mainroads
WESTERN AUSTRALIA

Intelligent Transport Systems (ITS) Master Plan

2022 – 2030

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Managing Director's Message

JOHN ERCEG
Managing Director of Main Roads

> "World class mobility for Western Australians across an intelligent, safe, sustainable and optimised network."

Main Roads is in a period of immense transition and technological change as we increasingly embrace technology in every aspect of what we do, and what we offer our customers.

Our 'Big Shift'; the change in emphasis from road building and maintenance to include better operations, started over a decade ago and continues to gather pace as a key focus within the organisation. To support this, we are committed to Intelligent Transport Systems (ITS) delivering integrated road network functions, with services that are orientated towards end users.

As part of this journey, we are rapidly adapting our services and leveraging new technologies to reimagine the future of transport, and to provide world class outcomes for the customer through a safe, reliable, and sustainable road-based transport system. Our achievements in the use of ITS are nationally and internationally recognised, and our continued emphasis on road network operations has improved the travel for people across the State. Through our advances in ITS, we have strived to meet the needs of all our customers, create better communities, enhance customer experience, and unlock economic opportunity.

We have achieved this level of success by working closely with our Transport Portfolio partners as well as many stakeholders across the State – an approach we will strengthen and expand on. By working collaboratively across Government, and with the wider industry, we aim to leverage and benefit from experience and expertise, and in turn share success.

Our *Intelligent Transport Systems Master Plan and Roadmap 2022-30* reveals another major uplift in our ambition to strengthen leadership, enhance skills and work methods, and re-emphasise our focus on how technology and data will continue to bring positive changes in how we transport people and goods throughout Western Australia.

Our strategic direction "Keeping WA Moving" underpins everything that we do. It defines our aspiration to provide world class outcomes for the customer through a safe, reliable, and sustainable road-based transport system.

On behalf of Main Roads Western Australia, I would like to thank everyone who has engaged, offered advice, and contributed to this Master Plan. We look forward to working with all levels of government and the wider community to progress towards our ITS Master Plan vision.

JOHN ERCEG
Managing Director of Main Roads

01

Introduction

01

Introduction

Intelligent Transport Systems (ITS) have been in use on Western Australian roads since the first set of traffic lights was installed at West Perth Subway in December 1953.

Intelligent Transport Systems (ITS) are roadside technologies, and control and data systems used for the purposes of:

- Increasing safety, reducing traffic congestion and managing incidents effectively.
- Improving the mobility of people and goods.
- Meeting transport policy goals and objectives.

The definition covers a broad array of techniques and approaches that may be achieved through stand-alone technological applications or through integration of different systems to provide new (or enhancements to) existing transport services. ITS provide the tools to transform mobility and improve safety – this is particularly relevant in the context of road network operations.

Over the last 20 years, we have gradually shifted from an agency solely responsible for building and maintaining a road network to one that increasingly focuses on facilitating better use of the transport network.

As congestion on Perth's road network continues to grow, the focus on network operations initiatives, enabled through use of technology and ITS is heightened and we now need solutions that can deliver improved performance safely, efficiently, and sustainably.

In parallel to this ITS Master Plan, our ITS Policy Statement has been established. Additionally, an ITS Planning, Development, and Implementation Frameworks and an ITS Architecture Framework are being developed.

Together, these components will shape the way we will adopt, plan, develop and implement appropriate technologies that support our aspiration to provide world class outcomes for our customers through a safe, reliable, and sustainable road-based transport system.

This ITS Master Plan succeeds the Master Plan issued in September 2014, and builds upon its achievements. Notably, the previous Master Plan laid out:

- Strategic vision for ITS.
- Supporting technical reports.
- High-level action plan.

The ITS Masterplan has now been refreshed in 2025 in consultation with both internal and external stakeholders. This ensures the accuracy and relevance of the ITS Masterplan as key document for the deployment of ITS in Western Australia.

02

Context

02

Context

Transport is presently undergoing a generational transformation with disruptive technologies significantly altering the way people travel. These technologies offer significant opportunities to move towards zero deaths and serious injuries on our transport network. They will create more efficient customer-centric mobility, and stimulate Western Australia's economy.

With its significant geographical size and dispersed population, Western Australia needs a transport network that supports the diverse and changing needs of our communities and industries, now and into the future.

One of our key responsibilities is to use "technology to optimise the real-time management of the network and provide traveller information". Our customers are increasingly embracing new technologies and expectations around how they want to interact with the transport network are changing. Technological advances are also driving innovation as we move towards greater automation of our roadways and vehicles.

ITS is technology that improves traffic flow, safety, air quality, and fuel efficiency when moving people and goods.

The purpose of this ITS Master Plan is to provide a dynamic long-term planning document that **provides a conceptual guide for future ITS projects;** providing a framework for determining our future ITS needs. It seeks to leverage innovation and transformative technologies in transport to support better outcomes for people and roads across the state.

This Master Plan formulates a strategy for the development and ongoing implementation of ITS on our road network; incorporating various methodologies aligning with national architectures and frameworks. This provides a sound basis for design, planning, specifications, estimates, operations and maintenance of potential ITS projects in a phased manner.

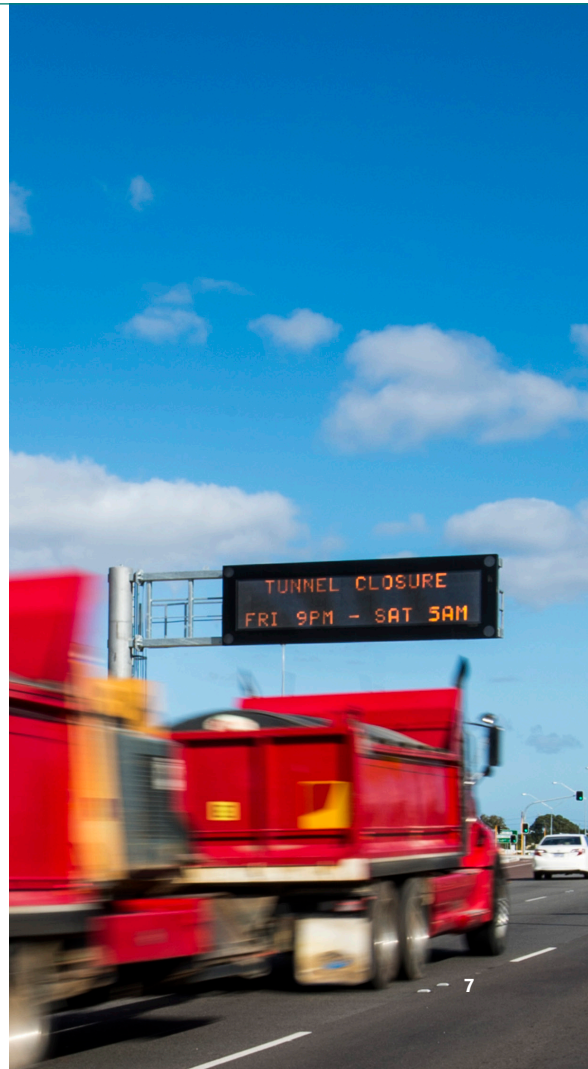
This ITS Master Plan comprises two central elements:

Strategy

Outlines key challenges, trends, opportunities and sets the long-term direction for the future of ITS in Western Australia, outlining priorities to guide policy and investment.

Roadmap

High level focus on the next five years to enable us to respond to the changing technological landscape and work in partnership with government and industry to shape the direction of ITS investment in Western Australia. The Roadmap identifies key actions and initiatives to support the Strategy objectives, defining key roles and an approach to measure success.



2.1 Strategy Linking

To ensure our roadmap initiatives meet requirements for measuring performance, actively managing our road network, and delivering positive safety and mobility outcomes to the travelling public, the ITS Master Plan seeks to align with:

+ **C-ITS Roadmap -** The Main Roads C-ITS Roadmap will support the implementation of a nationally harmonised C-ITS ecosystem across the Western Australian road network to enhance safety, movement, regional resilience, and enable Future Vehicle Technology.
+ **Infrastructure Western Australia State Infrastructure Strategy**[1] - The Strategy represents Infrastructure Western Australia's (IWA) assessment of the State's significant infrastructure needs and priorities, and how to address them.
+ **Climate Health WA Inquiry Final Report**[2] - This report records the fact-finding process which uncovers the challenges faced by the WA health sector as a result of climate change, and seeks to address the necessary responses to these issues.
+ **2021 Australian Infrastructure Plan** aligning with the Kyoto Protocol - The Plan is focused on reforms and policy recommendations for six infrastructure sectors within Australia.
+ **2024 WA Government Cyber Security** - The 2024 WA Cyber Security Policy outlines required controls for preventing, responding to, and recovering from cyber incidents, allowing entities to tailor additional measures based on their risk profile.
+ **National Policy Framework for Land Transport Technology Action Plan: 2020 – 2023** - Sets out a nationally consistent approach to policy, regulatory and investment decision-making for emerging land transport technologies.
+ **WA Road Safety Commission Driving Change: Road Safety Strategy for Western Australia 2020-30. -** The strategy aims to reduce the number of people fatally, severely, or seriously injured on Western Australian roads by 50% to 70% by 2030.
+ **The National Road Safety Strategy (NRSS) 2021 – 2030**[3] - This Strategy represents the national commitment to deliver significant reductions in road trauma, putting Australia on a path to achieve the goal of Vision Zero by 2050.
+ **State Planning Strategy 2050** - The State Planning Strategy 2050 is the Western Australian Government's strategic planning response to the challenges Western Australia is likely to face.
+ **Main Roads Road Safety Policy** - This policy has a target to reduce fatalities and serious injuries by 50% by 2030.
+ **The regulatory framework for automated vehicles in Australia 2022** - This paper presents proposals on the end-to-end regulatory framework for the commercial deployment of automated vehicles.
+ **Sectoral emissions reduction strategy for Western Australia 2023** - The State Emissions Reduction Strategy (SERS) aims for net zero emissions by 2050, focusing on reducing emissions, transitioning industries, and protecting the economy. With 40 new actions across 14 agencies, significant progress is expected this decade.
+ **Keeping WA Moving** - To provide world-class outcomes for the customer through a safe, reliable and sustainable road transport system
+ **Connecting People and Places Transport Portfolio 2020-21** - This report by the Department of Transport in Western Australia sets the broader Transport agenda for Western Australia and reviews the actions taken to meet objectives.
+ **Western Australian Regional Freight Transport Network Plan** - This plan articulates the Western Australian Government's planning, policy and project priorities to ensure the regional transport network continues to perform effectively over the next two decades.
+ **Western Australian Climate Policy:** A plan to position Western Australia for a prosperous and resilient low-carbon future November 2020.
+ **Perth and Peel@3.5million 2018.** - Key document guiding land use and infrastructure planning as the region's population approaches 3.5 million by 2050.
+ **Western Australian Bicycle Network Plan 2014 – 2031.** - Developed by the Department of Transport to enhance cycling infrastructure and promote cycling as a safe, connected, and convenient mode of transport across Western Australia. Initially released in 2014 and updated in 2017.
+ **Safe Active Streets Program.** - Aims to transform select local streets into safer, more inviting environments for walking, cycling, and driving.
+ **Perth Congestion and Movement Plan (CMP).** - The CMP aims to improve traffic flow across Perth through targeted small-scale investments. This includes expanding the pinch point program and enhancing roadside technology, control systems, and data management to better manage congestion.
+ **Environmental, Social and Governance (ESG) Framework** - The Environmental, Social and Governance (ESG) Framework helps to shape and guide the strategic direction for a Sustainable Transport System to deliver sustainable, integrated, accessible and safe transport solutions to meet current and future needs.

