as drones for transport. They may be used to deliver emergency transport services, disaster responses or last mile freight deliveries
<b>Aerotropolis</b>	A metropolitan subregion where the layout, infrastructure, and economy are centred on an airport which serves as a multimodal "airport city" commercial core. It is similar in form to a traditional metropolis, which contains a central city commercial core and commuter-linked suburbs. The area around Western Sydney Airport (WSA) is envisaged to perform this role.
<b>Alternative fuels</b>	Fuels derived from sources other than petroleum (eg. petrol or diesel). Examples include ethanol, electricity, hydrogen, biodiesel and natural gas.
<b>Amenity</b>	The extent to which a place, experience or service is pleasant, attractive or comfortable. Improved features, facilities or services may contribute to increased amenity.

Term	Definition
<b>Apps</b>	Refers to computer software-based applications that are available across a wide range of devices which can provide information and service features directly to users.
<b>Assisted mobility devices</b>	Forms of transport that facilitate individual personal transportation. Examples include powered wheelchairs, scooters, segways, bicycles ('e-bikes), and unicycles. Although many such devices are used by people with activity or mobility restrictions, mobility aids can be employed generally such as for transportation in place of private vehicles.
<b>Automation</b>	Use of control systems, such as computers, robots or artificial intelligence to undertake processes previously done by humans. Transport technology may be fully or partially automated, with the latter involving some form of human input to or management of the technology.
<b>Big data</b>	Describes high volumes of data obtained from the transport network that when analysed, can provide travel patterns and trends.
<b>Car share</b>	A model of car rental, with the ability to rent a car for a short period of time, often by the hour.
<b>Catchment</b>	The area from which a location or service attracts people.
<b>Central River City</b>	One of the three cities of the Greater Sydney metropolis, anchored by Greater Parramatta in the Central City District.
<b>Committed initiatives (0-10 years)</b>	Projects, service changes or policies that either have committed funding, are committed/ contractually committed, are for immediate detailed planning, or are part of key maintenance, renewal or safety programs. Some committed initiatives are subject to final business cases and funding.
<b>Congestion</b>	When demand for a part of the transport network during a particular time nears its capacity, resulting in lower average speed, increased delay and unreliable journeys.

Term	Definition
<b>Connected and automated vehicle (CAV)</b>	A <b>connected vehicle</b> is able to communicate wirelessly with other vehicles, infrastructure and/or devices. An <b>automated vehicle</b> has one or more element of the driving task that is automated and therefore does not require a human driver for at least part of the driving task. Levels of automation range from assisting the human driver with the driving task, through to fully and highly automated vehicles that can drive themselves. <b>“Connected and automated vehicle”</b> is widely used as a collective term to refer to the full range of different vehicles equipped with varying ranges and capabilities of connected and/or automated vehicle technologies.
<b>Corridor</b>	A broad, linear geographic area between places.
<b>Customer</b>	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.
<b>Customer interface</b>	The point at which transport services interact with their customers.
<b>Customer outcomes</b>	The economic, social and environmental benefits which customers can expect from the transport system. Used by planners to guide investment, policy and service provision.
<b>Customer service</b>	Information and assistance supplied by a service provider to the people who utilise or purchase their products.
<b>Demand management</b>	Systems, processes and activities that are aimed at efficiently allocating available capacity to meet demand including by influencing customers’ choices about when, where and how they travel.
<b>Developer contributions</b>	Where transport infrastructure is required, the associated development opportunities can be leveraged to contribute towards the costs for that infrastructure.



