



Made in Victoria for Victoria

Victorian Rolling Stock Strategy



▼ Standard gauge VLocity train operating on the North East Line.



Table of contents

MINISTER'S FOREWORD	4
ABOUT THIS STRATEGY	5
Victoria leading the way	5
Reshaping our city	5
Record investment in local supply chains	6
Investing in recovery	6
Working with industry	7
STRATEGIC FOCUS AREAS	8
Accessible	10
Case study: Accessibility solutions	11
Environmentally sustainable	12
Case study: Zero-emission buses	13
Future focused	14
Locally built	15
Case study: Hofmann Engineering	17
Innovative	17
NEW AND IMPROVED TRAINS, TRAMS AND BUSES	18
Metropolitan trains	19
Regional trains	22
Case study: McConnell Seats	23
Trams	24
Buses	26
TRAIN AND TRAM FLEETS	28
STABLING, DEPOTS AND MAINTENANCE	30
TOWARDS 2030: OUR ROLLING STOCK FUTURE	32

Minister's foreword



As part of the \$90 billion Big Build we are transforming Victoria's public transport system and supporting local jobs through a pipeline of hundreds of new locally built trains, trams and buses.

Made in Victoria for Victoria - Victorian Rolling Stock Strategy reaffirms the Andrews Labor Government's ongoing commitment to Victoria's advanced rolling stock manufacturing industry and the up to 10,000 jobs associated with it.

In 2015 we promised to reduce the peaks and troughs in business activity through an ongoing pipeline of rolling stock orders and a commitment to a minimum of 50 per cent local content.

We have delivered on this through an \$8 billion pipeline for 119 new metropolitan trains, 59 new regional trains, 150 trams, and over 1,400 buses. We are exceeding our commitments on local content with all new train, tram and bus orders now meeting a requirement for 60 per cent local content.

This has strengthened the local industry supply chain, boosted local business investment and promoted workforce development. It's brought about a change in the culture of how we think about our manufacturing capability.

Industry needs certainty to be able to continue to invest with confidence. That is why over the coming decade we will build on our rolling stock pipeline as further Big Build projects are delivered. We will also pursue a strategic approach to renewing and replacing our existing rolling stock to cater for our growing population, improve accessibility and reduce transport's carbon footprint.

Businesses that participate in our rolling stock development will become partners in Victoria's commitment to net zero emissions by 2050. Technologies like more efficient power systems, regenerative braking and on-board batteries are all exciting new features that I look forward to seeing on locally produced trains, trams and buses.

Over the coming decade Victoria will continue to lead the way as the one place in Australia where trains, trams and buses are all built, providing significant opportunities for Victorian businesses and workers to participate in our advanced rolling stock manufacturing industry.

The Hon Ben Carroll MP
Minister for Public Transport
Minister for Roads and Road Safety

About this strategy

This strategy outlines the future direction of rolling stock for the Victorian transport network, giving guidance to community, industry and investors.

This strategy supports the Victorian Government's commitments to:

- invest in new and improved trains, trams and buses across our transport network
- support population growth and meet demand on the transport network
- support the needs and opportunities of Big Build projects
- support the Victorian rolling stock industry through jobs and local production
- create accessible train, tram and bus fleets
- adapt to meet climate change goals and net zero emissions by 2050.

Victoria leading the way

The Victorian Government is investing in the biggest infrastructure pipeline in our state's history, which has created 165,000 new local jobs since 2014. We're transforming our state and strengthening our economy with investments across transport, health,

technology, education, and advanced manufacturing, making Victoria one of the world's premier destinations for growth and innovation.

With over \$90 billion committed for transport infrastructure and rolling stock manufacturing and upgrades over the next 10 years, Victoria is the perfect place for businesses to invest for the long term.

Building infrastructure for the future is a critical part of Victoria's economic recovery. City-shaping Big Build projects like the Metro Tunnel, level crossing removals, Melbourne Airport Rail, and North East Link are not just transport investments; they will change how Victorians live, work and play.

To keep the world's largest tram network servicing our growing city, we're investing in new infrastructure and progressing tram line and stop upgrades. We're also upgrading every regional rail line and building new freeways, bypasses and bridges to improve how people travel across Victoria.

These projects will create new communities and commercial precincts, helping to grow our city, and provide jobs and infrastructure for the future.

Reshaping our city



Suburban Rail Loop is the biggest infrastructure investment in Victorian history.

The new 90-kilometre rail line will enhance access to key employment, health, education and retail centres, transforming our public transport system.

This project will deliver enormous economic, social and environmental benefits over many decades for all Victorians.

SRL East from Cheltenham to Box Hill will be running by 2035 with a new dedicated fleet of high-tech trains. As a standalone line, trains will be purpose-built to provide a 'turn-up-and-go' service without being constrained by the requirements of Melbourne's existing train network.

SRL will deliver a long pipeline of construction jobs and help train the next generation of skilled Victorian workers with up to 24,000 jobs supported across the life of the project.

Works on SRL East will get underway in 2022, creating up to 8,000 direct local jobs during construction.

The Suburban Rail Loop Authority is currently working with industry to maximise local content provision for SRL rolling stock, in line with existing Victorian Government policy.

Record investment in local supply chains

Since 2015, we've invested more than \$8 billion in over 300 new trains, trams and supporting infrastructure, and \$180 million on more than 1,400 buses in order to meet passenger needs, improve accessibility and create thousands of jobs for Victorians.

Through 2020 and 2021, we announced over \$3 billion in investments to deliver more rolling stock and supporting infrastructure. This includes modern, accessible trams and trains on our busiest lines, allowing us to optimise our transformational infrastructure projects across the state.

Our investment in the rolling stock industry means we can provide manufacturers with a pipeline of work, significantly contributing to the Victorian economy and positioning us as the home of rolling stock manufacturing in Australia.

The rolling stock industry supports up to 10,000 local jobs across the supply chain, backed by our wide-reaching policy requiring minimum local content for building trains, trams and buses.

Our rolling stock orders and commitment to local content, under the Victorian Local Jobs First policy, supports an innovative and sustainable rolling stock industry and complements the huge investment in our network across the state.



Since 2015, we've committed to the delivery of:

Metropolitan trains



25 X'Trapolis 2.0 trains
(six-carriage trains)

70 High Capacity Metro Trains
(seven-carriage trains)

24 X'Trapolis trains
(six-carriage trains)

Regional trains



59 VLocity trains
(three-carriage trains)

Trams



100 Next Generation Trams

50 E-Class trams

Buses



1400+ Buses

Upgrades



to our longest serving trains and trams.

Investing in recovery

Victoria's transport system is critical to the economic and social recovery of our state from the COVID-19 pandemic.

COVID-19 has fundamentally shifted the way we travel and move freight across our state. We've kept services moving and adapted to meet changing travel patterns and customer needs.

In the short term, supporting recovery means providing safe, efficient and reliable transport. Longer term, our investment pipeline means industry has the confidence to keep the supply chain thriving in times of global uncertainty.

Through 2020 and 2021,
we announced over
\$3 billion in investments to
deliver more rolling stock and
supporting infrastructure

Working with industry

The Victorian Government is working to build an adaptable, highly skilled and diverse workforce by providing pathways for education, real-world experience, and opportunities for upskilling and reskilling new and existing workers. We are looking to attract new talent into the industry, while supporting the many skilled workers already delivering crucial projects across the state.

Our manufacturing businesses are already world-standard, complemented by a highly skilled workforce and strong research and development institutes.

We're fostering local technical skills by incorporating more modern features and technologies into our new trains and trams.

Whether it's new energy systems, accessibility features or safety technologies, we want the knowledge, skills and jobs to be here in Victoria.

Local component suppliers, including family-owned-and-run businesses in metropolitan Melbourne and regional Victoria, have created jobs for workers in industries in decline, such as the automotive industry.

The Victorian Government is dedicated to frequent engagement with local suppliers. Opportunities for Victorian apprentices, trainees, cadets, and workers from disadvantaged backgrounds form a key pillar of our ongoing success in manufacturing rolling stock.

