

Transport for NSW

Unlocking the value of data

Transport Data Strategy 2022–2025

transport.nsw.gov.au



Ministers' message

We are delighted to present the Transport Data Strategy which sets the direction for how we manage and use data to unlock its value to deliver world-leading mobility for our customers, communities and partners. It also outlines how we will continue to partner with other Government agencies and industry partners to support Whole of Government objectives.

The Transport Data Strategy is an integral component of our suite of strategies and plans to support and enable our refreshed Future Transport Strategy, which sets out the NSW Government's vision for transport in a growing and changing state.

As societal norms evolve and community needs and travel patterns shift, it is critical we make evidence-based decisions to ensure transport services, roads and infrastructure continue to deliver for our customers and communities across NSW.

We are developing international best practice data and analytics capabilities across all our transport networks so data can be generated and shared to inform our planning and delivery and improve our customers' experience. We want to transform the experiences of our customers by providing more connected trips.

We are committed to delivering services, roads and infrastructure that offer more choices and greater convenience. This will enable our customers to go where they need to, using whichever combination of mobility suits them – whether it be walking and cycling, public transport services, shared, on-demand and point-to-point services or private vehicle use.

We aim to deliver seamless journeys on our roads using data to manage congestion, improve road safety and pre-empt maintenance requirements.

The need for enhanced transport solutions in our regional communities is growing as our regional population expands. Creating more connected regional hubs starts with a better understanding of local needs. We plan to do this by actively listening to regional customers and acting on their feedback.

As we continue to return to a 'new normal' following COVID, data helps us understand customer feedback and apply expert analysis of our rich data sets to reshape our cities with improved transport services, urban amenity, environmental outcomes, and economic sustainability.

As technology advances in ways that make our lives easier, now is the time to unlock new possibilities using a range of mobility-related data and new analytical capabilities.

Our Transport Data Strategy outlines how we will continue improving our use of data to achieve these outcomes - and invites partners from across government, industry and academia to work with us to explore data-driven innovation.

It outlines the principles we are guided by in managing our data to ensure customer privacy and data safety. But most importantly, it paints a picture of what the future could look like when we explore the possibilities our data offers to deliver enhanced solutions and experiences for our customers, communities, partners and the NSW economy.

The Hon. (Rob) Robert Gordon Stokes, MP

Minister for Infrastructure, Minister for Cities and Minister for Active Transport

The Hon. David Andrew Elliott, MP

Minister for Transport, Minister for Veteran Affairs and Minister for Western Sydney

The Hon. Natalie Peta Ward, MLC

Minister for Metropolitan Roads, and Minister for Women's Safety and the Prevention of Domestic and Sexual Violence

The Hon. (Sam) Samuel Farraway

MLC Minister for Regional Transport and Roads

Deputy Secretary's message

The future of mobility will be unlocked through leveraging data to transform the infrastructure and services Transport delivers for our customers and communities across NSW.

This *Transport Data Strategy* sets a new benchmark for how Transport will capture, manage and use data and embed data-driven decision-making to fulfill Transport's purpose and the Government's priorities.

In line with our *Future Transport Technology Roadmap 2021–2024*, we will leverage data-driven innovation to create meaningful experiences for our customers, communities and our people. We will also continue to enable sustainable economic outcomes.

Our rich datasets build a picture of our customers' end-to-end journeys, from the moment they start planning to when they arrive at their destination.

Expertly analysing this information in near real time allows Transport to optimise our operations to improve mobility outcomes for public transport, roads and waterways users, covering both freight and passenger customers. It ensures the safety, efficiency, and resilience of the transport system and the optimisation of our network as well as helping in the design of places and sustainable environments for communities.

Data will continue to be part of Transport's DNA. We will leverage innovation with Artificial Intelligence, data science and emerging technologies and use data like never used before.

Our *Transport Data Strategy* will enable us to treat our data as an asset and realise its value, while balancing the need for open access and data sharing. It provides the strong governance, robust interoperable platforms, capability and coordinated processes Transport will adopt now and into the future.

Reciprocal data exchanges between government agencies, industry, researchers, and the community will boost innovation and improve mobility options and experiences. Reciprocal exchanges between Transport and commercial operators will create opportunities for Mobility as a Service, giving customers more seamless journeys and encouraging public transport uptake.

The Transport Data Strategy sets a roadmap for better mobility outcomes and place making for our customers, community, industry, partners, and our people.



Joost de Kock
Deputy Secretary
Customer Strategy and Technology



Unlocking the value of data for Transport

Digital technologies have rapidly changed all aspects of our lives, resulting in increased generation, consumption and use of data.

Our Transport vision for data is:

Unlocking the value of data for our customers, communities and people to enable seamless, safe and connected journeys and successful places

The role of data has changed from being a resource that supports business processes to an asset from which untold value is generated.