Term	Definition
<b>Disability Discrimination Act (1992)</b>	A Commonwealth Act that makes it unlawful to discriminate against a person, in many areas of public life, including: employment, education, getting or using services, renting or buying a house or unit, and accessing public places, because of their disability.
<b>Driverless Vehicles</b>	Commonly referred to as a “self-driving vehicle” or “fully automated vehicle” is a vehicle with an automated system that can perform all driving tasks, under all conditions, that a human driver could perform.
<b>Drones</b>	An aerial vehicle that can be remotely controlled or can fly autonomously.
<b>E-bike</b>	An electric bicycle, a standard pedal-powered bicycle with an electric motor built-in to assist the rider with additional propulsion.
<b>Eastern Harbour City</b>	One of the three cities of the Greater Sydney metropolis, anchored by the Harbour CBD in the Eastern City District.
<b>Energy efficiency</b>	The ratio of transport output to energy input for example vehicle kilometres per megajoule (vkm/MJ).
<b>Energy intensity</b>	The ratio of energy input to transport output for example megajoules per vehicle kilometre (MJ/vkm). It is the inverse of energy efficiency.
<b>First-mile and last-mile</b>	A term applied to the first and final stage of the journey in which people or goods travel to a broad range of origins or destinations. An example of a last mile journey is the trip made between a train station and the final destination of a shopping centre or place of work.
<b>Fixing Country Rail</b>	NSW Government program that provides targeted funding for rail infrastructure enhancement projects that eliminate connectivity constraints on the NSW regional rail network.
<b>Fixing Country Roads</b>	NSW Government program that provides targeted funding to local councils to repair and upgrade regional NSW roads.
<b>Fleet</b>	A collection of vehicles. This may describe all vehicles within NSW or the vehicles of an organisation transport company or service.

Term	Definition
<b>Flexible transport</b>	Transport services that are run based on the demands of individual customers, rather than a fixed timetable or route. See also on-demand (or demand-responsive) services transport.
<b>Freight</b>	Goods or cargo transported by truck, light commercial vehicles (eg. vans and utes), cycle couriers, rail, aircraft or ship.
<b>Freight as a Service</b>	Similar to Mobility as a Service, this is a business model whereby on-demand and ridesharing concepts formulate different procedures for the supply of goods to customers which is accessed through a single account and booking interface.
<b>Geographies</b>	Used in the Draft Regional NSW Services and Infrastructure Plan to differentiate between the different areas of NSW. The geographies have different population densities and growth rates, which influences how transport is provided and transport networks are structured. They include the Remote, Inland, Coastal and Outer Metropolitan geographies.
<b>Global city</b>	City that services and supports the complex and specialised economic activities of global markets.
<b>Global gateway cities</b>	Cities that provide state level services and facilities to support a broad population catchment while also having international connections through their airport and/or port. Canberra, Greater Sydney, Greater Newcastle and the Gold Coast are global gateway cities that support NSW.
<b>Greater Newcastle</b>	The area comprising five local government areas of Cessnock, Lake Macquarie, Maitland, Newcastle and Port Stephens.
<b>Greater Parramatta</b>	Greater Parramatta is at the core of the Central River City, encompassing Parramatta CBD, North Parramatta and Westmead, connected via Parramatta Park.

Term	Definition
<b>Greater Sydney</b>	The 33 local government areas of Bayside, Blacktown, Blue Mountains, Burwood, Camden, Campbelltown, Canada Bay, Canterbury-Bankstown, Cumberland, Fairfield, Georges River, Hawkesbury, Hornsby, Hunters Hill, Inner West, Ku-ring-gai, Lane Cove, Liverpool, Mosman, Northern Beaches, North Sydney, Parramatta, Penrith, Randwick, Ryde, Strathfield, Sutherland, The City of Sydney, The Hills, Waverley, Willoughby, Wollondilly and Woollahra.
<b>Greater Sydney Commission</b>	An independent cross-governmental agency responsible for leading the metropolitan planning for the Greater Sydney Region.
<b>Hub and spoke</b>	A transport network model that provides connections (spokes) to and from key centres (hubs). The spokes link to different hubs across an area, rather than focussing on one key hub.
<b>Independent Pricing and Regulatory Tribunal (IPART)</b>	An independent NSW regulator that reviews and provides advice on the pricing of services such as water, electricity, gas, local government and public transport. IPART can also investigate both policy and economic matters at the request of the NSW Government.
<b>Infrastructure NSW</b>	An independent statutory agency responsible for assisting the NSW Government with identifying and prioritising the delivery of critical public infrastructure for NSW.
<b>Initiatives for investigation (0-10 years, 10-20 years)</b>	Initiatives intended to be investigated for potential commitment or implementation within the next 20 years. Those listed in the 0-10 year horizon will be prioritised for more detailed investigation to determine if they are required in the next decade. They are prioritised based on their expected benefits or strategic importance. Initiatives proposed for investigation are unconstrained by affordability and will be subject to funding and strategic business cases that consider a range of possible solutions.
<b>Inland rail</b>	A proposed 1,700km freight rail link between Melbourne and Brisbane via regional Victoria, New South Wales and Queensland.