[1] https://www.infrastructure.wa.gov.au/sites/default/files/2021-07/Foundations-for-a-Stronger-Tomorrow-Draft-for-public-comment-web-standard_2.pdf

[2] https://ww2.health.wa.gov.au/climate-health-wa-final-report

[3] National Road Safety Strategy (NRSS) 2021-2030, available at https://www.roadsafety.gov.au/sites/default/files/documents/National-Road-Safety-Strategy-2021-30.pdf

2.2 Challenges

CHALLENGE 1
SAFETY

Road safety is a priority challenge for Western Australians. In regional areas, approximately 65% of WA road fatalities and 35% of serious injuries occur on regional roads. Vision Zero is the central theme of our efforts in the first phase of this Master Plan.

We subscribe to the Safe System Approach which holds the following principles as core:

+ People are fallible.
+ Humans are fragile.
+ Road safety is a shared responsibility.
+ Build a safe and forgiving road system.

ITS contributes to a safe and forgiving road system by providing data about conditions, and allowing the road operator to modify elements such as operating speed in response to new hazards. It also provides us with the option to implement safety programs such as incident awareness and fatigue management / messaging.

CHALLENGE 2
CLIMATE CHANGE

Current predictions indicate that climate change will impact areas of WA in different ways, such as reduced rainfall, more intense weather events, a rise in sea level, and shifts in temperature. Planning and delivery of our future infrastructure must have the capacity and resilience to deal with the challenges of climate change. The need to reduce emissions is also front and centre in dealing with the challenge of climate change. For WA, reducing carbon emissions to reach Net Zero by 2050 while remaining globally competitive, is both a challenge and an opportunity.

The West Australian State Government has also introduced the Climate Change Bill 2023 to Parliament formalising the state's long-term target of net zero emissions by 2050.

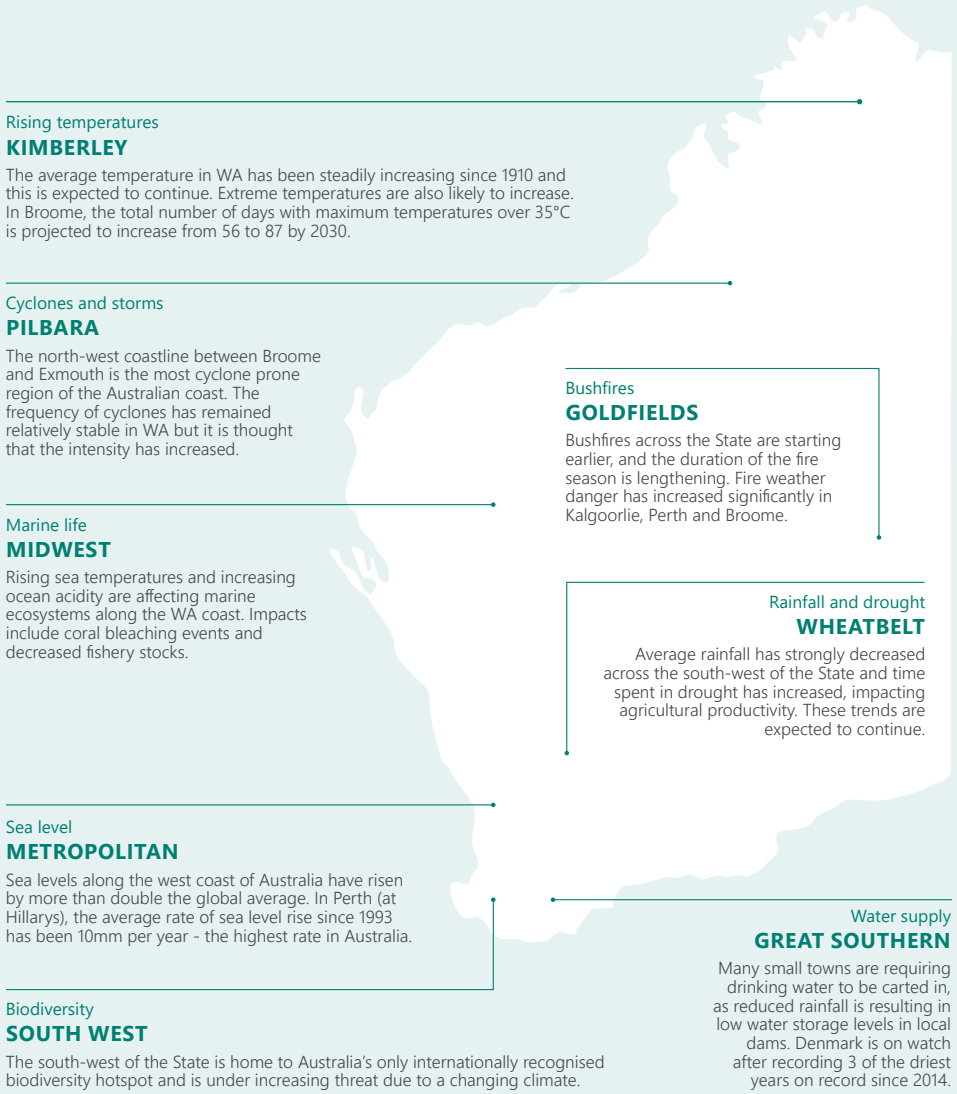


Figure 2.1 *Environmental impacts of climate change in WA.* **Source:** *Climate Health WA Inquiry Final Report*

CHALLENGE 3
FREIGHT

The growth pressures facing Western Australia's regional freight transport network have been addressed in the Western Australian Regional Freight Transport Network Plan. By 2031:

- The volume of regional-based freight movements through the State's port authorities will have increased by 2.5 times 2022's volume.
- Western Australia's regional road freight task will be around 2 times what it was in 2010.
- The rail freight task serviced by the State's rail freight network, managed by Brookfield Rail, will be 2.25 times what it was in 2010.

This growth brings a number of challenges in ensuring that the freight transport network in Western Australia can continue to support the State's immense freight task. Chief amongst these is the challenge of developing infrastructure in a coordinated and timely manner to sustain a high productivity network for freight movement whether it be by rail, truck, shipping or light goods vehicles.

CHALLENGE 4
LIMITED FUNDING

Road, rail and transport infrastructure spending totals $14.3 billion over the four years to 2025 26.[4] Due to the scale of investment, it is critical to adopt an integrated, coordinated approach to optimise long-term public benefit.

Building our way out of an increasing demand for infrastructure is unaffordable and unsustainable. The Western Australian population is forecast to increase 60% by 2042; placing increased pressure on existing infrastructure. This will also generate demand for better use of existing assets and investment in new infrastructure. This increasing demand will compound existing capacity and reliability constraints across the network.

Western Australia also faces a significant challenge in attracting skilled workers, especially in sectors like transport technology and infrastructure. The demand for specialized talent in areas is growing and the state's vast size and remote locations make recruitment difficult. To overcome this, WA needs to invest in education, training, and strategies to attract both local and global talent.

The infrastructure that is built, should be built to last and able to serve a future society, economy and environment which may be quite different from today.

CHALLENGE 5
DIGITAL DISRUPTION

Technology is a disruptive force that will fundamentally shape future transport infrastructure requirements. The potential for automated vehicles and increasing ride-sharing, may dramatically change the efficiency of the transport network and how people prefer to use it. A more flexible approach will be needed to identify adaptable transport solutions which form part of a dynamic and responsive network.

While population growth is a good predictor of future demand, the impact of new technology, fuel, parking costs and changing user preferences are playing an increasing role in altering travel behaviour. Additionally, flexible working arrangements, including working from home, have been accelerated since COVID, and should be considered when forecasting travel demand.

Advances in technology can alter transport supply and demand dynamics whilst optimising the efficiency and use of current infrastructure.

Disruption goes beyond Connected and Automated Vehicles (CAVs); including Electric Vehicles, Drones, Digital Twins and other connected technologies. These disruptions offer opportunities to improve safety, such as the recent on-road C-ITS trials which show a marked reduction in crashes. [5]

Where other trends coincide, such as automated road based Transit systems, the technology could be adopted earlier than expected. For example, the Australian Bureau of Statistics Labour Force statistics indicate that the average age of a truck driver is increasing at a rate of almost six months per year in a shrinking labour market. This trend could become a key driver for adoption of automated vehicles in the trucking industry.

If managed effectively, CAVs and ITS can help to 'flatten' demand and decrease the scale of transport infrastructure investment required to manage excessive congestion. Embracing digital technologies will result in greater agility in the provision of government services by enabling data-informed and quick-response decision-making, and flexible service delivery models.

As transportation relies more on digital technologies, ensuring digital accessibility is essential for all users, including those with disabilities or limited digital literacy. Digital equity must also be prioritised to avoid disadvantaging any community segment without reliable technology access. Furthermore, cybersecurity and data management are crucial to protect the extensive data generated by Connected and Automated Vehicles (CAVs) and maintain user privacy, and comply with regulations.

[4] Infrastructure Projects in Western Australia: June 2022, available at https://www.wa.gov.au/system/files/2022-08/infrastructure-projects-in-western-australia-june2022.pdf.pdf

[5] https://imoveaustralia.com/project/project-outcomes/ipswich-connected-vehicle-pilot/

2.3 Megatrends

While this Master Plan focuses on ITS, we recognise the need for continued collaboration and advancement across a wide range of areas, both across Government and industry.

Figure 2.2 broadly maps the global trends, developments in Connected Automated Shared and Environmentally friendly (CASE) technologies, and the strategic context of future mobility from now through to 2040. This will change based on the levers exercised by government to encourage uptake of new technologies. Megatrends in this discussion relate to the future of mobility and have an impact on a global scale.

These are well understood, internationally recognised trends that must be addressed in local planning in order to mitigate potential issues and optimise benefits. Megatrends have a pervasive scope of influence and they provide an indication of current and future challenges. They can be used to understand and prioritise plans for an uncertain future.

Considering future mobility, three mega trends – **demography, climate and disruptive economic needs and business models** – are likely to have a significant impact through to 2040. Technology and innovation in transport have the potential to influence change on these mega trends.