The future of mobility will be unlocked through leveraging data. It is a key enabler of Transport's mobility services. We use our data to improve performance, to design successful places and to allocate our infrastructure investment. It's data that helps power more than 469 million trips on public transport annually.

Transport is at the forefront of data advancement. We have found new ways to provide data to our customers to help them travel safely during the COVID pandemic.

We have achieved this outcome by working closely with partners including local and international businesses, technology providers, developers, research partners, councils and other jurisdictions. By collaborating and connecting datasets to drive meaningful insights, we all benefit.

The key to this future is recognising data is an asset to be valued and nurtured. We recognise this role and use it to unlock benefits for customers and communities.

Transport has become the first transport agency in the world to commit to exploring quantum computing. Our Quantum Centre of Excellence has the potential to aid the processing of vast volumes of data to solve complex problems and enables us to move towards dynamic optimisation of our network.

The Transport Data Strategy sets the direction for a major uplift in the NSW Government's ambition to maximise Transport's outcomes from our rich datasets. This will provide new solutions, improved services and better planning through new innovations.

As part of the Whole of Government, Transport is partnering in the delivery of shared outcomes aligned to the NSW Government's priorities and providing custodianship of mobility data across the NSW Government ecosystem.

By leveraging existing strengths, we reinforce NSW as a global transport leader using data to create world-class mobility solutions for the people and communities of NSW.

We welcome partners to help us unlock the value of our data to enable us to imagine and deliver innovative solutions and experiences.

We are going further – using data beyond anything we have done before and enabling a culture shift through available insights so that data driven decisions can be made faster.

Our vision and roadmap for data is laid out in our inaugural Transport Data Strategy 2022–25. The Strategy recognises the importance of data amongst our infrastructure and technology projects.

We use data everyday to improve outcomes for our customers

Transport provides services for NSW's 8.2 million people, using a portfolio of assets valued at \$161 billion.

Every day more than 16 million journeys take place on roads in the Greater Sydney area. Each week 1.25 million NSW residents ride a bicycle. Each year more than 469 million trips are made on public transport, 75 million point to point passenger journeys are taken and more than 500 million tonnes of freight

is moved. There are over 140 vessels carrying out water safety compliance operations.

Transport already has a strong foundation in using meaningful data insights for customer centric, collaborative and informed decision making. Realtime data used by our operations centres informs planning for safe and effective Transport services across NSW and drives everyday decisions to keep our customers and community safe and our network moving.

Our vast network generates a large amount of data which will continue to grow. We capture data from systems, sensors, from our partners and technologies as they emerge. Through apps, we provide essential information to our customers to help them make decisions about their journeys on the go. Our rich and diverse data helps us understand and measure what has happened; inform what is occurring in the moment; and helps us plan for the future to provide better customer outcomes.

Data from our 10,432 fleet vehicles carrying passengers between 292 train stations, 27,556 bus stops, 48 wharves, 48 light rail and 13 metro stations is used to understand customer travel patterns and optimise network design.

Transport uses data from ecological studies prior to building infrastructure to minimise habitat disturbance and inform the installation of structures which provide safe passage and movement through the landscape. To date, more than 205 structures have been installed to support our wildlife.

Population projections combined with road and public transport usage help us forecast the services that communities and industry need now and in the future.

We collect data from more than 9,000 traffic counters and sensors across almost 700,000 kilometres of state, regional and local roads to manage traffic flow, reduce congestion and keep our customers moving.

With the freight industry, Transport enables the movement of goods with an economic worth nearly \$66 billion per year.

Our safety analytics system examines and analyses NSW road crash data to identify road safety improvements and reduce deaths on our roads.

More than 1.3 million customers access real time data each month through Transport-endorsed applications to help them plan and make decisions about their journeys.

Transport's urban designers, placemakers and planners use the trip data of 7.4 million active transport customers to build infrastructure and create first and last mile connections.



The Transport data strategy will build on our strong foundations

Building on our foundations, our data vision will drive us to excellence in data innovation. Transport uses data to make operational and planning decisions across NSW.

The way we connect, interact, transact and socialise have significantly changed, generating vast amounts of data and insights. This increase in data is accompanied by new customer and community expectations of government services and data-driven innovations.

Everyday, Transport is using data for operational and planning decisions, and emergency response across NSW based on data relating to travel demand, fleet availability, network performance and customer feedback.

