3.0 Urban roads

STRATEGIC OBJECTIVE

Optimise passenger and freight movements on the existing roads network and facilitate broader economic development through selective extensions to the Sydney motorway network

KEY CHALLENGES

- Keep Sydney's roads moving and tackle congestion
- Cater for a growing demand for road travel without reducing safety, efficiency and amenity
- Extract the optimum performance from the existing road network
- Build future network capacity and protect potential future road corridors
- Enhance access to Sydney from growing regional cities
- Plan for population growth and integrate transport and land use planning more effectively

OPPORTUNITY	KEY Infrastructure NSW RECOMMENDATIONS	COSTS & FUNDING
Optimise the existing road network	• Relieve pinch points across the urban road network • Provide additional investment in the clearways program over five years • Make Smart Motorways investments on the M4, the Warringah Freeway and Southern Cross Drive-General Holmes Drive • Upgrade the Sydney Coordinated Adaptive Traffic System and the Transport Management Centre	Reservations of $300 million, $100 million, $400 million and $200 million respectively from the *Rebuilding NSW* initiative
Expedite major motorway projects	• Refine the scope, alignment and procurement strategy for the WestConnex Northern and Southern Extensions to deliver these projects as toll roads within the next decade • Develop a final business case for the Western Harbour Tunnel by the end of 2015, with the aim of delivering the project with, or immediately after, WestConnex Stage 3 • Undertake further review and development of Beaches Link, with a view to delivering the project over a 10 to 20 year timeframe	
Improve access through Sydney from the Illawarra	• Improve access to Sydney from the Illawarra by unblocking critical constraints on Sydney's southern road corridors • Undertake detailed assessments of larger scale investment options, including motorway options on the F6 and A6 corridors	Reservation of $300 million from the *Rebuilding NSW* initiative
Plan and protect future corridors	• Complete corridor identification work for the Outer Sydney Orbital (including the M9) and Bells Line of Road – Castlereagh Connection to the M7 by mid-2016 to enable protection of these corridors	
Implement an integrated approach to infrastructure for urban renewal	• Implement a framework for integrated infrastructure planning, funding and delivery from 2015–16 to accommodate future population growth • Align transport infrastructure planning with urban renewal projects	

Snapshot

- Urban roads serve a critical economic function, supporting around 278,000 heavy freight vehicle trips and more than 1.2 million light commercial vehicle trips each day. Roads support around 86 per cent of container movements to Port Botany.
- Motorways provide key support for freight movements. Around 27 per cent of all Heavy Commercial Vehicle kilometres are travelled on the orbital network.
- Road transport is best suited to non-centre based trips and multi-stop private journeys by car. However, roads also support bus and light rail services, as well as enabling walking and cycling.
- Growing demand for road travel reflects economic and population growth. The Household Travel Survey reports a 24 per cent increase in the number of private vehicles, with average distances travelled in vehicles rising 2 per cent in 10 years.
- Increases in road congestion increase travel time and reduce reliability. Congestion costs Sydney around $5 billion a year, set to grow to $8 billion a year by 2020.

3.1 Summary

Sydney's roads are a critical part of the city's transport network, directly supporting around 75 per cent of the 17.6 million trips made every weekday.[54] Across the city, people depend on the road network to get to work, deliver goods and services, move freight and carry out many other personal and business activities. As Sydney's population grows, so too is the demand for travel on the road network.

While measures can be taken to encourage more travel by other modes, it is clear that the road network will continue to accommodate the vast majority of journeys in the city for the foreseeable future. This means that keeping Sydney's roads moving is one of the principal infrastructure challenges facing the city.

Sydney's roads are some of the most congested in Australia. Congestion imposes costs on the economy and the community through longer commutes, higher operational costs and restricted access. Currently, the indirect costs of congestion represent 8 to 12 per cent of total transport costs incurred by Sydney businesses.[55] Sydney's congestion costs are currently around $5 billion per year – equivalent to annual losses of $1,100 per Sydneysider – and are forecast to increase to around $8 billion per year by 2020[56] if nothing is done. Without corrective action, congestion will worsen – and the costs to business and the community will escalate – as the city's population grows.

54. Bureau of Transport Statistics, 2012/2013 Household Travel Survey
55. Centre for International Economics 2006, *Business Costs of Traffic Congestion*
56. Bureau of Transport and Regional Economics [BTRE] (2007), *Estimating urban traffic and congestion cost trends for Australian cities*, Working Paper 71, BTRE, Canberra ACT

Infrastructure NSW acknowledges the current and planned investment being made in Sydney's road network. Infrastructure NSW considers there are a number of targeted, high value congestion-mitigating investments that would improve the performance of the existing road network. Most of these projects are already identified and are in the planning pipeline: they should be brought forward using *Rebuilding NSW* proceeds.