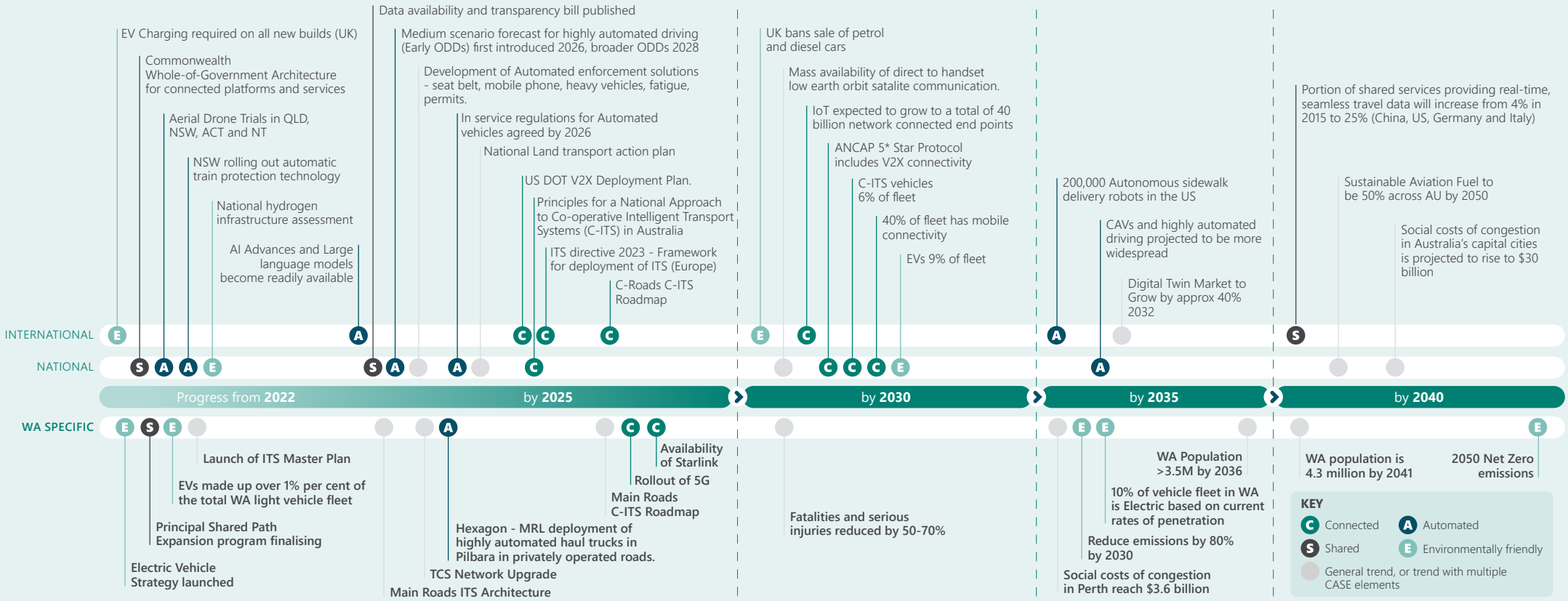


Figure 2.2 *Roadmap of key megatrends and CASE trends through to 2040*

Connected

Digital connectivity underpins daily activities and enables new technologies and services for end-users. This two-way data flow improves our understanding, planning and management of transport systems.

Automated

Automation of human tasks across transport is becoming more achievable, creating safer, more efficient systems and solutions.

Shared

Shared mobility business models and solutions are becoming more prevalent, providing user-focussed transport solutions that create more efficient use of the transport network, often enabled by the connected digital platforms.

Environmentally friendly

More environmentally friendly mobility services and solutions are being deployed with the phasing out of traditionally fuelled vehicles and increasing focus on sustainable practice.

Rapid advancements in the use of technologies in an increasingly connected world is changing the way people and freight move. Coupled with fundamental shifts in customer needs and expectations, this presents road and Transport Authorities with both opportunities and challenges. Connected, Automated, Shared and Environmentally friendly (CASE) technologies form the backbone of future mobility.

The opportunity offered by these technologies are offset by corresponding risks which must be mitigated. For example, implementing "Connected" technology in its present form creates risks due to the need for greater cyber security. To prevent new vulnerabilities being created, new systems and processes must be implemented as a preventative measure.

2.4 Setting a Direction

Our four key areas to create a focus on delivering value are:[6]

+ **Customers**
  Provide a transport network centred on what our customers need and value.
+ **Movement**
  Improve mobility of people and the efficiency of freight.
+ **Sustainability**
  Develop a sustainable transport network that meets social, economic and environmental needs.
+ **Safety**
  Provide improved safety outcomes for all users of the transport network.

These four areas demonstrate our recognition of customer-centric service delivery and have been used to set a clear direction for this ITS Master Plan. This has been ensured by considering how adopting and fostering innovation in transport technology can help achieve these wider objectives.

In concert with the Megatrends being demonstrated globally, it is clear that advancements in mobility technologies offer real opportunities to address some of the key challenges we face. These trends have been assessed in the context of our focus and our ITS Policy.

As new transport technologies and business models seek to integrate with the existing transport system, this Master Plan will help WA take advantage of the benefits of innovation and minimise unintended consequences.

[6] Keeping WA Moving

2.4.1 Alignment with Policy

In the context of disruptive influences and the CASE framework for viewing strategic direction, WA has a forward focused policy landscape. Figure 2.3 provides an insight into how WA's policy horizons are mapped against the national policy landscape.

The influence of the megatrends (Section 2.3) can be seen on the national and state policies, forecasts and targets.

These policies have been considered and aligned against the ITS Focus areas defined in the ITS Policy (refer to Section 4.1).

It is clear that there is sufficient scope to leverage planned national investment in broader CASE technologies to achieve excellent outcomes for Western Australians.

Figure 2.3 also provides an interpretation of the major national levers impacting the policy landscape of this ITS Master Plan with consideration of the changes brought about by Megatrends and population demographics. This representation reflects the best available insights at this point in time, acknowledging that these factors will continue to evolve. To ensure that WA is positioned to maximise the benefits of incoming technology advancements, this ITS Master Plan considers planning for near term investment in ITS technology with a clear understanding of CASE technologies.

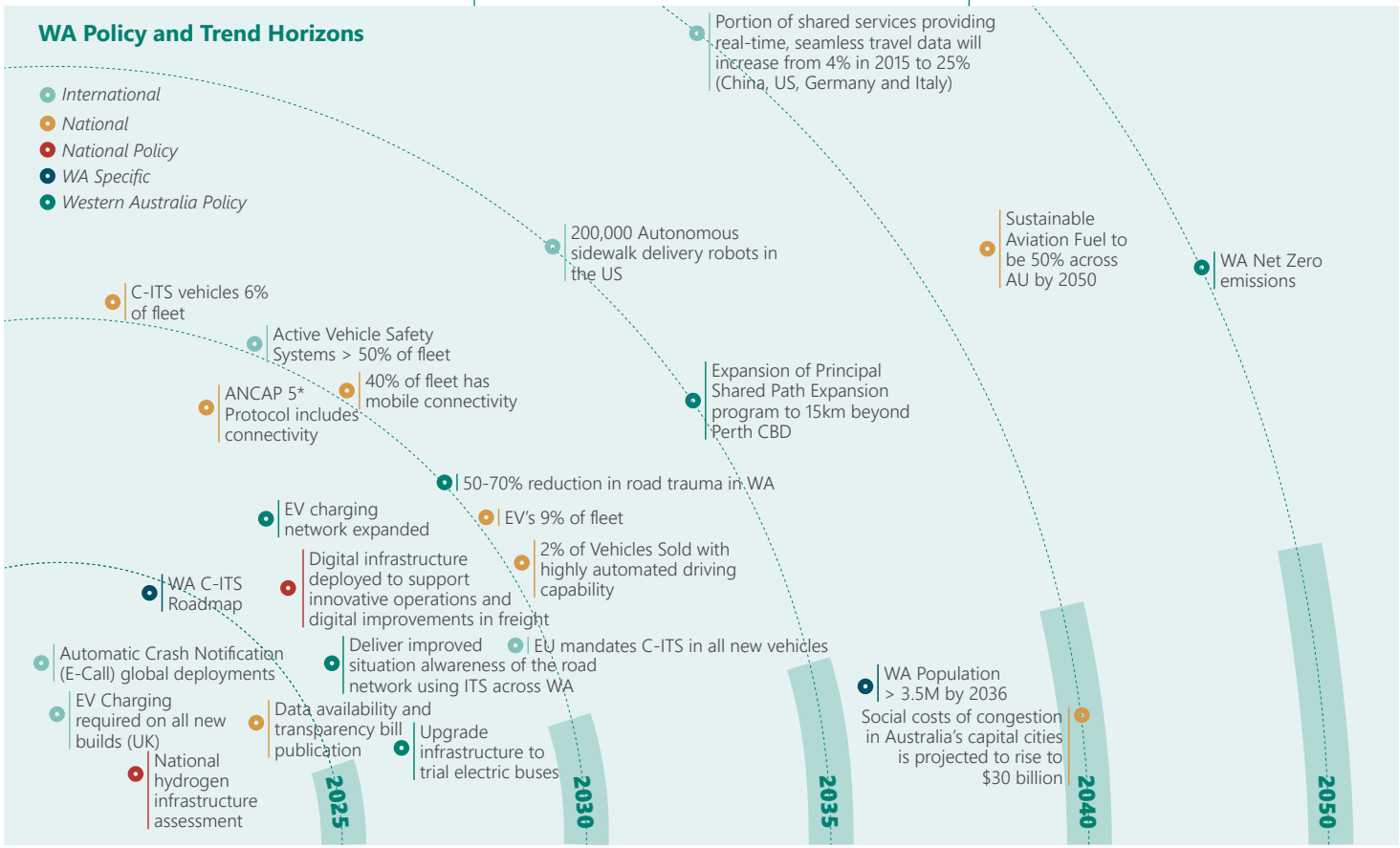


Figure 2.3 *WA Policy and Trend Horizons*

03

Introduction to ITS in WA

03

Introduction to ITS in WA

3.1 What is ITS?

Our ITS Definition presented in Section 1 covers a broad array of techniques and approaches that may be achieved through stand-alone technological applications or through integration of different systems to provide new (or enhancements to) existing transport services.

ITS provide the tools to transform mobility and improve safety – particularly in the context of road network operations.[7] The overall function of ITS is to improve the operation of the entire transport system (often in real-time) for transport network controllers, travellers, freight and other users.[8] Figure 3.1 provides a snap shot and summary of ITS Functions.

ITS cover all modes of transport and considers all elements of the transport system – the vehicle, the infrastructure, and the driver or the user, interacting together dynamically.