Term	Definition
<b>Intelligent Transport System (ITS)</b>	<p>The application of computing, electronics, information technology and communications to solve transport problems.</p> <p>An example of an Intelligent Transport System is Cooperative Intelligent Transport Systems (CITS). CITS allow vehicles to communicate with other vehicles and infrastructure. They enable greater safety and can optimise the management of pedestrian movement and vehicle traffic</p>
<b>Interchange</b>	A facility to transfer from one mode of transport or one transport service to another. For example, a rail station with an adjoining bus facility.
<b>Intermodal terminal</b>	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.
<b>Journey</b>	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 trips, and use more than one mode of transport.
<b>Land use planning</b>	The organisation of land, resources, facilities and services with a view to scuring physical and economic efficiency, social inclusion, the protection of environmental values, amenity, and health and well-being outcomes for urban and rural communities.
<b>Light rail</b>	An urban railway transportation system using vehicles that are capable of sharing streets with vehicular traffic and pedestrians, but may also be operating on an exclusive right-of-way such as a segregated rail corridor, tunnel or elevated structure.
<b>Liveability</b>	The term 'liveability' is used in land use planning to focus on quality of life within a given area considering social, economic and environmental factors. It encompasses the impact of the built environment on human health and community well-being.
<b>Local streets</b>	Places that are part of the fabric of suburban neighbourhoods where we live our lives and facilitate local community access.

Term	Definition
<b>Mass transit</b>	High capacity public transport services between major centres on fixed routes. Mass transit will typically be used on NSW's busiest public transport corridors to quickly and efficiently move a large number of customers.
<b>Metro</b>	An urban railway transportation system that is associated with high capacity, high frequencies (typically turn-up-and-go, rather than timetabled) and greater automation.
<b>Mobility</b>	The ability to move or be moved easily and without constraint.
<b>Mobility as a Service (MaaS)</b>	A business model for customers to access transport services in which customers can use a single account and booking interface to access a broad range of transport modes, none of which the customer owns. Examples would be allowing a customer to access public transport, car sharing and bike sharing all using the same system.
<b>Mode</b>	The type of vehicle or method used for a trip. For example train, bus, light rail, car, motorbike, bicycle, ferry or walking.
<b>Mode share</b>	The proportion of overall trips that are taken on a particular mode.
<b>Motorways</b>	Strategically significant, multi-lane roads that move people and goods rapidly over long distances.
<b>Movement</b>	The movement of people and goods on the transport network.
<b>Movement and Place Framework</b>	A framework for planning, designing and operating our road network based on a 'one road network' approach. It considers how different parts of the network perform different functions - moving people and goods and being places for people, particularly in centres.
<b>Movement corridors</b>	Places that provide safe, reliable and efficient movement of people and goods between regions and strategic centres.
<b>Net-zero</b>	The aspirational green house gas emission level which the NSW Government has targeted to achieve by the year 2050. 'Net' means emissions, less capture and storage. 'Net-zero' means that no emissions occur at all or that any emissions that do occur must be captured and stored.