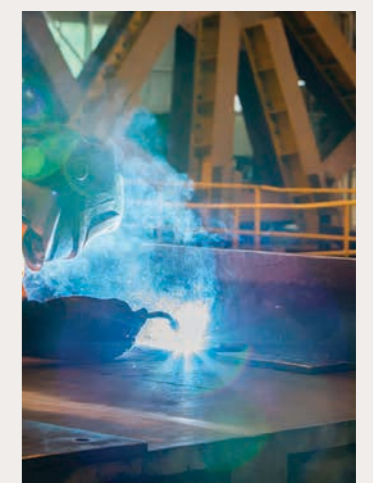
A voice for industry

With record investment across infrastructure and rolling stock, the rail sector is faced with significant challenges and opportunities.

The Rail Industry Development Advisory Committee (RIDAC) was established in 2020 to improve engagement and collaboration between government, industry and the education sectors. It brings together rail industry stakeholders, unions, transport operators, peak industry groups and government agencies to provide advice on long-term planning and initiatives to strengthen the rail manufacturing sector.

RIDAC is chaired by the Victorian Rail Advocate, who plays a key role in championing rail initiatives with the support of government and industry.

The committee provides expert advice to the Victorian Government on training, jobs, innovation, research and development, and ensures we are achieving the best outcomes for community through consultation across the sector.



Strategic focus areas

This section outlines our strategic focus areas over the coming years as we strengthen our rolling stock industry and transport network to meet the needs of all Victorians.

Getting where we need to be

The Victorian Government is looking to innovate and improve our transport fleet to meet changing demands. As a growing population, climate change, urban mobility and technology shift the way we live, work and play, it is vital that we reflect those changes in how people and goods move around our state.

The Victorian Government will work closely with the rolling stock industry to improve our transport network, making gains with our current orders and future pipeline opportunities. We want industry ideas, expertise, and skills to not only meet the transport needs of our state now and in the future, but to ensure the ongoing, long-term success of our industry.



Improving our network requires a holistic approach from government and industry

Accessible



When it comes to new trains, trams and buses, accessibility is not negotiable.

We're continually looking for ways to make our fleets more accessible for all Victorians.

Equitable access to public transport is a right, and we are working with the accessibility community and industry to ensure our future fleet meets this standard.

Environmentally sustainable



The Victorian Government has committed to achieve net zero emissions by 2050. This will require substantial reductions in transport sector emissions.

We're committed to minimising the impact of transport on the environment by pursuing low-energy and zero-emissions solutions.

We want our suppliers to provide cleaner, greener transport solutions to help us reach our goal of a carbon neutral future.

Future focused



Demand for transport services will grow over the coming decades.

We need our transport fleet across trains, trams and buses to meet that demand.

Designing and building new rolling stock takes time. We'll continue to invest in our fleet and supporting infrastructure to meet the changing needs of our cities and regions, while gradually retiring older assets.

Locally built



Victoria's world-class rolling stock industry is leading the way in Australia.

We will continue to invest in the skills and education of our local industry, ensuring jobs and opportunities for the sector.

Our local content requirements provide certainty to industry, encouraging local businesses to invest in the skills required to build and maintain our future fleet.

Innovative



We're always looking to improve what we do and will continue to innovate to meet future challenges.

Embracing new technology in manufacturing and data, creating local, national and international partnerships, and working closely with industry will ensure we can anticipate and accommodate change and progress.



Accessible

Our new trains, trams and buses will be accessible to all users.

The *Accessible Public Transport in Victoria Action Plan 2020–2024* identifies opportunities to improve the whole-of-journey experience for people with a disability.

When we're ordering new rolling stock, accessibility is not negotiable. We are working closely with suppliers to find innovative solutions to existing accessibility challenges posed by a complex transport network and an ageing fleet.

We will continue working with accessibility representatives, passenger groups and technical stakeholders to inform designs and deliver transport solutions that respond to the needs of all Victorians.

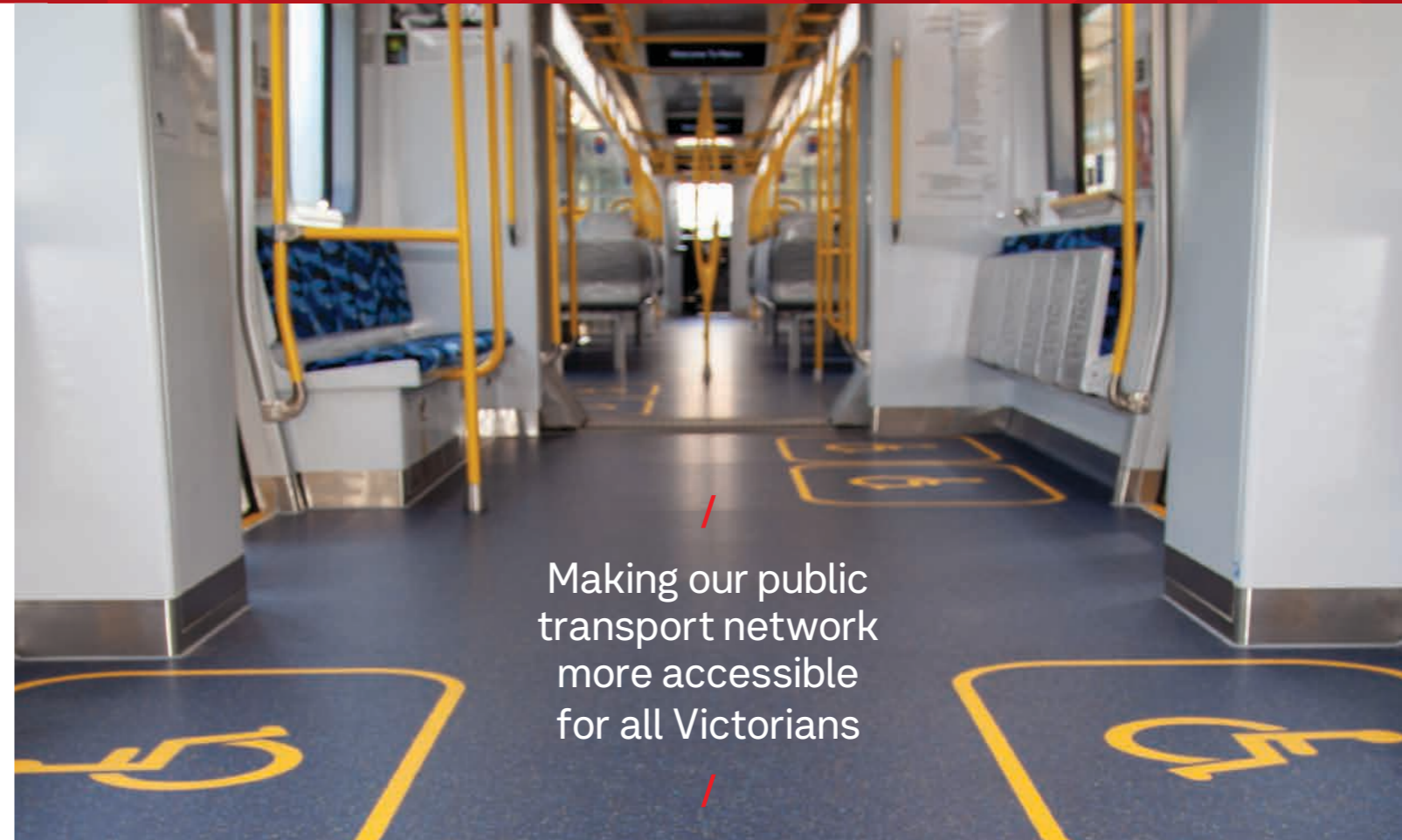
We have improved accessibility outcomes for passengers with disabilities across our network and continue to invest in solutions to provide an equitable, modern network.

We are always looking to innovate with our suppliers to provide a better, more inclusive transport experience for commuters. Through wide-reaching community consultation and by listening to accessible transport advocates, our new rolling stock orders provide better mobility access aids that complement our ongoing investment in an improved accessible network. This includes hearing loops, information displays, improved accessibility ramps, wider and safer doors, and better handholds.

Accessible rolling stock complements improvements to built infrastructure being delivered through the Big Build. Since 2015, we have built and upgraded 36 accessible train stations, and delivered 79 accessible tram stops. We're working to improve accessibility at bus stops across the network, with more than 400 accessible bus stops built in 2021 alone.

