HOW WE PLAN TRANSPORT
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When planning transport projects in NSW, we need to balance a range of competing needs, including those of our customers, local communities, the State economy, and the environment. Crucially, we also need to develop effective long-term transport plans in the face of an uncertain future and the rapid changes being brought on by the significant technological innovation and disruption currently impacting transport infrastructure and services. This paper provides an overview of how we address these challenges using an approach that is consistent with the Australian Transport Assessment and Planning Guidelines.

This paper is structured to follow the guidelines’ eight key steps for planning new projects (as represented in figure 1.1 opposite):

- **Section 2.1:** The evidence we need for transport planning
- **Section 2.2:** How we identify the vision and objectives
- **Section 2.3:** How we define the problem
- **Section 2.4:** How we develop options that address the problem
- **Section 2.5:** How we evaluate the options
- **Section 2.6:** How we make our investment decisions
- **Section 2.7:** How decide on the timing of a project
- **Section 2.8:** How we review
Key steps in planning transport

The figure below outlines the key steps in the planning process. As projects can take years to plan, the decisions made at each step in this planning process are reviewed and refined as the project evolves and as circumstances change.

Figure 1a Key steps in planning transport
2.1 The evidence we need for transport planning

This section provides a summary of the wide-ranging evidence we use in transport planning in order to:

- Understand our customers
- Understand what makes successful places
- Understand the travel demands of people and freight.

The evidence base

We use a range of analytical and consultative tools to collect the data we need to plan for transport, including:

- Travel behaviour analysis - using datasets like journey to work, Opal data, the household travel survey, and travel behaviour modelling
- Benchmarking to predict behaviour and outcomes when markedly different land use, transport or demographic environments are being considered
- Guidelines and case studies specifying the effectiveness of different transport modes (e.g. rail, bus, private vehicles etc.)
- Perspectives of and information from stakeholders and customers
- Land use analysis and projections
- Travel demand and network modelling.

2.1.1 Understanding our customers

For Transport for NSW, the customer is at the centre of everything we do.

Everyone in NSW relies on our transport system, whether for personal travel or for getting the goods and services they need. For this reason, understanding people’s lives and how they are changing lies at the heart of all of our transport plans. Below, we provide a brief overview of the different needs and interests of our customers across the State.

Our regional and urban customers

It is important to understand the different transport needs of regional and urban customers.

NSW has one of the most diverse regional economies in Australia, with more than a third of the population living outside Sydney. Their travel needs vary significantly, depending on whether they live in regional NSW and their reasons for travelling.

Likewise, the transport needs of residents across Greater Sydney’s six districts vary considerably, depending on their proximity to jobs and services, and access to transport services.

Our understanding of the transport needs of both our urban and regional customers is informed by a range of data, including customer feedback, survey data and predictive modelling tools.

Vehicle Drivers

There are over 5.6 million people with private drivers’ licenses in NSW. These drivers share the road with other passengers and with drivers of freight and private transport vehicles. Our research shows that vehicle drivers want roads to be in good condition, convenient, safe, predictable and free from congestion.

1 rms.nsw.gov.au
Public transport customers

Whether it’s once a day, once a week or less frequently, most people in NSW use buses, light rail, trains or ferries. When they do, customers expect timely, safe, convenient, connected, comfortable and clean services.

Walking

Walking is part of almost every trip. Pedestrians value the convenience, health, wellbeing and environmental benefits of walking and want connected networks and facilities that keep them safe.

Cycling

Cyclists value the health, wellbeing and environmental benefits of cycling and want connected networks and facilities that keep them safe.

Point-to-Point travel

Many customers require the convenience of transport that picks them up at a specific location and drops them directly at their destination. These point-to-point customers can travel in various ways including by walking, cycling, private vehicle, taxi, hire car and small buses. Point-to-point customers value reliability and timeliness, good customer service, safety and affordability.

Freight customers

Transport is the lifeblood of the NSW economy. Each year the freight industry moves about 450 million tonnes of freight with a value that exceeds $200 billion. An efficient freight industry is vital for making sure communities get the everyday goods they need and that businesses can get their products to market.

