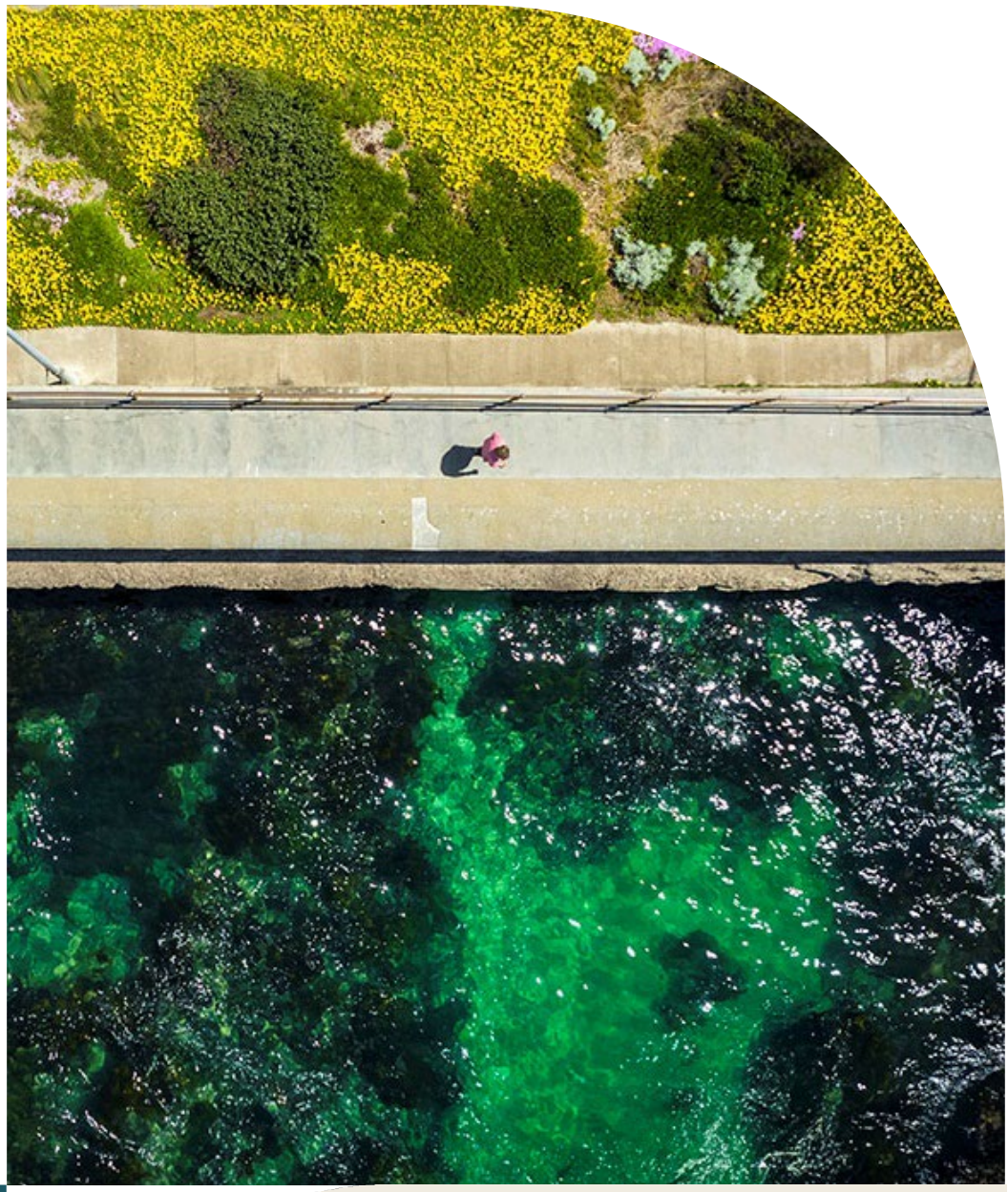


INFRASTRUCTURE VICTORIA

March 2025

Victoria's draft 30-year infrastructure strategy

About us

Infrastructure Victoria is an independent advisory body with 3 functions:

- preparing a 30-year infrastructure strategy for Victoria, which we review and update every 3 to 5 years
- advising the government on specific infrastructure matters
- publishing research on infrastructure-related issues.

Infrastructure Victoria also helps government departments and agencies develop sectoral infrastructure plans.

Infrastructure Victoria aims to take a long-term, evidence-based view of infrastructure planning, and we inform community discussion about infrastructure provision.

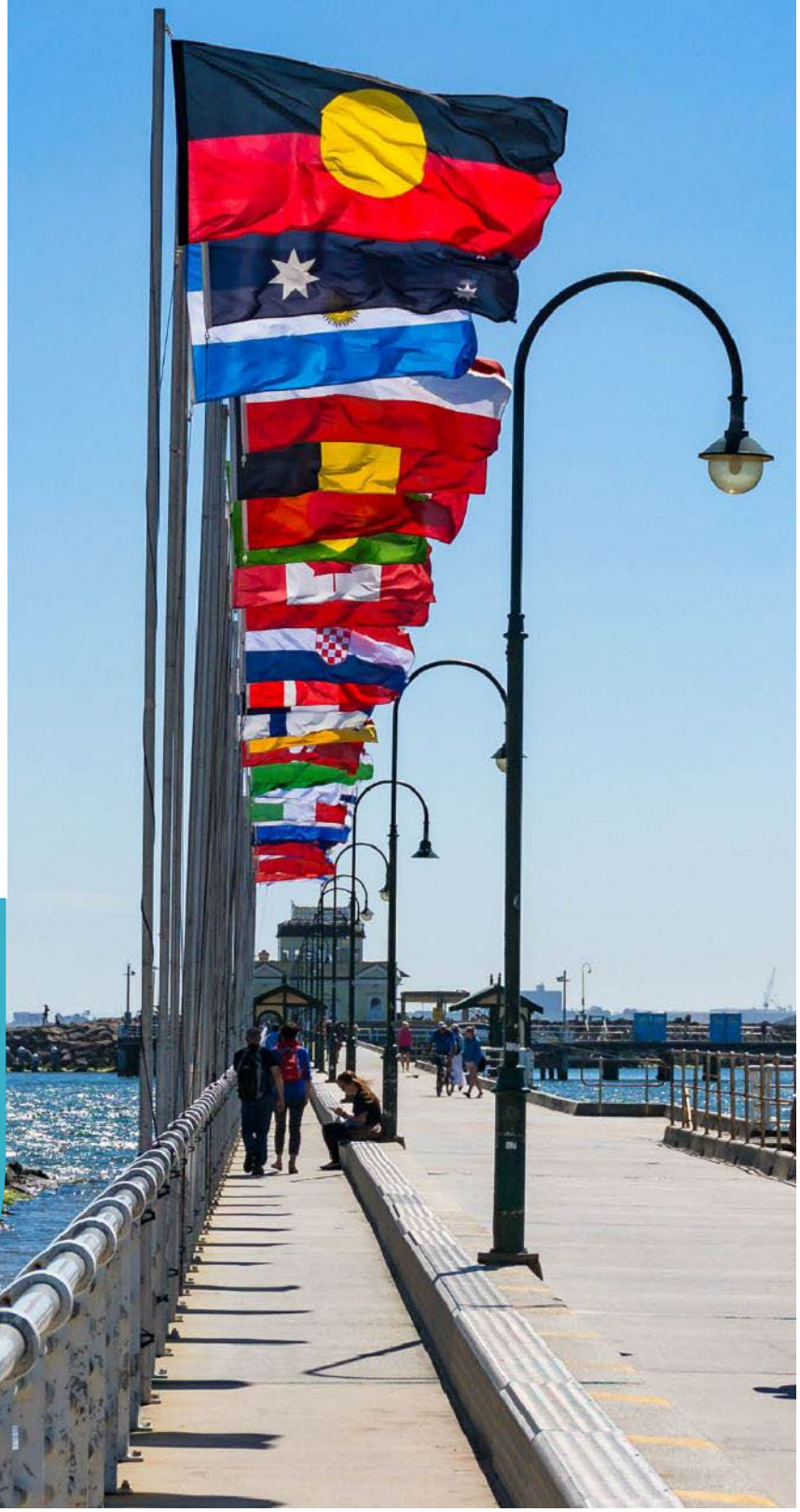
Infrastructure Victoria does not directly oversee or fund infrastructure projects.

Main cover image: Warrnambool Breakwater, Gunditjmara Country. Photographer: Robin Sharrock.

Secondary image: Royal Park, Melbourne, Wurundjeri Country, Photographer: Pete Glenane.

Acknowledgement

Infrastructure Victoria acknowledges the Traditional Owners of Country in Victoria and pays respect to their Elders past and present, as well as Elders of other First Peoples' communities. We recognise that Victoria's infrastructure is built on land that has been managed by Aboriginal people for millennia.



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Summary

Infrastructure helps Victorians live prosperous, purposeful lives

Every Victorian depends on infrastructure. They use roads or rail to reach work, study and services. They use public facilities and spaces to learn, play, exercise, socialise and receive care. And they depend on infrastructure to get energy and water to their homes, and to connect with each other by phone and internet.

We consulted Victorians on the infrastructure goals most important to them. They told us they want infrastructure to help them access opportunities and stay healthy and safe. They want it to help Victoria's natural environment to thrive. And they want it to enable a more productive economy, minimise the ongoing effects of climate change and protect them from risks.

This updated draft 30-year infrastructure strategy provides recommendations to the Victorian Government to help achieve these goals. No single draft recommendation will address the hopes of all Victorians, nor can infrastructure solve all of Victoria's challenges. But our draft recommendations aim to meet the infrastructure needs of current and future Victorians. When governments provide people with the infrastructure they need, communities become more resilient and able to thrive.

We considered existing and new infrastructure in our recommendations

Our draft recommendations include infrastructure policies, reforms and projects that will bring long-term benefits.

Since our last strategy in 2021 the Victorian Government has invested in major infrastructure projects. It has built new roads and rail, improved access to healthcare by building and upgrading hospitals, and separated trains from traffic by removing level crossings. We reviewed the recommendations in the 2021 strategy and found that the government has implemented or made progress on more than 80% of them.

Victoria already has a lot of high-quality infrastructure, including world-class cultural and sporting facilities. But there are areas where existing infrastructure does not meet Victoria's needs, such as in social housing, public transport, and community infrastructure like libraries and aquatic centres. To develop our recommendations, we researched the biggest challenges and opportunities facing Victoria's infrastructure. We analysed these alongside existing government policy directions and recent developments to identify the infrastructure priorities where Victorian Government action is most needed to make a difference.

Our draft recommendations respond to these immediate needs in Victoria's largest cities and regional areas. They also identify ways to harness population growth and help the Victorian Government sustainably plan for the infrastructure that communities will need over the coming decades. Well-managed population growth can bring new skills into Victoria's economy, enhancing economic prosperity and making Victoria a better place to live.

Infrastructure can help to overcome Victoria's future challenges

The Victorian Government will need to use its infrastructure to overcome some major challenges over the next 30 years. Victorians will need infrastructure to work in a warmer, drier climate and withstand more extreme weather events. And as Victoria's population grows and changes, more Victorians will need to use many types of infrastructure. The shape of Victoria's cities affects how quickly the government can provide this infrastructure. It is often more expensive to deliver infrastructure in new suburbs on the outskirts of Victoria's cities, compared to upgrading existing infrastructure in established suburbs.

The Victorian Government has already set out some ambitious targets. It is investing in projects and changing policies to help achieve a target of 800,000 new homes by 2034. It has set energy targets of 95% renewable electricity generation by 2035. And it has committed to net zero emissions by 2045. Victoria will

need to move quickly to achieve these targets, and the government will need to make large investments in partnership with the Australian Government and private investors.

However, the Victorian Government cannot build everything, everywhere, all at once. Rising debt levels and high material and labour costs make it more important than ever for governments across Australia to carefully prioritise and deliver new infrastructure. The government can find smarter and more efficient ways to use existing infrastructure and maintain its assets. This can help prioritise sustainability and equity in how resources are allocated and used. For example, it can change public transport fares to encourage better use of the transport network, or use digital technologies to improve care and ease demand on public hospitals. Digital technologies can also improve productivity by helping government better design, build, operate and maintain Victoria's infrastructure.

This strategy is a foundation for action

Delivering the draft recommendations in this strategy will help to create a prosperous, more inclusive and sustainable Victoria over the next 30 years. The recommendations can help the government create a more productive economy in which people and businesses prosper. Public transport, roads and digital infrastructure help Victorians access well-paid jobs, services and other opportunities. Infrastructure helps businesses create the goods and services that drive economic growth and enables them to send these goods across Victoria and beyond.

The government does not need to start implementing all our draft recommendations immediately. But many recommendations can be delivered quickly and at low cost. Others can be delivered in stages. In some cases, delaying action will cost more in the long run. The Victorian Government can partner with local governments, the Australian Government, and the private and not-for-profit sectors to help fund and operate the infrastructure we recommend.

We estimate that the total cost of implementing all 43 draft recommendations is around $60 billion to $75 billion. Almost three quarters of this is attributable to a small group of capital-intensive projects to improve social housing, kindergartens, schools, public transport and hospitals. A long-term infrastructure strategy can help achieve a stable investment profile. Our cost estimates allow the government to make informed decisions about infrastructure investment, project sequencing and delivery timelines.

The Victorian Government could reduce its costs of implementing the draft recommendations to around $55 billion by partnering with the Australian Government and other organisations, along with smarter use of existing government land. This includes an average of approximately $5 billion of infrastructure spending by the Victorian Government each year for the next 10 years. Our draft recommendations can then generate over $155 billion worth of benefits and help achieve the goals of Victorians.

We have listed each draft recommendation under one of our 6 infrastructure strategy objectives. These objectives reflect the goals that Victorians told us they value. Most draft recommendations advance more than one objective across different infrastructure sectors. Some draft recommendations focus on Victoria's largest cities or regional towns, others are statewide.

Infrastructure projects and policies are an investment for the long term. And yet the future remains uncertain. Changes in demand and capacity will affect the types of infrastructure that Victorians need most. This strategy aims to meet this challenge by making draft recommendations that produce good results in different possible futures. These draft recommendations can help the Victorian Government make informed decisions about infrastructure investment. They focus on the outcomes that Victorians want and set out Victoria's future infrastructure needs.

Summary of recommendations and future options

This strategy contains 43 draft recommendations and 7 future options that span across infrastructure sectors.

Recommendations propose actions for the Victorian Government to start in the next 5 years. They are projects, policies and reforms that Victoria will need before 2030 or actions that help government plan early for long-term challenges. The *Infrastructure Victoria Act 2015* requires the Victorian Government to respond to our recommendations.

Future options are projects, policies and reforms that Victoria will likely need over the next 30 years but do not necessarily require government action in the next 5 years. The Victorian Government does not have to respond to future options.

Victorians have good access to housing, jobs, services and opportunities

#	Recommendation / Future option
1	**Build more social housing** Consistently invest in new social housing to provide more Victorians on low incomes with access to a secure and affordable home.
2	**Facilitate markets and invest in kindergarten infrastructure** Facilitate markets for private and not-for-profit investment in kindergarten infrastructure. Share regularly updated information about the demand for and supply of kindergarten places. Publish priorities for government investment to deliver kindergartens in communities that will have the greatest need.
3	**Plan and deliver expanded and new schools** Identify schools to expand and confirm areas that will need new schools. Fund expansions of existing schools and begin delivery of new schools. Minimise costs by expanding the built capacity of existing schools and building larger new schools.
4	**Expand TAFE in Melbourne's growth areas and some large regional centres** Expand TAFE campuses in Melbourne's west, north and south-east growth areas, and some large regional centres, to train more students to fill skills gaps, especially in construction, energy and health.
5	**Build libraries and aquatic centres for Melbourne's growing communities** Fund councils to plan and build libraries and aquatic recreation centres in Melbourne's growth areas.
6	**Make government infrastructure more accessible** Complete priority public transport stop upgrades to meet legal accessibility requirements and fund further upgrades. Provide better public information on accessibility in government buildings.

7	**Rezone locations near existing infrastructure for more home choices** Change all relevant planning schemes to rezone for more homes in Victoria's cities and reach housing targets. More homes should be close to public transport and open space, with good access to services.
Future option	**Mandate more affordable homes near existing infrastructure** Choose a mechanism to mandate more housing that is affordable for low-income households and close to public transport, open space and services.
Future option	**Phase out residential stamp duties** Over the long term, phase out residential stamp duties and phase in residential land tax.
8	**Extend Melbourne's trams to encourage more new homes nearby** Increase services on key tram routes in activity centres that have been designated for additional housing development. Complete a detailed assessment of tram extensions in Melbourne's established suburbs. Start building extensions in areas that can support more new homes. Rezone land around the extended tram lines so more homes are built.
9	**Run faster bus services, more often, in Victoria's largest cities** Run buses more often, for longer hours, and give buses priority on the road. In stages, straighten out existing bus routes so they are fast and direct.
10	**Build a new bus rapid transit network** Complete a detailed assessment, reserve the required land, and build a new bus rapid transit network. Start with routes that connect train stations and busy destinations in Melbourne's north, west, and south-east, and extend the new Eastern Busway along Hoddle Street.
11	**Extend metropolitan trains and run more services in Melbourne's west** Extend and electrify metropolitan trains to Melton. Reallocate trains that serve Melton to other areas in Melbourne's west and regional Victoria. Assess delivery of a new train station at Altona North accompanied by land rezoning.
12	**Run more bus and coach services in regional Victoria** Deliver more bus services in regional cities. Run more V/Line coach services to better connect small towns to regional cities. Start with routes that improve access to jobs, education and healthcare.
13	**Make off-peak public transport cheaper and simplify regional fare zones** After upgrading the myki ticketing system, charge lower fares for off-peak travel on Victoria's buses, trains and trams. Simplify fares and reduce the number of regional fare zones.

Victorians are healthy and safe

#	Recommendation
14	**Make local streets safer for children and communities** Reduce speed limits to 30km/h on local streets, starting in places that children often visit including around schools, playgrounds, childcare centres and kindergartens.
15	**Build safe cycling networks in Melbourne and regional cities** Continue building protected and connected cycle corridors across Victoria. Publish updates to the strategic cycling corridor network.

16	**Help government schools share their grounds** Prioritise which government school sports fields and facilities could deliver the greatest benefits if they were shared with local communities outside school hours. Give these schools extra help for maintenance if they voluntarily share their grounds outside school hours. Offer funding for upgrades to incentivise shared access outside school hours.
17	**Invest in maintenance, upgrades and expansions of community health facilities** Develop and fund 5-year priorities for Victorian Government investment in community health facilities.
18	**Build more residential alcohol and other drug treatment facilities** Plan and start building residential rehabilitation and withdrawal facilities to meet the demand for alcohol and other drug treatment.
19	**Invest in digital healthcare** Expand digital healthcare to improve the quality of care and ease demand on public hospitals. Deliver a statewide medical image sharing system and a statewide virtual care service that remotely monitors suitable patients at home.
20	**Upgrade critical public hospital infrastructure** Define the scope and timeframes to upgrade the Royal Melbourne Hospital and begin the first stage of construction. Continue with upgrades at the Alfred and Austin hospitals.
21	**Better use prisons and invest more in health facilities and transition housing** Use prison capacity to move people to facilities that meet their needs. Invest more in prison health facilities and post-release transition housing. Close old prisons that are underused and expensive to keep.

Aboriginal people have self-determination and equal outcomes to other Victorians

#	Recommendation
22	**Invest in secure homes for Aboriginal Victorians** Fund a 10-year program to build social homes for Aboriginal Victorians and provide secure and sustainable tenancies. Work with Aboriginal housing providers and Traditional Owner corporations to develop capacity across the Aboriginal housing and homelessness sector.
23	**Fund better health and wellbeing infrastructure for Aboriginal Victorians** Fund and start health and wellbeing infrastructure projects for Aboriginal Community Controlled Organisations (ACCOs). Provide additional annual funding to further develop the skills and capacity of health and wellbeing ACCOs to plan, develop and deliver new and upgraded infrastructure in a self-determined way. Establish an interim fund for minor works and repairs until a self-determined perpetual infrastructure fund is introduced.

Victoria has a thriving natural environment

#	Recommendation / Future option
24	**Reduce greenhouse gas emissions from infrastructure** Adopt carbon values and measure carbon in infrastructure projects to reduce emissions.
25	**Advance integrated water management and use more recycled water** Work with partners to fund and deliver integrated water management projects. Determine the costs and benefits of introducing recycled drinking water in Melbourne and Geelong and build a pilot recycled drinking water facility. Deliver a community education campaign on the need for more water sources.
Future option	**Plan for and invest in manufactured water** Plan for and invest in manufactured water. Return more water to Traditional Owners and the environment.
26	**Better use government land for open space and greenery** Fund actions to better connect open spaces to each other and plant more trees and shrubs in urban areas. Give Victorians access to more public land in fast growing suburbs. Target at least 30% tree canopy and shrub cover on public land.

Victoria is resilient to climate change and other future risks

#	Recommendation
27	**Better prepare infrastructure for climate change** Fund high-priority, cost-effective infrastructure adaptation actions when climate adaptation action plans are updated in 2026. Produce an energy sector adaptation plan.
28	**Use new flood maps to revise planning schemes** Produce a common set of flood projections based on the latest climate data. Use this information to update flood studies and maps and apply them in planning schemes. Minimise building in areas at high risk of flooding.
29	**Coordinate faster delivery of key energy infrastructure** Fast-track key energy projects and coordinate enabling infrastructure. Establish a unified energy transition project pipeline and conduct annual progress assessments. Create a central energy transition coordinator to align priorities, improve transparency and manage risks.
30	**Improve environmental assessments and site selection for energy projects** Reform environmental assessments and help energy project proponents select good sites.
31	**Invest in home, neighbourhood and big batteries for more energy storage** Create new support for home batteries and provide incentives to encourage people to join a virtual power plant. Expand the neighbourhood batteries program, or similar. Facilitate more investment in big batteries for the transmission network.
32	**Determine long duration energy storage needs** Determine the most efficient policy or investment options to provide enough long duration energy storage to meet Victoria's needs.

33	**Develop regional energy plans, guide transition from fossil gas and maintain reliable gas supply** Develop an energy plan for electrification and gas use that meets each region's needs and prepare gas infrastructure decommissioning for homes and some businesses. Secure gas supplies to meet demand. Set a renewable gas target and support renewable gas production.
34	**Speed up household energy efficiency and electrification** Require efficient electric space heating and hot water when people replace their heaters at end-of-life and support low-income households to go all-electric. Complete social housing energy upgrades, including electrification. Require Victorian homeowners to disclose the energy efficiency of their homes at the time of sale or lease.

Victoria has a high productivity and circular economy

#	Recommendation / Future option
35	**Prepare and publish infrastructure sector plans to shape Victoria's cities** Agree a set of assumptions for future population, jobs and land use for more compact cities. Require each department that owns infrastructure to develop an infrastructure sector plan as soon as possible, based on these assumptions, and publish strategic-level plans. Use the finished sector plans to decide infrastructure project funding.
36	**Reform infrastructure contributions** Simplify Victoria's infrastructure contribution schemes to cover all types of housing developments and reflect the cost of infrastructure in different development settings.
37	**Improve asset management of all government infrastructure** Fund asset managers to better understand the condition, use and performance standards of all government infrastructure. Use this information to develop asset management strategies and prioritise funding.
38	**Prepare for more recycling and waste infrastructure** Identify places for new recycling and waste infrastructure and publish them in the next update to the *Victorian recycling infrastructure plan*. Plan for waste and recycling sites together with other commercial and industrial land. Make changes to planning controls to allow for facilities where they are needed.
39	**Use digital technologies to better design, build, operate and maintain government infrastructure** Pilot digital technologies on government infrastructure projects and report on their progress. Use building information modelling on major infrastructure and housing projects. Improve capabilities in government agencies and review procurement processes to promote greater use of digital technologies.
40	**Use modern traffic control technology for efficient and safe journeys** Further extend modern traffic control technology like sensors and cameras along arterial roads in Victoria's largest cities. Begin expanding smart motorways into Melbourne's growth area freeways.
Future option	**Charge people fairly to use roads** Introduce road charges that help manage congestion and improve productivity. Consider options such as car parking levies, off-peak freeway tolls, congestion pricing trials, or road user charging for all motorists with lowered fixed road charges. Work with the Australian Government on road pricing options.

41	**Make rail freight competitive, reliable and efficient** Develop and publish a 30-year integrated rail freight network plan and fund a 10-year rail freight maintenance program. Develop a freight network coordination policy.
42	**Encourage off-peak freight delivery in urban areas** Prepare for growing freight volumes in urban areas by piloting an off-peak freight delivery program in a high-density area of Melbourne. If successful, expand off-peak delivery for more productive and sustainable freight movement.
Future option	**Plan for more efficient and sustainable urban freight** Develop a network of urban freight delivery precincts in Melbourne to improve freight productivity and reduce emissions.
43	**Create and preserve opportunities for future major infrastructure projects** Create and preserve opportunities to build major infrastructure projects which might be required in the long term. This includes expanding desalination capacity, City Loop reconfiguration, extending and electrifying metropolitan trains to growth areas in Melbourne's north and south-east, Melbourne Metro 2, the Bay West port, the outer metropolitan road and rail corridor and connecting western intermodal freight terminal.
Future option	**Reconfigure the City Loop for more frequent and reliable trains** Reconfigure the City Loop by splitting 2 City Loop tunnels into 2 separate cross-city train lines. Build around 3 kilometres of new train tunnels and upgrade related power and signalling. Increase service frequency on the Craigieburn, Upfield and Frankston lines.
Future option	**Extend metropolitan trains to growth areas in Melbourne's north and south-east** Extend and electrify metropolitan trains to Clyde and towards Kalkallo to support growth in new suburbs.

Victoria's infrastructure strategy objectives

We consulted Victorians on the objectives

We asked Victorians to help us shape the objectives of this updated infrastructure strategy. They told us about infrastructure goals that are important to them. We first consulted Victorians on updating this strategy in 2023.[1] The consultation feedback informed the following objectives, as shown in Figure 1.

Figure 1: Victoria's infrastructure strategy objectives are equally important

Source: Infrastructure Victoria, *Strategy objectives engagement report*, 2023, p 5, accessed 5 September 2024.

We engaged with the community and stakeholders in several ways:

- We hosted a Young People's Forum to hear from Victorians aged between 15 and 25, because a 30-year infrastructure strategy will most affect their futures.
- We heard from regional Victorians at stakeholder workshops and learnt directly from local community representatives about their distinct infrastructure challenges and opportunities.
- We held discussions with First Peoples' representatives including Registered Aboriginal Parties and Aboriginal Community Controlled Organisations, who shared the perspectives and goals of Victoria's First Peoples.
- We consulted with experts in different infrastructure sectors and government departments to get accurate and up-to-date information about Victoria's infrastructure.

- We captured the views and ideas of everyday Victorians in an online consultation and heard their concerns about climate change, growing populations, urban change and local projects.

See section – How we developed the draft strategy and our *Strategy objectives engagement report* for more information on our strategy engagement and methodology.

These objectives can help guide Victoria's future

We used 6 objectives to guide the development of our draft recommendations. These objectives helped us prioritise the most important issues for Victorians. They helped us navigate the trade-offs involved in recommending infrastructure projects and policies to help steer Victoria's future.

We then used the 6 objectives to structure this updated draft strategy. Each section has draft recommendations for the Victorian Government.

The draft recommendations can help Victoria achieve these objectives. Many draft recommendations support multiple objectives. These draft recommendations provide practical advice to the Victorian Government to help ensure infrastructure meets Victoria's current and future needs.

Victoria faces challenges in achieving these objectives

Infrastructure is vulnerable to the impact of climate change and other risks

Victorians have recently faced the challenges of bushfires and floods. Climate change means Victoria will have more extreme weather events.[2]

Since we released *Victoria's infrastructure strategy 2021–2051*, Victorians have continued to live through the health and economic impacts of a global pandemic. Geopolitical tension and instability have affected Victoria, along with broader global economic challenges. Catastrophic events can happen suddenly and have devastating impacts.

Governments need to plan, build and maintain Victoria's infrastructure to be resilient to climate change and other risks. The Victorian Government has committed to net zero emissions by 2045.[3] Infrastructure is needed to achieve this target. It supports Victoria's transition to renewable energy generation.[4]

Climate change also threatens many of Victoria's natural ecosystems. Building infrastructure can further harm the natural environment. But governments can avoid this impact through planning for and designing infrastructure that minimises disruption to the natural environment. Healthy ecosystems provide many benefits to people and wildlife. Protecting and increasing vegetation helps to improve air and water quality, reduce soil erosion and increase biodiversity.[5]

A growing population places more demand on infrastructure

Victoria's population is growing faster than the national average.[6] By 2055, the government projects Victoria's population will reach up to 11.5 million.[7] This means Victoria's population will grow by about one million people each decade, for the next 3 decades.

Population growth places extra demands on Victoria's infrastructure. But harnessing this growth can help build a more prosperous economy and society. Well-planned, efficient and targeted infrastructure can help Victoria benefit from population growth.

A growing population can make it easier for businesses to find workers with the right skills.[8] Businesses also have access to more customers, helping to grow the economy and make it more productive.[9] People moving here from other countries can also make Victoria more culturally diverse and vibrant.[10]

Planning for future growth means Victoria can make the most of its unique regions.[11] Well-planned population growth can help Victoria continue to compete in the global economy.[12]

Governments can only build so much infrastructure

The high cost of materials makes new infrastructure more expensive to deliver.[13] Australia also does not have enough skilled workers to build its current pipeline of housing, energy and transport infrastructure.[14]

The Victorian Government expects its net debt will reach over $150 billion by mid-2025.[15] This debt may restrict future budget spending. The government will need to carefully prioritise its infrastructure investment to deliver what Victorians need most.

But there are also things the government can do without building more infrastructure. For example, it can better plan for the infrastructure it needs and investigate ways to improve the use of existing infrastructure. Government can also use more digital technologies, including artificial intelligence.[16] This can improve the productivity of Victoria's infrastructure and has wider benefits to people, businesses and Victoria's economy.[17]

The current shape of Victoria's cities makes it less efficient to deliver infrastructure

The shape of Victoria's cities influences Victorians' quality of life.[18] More compact cities – where people live and work closer together – are better for the economy, people and the environment.

Victoria's cities have historically expanded outwards. Landowners built new homes in new suburbs on city edges. But these places do not always have good access to infrastructure, sometimes for many years after homes are built. Spread out cities affect the ease with which Victorians can access health and social services.[19] They limit people's options to travel for work and study and restrict where they can rent or buy an affordable home.

Spread out cities cost the Victorian Government more.[20] Building infrastructure in new suburbs on a city's fringes can be up to 4 times more expensive than adapting existing infrastructure in established suburbs.[21] Continuing to build on the fringes of Victoria's cities also negatively impacts the natural environment and leads to lower social outcomes and economic benefits.[22]

More compact cities can give Victorians the best chance of living close to family and friends, jobs, education, shops and services.[23] It can also mean businesses have more opportunities to find skilled workers and be closer to markets and their customers.[24]

Have your say

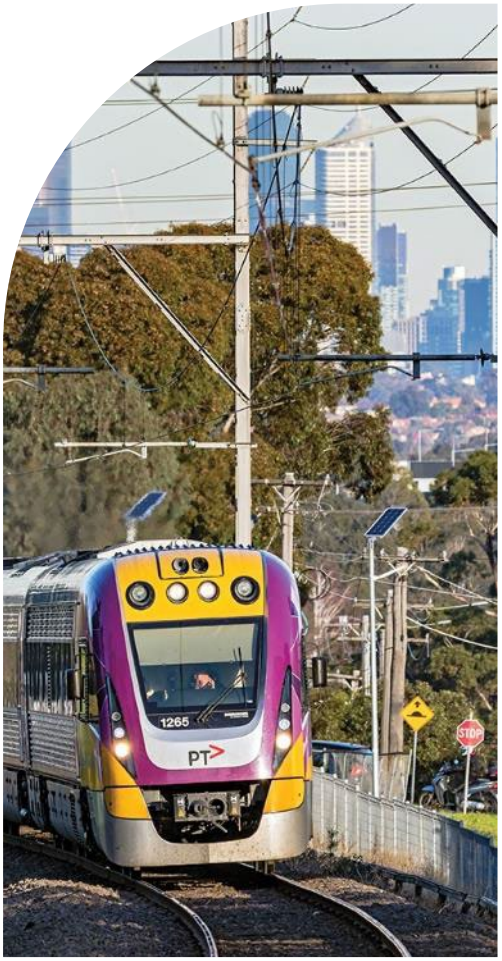
Every decision on infrastructure shapes Victoria's future. Your input will help shape Victoria's infrastructure strategy for the next 30 years. The draft strategy provides recommendations to the Victorian Government and Parliament on how to deliver new infrastructure where it is needed most and get the best use from the state's existing infrastructure.

We are seeking your feedback and evidence on our draft recommendations. Get involved in our public consultation at: https://engage.vic.gov.au/victorias30yearinfrastructurestrategy.

The updated infrastructure strategy will be tabled in the Victorian Parliament at the end of 2025.

Victorians have good access to housing, jobs, services and opportunities

Victorians can access housing, jobs, services, and opportunities to develop their capabilities, support their wellbeing, connect with other people, and take part in civic, community and cultural life.



Infrastructure influences how Victorians live

Victorians interact with infrastructure every day. It includes the roads they use to get to work, the education facilities that help them to learn and grow, and the health facilities where they receive care.

Infrastructure provides Victorians with essential services like the pipes that supply their water and the lines that supply their electricity. It also supports people and communities to connect at libraries, parks and community facilities.

Victorians told us they want transport infrastructure that better connects them with opportunities.[25] People preferred more space for public transport, cycling lanes and walking paths over road space for cars.[26]

But some people who live in Melbourne's growth areas and regional Victoria said they cannot easily access services and opportunities.[27] Victorians also mentioned the negative impacts of high housing costs, particularly for people experiencing disadvantage.[28]

Access to high-quality transport infrastructure varies across Victoria

Different types of transport can help people get to the places they need to go. Victorians take over 14 million trips every day.[29] They may be driving long distances, taking public transport to central locations, or making local trips by walking or cycling.