Term	Definition
<b>NSW Transport Cluster</b>	A group of agencies consisting of Transport for NSW, the operating agencies of Roads and Maritime Services, Sydney Trains, NSW Trains, and the State Transit Authority, the state's private transport operators, a number of project delivery offices for major transport projects, and the Port Authority of NSW.
<b>On-demand (or demand-responsive) services</b>	Transport services that are responsive to the demands of individual customers, rather than a fixed timetable or route. They can provide new or improved coverage to areas where traditional public transport is difficult to provide. They may act as feeder services to stronger public transport corridors in the Outer Metro Area.
<b>Optionality</b>	Factoring variables and different scenarios into project planning and design.
<b>Outer metropolitan areas / geography</b>	An area encompassing the local government areas of Shellharbour, Wollongong, Central Coast, Lake Macquarie, Cessnock, Maitland, Newcastle and Port Stephens.
<b>Patronage</b>	Number of customers using a transport service during a particular period.
<b>Place-making</b>	Refers to the development and management of the built environment to influence the character or experience of places. Successful place-making either preserves or enhances the character of our public spaces, making them more accessible, attractive, comfortable and safe.
<b>Places for people</b>	Streets with a high demand for activities and lower levels of vehicle movement. They create places people enjoy, attract visitors and are places communities value.

Term	Definition
<b>Place Plan</b>	<p>Plan to deliver an integrated transport network to improve access to/from/within key places or centres by all modes across regional NSW.</p> <p>It is the application of the Movement and Place Framework to improve the function of transport corridors to enhance the amenity of places. It will include the development of an active transport network, identifying the missing links and initiatives for behaviour change to support more sustainable travel options.</p> <p>Place plans will also include travel demand management policies and tools to support travel such as car sharing and to assist workers and employers better manage travel demand.</p>
<b>Point-to-point</b>	<p>Transport services that go directly from a passenger's origin to their destination. Outside of the private car, taxis and ridesharing services (Uber, Lyft) are the most common point to point transport modes.</p>
<b>Precinct</b>	<p>A geographical area with boundaries determined by land use. For example, an area where there is an agglomeration of warehouses may be termed a freight precinct.</p>
<b>Private vehicles</b>	<p>Passenger vehicles, motorcycles and trucks, owned and operated by those with a driving license and appropriate registration.</p>
<b>Real time information</b>	<p>Information about the status of the transport network and services that are completely live or have a lag of less than a minute or two. Real time analytics refers to analysis that is performed on real time data (generally automatically and without input from a human analyst) and is then used to make decisions or take action immediately.</p>
<b>Regional NSW</b>	<p>The area of NSW outside Greater Sydney. It includes the nine regions of Central Coast, Hunter, North Coast, New England North West, Central West and Orana, Far West, Riverina Murray, South East and Tablelands and Illawarra-Shoalhaven.</p>
<b>Resilience</b>	<p>The ability of infrastructure systems and services to withstand unexpected climate, weather and catastrophic events.</p>
<b>Ridesharing</b>	<p>Business models similar to Uber and Lyft which provide point-to-point transport services in private vehicles.</p>