Regionally, upgrades to the Warrnambool and Shepparton lines by the Victorian and Australian governments will enable accessible VLocity trains to run on them for the first time.

These are all vital steps in the gradual replacement of our ageing fleet and move us towards our goal of making our transport network equitable and accessible.



Making our public transport network more accessible for all Victorians



Case study: Accessibility solutions

Accessibility is a central focus of Victoria's ongoing strategy for rolling stock. All new train, tram and bus designs prioritise accessibility, ensuring we provide equitable access for all commuters and align with our wider accessible transport goals.

We're improving the accessibility of Melbourne's tram network by building accessible tram stops and matching them with newer, more accessible trams.

Design works on the Next Generation Trams and X'Trapolis 2.0 will involve extensive consultation with mobility and accessibility advocates and passenger representatives to make sure they meet community expectations for modern, accessible trains and trams.



This follows extensive work done for the High Capacity Metro Trains Project. Community feedback allowed us to design a modern train that boasts industry standard access features, including:

- 14 allocated spaces at accessible boarding doors
- fixed semi-automatic boarding ramp for primary boarding
- secondary portable boarding ramp
- passenger intercom in each allocated space for two-way communication with the driver
- dynamic route maps and passenger information displays with audio and visual about the journey and the next stop
- multi-use spaces in the middle three carriages for people travelling with prams or bicycles
- hearing aid loop coverage throughout the train.

Our Next Generation Trams will provide modern accessibility features and will enable the retirement of older high-floor trams, making our public transport network more accessible for all Victorians.



Environmentally sustainable

The Andrews Labor Government has legislated a commitment to reach net zero greenhouse gas emissions by 2050. Our transport rolling stock industry will play an important role in this transition.

The transport sector accounts for approximately 25 per cent of our total state emissions and is growing at the fastest rate of all sectors.

Our commitment to reducing emissions and adapting to climate change sits across legislation, policies and strategies, including the *Climate Change Act (2017)* (Vic), which legislates our commitment to reach net zero greenhouse gas emissions by 2050. Victoria's *Climate Change Strategy* and the Transport Sector Pledge contain industry-specific targets, which guide our policies.

We are working towards an environmentally sustainable transport network, including reducing or offsetting carbon emissions, using more recycled materials to support a circular economy, and enacting policies that prioritise the reduction of harm to human health and the environment.

By 2025, our metropolitan train network will be offset by 100 per cent renewables. We've already fitted 16 metropolitan train stations with solar panels, avoiding 375 tonnes of carbon emissions each year.

Our over 500-strong tram network is 100 per cent offset by the Solar Trams program, under which the Victorian Government matches electricity consumption by purchasing roughly 82,000 MWh in large-scale generation certificates each year from Bannerton Solar Park near Robinvale and Numurkah Solar Farm near Shepparton.

Since 2019, we've offset over 200,000 tonnes of carbon emissions – or around 80,000 tonnes of emissions every year – while also delivering hundreds of jobs and boosting our state-wide energy network.

We've pledged that all new public transport bus purchases will be zero-emission buses from 2025. A \$20 million trial will inform the transition to a 100 per cent zero-emission bus network, as we continue working with our industry partners and developing policies to achieve our emissions reduction commitments.

Melbourne's metropolitan trains and trams will be offset by 100% renewable energy by 2025



Sustainability pillars



Electricity

Supporting the electrical network to transition to renewable forms of energy



Fuel

Researching alternative fuels like hydrogen, battery-electric and clean biofuels



Energy efficiency

Improving security of supply, reducing energy costs and increasing service delivery



Storage and reuse

Storing and reusing energy through reversible substations, regenerative braking and on-board energy storage



Materials

Encouraging recycled or low emissions materials in all rolling stock procurement

Case study: Zero-emission buses

In 2021, Melbourne-based bus operator Kinetic was awarded a \$2.3 billion contract through the Metropolitan Bus Franchise up to June 2031 to kickstart the state's move towards net zero emissions.

This contract will see Kinetic introduce 36 fully electric buses to the network by mid-2025, with 341 of the fleet's 537 buses to be replaced with low- or zero-emission vehicles over the term of the franchise. Five electric buses will be added to Melbourne's fleet by June 2022.

These buses will be made at Volgren's Dandenong South facility, supporting local business and jobs, with minimum 60 per cent local content on all electric and hybrid buses, and a minimum 90 per cent local content on operations.

The introduction of these buses to our fleet will provide valuable insight alongside the three-year trial of zero-emission buses, beginning in 2022. The trial encourages industry collaboration and innovation as we transition to a sustainable bus fleet.

Initially, five Victorian bus operators will trial 41 zero emission buses across the state as part of the trial, with tens of thousands of people travelling on at least 78 quieter, smoother and fume-free electric buses each week across the state by mid-2025.

We are also creating Victoria's first fully electric bus depot by converting the existing Ivanhoe bus depot.

Industry participants will test operational aspects of various zero-emission vehicle technologies across the bus networks in Melbourne and regional Victoria.

The trials will answer critical questions, including depot charging needs and capacity, infrastructure and energy network requirements, environmental outcomes, customer expectations, and commercial arrangements.

The \$20 million investment in the Zero Emissions Bus Trial will create and support Victorian jobs, improve the skills of the local workforce, and increase demand for local materials.



The \$20 million investment in the Zero Emissions Bus Trial will create and support Victorian jobs



Future focused

Victoria's population will continue to grow – expanding the economy, requiring more jobs and homes, and increasing demand on the transport network.

People are moving beyond the CBD to live and work, producing growth in neighbourhoods, precincts and the regions.

Major investment in infrastructure needs to be supported by investment in modern and accessible trains, trams and buses to achieve the best network outcomes for passengers.

As we look to further retire Victoria's longest serving rolling stock – including more than 50 Comeng trains, 150 high floor trams and 25 regional trains – we will need to continue to refresh our train and tram fleets. This need will increase as the network evolves and passenger demand grows.

We're working to create a 'turn-up-and-go' network that is intuitive, accessible, and user-focused. We're also strengthening transport connections between towns and suburbs, regional centres and the city to support growth and prosperity across regional and metropolitan Victoria.