Public transport, walking and cycling help ease traffic congestion and can sometimes be faster than driving.[30] This is especially the case for inner city office workers who catch public transport to work. But in some parts of Victoria people have few alternatives to driving.[31] They also may have to deal with delays if roads need repairs or because of big transport projects.[32] It can be hard for people to access jobs in middle and outer suburbs, like people working in retail, hospitality, schools, hospitals, and factories.[33] Jobs in these areas typically have fewer public transport services.[34] If people cannot or do not drive, some might struggle to get to work, services and education.[35]

Victorians might not make a trip at all if public transport has few services each day or if the fare is too high.[36] Women, young and older people might not use public transport if they do not feel safe.[37] Many Victorians only have access to infrequent and indirect bus networks to get to jobs, services, education and recreation.[38]

Walking or riding a bike can be good for shorter trips, but in some places people might not feel safe.[39] Some people, including women and gender-diverse Victorians may find streets, public parks and trails unsafe, especially when walking.[40]

Established suburbs have good access to infrastructure, but many Victorians cannot afford to live in them

People who live in established suburbs often have more infrastructure like public transport, schools and libraries near their home.[41] The Victorian Government has a target for 70% of new homes to be built in these suburbs.[42] When people live closer to existing infrastructure, jobs and services, they have better health.[43] They spend less time travelling to work and other daily activities.[44] This means more time spent with family or doing social activities.[45] More than half of people living in Melbourne's inner suburbs have opportunities to get involved in cultural and creative experiences, compared to less than 40% in new suburbs.[46]

But homes in Melbourne and regional cities' established suburbs are expensive to buy and rent.[47] People with moderate and low incomes find it hard to afford to live in these suburbs.[48] Planning rules can make it difficult for property owners and developers to build new homes in places which have good existing infrastructure. Most homes that Victorians can afford are in new suburbs.[49] These places are only slowly getting public transport services, childcare and education facilities, libraries and aquatic centres.[50]

Access to infrastructure is worth investing in

Good access to infrastructure has social, economic and environmental benefits. Children who participate in high-quality early childhood education, and then regularly attend school and complete year 12, have better health and employment outcomes.[51] They also have higher incomes across their lives than those who do not.[52]

Getting to jobs can be easier when they are in places with existing transport options. Infrastructure also lets businesses connect with customers, markets and skilled workers. Businesses can have productivity benefits worth up to $193 billion.[53] If people can live in places that already have good infrastructure access, Victoria does not need to build so many homes in new suburbs. The edges of cities and towns can remain as farms producing Victoria's food or natural habitats for animals and plants.[54]

Some Victorians need access to specific types of infrastructure and services. Easily getting in and out of buildings with government services is especially important for people with mobility challenges. This is even more critical in regional Victoria, where a higher proportion of people have disabilities.[55]

Some people cannot find homes they can afford to rent in Melbourne, and in regional centres like Ballarat, Bendigo and Geelong.[56] Social housing can provide them with a safe and secure home.[57] Its social and economic benefits can be up to 1.25 more than the costs of meeting their housing needs.[58]

Draft recommendation 1

Build more social housing

> Consistently invest in new social housing to provide more Victorians on low incomes with access to a secure and affordable home.

Victoria needs more social housing

Between 2016 and 2021, homelessness in Victoria increased by 24% to over 30,000 people.[59] Without government investment, more people will experience homelessness and financial hardship. More people will also live in inadequate housing. This affects people's health, wellbeing, relationships and job opportunities.[60]

Victorians are finding it harder to afford a suitable, secure and safe home. More households are paying more than 30% of their income in rent, and Victoria does not have enough rental homes available for people on low incomes.[61] Just 1% of Victorian rentals are affordable for households on income support.[62]

Social housing can give low-income households long-term security because rent is more affordable. It also offers a secure home to households in crisis, such as those experiencing homelessness or fleeing family violence.[63]

Victoria does not have enough social housing for all the people who need it. Over 51,000 households were on the waiting list for social housing in June 2024.[64] The Victorian Government's initial Big Housing Build is coming to an end after funding 9,300 new social homes.[65] Even with this, social housing will make up only 2.8% of homes in Victoria compared to a national average of 4%.[66] This is the lowest of any Australian state or territory. Victoria needs an additional 60,000 social homes to meet the backlog of demand for homes.[67] Building this number will also get Victoria closer to reaching the national average.[68]

A 15-year program to build social housing can provide benefits to Melbourne and regional Victoria

We recommend that the Victorian Government fund a 15-year program to build around 4,000 social homes each year. This gives certainty to Homes Victoria and registered housing providers to secure land, develop supply chains and find workers. New social housing should be built in places close to jobs, transport and services, both in Melbourne and regional Victoria. Priority should be given to housing for Victorians on low incomes who have recently experienced homelessness, family violence or have other special needs.

Building 60,000 social homes will be expensive, but it is achievable when delivered as a program over 15 years. More social housing will help lower healthcare costs, increase productivity, and cut demand for support services.[69] For example, every $1 spent to eliminate youth homelessness alone can return an estimated $2.80 in benefits to the Victorian community.[70]

The Victorian Government can partner with organisations to develop and manage social housing

Upfront investment is the most cost-effective way to fund social housing.[71] The Victorian Government, not-for profit and for-profit organisations finance, develop and manage social housing.[72] The new program should fund both Homes Victoria and registered housing providers. The Australian Government also funds social housing in Victoria through the National Agreement on Social Housing and Homelessness.[73]

The government can build more public housing on well-located government land. It can fund community housing providers to build more homes by expanding the Social Housing Growth Fund.[74] It should also partner with Aboriginal housing providers to build homes for Aboriginal Victorians (see draft recommendation 22).[75]

The 15-year program will reduce homelessness and housing stress in Victoria, but it will not end it. As the population grows, the government will need to keep investing in social housing. It can create a long-term pipeline to deliver more social homes over time.

Cost range, timing and funding

We estimate that building 60,000 new social homes will cost $19 billion to $30 billion over 15 years.[76] We assume that the Victorian Government can fund $18 billion to $29 billion, around 95% of overall costs.

General Victorian Government revenue can partly fund this draft recommendation. But it does not need to do it alone. We have assumed the Australian Government will fund the remaining 5% of costs.[77]

This cost to the Victorian Government can be further reduced by up to $6 billion to $9.5 billion, assuming all new social homes can be built on land that government already owns, or on land owned by local government or not-for-profit housing organisations.

Starting in 2026 will allow the Big Housing Build investment to continue. This will improve efficiency and give certainty to all partners involved in planning, funding and delivery. Our commissioned report *Digital technologies and infrastructure productivity* found that building information modelling for public housing might provide Victoria with $1.9 billion in benefits by 2055, or $76.5 million each year (see draft recommendation 39).[78]

We estimate that each new home will cost $240,000 to $580,000, depending on size and location.[79] Building on land that government already owns will be cheaper, reducing the cost of each home by $25,000 to $300,000. Government can maximise the availability of public land to build social housing by identifying and prioritising suitable sites and streamlining transfers between public land owners. Strategic planning and development can also help to deliver better value and more diverse housing models, maximising the use of available land.

The Victorian Government can continue to use funding as part of public private partnerships and ground lease models so that not-for-profit and private sectors can build social and private homes in mixed developments.[80]

Maintaining these social homes will cost around $500 million each year. Rents collected, which will be set at around 25% to 30% of tenants' income, can cover some operational costs.[81] The Victorian Government does not currently fund regular maintenance of social housing and its financial sustainability is under review.[82]

We also recommend building more social housing for Aboriginal Victorians in this infrastructure strategy. See draft recommendation 22 for further detail on social homes specifically for Aboriginal Victorians. The cost of draft recommendation 22 is included as a component of the total cost to build social homes in this recommendation.

Draft recommendation 2

Facilitate markets and invest in kindergarten infrastructure

> Facilitate markets for private and not-for-profit investment in kindergarten infrastructure. Share regularly updated information about the demand for and supply of kindergarten places. Publish priorities for government investment to deliver kindergartens in communities that will have the greatest need.

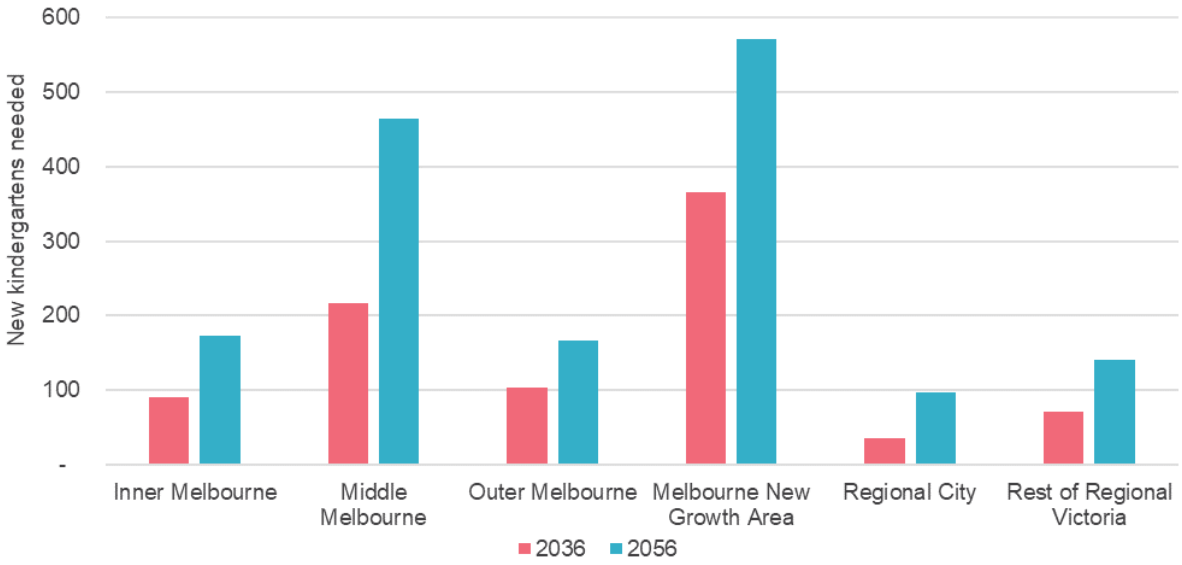
Early years education improves children's lives

Children who attend quality early childhood education have better life outcomes.[83] For every $1 invested in early childhood education, the community receives $2 of value.[84] This is because those children will have better skills, earn more, and use fewer health, welfare and justice services during their lives.[85]

The Victorian Government started offering free kindergarten to all 3-year-olds for at least 5 hours a week from 2022, increasing to 15 hours by 2029. It will offer all 4-year-olds a 30-hour weekly program by 2036.[86]

Victoria needs more kindergartens to meet future demand for these longer hours. We estimate that Victoria will need around 900 new kindergartens by 2036 (see Figure 2).[87] This is a big undertaking, but it can be achieved through a variety of providers and funding sources.

Figure 2: Victoria needs more kindergartens



Source: The Centre for International Economics, *Part 2: kindergarten provision projection*, report to Infrastructure Victoria, 2024, p 18, accessed 17 December 2024.

Active market facilitation is needed

Private businesses, not-for-profit organisations and local governments all deliver kindergarten programs. This combination provides different options for the diverse needs of families and children. The government can make its funding more effective by focusing on areas where other providers are unlikely to build new kindergartens.

The Victorian Government should do more to facilitate delivery of this infrastructure in a market with so many different providers. This involves building trusted and open relationships with private and not-for-profit providers, and local governments, to encourage information sharing.

The government should provide timely information about the demand for and supply of kindergarten places. It should update the information regularly. This can encourage planning and investment from all sectors. The current kindergarten infrastructure and services planning process is a good start.[88] To make it timely and accessible, the government should develop this into an online platform that combines statewide information from all sectors.

Good market facilitation will allow:

- providers and local governments to decide where and when they invest
- more lead time before projects start to align co-investment, such as from local governments
- time to collaborate on building design, such as integrated hubs that house other government services alongside kindergartens.

Target government investment in places with the greatest need to deliver better outcomes

The Victorian Government should publish clear priorities for where it will direct its kindergarten investment over the next 5 years. It should adapt these plans as other providers' activities become clear. This should include deciding which school sites will host government-funded kindergarten infrastructure to avoid duplicating any existing or planned facilities.

Targeted investment will deliver more infrastructure where it is most needed. This includes funding for lower-income areas, Melbourne's new suburbs and regional centres.[89] It also includes grants to local government and not-for-profit providers.

Cost range, timing and funding

We estimate that facilitating and investing in around 900 new kindergartens will cost around $17 billion from all funding sources.[90] We assume that the Victorian Government will be responsible for between 300 and 600 of these facilities.[91] We estimate that this will cost the Victorian Government $3.9 billion to $7.2 billion over 10 years, noting that the level of government contribution for kindergarten infrastructure differs by sector.

If the government needs to buy land for these kindergartens, it may cost $2.2 billion to $3.8 billion extra.[92] Co-locating kindergartens with schools and other services on public land can avoid or reduce these land costs.

The Victorian Government can build new kindergartens or give grants to local government and not-for-profit providers. General government revenue can fund new kindergartens. Local government, not-for-profit and private operators can fund the rest. The Australian Government has announced a $1 billion Building Early Education Fund which can also fund some new and expanded kindergartens in areas of need, including in outer suburbs and regional areas.[93] Using public private partnerships can help share costs, as happened in the 2008 to 2018 Victorian school building programs.[94]

We estimate costs include $5 million to $10 million over 10 years for Victorian Government staff to help develop markets for private and not-for-profit groups. They can oversee, monitor and take responsibility for the whole kindergarten education system. This includes predicting demand, looking at infrastructure needs each year, and showing where new kindergartens should go.

Once built, these new kindergartens will cost $200 million to $300 million a year to maintain.

Draft recommendation 3

Plan and deliver expanded and new schools

> Identify schools to expand and confirm areas that will need new schools. Fund expansions of existing schools and begin delivery of new schools. Minimise costs by expanding the built capacity of existing schools and building larger new schools.

More schools are needed to accommodate Melbourne's growth

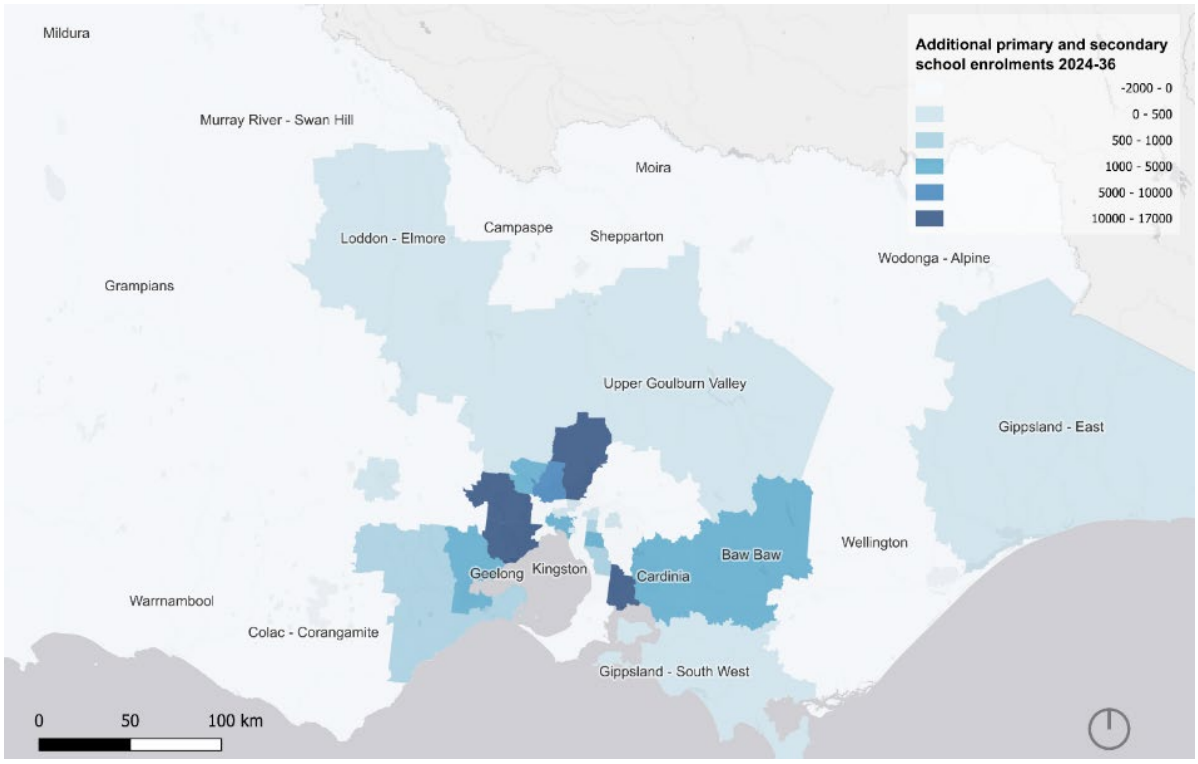
A good education provides people with more life choices. School infrastructure supports teachers, parents and the wider school community to deliver good teaching and learning outcomes.[95]

The Victorian Government has almost completed its 2018 promise to open 100 new schools, with 75 schools already open and 25 to open by 2026.[96] But it has not announced plans or funding to deliver new schools after 2026.

We used official 30-year population forecasts to examine Victoria's future government school needs (see Figure 3).[97] If the population grows as forecast, public schools will need many more places to accommodate all students. Some schools in inner Melbourne and new suburbs are already running out of space for more students.[98]

The government can meet this demand in different ways. It can add more portable buildings, build new classrooms in existing schools, or design new schools of different sizes. This affects how many schools Victoria will need and how much they will cost.

Figure 3: Victoria will have more primary and secondary students in 2036, especially in new suburbs



Source: The Centre for International Economics, *Part 1: primary and secondary schools provision projection*, report to Infrastructure Victoria, 2024, accessed 12 December 2024; Infrastructure Victoria, *Learning for life: preparing kindergarten, school and TAFE infrastructure for the future*, 2024, p 25, accessed 12 December 2024.

Some existing schools have space to grow

Schools can expand in different ways depending on where they are. Many government schools have space to grow. The government should plan for new students in existing schools before building new ones, wherever possible. Our modelling shows this might accommodate almost half of Victoria's enrolment growth by 2036.[99]

But some schools in inner and middle Melbourne do not have space for more buildings. They need to expand through multi-storey buildings on site to enrol more students. Adding buildings at existing schools is often cheaper than building new schools. New schools also cost more to build in established suburbs where land and construction costs are higher.[100]

We estimate that adding extra buildings at existing schools would cost $1.5 billion to $3.3 billion, depending on how many relocatable classrooms the schools need.[101] This would avoid government spending up to $2.4 billion in construction and land costs for new schools by 2036.[102]

Transparent planning and funding for future schools is needed

We modelled 4 scenarios that looked at how many new schools Victoria might need and where existing schools have space to grow. Our model estimates that between 35 and 60 new schools will be needed by 2036, depending on the size and distance between schools.[103] These are in addition to the new schools the government has already committed to. Nearly all will be in Melbourne's new suburbs.[104]

We estimate a further 85 to 145 new schools are likely to be needed by 2056.[105] Local area planning will need to determine future school locations. This is to ensure the government meets its legislative requirements that all students can access their local school.

The Victorian Government should plan, fund and acquire land for new schools now. Transparency about land acquisition and timing will give local governments, non-government schools and communities time to participate in the planning and design of new schools to best meet community needs.

Cost range, timing and funding

We estimate that planning and delivering expanded and new schools will cost around $5.7 billion over 10 years for implementation and capital works. This includes both the cost to expand existing schools and build new, larger schools. Land is around a third of the total cost for new schools on average, and up to half of the total cost in inner Melbourne.[106]

This draft recommendation can be funded through general government revenue. The Victorian Government has established systems and processes to plan and build schools and can use existing staff to carry out this work. Similar to draft recommendation 2, there are opportunities to spread costs by using public private partnerships, like in the delivery of schools built in Victoria in 2008 to 2018.[107] The Australian Government can fund some of this through recent programs like the Schools Upgrade Fund.[108]

Once complete, these new schools will cost $170 million to $220 million a year to maintain.

Draft recommendation 4

Expand TAFE in Melbourne's growth areas and some large regional centres

> Expand TAFE campuses in Melbourne's west, north and south-east growth areas, and some large regional centres, to train more students to fill skills gaps, especially in construction, energy and health.

TAFEs provide training to meet Victoria's skills needs

The *Victorian skills plan* estimates there will be 352,000 new workers in Victoria by 2026.[109] Almost half will require vocational qualifications.[110] Australia has growing shortages in trades, forecast to peak at 203,000 workers in 2025.[111] The healthcare sector also has skilled worker shortages, including aged and disability carers.[112]

Victoria's transition to renewable energy is expected to need 10,000 new workers every year until 2030.[113] These workers, including electricians and plumbers, will need construction and trades skills. They will also need new specialist skills, such as in battery storage or wind farms.

TAFE institutes train workers for these sectors. This helps Victoria's economy grow and become more productive.[114] TAFEs educate people at all stages of life and provide career paths to improve life outcomes. People who do not finish school have fewer job choices and opportunities.[115] TAFEs provide training for thousands of students, including those who have left school early or want to re-train for a different sector.

The Victorian Government expanded the Free TAFE program in 2024.[116] This means more students are enrolling. We found that 22% of adults would likely enrol in TAFE in the next 5 years.[117] TAFEs will need more space to train more students.

Victoria's TAFEs need more space for construction, energy and healthcare training

Many people living in Melbourne's growth areas and regional Victoria cannot access a TAFE campus that offers a suitable course in their local area.[118] For example, TAFE campuses in Werribee and Berwick offer limited construction and trades training. By 2036, we estimate Victoria's TAFEs will need about 20% more space to deliver the expected enrolments in all sectors.[119] This is on top of government commitments for new campuses in Melton and Sunbury.[120]

Melbourne's new growth areas are projected to have the largest increase in demand for construction and healthcare training. This training needs space due to its in-person and specialised nature. Students use equipment to learn practical skills in real work settings.[121] More classroom space is needed to teach more students.

We estimate that TAFEs in Melbourne's growth areas will need over 125,000 square metres of extra space to deliver training in construction, energy and healthcare combined. TAFEs in Geelong, Ballarat, Bendigo and the Latrobe Valley will together need around 50,000 square metres of extra space to meet future demand.[122]

TAFEs can expand to deliver more training

By 2030, the Victorian Government should fund the extra space needed at TAFEs in Melbourne's growth areas and large regional centres. This will improve access to construction, trades and healthcare training, so more people can attend a campus closer to home.

The government should work with TAFE institutes to confirm the best places to expand. They should choose places where TAFEs have space to grow. These should be close to public transport so people can get there easily, and also near jobs and services. Potential campuses include:

- Victoria University in partnership with Gordon TAFE – Werribee
- Chisholm TAFE – Berwick
- Melbourne Polytechnic – new campus in northern growth suburbs
- Gordon TAFE – Geelong or a new campus in outer Geelong or the Surf Coast
- Federation University – Ballarat
- Bendigo Kangan Institute – Bendigo
- Gippsland TAFE – Latrobe Valley.

Cost range, timing and funding

We estimate that expanding TAFEs will cost $1.9 billion to $2.5 billion over 10 years. General government revenue can fund this draft recommendation. The Victorian Government can also source additional funding through the Australian Government's National Skills Agreement.[123]

This includes the cost of building new teaching spaces at existing TAFE campuses in Melbourne's growth areas, and in Ballarat, Bendigo and the Latrobe Valley. This cost range assumes the Victorian Government does not need to buy more land.

Many TAFE institutes hold substantial amounts of land.[124] Some may not need it all for future growth. In these circumstances, some TAFEs might reduce the size of some campuses or consolidate their assets on a smaller site. The government can use any proceeds from selling land to help fund more infrastructure.

Once built, new TAFE facilities will cost $50 million to $75 million each year to maintain.

Draft recommendation 5

Build libraries and aquatic centres for Melbourne's growing communities

> Fund councils to plan and build libraries and aquatic recreation centres in Melbourne's growth areas.

Libraries and aquatic centres provide essential services to growing communities

Libraries help people learn important skills, participate in the economy and connect with each other.[125] Aquatic recreation centres promote health, wellbeing and water safety.[126]

Communities in Melbourne's new suburbs are young, diverse and growing quickly.[127] These areas also experience hotter temperatures and fewer people take part in sport and the arts.[128]

Libraries and aquatic centres provide services tailored to local needs. These places offer information in different languages and build identity and community.[129] They provide refuge from the heat and reduce the higher drowning risk for Australians born overseas.[130] They also provide spaces for creative, cultural and physical activity.[131] These services improve health and wellbeing which reduces government costs.[132]

Every $1 spent on an aquatic centre in a capital city has $3.70 in benefits.[133] Libraries deliver $2 to $4.30 in benefits for every $1 of investment.[134]

Access to libraries and aquatic centres is unequal and getting worse

Access to libraries and aquatic centres is still not equal.[135] There is one library for every 62,000 residents in Melbourne's growth areas. In established suburbs, there is one library for every 30,000 people (see Figure 4). Similarly, growth areas have one aquatic centre for every 82,000 residents, compared to every 58,000 people in established suburbs.[136] Growth area residents risk poorer health, wellbeing, social inclusion and learning outcomes.

Some councils, including Wyndham and Whittlesea, have created small library spaces that provide basic services.[137] These are a good idea, but they do not provide the same level of services for growth areas as libraries in other parts of Melbourne.

Planning and investment in new or expanded facilities should start now

Planning should start now for facilities in all 7 growth area councils. This work should assess existing capacity and identify future needs. It should consider opportunities to co-locate or share use with other services and councils. The Victorian Government should fund service planning for each council of up to $200,000 for aquatic centres and $100,000 for libraries.

Our analysis shows that Melton, Casey, Wyndham and Cardinia urgently need a new or expanded library. Residents in Melton, Wyndham and Casey also have poor access to aquatic centres. Rapid population growth will make this worse.[138]

Local councils own and operate libraries and aquatic centres. These facilities are costly to build and upgrade.[139] In the past, the Victorian Government provided large grants for aquatic centres and funding for libraries. But now its funding is not enough to meet the need for regional scale infrastructure in growth areas.[140]

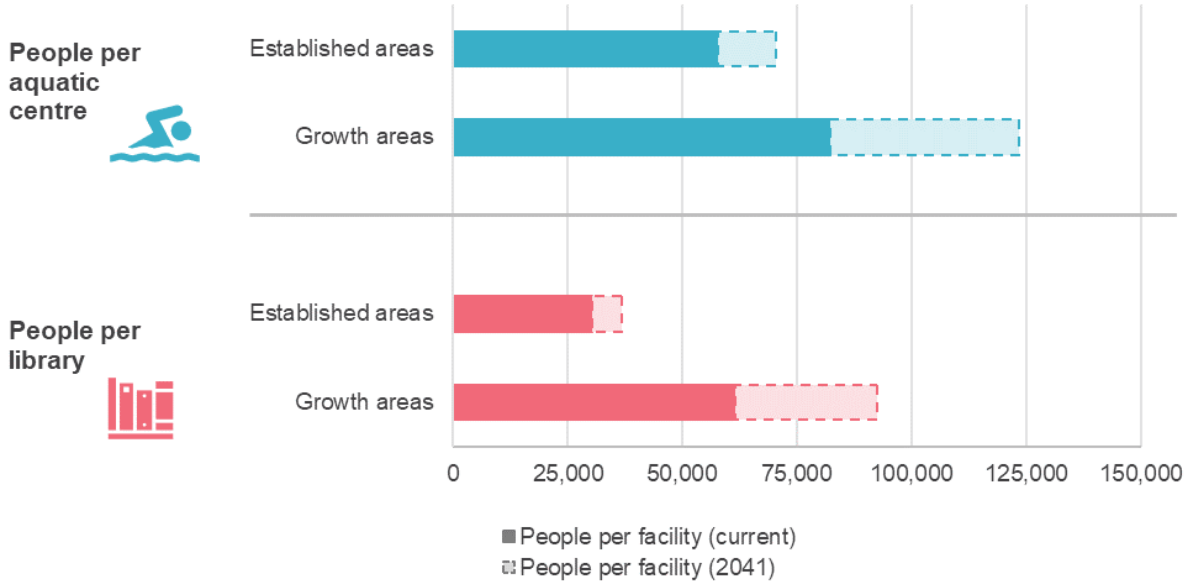
The Victorian Government should contribute up to a third of the cost to build or expand core components of the facilities, such as pools, with local and Australian governments covering the rest.[141]

Councils can fund any extra recreational or commercial spaces the community might need. This includes combining facilities like meeting rooms and gymnasiums with libraries and swimming pools to cross subsidise operational costs and provide benefits to the community. Staging delivery to expand functions over time can also reduce upfront costs.

Australian Government grants are also available, like the Thriving Suburbs Program.[142] Councils can apply for sustainability grants to reduce their operational costs.[143] Facilities should be energy efficient to minimise ongoing running costs.[144]

Co-location can also reduce costs, address local needs and realise further benefits.[145] For example, Warrnambool's public library is on the South West TAFE campus. The shared location avoids duplicating services. It also improves community access to the services available at TAFE.[146]

Figure 4: Melbourne's growth areas will need more aquatic centres and libraries



Source: Infrastructure Victoria analysis of local government data from Life Saving Victoria and Public Libraries Victoria, confirmed through desktop review and stakeholder consultation. Life Saving Victoria, *Victorian public pools register*, website, n.d., accessed 21 November 2024; Public Libraries Victoria, *Directory of public library services in Victoria*, State of Victoria, 2024, accessed 21 November 2024.

Cost range, timing and funding

We estimate that building core components of new libraries and aquatic recreation centres will cost $300 million to $500 million in implementation and capital works. These costs can be split into 2 stages. With funding shared across all levels of government, we assume this draft recommendation will cost the Victorian Government $100 million to $160 million.

The Victorian Government can implement the first stage of this draft recommendation for around $2 million. This covers grants to the 7 growth area councils for strategic planning, including opportunities to share facilities in neighbouring councils.

Strategic planning should happen across groups of local governments. For example, 50 metre pools for competition can serve more than one council area, while 25 metre pools can support local swimming lessons and wellbeing. General Victorian Government revenue can fund this stage.

The second stage includes grants to local governments for up to a third of the cost to deliver core components of new or improved libraries and aquatic centres in growth areas. This includes contributions for

3 new aquatic centres and 4 new libraries. We estimate grants of around $25 million for each aquatic centre and $10 million for each library. We estimate that it will cost less than $1 million to administer the grants using existing staff. General Victorian Government revenue and other infrastructure contributions (see draft recommendation 36) can fund this stage.

Our cost estimate excludes buying land as we have assumed local governments will prioritise using land they own. Local governments will also be responsible for operational costs.

Draft recommendation 6

Make government infrastructure more accessible

> Complete priority public transport stop upgrades to meet legal accessibility requirements and fund further upgrades. Provide better public information on accessibility in government buildings.

The Victorian Government funds infrastructure and services for all Victorians to use. But not everyone can access them. Over 1 million Victorians have a disability.[147] Many people with disability have challenges using transport and accessing services.[148] One in 5 Victorians with disability require help or have difficulty using public transport. One in 8 cannot use public transport at all.[149]

People experience different mobility challenges in their life. This includes people with injuries, people using prams and older people. Those who face barriers to services have a higher risk of social isolation, unemployment and poor health.[150]

Most public transport is still inaccessible

The Victorian Government missed the 2022 legal deadline to make all public transport stops accessible.[151] Almost half of regional and one-third of Melbourne's bus stops are not wheelchair accessible.[152] Over 70% of tram stops are not level access.[153] When tram stops are upgraded to level access, they reduce pedestrian injuries from road accidents by 81%.[154] The government is upgrading 8 stops a year.[155] At this rate, it will take 155 years to complete.[156]

The government is required to make all trains and trams accessible by 2032.[157] Over half of trams are not accessible, with steps and high floors.[158] The government is building 100 low-floor trams to start running from 2025, but it needs to replace 186 more.[159]

The government has published a prioritisation framework to identify the most important transport accessibility upgrades.[160] It has not funded these yet. The government should fund the highest priority stop upgrades and aim to finish them by 2030. By 2030, it should also approve funding for the next wave of accessibility upgrades.

Better information can help people manage barriers to access

In Victoria, 26% of people with disability have difficulty accessing buildings or facilities.[161] The Victorian Government's universal design policy outlines design principles that can improve accessibility for new buildings.[162] But many existing buildings are still not accessible.

Accessibility information allows people to decide how they travel outside their home. It lets them know what to expect before going to a new place. Parks Victoria publishes accessibility information for 17 local, state and national parks.[163] Melbourne's SmartBuses have real-time information and trams have brightly coloured QR codes to deliver audio information to blind and low vision people.[164] But not all government services do this.

In 2022, the government audited TAFE campuses to identify potential upgrades.[165] It should assess all buildings that deliver government services by 2030. The findings should inform published accessibility information for government buildings and services. For example, Canada's Rick Hansen Foundation runs an accessibility rating system that awards more points for features that improve access.[166] Information on building accessibility should be developed with people living with disability and updated as upgrades are made.

Cost range, timing and funding

We estimate this draft recommendation will cost around $1.5 billion over 10 years.

This includes up to $1.5 billion for bus and tram stops. The Victorian Government can also spend $1 million to $5 million on an information tool that explains how to access all government buildings and services. General government revenue can fund this draft recommendation.

People in wheelchairs can already use more than 50% of Victoria's bus stops.[167] We estimate upgrading the rest will cost $200 million to $300 million. The cost of upgrading tram stops is likely to be substantially higher.[168] The Victorian Government can explore building innovations like modular or pre-built parts to reduce costs and speed up installation for the remaining bus and tram stops.[169]

Draft recommendation 7

Rezone locations near existing infrastructure for more home choices

> Change all relevant planning schemes to rezone for more homes in Victoria's cities and reach housing targets. More homes should be close to public transport and open space, with good access to services.

More compact cities deliver more benefits

Our research in *Choosing Victoria's future* found that Victorians will be better off in more compact cities.[170] Compact cities have more homes closer to jobs and services. They have stronger economies and create more high-paid, secure jobs. By 2056, we estimate a more compact city can generate $9 billion more in economic activity, and Victorians can earn an extra $5 billion in wages and profits, compared to a spread out city.[171]

For decades, Victorians have built more homes in new suburbs than in established ones. Planning rules limit the number of homes that developers can build in established suburbs.

Most middle suburbs in Melbourne and Victoria's regional cities are very low-density neighbourhoods compared to other cities of similar size.[172] They do not have many housing options apart from detached homes and a few townhouses.[173] Heritage controls also make it hard to build new homes in these areas.[174]

Compact cities use less land and make better use of infrastructure.[175] They allow people more affordable home choices in more places. People have more transport options to easily reach work, schools, shops and services.[176] They can walk or cycle to more places, which encourages them to do so more often.[177] This helps keep people healthy. It also reduces air pollution and greenhouse gas emissions from transport.[178]

Rezoning allows more homes to be developed near existing infrastructure

The Victorian Government is developing activity centre plans to guide planning rule changes in and around some of Melbourne's activity centres, but there is an opportunity to do more.[179] It should develop plans and then rezone other areas close to public transport and open space that also have enough infrastructure for more people to live there. The inner and middle suburbs of Victoria's cities already have good access to infrastructure, including schools and parks.[180] Rezoning these places will allow developers to build more homes near existing infrastructure.

The government has reviewed access to jobs, services and public transport in and around activity centres.[181] But growing suburbs might need other infrastructure like open space.[182] The government should prioritise these criteria to find the best places for more homes. It can exclude sites with high heritage or environmental value. It has committed to setting housing targets for each local government area to help guide development. It can do this in Victoria's biggest cities first: Melbourne, Geelong, Ballarat and Bendigo.

The Victorian Government should consult with local governments on the plans, zoning changes and any necessary infrastructure upgrades. It should then change statutory planning controls in priority locations to allow more homes.

Rezoning should be bundled with other development incentives

Changing planning zones does not guarantee that developers will build more homes.[183] The government can offer incentives to developers in rezoned locations. It is already speeding up planning approvals in activity centres.[184] It can also give rights to develop unused air space above train stations or car parks, or finance brokerage to share risk among project investors.

The government has not typically monitored the effects of zone changes on home building. It should measure and report how well these and earlier changes generate more new homes in good locations and keep monitoring the impact of rezoning to identify potential future changes.