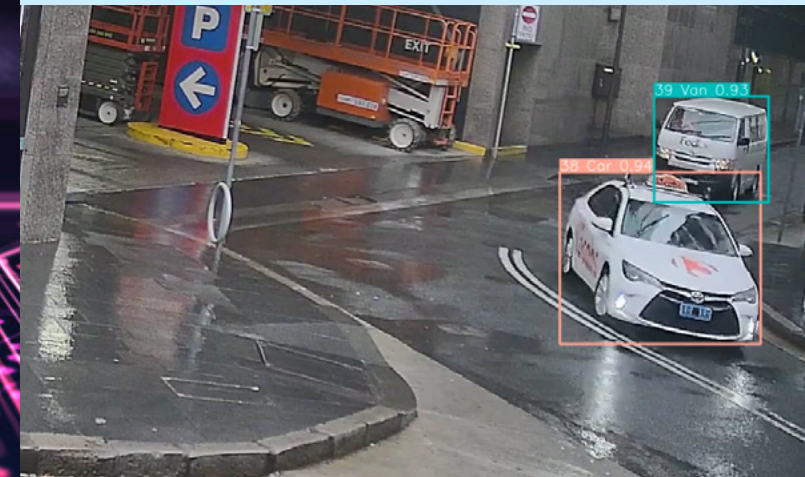
The *Transport Data Strategy* will unlock the value of our data to produce high-quality insights to provide greater understanding of our neighbourhoods, towns, cities and regions. Improving the way we work with data will transform services and infrastructure for our customers. A wider enterprise approach of using and managing data will create efficiencies, reduce costs, enrich insights, and facilitate

sharing of insights with the right people to better inform our decisions. We will unlock the value of data to help make journeys safer, easier, and more reliable with greater connectivity. It will help us to create successful places, both regional and metropolitan, underpinned by sustainability and ensuring economic value.

It will provide transparency on how we use and manage our data and lead to a consistent approach in:

- ▶ achieving NSW Government's and Transport's priority outcomes using data
- ▶ moving towards a customer and communities centric view through data
- ▶ applying principles and standards for working with data
- ▶ protecting the privacy of our customers' data and ensuring it is used ethically
- ▶ managing data throughout its lifecycle
- ▶ implementing projects and plans that support Transport's data roadmap

Using Artificial Intelligence for vehicle and object detection



Transport has developed a cutting-edge computer vision prototype using Artificial Intelligence (AI) that successfully detects and matches vehicles entering and exiting freight facilities, carparks and loading docks.

The prototype uses algorithms applied to camera images to detect and classify objects using their shape. This has been achieved using AI which trains the algorithm to automatically recognise objects using over 25,000 reference images.

Once recognised, the data is translated into de-identified insights and used to optimise the flow and use of freight facilities, parking and loading docks in future planning, design and the development of major buildings and precincts. Better planning of these facilities ultimately benefits placemaking, environmental outcomes and freight efficiency. This technique provides greater timeliness and reliability of information and replaces current manual survey methods used to record vehicles.

We are guided by principles

The Transport Data Strategy is guided by principles which outline the right values and behaviours for how we create, use and consume data, build data capability within Transport, and work with each other and our external partners.

These principles ensure that we treat our data appropriately with respect to ethics and safety, maintain a focus on customer and outcomes, continue to collaborate and innovate and deliver data capability in a scalable and sustainable way. This will ensure we are able to continue to leverage the value of data in the future.

As the role of data evolves, Transport recognises data as an asset in its own right. Intellectual property is valuable and must be managed as an asset. In accordance with this we will democratise data using an open by design approach, treating each data asset in the way that will unlock maximum benefits for the community.

Safe

We protect the privacy of our customers and people and minimise data risks associated with the use and sharing of data.



Ethical

We use data only to benefit our customers, community and people and are respectful of their rights including privacy and ethical use for decisions. We use AI responsibly, continually retesting outcomes to manage bias.



Customer centred

We take a customer and communities centric view when using data to improve outcomes and experiences.



Valued

We treat data as a valuable asset and unlock the value of data for our customers, community, industry, across Government and for our people.



Outcomes focused

We focus on enabling business, aligning to business needs and customer outcomes.



Collaborative

We co-design solutions with our partners. It is the way we work with our customers, community, industry, across Government and people.



Innovative

We proactively look for new ways of improving how we use data. We lead the way in data capability.



Scalable

We apply data insights to a range of solutions, and in a repeatable way.



Sustainable

Our data solutions are reliable and automated to maximise efficiencies and avoid duplication.