Term	Definition
<b>Safe system approach</b>	Planning services and designing infrastructure to integrate with human behaviour to prevent trauma. A safe system approach aims to improve the safety of all parts of the system, so that if one part fails, the other parts will protect people from being killed or seriously injured.
<b>Satellite cities</b>	The cities Wollongong and Gosford that form part of the conurbation of Greater Sydney.
<b>Service (or transport service)</b>	Service refers to transport services, generally public transport services. Examples include trains, buses, light rail and ferries. Services might also include shuttle buses and a range of privately operated but publicly accessible transport type.
<b>Shared vehicles</b>	Vehicles, such as cars or bicycles, made available for shared use to individuals on a very short term basis.
<b>Sharing schemes</b>	Private transport modes, especially cars and bikes, where the assets are utilised amongst several users, none of whom solely own the asset.
<b>Smart Motorway</b>	Motorways that use embedded sensors, analytics and customer feedback tools, to actively manage congestion and safety and respond to traffic incidents.
<b>Social inclusion</b>	The process of improving the terms on which individuals and groups take part in society—improving the ability, opportunity, and dignity of those disadvantaged on the basis of their identity.
<b>State Infrastructure Strategy</b>	The State Infrastructure Strategy, developed by Infrastructure NSW, provides the NSW Government with independent advice on the infrastructure needs of the State over the next 20 years.
<b>Supporting plans</b>	More detailed issues-based or place-based planning documents that will support the implementation of Future Transport 2056.



Term	Definition
<b>Three cities of Greater Sydney</b>	The three cities envisaged by the Greater Sydney Commission are the established Eastern Harbour City, the developing Central River City and emerging Western Parkland City in and around the new airport. Each of these three cities will have their own unique identity and each must be planned to maximise liveability, productivity and sustainability.
<b>Trade gateways</b>	Trade gateways are locations with major ports or airports, and their surrounding precincts. They perform an essential and ongoing role to connect Sydney with locations across Australia and the world. Trade gateways are vital to NSW's prosperity and often support large concentrations of complementary business activity and employment.
<b>Transport Access Program</b>	The Transport Access Program (TAP) is an initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure such as stations, wharves and commuter car parks.
<b>Transport disadvantage</b>	Describes a result when certain factors such as language, age and cost result in causing less choice for when, where and how customers travel.
<b>Transport for NSW</b>	The statutory authority of the New South Wales Government responsible for managing transport services in New South Wales.
<b>Transport hub</b>	A facility designed for transitioning between different modes, such as a major bus stop or train station. Transport hubs for freight include freight rail yards, intermodal terminals, seaport or truck terminals. Major airports are also considered transport hubs.
<b>Trauma</b>	Physical or mental injuries which require medical attention.
<b>Travel choices</b>	A Transport for NSW behavioural change initiative to help manage demand on the transport network in response to capacity constraints or disruption. It involves helping individuals and organisations prepare for and adapt to changes on the transport network.
<b>Turn-up-and-go</b>	Services with frequency equal to or under 5 minutes, requiring little to no travel planning.

Term	Definition
<b>Urban renewal</b>	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.
<b>Vibrant streets/ places</b>	Places that have a high demand for movement as well as place with a need to balance different demands within available road space.
<b>Visionary initiatives (20+ years)</b>	Longer term initiatives that may be investigated within the next 10 years, but on preliminary evidence are unlikely to require implementation within 20 years. Some initiatives have been planned for investigation in the 20+ years as the funding or benefits may be too uncertain at this stage. Initiatives proposed for investigation are unconstrained by affordability and will be subject to funding and strategic business cases that consider a range of possible solutions.
<b>Western Parkland City</b>	One of the three cities of the Greater Sydney metropolis, anchored by the metropolitan city cluster of Western Sydney Airport and Badgerys Creek Aerotropolis, Liverpool, Greater Penrith and Campbelltown-Macarthur in the Western City District.
<b>Western Sydney Airport (WSA)</b>	The designated name for the second Sydney airport, located within the suburb of Badgerys Creek.
<b>Western Sydney Airport and Badgerys Creek Aerotropolis</b>	The emerging metropolitan centre of the Western Parkland City centred on Western Sydney Airport and surrounding development as the economic catalyst for delivering more jobs and diversity for jobs to the Western City District.
<b>Whole of journey accessibility</b>	Barrier-free access to all elements of a journey on transport systems and services made up of the pedestrian environment, the different modes of transport and the road network.
<b>Whole-of-life costs</b>	The total cost of a particular item or service, from initial conceptualisation through to disposal.





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