Infrastructure NSW proposes reserving a total of $1 billion from the *Rebuilding NSW* initiative for:

- Relieving pinch points and extending clearways on the urban road network
- Implementing Smart Motorways on the M4, the Warringah Freeway and Southern Cross Drive-General Holmes Drive
- Upgrading Sydney's traffic management system.

First Things First identified the expansion and extension of the M4 corridor and expansion of M5 East as the two highest priorities for enhancing Sydney's motorway network. To complement these critical projects, Infrastructure NSW recommends refining the scope, alignment and procurement strategy for the WestConnex Northern and Southern Extensions with a view to their delivery as toll roads within the next decade.

Infrastructure NSW also recommends progressing the Western Harbour Tunnel – the third road crossing of Sydney Harbour – as a priority that could be delivered along with or immediately after Stage 3 of WestConnex.

A further $300 million should be reserved from the *Rebuilding NSW* initiative to improve access to Sydney from the Illawarra through a program of smaller scale investments that target critical constraints along the A1 and A3 corridors.

More broadly, as Sydney grows to be a city of 6 million people by 2031, Infrastructure NSW urges the implementation of integrated infrastructure planning to ensure that the impacts on the road network of population growth and changing patterns of land use are addressed in a timely and appropriate way.

3.2 Progress since 2012

In the last two years, the Government has begun implementing its program for Sydney's road network. Significant milestones include:

- Completion of M2 widening in August 2013, with M5 widening set to be completed before the end of 2014
- The development and initiation of WestConnex, integrating the two highest motorway priorities (the M4 and M5 corridors) identified in 2012 within a single scheme
- Agreement in-principle to a project framework and funding for private delivery of NorthConnex, *First Things First*'s third-ranked motorway enhancement, linking the M1 and M2
- State and Commonwealth agreement to a $3.5 billion package of road works supporting a second Sydney airport at Badgerys Creek, including a motorway link connecting the new airport with the M7.

3.3 Ongoing challenges

In recent decades, significant focus has been directed towards the potential detrimental impacts created by the road network in cities, including local safety, environmental and amenity effects and, more broadly, the global challenge of managing transport-related carbon impacts.

As noted in *First Things First*, Infrastructure NSW recognises these challenges and supports attempts to address them. These impacts can be addressed through measures such as the adoption of electric and fuel efficient car technologies, incentives to encourage higher vehicle occupancy and initiatives to moderate traffic flows on urban streets – as WestConnex aims to achieve on and around Parramatta Road.

However, Infrastructure NSW has identified no viable alternative to the road network over the life-time of this Report for the vast majority of journeys in Sydney. Road-based transport is, and will remain, critical to moving people and goods across the city efficiently.

Of the 17.6 million trips made each average weekday in Sydney, around 75 per cent are by road.[57] Even with the significant investment and high levels of patronage growth forecast for Sydney's public transport network, 72 per cent of 27.5 million journeys in 2031 will be made on the road network each week day by vehicle – or 4.3 million new trips compared to today.[58]

Keeping Sydney's roads moving as demand grows is one of the principal infrastructure challenges faced by Sydney and is the focus of this chapter.

57. Bureau of Transport Statistics, 2012/2013 Household Travel Survey
58. Bureau of Transport Statistics 2013, Household Travel Survey: Sydney Strategic Travel Model

While in theory there is an 'efficient' level of congestion – where the costs of tolerating congestion are outweighed by the costs of addressing it – it is clear there is a strong argument for initiatives to mitigate congestion in the Sydney context.

Infrastructure NSW has examined congestion mitigation programs that aim to get the most out of existing road networks and assessed potential major projects that could build future road and economic capacity in Sydney.