Cost range, timing and funding

We estimate that this draft recommendation will cost $1 million to $5 million to implement over 5 years. This includes reviewing existing zoning around public transport and other amenities, developing rezoning criteria, consulting with communities and local government, amending the planning scheme and monitoring growth in housing. Existing staff can carry out much of this work.

The cost of rezoning can be funded through general government revenue.

Rezoning may also create indirect benefits and costs to government and landowners. For example, rezoning is likely to increase the land value and require upgrades to existing infrastructure to support more housing. However, we found that building infrastructure in new growth areas can cost up to 4 times more than in established suburbs.[185] Where new infrastructure is needed, redesigned infrastructure contribution schemes can help to offset the cost of new infrastructure (see draft recommendation 36).

Future option

Mandate more affordable homes near existing infrastructure

> Choose a mechanism to mandate more housing that is affordable for low-income households and close to public transport, open space and services.

More Victorian households are struggling to find an affordable home

Many low-income households in Victoria are finding it hard to afford a home. Rent in the private market is often too expensive.[186] Affordable housing helps people avoid poverty, allows more businesses to hire local workers and supports more inclusive places.[187]

Housing is generally considered affordable for low-income households when it costs less than 30% of their income. This helps them avoid housing affordability stress.[188] In 2021, Melbourne's inner and middle suburbs had a shortage of 71,600 rental homes affordable for low-income households. Ballarat, Bendigo and Geelong had a combined shortage of 8,700 homes.[189] Current affordable housing approaches are inconsistent across Victoria, need project-specific negotiations, and do not produce enough homes.[190]

Our research in *Choosing Victoria's future: 5 urban development scenarios* shows that more compact cities can help more people find an affordable home in different places.[191] These cities have more homes closer to existing infrastructure.[192] They offer more travel options, so people can easily get to work, schools, shops and services.[193]

In *Our home choices: how more housing options can make better use of Victoria's existing infrastructure*, we show that most homes in established suburbs of Melbourne are unaffordable for households even on moderate incomes.[194] Many households must move to new suburbs and these often require more expensive new infrastructure.[195]

The government can encourage more affordable housing to better use existing infrastructure

When the Victorian Government is rezoning locations near existing infrastructure for more home choices (see draft recommendation 7), it can consider how to make housing more affordable for low-income households.[196] When rezoning, it can require developers to return some of the benefit of higher land values by building affordable homes.[197]

The government can do this first in inner and middle Melbourne, Geelong, Ballarat and Bendigo so developers build new affordable homes in places with existing infrastructure. More low-income households might then afford to live close to existing public transport, services and open space. This might improve their health and wellbeing by giving them better access to jobs.[198]

The Victorian Government can use different approaches to encourage developers to build more affordable homes near existing infrastructure. For example, it can require developers to include affordable homes in their housing developments or make cash contributions.[199] The government can also buy land and combine it with land it already owns to build affordable homes. South Australia and New South Wales are taking a similar approach (see case study – Affordable homes in other Australian jurisdictions).

To help determine which approach will work best in Victoria, the Victorian Government can:

- work with developers, local governments and registered community housing providers to decide how to include affordable homes in new developments while making sure the development is financially viable
- decide who is eligible for an affordable home

- explore how homes can stay affordable to low-income households over time (for example, affordable housing in the United States needs to stay affordable for at least 30 years)[207]
- model how many affordable homes can be built in rezoned areas by capturing some of the higher land value from rezoning
- trial the preferred affordable housing approach on government-owned land, including in state-led precincts and activity centres
- find ways to develop underused public land and combine lots in rezoned locations for affordable homes.

Cost range, timing and funding

We estimate this future option will cost $1 million to $5 million. General government revenue can fund this future option.

This includes costs for government staff to consult and model the impact of policy to decide on the best approach. It also includes costs to trial the approach.

The Victorian Government has already set up the Development Facilitation Program which fast-tracks project approvals for developments where 10% of new homes are affordable.[208] This can help to achieve housing targets as part of *Victoria's housing statement*.[209]

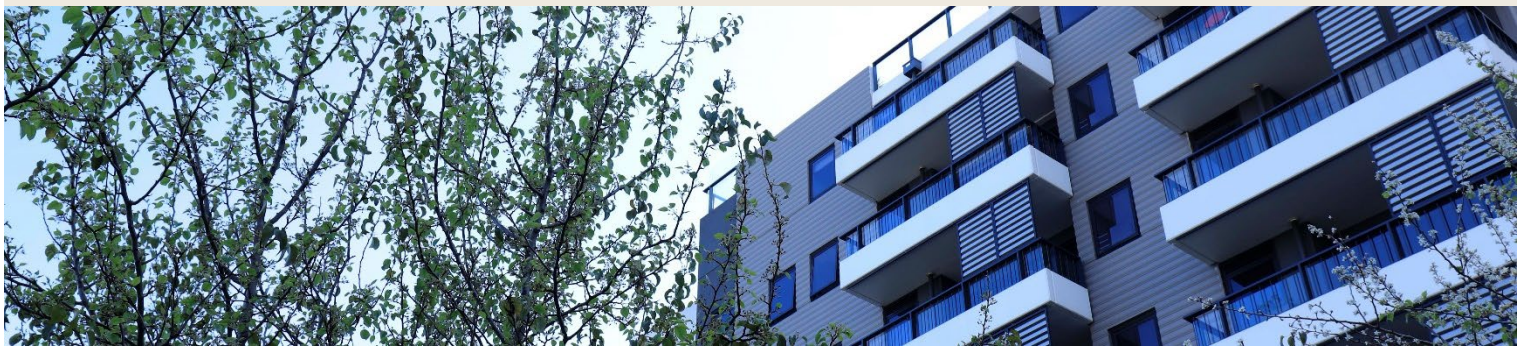
Case study

Affordable homes in other Australian jurisdictions

Governments across Australia are exploring ways to increase the supply of affordable homes. Schemes can include homes to buy or rent, or a combination of both.[200]

The South Australian Government introduced the *Housing plan for South Australia* in 2005. The scheme requires 15% of homes in large residential developments to be affordable. Initially, the requirement applied to government land releases in outer suburbs, but the policy now applies to urban renewal sites. Over the 10 years to 2015, the scheme delivered 5,485 affordable homes, around 17% of new supply in major residential projects.[201] These include a mix of social and affordable rental homes as well as low-cost home ownership.[202]

In New South Wales, the City of Sydney requires all developers to contribute towards affordable rental housing. This helps make sure that low-income households can still afford to live and work in the city.[203] Developers can include affordable homes in their projects or make a cash contribution instead.[204] Community housing providers then manage the rental homes. They also receive the cash contributions.[205] The scheme has delivered around 900 social homes in Ultimo-Pyrmont. It is expected to deliver over 300 affordable homes in Sydney's Green Square.[206]



Future option

Phase out residential stamp duties

> Over the long term, phase out residential stamp duties and phase in residential land tax.

Stamp duty influences home choices, infrastructure costs and use

Stamp duty is a tax on the transfer of land ownership, collected by the Victorian Government when people sell residential property.

Stamp duty pushes people to live in new suburbs, creating higher infrastructure costs to government. It discourages people from moving into different homes as their lives change. Instead, stamp duty encourages homebuyers to look for a larger 'forever home'.[210] These homes are often only affordable in new suburbs. Providing infrastructure for homes in new suburbs is more expensive than in established suburbs.[211] This means stamp duty increases infrastructure costs to government.

Stamp duty adds strain to transport infrastructure. It is a penalty for moving house to be close to family or for a new job.[212] It may prevent some people from moving, which means they need to travel further than they otherwise would.[213] This creates more congestion and crowding on the transport network which is costly for the government to address.

Replacing stamp duty with a residential land tax can improve economic productivity

The Victorian Government can phase out stamp duties on residential properties over time. This would remove the upfront tax on buying a home and encourage homebuyers to look for a house that suits their current needs. It would also make it easier for people to move to places where jobs are available. This makes it easier for businesses to attract staff, improving economic productivity.[214]

To make up for the tax revenue lost from stamp duty, the government can expand land tax to cover all residential properties.[215] Land tax is a yearly charge based on land value rather than a single upfront payment. It can provide a steadier revenue stream for governments and does not deter people from moving house.[216]

Modelling suggests that replacing stamp duty with land tax can increase home ownership rates among young people.[217] Land tax can also encourage higher housing densities, encouraging cities to be more compact.[218] Providing infrastructure for a more compact city is more efficient, and cheaper for government.[219] This means moving to a land tax can help reduce the cost of providing infrastructure to service new housing.

The government is already making some changes to stamp duties. Over 10 years, a land tax will replace stamp duty for commercial and industrial properties.[220] The government is also expanding stamp duty concessions for off-the-plan apartments, townhouses and units for a 12-month period.[221] Removing stamp duty for all residential properties would complement these measures, making it easier for people to buy and sell a home.

Phasing out stamp duty can be done over the long term

Stamp duty is a major source of government revenue. Stamp duties raised $8.3 billion in the 2023–24 financial year.[222] Transitioning away from stamp duty to land tax needs to be carefully phased over the long term to avoid disruptions to government revenue and the housing market.[223]

There are several sensible transition paths for the Victorian Government to choose from.[224] For example, the ACT Government is gradually reducing stamp duty rates while increasing land tax over 20 years.[225] This is a good model for the Victorian Government to consider.

Cost range, timing and funding

We estimate that it will cost $1 million to $5 million to action this future option. General government revenue can fund this work.

The cost includes developing a legislative impact assessment, consulting with stakeholders, and undertaking processes to amend and adopt new legislation. Our estimate allows for expanding government systems to allow for an increase in residential land tax collection, while also phasing out residential stamp duties. The government can use existing staff to do this work.

Draft recommendation 8

Extend Melbourne's trams to encourage more new homes nearby

> Increase services on key tram routes in activity centres that have been designated for additional housing development. Complete a detailed assessment of tram extensions in Melbourne's established suburbs. Start building extensions in areas that can support more new homes. Rezone land around the extended tram lines so more homes are built.

Trams can support more homes in inner and middle Melbourne

The Victorian Government wants to build 800,000 homes over the next decade, with 70% in established suburbs.[226] Building in these areas can improve access to jobs, schools, shops, and services.[227] It can also make better use of Victoria's existing infrastructure.[228] Yet only half of new homes approved in the past 2 years have been in established suburbs.[229]

Some tram routes serving activity centres that have been designated for additional housing development are already crowded at peak times.[230] Adding services can encourage more homes while helping reduce crowding, road congestion and transport emissions.[231]

The government should add around 300 more services a week on key routes where more homes are planned and trams are already very busy, like routes 86, 96 and 109.[232] It should run more evening and weekend tram services so people who live near tram lines are less dependent on cars and new housing developments do not require as many parking spaces.[233]

Extending tram lines in established suburbs can make the most of Melbourne's tram network and encourage more development.[234] This can encourage developers to build homes along the entire route, not just the new extensions.[235] Expanding the tram network is much cheaper than expanding the train network in established suburbs, which can involve expensive tunnelling.[236]

Extending the tram network and improving services to the government's priority precincts and activity centres can also encourage residential and commercial development. Tram services do not reach some of these places that can provide more new homes, like Fishermans Bend, Moorabbin and Chadstone.[237]

The government should deliver priority tram extensions to encourage new homes

The Victorian Government should complete a detailed assessment of tram extensions in Melbourne's established suburbs. We have prioritised 8 tram extensions for the government to start building by 2030 (see Figure 5). We chose these based on their potential to encourage new homes, improve access to jobs and increase public transport use. The priority projects are:

- Arden trams:
  - Swanston Street to Kensington
  - Spencer Street to Flemington Bridge
- Fishermans Bend trams:
  - Anzac train station to Fishermans Bend North
  - Southern Cross Station to Fishermans Bend South
- Middle suburbs tram extensions:
  - East Malvern to Hughesdale via Chadstone
  - East Brighton to Moorabbin
  - Melville Road to Batman train station in Coburg

- Wattle Park to Burwood East.

The 4 tram extensions in the middle suburbs could encourage around 32,000 new homes in these areas and increase daily public transport boardings by 17,500.[238] Building new homes in established suburbs could save over $1 billion in public infrastructure costs compared to building in new outer suburbs.[239]

These projects will connect people to trains at East Malvern, Moorabbin, Batman and the future Burwood station on the Suburban Rail Loop. Access to other activity centres in middle suburbs could improve by up to 9%.[240] Residents' trips would be up to 5% quicker and they could access nearly 15,000 more jobs in 45 minutes.[241] The 2 Fishermans Bend tram extensions could improve access to the area by 19%.[242]

Extending tram lines will only encourage development if supported by planning rules. The government should update local planning schemes to enable more homes around the new tram extensions and at the end of the existing tram lines (see draft recommendation 7).

Cost range, timing and funding

We estimate that it will cost $4 billion to $5.5 billion to extend tram lines. General government revenue can fund this work, and public transport fares can help offset the operating costs of the upgrades.

The Victorian Government can also seek additional funding from the Australian Government. The Australian Government has previously funded similar projects, such as the Canberra and Gold Coast light rail projects.[243]

Our cost estimates are over 5 years and include:

- $1 billion to $1.4 billion for 2 tram extensions in Fishermans Bend
- $1 billion to $1.4 billion for 2 tram extensions in Arden
- $1.5 billion to $1.9 billion for 4 tram extensions in Melbourne's middle suburbs
- $450 million to $600 million for additional rolling stock and power upgrades on tram routes 86, 96 and 109.

Costs include all infrastructure and additional rolling stock. Each tram line can be extended separately, and costs range between $200 million and $1 billion each.

We have provided a broad cost range as the projects can be implemented in various ways to provide best value for money. This requires further analysis by the Victorian Government. Our cost estimates are approximate for each upgrade.

Extended tram lines will then cost government $30 million to $40 million each year to operate all extended lines. This includes asset renewal of the tram corridor and rolling stock. It also includes maintenance costs. Running more services on existing key tram routes, and additional evening and weekend trams where more housing is planned will cost an additional $40 million to $60 million each year.

Figure 5: Tram extensions can make the most of Melbourne's tram network, and support priority precincts and activity

	Tram routes with extensions	Additional weekday public transport boardings	
		Year 2031	Year 2041
	Arden tram extensions (Routes 3, 5)	**14,600**	**17,000**
→	Route 3 (west) – Kensington to Malvern East	4,900	5,200
→	Route 5 – Malvern to Flemington Bridge Station	9,700	11,800
	Fishermans Bend tram extensions (Routes 11, 67)	**13,100**	**33,000**
→	Routes 11 – West Preston to Fishermans Bend South (Plummer Street)	3,900	15,500
→	Routes 67 – Carnegie to Fishermans Bend North (Turner Street)	9,200	17,500
	Middle suburbs tram extensions	**16,100**	**17,500**
→	East Malvern to Hughesdale via Chadstone (route 3 (south) – Melbourne Uni to Hughesdale via Chadstone)	4,800	5,600
→	Melville Rd to Batman Station in Coburg (route 58 – Toorak to Batman)	1,800	2,000
→	East Brighton to Moorabbin (route 68 – Kew to Moorabbin)	4,500	4,700
→	Wattle Park to Burwood East via Burwood SRL train station (route 70 – Docklands Stadium to Burwood East Tally Ho)	5,000	5,300

Source: Infrastructure Victoria.

Draft recommendation 9

Run faster bus services, more often, in Victoria's largest cities

> Run buses more often, for longer hours, and give buses priority on the road. In stages, straighten out existing bus routes so they are fast and direct.

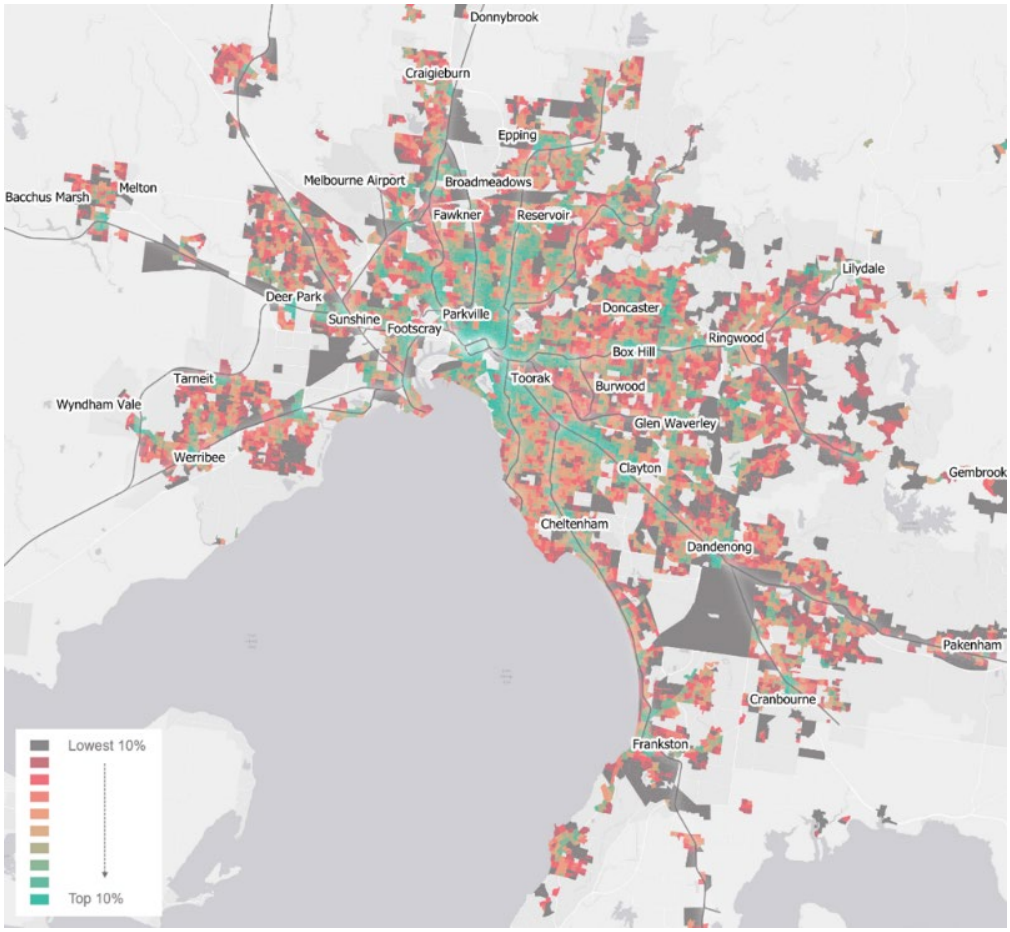
Bus services can be much better

Many Melbourne and regional city bus services have not changed much since they began.[244] The Victorian Government rarely revises bus services to match changes in people's needs and travel destinations.

More people use buses when they offer better quality services.[245] More than a third of Melburnians have never caught the bus, even though 8 out of 10 homes are within 400 metres of a bus stop.[246] The most disadvantaged areas commonly have the least public transport, most often in growth areas (see Figure 6).[247]

High-frequency bus services are key to supporting growing communities, including new activity centres as part of Victoria's housing statement.[248] About a third of Melburnians wait more than 20 minutes for a public transport service on an average weekday.[249] The wait is even longer for people living in Ballarat, Bendigo and Geelong.[250]

Figure 6: Outer and new growth areas commonly have the least public transport services



Public transport service provision per population per area. Source: Infrastructure Victoria analysis of General Transit Feed Specification (GTFS) and population data. See Infrastructure Victoria, *Fast, frequent, fair: how buses can better connect Melbourne*, 2023, p 79, accessed 11 November 2024.

Buses should run more often, start earlier and finish later

The Victorian Government should start running buses more often. Upgraded services should mean that by 2030, 80% of people in Melbourne, Geelong, Ballarat, and Bendigo live within 800 metres of a public transport service that arrives at least every 20 minutes.[251] More frequent buses mean people wait less to catch connecting public transport services.

Our research found that more frequent bus services in Melbourne deliver around $1.40 in benefits for every dollar spent.[252] The benefits of running buses more often are similar to any one of Victoria's big road or rail projects, but they are far cheaper.[253]

Buses should start earlier in the day and finish later in the evenings, especially on weekends. This helps shift workers in industries like retail and healthcare, who need to get to work early or return home late at night. Our community research showed that people prefer bus services to run between 6am and 11pm every day.[254] It also means people can get to train stations, shopping and entertainment precincts more easily.[255]

Bus routes should be more direct for faster travel times

Many of Victoria's bus routes are indirect.[256] Routes have been designed to be as close as possible to people's homes.[257] This slows down buses as they wind through local streets. Traffic also delays buses. If nothing changes, buses on 84% of Melbourne routes will run slower by 2036.[258]

The Victorian Government should redesign bus routes. This can start in north and north-east Melbourne, where the government has already consulted the community on bus route changes.[259] The government should give buses priority on the road to improve travel times. This can include new bus lanes and traffic signal priority for buses.[260]

These changes will have a big impact for many Victorians who experience poor bus services today.[261] They can immediately make buses more attractive to use. People will be able to use cars less, save money, and lower their transport emissions.[262]

Cost range, timing and funding

We estimate that improving bus services in Victoria's largest cities will cost $1 billion to $1.5 billion over 5 years. General government revenue can fund this draft recommendation.

Better bus services in Victoria's largest cities can be delivered as a series of separate smaller packages over time, rather than a single project.

Our cost estimate includes $0.8 billion to $1.2 billion to create around 100 kilometres of new bus lanes.[263] We also include $200 million to $300 million for minor upgrades to the road network to support new bus routes. This includes new bus stops, and intersection upgrades like traffic signalling and short bus lanes to prioritise buses. The Victorian Government can upgrade traffic signalling for buses at the same time as it improves traffic control systems on arterial roads (see draft recommendation 40).

Running more bus services will cost the government $550 million to $750 million each year to operate. This includes purchasing and maintaining the bus fleet and depot upgrades. Public transport fares can help offset the operating costs of improved bus services.

Draft recommendation 10

Build a new bus rapid transit network

> Complete a detailed assessment, reserve the required land, and build a new bus rapid transit network. Start with routes that connect train stations and busy destinations in Melbourne's north, west, and south-east, and extend the new Eastern Busway along Hoddle Street.

Melbourne needs a new type of public transport service

Melbourne's growth has led to many new homes on the edges of the city, often far away from train lines.[264] People who live in these areas have no fast public transport alternative to driving. This limits their travel options.[265]

This problem will only get worse as Melbourne's population grows. The city's roads will struggle to handle more traffic.[266] Even with new and wider roads, motorists face a 46% increase in road congestion between 2026 and 2036.[267] Road congestion is predicted to be particularly high in growth areas in Melbourne's north and west.[268]

Melbourne is well suited to a new bus rapid transit network. These services already run in other Australian cities like Sydney, Brisbane and Adelaide.[269] Services would use large buses that run along dedicated or separated lanes. Buses would stop at stations with platforms, real-time information, shelter and seating.[270] We recommend that buses run every 5 minutes during peak hours and every 10 minutes at other times.[271]

Bus rapid transit routes can support travel in outer and new growth suburbs

The Victorian Government should begin planning for bus rapid transit by completing a detailed assessment of routes. It should then secure land and build the network.

We have prioritised 5 routes to progress by the early 2030s, based on how many people we expect to use the services. These include Tarneit to Maribyrnong, Point Cook to Watergardens, Melton to Broadmeadows, Huntingdale to Upper Ferntree Gully and Endeavour Hills to Southland (see Figure 7).[272] Together, these routes could attract over 57,000 new daily boardings by 2036.[273]

The government should also prioritise bus rapid transport corridors in Melbourne's north to offer another transport choice to access jobs and services.

Bus rapid transit infrastructure can be delivered at a fraction of the cost of trams or trains to these areas.[274] Our analysis of possible bus rapid transit routes in Melbourne shows that they deliver benefits of at least $2.60 for every dollar invested.[275] This includes travel time savings to passengers worth around $1.5 to $2.1 billion.[276]

We highlighted another 5 routes that can be delivered after the early 2030s in our report *Fast, frequent, fair: how buses can better connect Melbourne*.[277]

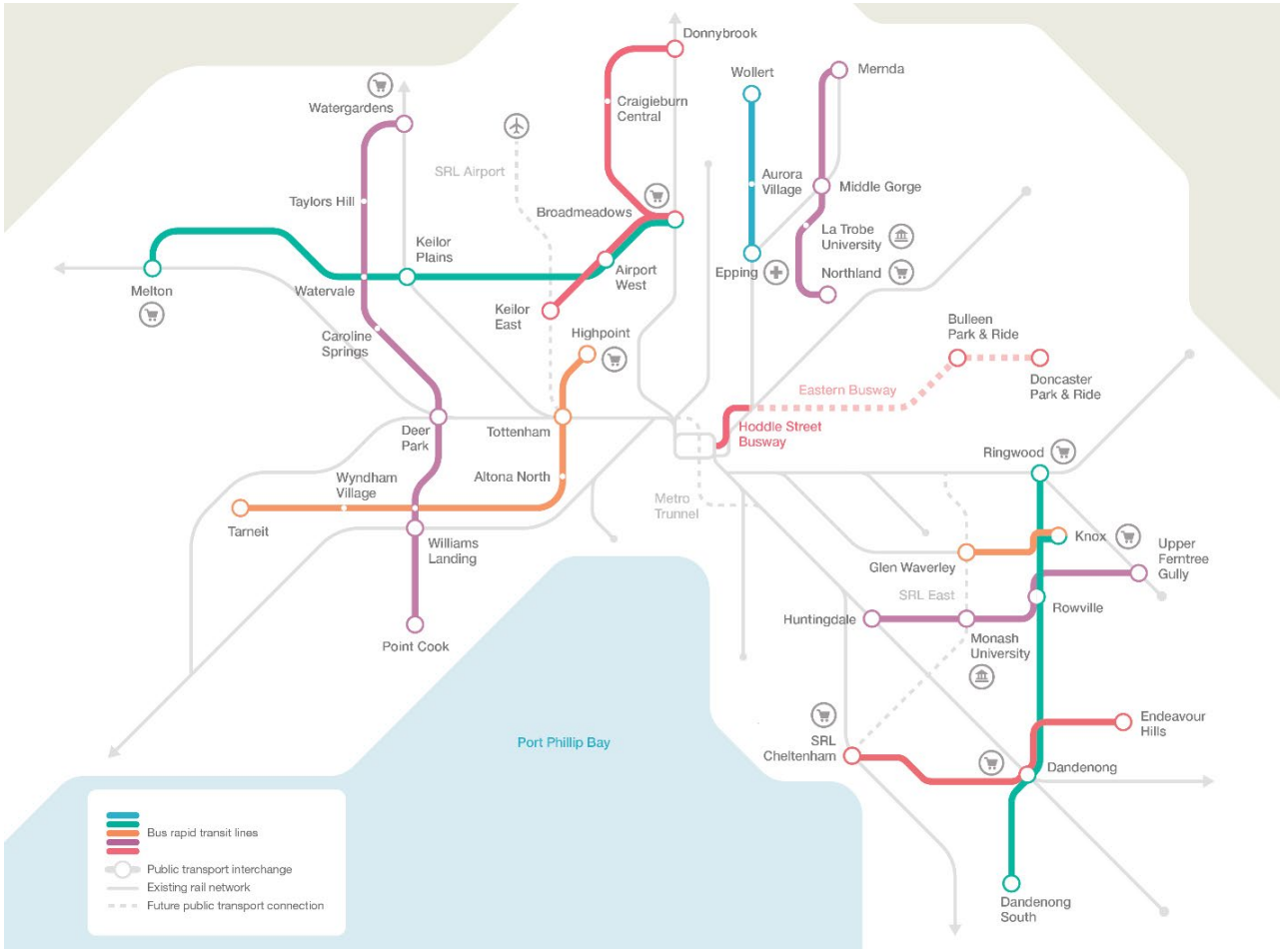
New infrastructure can speed up existing services, reduce emissions and encourage development

The Eastern Busway will be Melbourne's first bus rapid transit corridor, but it ends at Hoddle Street.[278] The government should make the most of its investment by completing a detailed assessment to extend the busway along Hoddle Street. This will improve reliability and efficiency for buses travelling from suburbs like Doncaster and Templestowe. These suburbs are in Melbourne's only local government area with no train or tram line.[279]

Bus rapid transit will provide faster and more frequent public transport options. It can reduce Melburnians' reliance on cars and connect with the city's train services.[280] It can also drive down transport emissions to help achieve Victoria's target of net zero emissions by 2045.[281]

International evidence shows that bus rapid transit can encourage more compact development along public transport routes.[282] It can help attract investment in the priority precincts the government identified in *Victoria's housing statement*.[283]

Figure 7: Melbourne is well suited to a bus rapid transit network that runs along dedicated lanes



Source: Infrastructure Victoria, *Fast, frequent, fair: how buses can better connect Melbourne*, 2023, p 63, accessed 31 October 2024.

Cost range, timing and funding

We estimate that building the first 5 bus rapid transit routes and extending the Eastern Busway will cost $3 billion to $3.5 billion over 5 years.[284] General government revenue can fund this draft recommendation. Public transport fares can help partially offset the cost of operating the new bus rapid transit network. The Victorian Government can also source additional funding from the Australian Government.[285]

This cost range includes $200 million to $900 million to build each of the bus rapid transit routes, depending on the route selected. We estimate extending the Eastern Busway will cost $500 million to $1.4 billion, depending on its final design. Each route can be delivered as a separate project, rather than all routes together, without adding to the cost.

Bus rapid transit services will then cost $75 million to $90 million every year to operate.[286]

Draft recommendation 11

Extend metropolitan trains and run more services in Melbourne's west

> Extend and electrify metropolitan trains to Melton. Reallocate trains that serve Melton to other areas in Melbourne's west and regional Victoria. Assess delivery of a new train station at Altona North accompanied by land rezoning.

Melbourne's western growth areas are growing but they have little public transport

New suburbs in Melbourne's west are growing rapidly. By 2041, over 860,000 people are expected to live there, an increase of almost 450,000 since 2018.[287] But these places do not have good roads or public transport.[288]

The metropolitan train network does not reach many of these communities. They have few bus services, and regional trains that pass through are increasingly crowded.[289] As a result, many residents must drive to work, school or other activities. In Melbourne's outer suburbs and new growth areas, 63% of residents drive to work compared to 32% in inner Melbourne.[290]

More car use means busier roads and lower air quality.[291] It can also put households who have no other transport options in financial stress.[292] Residents might have to take lower-paid jobs that do not match their skills because of poor access to public transport.[293]

Extending the train network can deliver better public transport for new suburbs

The Victorian Government should extend the metropolitan train network to Melton, Mount Atkinson and Deer Park. These places have strong population growth and plans for a metropolitan activity centre, including the new Melton Hospital.[294]

By 2030, the government should:

- extend metropolitan train services from Sunshine to Melton by electrifying the Melton line
- build 2 additional tracks (quadruplicate) from Sunshine to Caroline Springs to allow for faster Geelong, Ballarat and Wyndham Vale V/Line services
- build 2 new train stations at Thornhill Park (Paynes Road) and Mount Atkinson (Hopkins Road) to support communities without rail access.

We prioritised Melbourne's west for more rail services based on projected passenger numbers, current and future road congestion, access to areas with high job growth, and alignment with government policies and plans like the National employment and innovation clusters and future metropolitan activity centres.[295]

More frequent services on these train lines, including the extensions, can help meet the travel needs of residents in Melbourne's west. For example, Melton residents could access 18,000 more jobs within 60 minutes travel time.[296]

To deliver these benefits, the government should upgrade power and signalling on train lines and increase train capacity to reduce waiting times.[297] It could prioritise this work alongside the planned $143 million upgrade to the Sunshine Station precinct.[298]

The extensions would reduce congestion and travel times on many roads and trains during morning peak hours, including the Western Freeway.[299] Our modelling shows that they would result in up to 16,300 more train boardings and around 9,000 fewer car trips each day by 2041.[300]

Train line extensions can provide network-wide benefits

The Melton line electrification and extension allows trains that serve Melton to be reallocated to other areas. It also allows V/Line trains to skip many existing stations, potentially making services to Ballarat and Geelong faster.

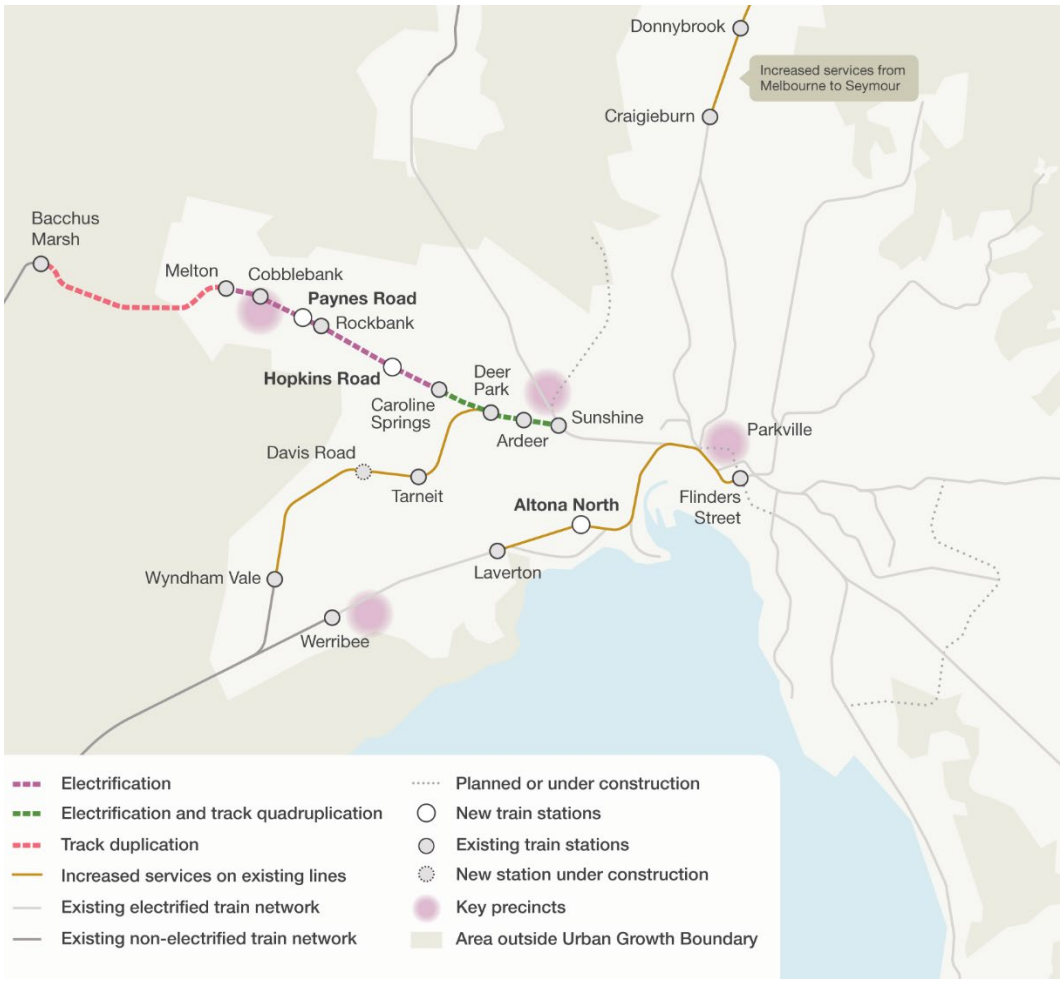
The government should assess where this is most needed. Our analysis suggests that the Wyndham Vale and Seymour corridors are a priority. For example, moving weekday Melton V/Line services to the Wyndham Vale corridor would provide a 10 minute service for stations like Tarneit and halve waiting times.[301] This would be a first step in extending and electrifying these services.