Maritime and waterways users

Each year an estimated two million people go boating and millions of trips are taken on the 10,000 commercial vessels in NSW. These customers rely on us to improve access to and manage maritime land and infrastructure. They also value policies, programs and regulations designed to keep them safe.

‘The customer is at the centre of everything we do’
Technology responding to customer needs

Through our collaborative Future Transport Technology program, we identified the following new and emerging technologies that have the potential to underpin a new era of personalised transport in NSW, and will transform transport as they mature, interact and converge over the next 10 to 20 years.

**Customer interface technologies**
- Digital and social, personalised engagement with customers using online interactive channels in real time.
- Dynamic demand management systems that help match capacity with demand.
- Frictionless access, payment and identification so customers can quickly board services or validate an entitlement and no longer have to manage multiple cards or accounts.
- Mobility-as-a-Service platforms that facilitate shared or personal transport on demand.

**Vehicle technologies**
- Connected and automated vehicles (CAVs) that make public, private and shared fleets intelligent, and improve safety with minimal driver input.
- Personal mobility devices such as pods and powered bikes that offer new options for first-mile and last-mile travel between homes and key public transport nodes.
- Alternatively fuelled vehicles, which can deliver greater sustainability and a quieter ride.

**Data and insight technologies**
- Advanced analytics and real-time decision support tools that generate insights from smart network infrastructure and customer service systems.
- Open data and intellectual property to facilitate private sector collaboration and innovative solutions to key challenges.

**Smart infrastructure technologies**
- Smart transport infrastructure, sensors and devices that allow more efficient congestion, capacity and traffic management.
- Next-generation information and communication technology that allows for real-time digital management, increasing the flexibility, connectivity and security of transport assets, while reducing cost and risk.

**Other technologies**
- Technologies that reduce demand for mobility, such as virtual reality, videoconferencing, telehealth, online learning and 3D printing.

To respond to these emerging technologies and to accommodate the range of possibilities that may arise, Transport for NSW has developed a flexible strategic framework and a technology Roadmap to put NSW at the forefront of adopting these technologies, so we can unlock value in our system and customise and personalise transport services for our customers across the state.

This roadmap is based upon five technology enabled strategies, which will be executed with the aim of shaping the most customer-centric, innovative, digitally-enabled transportation system in Australia, by incubating new uses, and trialling and adopting new, world-class technologies as they emerge.

These strategies and a new way of working will underpin how we approach planning in the future.
2.1.2 Understanding places

People travel to and from a range of places for different purposes, such as getting to work, school, shops or for recreational reasons. The quality of places affects if people want to visit and is influenced by what transport infrastructure and services are available. The type of transport can have a major impact on the surrounding environment and quality of place. An understanding of how our customers value the places they travel to and from informs how we plan and prioritise transport investment decisions.

How we balance these movement and place considerations is covered further in section 2.4.2.

2.1.3 Understanding travel demands

To identify opportunities for improving transport services, we need to understand the wide range of reasons that people, goods and services travel. This provides us with insights into the causes, and not just the symptoms, of a transport problem. For example, where there is local traffic congestion on a main road through a local shopping area, we consider two responses: do we increase transport capacity and invest in additional road infrastructure? Or do we encourage travel behaviour to make better use of our existing transport systems? Travel behaviour programs encourage customers to consider retiming, rerouting or changing modes of travel to avoid congestion.

The factors impacting the demand for freight travel are distinct from those impacting for passenger travel. Freight demand is influenced by a range of economic forces such as the location of a manufacturer, seasonal agricultural needs and the cycles of mining and development. The freight task is also rapidly changing in response to urban consumers’ demand for a more diverse range of products and services, either directly to their homes or to nearby commercial and retail hubs.
2.2 How we set the vision and objectives

To guide our decisions and investments, we need to be clear on what we want to achieve by having a vision and setting clear objectives. By setting objectives, we can:

- Help to identify challenges that need to be addressed
- Be clear about the outcomes we want to achieve for our customers
- Direct effort to the initiatives that have the highest probability of achieving positive outcomes
- Provide guidance on how options should be assessed
- Assist in monitoring our progress.