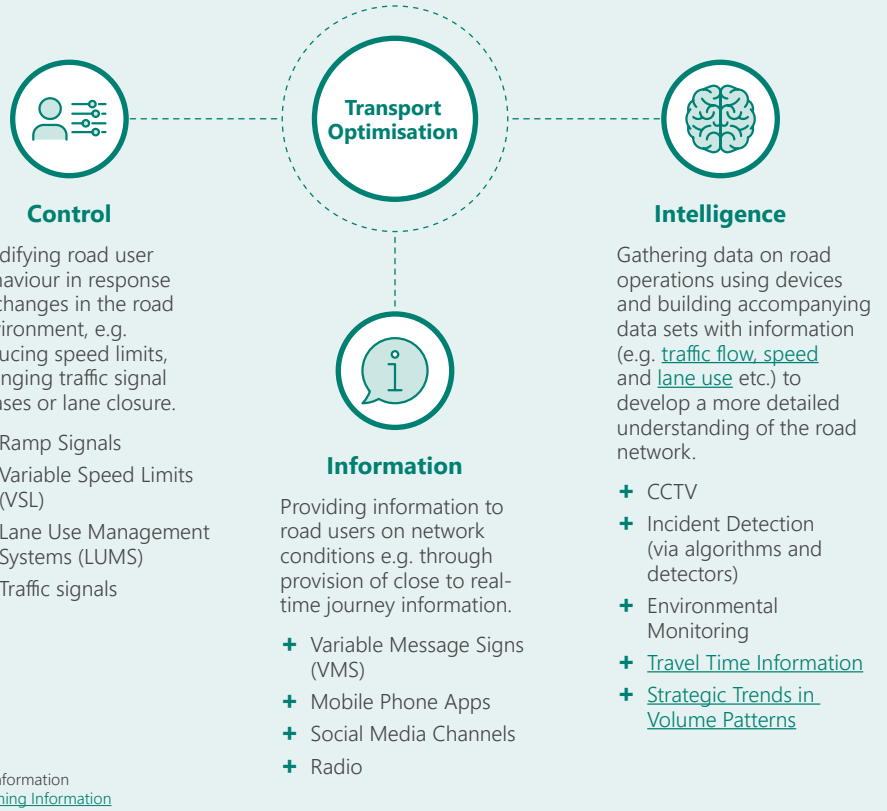


Figure 3.1 *Functions of ITS in Transport*

[7] Main Roads ITS Policy Statement

[8] World Road Association, available at https://rno-its.piarc.org/en/intelligent-transport-systems/what-its

3.2 Our ITS Vision

Our ITS vision statement provides a focal point to assist in aligning our ITS Goals; ensuring everyone is working towards a single purpose.

> “World class mobility for Western Australians across an intelligent, safe, sustainable and optimised network.”

3.3 ITS Policy and Objectives

Our ITS Policy Statement asserts that in developing, operating and maintaining Western Australia’s road network, we and our partners shall consider and utilise current and emerging ITS technologies to enable and enhance safety, efficiency, resilience and positive customer experiences.

Our objectives to ensure delivery of this policy are:

+ **Obj 1:** Improve safety of all road users including road workers.
+ **Obj 2:** To provide quality ITS systems which represent value for money.
+ **Obj 3:** To exploit existing and emerging technologies to future proof the road network and explore advances in mobility.
+ **Obj 4:** To maximise the effectiveness of ITS solutions, ITS requirements will drive the function and implementation of supporting civil infrastructure.
+ **Obj 5:** To enhance real-time information to improve customer travel experience.
+ **Obj 6:** To improve road network resilience and flexibility to meet abrupt change in demand or available capacity due to incidents.
+ **Obj 7:** To enable the efficient movement of people and freight.
+ **Obj 8:** To reduce congestion, emissions and cost of travel.
+ **Obj 9:** To minimise the need for significant infrastructure upgrades and through efficient management and operation of physical assets using ITS.
+ **Obj 10:** To use informed, data-led decision making related to planning, design and operation of our road network assets.

Based on these objectives, this Master Plan focuses on the next five years to enable us to establish an effective program to shape the direction of ITS investment in Western Australia.

This ITS Master Plan will be reviewed every two years.

3.4 Existing ITS Devices on our Road Network

The integrated use of ITS devices and systems improve the operation and safety of the entire transport system with a 750% increase in ITS devices installed on the road network over the last 10 years (refer Figure 3.2). This year-on-year growth in ITS deployments across our network emphasizes the need for skilled expertise to design, manage, and input into future initiatives outlined within this Master Plan.

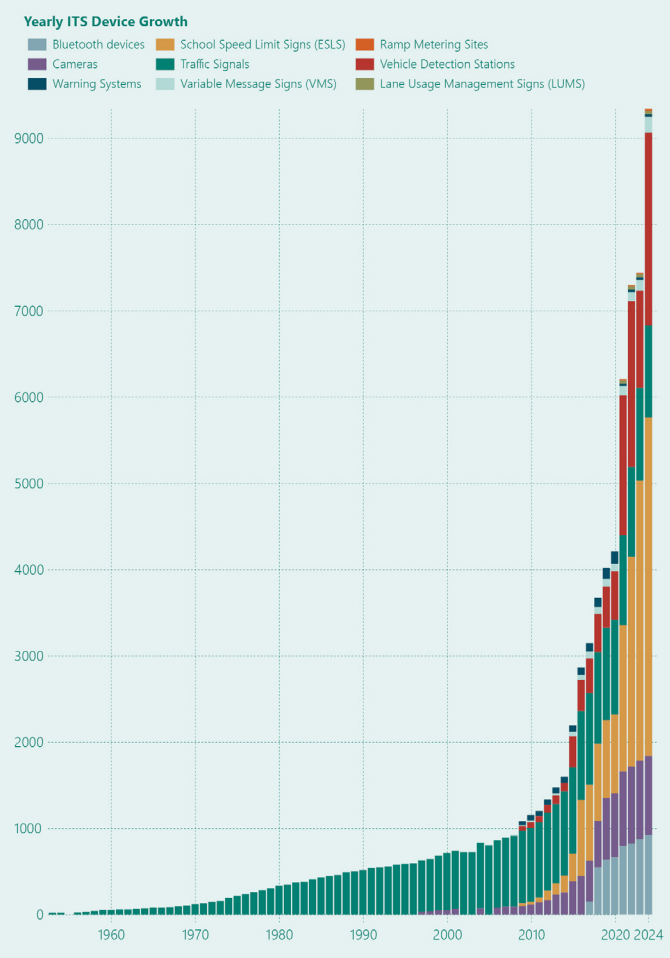


Figure 3.2 *ITS Device Deployment Growth 1960 - 2024*

Figure 3.3 further outlines the type and number of ITS devices deployed. These are the updated figures as of Jan 2025.

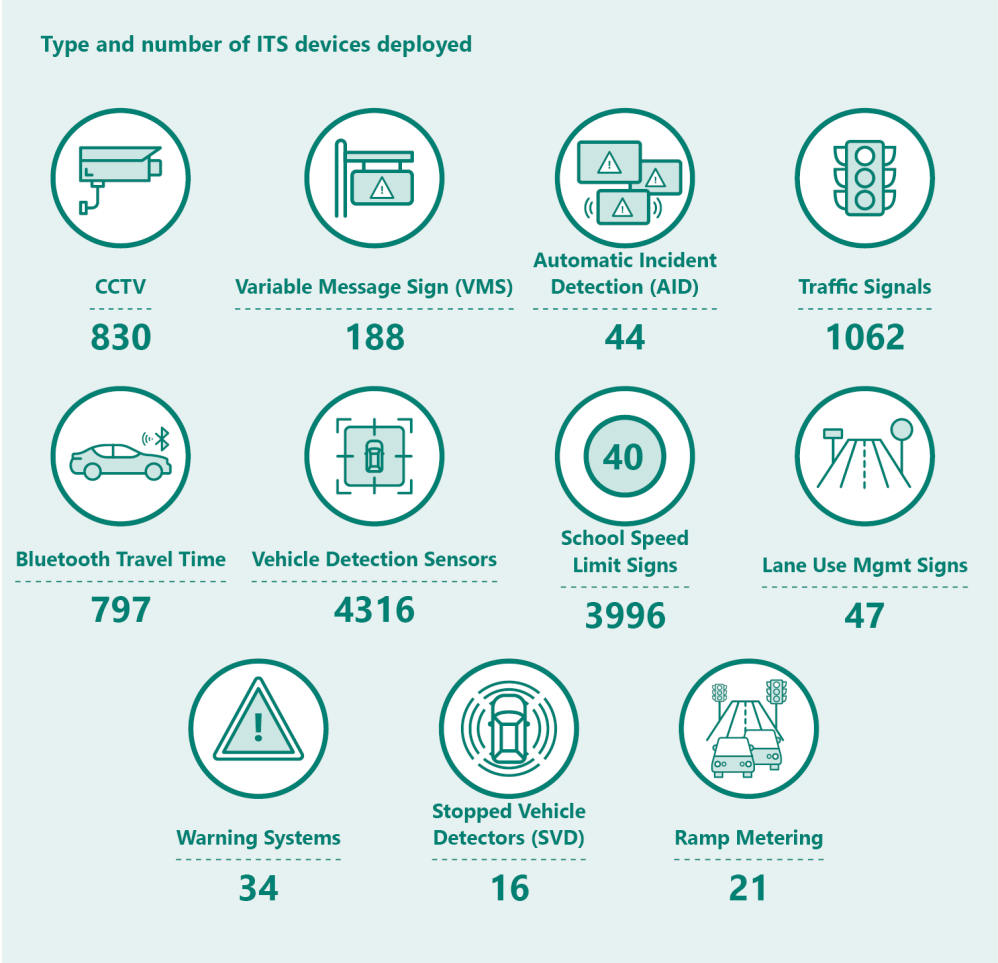


Figure 3.3 *Type and number of ITS devices deployed. Quantities correct as of January 2025*

04

Strategic Goals and Objectives

04

Strategic Goals and Objectives

4.1 ITS Focus Areas

To align with our ITS Vision, strategic focus areas have been established that lead the direction of this ITS Master Plan.

Figure 4.1 shows the alignment between our ITS Vision, the ITS Policy, and the ITS Focus Areas. The ITS Master Plan and Roadmap will contribute to the objectives of the ITS Focus Areas through the initiatives it promotes.

The Focus Areas will act as the foundation for the development and continuous assessment of this ITS Master Plan.

These focus areas help shape program categories or packages, identify relevant projects, and incorporate stakeholder input. They also define the desired outcomes that will guide the development of the future ITS Master Plan portfolio of projects.

Specific ITS Master Plan Objectives have been developed to align to the six ITS Focus Areas. These align with our Guiding Principles and ITS Strategic Recommendations.

Figure 4.1 *Alignment between ITS Focus Areas and ITS Policy and Objectives*

FOCUS AREA

Safety and Vision Zero

Improving safety and security for the whole road network particularly rural and regional areas which have the highest proportion of fatalities in WA.

The Safe System approach involves all elements of the road transport system working together to prevent crashes or reduce the severity of injury; making crashes survivable. In this context security refers to the ability of the system user to trust that the system is acting with integrity. For example, a motorist can confidently proceed assuming conflicting movements of a signalised intersection are **not** going to turn green simultaneously leading to a crash.

DEFINITION

Provision of safe and secure transportation infrastructure to create a safe mobility system. The goal is to increase safety of the community when using the transport system for all users targeting no lives lost by 2050.

STRATEGY ALIGNMENT / DRIVER

- Keeping WA Moving.
- WA Road Safety Commission Driving Change: Road Safety Strategy for Western Australia 2020-30.
- The National Road Safety Strategy (NRSS) 2021-2030.[9]
- Main Roads Western Australia Road Safety Policy.

MAIN ROADS ITS POLICY ALIGNMENT

Obj 1: Improve safety of all road users including road workers.