A new station in Altona North can improve access to services and encourage new homes in Melbourne's inner west

Newport to Laverton via Altona North is the longest gap between stations on the metropolitan train network.[302] Altona North is a key activity centre. A station there would triple the number of jobs residents can reach in 45 minutes and reduce travel times to the activity centre by around 10%.[303] More services would need to operate to serve the station, providing benefits to passengers from Footscray to Newport and Laverton to Werribee.[304]

Our draft recommendation to extend Melbourne's trams to encourage more new homes nearby (draft recommendation 8) highlights that transport infrastructure investment can encourage more housing. Rezoning land around a new Altona North station can have the same effect. The government should update local planning schemes to enable more homes around the new station.

Figure 8: Extending metropolitan trains helps to better connect places with strong population growth



Source: Infrastructure Victoria

Table 1: Additional weekday train boardings at stations on line segments (with train extensions)

Train extension	Year 2031	Year 2041
Electrify and quadruplicate the Melton line and build 2 new train stations: Thornhill Park (Paynes Road) and Mount Atkinson (Hopkins Road)	3,500	10,100
More services on the Wyndham Vale and Seymour corridors	3,100	4,700
New train station at Altona North	1,000	1,500

Cost range, timing and funding

We estimate that this draft recommendation will cost $4 billion to $5.5 billion by 2030. The Victorian Government can consider a mix of funding mechanisms, including value capture. General government revenue is likely to be a major funding source. Public transport fares can help offset operating costs. The Victorian Government can also seek additional funding from the Australian Government.[305]

Our cost estimates include:

- $3.9 billion to $5 billion to upgrade the Melton line
- $150 million to $250 million for a new station at Altona North on the Werribee line.

The cost includes upgrading the train line and buying new rolling stock. Our cost ranges are broad as each extension or upgrade can be implemented in various ways to provide best value for money. Each cost estimate is approximate and based on 2020 estimates adjusted to reflect today's higher costs.[306] The train line extension and new station can be done as separate projects. Overall costs will require further analysis by the government.

We estimate this draft recommendation will then cost government $60 million to $80 million each year to operate. This includes maintenance and asset renewal of the train corridor and rolling stock.

Draft recommendation 12

Run more bus and coach services in regional Victoria

> Deliver more bus services in regional cities. Run more V/Line coach services to better connect small towns to regional cities. Start with routes that improve access to jobs, education and healthcare.

Regional public transport helps connect people to education, healthcare and jobs

Regional Victorians travel far to jobs, education, healthcare and other services which are mostly located in regional cities.[307] Many people rely on cars to reach these places.[308]

But not everyone can afford to own a car.[309] Others cannot drive, like some young people, older Victorians and people with a disability. They rely on public transport to travel independently.[310]

If people use public transport more, they can save money and Victoria will produce fewer greenhouse gas emissions.[311] But our modelling confirms that many regional Victorians struggle to access services by public transport.[312]

Many transport services do not reach the places people need, including TAFEs, universities, hospitals and health centres.[313] Around 90% of young people living in rural and regional Victoria cannot access their TAFE or university by public transport. Even when they can, they often have to leave classes early or wait a long time to get home.[314]

Better public transport can improve access to education and help young people stay in regional areas.[315] It can connect people to jobs and help fill labour shortages.[316] It can help older people stay independent and mobile.[317]

Public transport in regional cities can better meet local needs

The Victorian Government should deliver more bus services in regional cities, starting in Shepparton, Wodonga, Mildura, Wangaratta, Horsham and Bairnsdale. This complements our draft recommendation to run more bus services in Victoria's largest cities (see draft recommendation 9).

These are regional cities where bus services are infrequent and indirect.[318] These cities provide health, education and social services to their wider region. They are also home to a high share of people with limited access to transport, low-income households, Aboriginal Victorians and older people.[319] New suburbs in Shepparton and Wodonga have no bus services at all.[320]

Few weekend and night buses mean that young people miss out on work and social opportunities.[321] Many people in Mildura say they need buses that run from 7am to 9pm on weekdays, and after 9pm on Friday and Saturday nights.[322] The government should consult with communities, councils and bus operators in the other regional cities to identify transport needs and then run services to meet them.

Running buses more often and for longer hours will add up to 250 new services each day in larger cities and around 30 new services each day in smaller cities.[323]

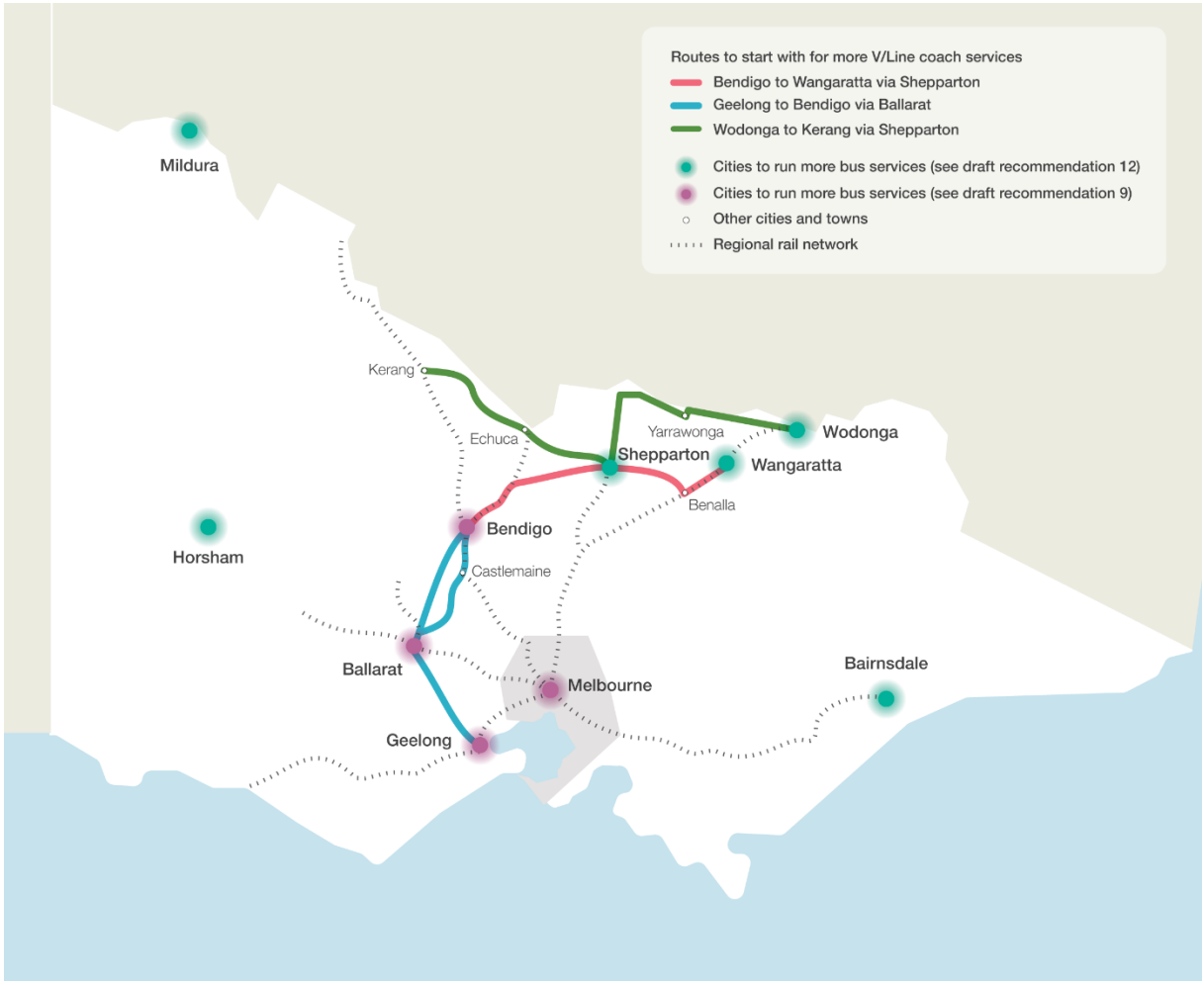
Local communities need better access to regional cities

For many towns, V/Line coaches are the only public transport to regional cities. But they often do not run when people need them.[324] For example, morning services can arrive too late for classes, work or medical appointments. Sometimes people have just 40 minutes before their only return service leaves.[325]

The Victorian Government should improve existing V/Line coach services. It should add stops, extend existing routes and fund extra services to improve access to regional cities.

It should start with routes like Bendigo to Wangaratta, Geelong to Bendigo via Ballarat, and Wodonga to Kerang. Communities on these routes need access to jobs, education and healthcare in regional cities but have limited public transport services. The government should run 6 services each day from Geelong to Bendigo, and 3 services each day from Bendigo to Wangaratta and Wodonga to Kerang.[326]

Figure 9: The Victorian Government should improve regional bus and V/Line coach services



Source: Infrastructure Victoria

Cost range, timing and funding

We estimate that this draft recommendation will cost $100 million to $150 million over 5 years. General government revenue can fund this draft recommendation. Public transport fares can help offset the operating costs of more regional services.

Our cost range includes new bus stops and transport hubs to support new bus and coach services. These can be delivered as a series of separate smaller packages rather than one project.

More bus and coach services in regional Victoria will then cost government $25 million to $40 million each year to operate. This includes purchasing and maintaining the bus fleet and depot upgrades.

Draft recommendation 13

Make off-peak public transport cheaper and simplify regional fare zones

> After upgrading the myki ticketing system, charge lower fares for off-peak travel on Victoria's buses, trains and trams. Simplify fares and reduce the number of regional fare zones.

Cheaper off-peak fares are a simple first step for Victoria's upgraded myki

Public transport fares influence travel behaviour.[327] Victoria's fares can be changed to encourage better use of the transport network and deliver the most benefit to Victorians.

More people travel during peak hours than off-peak. This puts pressure on roads and public transport. Buses, trains and trams are often crowded in peak times but underused at other times.[328] Victorians typically drive instead of taking public transport on weekends.[329]

Lower off-peak fares can encourage motorists to catch public transport instead. There are many benefits including less congestion and fewer emissions.[330] Cheaper off-peak fares can also help to defer costly infrastructure upgrades.[331]

We found that changing the way people pay for public transport might remove over 31 million car trips. It might also provide about $520 million in value each year and reduce peak hour crowding equivalent to 27 trains.[332] Our research showed that bus passengers can increase by up to 19% for every $1 discount.[333] More public transport users can help offset the revenue impact of cheaper fares.[334]

Off-peak fares benefit low-income earners

The Victorian Government should adopt off-peak fare discounts when it has upgraded the myki ticketing system.[335] This will reduce crowding on peak hour services by rewarding people who travel at quieter times. It will also benefit low-income earners, who make 45% of off-peak trips.[336]

Currently people travelling at quieter times pay the same price as those travelling during peak hours.[337] In our modelling, a 50% discount was enough for people to change their travel time and mode of transport.[338] V/Line passenger numbers grew rapidly when regional fares were capped in 2023.[339] This shows that cheaper fares attract users. The government can set the rules for off-peak discounts so that people make travel choices that benefit everyone.

Simple fares have the greatest impact

When fares are complex, travellers can end up paying more.[340] Our research found that off-peak fares were the easiest to understand.[341] To reduce complexity and make public transport fairer, the government should replace Early Bird train-only fares with off-peak discounts that apply to all public transport modes. Passengers should be able to switch between trains, trams and buses at the same fare.

In regional Victoria, the government should simplify fare zones. The regional fare cap reduced prices for long-distance trips to Melbourne, but it had little impact on shorter trips between regional cities and towns.

Reducing the number of regional fare zones will help to lower the cost of these trips. It will reinforce the regional fare cap in providing more affordable travel in regional Victoria. It can be delivered when the upgraded myki system is rolled out in regional areas.[342]

Over time, refine the off-peak discount and pair with service upgrades

Off-peak discounts are a first step to improving Victoria's public transport fares. We identify further reforms in *Fair move: better public transport fares for Melbourne* including cheaper fares for buses at all times. The government can implement these after assessing the impact of off-peak fares.[343]

Importantly, more people will catch public transport if fare reform is matched with service upgrades. This includes running more buses in Victoria's largest cities (see draft recommendation 9) and improving regional bus and coach services (see draft recommendation 12).

Cost range, timing and funding

We estimate that it will cost up to $1 million a year to improve public transport fares. General government revenue can fund this draft recommendation. Existing government staff can do this work.

The cost range includes detailed modelling of public transport fares, tracking the impact of fare changes to the public transport network, and refining fares. Changes to public transport fares can be made using Victoria's upgraded myki ticketing system.[344] Victoria has previously trialled off-peak fares, suggesting this feature can be implemented again at minimal cost.[345]

Fare reform can reduce revenue to government from public transport users depending on the fares adopted. But more public transport users, especially in off-peak periods, can help to partially offset any revenue loss from cheaper fares. Shifting public transport demand away from peak periods can also help the government defer capital upgrades like new tunnels, costing substantially more than any change in fare revenue.[346]

Victorians are healthy and safe

Victorians achieve and maintain good physical and mental health. They are safe from harm.

Victoria's health challenges are growing

Keeping Victorians healthy and safe helps create a productive and thriving society. Good health allows Victorians to work, learn and engage fully with their communities.[347] This adds to Victoria's social wellbeing and economic prosperity.[348]

Victoria faces several health challenges. These include an ageing population and rising health costs.[349] An ageing population has led to a rise in the frequency of chronic health conditions such as cancer, diabetes, dementia and heart disease.[350] These complex, long-term conditions can place more demand on health services.

In 2022–23 there were 564,886 potentially avoidable presentations to emergency departments in Victoria that could have been managed in primary or community health.[351] Many of these were related to chronic conditions.[352]

Victorians' health is influenced by where and how people live and work.[353] A person's social circumstances can also affect their health.[354] Social exclusion, low incomes and limited access to education and other services can worsen their health outcomes throughout their life.[355]

Infrastructure can help to reduce these risks. Buildings like hospitals and community health facilities provide access to essential healthcare services. Public open spaces such as parks and sports fields, and walking and cycling paths give people opportunities for exercise.[356] Digital technologies can also offer new ways to connect people with the services they need.[357]

Infrastructure can help prevent illness and injury

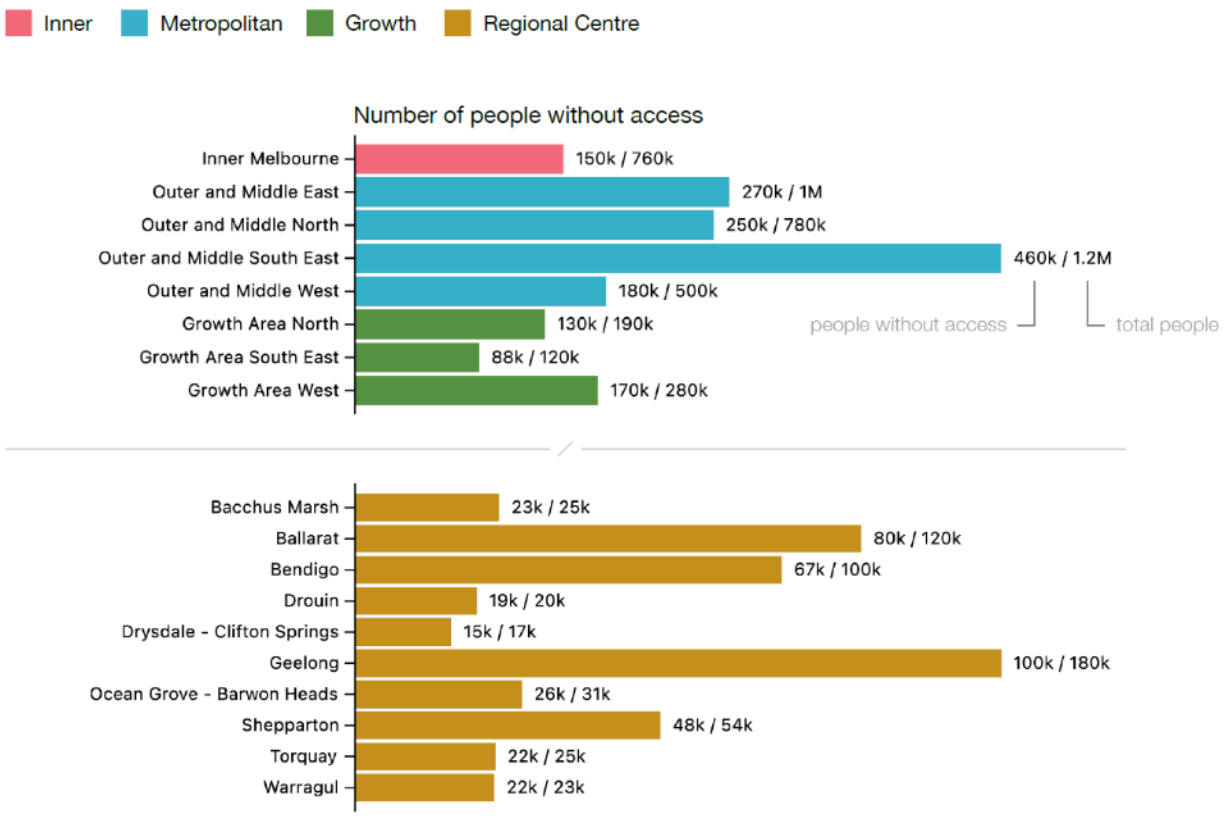
Preventive health measures can save money and help reduce demand on the hospital system.[358] Reducing risky lifestyle factors could prevent almost 40% of disease.[359] Many chronic diseases are linked with diet and physical activity.[360]

Access to the right types of infrastructure can help Victorians be healthier and happier.[361] Outdoor sports facilities, walkable neighbourhoods and areas that are safe to cycle in can increase physical activity and social connection.[362]

For every $1 invested in walking and cycling infrastructure, the community receives $13 in health, economic and environmental benefits.[363] Investing in walking and cycling can reduce noise and pollution while lowering the risk of conditions like heart disease, stroke and diabetes.[364] By encouraging healthy lifestyles, infrastructure can help reduce demand on public hospitals.[365]

But not everyone has the same access to open space and sports fields (see Figure 10). Some Victorians have limited opportunities for outdoor exercise, potentially increasing their risk of developing chronic disease.[366]

Figure 10: Many Victorians cannot access outdoor sports fields within a 10 minute walk



Source: Arup, *Social infrastructure accessibility mapping – outdoor sport fields*, report to Infrastructure Victoria, 2024, p 3, accessed 6 December 2024.

Access to health infrastructure in Victoria is unequal

Access to healthcare in Victoria also varies depending on where people live. For example, people living in outer suburbs and regional areas sometimes have fewer services, less consistent care and must travel further to reach them.[367] Chronic diseases and unintended overdose deaths are more common among people living in regional areas.[368] These risks are worse among some groups including First Peoples and culturally diverse communities.[369]

Community health services provide primary and preventive healthcare targeted to Victorians who are experiencing poverty or homelessness.[370] This can include vital dental services, mental health services and support for people to manage ongoing chronic conditions like type 2 diabetes.[371]

Victoria's prisons also provide healthcare and mental health services.[372] These services help prisoners rehabilitate and reduce reoffending.[373]

Improving access does not always mean building new hospitals and other infrastructure. Innovative service models and digital technology can transform service delivery. Digital healthcare can help public hospitals work more efficiently and ease demand on limited infrastructure.[374] For those in regional areas, digital healthcare can allow patients to receive care closer to home, reducing patient travel and costs.[375] There are also opportunities to better use prisons to improve community safety outcomes.

Draft recommendation 14

Make local streets safer for children and communities

> Reduce speed limits to 30km/h on local streets, starting in places that children often visit including around schools, playgrounds, childcare centres and kindergartens.

Slower local streets reduce road trauma

Victoria's neighbourhoods should be safe for people to travel and for children to play. Local streets that encourage walking and cycling can help achieve this. However, many roads are not safe for pedestrians or bike riders. An average of 35 pedestrians die each year in Victoria.[376]

Road trauma is a leading cause of death for children aged 1 to 14 in Australia.[377] Seven children die each year on Victoria's roads.[378] Nearly 300 children a year are seriously injured, mostly on local roads with speed limits of 50km/h.[379]

Slower speeds make streets safer.[380] They have little effect on travel times by car.[381] A pedestrian hit by a car at 50km/h has an 85% chance of dying, and a 40% chance at 40km/h. At 30km/h, this falls to 10%.[382] Some councils already have lower speed limits for safety. For example, the City of Yarra introduced 30km/h zones in the suburbs of Fitzroy and Collingwood.[383]

The Victorian Government should update its speed limit policy and work with local governments to update speed limit signs to set 30km/h limits, starting with local streets around places that children often visit. Schools, playgrounds, childcare centres and kindergartens should all have lower speed limits around them (see Figure 11).[384] The current 40km/h speed zone only applies to schools and some other busy areas.[385] The changes should apply to streets with current speed limits of 50km/h or less.

The Victorian and local governments can lower speed limits on more local streets over time to improve pedestrian safety. But we do not recommend these changes to roads with speed limits above 50km/h. These roads transport people in trams and buses and goods in commercial vehicles.

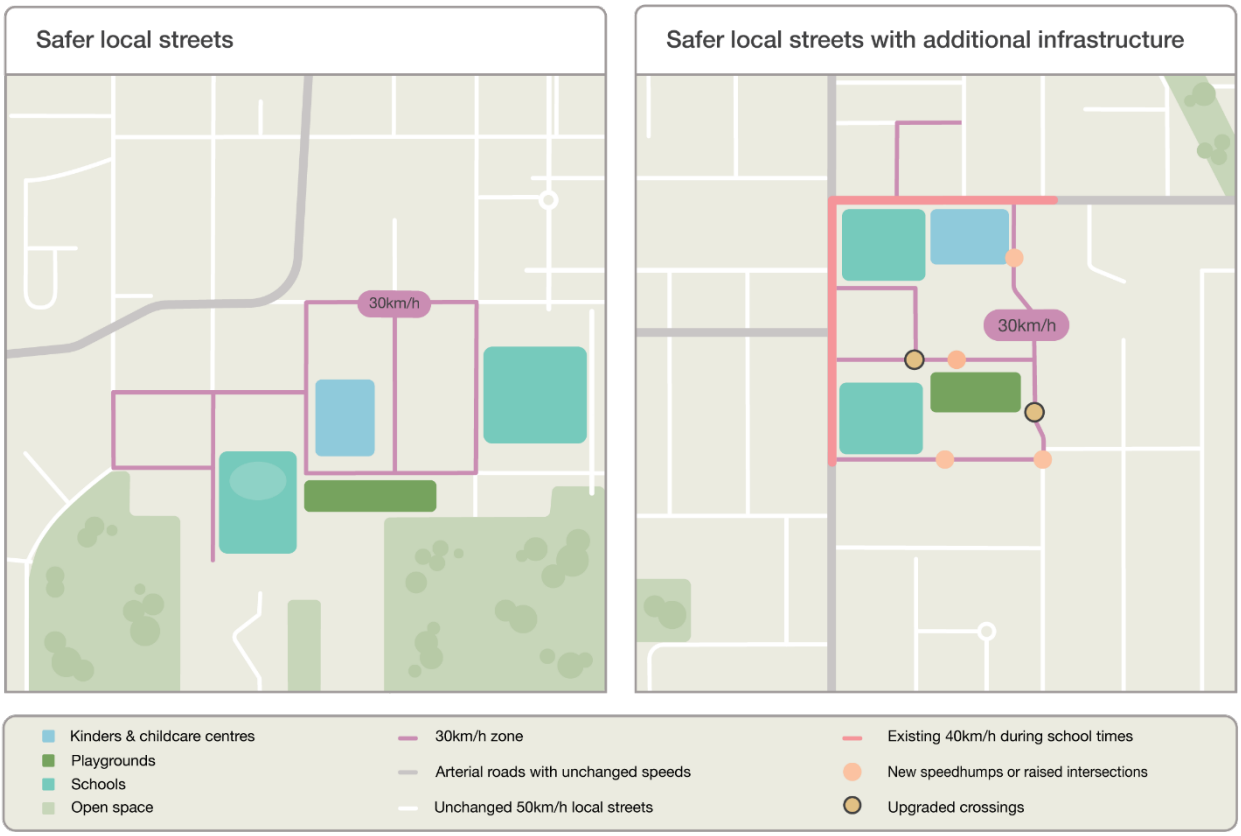
Research shows that reducing speed limits works better when combined with changes to local street infrastructure.[386] This helps more drivers stick to the speed limit so people can walk and cycle safely. Many local streets do not have safe crossing points. Governments can trial upgrades to infrastructure on streets where speeds have been reduced to show how these changes benefit the community.

More active travel is good for people's health and the environment

Most parents are worried about traffic and road safety, and do not let their children walk or cycle alone.[387] Instead, they drop off and pick up their children by car.[388] This has led to historically low levels of walking and outdoor play.[389] If children walk and ride bikes more, this will reduce obesity and social isolation.[390]

The lower speed limit will increase physical activity and help Victoria achieve the government's target of 25% of trips by active travel by 2030. Switching one trip a day from car to cycling can also save each person half a tonne of greenhouse gas emissions a year.[391] Schools, playgrounds, childcare centres and kindergartens are often close to people's homes. These trips are the easiest for people to switch from cars to walking and cycling.

Figure 11: Simple changes can make Victoria's streets safer



Source: Infrastructure Victoria

Cost range, timing and funding

We estimate that making local streets safer for children and communities will cost $35 million to $45 million. This includes the cost of changing speed limit policy and working with local governments to install speed limit signs.

General government revenue and ongoing road safety improvement programs, such as those run by the Transport Accident Commission and Australian Government, can fund this draft recommendation.[392] Government can also use funding attached to Victoria's Road Safety Action Plan.[393] To increase the benefits from this draft recommendation, these funding sources could be used to improve footpaths and add crossings and other infrastructure to slow cars down.

Local government upgrades to streets, footpaths, parks and drainage can also contribute to local streets being safer and easier for drivers to stick to speed limits.

Draft recommendation 15

Build safe cycling networks in Melbourne and regional cities

> Continue building protected and connected cycle corridors across Victoria. Publish updates to the strategic cycling corridor network.

Few Victorians ride bikes, even for short trips

In Melbourne, 60% of people's trips are under 5 kilometres. Despite many of these trips being well-suited to a short bike ride, less than 2% of them are made by bicycle.[394] Many people do not ride because they are worried about their safety.[395]

Between 2020 and 2022, with more people cycling during the COVID-19 pandemic, 57% more bike riders were seriously hurt on Victorian roads compared to the years before.[396] One in every 4 serious road crashes in Australia involves a bike rider.[397]

Victoria has a disconnected, low-quality cycling network.[398] Bike lanes can be too narrow, blocked by parked cars, or end suddenly.[399] Lanes are often not separate at dangerous intersections.[400] Riders can feel unsafe when cycling close to cars and other vehicles.[401] Women riders in particular can feel unsafe on quiet streets at night.[402]

The Victorian Government has a target for people to make 25% of their trips by bike or on foot.[403] More people owning cars, more car trips and busy roads make this target harder to reach.

More bike riding can reduce congestion

Using bikes is a healthy and cheap way to travel.[404] It has few greenhouse gas emissions and can help meet net zero targets.[405] Up to 5 times more people can travel on bike lanes each hour compared to car lanes.[406] Bicycle infrastructure can deliver almost $5 in benefits for every $1 invested.[407]

Separated bike infrastructure helps more people to choose a bike over their car, including young people, women and less confident riders.[408] People using micromobility transport like electric scooters are also safer with separated bike infrastructure.[409] More than 75% of Victorians are interested in riding if they can use bike lanes separated from car traffic.[410]

A network of safe cycling corridors will encourage more people to ride

Victoria already has a strategic cycling corridor plan.[411] It is a blueprint for a safe and high-quality 2,768 kilometre bicycle network.[412] But the government is only building small sections of this network as part of major transport projects.[413] Just 13% of Victorians live within a 2 minute ride of roads with a protected bike lane.[414] Together with safer local streets (see draft recommendation 14), bicycle corridors can encourage more cycling, both locally and for longer trips.[415]

The Victorian Government should build priority bicycle corridors in the strategic cycling corridor network. It should build 10 corridors in Melbourne and a network of cycle corridors in 6 regional cities, including Geelong, Ballarat, Bendigo, Wangaratta, Wodonga and Castlemaine by 2035 (see Figure 12). This will create more than 180 kilometres of continuous safe bike connections (see Table 2).[416] It includes adding separated bike lanes, wayfinding, lighting and protected bike infrastructure at intersections.[417]

We have chosen these corridors based on the places people travel to, connections to existing bike infrastructure, accident hotspots and local government priorities.[418] These corridors will encourage more cycling trips and can replace around 40,000 car trips every day.[419]

Regional Victoria only has a small strategic cycling corridor network.[420] In Melbourne, some corridors can be adjusted or expanded as the city grows. The government should continue to plan and consult on the network and publish updates every 3 years, particularly for regional Victoria.

Table 2: Length of new and upgraded cycling corridors

Type of change	Length
New cycling infrastructure (including providing protected bike infrastructure at intersections)	94km
Upgraded painted cycling lanes to separated cycling infrastructure	40km
New wayfinding and lighting to existing cycling corridors	53km
Total	*187km*

Figure 12: The Victorian Government should deliver bikeways in Melbourne and a network of cycle corridors in regional Victoria

Source: Infrastructure Victoria 2024

Cost range, timing and funding

We estimate that building a safe cycling network in Melbourne and regional cities will cost $400 million to $600 million over 10 years. This network can be built as a series of separate smaller packages.

General government revenue can partly fund this draft recommendation, or government can use funding attached to Victoria's Road Safety Action Plan.[421] The Victorian Government can also seek funding from the Australian Government's national Active Transport Fund.[422] We assume Australian Government funding will help to reduce the cost of this draft recommendation to the Victorian Government by $10 million to $20 million.

Bike paths vary in complexity. Based on recent projects, building new bike paths can cost from $500,000 to $5 million a kilometre.[423] These costs range from a protected cycling corridor to comprehensive place-making redevelopment that includes pedestrian and public transport access, and landscaping works.

Our cost estimate includes construction of a protected cycling corridor, including physical barriers, traffic signal upgrades and new cycle pavements, depending on the location. It does not include additional place-making works.

To increase the benefits from this draft recommendation, Victorian and Australian governments can also give grants to councils to build safe cycling paths between local destinations and the new cycling corridors.[424] These grants are not included in our cost estimate.

Draft recommendation 16

Help government schools share their grounds

> Prioritise which government school sports fields and facilities could deliver the greatest benefits if they were shared with local communities outside school hours. Give these schools extra help for maintenance if they voluntarily share their grounds outside school hours. Offer funding for upgrades to incentivise shared access outside school hours.

Sharing school grounds can help more Victorians stay healthy, active and social

Our research report, *Getting more from Melbourne's school grounds: sharing places for play and exercise*, shows that sharing school grounds in some places means many more people can walk to a local outdoor recreation facility.

This is especially true in Melbourne's north, west and outer south-east.[425] These places have fewer sports fields for each person than inner suburbs and people must travel further to reach one.[426] They are also places where children participate less in organised sport, and where communities have worse health outcomes.[427]

The Victorian Government can give local communities more access to outdoor recreation facilities. This can help people stay active, healthy and socially connected.[428]

Schools are often centrally located in suburbs within easy walking distance. Many communities already have out of school hours access to outdoor recreation facilities at their local government school. But around a third of government schools do not allow use after hours or on weekends.[429] In some places, communities have few other nearby options for informal sports and recreation.

Melbourne will need more spaces for recreation as its population continues to grow.[430] We estimate the total land value of Melbourne's government school courts and ovals is $6.6 billion.[431] The Victorian Government can help communities get more benefit from these valuable public assets by offering support for schools to share their grounds outside school hours.

Government can help schools share their grounds

Some schools might hesitate to share their grounds because of concerns about damage to school property.[432] The government should support schools to manage this risk in areas where sharing grounds will make the biggest difference. It should provide additional funding to the Department of Education to help schools manage extra maintenance and other costs if they voluntarily share their grounds outside school hours.

Some school grounds might not be ready for community use.[433] The government should encourage these schools to open to the community outside school hours by offering grants to upgrade facilities. This can include better infrastructure such as extra lighting, sports field upgrades or new toilets.

In priority areas, and depending on local needs, the government should offer grants for up to $2 million per school to ensure grounds have enough facilities for community use. This can deliver around $10 million worth of outdoor facilities to communities that need them most.[434]

Most local governments support shared use of school grounds outside school hours.[435] Grants for improved facilities should depend on local governments agreeing to partner with schools to help maintain school grounds for out-of-hours use.

Cost range, timing and funding

We estimate that helping schools share their grounds will cost $1 million to $40 million over 5 years. General government revenue can fund this draft recommendation.

Many schools can share their grounds with local communities immediately without the need to upgrade facilities. However, there are also benefits in investing in upgrades for schools in priority locations. The upper limit of $40 million for this draft recommendation allows for 20 priority schools to upgrade their sports fields, lighting and toilet facilities for after-hours use, and other community infrastructure like seating.[436]

Maintenance costs will rise as more people use school grounds that are open to the public. However, this small increase is relatively low compared to the overall cost of maintaining a school. We estimate it will cost about $1 million a year for 70 schools to be kept open.

As improvements in open space will benefit local communities, the Victorian Government can explore opportunities to jointly fund maintenance costs with local governments.

Draft recommendation 17

Invest in maintenance, upgrades and expansions of community health facilities

> Develop and fund 5-year priorities for Victorian Government investment in community health facilities.

Community health services target Victorians at most risk of poor health

Access to healthcare varies across Victoria, with some people facing more challenges. Some groups have worse access, such as Aboriginal Victorians, refugees and asylum seekers, and culturally diverse Victorians.[437] People in disadvantaged places are more likely to get sick, injured or die earlier.[438]

Community health services focus on supporting Victorians at most risk of poor health and that have the highest economic and social needs.[439] They tailor different preventive, primary healthcare and social care services to meet local community needs.[440] These services can include general practice, dental, nursing, allied health, mental health and wellbeing, alcohol and drug, disability, aged care, carer and parenting support. Some also help with employment and housing services.[441]

All community health services in Victoria deliver the Victorian Government's community health program. This program provides allied health, counselling and nursing services. Those eligible to use the program include concession card holders, people with a low or medium income, refugees, people who are homeless, children in care, and Aboriginal and Torres Strait Islander people.[442]

Preventive healthcare is very beneficial. Many interventions achieve good results at relatively low cost, with some returning over $14 in benefits for $1 spent.[443] Reducing lifestyle factors like smoking, obesity, poor diet, high blood pressure and high alcohol use might prevent up to 38% of disease.[444]

There are 78 community health services in Victoria, split into 2 types.[445] Twenty-four are independently managed. These are registered community health services. The other 54 community health services are part of government organisations that also provide hospital and other public health services.[446] These are integrated community health services.