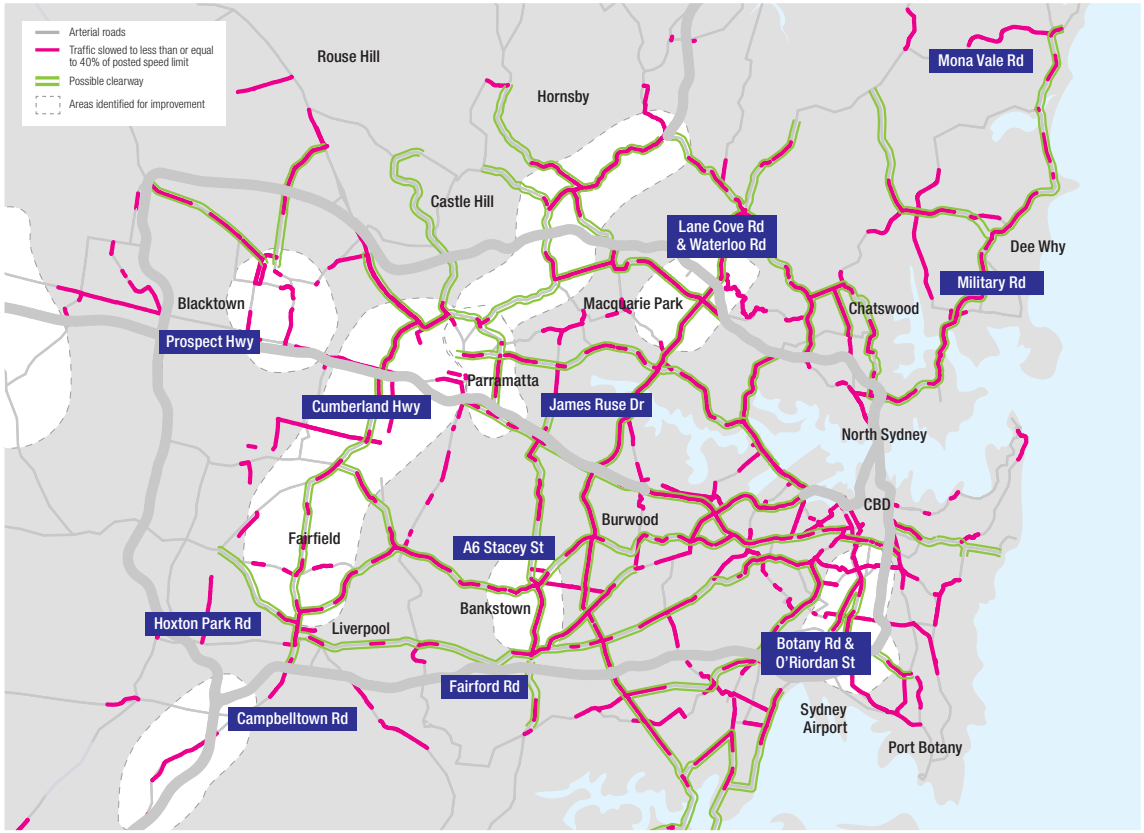
3.3.1 Optimising the performance of the existing road network

Sydney already has a substantial program of investment planned for the city's road network over the next decade. A relatively modest program of well-targeted, small scale investments can make much better use of existing roads and resolve localised congestion problems that impair broader network and economic outcomes.

A key way to respond to congestion is harnessing traffic information more effectively. This includes updating existing road management systems and modernising the Transport Management Centre's traffic control technology. Contemporary real time information systems can also enable more effective management of Sydney traffic and defer the need for major roads investment.

These information management programs work in tandem with demand side measures –such as real time traffic messaging and smart parking technology – to influence people's use of the transport network. Together, this suite of measures (described in the following sections) would deliver a holistic, integrated package to tackle Sydney's congestion.

Figure 3.1 Morning road congestion patterns across Sydney



Source: Transport for NSW

The case for action on congestion

Congestion on Sydney's streets is not new – and is unlikely to ever be eliminated. In some ways, it is a symptom of economic growth and vibrancy, reflecting the vitally important role of roads in the city's social and economic activities. However, congestion imposes real costs on NSW's economic productivity and competitiveness, particularly in time-sensitive commuter and freight markets. Without intervention, these costs are expected to rise significantly.

Sydney's congestion costs are currently around $5 billion per year – equivalent to annual losses of $1,100 per Sydneysider – and are forecast to increase to around $8 billion per year by 2020.[54]

Projected population increases suggest that, in the absence of corrective action, congestion will become a worsening problem. More congestion means greater delays for businesses, motorists and bus commuters, higher costs to operate a vehicle and a reduction in air quality, with adverse health outcomes.

Rising congestion also creates a less reliable transport network, with more redundant, dead time needed to be built into logistical tasks.

Sydney's congestion problems can be set against those in other cities. A recent benchmarking study that compared actual travel speeds of GPS users with free-flow travel speeds ranked Sydney's congestion worst out of the nine benchmarked major Australian and New Zealand cities.[55] Congestion in Sydney increased average travel times by 34 per cent compared to free-flow traffic, and morning and afternoon peak hour travel times by up to 66 and 62 per cent respectively compared to free flow-traffic.

Sydney's congestion also compares unfavourably in a wider context: it equates to the sixth most congested city in the Americas and the twelfth most congested in Europe.

54. BTRE (2007) op. cit.
55. *Tom Tom 2014, Australia & New Zealand Traffic Index*

Pinch Points
Targeted changes to road configuration at congestion 'pinch points', such as improvements to intersection design, turning lane approaches and lane widening and bus priority treatments, can deliver network-level productivity improvements.

Transport for NSW estimates that every dollar invested from its first Pinch Point program produced $6 worth of travel time savings.

Following *First Things First*, $130 million of Restart NSW funding was provided in the 2013/14 Budget to improve pinch points across the network, including around Parramatta and the Northern Beaches.