Obj 2: To provide quality ITS systems which represent value for money.

OBJECTIVES

SV1 Improving safety and security for the whole road network, particularly rural and regional areas which have the highest proportion of fatalities in WA.

SV2 Provision of technology to create a system that outperforms national and international safety benchmarks.

SV3 Utilise ITS to target road user behaviour and improve end user safety.

SV4 Increase collaboration with enforcement agencies and safety advocates.

PROGRAM OUTCOME

Projects contribute to a reduction in:

- People killed on the road network in both Metropolitan and Regional areas by 50 to 70% by 2030.
- People seriously injured on the road network in both Metropolitan and Regional areas by 50% to 70% by 2030.

[9] National Road Safety Strategy (NRSS) 2021-2030, available at https://www.roadsafety.gov.au/sites/default/files/documents/National-Road-Safety-Strategy-2021-30.pdf

FOCUS AREA

Sustainability and Net Zero

Sustainability refers to all areas; transport, human, social, economic and environmental. Increased implementation of transport technologies that provide efficiency benefits. These also have flow on environmental benefits because shorter trips and free flowing traffic increase fuel savings and emission reductions. The provision of ITS to enable mode shift is also a key objective of this focus area. To enable an optimised network, ITS signage and wider information provision should act to support efficient mode choices for travel.

DEFINITION

Sustainable mobility encompasses the mobility needs of current and future generations. It involves *balancing* trip types, and the infrastructure used to facilitate and manage transportation to minimise CO_2 and particulate emissions. Further, we will embed sustainability in all levels of ITS deployment; including consideration of whole of life impacts and maintenance.

STRATEGY ALIGNMENT / DRIVER

- Western Australia Climate Policy.
- Climate Health WA Inquiry Final Report.[10]
- 2021 Australian Infrastructure plan.
- Sectoral emmission reduction strategy for Western Australia 2023.
- Environmental, Social and Governance (ESG) Framework.

MAIN ROADS ITS POLICY ALIGNMENT

Obj 7: To enable efficient movement of people and freight.

Obj 8: To reduce congestion, emissions and cost of travel.

Obj 9: To minimise the need for significant infrastructure upgrades and through efficient management and operation of physical assets using ITS.

Obj 10: To use informed, data-led decision making related to planning, design and operation of Main Roads network assets.

OBJECTIVES

SN1 Net zero emissions by 2050.

SN2 Encouraging greater uptake of low and zero emission vehicles, shared mobility and active travel options by creating an enabling ecosystem and deploying supportive technology.

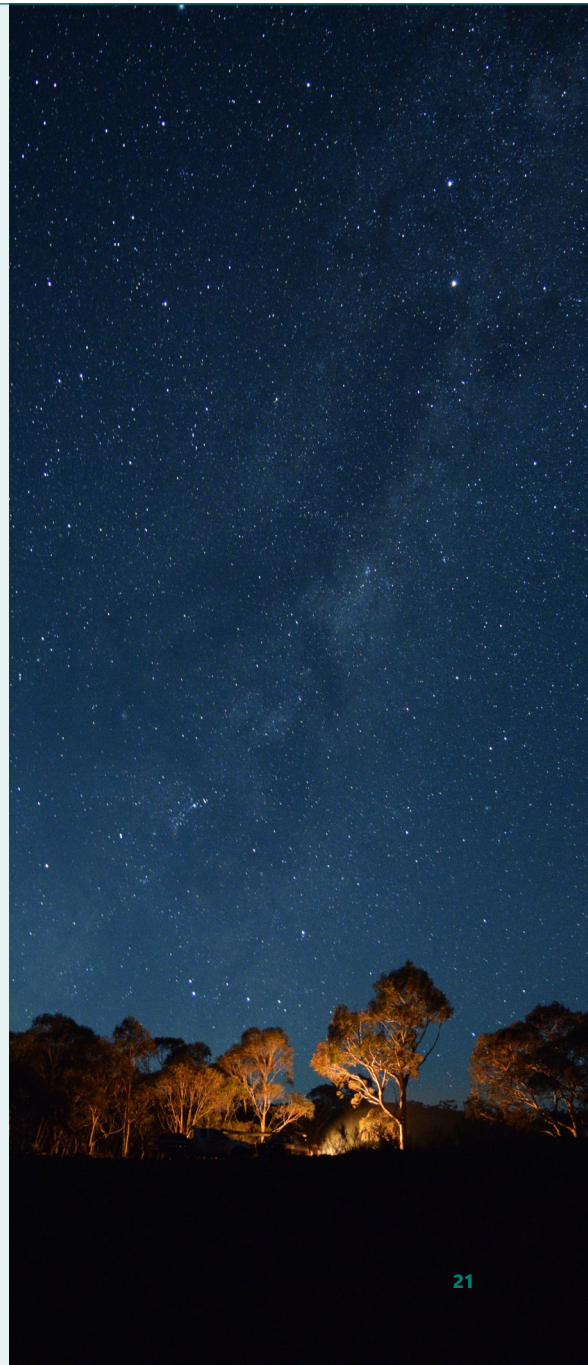
SN3 Improve transportation related environmental reporting.

SN4 Support alternative fuelled vehicle usage.

SN5 Reduce vehicle emissions through reduced congestion.

PROGRAM OUTCOME

- Projects contribute to a reduction in Road-based Transportation related emissions.
- Accurate Environmental reporting related to Net Zero emissions.
- Sustainable Principles are applied in ITS Design and Delivery.
- Sustainability KPIs are included where relevant during project development stage.



[10] ww2.health.wa.gov.au/climate-health-wa-final-report

FOCUS AREA

Regional Resilience

Improving situational awareness of the road network through ITS and enabling greater capability in the ITS discipline in regional areas.

DEFINITION

Improvements in regional resilience through fostering regional capability in:

- Standardised deployment of ITS that is fit for purpose.
- Using ITS as a solution/toolkit to address issues particular to rural areas within a regional context.

As more ITS is deployed, consistent implementation, operations and maintenance will become critical to the success of these deployments.

STRATEGY ALIGNMENT / DRIVER

- State Planning Strategy 2050.
- State Infrastructure Strategy.
- Western Australia Regional Freight Transport Plan.
- Keeping WA moving.

MAIN ROADS ITS POLICY ALIGNMENT

Obj 3: To exploit existing and emerging technologies to future proof the road network and explore advances in mobility.

Obj 4: To maximise the effectiveness of ITS solutions, ITS requirements will drive the function and implementation of supporting civil infrastructure.

Obj 5: To enhance real-time information to improve customer travel experience.

OBJECTIVES

RR1 Target ITS deployments based on needs.

RR2 Enhance regional accessibility to transportation services via ITS.

RR3 Reduction in delays to close a road, or delays to drivers via quicker execution / messaging of road closure.

RR4 Reduction in delays to open a road, and reduction in economic cost to the community as a result of road closure.

PROGRAM OUTCOME

- A standard ITS architecture is deployed throughout Western Australia.
- Each ITS project gives due consideration to operational and maintenance requirements.
- Regional expertise in ITS is improved.

FOCUS AREA

Moving People

Increasing the range of travel options available to users of the road network.

DEFINITION

Application of innovation and technologies to enable intelligent, integrated travel solutions for the safer, efficient and more sustainable movement of people.

STRATEGY ALIGNMENT / DRIVER

- Connecting People and Places Transport Portfolio 2020-21.
- Perth and Peel @ 3.5 million frameworks.
- Infrastructure Western Australia State Infrastructure Strategy.
- Keeping WA moving.

MAIN ROADS ITS POLICY ALIGNMENT

Obj 4: To maximise the effectiveness of ITS solutions, ITS requirements will drive the function and implementation of supporting civil infrastructure.

Obj 5: To enhance real-time information to improve customer travel experience.

Obj 6: To improve road network resilience and flexibility to meet abrupt change in demand or available capacity due to incidents.

OBJECTIVES

MP1 To have a cost efficient, convenient and reliable commuter network as an essential part of personal mobility.

MP2 Use ITS to improve throughput on new and existing roadways.

MP3 Improve consistency of transportation services by using ITS to reduce delay and provide certainty to users.

MP4 Providing accurate, real-time transportation information to end users.

MP5 Utilise ITS to make multi-modal trips a smooth and easy experience.

PROGRAM OUTCOME

- Reduced travel times.
- Improved network reliability.
- Provide a consistent road user experience (measured through customer surveys).
- Increased uptake of active modes and public transport.

FOCUS AREA

Moving Goods

Improving the ability to understand freight performance, and to link the benefits of emerging technologies to improve outcomes in this sector.

DEFINITION

Application of innovation and technologies to enable intelligent, integrated travel solutions for safer, efficient and more sustainable movement of goods.

STRATEGY ALIGNMENT / DRIVER

- Infrastructure Australia Audit 2019.[11]
- Connecting People and Places Transport Portfolio 2019-20.
- Western Australia Regional Freight Transport Plan.

MAIN ROADS ITS POLICY ALIGNMENT

Obj 4: To maximise the effectiveness of ITS solutions, ITS requirements will drive the function and implementation of supporting civil infrastructure.

Obj 5: To enhance real-time information to improve customer travel experience.

Obj 6: To improve road network resilience and flexibility to meet abrupt change in demand or available capacity due to incidents.

OBJECTIVES

MG1 Improved network reliability.

MG2 Optimisation of freight movement and longer-term consideration of CAVs, as well as data and mobile applications to allow drivers to make better decisions.

MG3 Implement freight management systems to facilitate the movement of goods.

PROGRAM OUTCOME

- Reduced Travel Times.
- Improved network reliability.
- Provide a consistent road user experience (measured through customer surveys).

[11] https://www.infrastructureaustralia.gov.au/australian-infrastructure-audit-2019-transport

FOCUS AREA

Future Vehicle Technology

Aligning with national and international standards to drive the benefits arising from the adoption of emerging technologies in a considered manner as "close followers" rather than early adopters. By optimising control via signal and longer-term consideration of CAVs, as well as data and mobile applications, we wish to facilitate better decisions both by users (drivers etc.) and operations staff.

DEFINITION

CAVs in tandem with micro and e-mobility elements are forming part of the future mobility technology framework. We will enable the operation of future mobility technologies on WA transport infrastructure.

STRATEGY ALIGNMENT / DRIVER

- Guidelines For Trials of Automated Vehicles in Australia 2023.[12]
- Main Roads process for Automated and Non-Conforming Vehicles.
- C-ITS Roadmap.
- The regulatory framework for automated vehicles in Australia 2022.

MAIN ROADS ITS POLICY ALIGNMENT

Obj 3: To exploit existing and emerging technologies to future proof the road network and explore advances in mobility.