Statewide community health investment priorities are needed

Our research found there is unmet need for community health services. Many people who had used a community health service reported long wait times to get an appointment.[447] But 45% of eligible Victorians had not used these services in the last 5 years.[448]

The Victorian Government has not consistently funded community health facilities, and many are outdated and poorly maintained. In some cases, failing facilities limit the ability to provide services.[449]

The Victorian Government should invest in community health facilities to deliver quality community health services. It should fund new sites, expansions, upgrades, maintenance and minor works.

The government should develop statewide investment priorities covering at least 5 years. These should be informed by community needs, type of community health organisation, and the condition, capacity and ownership of existing infrastructure.

The government should then commit funding for the first 5 years of these priorities. While government priorities should cover all community health services, our research suggests registered community health facilities need more urgent investment.

Cost range, timing and funding

We estimate that investing in community health facilities will cost $150 million to $300 million, with funding committed and works commenced within 5 years. General government revenue can fund this draft recommendation. The government should seek co-funding from community health services and other organisations where possible.

Our cost estimate is based on addressing infrastructure needs of registered community health services. It does not include costs beyond the first 5 years.

Our cost estimate also includes Victorian Government implementation costs of $4 million to $6 million to work out the condition of all existing community health facilities, plan, consult and determine statewide investment priorities. Future infrastructure funding decisions should depend on the outcomes of this work.

Draft recommendation 18

Build more residential alcohol and other drug treatment facilities

> Plan and start building residential rehabilitation and withdrawal facilities to meet the demand for alcohol and other drug treatment.

Victoria's alcohol and other drug treatment is not meeting demand

Alcohol and other drug use affects the wellbeing of many Victorians. High levels of use are linked to health problems, violence and disadvantage.[450] The social and economic costs of addiction in Australia are estimated to be $35.5 billion a year.[451] Treating alcohol and drug use can return around $4.60 in benefits for every $1 invested.[452] These benefits include reducing crime.[453]

Demand for alcohol and other drug treatment has gone up since the COVID-19 pandemic.[454] Alcohol and drug-related ambulance attendances have grown over the past decade.[455] Drug overdose deaths were the highest ever recorded in 2022.[456] More Victorians are being treated for addiction, but access is unequal and the system is not keeping up with demand.[457]

Waitlists have increased by around 40% since the pandemic.[458] The average wait time between assessment and treatment was 42 days in 2023–24, double the government's target of 20 days.[459] Wait times for residential rehabilitation can be up to 90 days.[460] This is on top of the wait for assessment. Long wait times can cause people to give up on treatment.[461]

Residential rehabilitation and withdrawal services are an effective form of treatment

Residential withdrawal facilities support people to safely withdraw from alcohol or drug dependence in a supervised setting.[462] Residential rehabilitation facilities provide therapeutic treatment for people who have undergone withdrawal but have not yet overcome their addiction.[463] Services can benefit from purpose-built facilities that create safe and effective treatment environments.[464]

Residential rehabilitation is effective at supporting recovery from addiction.[465] Research suggests it is particularly effective at reducing long-term methamphetamine and heroin use.[466] For some, their home or social circumstances may not provide the right conditions for rehabilitation.[467]

Alcohol and other drug use affects some communities more than others

Harmful drug and alcohol use contributes to the gap in health outcomes for First Peoples.[468] Aboriginal Victorians make up 10% of people receiving treatment, but 1% of Victoria's population.[469] They face barriers in accessing culturally safe treatment in mainstream facilities.[470] This can contribute to further harm.[471]

Regional Victorians also face challenges. They are more likely to die from an unintended overdose than people living in Melbourne.[472] People living in rural areas are more likely to drink alcohol at dangerous levels.[473] Patients spend more time travelling to access treatment.[474] The government is building new residential facilities in regional areas, but some regions still have none, including Great South Coast, Goulburn and Wimmera Southern Mallee.[475]

The government should build new facilities for communities that need them

Victoria has the second lowest number of residential rehabilitation beds per person in Australia. It provides 0.7 beds per 10,000 people compared to 1.0 in Queensland and 1.2 in New South Wales.[476] Victoria needs at least 200 extra beds to bring it in line with the national average.[477]

The Victorian Government should plan and start building more residential alcohol and other drug treatment facilities to target at least 200 extra rehabilitation beds. It should prioritise communities with demonstrated need but low access, including First Peoples and regional Victorians. Rehabilitation and withdrawal services can be co-located to provide greater value.

The government should design and deliver facilities for Aboriginal Victorians in partnership with First Peoples' communities and Aboriginal Community Controlled Organisations so that they are culturally safe and responsive.

Cost range, timing and funding

We estimate that building new facilities for 200 more rehabilitation beds will cost around $100 million over 10 years. We used costs from recently built facilities in Gippsland, Wangaratta and Corio.[478] General government revenue can fund this draft recommendation. We assume the Victorian Government can minimise costs by repurposing existing government land, so land costs are not included in our estimate.[479]

The cost range also includes government staff and consultancy costs to plan and develop the facilities.

We estimate the new facilities will cost $5 million to $7.5 million a year to maintain.

Draft recommendation 19

Invest in digital healthcare

> Expand digital healthcare to improve the quality of care and ease demand on public hospitals. Deliver a statewide medical image sharing system and a statewide virtual care service that remotely monitors suitable patients at home.

Victoria's health system is under pressure from population growth, an ageing population and more complex, chronic illnesses.[480] Building and upgrading hospitals alone will not be enough to meet growing demand.

Digital technology can make hospital infrastructure work more effectively. It can provide better care for patients while easing pressure on public hospitals.[481] Virtual care can be more comfortable for patients and save hospitals at least $1,000 per patient.[482]

Better information sharing can improve healthcare services

Victoria's digital health transformation is uneven. Some of Victoria's health services still use paper-based records.[483] Others use different electronic medical record systems, which do not always communicate well with each other.[484] Better sharing of health information improves patient care by giving doctors and nurses faster access to important information.[485] This can reduce readmissions and the cost of care for hospitals.[486]

The Victorian Government plans to roll out electronic medical records to all public hospitals so they can share records digitally.[487] But there are other opportunities to share information. For example, clinicians cannot easily share medical images across health services.[488] They might need to repeat tests if they cannot access past results.[489] For some scans, this can expose patients to unnecessary radiation.[490]

The Victorian Government should fund and deliver a statewide medical image sharing system. Medical image sharing can improve care, reduce unnecessary tests and save costs for hospitals and patients.[491] Other states have already introduced similar systems.[492]

Virtual care can improve quality and access to healthcare

Virtual care is already changing how Victorians access healthcare (see case study – Virtual emergency care in Victoria). Virtual care is the remote delivery of health services using digital technology. This includes phone or video telehealth consultations and remote monitoring of patients.[493]

Patients can receive care at home, reducing time spent travelling or in hospital.[494] Telehealth already saves Australian patients around $895 million each year through less travel time and waiting.[495] Expanding virtual care can increase hospital bed capacity, improve patient satisfaction and outcomes, and save money.[496]

Patients suitable for remote monitoring are given devices and sensors that track health data like blood pressure, heart rate or glucose levels.[497] Doctors or nurses can intervene if a patient's health is declining, potentially keeping them out of hospital.[498] Many health services, like Austin Health and Loddon Mallee Health Network, already monitor some patients remotely.[499]

The government's Better at Home initiative has funded many home-based care programs, but use of remote monitoring technologies is still limited.[500] A statewide service will ensure fair access, provide consistent service quality and allow greater efficiencies.

The Victorian Government should design and fund a statewide virtual care service to monitor patients at home. This should include a statewide digital platform for remote monitoring. It can introduce the service in stages, for example by clinical pathway or region.

A statewide service can focus on patients with chronic conditions, including heart disease, lung disease and diabetes.[501] This would ease demand on health infrastructure.[502] Chronic conditions are a leading cause of preventable hospital visits.[503]

When expanding digital healthcare, the government should fund change management and staff training. Expanding virtual care may also require changes to funding models. This is already being considered nationally.[504]

Cost range, timing and funding

We estimate that expanding digital healthcare will cost $100 million to $200 million over 5 years. This is in addition to existing hospital funding. General government revenue can fund this draft recommendation. Expanding virtual care may also require changes to hospital and health service funding models. Our estimated costs do not include this.

Setting up medical image sharing and virtual care will each cost $50 million to $100 million. This includes establishing a software platform, training staff and a dedicated team to support implementation of new systems across all health services over 3 years. The government should aim for full implementation of these systems by 2030.

Running these systems will cost a further $25 million a year. This includes $5 million for medical image sharing and $20 million for virtual care. These costs include software platform licenses, patient monitoring devices, staff tablets and running a help desk. Our costs assume virtual care supports approximately 4,000 Victorians each week.

Case study

Virtual emergency care in Victoria

The Victorian Virtual Emergency Department (Virtual ED) shows the potential of statewide virtual care services to reduce pressure on hospitals and improve access to healthcare in regional areas. The Virtual ED is a 24-hour statewide service run by Northern Health that allows nurses and doctors to assess patients with non-life-threatening emergencies through video calls.[505]

Doctors can provide patients with electronic scripts, refer them to other health services or direct them to attend an emergency department in person.[506] Patients can contact the Virtual ED directly or be referred from residential aged care, urgent care centres or other healthcare providers.[507] Patients can access expert medical advice for urgent problems without attending a hospital. This can be particularly effective for people living in regional and rural Victoria, who often travel long distances to access care.

The Virtual ED also provides clinical support for paramedics, potentially avoiding unnecessary ambulance transfers.[508]

Early evaluation of the Virtual ED found that 86% of patients using the service did not need to then attend an emergency department.[509] One academic study found there were cost savings from avoided emergency presentations in an earlier virtual emergency department pilot in Victoria.[510] These findings are supported by evaluations of similar virtual emergency department trials in Australia and internationally.[511]

Draft recommendation 20

Upgrade critical public hospital infrastructure

> Define the scope and timeframes to upgrade the Royal Melbourne Hospital and begin the first stage of construction. Continue with upgrades at the Alfred and Austin hospitals.

Some of Victoria's major tertiary hospitals need renewal

Public hospitals provide many essential healthcare services, including emergency care, surgeries, and treatment for chronic and acute illnesses.[512] One objective of the *Health Services Act 1988* is for all Victorians to have access to an adequate range of essential health services.[513]

Victoria's hospitals face rising demands from an ageing population and an increase in chronic diseases, service delivery costs and workforce challenges.[514] By 2051, around one-fifth of Victorians will be 65 or over.[515] About 80% of people in this age group have at least one chronic health condition, and 28% have 3 or more.[516] Hospitals must be able to meet these changing demands.

Audits show that some of Victoria's largest public hospitals have been in urgent need of renewal since at least 2017, including the Royal Melbourne, Alfred and Austin hospitals.[517] In some instances, maintenance issues have affected the quality of care.[518] This can make it harder to deliver modern, high-quality care and result in higher long-term costs.[519]

These hospitals provide essential healthcare services to Victorians. This includes complex and specialised care.[520] For example, the Royal Melbourne Hospital provides intensive care for patients after major surgeries or trauma.[521] The Austin hospital specialises in liver transplants and has a state-of-the-art spinal cord unit that services all of Victoria and Tasmania.[522] The Alfred hospital is one of the busiest emergency centres in Australia and has Victoria's only 24-hour, all-weather helipad.[523]

Government action and coordination is required to plan for hospital infrastructure

In 2022, the Victorian Government committed funding to start redeveloping the Royal Melbourne Hospital. This funding was to build a new facility at Arden and prepare the Parkville site for future upgrades.[524] The government has since announced that the facility at Arden will not go ahead.[525] It has not yet provided details on the updated scope of works or timeframe to redevelop Parkville.

The government announced funding in the 2024/25 Victorian Budget to upgrade Austin Health's emergency department and to help maintain operating theatres, intensive care and inpatient units at the Alfred hospital.[526] While this will help address some immediate needs, both hospitals are likely to still require major capital works.[527]

The Victorian Government should announce the scope and timeframes for redeveloping the Royal Melbourne Hospital's facilities in Parkville and begin these upgrades. It should also announce timing and funding for the further renewal at the Alfred and Austin hospitals.

Facility design should be flexible so they can adapt as service demands change.[528] Staging delivery of major hospital upgrades will help to address construction workforce shortage issues. It will also help manage cost, timing and other project risks.[529]

Cost range, timing and funding

We estimate hospital upgrades will cost $6 billion to $8 billion over the next 10 years. This cost is in addition to funding that the government has already announced.[530]

General government revenue can fund the hospital upgrades. The Victorian Government can also consider alternative funding sources, like leasing parts of hospitals to businesses who then provide services for hospital staff, consultants, patients and visitors. Other funding sources include property income, provision of other services, donations and bequests. The government can use funding models like public private partnerships and ground lease models to enable private financing and delivery of hospital upgrades.[531]

This cost range includes renewing or replacing ageing infrastructure like existing buildings, plant and equipment at the Royal Melbourne, Alfred and Austin hospitals. The Victorian Government might expand these hospitals at the same time, but at additional cost. We estimate that operational costs are unlikely to increase following these upgrades, given existing infrastructure is inefficient and already has high maintenance costs.

The government should aim by 2030 to define the scope, timeframes and funding of hospital upgrades and begin the first the first stage of construction on the Royal Melbourne Hospital. Funding for this draft recommendation might be spent beyond the 10-year period from 2026 to 2036, depending on construction industry availability and the need to coordinate with hospital operations and other projects on-site.

Draft recommendation 21

Better use prisons and invest more in health facilities and transition housing

> Use prison capacity to move people to facilities that meet their needs. Invest more in prison health facilities and post-release transition housing. Close old prisons that are underused and expensive to keep.

Victoria's prisons are costly to operate, and underused

Prisons are costly to build, run and keep. The Victorian Government spent $1.5 billion on prisoner support and services in 2022–23.[532] Costs have grown by 67% over 8 years.[533] In 2018–19, prison numbers peaked at 8,044 prisoners.[534] The government built extra prison infrastructure to meet expected demand, including the new Western Plains Correctional Centre.[535] The government will start using this prison in 2025.[536]

However, Victoria's prisons are underused. Since 2019–20 prisons have been less than 90% full. In 2022–23, 21% of male prison beds and 38% of female prison beds were empty.[537] Dhurringile Prison closed in 2024.[538] Port Phillip Prison will close in 2025.[539] The Victorian Government should review capacity needs and close other prisons that are unsuitable and expensive. Closed prisons can be repurposed.

Some prisons can be repurposed for other justice services

First Peoples face entrenched systemic racism.[540] Legislative and policy decisions continue to contribute to the over-representation of First Peoples in Victoria's prisons.[541] They are 18 times more likely to be in prison than non-Aboriginal Victorians.[542] Prisons can cause lifelong harm to First Peoples.[543]

The Wulgunggo Ngalu Learning Place is a joint initiative between the Victorian Government and Aboriginal people at a former prison in Gippsland. It is a culturally safe place for Aboriginal men completing community correction orders.[544] The government should consider whether Dhurringile or Port Phillip prisons can be repurposed for other justice services.

Victoria needs more facilities to help prisoners transition into the community

Victoria's prisons are not designed to rehabilitate people.[545] Almost half of adult prisoners return within 2 years of release.[546] Some prisoners also find it difficult to access healthcare.[547] At its worst, this has led to preventable deaths in custody.[548]

Previous reviews recommend the government provide better access to healthcare and mental health services in prisons.[549] This can help prisoners rehabilitate and reduce reoffending.[550] The Victorian Government should use prison capacity to provide more health and mental health services in prisons.

Many people leaving prison are at high risk of becoming homeless. But prisoners released into stable housing are much less likely to reoffend.[551] Research shows that putting people in prison can cost 23 times more than providing them with housing support.[552]

Victoria has some places that help prisoners transition into the community. For example, the Maribyrnong Community Residential Facility provides temporary housing for around 40 men leaving prison.[553] Baggarrook provides culturally safe housing and services for up to 6 Aboriginal women as they transition back into the community.[554]

Evidence shows that these facilities work. For example, men supported by the Maribyrnong Community Residential Facility are 30% less likely to reoffend.[555] But there are not enough places in transition housing to meet demand.[556] The government should expand post-release transition facilities so more people can access them.

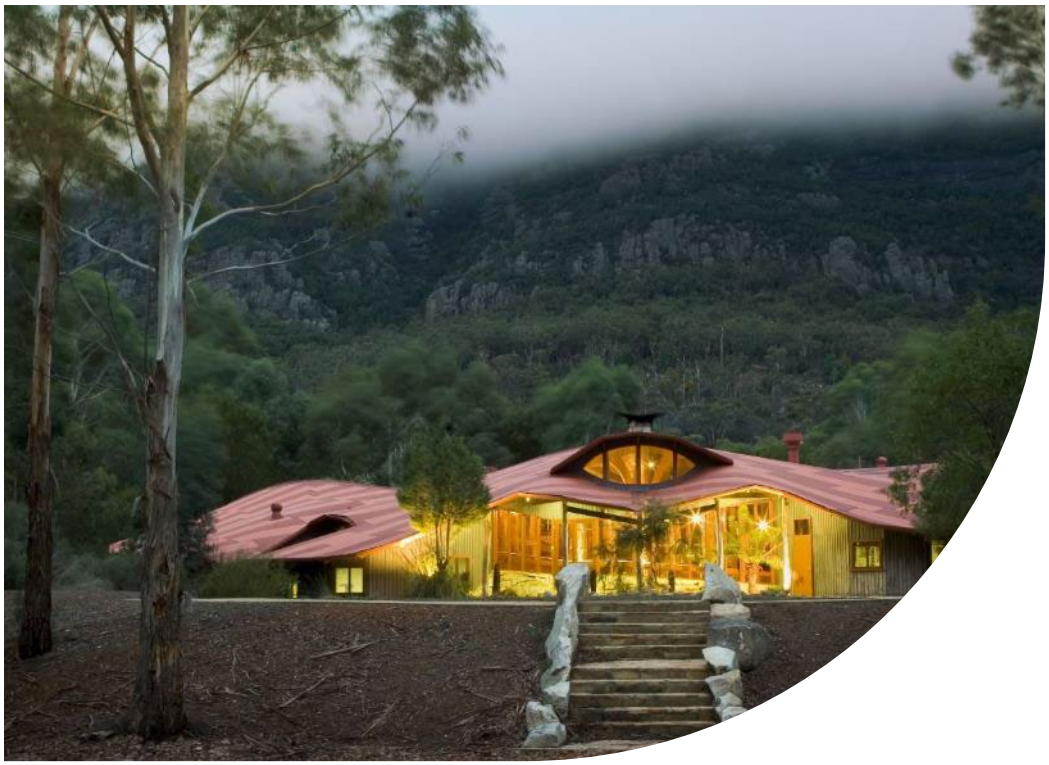
Cost range, timing and funding

We estimate this draft recommendation will cost $150 million to $230 million over 10 years for implementation and capital works. General government revenue can fund this draft recommendation. In some cases, proceeds from selling land or operational cost savings from closing prisons can help to offset the overall cost to government.

The Victorian Government could spend up to $1 million for a business case to close underused prisons and use existing systems and staff to do this work as a first stage. The government should aim to close underused prisons by 2030.

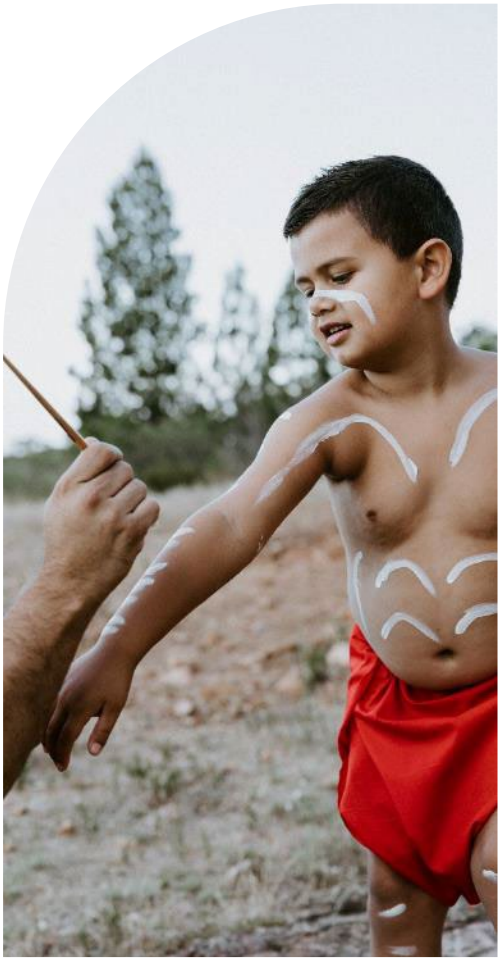
Most of the cost of this draft recommendation is to build post-release transition homes and expand health services in existing prisons. We estimate the homes will cost $100 million to $150 million, and renovations for health services will cost $50 million to $80 million.

New post-release transition homes will need $3 million to $5 million a year for maintenance.



Aboriginal people have self-determination and equal outcomes to other Victorians

Victoria's Aboriginal people have the power and resources to make decisions about their services, infrastructure, communities and future. Victoria has closed the gap in outcomes between Aboriginal and Torres Strait Islander people and other Victorians. Victorian infrastructure reflects respectful engagement with Aboriginal communities, draws on their knowledge, and celebrates their history, culture and values.



Aboriginal people were Victoria's first infrastructure builders

First Peoples have practised their law, lore, customs and languages in Victoria for tens of thousands of years. They have nurtured Country through their spiritual, cultural, material and economic connections to the land, water and resources.[557] In all regions of Victoria, Traditional Owners express a strong connection to Country and emphasise its importance to wellbeing and cultural identity.[558]

Aboriginal peoples were Victoria's first infrastructure builders.[559] For example, the Gunditjmara people farmed and harvested kooyang (short-finned eels) and other fish by cultivating ancient lava flow channels. This infrastructure is one of the world's oldest freshwater aquaculture systems. Gunditjmara clans also built clusters of stone houses to establish villages along the Budj Bim Cultural Landscape.[560]

European settlement brought about devastating changes for First Peoples. The colonial system excluded First Peoples from the places they traditionally occupied and disrupted their culture and kinship systems.[561] The construction of roads, railways, ports and telegraph lines enabled settlers to expand further into Victoria, without the agreement of First Peoples. Dispossession resulted in social exclusion, institutionalisation and disadvantage for Aboriginal Victorians.[562]

The consequences continue to play out in the lives of Aboriginal Victorians today. They have lasting effects on First Peoples' health, housing, employment and education outcomes, and in their interactions with the criminal justice system.[563] Aboriginal people still experience more disadvantage than non-Aboriginal people on most indicators.[564]

All the objectives of this draft strategy are relevant to Victorian Aboriginal communities. But the unique cultures and histories of First Peoples call for a specific objective. Infrastructure planning, design, delivery, operation and maintenance offer opportunities for Aboriginal self-determination, to improve outcomes for Aboriginal Victorians and to protect and heal Country.[565]

Self-determination requires a different approach to infrastructure planning and delivery

Victorian Traditional Owners are diverse and have different hopes and goals. But all want to practice culture through relationships to Country.[566] This can be caring for waterways, managing living cultural heritage, traditional burning or accessing culturally significant places.[567] People making decisions about land, water and infrastructure must understand and respect Traditional Owner aspirations and goals. Culture and Country need to be preserved for future generations.[568]

Self-determination describes First Peoples' right to have control and authority over their own lives.[569] It can mean different things to different communities in different contexts.[570] When applied to infrastructure, it empowers Aboriginal communities to own, design and control infrastructure for their social, economic and cultural needs.

Each infrastructure policy and project that affects culture and Country needs the early, direct and ongoing involvement of Traditional Owners.[571] We have worked with First Peoples and Aboriginal organisations to develop the draft recommendations on infrastructure goals most important to them.[572]

Victoria is working towards Aboriginal self-determination through Treaty negotiations. A Treaty provides a path for First Peoples in Victoria to negotiate the transfer of power and resources. It means that First Peoples will have control over decisions that affect their lives, culture and Country.[573] Treaties can deliver meaningful reform for Aboriginal Victorians.[574] It promises Traditional Owners increased autonomy as well as increased involvement in infrastructure projects undertaken on Country.[575]

The First Peoples' Assembly of Victoria is the independent body representing First Peoples in Victoria's Treaty process. It has been operating since 2019. Assembly members are democratically elected representatives from Traditional Owners in all areas of the state. The Victorian Government will negotiate Statewide Treaties and local Traditional Owner Treaties over time. Statewide Treaty negotiations opened in November 2024.[576]

Infrastructure continues to be built on and use materials derived from the traditional lands of First Peoples in Victoria, but decisions are still made without their involvement. This can lead to infrastructure that damages Country and does not deliver prosperity or meet their cultural needs.[577] This can also make existing injustice and inequality worse.[578]

The Victorian Government has committed to closing the gap in life outcomes between Aboriginal people and other Victorians.[579] To do this, it must share decision-making powers with First Peoples.[580] This means partnering with Traditional Owners, Aboriginal organisations and representative bodies to design and deliver policies, services and infrastructure. It will require governments to work with these organisations to build capacity over time.[581] Strong, ongoing relationships and openness are essential.[582]

Infrastructure can help close the gap for Aboriginal Victorians

Infrastructure can connect Aboriginal people to family and community and support connections to Country. It can reflect Aboriginal culture in its planning and design.[583] It can also help improve economic, health and wellbeing outcomes for Aboriginal Victorians by improving access to jobs and services.[584]

First Peoples have significantly less access to affordable, secure and quality housing, but a safe and secure home is essential for good health and wellbeing.[585] It also supports access to employment, education and training.[586]

The Aboriginal population in Victoria is growing at an average annual rate of 3.8%, more than double the 1.6% growth rate of the broader population.[587] Aboriginal Victorians already need many extra homes just to meet existing demand. They will need more healthcare, mental health and other services, along with infrastructure that can support service delivery in a culturally safe way.[588] This means facilities where First Peoples can feel safe, and free from challenge or denial of their identity and experience.[589] It includes creating spaces that celebrate Aboriginal cultures and acknowledge the Country on which they are located.[590]

Victorian ACCOs are best placed to provide effective services for First Peoples while also supporting Aboriginal employment and self-determination. But many ACCOs that provide health and wellbeing services operate in buildings that are in poor condition. In some cases, this limits their ability to provide services.[591] Our research shows that First Peoples' transport access to health and wellbeing ACCOs is limited in almost every region in Victoria.[592]

Our draft recommendations support self-determination and better outcomes for Aboriginal Victorians in the housing, health and wellbeing sectors. Elsewhere in this draft strategy we consider responses to improve access to culturally safe and appropriate facilities (see draft recommendations 18 and 21) and to return more water to Traditional Owners (see future option – Plan for and invest in manufactured water).

Draft recommendation 22

Invest in secure homes for Aboriginal Victorians

> Fund a 10-year program to build social homes for Aboriginal Victorians and provide secure and sustainable tenancies. Work with Aboriginal housing providers and Traditional Owner corporations to develop capacity across the Aboriginal housing and homelessness sector.

Housing outcomes for Aboriginal Victorians are worse than for other Victorians

Housing outcomes are worse for Aboriginal people than for other Australians. Only 10% of First Peoples households own their home outright compared to 30% for all Australians. One third of First Peoples are in social housing compared to 3% of all Australians.[593] By 2041, Victoria will have more than 60,000 Aboriginal households, up from around 34,000 in 2021.[594]

Aboriginal Victorians face discrimination that makes it difficult for them to secure private rental homes.[595] They also have fewer opportunities to own a home.[596] Aboriginal Victorians are 13 times more likely to seek homelessness support than non-Aboriginal people.[597] More than 5,000 Aboriginal households are already on Victoria's waiting list for social housing.[598] This is around 1 in 6 Aboriginal households.

A safe, secure, affordable and culturally appropriate home is essential for good health and wellbeing.[599] Stable housing can help close the gap in life outcomes for Aboriginal Victorians.[600]

Aboriginal housing providers need funding certainty to deliver secure homes

Mana-na-worn-tyeen maar-takoort: every Aboriginal person has a home is Victoria's self-determined housing policy framework.[601] It lays the foundation for housing and homelessness reform to benefit Aboriginal Victorians.[602] The Victorian Government has endorsed the framework.[603]

Mana-na-worn-tyeen maar-takoort sets a target to build at least 5,000 social homes by 2036.[604] The Victorian and Australian governments funded around 1,000 new social homes for Aboriginal Victorians over the 4 years to 2026–27. This is below the number of homes the framework calls for.[605] It also falls well short of the number of Aboriginal households already in need of a home.

The Victorian Government should fund a 10-year program to build at least 300 Aboriginal-owned social homes each year. This is in line with *Mana-na-worn-tyeen maar-takoort* targets.[606] The scale of need is greater, but this will make a meaningful difference in housing outcomes for Aboriginal Victorians. It will contribute towards our draft recommendation to build more social housing (see draft recommendation 1).

Aboriginal housing providers deliver housing services and culturally appropriate, affordable and secure homes to Aboriginal Victorians. But they must compete for funding with larger, non-Aboriginal service providers.[607] Like many other parts of the social services and housing sectors, contracts are too short to allow Aboriginal housing providers to plan and deliver services that meet community needs.[608] This limits the support they can provide.

Many Aboriginal Victorians experience significant disadvantage. This can make it difficult for some tenants to meet their responsibilities once they have a home.[609] The government should fund Aboriginal housing providers to deliver tenancy support to help people stay in their homes and avoid homelessness.[610]

Housing responses should be led by Aboriginal people

Aboriginal self-determination requires housing responses that are led by Aboriginal people. Aboriginal housing providers are best placed to provide culturally appropriate, affordable and secure homes to their communities. The government should work with Aboriginal housing providers, Traditional Owner

corporations and Aboriginal Trusts to expand the capacity of the Aboriginal housing sector to develop and manage more homes and housing services.[611] This can include home ownership programs and initiatives to create intergenerational wealth in the Aboriginal community and reduce future reliance on social housing.

Cost range, timing and funding

We estimate that building 3,000 social homes will cost $1.5 billion to $2 billion over 10 years. We assume that the Victorian Government can fund $1.4 billion to $1.9 billion, around 95% of overall costs. These cost estimates are already included as a component of the total cost to build social homes in draft recommendation 1.

General government revenue can partly fund this draft recommendation. But it does not need to do it alone. We have assumed that the Australian Government will fund the remaining 5% of costs.

This cost to the Victorian Government can be further reduced by up to $400 million to $500 million, assuming all new social homes can be built on land the government already owns, or on land owned by local government, Aboriginal housing providers, Aboriginal Trusts or other not-for-profit housing organisations.

Government can maximise the availability of public land to build social housing by identifying and prioritising suitable sites and streamlining transfers between public land owners. Strategic planning and development can also help to deliver better value and more diverse housing models.

We used costs at the higher end of the range from draft recommendation 1. This is because Aboriginal households tend to be larger than non-Aboriginal households and experience crowding at higher rates. There is significant need for more homes with 3 and 4 bedrooms in good locations.[612] This estimate includes $15 million to $20 million a year for tenancy support services and for the Aboriginal housing sector to build skills to develop and manage more homes.[613]

Once complete, new homes for Aboriginal Victorians will need around $30 million each year for maintenance. Housing rental payments collected from tenants can contribute. These payments are capped at between 25% and 30% of household income, including wages and government payments.[614] The Victorian Government can also ask the Australian Government for more funding.[615]

Treaty negotiations could consider powers and resources required to build and maintain social homes for Aboriginal Victorians.

Draft recommendation 23

Fund better health and wellbeing infrastructure for Aboriginal Victorians

> Fund and start health and wellbeing infrastructure projects for Aboriginal Community Controlled Organisations (ACCOs). Provide additional annual funding to further develop the skills and capacity of health and wellbeing ACCOs to plan, develop and deliver new and upgraded infrastructure in a self-determined way. Establish an interim fund for minor works and repairs until a self-determined perpetual infrastructure fund is introduced.

Victorian ACCOs' holistic health and wellbeing care model is effective and can help close the gap

The Victorian and Australian governments have committed to closing the gap in outcomes for Aboriginal and Torres Strait Islander people.[616] But in 2023, health outcomes for Aboriginal Victorians continued to be worse than for non-Aboriginal people. This included higher rates of hospitalisation for preventable diseases and for alcohol and other drug-related harm. Aboriginal Victorians are reporting worse health than in previous years.[617]

The Victorian ACCO health and wellbeing model promotes social, emotional, physical and cultural wellbeing.[618] Governments endorse this model as holistic, integrated, strengths-based and trauma-informed. It includes health, family education, justice and aged care services. Health and wellbeing ACCOs that deliver services using this model help to close the gap.[619]

The standard of existing ACCO health and wellbeing infrastructure is poor, limiting service delivery

Demand for health and wellbeing ACCO services is increasing.[620] Their funding comes from many different programs, mostly through short-term grants. ACCOs do not have funding certainty to commit to major infrastructure projects.[621] Rare infrastructure funding only covers small projects and occasional repairs.[622]

The Victorian Aboriginal Community Controlled Health Organisation (VACCHO) recently assessed ACCO health and wellbeing infrastructure.[623] It found that 82% of buildings need to be fully or partially replaced in the next 15 years. Many of the buildings are not culturally safe for Aboriginal people (see box – Culturally safe building design). This can lead to people missing or not making appointments. It also limits service delivery.[624]

The assessment identifies the most urgent health and wellbeing infrastructure projects at a cost of $100 million to $150 million. These projects need to be underway by 2030.[625] The Victorian Government should fund and start these projects over the next 5 years.

ACCOs can only engage with their communities to plan services and facilities when they have funding certainty. This means the Victorian Government should provide additional annual funding to cover minor upgrades and maintenance for the 33 health and wellbeing ACCOs. This will allow ACCOs to maintain and upgrade existing infrastructure to a reasonable standard.

Aboriginal community-controlled infrastructure should remain in, or be transferred to, ACCO ownership. This respects Aboriginal self-determination. Ownership increases ACCO equity. It improves financial sustainability and enables service delivery to close the gap. ACCO building and maintenance services also provide economic development and employment opportunities for Aboriginal Victorians.

Self-determination requires reform in health and wellbeing ACCO infrastructure planning and delivery

The Productivity Commission found that closing the gap requires governments to share power with Aboriginal communities.[626] To action this, the government has committed to a business case for an ACCO perpetual infrastructure fund. This will support long-term, self-determined minor capital and maintenance works, infrastructure planning and management.[627]

VACCHO is the peak body for Aboriginal and Torres Strait Islander health and wellbeing in Victoria. It has the skills and capabilities to work with health and wellbeing ACCOs to place them at the centre of infrastructure planning, development and delivery. Future infrastructure delivery should consider expanding the role of ACCOs to plan and deliver projects, or partnership models that can build their resources and capability to do so.

This will ensure that upgraded and new infrastructure meets each ACCO's self-determined needs. It provides a pathway towards self-determined ACCO infrastructure governance and delivery beyond the first wave of priority projects. The government should fund this work until the perpetual infrastructure fund is established.

Culturally safe building design

Culturally safe building design is about amending or creating a built environment which is safe for Aboriginal and Torres Strait Islander people. Culturally safe buildings include:[628]

- natural light and air to incorporate Country into the building structure, so users of the building can hear, see or touch Country
- community, Elders and children's spaces, so users have their privacy and confidentiality maintained
- space for displays of Culture and cultural practices, whether Culture is incorporated into the building structure and buildings, to enable men's and women's business to be conducted
- connections to wraparound supports, therapeutic rooms and spaces to enable users to have their health and wellbeing appropriately addressed
- a community sense of legacy to a site.