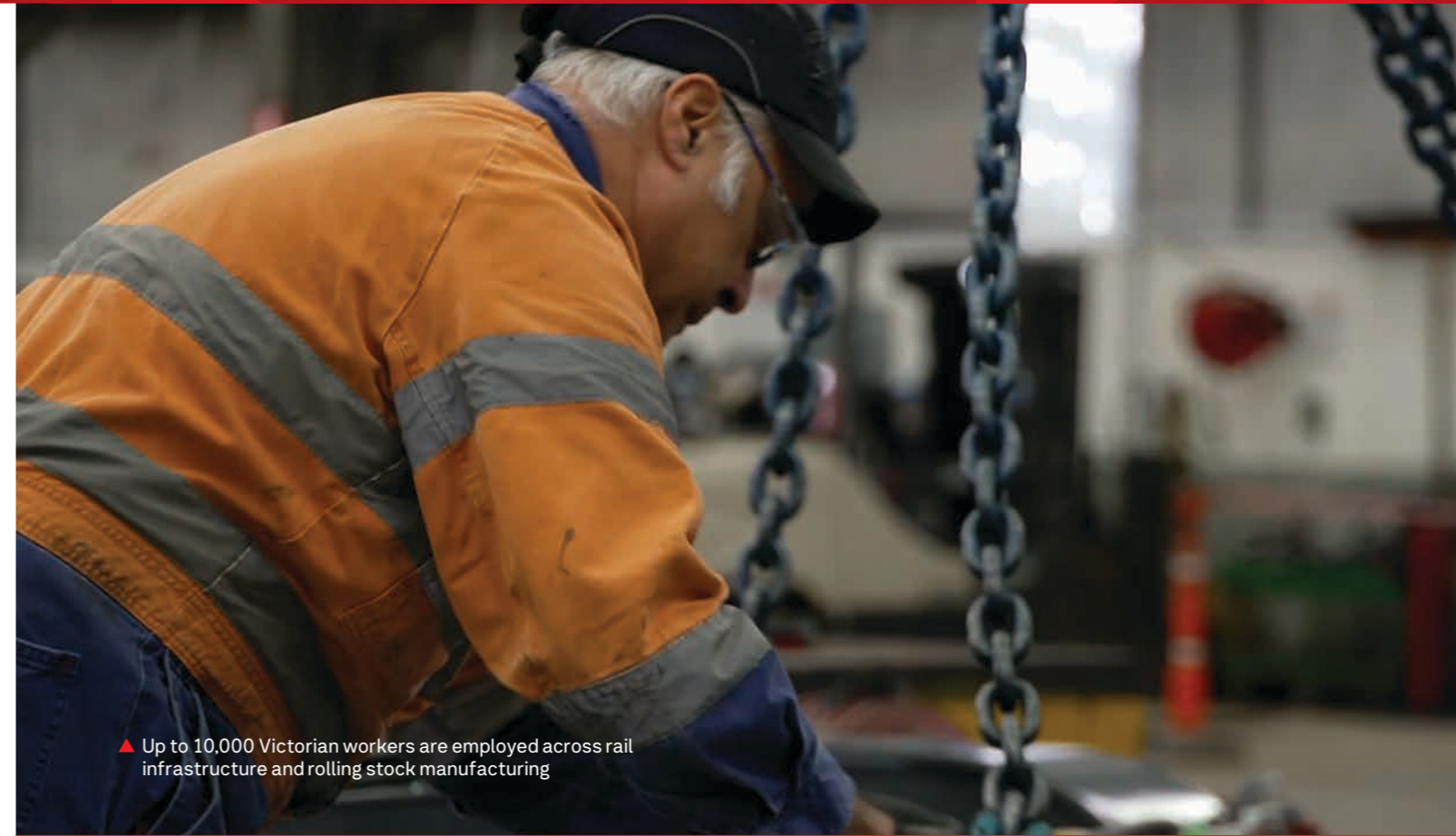
New trains and trams – backed by well-planned, complementary bus services – will help us create a truly integrated transport network to meet the needs of Victorians over the next decade and beyond.

The bigger, more modern High Capacity Metro Trains running on our network will provide capacity for 121,000 passengers every week on the Cranbourne and Pakenham lines during peak periods – that's a 45 per cent increase on current levels.

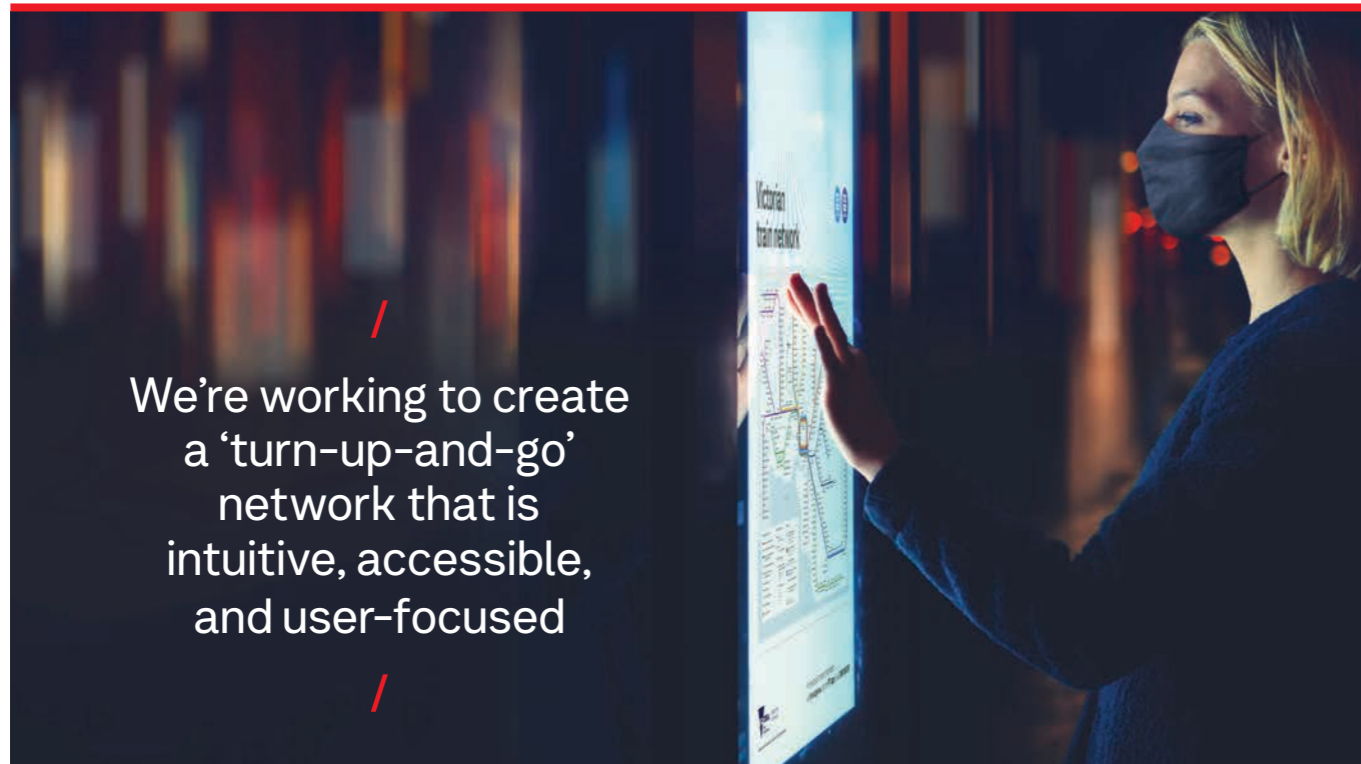
Existing signals used along these lines will be updated so trains that use high-capacity signalling and those that use conventional signalling – such as freight and regional passenger services – can safely and efficiently operate on the one system.

New rolling stock takes time to design and build, so it's important that, alongside new train and tram purchases, we get the greatest possible use out of existing assets through refurbishment and life extension projects.

We will continue our refurbishment and life extension projects to maximise the longevity of our older vehicles, keeping them servicing our busiest routes and supporting 100 more jobs.



▲ Up to 10,000 Victorian workers are employed across rail infrastructure and rolling stock manufacturing



We're working to create a 'turn-up-and-go' network that is intuitive, accessible, and user-focused



Locally built

We will continue to champion Victoria as the hub of rolling stock manufacturing in Australia.

Through the Victorian Local Jobs First policy, we are leading the way on our minimum local content requirements. This encourages businesses to invest, innovate and create both local and global opportunities for Victorian workers and apprentices.

Our projects meet and exceed local content requirements. The industry and supply chain employs up to 10,000 Victorian workers across rail infrastructure and rolling stock manufacturing.

As investment continues to grow in new rail infrastructure and rolling stock, it is vital that we also grow our already highly skilled workforce.

This requires collaboration between government, education providers and our local industry will ensure we have the workforce to meet demand, as thousands more opportunities arise over the coming years.

We are working to finalise the Rail Skills Strategy with clear actions and outcomes to enhance an already strong rail skills sector.