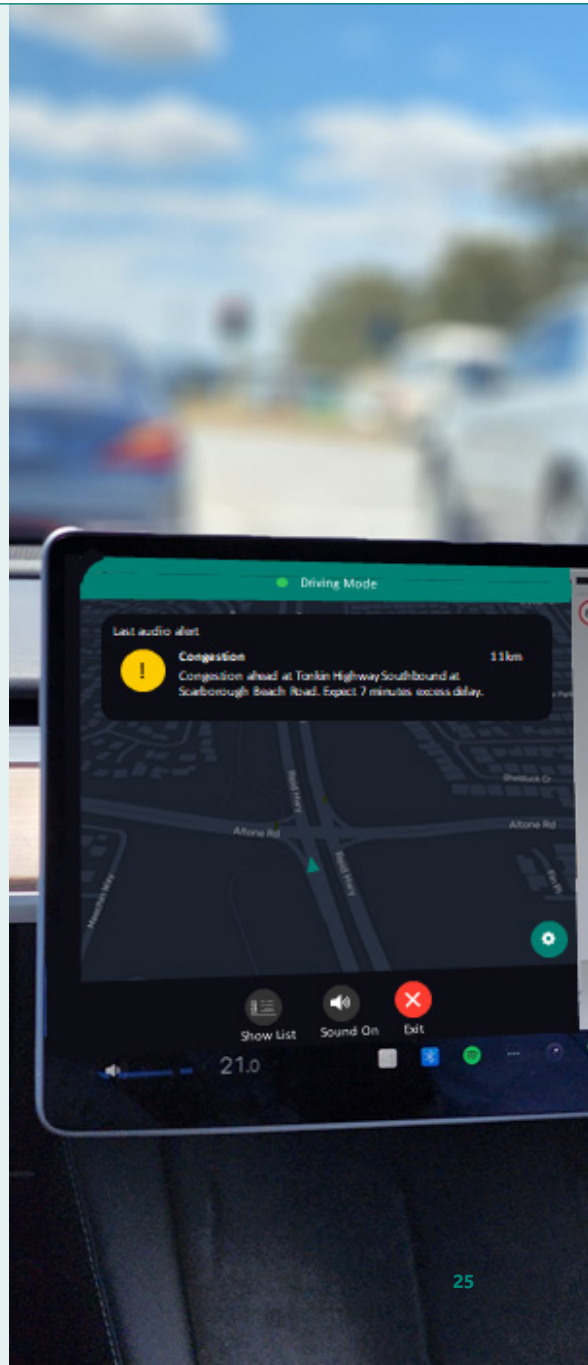
Obj 4: To maximise the effectiveness of ITS solutions, ITS requirements will drive the function and implementation of supporting civil infrastructure.

OBJECTIVES

FVT1 Trial, understand and implement emerging technologies.

PROGRAM OUTCOME

- Increased number of trials of new technologies.
- Increased number of new pre-approved ITS devices for use in WA.



[12] https://www.ntc.gov.au/sites/default/files/assets/files/Guidelines%20for%20trials%20of%20automated%20vehicles%20in%20Australia%202023.pdf

4.2 Objectives Linked to Keeping WA Moving

Keeping WA Moving is our strategic direction; it underpins everything that we do. It defines our aspiration: *To provide world class outcomes for the customer through a safe, reliable and sustainable road-based transport system.* Our guiding principles and areas of focus are Customers, Movement, Sustainability, Safety and Capability. These areas underpin what we do and help us concentrate on delivering what is important. Table 4.1 looks at the alignment between the ITS Master Plan Focus Area Objectives and our areas of focus.

ITS MASTER PLAN OBJECTIVES		MAIN ROADS' AREAS OF FOCUS				
		CUSTOMERS Provide a transport network centred on what our customers need and value	MOVEMENT Improve mobility of people and the efficiency of freight	SUSTAINABILITY Develop a sustainable transport network that meets social, economic and environmental needs	SAFETY Provide improved safety outcomes for all users of the transport network	CAPABILITY Develop our people and industry to create a mentally healthy, skilled and inclusive sector
SV1	Improve safety and security for the whole road network particularly rural and regional areas which have the highest proportion of fatalities in WA	✓			✓	
SV2	Provide technology to create a system that outperforms national and international safety benchmarks	✓			✓	✓
SV3	Utilise ITS to influence road user behaviour and improve end user safety	✓		✓	✓	
SV4	Increase collaboration with enforcement agencies and safety advocates				✓	✓
SN1	Net Zero emissions by 2050			✓		
SN2	Encourage greater uptake of low and zero emission vehicles, shared mobility and active travel options by creating an enabling ecosystem and deploying supportive technology	✓	✓	✓		
SN3	Improve transportation related environmental reporting			✓		
SN4	Support alternative fuelled vehicle usage	✓	✓	✓		
SN5	Reduce vehicle emissions through reduced congestion		✓	✓		

Table 4.1 *Alignment between ITS Master Plan Objectives and Main Roads' Guiding Principles*

ITS MASTER PLAN OBJECTIVES		MAIN ROADS' AREAS OF FOCUS				
		CUSTOMERS Provide a transport network centred on what our customers need and value	MOVEMENT Improve mobility of people and the efficiency of freight	SUSTAINABILITY Develop a sustainable transport network that meets social, economic and environmental needs	SAFETY Provide improved safety outcomes for all users of the transport network	CAPABILITY Develop our people and industry to create a mentally healthy, skilled and inclusive sector
RR1	Target ITS deployments based on needs	✓		✓		
RR2	Enhance regional accessibility to transportation services via ITS	✓	✓			✓
RR3	Reduce delays to close a road, or delays to drivers via quicker execution / messaging of road closure		✓		✓	
RR4	Reduce delays to open a road, and reduction in economic cost to the community as a result of road closure	✓		✓		
MP1	To have a cost efficient, convenient and reliable commuter network as an essential part of personal mobility	✓	✓	✓		
MP2	Use ITS to improve throughput on existing roadways		✓	✓		
MP3	Improve consistency of transportation services by using ITS to reduce delay and provide certainty to users	✓	✓			
MP4	Provide accurate, real-time transportation information to end users	✓	✓			✓
MP5	Utilise ITS to make multi-modalism a smooth and easy experience	✓	✓	✓		
MG1	Improve network reliability	✓	✓			✓
MG2	Optimise network operations to support efficient freight movement and improve real-time travel information and data for future freight vehicles.	✓	✓		✓	✓
MG3	Implement freight management systems to facilitate the movement of goods	✓	✓			
FVT1	Trial, understand and implement emerging technologies	✓	✓	✓	✓	✓

Table 4.1 *Alignment between ITS Master Plan Objectives and Main Roads' Guiding Principles (continued)*

4.3 Objectives Linked to ITS Policy

Our ITS Policy which reinforces our commitment to increase the adoption of ITS solutions into our existing and future transport infrastructure assets and operations. The ITS Policy supports the successful implementation of technology to deliver our vision of world class mobility for Western Australians across a smart, safe, reliable, sustainable, optimised, and resilient road network. Table 4.2 looks at the alignment between the ITS Master Plan Focus Area Objectives and ITS Policy Objectives.

		ITS POLICY OBJECTIVES								
ITS MASTER PLAN OBJECTIVES		Maximise safe mobility for our customers and road workers	Improve the efficient and reliable movement of people and freight, and reduce travel delays	Optimise real-time management of the network and provide improved traveller information	Enable and improve data-driven decision making in planning, development, delivery, operation and maintenance of the road network	Improve regional resilience contributing to the state's economic prosperity	Support the delivery of sustainable transport outcomes and value for money in the implementation of road-based transport projects	Improve the sustainable management and operation of existing main roads assets through targeted, fit-for-purpose implementations	Support the roll out of connected and automated vehicles in Western Australia	Meet new and evolving expectations of our customers
SV1	Improve safety and security for the whole road network particularly rural and regional areas which have the highest proportion of fatalities in WA	✓				✓				
SV2	Provide technology to create a system that outperforms national and international safety benchmarks	✓			✓					✓
SV3	Utilise ITS to influence road user behaviour and improve end user safety	✓		✓						
SV4	Increase collaboration with enforcement agencies and safety advocates				✓					
SN1	Net Zero emissions by 2050							✓		✓
SN2	Encourage greater uptake of low and zero emission vehicles, shared mobility and active travel options by creating an enabling ecosystem and deploying supportive technology						✓	✓	✓	✓
SN3	Improve transportation related environmental reporting				✓					
SN4	Support alternative fuelled vehicle usage								✓	✓
SN5	Reduce vehicle emissions through reduced congestion		✓							✓

Table 4.2 *Alignment between ITS Master Plan and ITS Policy Objectives*

ITS MASTER PLAN OBJECTIVES		ITS POLICY OBJECTIVES								
		Maximise safe mobility for our customers and road workers	Improve the efficient and reliable movement of people and freight, and reduce travel delays	Optimise real-time management of the network and provide improved traveller information	Enable and improve data-driven decision making in planning, development, delivery, operation and maintenance of the road network	Improve regional resilience contributing to the state's economic prosperity	Support the delivery of sustainable transport outcomes and value for money in the implementation of road-based transport projects	Improve the sustainable management and operation of existing main roads assets through targeted, fit-for-purpose implementations	Support the roll out of connected and automated vehicles in Western Australia	Meet new and evolving expectations of our customers
RR1	Target ITS deployments based on needs	✓			✓	✓				✓
RR2	Enhance regional accessibility to transportation services via ITS				✓	✓				
RR3	Reduce delays to close a road, or delays to drivers via quicker execution / messaging of road closure		✓	✓	✓	✓		✓		✓
RR4	Reduce delays to open a road, and reduction in economic cost to the community as a result of road closure	✓	✓		✓		✓	✓		
MP1	To have a cost efficient, convenient and reliable commuter network as an essential part of personal mobility		✓	✓				✓		
MP2	Use ITS to improve throughput on existing roadways		✓		✓	✓		✓		
MP3	Improve consistency of transportation services by using ITS to reduce delay and provide certainty to users				✓			✓		✓
MP4	Provide accurate, real-time transportation information to end users			✓	✓					
MP5	Utilise ITS to make multi-modalism a smooth and easy experience		✓	✓						✓
MG1	Improve network reliability		✓		✓	✓				
MG2	Optimise control via signal and longer-term consideration of CAVs, as well as data and mobile applications to allow drivers to make better decisions								✓	
MG3	Implement freight management systems to facilitate the movement of goods		✓	✓		✓				
FVT1	Trial, understand and implement emerging technologies								✓	

Table 4.2 *Alignment between ITS Master Plan and ITS Policy Objectives (continued)*

4.4 Objectives Linked to Department of Transport Strategic Priorities

ITS MASTER PLAN OBJECTIVES		DEPARTMENT OF TRANSPORT STRATEGIC PRIORITIES[13]		
		Community Centric Services	Sustainable transport solutions	Capable and future-ready organisation
SV1	Improve safety and security for the whole road network particularly rural and regional areas which have the highest proportion of fatalities in WA	✓		
SV2	Provide technology to create a system that outperforms national and international safety benchmarks	✓		
SV3	Utilise ITS to influence road user behaviour and improve end user safety	✓		
SV4	Increase collaboration with enforcement agencies and safety advocates	✓		
SN1	Net Zero emissions by 2050		✓	
SN2	Encourage greater uptake of low and zero emission vehicles, shared mobility and active travel options by creating an enabling ecosystem and deploying supportive technology	✓	✓	
SN3	Improve transportation related environmental reporting			✓
SN4	Support alternative fuelled vehicle usage		✓	
SN5	Reduce vehicle emissions through reduced congestion	✓	✓	