Cost range, timing and funding

We estimate this draft recommendation will cost $270 million to $330 million over 5 years. This includes capital and implementation costs for the most urgent health ACCO facilities and the creation of a minor works and maintenance fund. This can be funded through general government revenue. The Victorian Government can seek additional Australian Government funding, although this has previously been generally directed to remote rather than Victorian projects.[629]

Capital costs for ACCO facilities range between small ($5 million to $10 million), medium ($20 million to $50 million) and large ($50 million to $80 million), using costs from similar projects.[630] The minor works and maintenance fund can provide $30 million a year to 2030 to deal with the urgent backlog of works.[631] The existing Aboriginal Community Infrastructure Program provides $10.2 million over 2 years for Aboriginal organisations to build new community infrastructure or to repair existing infrastructure.[632] This funding ends in June 2025.[633]

We estimate implementation costs of $4 million to $6 million a year for staff and consultants to plan, consult and support the delivery of infrastructure projects and the fund.

We expect all new and updated facilities to cost $3 million to $5 million each year to maintain.

Treaty negotiations could consider powers and resources required to build and maintain health and wellbeing infrastructure for Aboriginal Victorians.

Victoria has a thriving natural environment

Victoria's ecosystems are biodiverse and clean. Victoria does not pollute or put waste in the air, water, land, and natural ecosystems. This includes producing net zero greenhouse gas emissions. Greenhouse gases pollute Earth's atmosphere and contribute to dangerous climate change.

Victorians want healthy environments

Victoria's plants and animals need healthy ecosystems. Minimising waste and pollution helps rivers, waterways and oceans stay healthy. This benefits the fish, turtles and other aquatic life in these ecosystems. On land, parks and forests provide habitat to many of Victoria's mammals and birds. Some species are not found anywhere else in the world.[634] For example, the Leadbeater's Possum is found only in a small area of Victoria's central highlands and forests to the east of Melbourne.[635]

Victorians told us they want a thriving natural environment.[636] They identified reducing greenhouse gas emissions as a priority.[637] Victorians also value actions that help to keep Victoria's ecosystems biodiverse and clean. This includes keeping water for the environment, quickly reducing waste and encouraging more recycling.[638]

Building new infrastructure can threaten the environment. It can lead to the destruction of habitat or produce more pollution.[639] Using materials like concrete and steel for new infrastructure creates greenhouse gas emissions.[640] But infrastructure can also support and minimise harm to a healthy environment. Better using existing infrastructure and using recycled materials in maintenance and construction can keep emissions down.[641] Victoria's landfills will also have less waste.

Well-planned infrastructure can reduce environmental pollution and greenhouse gas emissions. Building infrastructure off-site and using pre-built parts can help.[642] How infrastructure runs can also lower air pollution from energy generation and transport. It can help keep water for the environment. These actions on emissions can increase productivity and lower costs (see section – Victoria has a high productivity and circular economy).

A thriving natural environment benefits Victorians

Communities value Victoria's natural environments.[643] People benefit when they can visit and explore natural areas. For example, access to parks can make Victorians healthier. This saves Victoria $80 million to $200 million of costs from illness each year.[644] The trees and soil in Victoria's parks also remove emissions from the air. They store at least 270 million tonnes of carbon.[645] This helps Victoria minimise the dangerous impacts of climate change.

Healthy environments have many other benefits. Victoria's forests filter rain before it flows into water catchments. Most of Melbourne's drinking water comes from forests in protected catchments.[646] These parks and forests save Victorian cities and towns about $33 million in water treatment costs each year. In rural areas this increases to $50 million each year.[647]

Thriving local environments also help local communities. For example, the Birrarung (Yarra River) has significant cultural value for Victoria's First Peoples.[648] It provides $730 million in economic benefits each year.[649] People can enjoy spending time near the river and using it for recreation.[650] Farmers also use the river's water. The trees along its banks remove emissions from the air.[651]

Victoria's natural ecosystems are in decline

The health of Victoria's ecosystems has declined since European settlement. Victoria has cleared more than half its native vegetation in the past 200 years.[652] Clearing still happens.[653] Other ecosystems are also in decline. For example, Australia's average sea temperature has risen by over 1 degree Celsius since 1900.[654] This has caused ocean acidification, which is impacting Victoria's marine ecosystems.[655]

Urban growth can lead to less biodiversity. Climate change and introduced pests can make this worse. More animal and plant species are at risk of becoming extinct.[656] But the decline in Victoria's biodiversity can be slowed and there is hope for many species. For example, scientists thought the Victorian grassland earless dragon was extinct as it was last seen in 1969.[657] They recently rediscovered the small lizard in native grasslands west of Melbourne.[658]

Climate change is an ongoing threat to Victoria's ecosystems

Victoria will become hotter and drier because of climate change. This will affect Victoria's parks, farmland and rivers. Bushfires have become more frequent in Victoria over the past 40 years.[659] They are likely to occur more often in the future.[660] In some places, this could cause entire ecosystems to collapse.[661]

Bushfires threaten Victoria's water security. Melbourne has historically relied on water from forested catchments. These areas are vulnerable to bushfires, which harm water quality and quantity.[662] Fires can lead to landslides, and soil and ash in water holding areas.[663]

Less water flowing down Victoria's rivers will impact their health. Some rivers in southern Victoria already need more water.[664] For example, the Moorabool River near Geelong is one of the driest in Victoria. In summer parts of it can dry out, leading to fish deaths.[665]

Infrastructure can contribute to a healthier environment

The Victorian Government can respond to these challenges. For example, Victoria can use new sources of water to meet future needs.[666] This means more water can stay in Victoria's rivers.

Traditional Owners have cared for Country and waterways for generations. Increasing Traditional Owner access to water supports economic independence and can improve wellbeing.[667] It also has many benefits for the environment and Victorian communities.[668]

Planting more trees and shrubs can help cool Victoria's cities.[669] It also increases shade, removes pollution and emissions from the air, reduces stormwater runoff and increases biodiversity.[670] Reducing the amount of waste Victorians produce means less rubbish ends up in Victoria's rivers, oceans and landfills. This further protects biodiversity.[671]

Elsewhere in this draft strategy we consider how other infrastructure sectors like energy can contribute to a healthier environment and meet future needs of Victorian communities (see section – Victoria is resilient to climate change and other future risks).

Draft recommendation 24

Reduce greenhouse gas emissions from infrastructure

> Adopt carbon values and measure carbon in infrastructure projects to reduce emissions.

Building and operating infrastructure produces emissions

Infrastructure contributes around 70% of Australia's greenhouse gas emissions.[672] Producing materials like cement and steel generates emissions.[673] Construction machinery often runs on fossil fuels. Buildings and infrastructure use energy when they run.

To reduce greenhouse gas emissions, governments and businesses can make swift and widespread changes to how they plan, build, maintain and reuse infrastructure. Victoria must reduce emissions generated when producing materials and building infrastructure to meet its emissions reduction targets. Acting now can reduce costs and improve productivity.[674] It can also promote innovation and grow jobs.[675]

Infrastructure investment decisions need to clearly consider emissions

Greenhouse gas emissions impose costs on the community. These costs include infrastructure damage from extreme weather.[676] A carbon value represents the cost of these emissions to society. Cost benefit analyses use a carbon value to estimate the impact of different projects and policies on emissions. This encourages governments and businesses to reduce emissions and invest in cleaner alternatives.

The government does not have a standard method to value carbon and existing guidance is out of date.[677] In our advice, *Opportunities to reduce greenhouse gas emissions of infrastructure,* we showed that Victoria can align its approach with other governments.[678] For example, Infrastructure Australia recommends carbon values of $56 a tonne in 2024, rising to $377 in 2050, to meet Australia's emissions reduction targets.[679] Australia's infrastructure and transport ministers support using these nationally consistent carbon values for projects over $100 million.[680]

State and territory governments need carbon values that reflect costs specific to their own emissions reduction targets. The Victorian Government should adapt the national approach and calculate carbon values that will meet Victoria's target of net zero emissions by 2045.[681]

Assessing emissions from infrastructure requires a standard approach

In Victoria, infrastructure cost benefit analyses do not always include consistent carbon values.[682] Project teams have little incentive to reduce emissions. They tend instead to focus on reducing monetary costs.

The Victorian Government should value carbon in infrastructure cost benefit analyses. This can encourage decision-makers to reduce carbon at the project planning stage when it has the greatest influence on outcomes (see Figure 13).[683] The New South Wales Government updated its requirements for valuing carbon and emission impacts in cost benefit analyses in 2024.[684]

The government should update its business case, procurement and contracting guidance to prioritise reducing emissions. It should include emissions reduction requirements in tenders and government contracts. If infrastructure projects measure and value carbon, options to reduce emissions can be compared.

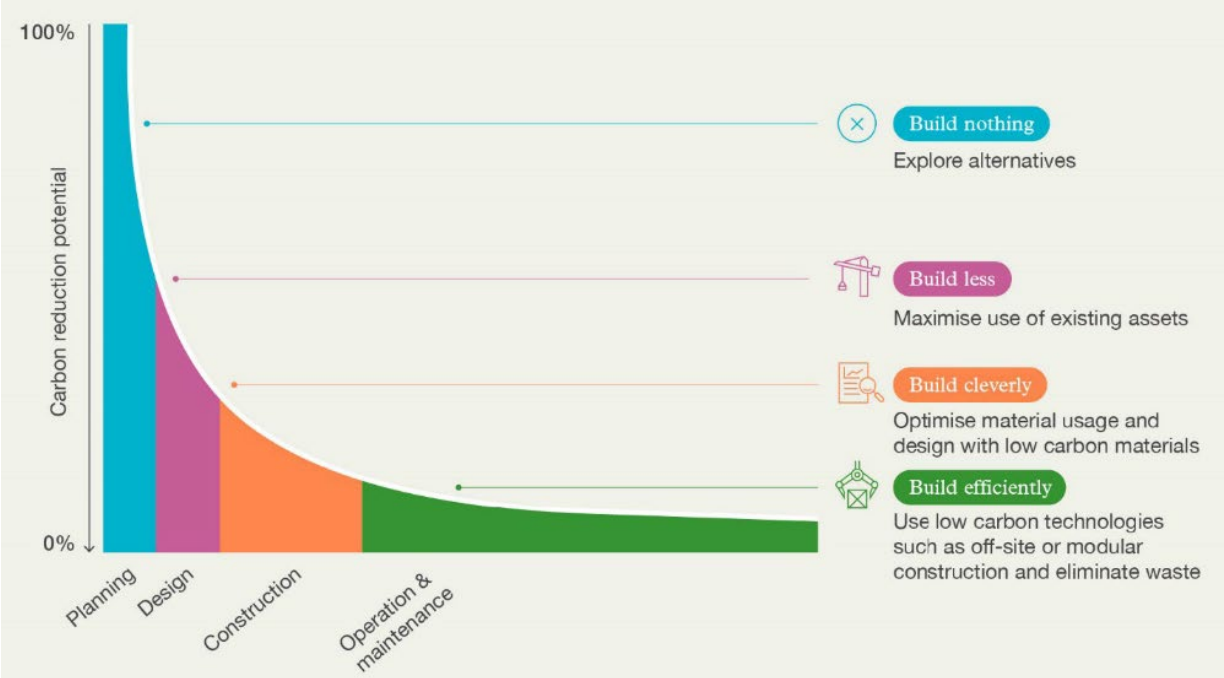
The government can help build more low carbon infrastructure

The Victorian Government should prioritise non-build and low-build solutions. It should better use existing infrastructure or modify it before building new.

When it does build, the government should use more low carbon and recycled materials. These are not used widely, making them more expensive.[685] Government procurement practices can discourage low carbon options because they specify using certain designs and materials instead of performance outcomes.[686]

The government should work with industry to fast-track low-carbon materials. It should update standards and specifications to reflect required performance.[687]

Figure 13: Carbon reduction potential across different project stages



Source: Adapted from World Green Building Council, *Bringing embodied carbon upfront: coordinated action for the building and construction sector to tackle embodied carbon*, 2019, p 20, accessed 24 December 2024.

Cost range, timing and funding

We estimate that this draft recommendation will cost around $1 million and can be funded through general government revenue.

The cost includes working out Victoria's carbon value, developing supporting policies and updating procurement guidelines, contracts, standards and specifications.

Draft recommendation 25

Advance integrated water management and use more recycled water

> Work with partners to fund and deliver integrated water management projects. Determine the costs and benefits of introducing recycled drinking water in Melbourne and Geelong and build a pilot recycled drinking water facility. Deliver a community education campaign on the need for more water sources.

Integrated water management has many benefits

Integrated water management considers the supply of water, wastewater and stormwater services as a joint system. This can improve water security, public health, urban amenity and the environment.[688] It can also reduce flood risk, better protecting houses and infrastructure.

The Victorian Government partners with organisations such as local governments and water authorities to deliver integrated water management projects (see case study – Growing native plants with integrated water management).[689] Previous projects provided recycled water to farms on the Bellarine Peninsula and built wetlands that remove excess nutrients and sediment from stormwater flowing into Bendigo Creek.[690]

The government has set integrated water management targets. Current projects in Melbourne will create 67 billion litres of recycled water.[691] But together these projects only provide 68% of the 2030 alternative water for agriculture target and 80% of the 2032 environmental water target.[692] Many of the initiatives are not funded yet.

The Victorian Government should work with partners to fund and deliver planned integrated water management projects. It should also find more projects to meet 2030 targets. These projects are an opportunity for Victoria to use more recycled water and boost water security.

Victorians already use some recycled water

Recycled water is wastewater that is treated to make it safe for people to use.[693] Victorians use recycled water for agriculture, sports fields, parks, the environment and industry.[694] Some households use it in gardens, laundries and toilets.[695]

Recycling water reduces demand on other drinking water sources. It also reduces the amount of wastewater released into oceans and waterways.[696] This protects biodiversity.[697] But Victoria only reused 15% of its wastewater in 2021–22.[698]

Recycled drinking water is a further opportunity

Recycled water can be made safe to drink.[699] People in Singapore, Perth and over 30 other places drink recycled water.[700] The New South Wales Government is considering recycled drinking water in Sydney.[701]

Recycled drinking water would be new in Victoria. The Victorian Government should better understand recycled drinking water and consider whether to introduce it in Melbourne and Geelong. The government should determine the costs and benefits of using recycled drinking water by investigating how existing infrastructure can be used and what new infrastructure would be needed.

The government should also build a pilot recycled drinking water facility. Pilot facilities provide data on treatment requirements.[702] This can give regulators a better understanding of whether recycled water can meet drinking water regulations. These facilities also improve consumer understanding.[703] For example, water authorities in Sydney, Singapore and Silicon Valley have provided tours of recycled drinking water facilities.[704]

Recycled drinking water would be a big change. People are more likely to support it if they know their community needs more drinking water.[705] Consumer support for recycled drinking water also grows when people have more information.[706]

Many Victorians do not understand the need for more water sources

Victorians influence what their water corporations invest in.[707] But many Victorians do not know that water resources are under pressure from population growth and climate change.[708] Victoria will need more water sources that do not rely on rainfall (see future option – Plan for and invest in manufactured water).[709]

The government should deliver a statewide community education campaign on the need for more diverse water supply sources to improve water security. This should include information on the opportunity to use recycled drinking water.

Case study

Growing native plants with integrated water management

The Royal Botanic Gardens Cranbourne waters native plants using recycled water from the Eastern Treatment Plant. A one kilometre pipeline transfers recycled water to the gardens, saving 35 million litres of drinking water each year.[710]

The project helps the Royal Botanic Gardens Cranbourne respond to climate change and means that more drinking water will be available for Victorians to use. The Victorian Government provided funding for the project from the integrated water management program.[711]

Image: Royal Botanic Gardens Cranbourne

Cost range, timing and funding

We estimate this draft recommendation will cost around $300 million over 10 years. This includes a grant fund for integrated water management initiatives including a pilot recycled drinking water plant. General government revenue can fund this draft recommendation.

The integrated water management framework is a collaborative model funded jointly by partnering organisations. Victorian Government funding can encourage water authorities, local government and catchment management authorities to contribute more. Partnering organisations can also collect user charges to help recover some capital costs and ongoing infrastructure operation.

Our cost range includes $5 million to $10 million for technical studies on how Melbourne and Geelong can adopt recycled drinking water and to run community education programs. We estimate a pilot recycled drinking water plant will cost $30 million to $50 million. It would cost less than $1 million every year to maintain.

Future option

Plan for and invest in manufactured water

> Plan for and invest in manufactured water. Return more water to Traditional Owners and the environment.

Victoria will need more manufactured water

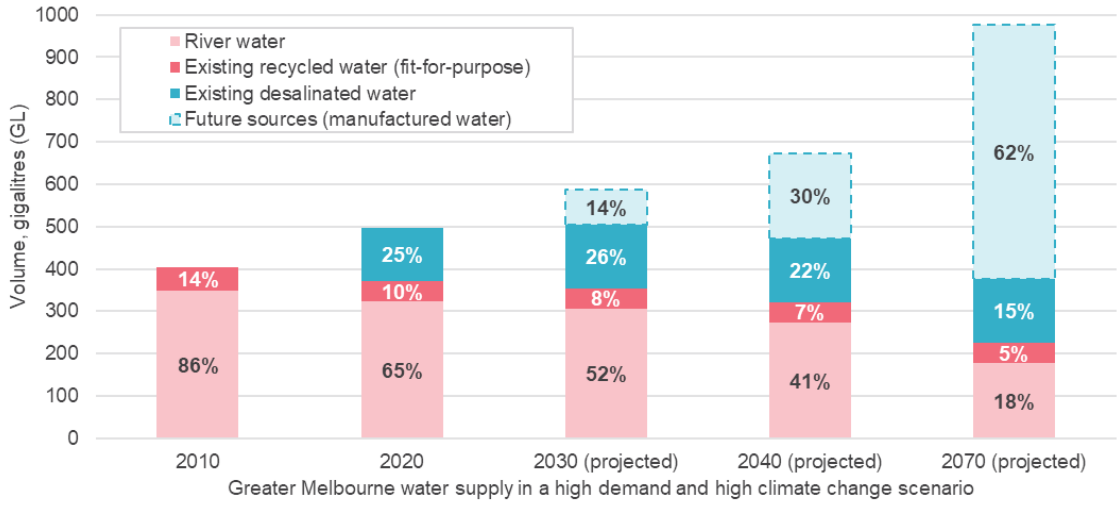
Water is needed for Victoria's communities, agriculture, the environment and Traditional Owners. Climate change means that Victoria will have less water flowing into rivers and dams as the climate becomes warmer and drier.[712] Manufactured water can help address these challenges.

Manufactured water sources include recycled water, treated stormwater and desalinated water. Recycled water is wastewater that has been treated to make it safe for people to use.

Victorians already drink manufactured desalinated water from the Victorian Desalination Plant.[713] They also use manufactured recycled water and stormwater treated to a lower standard for gardens, agriculture and industry.[714] This reduces demand on Victoria's other drinking water sources.

Up to 65% of Melbourne's water might need to be from manufactured sources in 2050. This is an increase from 2020, when 25% of Melbourne's water was desalinated and 10% was recycled (see Figure 14).[715]

Figure 14: Melbourne needs more manufactured water



Source: Infrastructure Victoria, adapted from Department of Environment, Land, Water and Planning, *Central and Gippsland region sustainable water strategy*, State of Victoria, 2022, p 37, accessed 26 September 2024.

Plan early for manufactured drinking water facilities

Melbourne's water supply might need to double within 50 years.[716] Bendigo and Geelong are likely to need more drinking water by 2040.[717] Manufactured water facilities can take up to 10 years to plan and build.[718] Preparing now means that more water will be available when Victorians need it.

The Victorian Desalination Plant was designed so that it can be expanded when Melbourne needs more drinking water.[719] The Victorian Government should develop a business case that considers expanding the plant (see draft recommendation 43).

But Melbourne will need even more water.[720] This can come from a new desalination plant or recycled drinking water facility. Recycled drinking water is likely to be cheaper.[721] It also uses less energy.[722] The Victorian Government should plan for and invest in other manufactured water sources before Victoria needs more drinking water.

Traditional Owners and the environment also need more water

Climate change will reduce how much water flows down Victoria's rivers.[723] Using manufactured water in Victorian cities and towns means that more water can stay in rivers.[724]

Rivers have cultural value for Traditional Owners.[725] But the way rivers have been managed since European settlement has undermined their cultural value and connection. Aboriginal people owned less than 0.2% of Victoria's water entitlements in 2022.[726] The exclusion of Traditional Owners in water management has prevented them from caring for Country.[727] The Victorian Government has committed to working with Traditional Owners to increase access to water entitlements.[728]

Victorian rivers also need more water to support a healthy environment for plants, fish and other animals.[729] Some rivers already dry out in summer, causing plants and animals to die.[730] The government has committed to returning almost 100 billion litres of water to the environment in the Central and Gippsland region.[731] But this is only 26% of the water these rivers need.[732]

Victoria needs to better use and manage water to improve cultural and environmental outcomes. The government should return more water to Traditional Owners and the environment. It has already returned 2 billion litres of water to the Gunaikurnai Land and Waters Aboriginal Corporation (see box – Returning water to Victoria's First Peoples).[733] In regions where water rights are fully allocated, the government can buy water entitlements for First Peoples' communities.[734] Manufactured drinking water is another opportunity to return water.

Returning water to Victoria's First Peoples

The Victorian Government returned 2 billion litres of water to the Gunaikurnai Land and Waters Aboriginal Corporation in March 2021.[735] Announced in November 2020, it was the first formal hand back of water rights to Traditional Owners in Victoria.[736]

The water can only be taken from the Mitchell River when river flows are high during July to October. The water helps restore traditional practices, protect cultural values, heal Country and support the Gunaikurnai people to gain economic independence.[737]

Cost range, timing and funding

We estimate that planning for manufactured water will cost $1 million to $5 million. General government revenue and user costs collected by water authorities can fund this future option.

Our estimate includes costs to undertake feasibility studies and develop business cases to provide Victorians with more manufactured water. Completing these studies between 2030 and 2032 can support strategic planning of the full water network and allow for projects to start construction by 2035 if required.

Our cost estimate for planning does not include the cost of investing in projects. We estimate that building manufactured water projects will cost in the billions of dollars. For example, the Victorian desalination project in the Wonthaggi region cost $3.5 billion to build in 2009.[738]

Draft recommendation 26

Better use government land for open space and greenery

> Fund actions to better connect open spaces to each other and plant more trees and shrubs in urban areas. Give Victorians access to more public land in fast growing suburbs. Target at least 30% tree canopy and shrub cover on public land.

Open space provides social, health and environmental benefits but it is under pressure

Open space can be parks, ovals, reserves and along streets. People have different opinions on the type of open space they want and how to use it.[739] Green open space helps people enjoy a more compact city.[740]

More people living in Victoria's cities puts pressure on open spaces. We estimate that Victorians will need 900 more hectares of open space by 2036.[741] Local governments are usually responsible for securing land for open space. Some funding comes from developer contributions. But land is expensive.[742] It can cost up to $3 billion to buy 900 hectares of land in urban areas.[743]

Connected open spaces support walking and cycling, reduce congestion and improve people's health.[744] They can also improve biodiversity and ecosystems by allowing safe travel for wildlife.[745] The existing open space network has gaps.[746] Many parks and trails are not connected to other open spaces. This limits their social, health and environmental benefits.

Governments can open up more land for public use

The Victorian and local governments own over 45,000 hectares of Melbourne's open space.[747] But public access to over 4,000 hectares of this land is restricted.[748]

The Victorian Government can better use public land for open space to support more compact cities (see Figure 15).[749] The *Open space for everyone* strategy already identifies actions to create a more connected open space network in Melbourne.[750] For example, Victoria can better use the 2,000 hectares in public golf courses. It can fund cemetery trusts to upgrade cemeteries for respectful use by communities.[751]

Regional cities also need better connections between open spaces.[752] The government should use regional infrastructure funding to help implement local governments' open space strategies.[753]

By 2030, the government should open at least 450 more hectares of public land where most population growth will happen. This is half the open space Victoria needs by 2036. It can start with fast growing suburbs in Melbourne, Geelong, Ballarat and Bendigo. The Pick My Park program, which encourages local communities to vote for new or upgraded parks, should prioritise connecting existing open spaces.[754]

The government should work with organisations such as Melbourne Water and schools to make more public land available for community use (see draft recommendation 16).[755] It should identify sources of maintenance funding for local governments and schools to care for new open spaces.

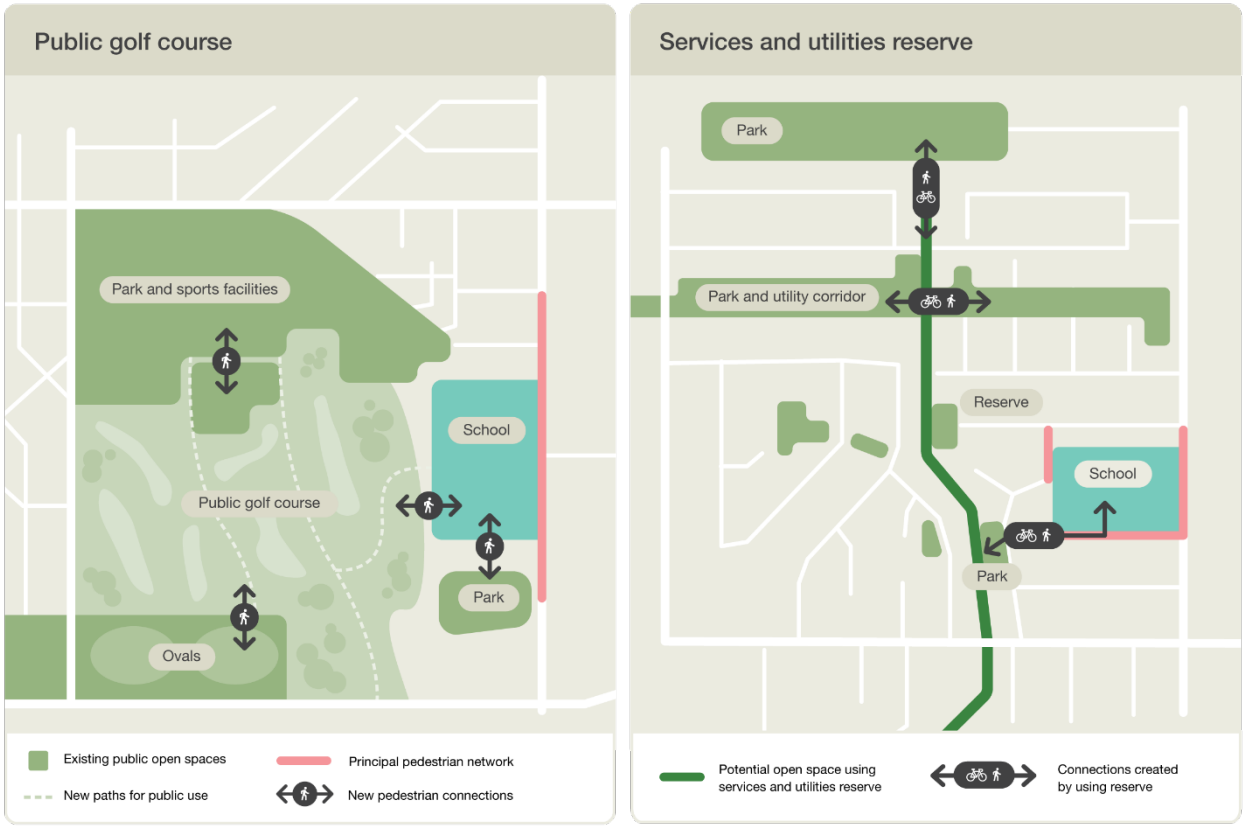
More trees and shrubs make open spaces better

Victoria's cities are getting hotter.[756] More vegetation lowers temperatures, keeps water in soils, improves air and water quality and helps manage flood risk.[757] People are more likely to use cool and shaded open spaces, but trees and shrubs cover only 22% of Melbourne's residential areas.[758] Developers remove vegetation when they build homes.[759] Plants on public land must then make up for fewer trees and shrubs on private land.[760]

The government has vegetation targets for public land in new suburbs.[761] It should set targets for Melbourne's established suburbs using Living Melbourne's target of 30% to 50% land covered by tree canopy and shrubs by 2050.[762] It can set targets for regional cities based on their greening strategies.[763]

Targets are most useful when they measure progress. The government should collect vegetation data so it can show how it is meeting its targets each year.[764]

Figure 15: Government can better use public land for connected open space



Source: Infrastructure Victoria

Cost range, timing and funding

We estimate that better using government land for open space and greenery will cost $10 million to $15 million over 5 years. General government revenue can fund this draft recommendation.

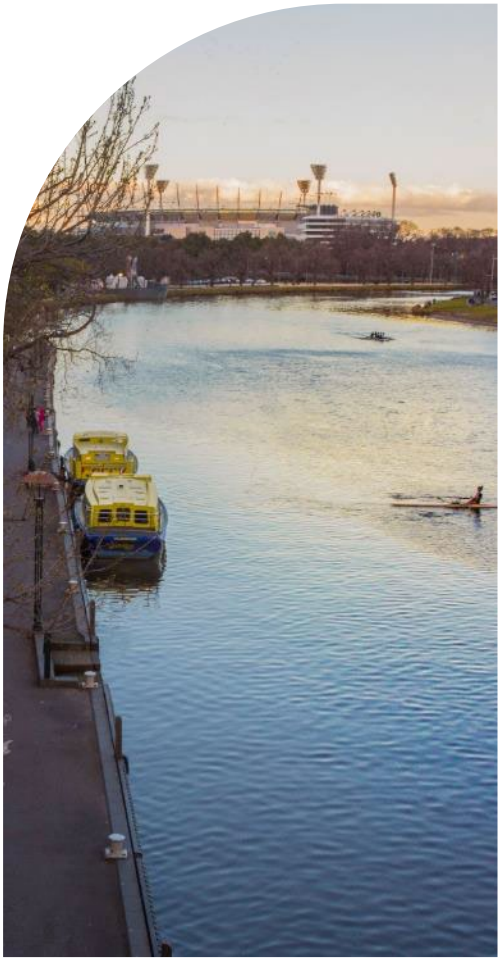
Half of our cost estimate is for staff to implement the government's *Open space for everyone* strategy and set targets for tree canopy and shrubs.[765] Existing government staff can lead this work.

The other half covers Victorian Government grants to local governments and organisations that look after public land like creek corridors, golf courses and cemeteries. These costs can be covered by the Victorian Government's $30 million Pick My Park program.[766] Local governments and organisations can then use the funding to make their open spaces more usable by improving paths, building toilets and planting trees. Regional councils can use Pick My Park funding to invest in their open space and greening strategies.

Organisations and communities in Melbourne can apply for grants to buy or maintain trees and shrubs.[767]

Victoria is resilient to climate change and other future risks

Victoria can minimise the impact of adverse future events. Victoria's greatest future risk is the impact of climate change, but it also faces risks of economic, technological, geopolitical, health or other environmental disasters and crises.



Climate change and other risks threaten Victoria's infrastructure

Victoria will change over the next 30 years. By 2055, extreme weather events will occur more often. The state will face more intense rainfall, more hot days, and higher sea levels.[768] Other risks could also affect Victoria, including economic volatility, ageing or obsolete technologies, geopolitical instability, health crises and environmental disasters.

These extreme weather events, crises and disasters disrupt daily life. They can destroy homes and challenge businesses.[769] A single event can happen in a matter of hours but change communities forever. Victorians have experienced these disruptions already, from pandemics to bushfires, droughts and floods.[770] Victorians' future health, safety and prosperity will be shaped by how governments and communities anticipate, mitigate and adapt to the impact of adverse events.

Victorians want their communities and environments to be resilient.[771] They recognise that climate change will affect their future. Stakeholders and community members told us they strongly support action on climate change.[772] Many called for urgent measures to reduce greenhouse gas emissions and to adapt infrastructure for the new climate.[773] They wanted infrastructure that protects people and nature from the impacts of climate change.[774]

Victoria can prepare now for an uncertain future

Victorians rely on services provided by essential infrastructure. This includes water, transport, healthcare, energy and communications.[775] Disruptions to infrastructure can have serious consequences for communities, businesses and governments.[776]

Climate change presents profound and far-reaching challenges for Victoria. It threatens infrastructure, including buildings, roads and power lines. Most of Victoria's infrastructure was not designed for the changing climate. If governments take no action, Victoria's infrastructure will fail more often, affecting communities and industries in every region.[777]

Climate change can harm people and businesses. Households and businesses will face higher insurance costs as homes and commercial buildings will need more maintenance and repair.[778] Some Victorians will be unable to afford these increases.[779] Farms will also be less productive and make fewer profits if they do not adapt.[780] Wheat crop yields could fall by 14% across Victoria.[781]

Victorians are already paying for climate impacts. Between 2007 and 2016, recovery from extreme weather events cost Victoria an average of $2.7 billion a year.[782] Heatwaves alone cost the Victorian economy $87 million each year.[783] This could grow to $179 million by 2030.[784]

One study estimated that climate change damage could reach $150 billion by 2050.[785] This includes costs from lower productivity, sea level rise and infrastructure damage.[786] It does not include the impact of pollution, bushfires, floods and biodiversity loss.[787] Some of these costs are locked in, but governments can avoid many future costs by acting now to reduce emissions and prepare for climate change.[788]

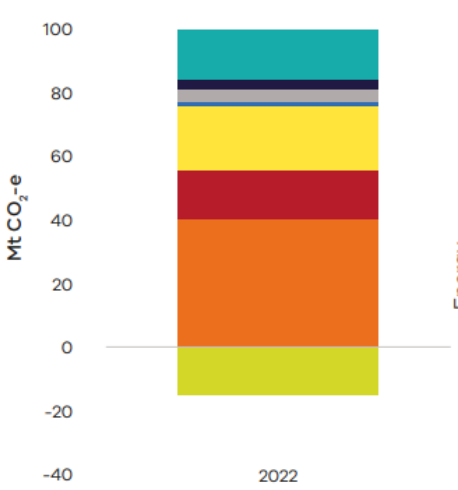
As natural hazards become more frequent and intense, adapting and investing in more resilient infrastructure is urgent.[789] In the past, governments have waited until infrastructure fails and then spent large amounts of money to fix it.[790] This has high economic, social and environmental costs.[791] Investing in infrastructure that can better withstand climate effects is often more cost-effective than repairing and rebuilding it.[792]

Victoria's transition to renewable energy relies on infrastructure planning and investment

Infrastructure contributes to Victoria's greenhouse gas emissions. Building new infrastructure creates emissions that harm the natural environment. We consider how Victoria can reduce emissions from infrastructure in draft recommendation 24.

Minimising the risks of climate change means acting to lower emissions. Fossil fuels such as oil, coal and gas are the main source of Victoria's emissions.[793] Almost half of energy sector emissions come from generating electricity (see Figure 16).[794]

Figure 16: Victorian emissions by sector and energy subsector, 2022



	Mt CO_2-e	Share
Agriculture	15.5	18.3%
Waste	3.2	3.8%
Industrial processes and product use	3.6	4.2%
Energy: Fugitive emissions from fuels	1.8	2.2%
Energy: Transport	19.7	23.3%
Energy: Fuel combustion	15.5	18.3%
Energy: Electricity generation	40.4	47.7%
LULUCF	-15.0	-17.7%
Total	84.7	100%

Source: Department of Energy, Environment and Climate Action, *Victorian greenhouse gas emissions report 2022*, State of Victoria, 2024, p 8, accessed 5 December 2024. Note: Land Use, Land-Use Change and Forestry (LULUCF).