Figure 1: Victoria's supply chain

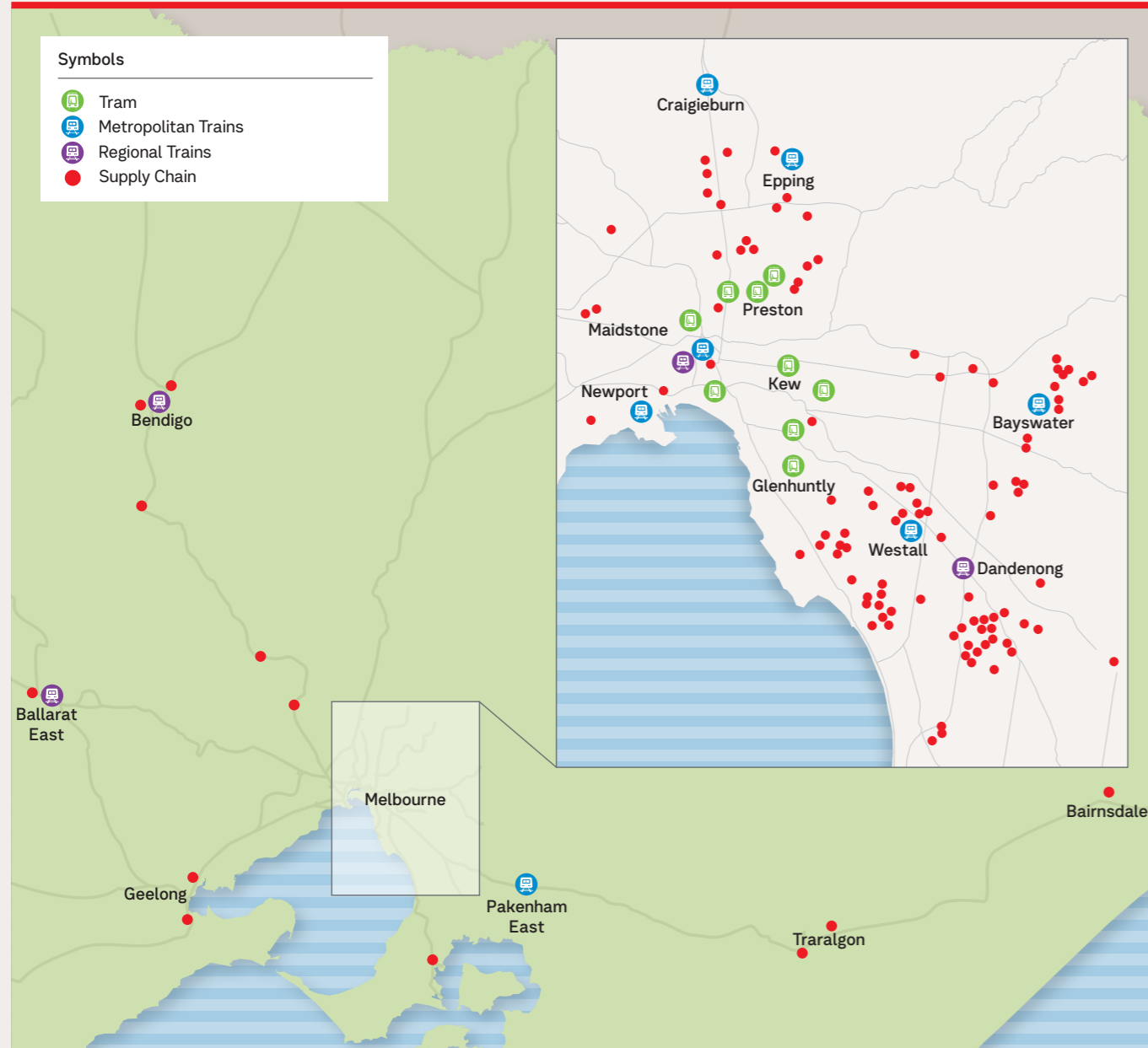


Figure 1: This map shows major rolling stock manufacturing and maintenance sites across Victoria, along with our extensive supply chain providers.

We've established the Rail Industry Development Advisory Committee to advise on the best ways to support local manufacturing and attract the next generation of skilled workers. We are working to align with the National Rail Action Plan to ensure a holistic approach to rail skills in Australia.

This work has resulted in the establishment of the National Skills Hub, which will facilitate the efficient and flexible development of skills and match them with the needs of the industry.

The industry and supply chain employ up to 10,000 Victorian workers across rail infrastructure and rolling stock manufacturing

Case study: Hofmann Engineering

Hofmann Engineering is one of Victoria's leading manufacturers of high-quality tooling and engineered components, operating out of Cheltenham in Melbourne's south-east and Bendigo.

In August 2017, the manufacturer was contracted to deliver more than 900 bogie frames as part of the High Capacity Metro Trains project – the largest order of new trains in Victoria's history.

Hofmann is one of many local suppliers contributing to the project's 60 per cent local content commitment, and supports 30 regional manufacturing jobs.

Staff have adopted modern manufacturing techniques from the largest train and tram manufacturer in the world, CRRC, which is part

of the Evolution Rail consortium designing and building the High Capacity Metro Trains. This transfer of knowledge and skills makes Hofmann Engineering more competitive in the market.

Since securing a contract on the High Capacity Metro Trains project, Hofmann Engineering has increased its manufacturing capability and diversified into other industries such as the defence, food and beverage and aerospace sectors.



Innovative

We're continuously looking to improve what we do.

To meet the needs of our state into the future, we need to keep innovating and improving how we deliver our transport network.

Investing in new and upgraded trains, trams, buses and infrastructure across metropolitan Melbourne and regional Victoria drives innovation and supports our focus on improving social and economic outcomes for all Victorians.

We are embracing new technology in manufacturing and data, creating local, national and international partnerships, and working closely with industry to anticipate and accommodate change and progress.

Innovation allows us to change the way we move people and goods around our state. We want new ideas, new solutions and better efficiencies. Better technology will allow us to revolutionise Victoria's train network as we move towards a reliable 'turn-up-and-go' network, similar to those in London, Singapore or Hong Kong.

This work is already underway, with the installation of high-capacity signalling technology on the Metro Tunnel and Cranbourne, Pakenham and Sunbury lines. This allows trains to communicate wirelessly and travel closer together, providing more frequent services and giving commuters more freedom in how and when they travel.

High-capacity signalling technology will also be rolled out on the new Melbourne Airport Rail when it is built, letting us deliver more trains, more often during peak times.

New and improved trains, trams and buses



▲ Artist's impression of the new X Trapolis 2.0 train



Metropolitan trains

We will continue to deliver a train fleet that meets the needs of our growing metropolitan network, capitalising on advances in design and technology and improving passenger experiences.

Ensuring easy access to jobs, schools, shops and services in both established suburbs and growing communities is integral to supporting Melbourne's growth and change.

Record investment in new trains will cater to growing demand and support major infrastructure projects as our network expands. It will also support the retirement of our longest serving Comeng fleet, providing a more accessible, comfortable and reliable trip for passengers.

Comeng retirement

The introduction of new trains to the network is enabling the gradual retirement of our Comeng fleet.

With the continued rollout of High Capacity Metro Trains, along with the introduction of the X'Trapolis 2.0 from 2024, we are now able to start the work of retiring our ageing fleet.

We are currently developing a strategy for the retirement of the remaining Comeng trains, with a focus on public safety, security and environmental responsibility.

High Capacity Metro Trains

The \$2.3 billion High Capacity Metro Trains project is delivering 65 bigger, better trains on the network, along with new supporting maintenance facilities. The new trains are gradually entering passenger service on the Cranbourne and Pakenham lines. Longer term, they will run through to Sunbury following the opening of the Metro Tunnel in 2025.

An additional \$123 million will deliver five new trains to service the Melbourne Airport Rail Link, bringing the total High Capacity Metro Trains fleet to 70.

Assembled at Newport, the High Capacity Metro Trains project includes 60 per cent local content and has created more than 1,100 local jobs throughout the supply chain. They are the most passenger-friendly and highest capacity trains operating on our network, with more carriages, better accessibility features, more handholds, and more space than our older fleet.

▶ An HCMT being inspected for service at Pakenham East.



◀ Artist's impression of the new X'Trapolis 2.0 train



The trains include high-capacity signalling that will deliver a 'turn-up-and-go' service following the opening of the Metro Tunnel. High Capacity Metro Trains can move 20 per cent more passengers than our current fleet. They provide passengers with more space, better accessibility and real-time information, making for a smoother journey from start to finish.

The design of the trains involved extensive work with accessibility groups, passenger groups, the broader community and technical stakeholders, across the design phase, to provide improved accessibility solutions.

Key passenger benefits include:

- 28 allocated spaces for wheelchairs and other mobility devices (14 allocated spaces in each direction of travel)
- priority seating throughout the train, located close to doorways and windows
- clear walkway through the entire train end to end
- more space for bikes and prams
- improved real-time information through dynamic route maps and passenger display.



X'Trapolis 2.0

In the 2021-22 State Budget, we invested \$986 million in 25 state-of-the-art X'Trapolis 2.0 trains and supporting infrastructure. The new trains include a minimum of 60 per cent local content and will be manufactured in Ballarat, supporting 750 local jobs.