As projects can take years to plan, we continually review and, if appropriate, revise the vision and objectives.

Putting safety first

We are committed to moving ‘Towards Zero’ deaths and serious injuries on our transport networks. To make the transport network safer, we need to take a holistic approach to understanding the causes of accidents on the network. This means that we must not only examine how to make transport infrastructure and vehicles safer, but also how drivers, pedestrians and public transport customers can make the transport network safer.

It also means that we have to consider how each part of the transport network interacts with each other.

Safety is a key priority that will guide the development of the Future Transport Strategy, underpinning all our thinking and decision making from options development and detailed planning to delivery of freight and passenger transport services.

2.3 Problem identification

Identifying and clarifying the transport problem is an early critical step in planning for transport projects. We identify existing and future transport problems by analysing a range of information, including:

- Our objectives
- Analytical tools, such as projected population and travel demand growth
- Community consultation and customer insights
- Quantitative and qualitative assessments weighing the relevance of the problem against the objectives for the transport system.

As projects can take years to plan, we continually review and, if appropriate, refine our understanding of the problem that has been identified.
2.4 How we develop options that address the problem

Once we have identified the problem, we can then begin to develop options to address the problem. In exploring solutions we need to engage customers and industry up front so we can test our understanding of the problem and other perspectives for how problems could be resolved. Options might include changes in policy, services or infrastructure, use of a new technology, or a combination of all four. In most cases, combinations of multiple initiatives will achieve better, faster and cheaper results than one big project alone.

Options development must consider:
- The trade-offs between time, cost and potential effectiveness
- Optimise transport services and infrastructure
- Influence customer behaviour to better fit existing transport investment
- The complementary roles of ‘top down’ centralised planning, and ‘bottom-up’ change driven by customer choice in competitive marketplaces.

Infrastructure and service planning

The figure below includes the kinds of information we use to identify transport services or infrastructure options for addressing a specific transport problem. This figure outlines the key features of different public transport modes, showing the kinds of journeys they support, how many people they can move, and their suitability for different urban environments.

**Figure 2a Transport mode characteristics**

<table>
<thead>
<tr>
<th>Mode &amp; Capacity</th>
<th>Standard bus</th>
<th>Double decker</th>
<th>Bendy bus</th>
<th>Light rail</th>
<th>Suburban train</th>
<th>Metro train</th>
</tr>
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<tbody>
<tr>
<td>Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ $$ $$ $$ $$</td>
<td></td>
</tr>
<tr>
<td>Customers per hour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>10 per hour</td>
<td>20 per hour</td>
<td>30 per hour</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Cost of infrastructure:
- $: Suitable for local and suburban routes
- $: Suitable for rapid and suburban routes
- $$: Suitable for high demand or longer distance routes
- $$$: Suitable for high demand, longer distance or dedicated corridors
- $$$$: Suitable for high demand, shorter distance trips
- $$$$$: Suitable for high demand, shorter distance trips in urbanised environments with high turnover of passengers.
Network option development

Figure 2b below shows that transport networks can be designed to focus on a single city centre (radial network) or one that supports more cross-city and cross-region journeys (connected network).

![Transport Network Design](image)

2.4.1 Policy development and options

Government policies can be an effective way to address transport problems that the market alone cannot deliver or for ensuring transport infrastructure dollars are spent wisely. The government’s policy “toolkit” includes:

- Listening to and responding to our customers
- Sending the appropriate price signals to influence demand and supply
- Determining which uses will have priority access on transport corridors (road and rail)
- Encouraging industry engagement, establishing competitive markets wherever possible and reducing barriers to entry
- Ensuring government regulation is agile, efficient, effective and targeted with best practice compliance and enforcement programs
- Engaging in public-private partnerships
- Facilitating use of ‘open data’ to drive the creation of innovative transport services that deliver public value
- Designing policies to incentivise individuals to act in a socially, economically and environmentally responsible manner
- Using information and community education to drive desired behaviour changes
- Integrating transport policy needs and outcomes with the other functions of government such as land use planning.