Areas of growing pressure to be addressed as priorities within the next stage of pinch point investments include the following major and minor works:

- Prospect Highway from Prospect to Blacktown
- Campbelltown Road from Campbelltown to the Cross Roads
- Cumberland Highway (A28) from Warwick Farm to Northmead
- James Ruse Drive from Clyde to Northmead
- A6 Stacey Street, Bankstown and grade separation at Hume Highway (see also the Southern Sydney Access Investigation below)
- Lane Cove Road and Waterloo Road, Macquarie Park grade separation
- Hoxton Park Road between West Hoxton and Liverpool
- Mona Vale Road between Terrey Hills and St Ives
- Fairford Road / Rookwood Road between Padstow and Yagoona

Roads and Maritime Services (RMS) has indicated that additional funding will allow corridors serving the Airport and south of the Sydney CBD to be progressed. Measures that could be considered include intersection upgrades and turning lanes, road widening, CCTV cameras and variable messaging signs.

$ Recommendation

Infrastructure NSW recommends that a reservation of $300 million should be made from the *Rebuilding NSW* initiative for the Urban Roads Pinch Points Program.

Clearways
Clearways prevent stopping and parking on key corridors during peak periods, making the full road corridor available for traffic movement during the heaviest periods of congestion. Clearways have been in place for several decades in Sydney. The Government's December 2013 Clearways Strategy confirms that corridor management measures must play an increasingly important role in addressing congestion in the future.

Extended clearways have the same benefits as road widening, but without the costs of constructing additional lanes. A preliminary benefits assessment from the extension of the Rozelle clearway suggests it has reduced travel times by up to 40 per cent.

The potential impacts of clearways on local businesses and communities mean that their implementation should include measures to mitigate local impacts, including alternative parking arrangements. Over time, additional investment in the clearways program will enable the extension of clearways across longer periods of the day, on weekends and to a broader number of major road segments.

$ Recommendation

Infrastructure NSW recommends that a reservation of $100 million should be made from the *Rebuilding NSW* initiative for the Expanded Clearways Program.

Smart Motorways
'Smart Motorways' involves implementing technologies and other measures aimed at enabling real time, integrated management of motorway performance.

Smart Motorway technologies have been shown to enable greater throughput on the road network, higher travel speeds and more reliable travel times. Smart Motorway initiatives include:

- Ramp metering – regulating traffic flows at points of entry to the motorway, smoothing disruptions associated with merging traffic during periods of high demand
- Lane use management and variable speed limits – reallocating lanes and managing speed to minimise the need for heavy braking and sudden lane change manoeuvres
- Vehicle detection technologies – monitoring traffic and providing information to allow operational adjustments to be made to maintain optimal motorway flow
- CCTV cameras – allowing early detection and rapid management of congestion issues or accidents
- Enhanced motorist information – advising drivers of real time traffic conditions, empowering them to make informed decisions in determining which route they will take.

Smart Motorways are proposed to be first introduced on the M4, Sydney's busiest untolled motorway, from west of Church Street in Parramatta to Russell Street in Emu Plains. The works will integrate ramp metering and lane use and speed management measures with civil works to increase capacity on ramps and a section of motorway widening.

The M4 Smart Motorway investment is costed at just over $400 million and is projected to deliver a $5.4 billion benefit, suggesting an indicative benefit cost ratio of 13.1.

Subsequent smart motorways investments should include the Warringah Freeway and Southern Cross Drive-General Holmes Drive. The Warringah Freeway investment is costed at $42 million, with an indicative benefit cost ratio of 6.7. Southern Cross Drive/General Holmes Drive investment is costed at $73 million, with an indicative benefit cost ratio of 7.7.

$ Recommendation

Infrastructure NSW recommends that a reservation of $400 million should be made from the *Rebuilding NSW* initiative for Smart Motorways investments on the M4, the Warringah Freeway and Southern Cross Drive-General Holmes Drive.

Smart Motorways deliver economic benefits

Smart Motorways measures have the effect of providing extra road capacity at relatively low cost and in shorter timeframes compared to new build solutions.

Smart Motorways initiatives provide capacity at rates equivalent to $5 to $10 million per kilometre. By comparison, new motorways and tunnels can cost between $50 and $350 million per kilometre.

Domestic and international experience bears out the economic potential of Smart Motorways initiatives, returning between $3 and $20 for every dollar invested.

In Melbourne, M1 Monash Freeway ramp signalling reduced peak travel times by 42 per cent and crashes by 30 per cent, with economic benefits of more than $1 million a day.*

Auckland Motorway ramp signalling reduced peak travel times by 22 per cent and crashes by 24 per cent, and improved daily travel time reliability by 91 per cent.**

** ITS International 2012, Integrating Traffic Management improves Management and Control*
*** Transit New Zealand*

Intelligent transport control systems
Intelligent transport control systems use technology to manage the road network in more efficient ways. Roads and Maritime Services operates the Sydney Coordinated Adaptive Traffic System (SCATS), a traffic management system that seeks to optimise road utilisation – for example, by adjusting traffic light changes to demand patterns.