These trains will gradually replace a portion of the Comeng fleet with a modern vehicle that will provide a better passenger experience. Adopting newer technology, the train will improve accessibility for hearing-, vision- and mobility-impaired passengers, use updated information systems, and operate with improved traction performance and energy efficiency.

Design work on the X'Trapolis 2.0 will include extensive consultation with accessibility and technical representatives to improve outcomes for all passengers.

X'Trapolis trains

We have invested almost \$500 million in 24 X'Trapolis trains since 2015, built in Ballarat by Alstom and now running on the network.

These have taken the total X'Trapolis fleet on our network to 106 trains, improving reliability and capacity on the network.

Our existing X'Trapolis fleet has been modified to improve accessibility and increase wheelchair space.



Built-in and improved accessibility features across all new metropolitan trains

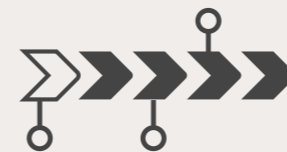
**100%
OFFSET**



All metro trains to run on a network 100 per cent offset by renewable energy by 2025



\$986 million on 25 new state-of-the-art X'Trapolis 2.0 trains and upgrades to a supporting maintenance facility



Supporting the retirement of the Comeng fleet with new modern trains

**60%+
LOCAL**



Minimum 60% local content on High Capacity Metro Trains and X'Trapolis 2.0 builds



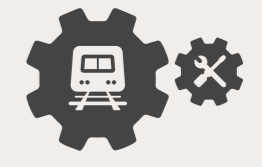
More trains and more services to maximise the benefit of Victoria's Big Build



State-of-the-art signalling to let us run more trains more often



Thousands of local jobs supported across the state in manufacturing and maintenance



Purpose built by world-class manufacturers in Victoria for our modern train network



Regional trains

We will continue to invest in our regional fleet, connecting cities, communities and towns with each other and Melbourne.

VLocity trains

The Victorian Government has invested over \$1.4 billion in 59 new VLocity trains since 2015. These new trains are built by Alstom in Dandenong with more than 65 per cent local content.

Six new standard-gauge VLocity trains will progressively replace the existing Classic Fleet running on the North East Line. They have been co-designed with local passengers and disability groups to meet the needs of our commuters. The new trains include more comfortable seats, USB chargers and improved accessibility throughout the train.

Further broad-gauge VLocity trains are being added to the network. This includes an additional 12 VLocity trains that will allow increased services on the Shepparton corridor and fully retire the loco-hauled Classic Fleet on the Warrnambool Line.

The VLocity Refresh Project is upgrading 75 VLocity trains as part of a \$600 million maintenance program to deliver more reliable services across regional Victoria, improving the accessibility and amenity of older VLocity trains.

A VLocity mid-life overhaul program will also be developed, as some of the earlier VLocity trains reach the middle of their design life, ensuring they can continue to run efficiently and reliably for years to come.

Supporting the Western Rail Plan

Transforming Victoria's rail network in the growing west requires staged investments across the medium and long term to maximise benefits to passengers and increase capacity.

The 2020/21 State Budget funded \$93.6 million for the Melton and Wyndham Vale corridors, enabling higher capacity trains, such as nine-car VLocity trains, to operate in these areas. These longer trains will increase capacity by up to 50 per cent during peak periods.



Further development work will be undertaken for a new commuter train as part of a future higher capacity rail network to service our growing outer suburbs. This may also provide opportunity to replace the loco-hauled Classic Fleet services.

V/Line's Classic Fleet

V/Line's Classic Fleet is being refurbished to improve safety, amenity and reliability as part of vital, ongoing maintenance and renewal works. This ensures our fleet can continue to deliver safe and reliable services on our regional network.

Upgrading our regional network

We're investing over \$800 million to complete maintenance works and upgrades to communication systems, improving reliability and enabling more passenger services and freight trains to operate.

Through installing mobile signal boosters on all V/Line trains, we're keeping passengers connected as they travel.

These investments provide people living in regional areas reliable connections to jobs, education and services in Melbourne and major regional centres.

Case study: McConnell Seats

McConnell Seats Australia is a local manufacturer specialising in public transport seating. The company is based in Broadmeadows, Melbourne with various interstate manufacturing facilities.

Opening in Coburg in 1952 as a small motor trimming business, by the early 1970s McConnell had begun designing and manufacturing their own seats for the transport industry. McConnell has designed and manufactured the passenger seating for the majority of Victoria's VLocity regional trains.

In 2016, McConnell moved from their Coburg facility to a larger site in Broadmeadows and attributes much of their growth to being part of Victoria's rolling stock industry, with local content rules benefitting the entire supply chain and underpinning rolling stock manufacturing in this state.


The company supports jobs and local industry and has an extremely diverse workforce, with most employees living in the local area.


McConnell Seats aims to continue designing and manufacturing a new range of seating solutions for the rolling stock industry, while investigating opportunities to become more competitive in the global market.


NORTH EAST

 OVER \$800 MILLION




 New VLocity trains for the Shepparton, Warrnambool, Gippsland and North East lines


 Over \$800 million of vital maintenance and upgrades on our regional lines

 More new trains to support Victoria's Big Build and the Regional Rail Revival




 A new commuter train is being explored to service Melbourne's outer suburbs




 VLocity Refresh Program upgrades our older trains to improve accessibility and service the network for longer



 New Bairnsdale facility to enable VLocity stabling and retirement of Classic Fleet from Gippsland Line


65%+ LOCAL

 All VLocity trains are being built in Dandenong with more than 65 per cent local content

NEARLY 2 MILLION BY 2040

 Regional Victoria's population will grow to over 1.9 million by 2040



 VLocity trains co-designed with local passengers and disability groups to meet passenger needs



Trams

We're making unprecedented investment in our tram network, including new and improved accessible trams.

Melbourne has the biggest tram network in the world, carrying over 600,000* people every day.

The 2020-21 State Budget saw the largest order of trams for our state in decades, with \$1.85 billion to build 100 new, state-of-the-art, accessible trams that will progressively replace Victoria's longest serving A- and Z-Class trams.

This investment includes construction of a dedicated tram maintenance facility in Victoria's booming western suburbs to keep our rolling stock world-class. This follows a \$163 million investment for new and upgraded trams in 2019-20.

*Prior to the COVID-19 pandemic.

Next Generation Trams

Our 100 Next Generation Trams are being built right here in Victoria, with a minimum of 65 per cent local content, ensuring jobs for years to come. Next Generation Trams will set a new standard for comfort, accessibility and energy efficiency when they start rolling out from 2025.

Next Generation Trams will help us gradually replace our longer serving high-floor trams, such as the A- and Z-Class, improving accessibility and reliability on the network.

The vehicle build, along with the development of a dedicated tram maintenance facility at Maidstone, will support almost 1,900 local jobs.



The Next Generation Trams project will support around 1,900 local jobs

Next Generation Trams will be designed in consultation with user groups, tram drivers, transport operators, the general public and manufacturers to make sure the best outcomes are achieved. To ensure the best accessibility outcomes are achieved, we are engaging industry to test and develop accessibility technologies, working with designers and engineers to find bespoke solutions to meet the needs of all passengers.

The trams will be equipped with an on-board energy storage system (OESS) to reduce energy consumption, significantly reducing the need to draw power from the overhead power supply. The trams will include the latest technology, with regenerative braking to feed energy back into the OESS and a real-time energy management system to manage energy consumption.



E-Class trams

The 100th and final E-Class tram entered service in October 2021, completing the Victorian Government's delivery of its E-Class fleet.

Built with 50 per cent local content, the project supported around 500 local jobs at peak production.

These trams have increased the number of low-floor vehicles running on the network, improving accessibility across Melbourne.

Keeping the network moving

Extending the life of Victoria's existing tram fleet means we can keep them servicing our busiest routes reliably, while supporting local jobs. We're refurbishing more of our A-, B-, C-, D- and Z-Class trams and we have restored 12 historic W-Class trams for City Circle services, keeping an important piece of Melbourne's transport heritage running safely on our modern network. We've also invested in further works to the A- and Z-Class trams to ensure safe and reliable operations.