Victoria will need more renewable energy infrastructure to meet its target of net zero emissions by 2045. Victoria's coal-fired power stations are also ageing. A balance of renewable energy generation and storage can replace them as they are retired. The Victorian Government has set targets to generate 65% of electricity from renewables by 2030, increasing to 95% by 2035.[795] It has also set storage targets.[796] This can help make Victoria's electricity system affordable, reliable and sustainable.[797]

Shifting to renewable energy means upgrading and building new infrastructure. Some existing infrastructure, such as coal-fired power stations, will no longer be used. Gas network infrastructure will also need to change as Victoria moves away from fossil gas in some sectors while still meeting the needs of industry and energy system security.[798]

Governments and the private sector are investing in new renewable electricity generation and storage, including offshore wind, to provide the energy Victoria needs.[799] VicGrid is planning for more transmission infrastructure to develop renewable energy zones, helping to connect new large-scale renewable electricity projects.[800]

The electricity sector's transition to net zero opens opportunities for the gas and transport sectors to decarbonise, as more Victorians switch to electric vehicles and energy-efficient electric appliances.[801] As more homes, businesses and vehicles electrify, Victoria's electricity use will increase by about 50% by 2036.[802]

The scale and pace of change required means Victoria will need to speed up and expand efforts to meet its emissions and energy targets. In doing so, the Victorian Government will need to work with Australian and state governments, energy market bodies and the private sector to bring about major change.

The government will also need to manage potential energy shortfalls due to extended periods of cloud cover or low wind, and increasingly variable demand for electricity as more people switch to electric vehicles and install rooftop solar. Without the right policy direction and investments, communities face a higher risk of blackouts and power outages.[803] Electricity prices might also rise.[804] Therefore, an orderly transition to a lower emissions energy network is in the long-term interests of consumers.[805]

Households can help with Victoria's renewable energy transition by using less electricity during peak times to take pressure off the electricity network.[806] Improving energy efficiency means Victorians will use less electricity to heat or cool their homes. It also makes homes more comfortable. Adding solar panels and batteries means that households can generate and store electricity as well.[807]

Draft recommendation 27

Better prepare infrastructure for climate change

> Fund high-priority, cost-effective infrastructure adaptation actions when climate adaptation action plans are updated in 2026. Produce an energy sector adaptation plan.

Victoria's infrastructure needs to handle extreme weather

Victoria's climate is changing rapidly. It is already 1.2°C hotter than when official Australian records began in 1910.[808] This means Victorians will have more intense storms and floods, more heatwaves and bushfires, and higher sea levels.[809] Climate change seriously threatens infrastructure, including buildings, roads and power lines.

Weather-related damage might cost Victoria nearly $1 trillion by 2100 if no one acts.[810] It can be cheaper to invest in infrastructure that can withstand more extreme weather than to repair and rebuild it.[811] More resilient infrastructure also helps keep people safe and well, and businesses and services running.[812]

The Australian Government spends 97% of its natural disaster funding on recovery and only 3% on prevention.[813] A shift to adaptation spending can break the cycle of low upfront investment and high repair and recovery costs.[814]

Investment in adaptation can be cost effective

Our work in *Weathering the storm: adapting Victoria's infrastructure to climate change* shows that the Victorian Government can take cost-effective adaptation action to reduce climate impacts on infrastructure.[815] Some adaptation measures returned over $5 in benefits for every $1 spent.[816]

But the government has not set aside funds for adaptation. Infrastructure managers are not confident the government will fund adaptation projects.[817] Managers are reluctant to use limited resources to look at climate risks and adaptation actions for no result.

Victoria's climate change strategy contains the government's adaptation priorities.[818] These set the focus for 7 sectoral adaptation action plans and 6 regional adaptation strategies. Together they outline government priorities to adapt to climate change. The *Climate Change Act 2017* requires government to produce new adaptation plans by 2026.[819]

The Victorian Government should set aside funds for its 2026 adaptation update. It should fund adaptation proposals that have strong business cases. Agencies should first work on high-risk assets to find the best solutions to manage these risks. They can ask for funds for bids that show a good return on investment.

This is like the approach in other countries, including New Zealand's NZ$419 million Crown Resilience Programme and Canada's CAD$200 million Natural Infrastructure Fund, which focuses on nature-based adaptation.[820]

Nature-based approaches to climate adaptation

Nature-based solutions for infrastructure are actions that protect, manage or restore ecosystems while also building resilience to climate change. For example, restoring forests can help reduce flooding and associated property damage following major storms.[821]

The energy sector needs its own adaptation plan

Power keeps homes and essential services running, including mobile phones and internet connections. These telecommunication services keep communities connected and updated during emergencies. Over 525,000 Victorians lost power after extreme winds in October 2021.[822]

The Victorian Government does not have an energy sector adaptation plan. The built environment plan includes some parts of the energy sector but not others.[823] It has few actions to improve energy infrastructure resilience, even though other adaptation action plans identify energy as essential to provide services.[824]

The government should create an energy adaptation plan in the 2026 update, to cover all parts of the energy sector. The new plan can build on the findings of the 2022 *Electricity distribution network resilience review*.[825] It should set out adaptation tasks for the government's energy agencies and regulators. It should also clarify the respective responsibilities of private businesses, governments, regulators and local communities in building resilience.[826]

The government can also better track and report whether its adaptation actions are working. This can help infrastructure managers make better decisions by providing the evidence they need.[827] They can learn from past efforts and change future programs to perform better. The Victorian Government should monitor and evaluate its adaptation action plans and publish the results.

Cost range, timing and funding

We estimate that better preparing infrastructure for climate change will cost $300 million to $500 million over 10 years. General government revenue can fund this draft recommendation.

Most of this cost is to fund infrastructure adaptation projects with a strong business case. It also includes up to $1 million in government costs to develop an energy sector adaptation action plan, as well as to better track and report on actions. We assume existing staff can do this work. General government revenue can fund this draft recommendation.

We have not estimated operational costs as these will vary depending on the specific adaptation measure. Business cases will ensure value for money from capital and operational costs.

Draft recommendation 28

Use new flood maps to revise planning schemes

> Produce a common set of flood projections based on the latest climate data. Use this information to update flood studies and maps and apply them in planning schemes. Minimise building in areas at high risk of flooding.

Floods pose risk to Victoria's infrastructure

Climate change means floods will damage more of Victoria's infrastructure, more often. The risks include flash floods, river floods and coastal floods. Properties in north central Victoria face the biggest risk from river floods in Australia.[828] Coastal communities are at risk from rising sea levels, high waves and erosion (see Figure 17).[829]

Floods and sea level rise are costly. The 2022 floods had Australia's highest ever insurance cost.[830] In Victoria, over 10,000 people claimed $489 million.[831] The Victorian Government's relief and recovery costs were nearly $2.5 billion.[832] Rising sea levels might cost Victoria $442 billion by 2100.[833]

Victoria's flood data is outdated and unreliable

If governments have good data about where floods might happen and how likely they are, they can better manage the risks.[834] Climate change means that past data is no longer a useful guide. Climate science is complex. Even when climate projections exist, people need expert knowledge to understand them. Climate scientists advise using several models to account for unknowns, and most people cannot decide which to use.[835]

Governments, businesses and communities find it hard to get flood modelling that incorporates climate projections.[836] Flood standards and sea level rise benchmarks are out-of-date.[837] Planners base decisions on inaccurate or outdated flood maps.[838] Councils gather and apply flood data in different ways. This results in a patchwork of partial information.[839] Without good information, councils approve buildings in flood risk areas. This makes flood damage to infrastructure and communities worse and increases costs and disruption.

Flood projections and maps should be updated

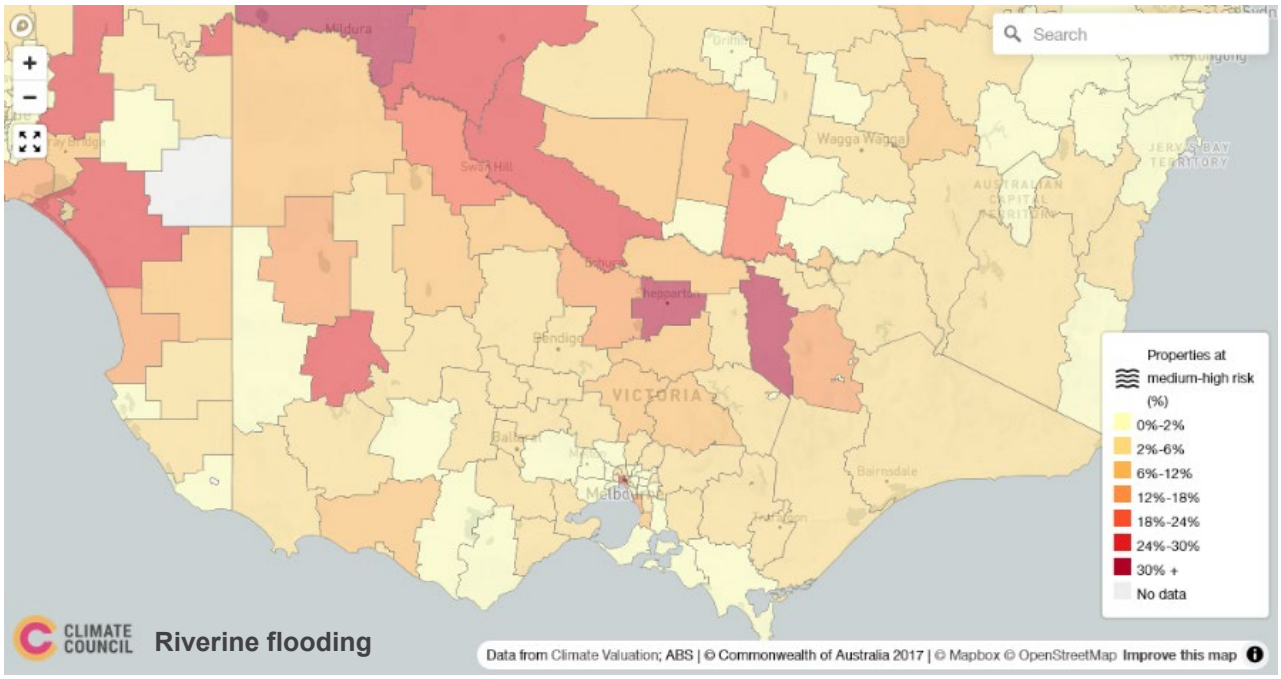
The Victorian Government should make consistent updates to flood projections, using the latest scientific data.[840] For example, Victoria's sea level rise benchmark should rise from 0.8 metres to 1.1 metres by 2100, in line with the Intergovernmental Panel on Climate Change's latest projections.[841] The projections should include higher frequency events, like a 2% or 5% chance of a flood each year, instead of only the 1% Annual Exceedance Probability flood standard.[842]

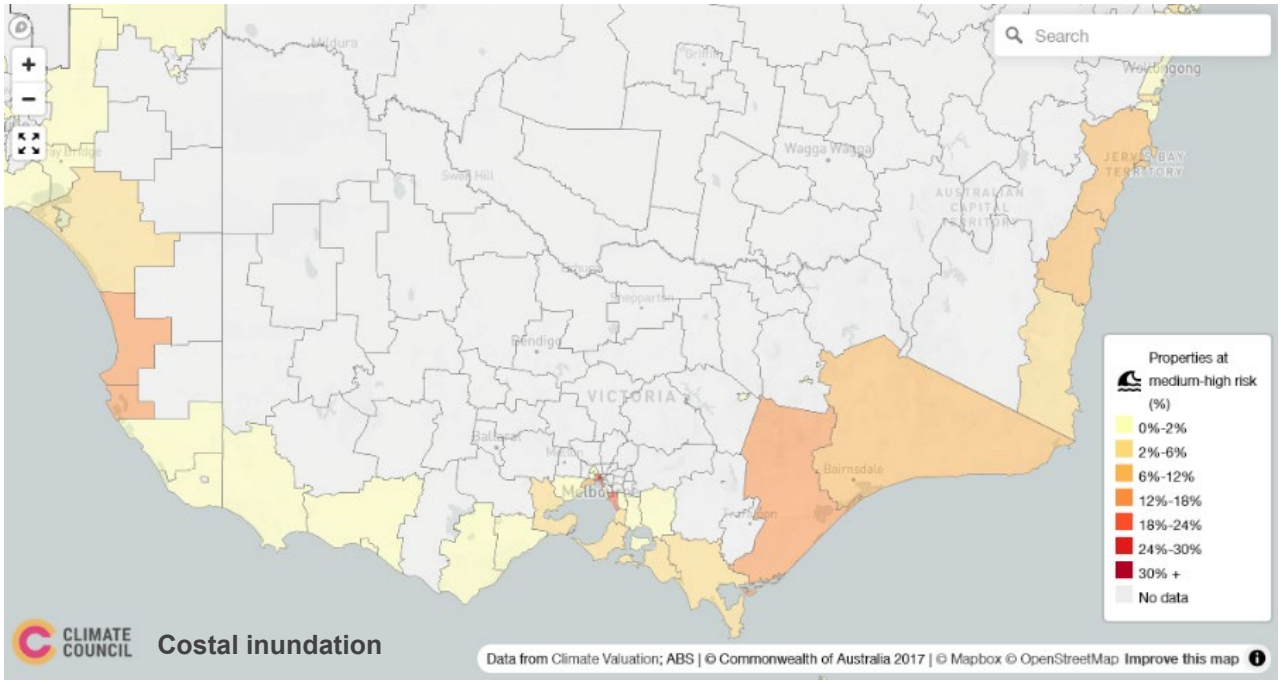
The government should coordinate flood studies and maps for all local government areas, and ensure they are regularly updated using the latest climate projections and any changes in land use to better understand flood risks.[843] It should then work with local governments to update planning schemes to reflect the most up-to-date flood information.[844] This includes updating flood data, overlays and zones in the planning provisions. Decision-makers can use the updated planning rules to minimise building in high-risk flood areas. They can also prepare for adaptation or retreat from at-risk areas where necessary.

Good climate data allows governments to develop adaptation plans and evaluate them.[845] New projections and maps should be easier to access, like maps already available for bushfire risks.[846] This will let people use the same information to make decisions. Ideally, the government can provide Victorians with detailed

local data to analyse individual sites.[847] People can use this to assess local area risks. They can then prioritise which infrastructure to adapt and where they should build.

Figure 17: Victorian properties at risk of riverine flooding and coastal inundation





Top figure: *Riverine flooding* – North central Victoria, near the Murray and Goulburn rivers, faces the highest risk of riverine flooding in Australia, with 3 in 10 homes in areas like Campaspe, Greater Shepparton and Moira at high risk in 2100 (medium emissions scenario).

Bottom figure: *Costal inundation* – Coastal communities, including Queenscliff and parts of Melbourne like Port Phillip and Kingston, face significant risks from rising sea levels, affecting almost 4 in 10 homes in 2100 (medium emissions scenario).

Source: Climate Council, *Climate risk map of Australia*, Climate Council website, 2 May 2022, accessed 24 December 2024.

Cost range, timing and funding

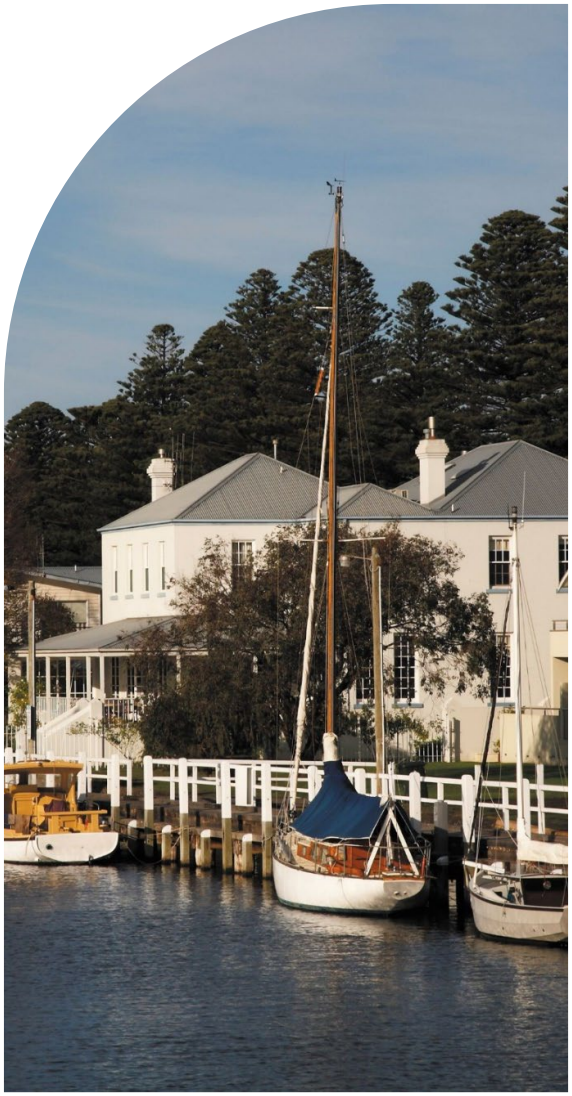
We estimate that this draft recommendation will cost $10 million to $15 million over 5 years. General government revenue can fund this draft recommendation.

These costs include the Victorian Government coordinating updates to flood projections, flood maps and planning schemes. The government will need to work with catchment management authorities and local government to incorporate local knowledge. Costs also cover using an advisory committee to develop flood modelling standards and fast-tracking planning scheme amendments.[848]

Our cost range includes around $2 million to make flood study data more accessible using existing tools like VicPlan.[849]

The Victorian Government does not need to provide additional funding to prepare flood studies. It has already provided funding to Melbourne Water and local governments for this purpose. Melbourne Water is committed to updating all of Melbourne's flood modelling by 2026.[850] Melbourne Water will then review flood models every 5 years.[851]

In regional Victoria, the Victorian Government has also already provided grants to local governments to undertake flood modelling and incorporate these results into planning schemes.[852] Updated climate change data is already available.[853]



Draft recommendation 29

Coordinate faster delivery of key energy infrastructure

> Fast-track key energy projects and coordinate enabling infrastructure. Establish a unified energy transition project pipeline and conduct annual progress assessments. Create a central energy transition coordinator to align priorities, improve transparency and manage risks.

Victoria needs new renewable energy and enabling infrastructure but faces challenges

Victoria needs to build a large amount of new renewable energy generation, storage and transmission infrastructure to reach its net zero emissions targets.[854] This task faces challenges including limited scale of private investment so far, rising costs, supply chain disruptions and long approval times. Some community opposition, policy uncertainty, and physical limitations such as restricted transmission connections and inadequate roads make the task harder.[855]

Workforce shortages are another challenge.[856] As other states develop renewable energy zones, Victoria faces competition for skilled construction and power system labour (see draft recommendation 4), potentially delaying projects and increasing costs.[857] A lack of resources within government can add to delays. Limited coordination between Australian and state governments can also lead to conflicting priorities and inefficiencies.

Delays in completing key energy projects can prevent Victoria from meeting its net zero emissions targets and lead to higher energy bills.[858] Major projects like the Victoria to NSW Interconnector West and the Western Renewables Link risk delays.[859] Changes in one part of the energy system affect others. For instance, delays in environmental approvals for port infrastructure affect offshore wind timelines (see case study – The Victorian Government plays a key role in offshore wind development).[860] Without coordinated management, inefficiencies, higher costs and delays can disrupt Victoria's path to net zero.[861]

The government can reduce the risk of delays and cost increases

The Victorian Government can reduce Victoria's energy transition risks by taking a greater role in identifying, prioritising and fast-tracking 'state significant' energy infrastructure projects. This includes enabling infrastructure like ports and roads. The government needs to build capacity and capability to do this, while also communicating the benefits of key energy projects to the community.

Expanding the Development Facilitation Program to include more 'state significant' projects is one way to fast-track key energy projects.[862] The government has already done this for renewable energy projects, and is planning to do the same for new gas projects.[863] The Victorian Transmission Investment Framework is seeking to reduce timelines for transmission investment decisions.[864] Environmental assessments also need reform (see draft recommendation 30). The government needs a well-resourced program to develop policy, identify projects and simplify assessments and approvals for all energy and enabling infrastructure.

The government should also create a live pipeline of key energy transition projects and enabling infrastructure, including network and transport infrastructure. This should outline project priority, location, budget, funding and timeline, as well as how it aligns with plans such as the Australian Energy Market Operator's *Integrated system plan*.[865]

The government should use the pipeline to regularly assess market capacity, especially workforce availability, to secure enough resources and investment for key projects. A live pipeline of key projects can also give confidence to private developers to invest, and allow the government to better engage with communities on project benefits and potential impacts.

A central energy transition coordinator can help

The Victorian Government should create a central energy transition coordinator to ensure 'state significant' projects across the electricity, gas and transport sectors are on track. The coordinator should develop the live pipeline, track project progress and assess what resources or actions are needed. It should publish annual progress assessments that identify where the government needs to take further action to help deliver key energy transition projects. It can work with the new investment coordinator-general to improve planning and communication between agencies.[866] This can build confidence in the transition among industry and communities.

The energy transition coordinator should provide assurance that energy transition policies are applied consistently across government. It should also monitor and provide advice on managing risks to achieving Victoria's emissions reduction targets, as well as legislated renewable energy, storage and offshore wind targets. It would not be responsible for project delivery or policy development.

An energy transition coordinator can reduce delivery risks and improve coordination between private sector developers, state and national governments.[867] Queensland, New South Wales and the USA use a similar central coordinator.[868]

Cost range, timing and funding

We estimate that this draft recommendation will cost $60 million to $80 million over 10 years. General government revenue can fund this draft recommendation.

Our cost range includes about $10 million for the Victorian Government to change how it assesses and approves large energy projects, and how it coordinates planning of supporting infrastructure for priority projects. This covers developing policy, identifying projects and implementing accelerated development pathways.

Our cost range includes $20 million to $25 million to develop a unified energy transition pipeline. This will be done by the central energy transition coordinator, to be established by 2027. The central energy transition coordinator can use existing Victorian Government staff and some newly recruited technical experts.

We also include costs of $3 million to $5 million per year for the ongoing role of the central energy transition coordinator once the pipeline has been developed. This covers the costs of tracking project progress against the live pipeline, publishing progress assessments, monitoring risks, and coordinating between Victorian and Australian government agencies and the private sector. The role of the central energy transition coordinator is likely to extend beyond 2035, however we have only included costs to 2035 as part of this draft recommendation.

Case study

The Victorian Government plays a key role in offshore wind development

Offshore wind can play a key role in Victoria's energy transition. Strong ocean winds spin turbines to generate electricity. Offshore wind farms run more often than onshore ones, producing more energy.[869] They save land, avoid competing land uses, and reduce visual and noise impacts on communities.[870] Without offshore wind, Victoria faces capacity constraints and supply shortages during peak times. That might increase electricity prices and reliance on energy imports.[871]

Victoria plans to build Australia's first offshore wind farms. The Victorian Government has legislated offshore wind energy targets of at least 2 gigawatts by 2032, increasing to 4 gigawatts by 2035 and 9 gigawatts by 2040.[872] Missing these targets risks higher emissions, and reduced energy reliability and affordability.[873]

Offshore wind is a new industry in Australia.[874] Building offshore is different from onshore projects. Sites are in remote locations with harsher environmental and engineering challenges.[875] The industry needs to develop local supply chains and port infrastructure to support large-scale projects.[876] This adds to high development costs when compared to onshore wind and solar.[877] It also makes coordinated infrastructure planning even more important.

Offshore wind depends on efficient supply chains and skilled workers.[878] Projects need specialised equipment like vessels and subsea cables. These have long lead times due to high global demand.[879] The Victorian Government can help reduce delays by coordinating supply chains, aligning project schedules with a unified pipeline and collaborating with other jurisdictions.[880]

Offshore wind farms need enabling infrastructure, including ports and transmission networks.[881] Ports must support the transport of large parts, like turbines and foundations.[882] Australia's port infrastructure is currently unsuitable for receiving and assembling offshore wind parts, as it needs significant upgrades.[883] Sensitive environments around ports pose additional challenges. In 2023, the Australian Government denied environmental approvals to develop the Port of Hastings due to the impact on protected wetlands.[884]

Developing suitable port infrastructure is a priority and requires strong coordination across Victorian and Australian government agencies. For example:

- Australia's Department of Climate Change, Energy, the Environment and Water oversees approval processes and environmental assessments for projects in Commonwealth waters and projects that potentially impact protected matters under Commonwealth law.[885]
- Victoria's Department of Transport and Planning plans and approves environmental assessments for local infrastructure.[886] The department also manages port infrastructure development for offshore wind projects.[887]
- Offshore Wind Energy Victoria, part of Victoria's Department of Energy, Environment and Climate Action, coordinates the work streams and engagement with communities, developers, investors and supply chains.[888]

Offshore wind farms require transmission infrastructure to deliver renewable energy to Victorian homes and businesses. VicGrid leads the development of transmission infrastructure to coordinate offshore wind connections. It uses shared infrastructure to avoid multiple builds.[889] Coordinating offshore energy zones will require ongoing collaboration with project proponents and planners.

Draft recommendation 30

Improve environmental assessments and site selection for energy projects

Reform environmental assessments and help energy project proponents select good sites.

Unpredictable environmental assessment processes cause project delays

Large-scale renewable energy projects face complex planning and approvals processes. Many energy projects require an environmental approval to assess their impact, such as an environment report or Environment Effects Statement (see box – Environmental approvals in Victoria and Australia).[890] After receiving a referral for environmental approval, the planning minister can decide whether the project needs an assessment, what form it should take and what information it requires.[891]

Project proponents often cannot predict these requirements in advance. This means they might have to commission extra studies or technical work. Sometimes the information requirements are unclear, and proponents spend time and money gathering irrelevant details. Alternatively, they might initially provide too little information, meaning further studies are needed.[892] These situations add cost and delays, and can risk a project's financial viability.[893] In some cases the process can take over 3 years.[894]

Environmental approvals in Victoria and Australia

An Environment Effects Statement (EES) is Victoria's most comprehensive environmental assessment. It is set by the *Environment Effects Act 1978*. An EES reviews the environmental, social and economic impacts of a development and includes mandatory public consultation.

After receiving a project referral, Victoria's planning minister decides whether a development needs an environment report, an EES, or neither. After the prescribed assessment is complete, the minister can recommend the project be rejected, approved, or approved with conditions.[895] But this recommendation is non-binding, and the major approval, such as a planning or building permit, can still be approved or rejected regardless.

Australian Government environmental approvals are conducted under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This legislation applies to projects that affect matters of national significance, such as World Heritage sites, or impact endangered species. Assessments under the EPBC Act also require public consultation. Australia's environment minister makes the final, legally binding decision and sets conditions to limit environmental harm.[896]

The EES and EPBC Act both assess environmental impacts but differ in scope, triggers and timelines.[897] In some cases, a single assessment can meet both EES and EPBC requirements.[898] However, the separate processes cause multiple assessments and delays. The proposed EPBC Act reform aims to better align national and state assessment processes, although the Australian Government has delayed delivery of some of the reforms while it consults with stakeholders.[899]

Streamlined approval processes can provide more clarity for energy projects

Victoria can streamline energy project assessments to reduce cost and delays.[900] This can help Victoria meet its energy targets. Renewable energy projects of state significance can use Victoria's Development Facilitation Program for faster approvals.[901] The government can further simplify assessments without compromising the quality of its environmental approvals.[902] Other states have made similar reforms.[903]

The Victorian Government has announced plans to speed up Environment Effects Statement processes.[904] It should reform environment approvals legislation and guidance to achieve the same level of environmental protection through a faster, more cost-effective and predictable process. The reforms should clarify required information and environmental management controls.

The reforms can:

- establish statutory timeframes for assessment and decision-making under the *Environment Effects Act 1978*[905]
- more clearly specify the scope and technical information needed for project assessment[906]
- assess a project's environmental benefits, such as its potential to reduce greenhouse gas emissions[907]
- more clearly state whether a project requires an Environment Effects Statement or an environment report (for example, an environment report can be appropriate for projects in renewable energy zones that have been pre-assessed for biodiversity impacts)[908]
- make environmental management conditions more consistent, so that projects with similar environmental impacts have comparable conditions imposed[909]

set agreed limits for design flexibility through the approval process to minimise the need for time-consuming amendments.[910]

The Queensland Government recently reformed its environmental approvals. It can now quickly identify and reject unacceptable projects, meaning resources are not wasted on assessing unsuitable projects (see case study – Queensland's recent reforms clarify planning and approvals).[911]

Case study

Queensland's recent reforms clarify planning and approvals

Queensland has changed its environment laws to increase consultation on resource projects, provide early clarity to proponents on unacceptable proposals and keep environmental impact statements up-to-date.[912]

The government can stop the planning process if a project poses serious environmental risks, affects significant environmental or cultural heritage areas, or does not meet legal standards. The reforms add an 'early no' step to the assessment process, allowing industry and the community to quicky learn if a project will not be approved as proposed. Proponents can no longer appeal directly to the minister.[913] Assessment reports expire after 3 years unless proponents apply to extend them, to ensure they include the most recent and relevant information.[914]

The reforms simplify Queensland's planning and approval process by quickly identifying and rejecting projects that are clearly unacceptable. This prompt decision-making saves time and money.

Choosing good sites can protect biodiversity and speed up approvals

The Victorian Government should give industry clearer information on environmental conditions and good sites. This can avoid biodiversity loss and project delays.[915]

The government has started to study the biodiversity impact of wind energy projects on brolga and bat populations.[916] It has published maps of these species' range and prepared guidelines on wind farm management techniques to better protect wildlife. The government can replicate this process for transmission, solar and battery projects, and expand it to assess impacts on other species. The draft *Handbook for the development of renewable energy projects in Victoria* is a good start.[917] The government should build on this over time.

VicGrid should use the biodiversity studies and guidelines in land use assessments for renewable energy zones.[918] This will allow project proponents to select sites that minimise project impacts and to mitigate impacts they cannot avoid.

Cost range, timing and funding

We estimate this draft recommendation will cost around $25 million over 5 years. General government revenue can fund this draft recommendation.

Our cost range includes existing government staff updating guidelines and preparing changes to legislation for environmental approvals, costing up to $6 million. It also includes around $20 million for the government to do further technical studies.

Draft recommendation 31

Invest in home, neighbourhood and big batteries for more energy storage

> Create new support for home batteries and provide incentives to encourage people to join a virtual power plant. Expand the neighbourhood batteries program, or similar. Facilitate more investment in big batteries for the transmission network.

Victoria is rapidly replacing its ageing coal-fired power plants to reduce emissions. This means reconfiguring electricity networks so homes and businesses have a stable renewable energy supply. But potential transmission project delays, inadequately managed extra distribution network loads and flows, or low battery storage uptake might mean Victoria misses its emissions reduction targets.[919]

Some renewable energy sources only generate energy on sunny or windy days. Batteries can store this energy and supply it when needed. They come in many sizes including small home systems, medium-sized batteries connected to the distribution network and large batteries connected to the transmission network.

Batteries can help Victoria's electricity network operations. They can help balance the electricity system by allowing two-way flows and improve the stability of energy supply.[920]

Using virtual power plants to coordinate consumer energy resources is a big opportunity

Consumer energy resources, like rooftop solar, electric vehicles and home batteries, have huge potential to reduce emissions. But they might strain the energy system if not coordinated.[921] For instance, charging electric vehicles during peak times might require extra new infrastructure. But charging when rooftop solar is available can avoid this.[922]

Networking home batteries to form a virtual power plant can help (see box – Virtual power plants). Virtual power plants respond quickly to changes in supply and demand, making power supply more reliable.[923]

Virtual power plants

A virtual power plant is not an actual power plant. It is a group of rooftop solar, batteries and smart devices like air conditioners or pool pumps that can be coordinated together to work like a traditional power plant.[924] Using a digital platform, a virtual power plant operator links the assets together and provides instructions on when to store and release power.

Virtual power plants can provide services like trading in wholesale markets, demand management and frequency control ancillary services which keep the electricity system operating within safe technical limits.[925] They can turn up storage when there is too much renewable energy in the system, and release stored energy when there is high demand.

Virtual power plants are not new. For instance, South Australia hosts the largest virtual power plant in Australia.[926] The initiative installed solar and home batteries on social housing properties with no upfront cost to tenants. The battery systems are centrally managed. In return tenants receive a lower electricity rate, access to clean energy and backup power in case of power outages.[927]

Coordinating consumer energy resources delivers other benefits to the energy system. Effective coordination of consumer energy resources might avoid around $10 billion in distribution networks investment by 2040 and $4.1 billion grid-scale investment across the National Electricity Market.[928] Virtual power plants are a mechanism that can support this.

Victoria's Solar Battery Loans program helps households buy small batteries but it ends in 2025.[929] The government should create new support for home batteries and provide incentives for people to join a virtual power plant. This will better connect and coordinate more home batteries, which benefits consumers and the network. The government should also keep implementing the *National consumer energy resources roadmap*.[930]

Mid-sized batteries can allow more rooftop solar and reduce emissions

Parts of Victoria's distribution network have limited capacity to host more rooftop solar.[931] Many homes have rooftop solar but no battery storage.[932] By 2035, Victoria might need 20 times more coordinated battery storage than it has today.[933]

Mid-sized batteries, also called neighbourhood batteries, store more solar power than individual home batteries. These batteries can store excess energy from home solar systems locally, which reduces strain on the energy grid.[934]

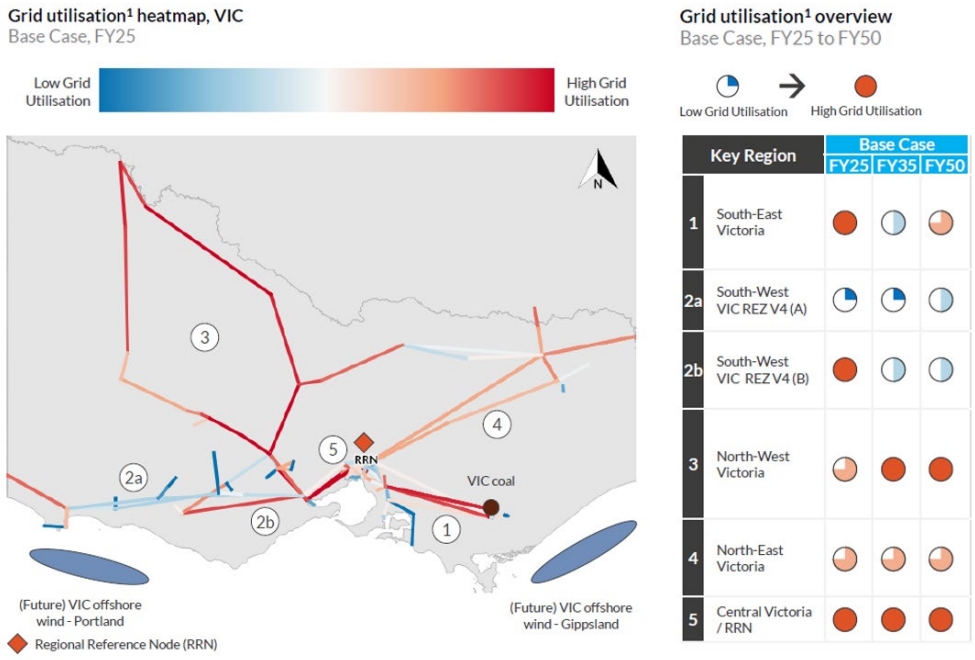
The government should invest in mid-sized batteries, such as by expanding the current neighbourhood batteries program to 2030. It should also work with distribution network businesses, retailers, battery operators and communities to trial new battery tariffs. For example, Ausgrid is supporting energy storage as a service in New South Wales by using a new tariff. This will allow customers to benefit from neighbourhood batteries without any upfront costs (see case study – Ausgrid trials neighbourhood battery tariffs).[935]

Big batteries can help with potential transmission risks

Victoria needs new infrastructure to transmit another 6 gigawatts of renewable energy by 2030. This rises to over 25 gigawatts by 2050.[936] The *Victorian transmission plan* will outline renewable energy zones and transmission projects to make this possible.[937] But even current transmission projects face delays from community concerns and supply chain issues.[938]

While not removing the need for more transmission capacity, big batteries can help by reducing transmission loads and providing backup power. The government should facilitate more investment in them now, as backup if major transmission projects are delayed. It should prioritise areas where transmission congestion is likely to remain a problem, such as north-west and central Victoria (see Figure 18).[939]

Figure 18: Victoria's transmission network is likely to experience congestion



1) Utilisation is defined as the annual average power flow on a line (in absolute values) as a proportion of the total line rating

Source: Aurora Energy Research, *Infrastructure Victoria energy transition analysis*, report to Infrastructure Victoria, 2024, p 22.