Travel Demand Management: a case study of policy, services and infrastructure measures:

There are two broad approaches we can take to address congestion on the transport network: we can increase the supply of transport infrastructure or services by, for example, building new roads or train lines; alternatively, or in addition, we can address demand on the transport network by reducing or redistributing the number of people or amount of goods using our roads, rail or ferry network at any given time.

Travel demand management looks at how we can influence the levels of demand on transport network. This can be achieved by redistributing that demand to other times of the day, different transport modes or different parts of the network. It can also be achieved by reducing the need for travel in the first place such as through working from home rather than traveling to a workplace.
2.4.2 Balancing movement and place

Our roads not only support the movement of people, goods and services – they also provide access to places that support a range of activities. Balancing the movement and place functions of roads result in the following different road environments:

• Motorways – move people, goods and services long distances with no access requirements
• Movement corridors – are main roads providing safe, reliable and efficient movement between our regional centres and within our urban areas with limited access requirements to the surrounding places
• Vibrant streets – competing demands for movement and local access requirements to the surrounding places
• Places for people – important for local access, often locations with lots of people, and places of value for local communities and visitors
• Local streets – are part of the fabric of suburban neighbourhoods where we live our lives and facilitate local community access.

Understanding the function of various parts of our road network influences how we measure the performance of a particular road and informs how we plan and prioritise investment decisions.

2.5 How we evaluate the options

The next step in the transport planning process is assessing the benefits and costs of the options that we have identified. To compare the relative benefits and costs of different options, we use a range of assessment tools such as multi-criteria assessments and benefit-cost analyses.

Specific characteristics we assess include:

• An option’s effectiveness in achieving our objectives – by itself or in combination with other proposed actions
• The cost of an option, including the short and long-term costs, and the availability of funds
• The option’s sustainability and environmental impact
• How long it takes for the action to deliver results, taking into account how the challenges or opportunities may change over that time
• The potential risks associated with an option – including risks to safety, security and the environment
• Whether an option is acceptable to the people of NSW, particularly the communities the option serves or impacts.
2.6 How we advise on investment decisions

The outcome of the options evaluation is a preferred option or preferred set options that will be assessed through a business case. Business cases provide a detailed economic and financial analysis of the option/s, which guides our decision whether to recommend investing in any given option. The outcome of the business case is a single preferred option or set of options that we will consider for advising on prioritisation, funding and delivery.

The cost of operating and maintaining $100 billion in assets

Transport for NSW has over $100 billion in assets to operate and maintain, which includes trains, rail corridors, roads, buses and properties. Before government can invest in any new transport infrastructure or services, there is a need to prioritise the maintenance of these existing assets.

Each year, the transport cluster spends about $4.6 billion\(^3\) to operate the thousands of daily services across the state’s roads, rail network and waterways. In addition, we spend roughly $3.6 billion\(^4\) to maintain these assets, so that transport agencies can continue to deliver safe and efficient transport services for our customers over the long term. In some instances, we can deliver more cost effective benefits by maintaining our existing infrastructure than we could by creating new infrastructure.

2.7 How we advise on the timing of a project

To inform an investment decision, we need to develop a clear plan for the project that will ensure it is delivered in a timely and efficient way. This planning takes into account a range of factors, such as the timing of related projects, integration with land use change over time, industry capacity to deliver, expenditure profile, and construction impacts.

Delivering a long term transport plan to meet the needs of an uncertain future

One of the key challenges facing transport planning is how we can best make long term investments in the transport system given the uncertainty of the future. These uncertainties include:

- How transport needs, behaviours and expectations will change, particularly with technological and societal changes
- The degree of land use and demographic certainty for an area or population
- The degree to which transport investment will shape land use and societal outcomes
- The government’s capacity to commit the finances and other resources to both create and maintain services and infrastructure.

2.8 How we review a project

The final stage in the planning process is to assess the effectiveness of a project. We want to know whether we met the objectives we set earlier in the planning phase. If we haven’t met our objectives, then it is important to identify why and amend our approach accordingly. To make this assessment, we use a range of performance measures that are transparent, objective and customer focused.

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\(^3\) NSW Government Budget Estimates 2016-17
\(^4\) NSW Government Budget Estimates 2016-17
‘Delivering a long term transport plan to meet the needs of an uncertain future’