150+



Over the next ten years Victoria will need more than 150 new trams to replace our ageing high floor fleet



Largest tram network in the world, with 250km of tram tracks carrying over 600,000 people every day

\$1.85 BILLION



\$1.85 billion to design and build a fleet of 100 Next Generation Trams and our state-of-the-art maintenance facility in Maidstone



Next Generation Trams will have improved energy efficiency through energy storage and regenerative braking



We are making our trams more accessible, modern and energy efficient

2025



Next Generation Trams are expected to hit the network from 2025

100x E-CLASS



100 modern E-Class trams now on the network – all built in Melbourne



Next Generation Trams allow us to retire our longest-serving tram fleets

65%+ LOCAL



Minimum 65% local content on all Next Generation Trams



Buses

Buses are Victoria's great connectors. Our bus network carries over 135 million passengers a year and makes up 21 per cent of all trips taken on metropolitan public transport.

As our train and tram networks grow, we are transforming our bus network through optimising services and routes, and encouraging operators to upgrade their fleets.

Around 34 per cent of bus trips also involve a tram or train connection and the bus network carries 50 per cent of the annual passenger load of the train network. We now service more than 400 metropolitan routes, 30 night routes, 50 regional routes and 125 regional intertown routes, with more than 4,000 buses running on our network.

In November 2019, we launched our first locally made electric bus in partnership with Transdev. During its first 300 days on the road, the Victorian-built electric bus saved 61 tonnes of carbon dioxide emissions, which is equivalent to over 30,000 kilos of coal burned, or over 23,000 kilometers driven by an average car.

The Victorian Government also awarded a \$2.3 billion contract to bus operator Kinetic in 2021 to increase Melbourne's zero emission bus fleet by 2031, with more than 300 low- or zero-emission buses to be operating by the end of the franchise term.

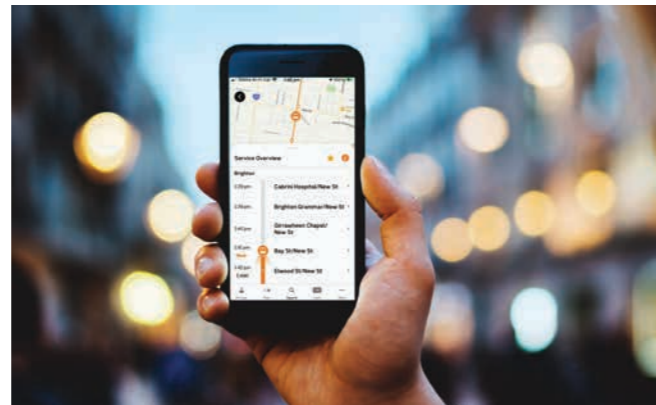
Victoria's Bus Plan

Victoria's Bus Plan (2021) outlines six objectives to transform our bus network to capitalise on upcoming Big Build projects, help us cut emissions, and provide services where they are needed most.

We are creating an environmentally sustainable bus network that provides for simple, safe, reliable and comfortable journeys, ensuring passengers can get where trains and trams can't go.

Our existing network is large and complex, and unknitting that to build a better, simpler, and more efficient bus network will take time. Over the next 10 years (and beyond) we will:

- leverage the Big Build and test new approaches, processes and plans to support a reform agenda
- transform the bus network to meet growing demand
- embed new practices and long-term initiatives.



Local content built into contracts

The Metropolitan Bus Service Contracts now require local content targets for both new buses and operations, including:

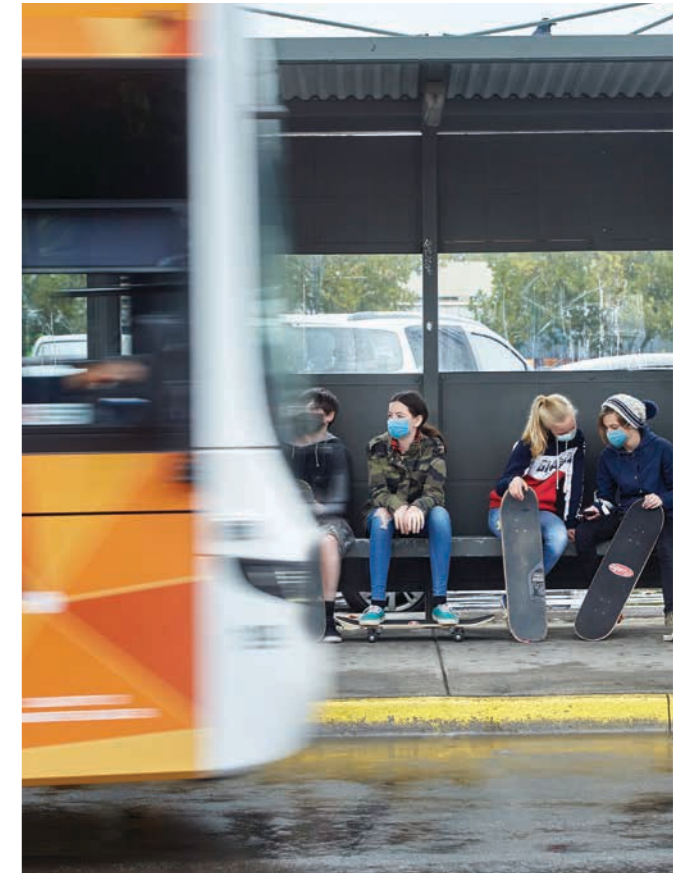
- 60 per cent local content for new, replacement or growth buses
- 86 per cent local content for bus operations.

Zero-emission buses

In order to meet our goals of net zero emissions by 2050, we need cleaner buses. All new public transport bus purchases will be zero-emission buses from 2025.

Transitioning to zero-emission buses will require close collaboration with manufacturers and operators to ensure our infrastructure, maintenance capabilities and depots are equipped to keep our bus fleet running.

Our \$20 million, three-year Zero Emissions Bus Trial, starting in 2022, will help us work in partnership with the bus industry, operators and manufacturers to understand the infrastructure requirements to deliver this target. The trial will inform a shared transition roadmap to identify and address requirements for our new fleet, depot and charging infrastructure, and workforce training requirements, upskilling and retraining.

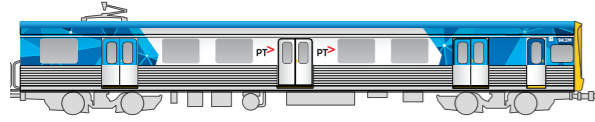


<p>All new bus purchases to be zero emission buses by 2025</p>	<p>Melbourne's first electric bus saved 61 tonnes of carbon dioxide emissions in first 300 days on the road</p>	
		<p>60%+ LOCAL</p>
<p>Improved accessibility for passengers on new bus purchases to align with bus stop accessibility improvements</p>	<p>Victoria's Bus Plan provides a pathway to build a more efficient bus network</p>	<p>Minimum 60 per cent local content for new, replacement or growth buses and minimum 86 per cent local content for bus operations</p>
<p>\$20 MILLION</p>		
<p>\$20 million trial to understand how to roll out a modern zero-emission bus network</p>	<p>Our new bus network will be aligned to our wider transport network to make it easier for passengers to get from A to B</p>	

Train and tram fleets

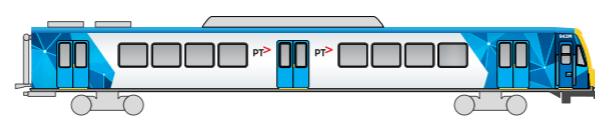
Metropolitan train fleet

Comeng



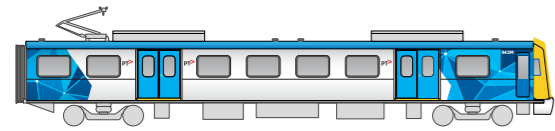
Trains: 72 (progressively retired) Introduced: 1982-1989
Carriages: 6