Updating SCATS to best international practice could further improve Sydney's traffic management capabilities by:

- Monitoring real time travel speeds of vehicles, with continuous feedback to traffic control systems to optimise the flow of traffic along corridors and across the network
- Understanding where vehicles are travelling to and from, and predicting the most efficient and reliable route for customers
- Warning vehicles when they are too tall to safely pass under a bridge or enter a tunnel, preventing crashes and infrastructure damage that contribute to delays across the network.

Transport management centres (TMCs) help to avoid or delay the onset of congestion and mitigate the impacts of incidents and service outages. However, Sydney's existing TMC systems constrain the speed and adequacy of responses to network incidents, adversely impacting the safety and efficiency of road operations

Replacement of the TMC's existing road network management system will improve the Centre's capability to integrate and respond to network information and reduce delays to motorists.

Recommendation

Infrastructure NSW recommends a reservation of $200 million from the Rebuilding NSW initiative to upgrade the Sydney Coordinated Adaptive Traffic System (SCATS) and the Transport Management Centre (TMC).

Empowering customers
Customers are able to make better travel decisions when equipped with accurate, real time information about network conditions. Customers can be informed in a variety of ways, including smartphone apps, on-road Variable Message Signs that provide real time traffic and road condition information to road users and smart parking technologies that provide real time information about available parking spaces, making searches for parking easier.

Recommendation

Infrastructure NSW recommends that Transport for NSW, working with RMS and consistent with the Government's ICT strategy, develop a program of customer empowerment initiatives for potential investment from within their capital program from 2015.

3.4 Building future network capacity

WestConnex enhancements

First Things First identified the expansion and extension of the M4 corridor and expansion of M5 East as the two highest priorities for enhancing Sydney's motorway network. Infrastructure NSW proposed they be delivered within a single integrated transport and urban regeneration scheme, WestConnex, within a 10-year period.

As noted in section 3.2, the Government has made substantial progress in developing WestConnex over the last two years. A dedicated agency, the WestConnex Delivery Authority (WDA) is progressing the three stages that make up the scheme. Work is on track to begin widening the M4 in early 2015, as part of the first stage of WestConnex.

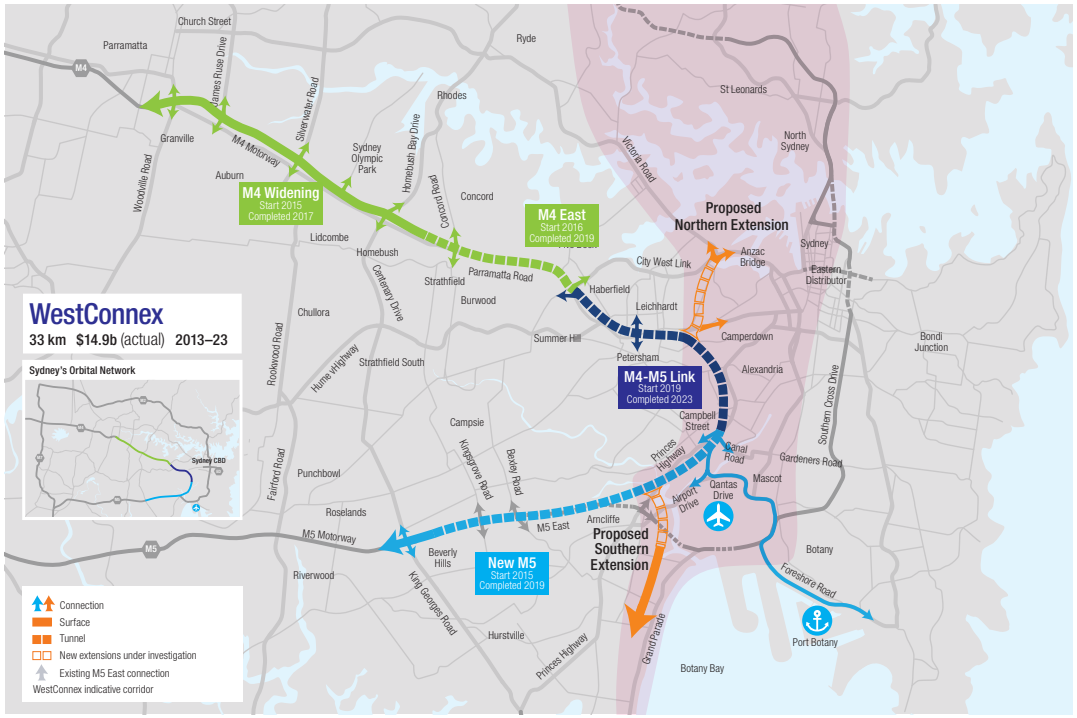
In June 2014, the Government requested that WDA assess the potential for enhancing the scope of WestConnex through northern and southern extensions to the scheme, depicted conceptually in Figure 3.2.