Table 4.3 *Alignment between ITS Master Plan Objectives and Department of Transport Strategic Priorities*

[13] Strategic Intent 2023 - 2025, available at https://www.transport.wa.gov.au/mediaFiles/about-us/ABOUT_P_Strategic_Intent_2023_25.pdf#:~:text=Our%2Strategic%20Intent%202023%20-%202025%20is%20built,increased%20mobility%20and%20evolving%20community%20needs%20and%20expectations

ITS MASTER PLAN OBJECTIVES		DEPARTMENT OF TRANSPORT STRATEGIC PRIORITIES[13]		
		Community Centric Services	Sustainable transport solutions	Capable and future-ready organisation
RR1	Target ITS deployments based on needs	✓	✓	✓
RR2	Enhance regional accessibility to transportation services via ITS	✓	✓	
RR3	Reduce delays to close a road, or delays to drivers via quicker execution / messaging of road closure	✓		
RR4	Reduce delays to open a road, and reduction in economic cost to the community as a result of road closure	✓		✓
MP1	To have a cost efficient, convenient and reliable commuter network as an essential part of personal mobility	✓	✓	
MP2	Use ITS to improve throughput on existing roadways	✓		✓
MP3	Improve consistency of transportation services by using ITS to reduce delay and provide certainty to users	✓		✓
MP4	Provide accurate, real-time transportation information to end users	✓	✓	✓
MP5	Utilise ITS to make multi-modalism a smooth and easy experience	✓	✓	
MG1	Improve network reliability	✓		
MG2	Optimise control via signal and longer-term consideration of CAVs, as well as data and mobile applications to allow drivers to make better decisions	✓	✓	
MG3	Implement freight management systems to facilitate the movement of goods	✓		
FVT1	Trial, understand and implement emerging technologies	✓	✓	✓

Table 4.3 *Alignment between ITS Master Plan Objectives and Department of Transport Strategic Priorities (continued)*

[13] Strategic Intent 2023 - 2025, available at https://www.transport.wa.gov.au/mediaFiles/about-us/ABOUT_P_Strategic_Intent_2023_25.pdf#:~:text=Our%20Strategic%20Intent%202023%20-%202025%20is%20built,increased%20mobility%20and%20evolving%20community%20needs%20and%20expectations

05

ITS Master Plan Roadmap

05

ITS Master Plan Roadmap

The ITS Master Plan has defined the six major Focus Areas that will continue to move Western Australia towards the future of connected mobility and ensure integration of the entire transport network.

Our Roadmap for ITS Initiatives, key projects and programs is presented in Figure 5.1. The Roadmap is based on a number of relationships and dependencies, and as such is subject to change and will be reviewed and updated every two years.

The ITS Master Plan Roadmap is a strategic plan for ITS initiatives and will ensure we meet our overall ITS Vision. It is not intended to be a fully itemised, prioritised and costed document; instead providing strategic guidance in response to the emerging challenges of society and technology trends inherent in industry.

The Roadmap provides a strategic plan for coordinated investment in needs-based infrastructure deployment as well as the delivery of enabling services. The Roadmap includes actions that will work together to deliver 'whole-of system' benefits. The recommended actions and projects also capture the capabilities required to build a robust ITS data collection network.

Availability and access to ITS data is a major enabler for Future Vehicle Technology initiatives. It facilitates improvements in sustainability reporting and management, and provides monitoring and enhanced safety functionality on the road network. These initiatives will look to serve all within Western Australia through better information gathering and distribution.

The Roadmap will be used as a guide to understand what types of technology implementations need to occur while aligning the implementations to contribute to WA State policies and targets.

The Roadmap shows the dependencies that may exist between efforts. The timeline depicts a period from current day through to 2030, and captures important milestones such as:

+ Smart Work Zone Safety adoption.
+ Increasing safety on the regional road network.
+ Increasing sustainability using "Green ITS" deployments.
+ Further implementation of Smart Freeways.
+ Key enablers for First and Last Mile Public Transport initiatives.
+ Freight performance strategies and Freight Vehicle Prioritisation.
+ Modal Priority at traffic signals.
+ Traffic Signal improvements.
+ Cooperative ITS strategies and implementation of C-ITS initiatives on the road network to ensure Automated and Connected vehicle interaction.