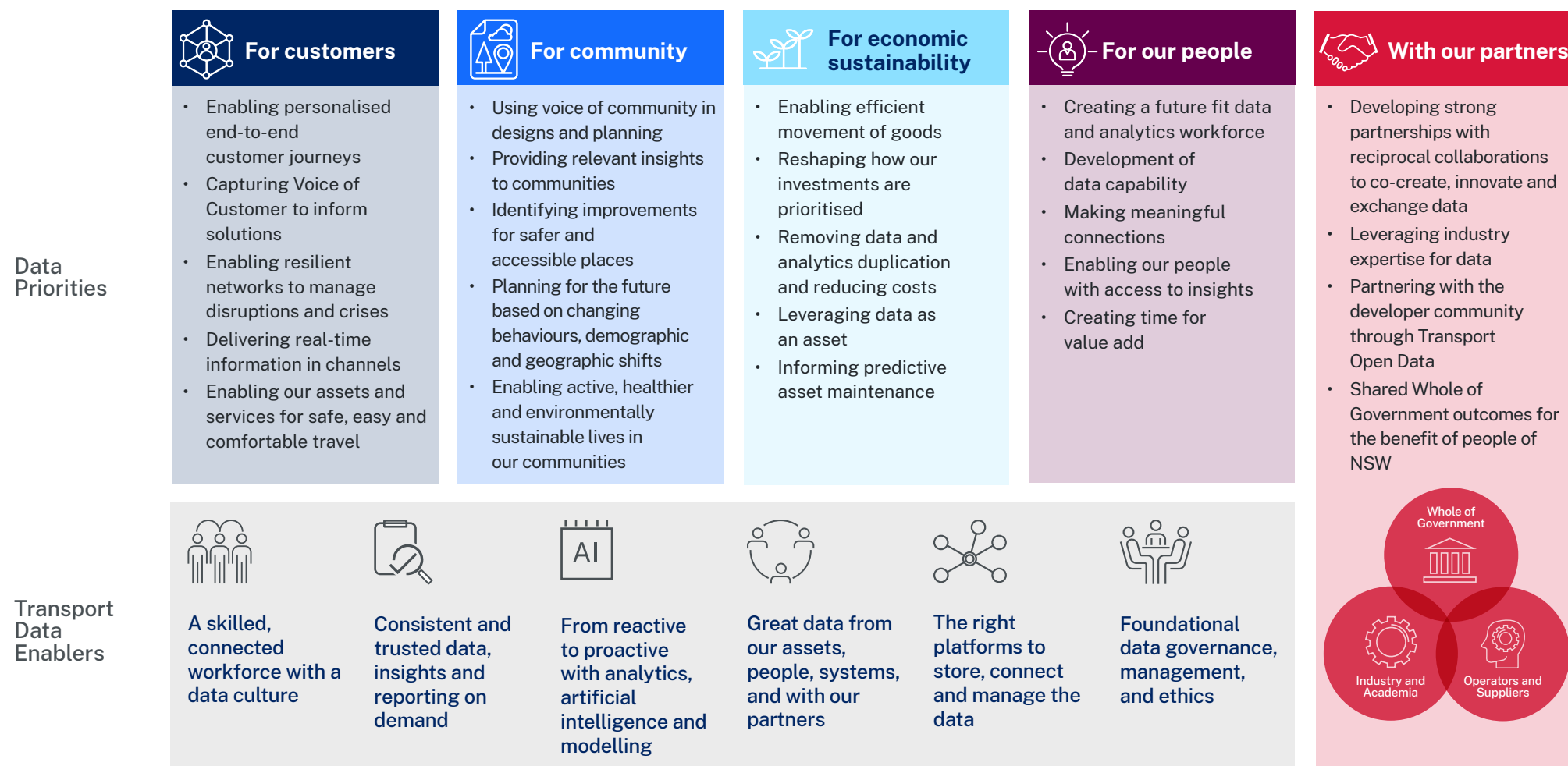


Transport data framework

The Transport data framework provides a clear overview of how data will be used to deliver Transport's outcomes of connecting our customers lives, successful places for communities, enabling economic sustainability and helping thriving people do meaningful work.

The framework is made up of four data priorities, aligned to the Transport outcomes, with a partnership priority reflecting the importance of Transport's partners in achieving our outcomes. The six enterprise data enablers form the building blocks which will deliver the data priorities.

Unlocking the value of data at Transport





Unlocking the value of data for our customers

A future where we use data to transform the travel experiences of our customers by providing relevant information, real-time choices, resilient networks and safe and comfortable travel.

Transport outcome

Connecting our customers lives

Examples of *how* we will be using data for better outcomes for our customers

We use real time spatial data to manage and optimise services and digital connectivity across the end to end network

We understand our customers travel patterns and use this to configure and build a convenient future Transport network

We use voice of customer programs to uncover customer travel needs and expectations and address these in a holistic way

Examples of *what* this will look like for our customers

My journey is optimal with efficient connection hubs to get me where I need to be safely and in comfort



Events and incidents relating to my journey have been proactively managed with alternate routes communicated before I set out

I have clear and easy ways to provide feedback to Transport about my experiences

Supporting COVID recovery with predictive analysis

When NSW Government updated its COVIDSafe Transport plan to increase capacity, extensive planning was carried out to ensure services met demand.

Transport used predictive analytics to forecast when services would reach capacity as customers returned to public transport.