The **Northern Extension** is scoped as a link to the former Rozelle Goods Yards, enabling connection to the Victoria Road corridor to the North and Anzac Bridge / Western Distributor to the East.

The **Southern Extension** is scoped as a connection between the new M5 East tunnels being built as part of Stage 2 of WestConnex and President Avenue, Rockdale.

These proposed extensions aim to offer a western bypass of Sydney's CBD, alleviating pressure on the existing north-south corridor of Sydney's orbital network and reducing journey times from the city's south.

Figure 3.2 WestConnex extensions

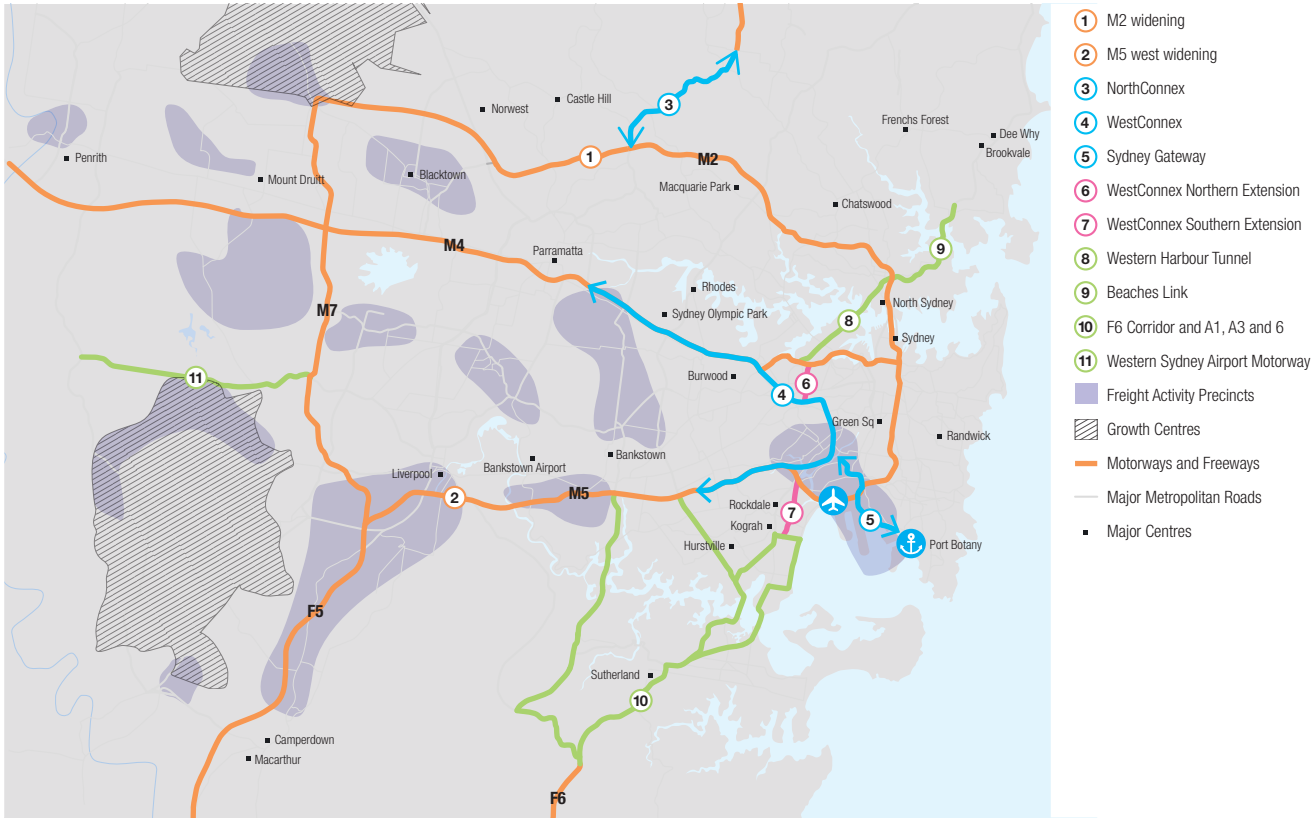


Source: WestConnex Delivery Authority

Over the longer term, through the Western Harbour Tunnel project (discussed below), the proposed northern extension to WestConnex could potentially connect to a third harbour road crossing, alleviating pressure on Sydney's most constrained 'pinch point'.

WDA has completed a preliminary business case for the Northern and Southern Extensions that sets out their strategic and economic rationale and indicates a path for their further development. Work undertaken by WDA shows strong incremental traffic forecasts for these connections, suggesting toll revenues could significantly reduce the need for Government contributions towards the cost of delivery.