X'Trapolis



Trains: 106 Introduced: 2002-2020
Carriages: 6

Siemens



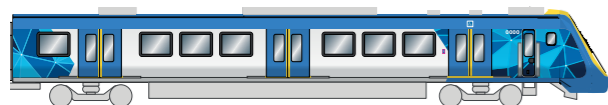
Trains: 36 Introduced: 2003-2006
Carriages: 6

High Capacity Metro Train



Trains: 70 (progressive delivery) Introduced: 2020
Carriages: 7

X'Trapolis 2.0



Trains: 25 (progressive delivery) Introduced from: 2024
Carriages: 6

Building our transport infrastructure and rolling stock sector

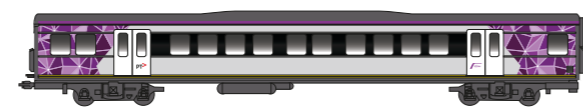
Regional train fleet

Classic N Type



N and Z type carriages: 61 Introduced: 1956-1984

Classic H Type



H type carriages: 54 Introduced: 1956-1992

Sprinter



Diesel Multiple Units: 21 Introduced: 1993-1995

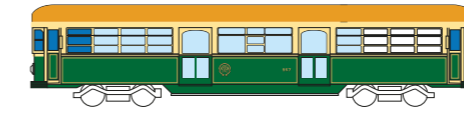
VLocity



Trains: 118 (progressive delivery) Introduced: 2005
Carriages: 3

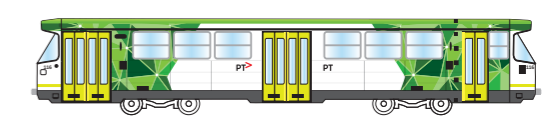
Tram fleet

W8 Class



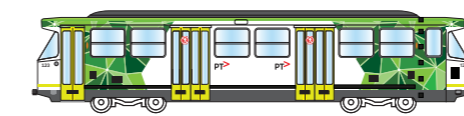
High-Floor Trams Introduced: 1940-1956
Trams: 12

Z3 Class



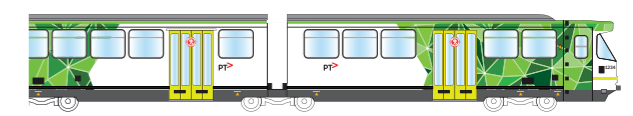
High-Floor Trams Introduced: 1979-1984
Trams: 101 (progressively retired)

A Class



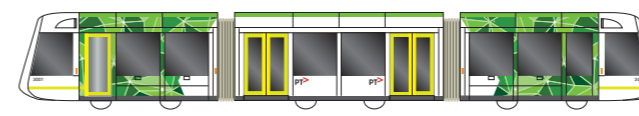
High-Floor Trams Introduced: 1984-1986
Trams: 69 (27 A1 & 42 A2)

B2 Class



High-Floor Trams Introduced: 1988-1994
Trams: 130

C1 Class



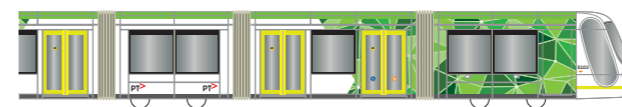
Low-Floor Trams Introduced: 2001-2002
Trams: 36

D Class



Low-Floor Trams Introduced: 2002-2004
Trams: 59 (38 D1 & 21 D2)

C2 Class



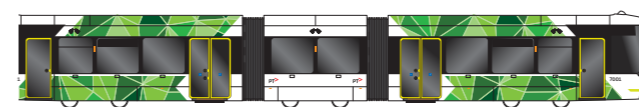
Low-Floor Trams Introduced: 2008
Trams: 5

E Class



Low-Floor Trams Introduced: 2013-2021
Trams: 100 (50 E1 & 50 E2)

G Class (Next Generation Trams)



Low-Floor Trams Introduced from: 2025
Trams: 100 (progressive delivery)

Train and tram fleet information is correct as at date of publication.

Stabling, depots and maintenance

▼ New stabling and maintenance facilities will help keep our modern fleet servicing Victorians. Pakenham East Train Maintenance Facility pictured.

Providing our future fleets with opportunities to grow and innovate

We will ensure our stabling, depots and maintenance facilities provide for our future fleets, with opportunities to grow and innovate.

New rolling stock orders alone won't allow us to meet future demand. To support our massive investment in new trains, trams and buses, we are also investing in new stabling and maintenance facilities across Victoria to keep our fleet in working order and service our busiest rail lines reliably.

Manufacturing and maintenance of rolling stock provides ongoing employment in Melbourne and regional Victoria, with more than 1,000 local jobs involved in the maintenance of trains and trams across 18 depots.

As part of our investment in rolling stock, we are delivering:

- a new train maintenance and stabling facility at Pakenham East for our High Capacity Metro Trains
- upgrades to Flemington Racecourse Stabling Facility to support metropolitan train operations
- a light service facility in Calder Park to enable efficient whole-of-asset-life maintenance for High Capacity Metro Trains
- upgrades to the Craigieburn train maintenance facility
- a dedicated maintenance facility for our Next Generation Trams
- upgrades to the South Dynon train maintenance facility
- construction of a new stabling facility at Bairnsdale supporting regional operations
- significant maintenance works and upgrades to communication systems.

Next Generation Trams depot

We will build a dedicated tram maintenance and stabling facility at Maidstone to house our fleet of state-of-the-art Next Generation Trams.

The facility will create around 280 jobs across construction, ongoing maintenance and the supply chain, as well as delivering a more reliable and accessible tram fleet in Melbourne's inner west.

High Capacity Metro Train stabling facility

As part of the High Capacity Metro Trains project, a stabling facility has been constructed at Pakenham East. The facility includes the construction of a modern, efficient train maintenance service, which is being used to support regular maintenance activities throughout the life of the High Capacity Metro Train fleet. Built using 87 per cent local content, the depot creates up to 100 ongoing jobs throughout the supply chain for the south-east region. A light service facility in Calder Park - the city's north-west - will also accommodate High Capacity Metro Trains.

Flemington Racecourse stabling facility

Investing in our existing network will enable optimised use of facilities close to Melbourne. Upgrades to Flemington Racecourse stabling facility will provide increased capacity for train stabling, easing operations on the metropolitan network.

South Dynon depot

South Dynon depot is being upgraded to meet the maintenance needs of the growing VLocity fleet. With a 40 per cent increase in regional rail services since 2014 and V/Line now running more than 2,000 services every week, upgrades like these are vital to the ongoing success of our regional fleet.

The construction phase will support over 100 jobs, while expanded maintenance operations at the facility will also deliver over 35 new ongoing train maintenance jobs.

Bairnsdale stabling facility

The construction of a VLocity stabling facility at Bairnsdale will allow the retirement of the Classic Fleet on the Gippsland corridor, and future proof regional operations with the necessary support infrastructure.

As new trains hit the network, we will need to continue to invest in stabling and maintenance projects across the state to support our growing fleet. Further stabling works are planned or underway across Victoria, ensuring we will have the infrastructure in place to keep our fleet running smoothly and meeting growing demand.

Towards 2030: Our rolling stock future



As we head towards 2030 and beyond, our vision for Victoria's transport network will evolve in response to emerging challenges and opportunities. What won't change is our commitment to building a world-class transport system that supports passenger needs and our local rolling stock industry.

2021

→ New and improved VLocity trains



70 High Capacity Metro Trains →

100th E-Class delivered

Train network switches to 100% renewable energy

2025

← 100 Next Generation Trams

← 25 new X'Trapolis 2.0

Metro tunnel opens



All new bus purchases to be Zero Emission Buses →

2030

New Commuter Train →

Suburban Rail Loop trains



Made in Victoria
for Victoria

Authorised by the Victorian Government, Melbourne
1 Spring Street Melbourne Victoria 3000
Telephone (03) 9655 6666

Designed and published by the
Department of Transport

ISBN 978-0-7311-9200-7 (PDF/online/MS Word)

Contact us if you need this information
in an accessible format such as large print
or audio, please telephone (03) 9655 6666
or email community@transport.vic.gov.au

© Copyright State of Victoria Department of Transport 2022



Except for any logos, emblems, trademarks, artwork and
photography this document is made available under the terms
of the Creative Commons Attribution 3.0 Australia licence.

transport.vic.gov.au



Department
of Transport