These insights were used to support the NSW Government decision to increase capacity sooner than previously planned to keep our customers safe.

An increased percentage of green dots were placed on seats for social distancing across all public transport vehicles in NSW. This allowed Transport to be prepared for the return of customers and to abide by guidelines from health agencies.





Unlocking the value of data for our communities

Partnering with communities and listening to their current and future needs to provide the infrastructure and services for successful places, and healthier active lives.

Transport outcome

Successful places

Examples of how we will be using data for communities

We understand the different community needs across NSW through continuous listening which help us plan and deliver our services and infrastructure

We use mobility data to design and create smart, safer, accessible local places and cities

We use a range of data to make decisions which are relevant for future environmental sustainability, effective procurement and net zero impact

Examples of what this will look like for our communities

I am confident that Transport is actively listening to, and understanding the needs of my community



I have access to insights about local travel options and place making plans for my community

My local community is a safe and liveable place because of smart infrastructure planning and design

Using insights to manage cycleways

Transport, in collaboration with Councils across Greater Sydney, develop insights from data to help prioritise the delivery of connected network of cycleways.

Using visualised data on existing and planned cycleways, Transport aims to optimise the future planning and management of the cycle network as well as providing insights to Councils to help shape and inform infrastructure and facilities responses.

These insight delivery platforms will assist Council and Policy makers understand the progress of current cycleway infrastructure in their area and help to inform decision making and communication to the local community.





Unlocking the value of data for economic sustainability

Using data to make smarter decisions in the way we deliver projects and infrastructure, maintain assets, support freight supply chains and contribute to better economic outcomes across NSW.

Transport outcome

Strong economy and quality of life

Examples of how we will be using data for economic sustainability

We improve the data capture and simulation of freight movements to help inform optimised movement of goods in partnership with the freight industry

We use predictive analytics and models to anticipate when assets need to be maintained reducing costs of management

Improvements in modelling will lead to investment decisions which reflect the changing travel behaviours and characteristics of the people of NSW

Examples of what this will look like for economic sustainability

The freight industry has the information that it needs to manage and improve the delivery of goods



Investing in reusable and sustainable data assets and systems enables data to be leveraged in a more cost effective way

Transport and our industry partners use insights to improve the development, delivery and maintenance of assets and infrastructure

Sydney Trains uses data to achieve net zero emissions



Sydney Trains is one of the top 5 users of electricity in NSW making up 1.3 per cent of the total use. To address this an ambitious target was set by the team to achieve Net Zero Emissions from electricity consumption by 2025, as well as a 10 per cent reduction in the rate of energy consumption over five years.

An Energy Data Management System was developed using energy and emissions data to identify areas with the biggest impact on emissions. These insights uncovered electricity consumption in Sydney Trains operations as a key driver of emissions.

As a result, Sydney Trains signed up to renewable energy, and was able to achieve its Net Zero target in 2021, 4 years ahead of schedule. Further targeted action continues to be taken to lower the rate of energy consumption used by rail fleet movements which accounts for a large proportion of energy use.



Unlocking the value of data for our people and partners

Investing in our people and creating a data driven culture to become a workplace of choice. Building strong reciprocal collaborations where we co-create, innovate and exchange data with industry, government, operators and other partners to make NSW a better place to live, work and visit.

Transport outcome

Thriving people doing meaningful work

Examples of *how* we will be using data for better outcomes for our partners and people

Reciprocal partnerships allow the exchange of data to enrich information and improve Transport outcomes across the sector

Transport Open Data and insights to drive innovation and enable regional and metropolitan customer benefits

Investment in data capabilities and skills of our people to create a data literate workforce

Examples of *what* this will look like for our partners and people

Our people have the confidence to make informed decisions using trusted data in an ethical and responsible way



Co-designed innovative solutions with communities, industry and academia provide tailored outcomes for customers and communities

We build strong relationships across government enabling connected data for shared outcomes that maximise benefits for the people of NSW

Transport Open Data

Transport's Open Data Program provides data to encourage innovation and the development of new mobility products. The platform enables Transport to effectively partner to deliver a range of solutions for customers including apps, website and insights which inform planning beyond Transport for NSW.