Figure 3.3 Long-Term Transport Master Plan: vision for Sydney's motorway network



Source: Long-Term Transport Master Plan (2012)

Further work is required to refine the scope of these extensions prior to any investment decision being made, particularly the Northern Extension which will interface with both the third stage of WestConnex and a potential third harbour road crossing.

Recommendation

Infrastructure NSW recommends the WestConnex Delivery Authority develop final business cases for the Northern and Southern Extensions to WestConnex by the end of 2015, with a view to their procurement and delivery as toll roads within the next decade.

Recommendation

Infrastructure NSW recommends any future State investment in the Northern and Southern Extensions utilise the increase in the State's financial flexibility created by the *Rebuilding NSW* initiative in a manner consistent with maintaining the AAA rating.

Sydney's long-term motorway strategy
The Government's Long-Term Transport Master Plan, published in 2012, set out a 20-year vision for Sydney's motorway network (shown in Figure 3.3).

Transport for NSW has been progressing initial planning into these 'missing links' in the motorway network to assess their relative priority and potential timeframes and identify the next steps. The options under assessment are described in the following sections.

Western Harbour Tunnel
A third road crossing of Sydney Harbour, the Western Harbour Tunnel, is under investigation as part of the Government's strategic motorway planning program. As with the existing harbour crossings, the Western Harbour Tunnel is expected to be a tolled motorway.

The Western Harbour Tunnel would provide a tunnel from WestConnex across Sydney Harbour to North Sydney, creating another bypass of Sydney's CBD and easing demands on the Sydney Harbour Bridge, Eastern Distributor and other approaches to the city. The southern portal at Rozelle would connect with the WestConnex Northern Extension and its northern portal would be in the corridor between the Gore Hill and Warringah Freeways.

The pre-feasibility assessment of the Western Harbour Tunnel highlights that by 2031 travel demand on the existing harbour crossings and Anzac Bridge will significantly exceed capacity in peak periods. Traffic modelling indicates that around 13 per cent of demand – or almost 2,000 vehicles per hour – would divert to the new tunnel during the morning peak, easing congestion on the Harbour Bridge and the existing Tunnel.

The Western Harbour Tunnel's indicative cost is estimated at up to $4.5 billion. Initial assessment suggests that the project would be expected to raise significant toll revenues from motorists.

Recommendation

Infrastructure NSW recommends that Transport for NSW should develop a business case for the Western Harbour Tunnel by the end of 2015 to enable the project's procurement and delivery as a tollway with, or immediately after, the delivery of WestConnex Stage 3.

Recommendation

Infrastructure NSW recommends that any future State investment in the Western Harbour Tunnel utilise the increase in the State's financial flexibility created by the *Rebuilding NSW* initiative in a manner consistent with maintaining the AAA rating.

Beaches Link investigation
A potential Beaches Link toll road (currently being assessed) would provide a direct connection from Seaforth to the Warringah Freeway corridor, improving journeys from the Northern Beaches to the major employment centres of Sydney's Global Economic Corridor.

Beaches Link would likely use a tunnel connection for its full length, although the option of a combined tunnel and bridge over Middle Harbour is also under consideration.

The project is estimated to significantly alleviate congestion on one of the slowest corridors of Sydney's road network – potentially reducing morning peak traffic movements from the Spit Bridge by around 30 per cent and improving the local amenity of Military and Spit Roads.

Beaches Link could also improve public transport journeys from the Northern Beaches by offering a 'Mosman Bypass' for express bus services to the CBD and other centres.

Beaches Link is likely to be connected to the Western Harbour Tunnel, noting that both projects serve related travel demands for access to and from the CBD, gateways and western Sydney from the north of the city. Beaches Link is best viewed as a longer term complement to the Western Harbour Tunnel, given the heavy congestion currently experienced on the Warringah Freeway and harbour crossings during peak periods.

Pre-feasibility work undertaken to date suggests that Beaches Link would cost between $2.4 billion and $3.1 billion ($2014). Projected toll revenues are unlikely to fully offset the cost.

Infrastructure NSW considers that the Western Harbour Tunnel represents a higher medium term priority than Beaches Link. Initial analysis indicates that the Western Harbour Tunnel – by alleviating pressure on the existing harbour crossings and Warringah Freeway – is an essential precursor to Beaches Link.

Recommendation

Infrastructure NSW recommends that Transport for NSW undertake further review and development of Beaches Link, with a view to a potential investment being made over a 10 to 20 year timeframe.

Southern Sydney Access Study

The Southern Sydney Access Study is also under way as part of the Government's strategic motorway planning program. The Study is reviewing ways of enhancing access between Sydney and the Illawarra through improvements to Sydney's southern road corridors. The Government has previously indicated that providing a 'Gateway to the South' is a priority which merits detailed investigation.