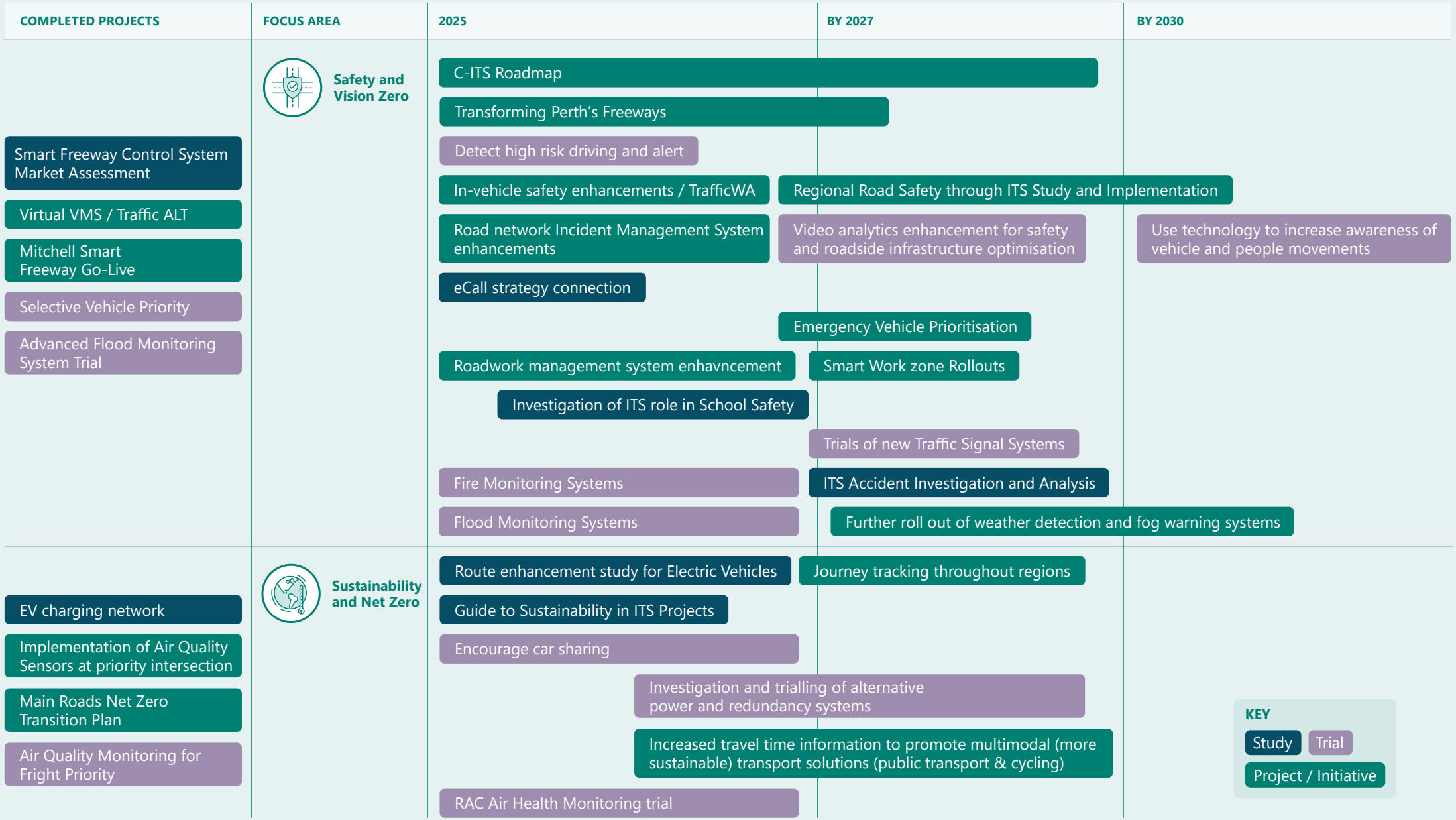


Figure 5.1 *ITS Master Plan Roadmap*

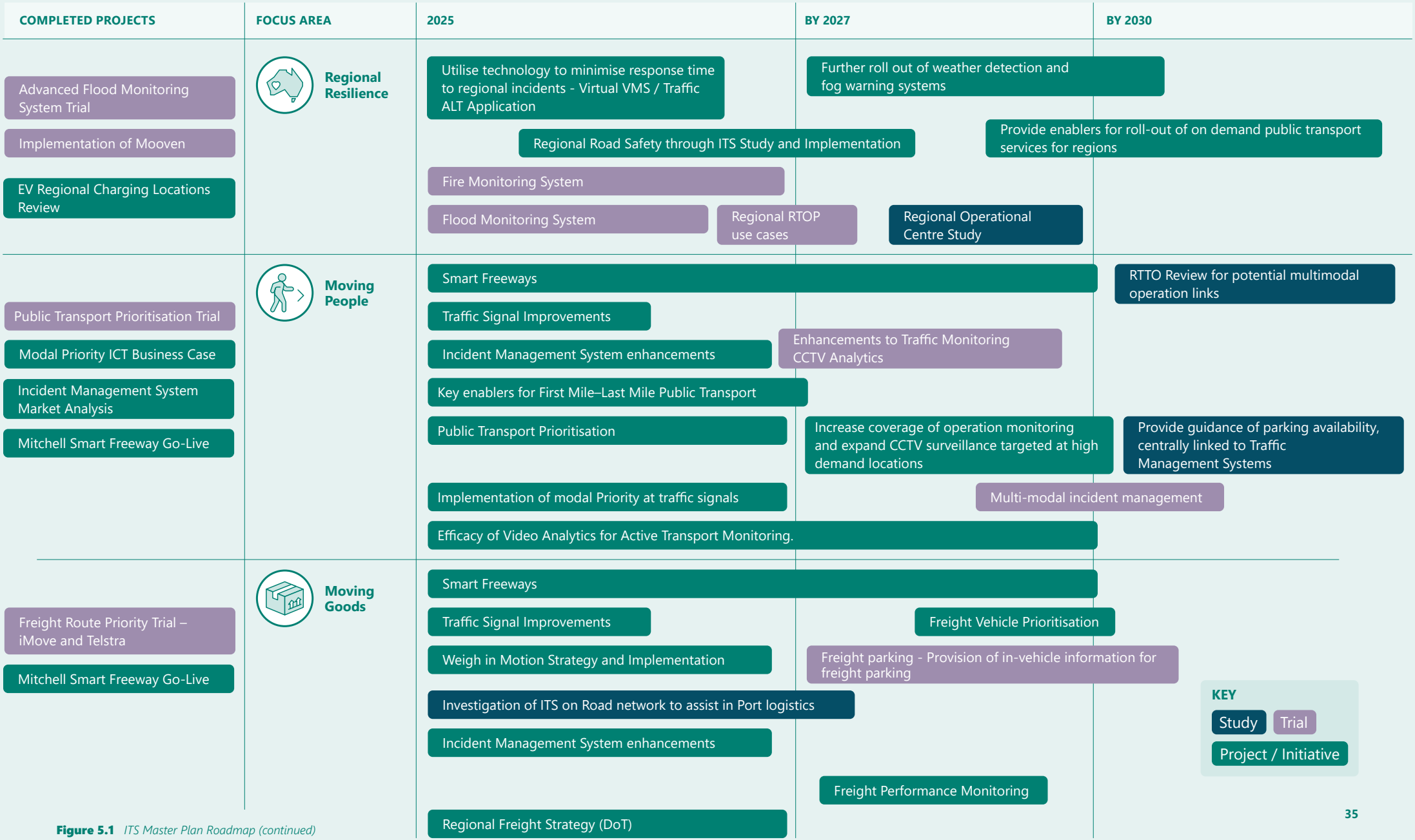


Figure 5.1 *ITS Master Plan Roadmap (continued)*

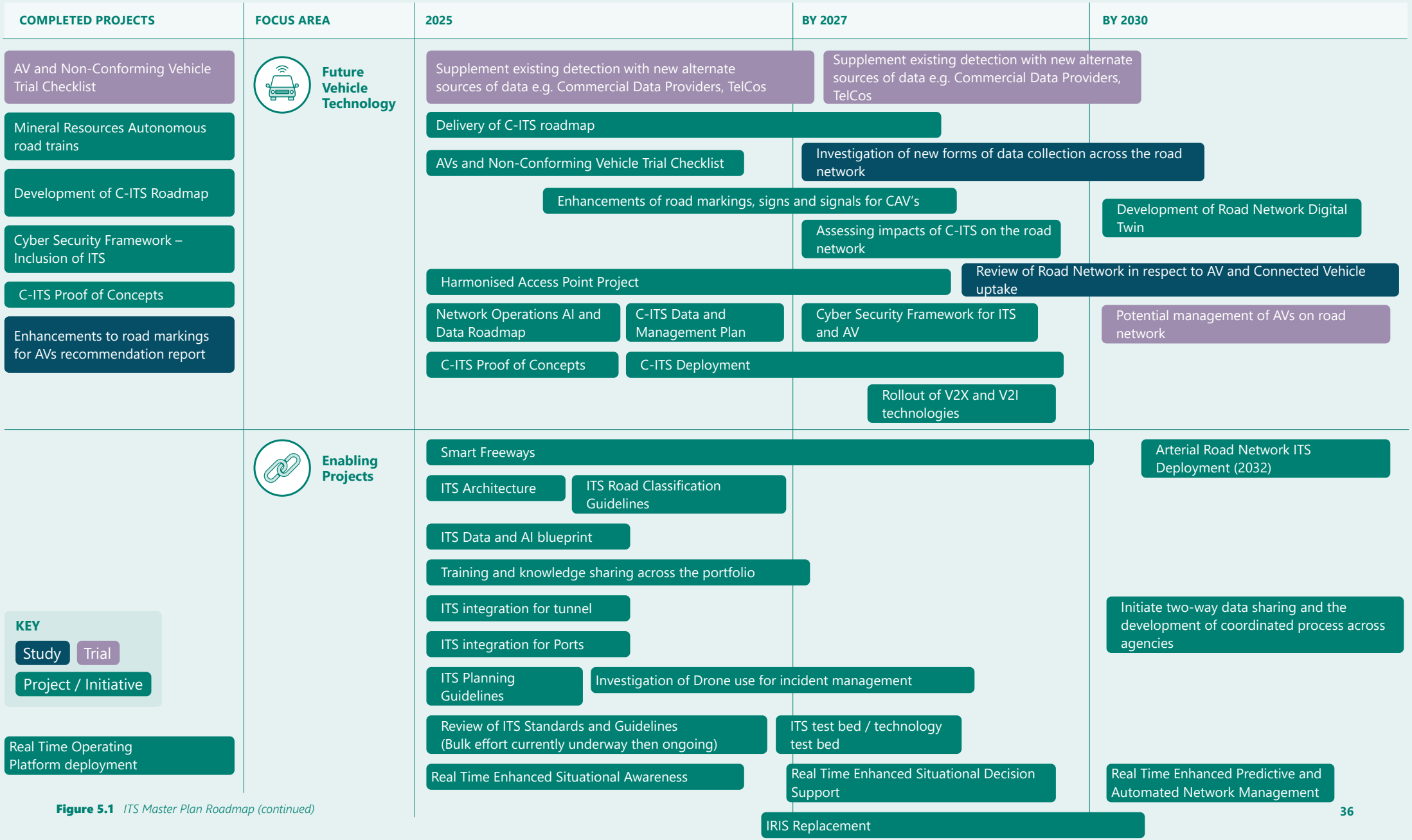


Figure 5.1 *ITS Master Plan Roadmap (continued)*

06

How we will deliver the ITS Master Plan

06

How we will deliver the ITS Master Plan

This document provides our strategic direction for delivery of ITS throughout Western Australia.

The realisation of the ITS Master Plan will be via endorsement and commitment across the organisation. Resources and budgetary commitments will be required to deliver projects, which will contribute and/or achieve the specific capabilities detailed in this Master Plan.

The ITS Master Plan Roadmap outlined in Section 5 is a strategic plan for ITS initiatives and is instrumental in delivering our overall ITS Vision.

Yearly projects will be identified aligning to the ITS Roadmap, as will actions and the directorates responsible to achieve the Plan. The ITS Master Plan is intended to be a living document and will be formally reviewed every 2 years on an ongoing basis, and updated every five years to reflect the changes in industry.

The year-on-year growth in ITS deployments on our road network emphasises the need for a standardised process that enables safe, effective, and consistent implementation of ITS which is fit for purpose and based on the needs of our customers and community. To address this need, implementation will be guided by the ITS Planning, Development, and Implementation (PDI) Framework.

The ITS PDI Framework aligns with our project lifecycle known as RO&DS – Recognising Opportunities & Delivering Solutions, and provides a common language across our organisation to understand the appropriate activities, roles, documents, and decisions for ITS Projects.

Like RO&DS, the ITS PDI Framework contains the various project phases and identifies the inputs, outputs, and tools utilised as part of the project management and controls in each phase. The ITS Master Plan will be the input for the Assess and Select phases to identify the needs, opportunities, options, goals and benefits when determining the right projects to go into Development.

Funding of projects and initiatives outlined in this ITS Master Plan will align with our existing budgetary processes.

07

How we will monitor progress of the ITS Master Plan

07

How we will monitor progress of the ITS Master Plan

With such an ambitious vision and a commitment to elevate ITS implementation across Western Australia, we will be monitoring and evaluating programs and projects to ensure our customers experience the benefits of improved safety, economic and environmental enhancements.

Since 2022, significant progress has been made, reflecting a strong commitment to realising this vision for customers and road users.

As outlined in Section 6, the ITS Project Delivery and Implementation (PDI) Framework describes the process for delivery of ITS projects. This will ensure that best practice and alignment with the ITS Master Plan is embedded in the delivery process. High level targets and measures will be identified for each ITS Master Plan Project in the initial phases. These targets will align and contribute to the objectives and outcomes detailed in the ITS Master Plan Areas of Focus. The achievement of the projects to the Areas of Focus objectives will be the measure of success for the ITS Master Plan.

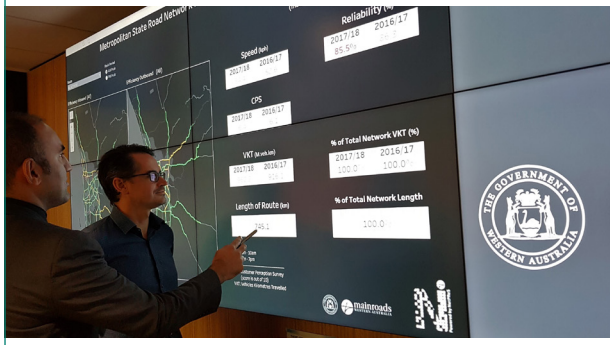
Primary governance of the ITS Master Plan will be via our ITS Master Plan Steering Committee. The committee will typically meet quarterly although this can be adjusted. The Steering Committee will review the status of the targets and objectives set in the ITS Master Plan projects as Key Performance Indicators (KPIs). KPIs linked to ITS projects must also align with the QMWG and the work being undertaken in that area. Any significant issues with achieving the targets and objectives will be escalated to the Main Roads Corporate Executive.

Based on the experience with recent ITS projects, we expect strong results with the delivery, uptake, and usage of projects. However, we are prepared to be agile to any changes that might be needed to achieve success. This approach keeps customer outcomes at the centre of our work.

We will also share our progress with customers, communities, and our partners through quarterly external stakeholder meetings and by publishing progress updates on our website.

Completed projects to date showcasing the realised benefits of the ITS Master Plan:

+ Smart Freeway Control System Market Assessment.
+ Selective Vehicle Priority Trial.
+ EV charging network Study.
+ Autonomous Haul Trucks – Mineral Resources Ltd.
+ Development of C-ITS Roadmap.
+ C-ITS Proof of Concepts.
+ Real Time Operating Platform deployment.
+ Implementation of Mooven Trial.
+ EV Regional Charging Locations Review.
+ Public Transport Prioritisation Trial.
+ Freight Route Priority Trial – MTData and Telstra.
+ Advanced Flood Monitoring System Trial.
+ Modal Priority ICT Business Case.
+ Incident Management System Market Analysis.
+ Smart Freeway Control System Market Analysis.
+ AV and Non-Conforming Vehicle Trial Checklist.
+ Enhancements to road markings for AVs recommendation report.
+ Cyber Security Framework - inclusion of ITS.
+ TrafficALT Virtual VMS project.
+ Emergency Vehicle Prioritisation trial.
+ Smart Freeway Mitchell Southbound Go Live.
+ Main Roads Net-Zero Transition Plan (which includes ITS).
+ Air Quality Monitoring for 10 most congested intersections.
+ Trial of Air Quality Monitoring to Support Freight Priority at 10 Signalised Intersections.



08

ITS Master Plan Stakeholders

08

ITS Master Plan Stakeholders

The various external stakeholders who have assisted in the creation of this ITS Master Plan are presented in Figure 8.1. These stakeholders will continue to play a part in the achievement of its Vision, Focus Areas, Objectives and Roadmap.

Figure 8.1 *ITS Master Plan Stakeholders*

Abbreviations

ANCAP	Australasian New Car Assessment Program
C-ITS	Cooperative Intelligent Transport Systems
CAVs	Connected and Automated Vehicles
DENM	Decentralised Environment Notification Message
ITS	Intelligent Transport Systems
ODD	Operational Design Domain –describes the specific operating domain(s) in which an automated function or system is designed to properly operate, including but not limited to roadway types, speed range, environmental conditions (weather, daytime/night time, etc.), and other domain constraints.
V2I	Vehicle to Infrastructure
V2V	Vehicle to Vehicle
V2X	Vehicle to Everything
VRU	Vulnerable Road Users

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