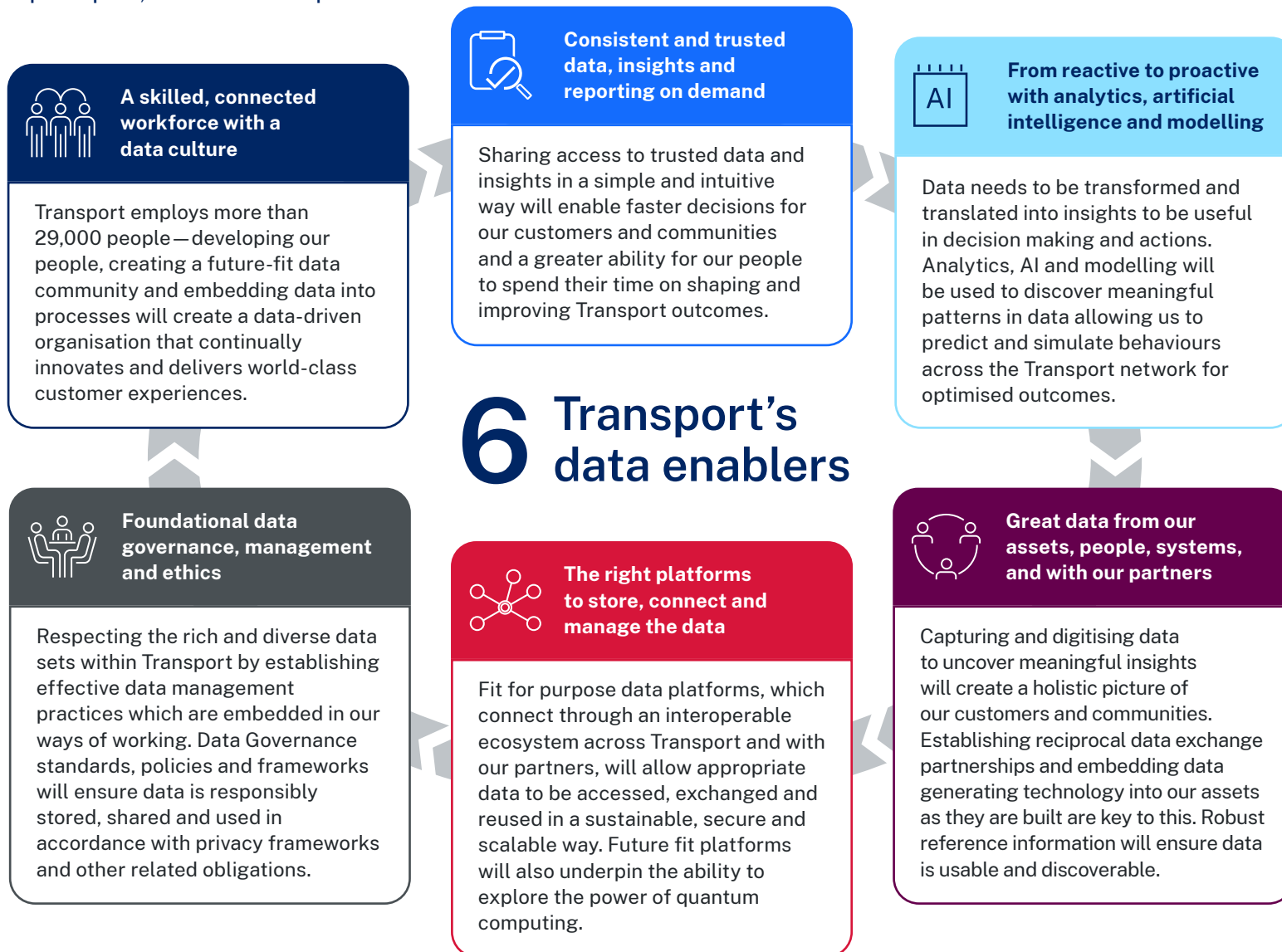
More than 53,000 registered users use more than 200 data sets, which provide rich information to industry, developers and academia. With over 5,000 applications delivered to date that benefit customers and communities, 14 of these have been endorsed by Transport for NSW.

The products developed using Transport Open Data make a difference in our customers lives. They include apps with timetables in multiple languages, stop announcers for the visually impaired community and cross-government collaboration initiatives such as learner log books.



Transport's building blocks will accelerate our success

Transport's success in implementing this data strategy will come from its six data enablers. These building blocks provide the foundation for how Transport will drive a step change in the way we use data, aligned to our principles, to achieve our priorities.



Sophisticated tools offer near real time insights on customer journeys

Transport is using intelligent tools which provide near real time metrics and insights on the public transport network and customers' end-to-end travel experiences within our internal Transport operations and planning teams.