The Study is looking at the principal traffic flows along Sydney's southern road corridors (A1 Princes Highway, A3 King Georges Road and A6 Alfords Point Road), including demand for:

- Journeys from Sutherland Shire which make up 93 per cent of vehicle movements crossing the Georges River in the morning peak
- Journeys from Wollongong and the wider Illawarra Region, which make up 7 per cent of vehicle movements crossing the Georges River in the morning peak.

Infrastructure NSW recognises the benefits that would come from improving intra-urban and inter-urban journeys along Sydney's southern road corridors. However, initial findings suggest substantial upgrades to these corridors is likely to be very expensive. For example, the F6 corridor faces significant topographical constraints. The Study is yet to be completed.

Infrastructure NSW considers that in the interim, focus is best placed on targeted investments that address critical pinch points along these corridors, in tandem with the Southern Extension of WestConnex.

A package of 13 minor intersection upgrades across A1, A3 and A6 corridors has been indicatively costed at around $45 million, with additional bus infrastructure works costed at $11 million. Subject to the completion of project development and assessment processes, works should be delivered in parallel with, or ahead of, the Southern Extension of WestConnex.

$ Recommendation

Infrastructure NSW recommends a reservation of $300 million from the *Rebuilding NSW* initiative for a Sydney-Illawarra Pinch Points program to improve access to Sydney from the Illawarra by unblocking critical constraints on Sydney's southern road corridors.

Future corridor definition and protection

Work is under way to define and protect a north-south Outer Sydney Orbital corridor that would comprise future motorway (the M9), a freight rail line and, where practical, passenger rail in the form of the South West Rail Link extension (see Chapter 2).

Studies are also under way to define and protect a road corridor between the Sydney Motorway Network (M7) and the Bells Line of Road at Lower Hawkesbury. This corridor will provide for a future high quality east-west route connecting the Central West with Sydney.

Recommendation

Infrastructure NSW recommends that Transport for NSW should complete corridor identification work for the Outer Sydney Orbital and Bells Line of Road – Castlereagh Connection corridor identification work by mid-2015 to enable these corridors to be protected for future longer term development.

Outer Sydney Orbital

The Outer Sydney Orbital (M9) is a 76 kilometre multi-modal transport corridor running from the Central Coast to the Illawarra via a corridor west of the M7. Once complete, it will connect the North West and South West Growth Centres, provide links to the future Western Sydney Airport, support the NSW freight network and deliver potential benefits as a flood evacuation route for the Hawkesbury Nepean Valley.

While the actual delivery of the M9 is not planned to occur during the timeframe of this Strategy, the strategic need for the corridor is clear. Accordingly, further work is planned in 2015 to refine the M9 alignment and ensure the corridor can support future growth.

A more certain alignment will also enable stronger protection of the corridor through appropriate planning mechanisms. Earlier statutory preservation of all or parts of the corridor would prevent future urban development encroaching on it. There may also be potential for the Government to acquire and manage sites or sections along the corridor if this delivers the best economic outcome.

An economic appraisal of the corridor is also planned to inform the optimum approach and next steps for this important corridor. If undertaken at the right time, better corridor planning and investment could result in substantial savings in future land acquisition costs and broader benefits for local and State economies.

3.5 Enabling Sydney's growth

As Sydney heads towards a population of 6 million, the Department of Planning and Environment has projected a need for an additional 664,000 dwellings will be required over the next 20 years to house Sydney's growing population – equivalent to sustaining an annual rate of production of 33,200 dwellings a year.[59]

While a significant number of Sydney's new dwellings will be located in greenfield areas, the majority of housing growth is expected to be infill within existing urban centres.

Infill development is a desirable and appropriate land use planning outcome, offering the dual advantages of using the capacity of existing transport links and infrastructure and locating dwellings in highly amenable locations close to established social and economic hubs of activity.

However, increasing population densities will put pressure on transport infrastructure, even where public transport mode shares are relatively high. Responding to these impacts is a challenge given that the urban environment is constrained and infrastructure responses are typically expensive and difficult to implement.

Integrated infrastructure planning, funding and delivery will be critical to ensuring impacts on the road network are addressed in a timely and satisfactory way. Infrastructure priorities identified through subregional growth infrastructure planning must be fully integrated with the Government's central processes for allocating resources.

59. Department of Planning and Environment, *NSW Population, Household and Dwelling Projections*, June 2014

The initial Subregional Delivery Plans are to be finalised in the near future. With the benefit of these plans, and further development of the Urban Activation Precinct program and the Major Urban Renewal Program, agencies like Transport for NSW will be able to ensure their capital priorities align with the Government's objectives for land use in general and housing supply in particular.

Recommendation

Infrastructure NSW recommends the progressive implementation of a framework for integrated infrastructure planning, funding and delivery from the 2015/16 financial year to help accommodate and plan for population growth. As part of this integrated approach, agency capital plans should include explicit provisions for growth infrastructure funding requirements, including Priority Precincts and Major Urban Renewal portfolio projects.