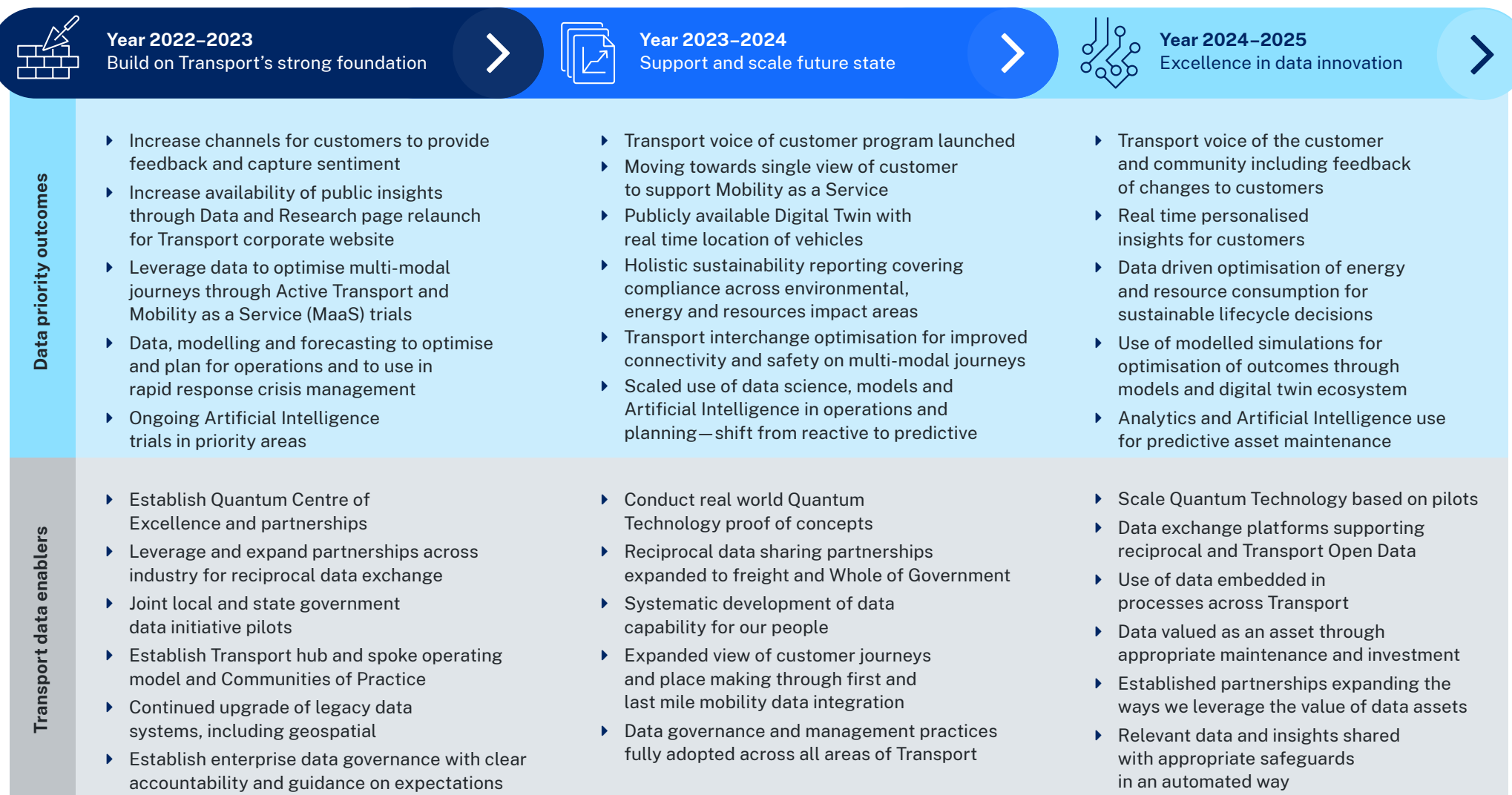
Through application of sophisticated algorithms, the likely route customers are taking is calculated including travel time, delays experienced and transit through interchanges.

Using this data, Transport for NSW can adjust services to improve customer journeys. At the precinct level, we can understand how our customers are moving between platforms and different types of public transport so that we can optimise interchange points for more seamless travel experiences.



Transport Data Roadmap 2022–25

The data roadmap shows the planned outcomes that Transport will deliver on as the value of data is increasingly unlocked for our customers, the community, government and industry partners.



Transport for NSW collaborates across Government to unlock the value of data

As part of the Whole of Government ecosystem, Transport is using data to help shape our communities. The NSW Government Data Strategy sets the scene for achieving this.

Transport for NSW is already collaborating with other government departments to better understand customers and prioritise services. Transport shares data, insights and expertise enhancing outcomes for the people of NSW and contributes to the Government response to crises. This supports the NSW Government vision of becoming the world's most customer-centric government by 2030.

The *NSW Government Data Strategy* is the State's overarching data strategy enabling a coordinated, consistent and safe approach to using and sharing data and insights across government. The Transport Data Strategy aligns to the NSW Government Data Strategy, reflecting its four themes:

- ▶ Treating data as an asset
- ▶ Accelerating actionable insights
- ▶ Strengthening transparency and trust
- ▶ Fostering culture, leadership and capability

In alignment with the Australian Trust principles, Transport is committed to using data to improve the lives of people of NSW now and into the future. Transport is guided by other Government policies such as the NSW Smart Places Customer Data Charter, NSW Government Data Reform and NSW Government priorities such as Government Made Easy.

We leverage NSW guidelines and international standards for good data practices including NSW Data Governance toolkit and NSW Artificial Intelligence Assurance framework. We are actively contributing to the whole of Government initiatives including NSW Spatial Twin and shared data assets such as National Road Safety and National Freight Data Hub.

Transport Data Strategy has also taken the Future Transport Strategy and the Future Transport Technology Roadmap 2021–2024 as foundational strategies and has been guided by other sources including NSW and Transport policies, strategies, and legislation, external research on global trends in government, data, and technology and in consultation across Transport and NSW Government.



Treating data as an asset

We treat data as an asset by identifying the data that matters for delivering better customer outcomes, governing and managing it effectively across the data lifecycle.



Accelerating actionable insights

We generate actionable insights and make them available to the people who need them to make decisions.



Strengthening transparency and trust

We cultivate trust in the way we collect, manage, use and share data by handling, safeguarding and governing data with clear and consistent guidelines.



Fostering culture, leadership, and capability

We foster a culture of data-driven decision-making through strong leadership and capability. Our people understand the importance of data and are equipped with the right skills to use it effectively.

Collaboration with NSW Health

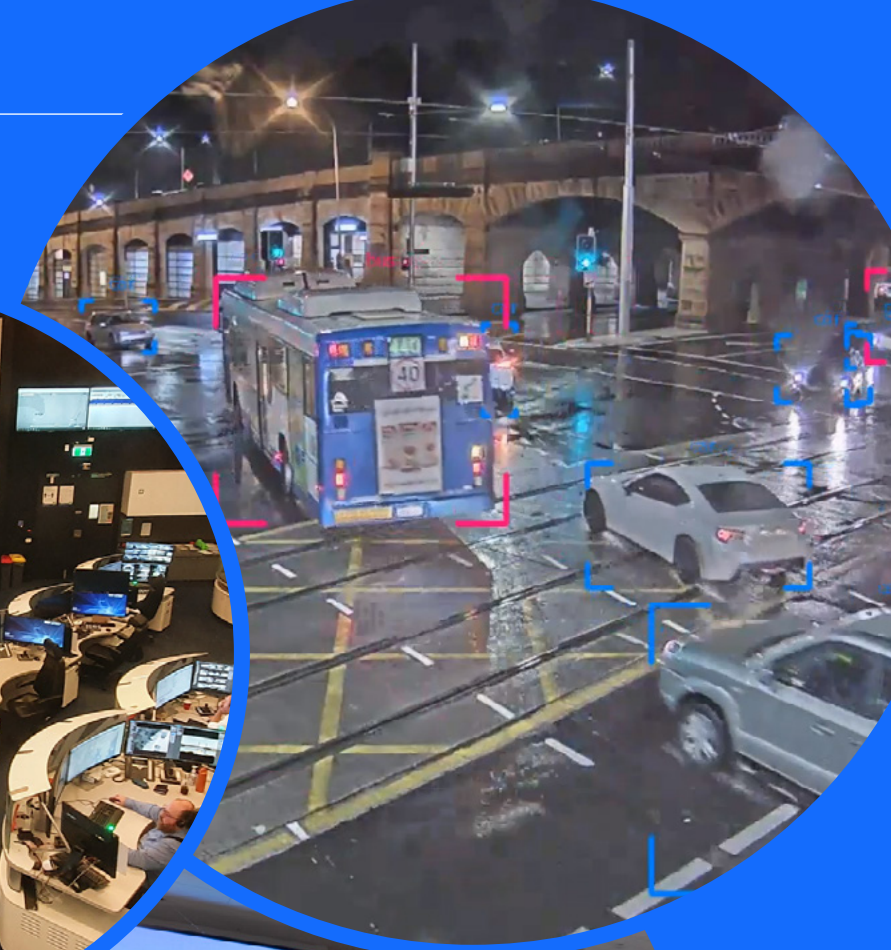
At the outset of the COVID19 pandemic the NSW Ministry of Health began developing forecasts to help identify future potential impacts of COVID19 on the community and demand on health system.

The NSW community responded to Health advice and Public Health Orders to work from home, undertake only essential travel and to reduce community contact as much as possible.

NSW Health's modelling group urgently needed data to understand the extent of the changes to community mobility that could be fed into the model and calibrate the projections that were being produced. Transport for NSW collaborated closely with the Ministry of Health to provide travel patterns within and between Local Government Areas across end to end journeys, public transport and roads.

Continued sharing of community mobility trends have enabled NSW Health to monitor changes and modify the model keeping the community informed with relevant information and influencing health system planning throughout the pandemic.





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