Cost range, timing and funding

We estimate that investing in batteries for more energy storage will cost $45 million to $85 million over 10 years. General government revenue can fund this draft recommendation.

Our cost range is made up of several parts:

- We estimate that supporting home batteries and providing incentives to join virtual power plants to 2030 will cost $20 million to $50 million.[940] Starting by 2026 means that incentives will continue beyond 2025, when the current Solar Battery Loan program ends.[941]
- Expanding the neighbourhood batteries program, or a similar program, to 2030 will cost an estimated $25 million to $35 million.[942]

We estimate the investment required in big batteries to be $300 million to $500 million by 2030. Actioning this by 2030 will better manage the risk of potential delays to transmission infrastructure. The Victorian Government should facilitate more private sector investment in big batteries, with costs added to electricity bills as happens now. The Victorian Government has also already committed $1 billion in funding to the State Electricity Commission to invest in areas where the market is uncertain, including for big batteries.[943]

Case study

Ausgrid trials neighbourhood battery tariffs

Ausgrid, a distribution network business in New South Wales, is implementing a trial tariff agreement with retailers providing an energy as a service retail plan.

Network tariffs are charges for transporting energy along the electricity network. They are imposed on retailers who then pass these charges through to customers. This is the network charge on the bill. Retailers are typically charged network tariffs for transporting a customer's solar energy to a neighbourhood battery, and again when the battery sends it back to the customer. This can make investing in neighbourhood batteries unattractive, and does not recognise the network benefits batteries can provide.

Energy as a service is a business model where customers pay a subscription fee for an outcome, compared to traditional energy plans where a customer pays for a unit of energy.[944] In this case, a customer pays a fee for access to a neighbourhood battery. It means a customer can use part of a shared battery instead of buying their own. Retailers offering this kind of plan to customers in Ausgrid's network can access a special tariff. It is a 'local use of system' tariff which allows free battery charging if it absorbs local generation.[945] This enables bill benefits.[946]

This tariff trial supports multiple eligible customers to access a shared battery without upfront costs. It will study customer responses to these tariffs.[947]

Draft recommendation 32

Determine long duration energy storage needs

> Determine the most efficient policy or investment options to provide enough long duration energy storage to meet Victoria's needs.

The electricity system will operate differently as coal power plants close

Victoria's 3 remaining coal power plants need to close by 2035 to meet emissions and renewable energy targets.[948] Transition arrangements are in place for 2 of them.[949] As each plant closes, Victoria must replace its energy generation with renewable sources and energy storage.

Electricity generation will depend heavily on weather conditions when coal power stations close. Victoria will have times of low demand and high supply, and high demand and low supply. A flexible system can manage this.[950] However, sometimes Victoria has several cloudy and windless days in a row. This weather pattern is difficult to predict, including how often it might happen or how long it will last.[951] During those times, Victoria will need other electricity sources to cover the shortfall.

Long duration energy storage can help manage the energy transition

Long duration energy storage is defined as storage that can last 8 hours or more.[952] It comes in various forms, including pumped hydroelectricity, compressed air, molten salts and advanced battery systems.[953] Victoria's largest battery under development will be able to deliver energy for up to 4 hours.[954] Current battery technology can address daily peaks and troughs, but not days or weeks of low renewable output.[955] And the energy market does not currently support developers to invest in longer duration technologies.[956]

A lack of long duration energy storage is a high risk for Victoria's energy transition.[957] The impacts of this include high prices and unreliable supply by 2035, depending on weather and demand patterns.[958] Without enough long duration storage, Victoria will rely on fossil gas power plants and electricity imports from other states to cover gaps in supply when there is less renewable energy available. But this approach also has risks, including future gas shortages (see draft recommendation 33).[959] Energy projects in other states have similar cost, supply chain and timing pressures.[960]

The Victorian Government should decide the most efficient policy or investment options to provide enough long duration storage to meet Victoria's needs. Several options are available. For example, the government can work with other jurisdictions to develop market signals that encourage developers to invest in long duration energy storage.[961] This can be part of the National Electricity Market wholesale market settings review.[962]

It can also set targets for different duration storage requirements and develop procurement to support them, like some other jurisdictions (see case study – Long duration energy storage in Australia and overseas). For instance, New South Wales uses Long-Term Energy Service Agreements.[963] This approach offers developers stable income, which reduces project risks and can lower costs for consumers.

Another option the government can consider is direct support through grants or targeted tenders. State-level planning can also improve system reliability and ensure resources and infrastructure are available as coal plants close.[964]

Reliable energy operations require an understanding of long duration storage needs

Research shows that grid planners must identify storage needs in detail to ensure reliable energy supply and operations.[965] In deciding the most efficient policy or investment option, the government should define Victoria's long duration energy storage needs and its policy goals. For example, the need might differ if local

energy storage is a priority. There might also be trade-offs between making the system reliable and reducing emissions. The government can consider different risk scenarios, such as potential downtime of critical energy infrastructure. Public consultation can help balance the different goals, risks and trade-offs.

Cost range, timing and funding

We estimate that determining long duration energy storage needs will cost $1 million to $5 million over 2 years. General government revenue can fund this draft recommendation.

The cost range includes the Victorian Government's costs to complete investigations, develop policy, consult and determine future actions. Completing this work by 2027 means that the government can reduce the risk of not having enough long duration storage to support Victoria's energy transition.

Case study

Long duration energy storage in Australia and overseas

New South Wales long duration energy storage review

The *NSW electricity infrastructure roadmap* sets out minimum long duration storage objectives.[966] These were initially set with 2 gigawatt and 16 gigawatt hours of long duration storage by 2030.

In 2024, the New South Wales Government reviewed long duration storage.[967] This followed an independent *Electricity supply and reliability check up*, and the interaction between the Australian Government's Capacity Investment Scheme and state tenders for long duration storage.[968] New South Wales also commissioned AEMO Services to advise on the value of long duration storage.[969]

Consultation focused on the roadmap's 2030 infrastructure objectives and the potential to reduce minimum storage duration to help meet system reliability to 2030. It considered the challenge of meeting energy needs for 2030 and beyond, when reliability risks and system needs are expected to be different.[970]

Stakeholder feedback outlined the need to focus on system needs when coal closes.[971] The New South Wales Government also commissioned AEMO to run a reliability scenario that assumed all NSW coal power plants closed by 2034, to investigate how storage portfolios can close reliability gaps. This produced an estimate of the minimum long duration storage infrastructure needed to meet the reliability standard.[972]

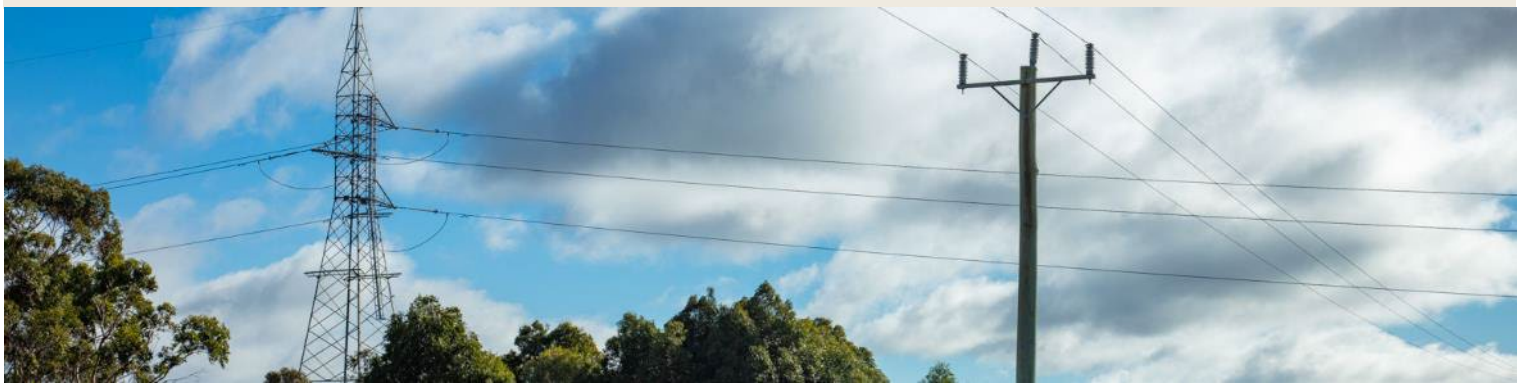
The New South Wales Government will also update its Long Term Energy Service Agreement framework to include a requirement for the Consumer Trustee to consider additional financial benefits when assessing a competitive tender. This can be the value of system resilience to low-probability/high-impact events, additional system security services such as inertia and system strength, and any value that long duration storage creates by avoiding or deferring network investment.[973]

Long duration energy storage developments in the UK

In early 2024, the UK Department for Energy Security and Net Zero consulted on a policy framework for long duration energy storage investment.[974]

By October 2024, the UK Government agreed to a cap and floor scheme for its long duration energy storage policy to support rapid and efficient investment.[975] A cap and floor scheme provides a guaranteed revenue should returns fall below an agreed floor price, and a cap on the revenue earned. Some or all revenue earned over the cap is returned to the consumer.[976] This type of scheme provides revenue certainty for investors.

The government also appointed Ofgem, the energy regulator, to act as the long duration energy storage regulator and the investment framework delivery body, due to its track record and expertise in a cap and floor scheme.[977]



Draft recommendation 33

Develop regional energy plans, guide transition from fossil gas and maintain reliable gas supply

> Develop an energy plan for electrification and gas use that meets each region's needs and prepare gas infrastructure decommissioning for homes and some businesses. Secure gas supplies to meet demand. Set a renewable gas target and support renewable gas production.

Victoria relies on gas but needs to reduce its emissions impact

Victoria relies on fossil gas to meet its current energy needs. Many households use it for heating and cooking. Some industries rely on it.[978] Gas can also provide stable electricity as coal power plants close.[979]

Victoria's gas supply is expected to fall faster than demand. Reduced production and ageing infrastructure will lead to shortfalls by 2027.[980] At the same time, gas accounts for around 16% of Victoria's total emissions.[981] Victorians need to reduce fossil gas use to meet climate targets.[982] Renewable gases like biomethane and green hydrogen are not yet commercially viable.[983]

Gas use is declining slowly.[984] Switching to efficient electric appliances has lower running costs but high upfront costs, and rental households are less able to electrify.[985] Electrification will double electricity demand by 2050, requiring major network upgrades.[986] Some industries, like heavy manufacturing, cannot easily switch to other fuels.[987]

Energy planning should include electrification, renewable gas and a gradual phase out of residential and some commercial gas

As gas demand falls and electricity needs rise, governments must improve integrated energy planning, with more detail on necessary infrastructure. The government should build on the *Gas substitution roadmap* and input from relevant bodies, such as the Australian Energy Market Operator and network businesses, to create a long-term plan for electricity and gas infrastructure that covers:

- electricity network upgrades to handle future demand[988]
- renewable gas production, including biomethane and green hydrogen[989]
- future use of gas networks, including repurposing for renewable gases or removing infrastructure[990]
- gas-powered electricity generation to balance renewables, meet peak demand and improve reliability[991]
- emissions offsets for continued fossil gas use[992]
- residential, commercial and industrial energy use, including electrification, energy efficiency, affordability and renewable gas for hard-to-switch uses[993]

workforce development, focusing on skills gaps and retraining needs.[994]

The plan should include regional strategies that identify where to prioritise electrification, biomethane or hydrogen to meet regional energy needs. It should identify sites that can co-locate industry with renewable gas production, storage and supply.[995] It should also clarify roles and responsibilities in carrying out the plan's actions.

The government should also develop a strategy to phase out gas distribution networks, ending fossil gas use for space and water heating in residential and some commercial buildings (see case study – Various approaches to help customers get off gas). It should provide clear timelines, set criteria based on customer density and pipeline use, and provide guidelines for complex buildings like multi-unit apartments.[996] Early planning will help low-income households to switch (see draft recommendation 34).[997]

A secure gas supply can support reliable power during the energy transition

The Victorian Government needs to secure a reliable gas supply to prevent expected shortages from 2027 and to keep gas available for industries and electricity generation.[998] It should work with energy companies and other Australian governments to deliver more gas and expand storage. This helps maintain reliable supplies during peak demand times and prevent price spikes as coal plants close.[999]

The government should also work with other jurisdictions and regulators to deliver changes to the national gas rules. These can include prioritising domestic supply, capping prices, supporting renewable gas integration and improving transparency and reporting.[1000]

Renewable gas, including biomethane and green hydrogen, can support industries in the longer term

A renewable gas production target can support industry and power supply. The government is proposing a target of 4.5 petajoules by 2035 as part of its planned Industrial Renewable Gas Guarantee scheme. It will review the scheme after 3 years to assess costs and demand.[1001] The government should increase the target at this time, if it is confident the scheme is producing renewable gas with reasonable costs. Higher targets are more consistent with emissions reduction goals. An ambition of between 9 and 28 petajoules by 2035 is consistent with modelling and industry analysis.[1002]

Case study

Various approaches to help customers get off gas

The European Union recognises the need to transition from fossil gas to achieve net zero emissions by 2050.[1003] Distribution system operators are required to create plans to shut down gas networks when demand for fossil gas is expected to decrease.[1004] Utilities companies must adopt transparent pricing models and offer subsidies for vulnerable consumers to ensure costs are allocated fairly as gas users leave the network.[1005]

Several European countries are developing local plans to phase out gas. In the Netherlands, municipalities develop local heating plans and apply accelerated depreciation to gas infrastructure. In Germany, municipalities create detailed heating decarbonisation plans and specify areas for gas grid phase out. Denmark has taken the most ambitious approach by buying back its gas grid, setting up a decommissioning fund and aiming to phase out gas for heating by 2030.[1006]

The ACT Government's *Integrated energy plan* outlines the transition from gas to electricity. It has banned new gas connections since 2023 to introduce electric alternatives. The plan aims to significantly reduce residential and commercial gas use by 2030, phase out most gas infrastructure by 2040 and achieve net zero emissions by 2045. The local distributor, Evoenergy, will help to wind down the gas network.[1007] The government offers interest-free loans of up to $15,000 and subsidies of up to $5,000 to support households, along with education campaigns.[1008]

Cost range, timing and funding

We estimate that this draft recommendation will cost around $65 million over 5 years. General government revenue can fund this work. Alternatively, costs to develop Victoria's renewable gas production can be passed on to customers through their energy bills.

Our cost range includes about $50 million over 5 years to develop an integrated energy plan for electricity and gas networks, and then region-specific strategies to phase out gas networks. This is a significant investment as the involvement of many stakeholders with competing interests adds complexity to the process. The Victorian Government will need to thoroughly investigate, analyse and consult on these plans and strategies. Existing government staff can do this work.

Our cost range includes $10 million in Victorian Government costs to work with energy companies and other Australian governments to deliver more gas and expand storage by 2027. The government can also work with private industry, the Australian Government, other jurisdictions and regulators to develop policy and change the national gas rules.

We also include $1 million to $5 million to develop policy, undertake a regulatory impact statement and consult on a renewable gas target. We assume scheme costs are recovered from gas consumers and a full cost recovery model for fees, like the Victorian Energy Upgrades program.[1009] Energy concessions can provide discounts on bills for eligible low-income households.

Draft recommendation 34

Speed up household energy efficiency and electrification

> Require efficient electric space heating and hot water when people replace their heaters at end-of-life and support low-income households to go all-electric. Complete social housing energy upgrades, including electrification. Require Victorian homeowners to disclose the energy efficiency of their homes at the time of sale or lease.

Energy efficiency and electrification have many benefits

Home electricity and gas accounts for around 40% of Victoria's net greenhouse gas emissions, mostly through space heating and hot water.[1010] Unless homes are more energy efficient, Victoria risks missing its emissions reduction targets by up to 1 million tonnes of carbon dioxide equivalent a year.[1011] Victoria also faces future gas supply shortfalls.[1012]

More efficient homes can lower energy bills, make homes more comfortable in a changing climate and reduce the need for new energy infrastructure.[1013] Homeowners can make their homes more energy efficient by installing insulation, sealing draughts and covering windows.[1014] Some electrical appliances are also more efficient than gas, such as heat pumps.[1015] Switching from gas to efficient electric appliances when they need replacing can save households around $1,200 a year.[1016]

In 2024, the Victorian Government assessed pathways to electrify homes across Victoria.[1017] It should require that households switch to efficient electric space heating and hot water when they replace their end-of-life gas heaters.

Low-income households and renters are missing out

People who cannot afford to make home upgrades face more challenges with energy costs. The energy transition can increase inequality if the benefits and costs are unevenly distributed.

Low-income households and renters are less likely to access schemes that help manage energy costs, such as energy efficiency upgrades and solar rebates.[1018] Some people cannot afford the upfront costs.[1019] Others cannot make changes because they do not own their homes.[1020]

As more people switch from gas to electricity, the financial burden for those who remain on the gas network increases. This makes energy more expensive for people who cannot switch.[1021] The Victorian Government should support low-income homeowners to electrify their homes, including cooktops, to reduce their exposure to higher gas prices.[1022]

The government should also fund a 7-year program to electrify all social homes. It should include energy efficiency upgrades and install solar panels where possible, to achieve benefits from scale.[1023] The program can leverage the existing Energy Efficiency in Social Housing Program and partner with the Australian Government to fund the upgrades.[1024]

Better information can lead to more energy efficient homes

Most Victorian homes have low energy efficiency. Around two-thirds of detached and semi-detached homes have an energy rating of 2 stars or below, much lower than the current 7-star standard for new homes.[1025]

Having clear information about their home's energy efficiency encourages homeowners to make upgrades. It also helps renters and buyers choose homes that are more energy efficient, comfortable and affordable.[1026]

The Victorian Government should introduce a mandatory energy efficiency disclosure scheme. This should require owners to share their home's energy efficiency rating in all marketing when selling or leasing. The scheme should align with the national framework on home energy disclosure, and rate how homes handle hot and cold weather, the energy efficiency of installed appliances, and provide advice on improvements.[1027] It should also include information on rebates or discounts for energy efficiency upgrades, and how much money they are likely to cost or save.

Better information can encourage more new homes to exceed minimum energy efficiency standards. In Victoria, less than 25% of homes built since 2016 are above minimum standards. In the ACT, where disclosures are mandatory, this is more than 60%.[1028]

Cost range, timing and funding

We estimate that this draft recommendation will cost $2 billion to $5 billion. General government revenue can fund this draft recommendation. The Australian Government can also provide funding under similar existing schemes.[1029]

Our cost range includes $1 billion to $2.5 billion in Victorian Government grants to support low-income households switch to efficient electric appliances.[1030]

We included $1 billion to $2.5 billion to electrify social housing properties currently using gas, along with energy efficiency and solar upgrades. This would cover approximately 70,000 social homes.[1031] Starting both programs from 2026 can help low-income households manage the impact of higher gas prices.

We also include cost estimates of $5 million to $10 million for the Victorian Government to oversee the low-income household grant program, and to introduce and manage the mandatory energy efficiency disclosure scheme.

Victoria has a high productivity and circular economy

Victoria has a high productivity economy that creates well-paid jobs, attracts investment and facilitates trade. It does so while also continually reducing the environmental impacts of production and consumption.

Infrastructure can drive a more productive economy

Increasing productivity can help Victoria's economy grow.[1032] This can improve work and social opportunities for Victorians. When productivity grows, employers can afford to pay higher wages.[1033] Productivity growth also means workers can have more time for leisure.[1034]

In a high productivity economy businesses can attract the investment they need. They can then create the goods and services that drive economic growth. Consumers can get better products, which businesses can produce with fewer resources and hours of work.[1035]

Investing in infrastructure is one way of building a more productive economy. Education and training infrastructure helps workers get the right skills for the jobs the local economy needs.[1036] This helps workers find well-paying jobs. Transport infrastructure helps Victorians access these jobs. It also makes it easier for businesses to send their goods across Victoria, interstate and internationally. Digital infrastructure connects people remotely to jobs and services. It allows businesses to be more efficient and to reach global markets.

A circular economy leads to less waste, more jobs and healthier environments

Victorians made it clear through our consultation that a highly productive economy must not come at the cost of a healthy and thriving natural environment.[1037] Victoria can do this by moving towards a more circular economy.

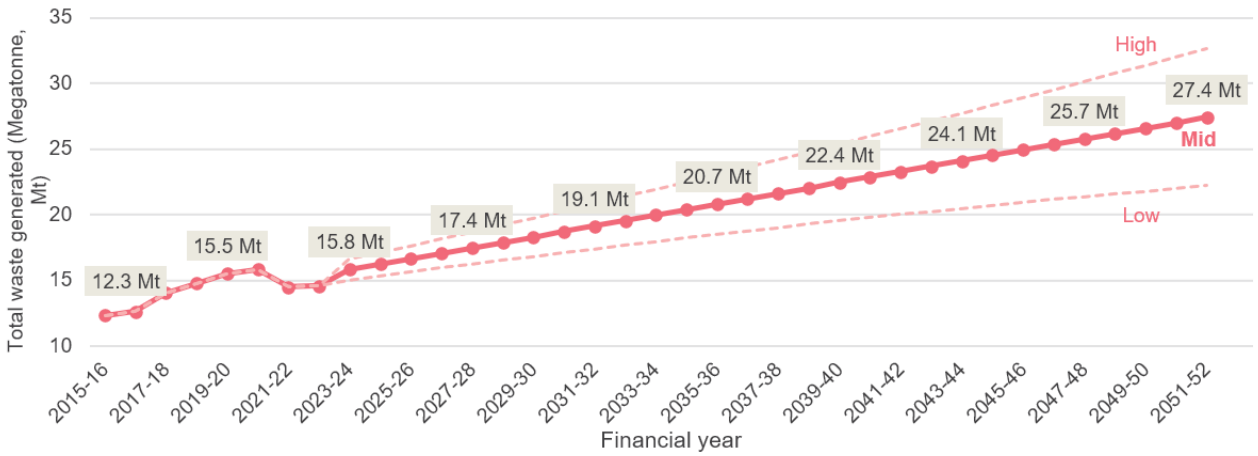
Businesses typically use raw materials like wood, plastics or metals to make products. This creates some waste. After consumers use these products, they often throw them out, creating more waste. A circular economy shifts away from this linear system of production and consumption. It aims to design products so they are in use for longer.[1038] This means that consumers can meet their needs with fewer materials.

In a circular economy, Victoria would recycle and reuse more materials. This would reduce the environmental impact of the goods communities produce and consume. The Victorian Government has committed to transitioning to a circular economy.[1039] It has taken some steps towards this. For example, the government uses some recycled materials when it builds transport infrastructure.[1040]

The government wants to reduce the amount of waste Victoria produces.[1041] But it expects that Victorians will produce more over the coming years (see Figure 19).[1042] This means more waste will end up in landfill. Materials sent to landfill often have economic value, which is lost if they are thrown away. For example, electronic waste contains valuable materials that Victoria can recover and reuse.[1043]

A circular economy helps businesses innovate and develop new ways to reuse products. This can mean new jobs that need different skills.[1044] Highly skilled workers help grow the economy.[1045]

Figure 19: The government expects Victoria's waste volume to increase over coming years



Victoria's projected waste generation. Source: Infrastructure Victoria, adapted from Recycling Victoria, *Victorian waste projection model dashboard*

Infrastructure helps businesses move goods across Victoria and beyond

Trade helps productivity grow.[1046] When Victorian businesses trade with each other and with businesses outside the state, they can become experts at making certain products. Trade also gives consumers access to goods from around the world.[1047] Infrastructure is a part of the supply chains that make trade possible.[1048] These supply chains mean Victorians can get what they want, when they need it, often delivered to their doorstep.

Transport infrastructure helps Victorian businesses move imports and locally produced goods across the state. Businesses also use infrastructure to send their products interstate and overseas. For example, farmers use roads, railways and ports to send their produce to different places. This includes food and fibre, which make up more than 35% of Victoria's exports.[1049] These exports were worth $19.6 billion in 2022–23.[1050]

Rail can be more efficient than road transport when moving heavy freight over long distances.[1051] But some goods still need to move by road, particularly during the last stage of delivery. Traffic congestion can make this expensive. Freight operators can work more efficiently when infrastructure makes their deliveries easier. They can have faster delivery times, be safer and produce fewer emissions.[1052]

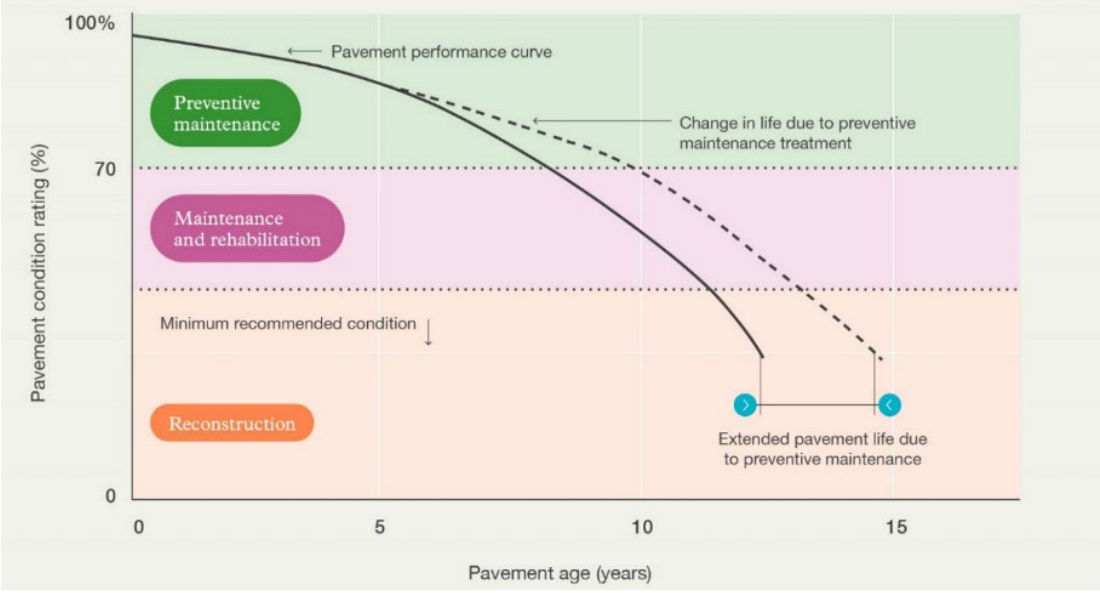
Opportunities exist to make infrastructure more productive

Infrastructure is more productive when it is well-designed, built efficiently and maintained regularly.[1053] Planning infrastructure early reduces overall costs.[1054] It helps the government deliver the most important infrastructure when and where Victorians need it.[1055]

Managing how people use infrastructure can make it more productive.[1056] This includes making the most of space on roads and public transport during quieter hours of the day. Maintaining infrastructure also keeps it in better condition for longer. For example, preventive maintenance of road surfaces means they last longer (see Figure 20).[1057] This helps Victoria do more with less.

Our commissioned research *Digital technology and infrastructure productivity* looked at how digital technologies can help meet Victoria's growing infrastructure needs faster. It found 5 technologies that can transform the way infrastructure is designed, built and maintained.[1058] These technologies will need workers with new skills.[1059] Technologies can also help the Victorian Government save money, improve worker safety and boost productivity.[1060]

Figure 20: Preventive maintenance can help to extend asset life



Source: Infrastructure Victoria, *Opportunities to reduce greenhouse gas emissions of infrastructure*, 2023, p 29, accessed 14 November 2024.

Draft recommendation 35

Prepare and publish infrastructure sector plans to shape Victoria's cities

> Agree a set of assumptions for future population, jobs and land use for more compact cities. Require each department that owns infrastructure to develop an infrastructure sector plan as soon as possible, based on these assumptions, and publish strategic-level plans. Use the finished sector plans to decide infrastructure project funding.

Integrated infrastructure and land use planning delivers better outcomes

Different city shapes need different amounts of each infrastructure type to work well.[1061] For example, a more compact city needs a different public transport network for people to move around easily, compared to a more dispersed city.[1062] Governments can better coordinate land use and infrastructure planning to shape the growth of Victoria's cities.

Governments can better plan and sequence infrastructure delivery so people can reach facilities and services.[1063] The base assumptions Victorian Government agencies use to plan their infrastructure are not aligned with government goals for more compact cities. They do not always share their plans with each other, or with local governments and industry. This means they miss chances to pool funding or streamline delivery. It also means infrastructure costs more in the long term.[1064]

Integrated land use and infrastructure planning requires governments to discuss options at an early stage, long before they make final commitments or budget decisions.[1065] If government agencies are open about their plans, then government, private and non-profit sectors can align their decisions.

Infrastructure sector plans can help improve Victoria's cities

The Victorian Government should agree on a set of assumptions for departments to use in their plans to shape more compact cities. These assumptions should set out long-term population, job and land use forecasts. They should also match the housing targets set by a new plan for Victoria.[1066]

The government should then direct each department that owns infrastructure to develop an infrastructure sector plan as soon as possible, based on the assumptions. The plans should show the government's goals and options to reach them.

The plans should at least cover:

- transport
- health, including hospitals and other health facilities
- social housing and social services
- education, including schools, TAFE and early childhood facilities
- justice and emergency services
- water and sewerage
- recycling and resource recovery.

Plans should cover 15 to 20 years. They should name the timelines, triggers and order for infrastructure design and delivery. They should consider the supporting assets each sector needs for its infrastructure to perform well as a network. For example, the transport sector needs clear plans for its train and tram power and signalling assets to support network planning and operation (see case study – Sector plans help with network planning and operation). The government should use the plans to decide which projects to fund.

Departments should publish their high-level plans. This means local governments, businesses and not-for-profit organisations can better align their decisions with them.[1067] Publishing these plans can also help encourage private investment earlier. If needed, the plans can leave out detailed information about exact locations.

Some governments worry that people might think the plans are promises to build a specific infrastructure project by a certain date. But governments in Queensland, New South Wales and the United Kingdom show they can publish plans and manage this risk.[1068]

Cost range, timing and funding

We estimate that preparing and publishing infrastructure sector plans will cost around $35 million. General Victorian Government revenue can fund this draft recommendation.

We estimate that the 7 plans will cost around $5 million each. This covers technical studies, and policy review and development. This will help the Victorian Government determine a consistent set of assumptions, common policy scenarios and produce sector-specific plans.

Sector plans might use existing work being done by government. Each plan can be developed by existing government staff and largely funded through existing resources, supported by technical advice. Preparing each plan will require sharing and coordination within an infrastructure sector, and with other departments, agencies and stakeholders.

Case study

Sector plans help with network planning and operation

The Victorian Government has spent the last 10 years building large train and road infrastructure projects.[1069] People moved to Victoria, families grew and businesses expanded. They needed new and improved transport infrastructure to help them travel and move goods. The government has finished over 60% of its Big Build projects.[1070] It can now begin to shift its emphasis towards how Victoria's transport network can operate cohesively to support achievement of future population, jobs and land use goals.

Transport sector service and infrastructure planning enables the full benefits of individual Big Build projects to be realised across the network. These plans can address all the different components that make up the sector. For example, train infrastructure planning can cover important assets like power, signalling, tunnels and rolling stock.[1071] These plans can provide clear direction on adoption of new, rather than 100-year-old, technologies.[1072] This will help public transport operators prioritise the changes they need to make each year. They can also guide the asset management strategies for transport infrastructure (see draft recommendation 37) so that the overall network can be planned and operated optimally.

Service, infrastructure and asset plans can provide the foundations for a future-focused transport network that helps achieve population, jobs and land use goals.

Draft recommendation 36

Reform infrastructure contributions

> Simplify Victoria's infrastructure contribution schemes to cover all types of housing developments and reflect the cost of infrastructure in different development settings.

Infrastructure costs vary in different development settings

Growing suburbs create more demand for local infrastructure like schools, roads and parks. Governments need to upgrade or build new infrastructure to support more people. In new suburbs, people need new transport, utilities, footpaths and social infrastructure.

Large urban renewal projects can increase housing supply in established suburbs, but they might need costly investment in new or upgraded infrastructure. These areas might also need new land for open space. A lack of infrastructure is often the reason sites stay undeveloped.[1073]

Our report *Choosing Victoria's future* found that the infrastructure needed to support an extra house in a new suburb is $59,000 more expensive than in an established suburb.[1074] Infrastructure in established suburbs will also need upgrades as cities grow, but the total costs are likely to be lower than in new suburbs.[1075]

Victoria's current infrastructure contribution system is complicated and inconsistent

Infrastructure contributions can help fund essential infrastructure in new and growing communities.[1076] They can apply to new developments like housing, commercial spaces and urban renewal projects.[1077] They encourage developers to factor in the costs of new infrastructure when they develop land.[1078] This helps reflect infrastructure costs in the price of new homes and can influence where developers choose to build.[1079]

Victoria has several infrastructure contribution schemes. They apply in Melbourne's new suburbs but are less common in established suburbs and regional cities. Both Victorian and local governments can charge them. Different schemes work separately and are not part of an overall system.[1080] This is complex and costly for governments and developers.[1081] It also means that developments do not contribute equally to infrastructure costs. Even in areas covered by contribution schemes, most infrastructure funding comes from taxpayers.[1082]

Victoria's infrastructure contribution schemes are not delivering the infrastructure that growing communities need.[1083] The Victorian Auditor-General has called for a development contributions framework with clear strategic goals, accountability and governance.[1084]

Infrastructure contributions can support more new homes in established suburbs

The Victorian Government is working with property industry stakeholders to identify a new model for infrastructure contributions in 10 activity centres.[1085] It should then select a statewide model that creates a simple, consistent and efficient system for both Victorian and local government infrastructure. The system should cover established suburbs, new suburbs and urban development projects in Victoria's cities. It should set a higher rate for areas where infrastructure costs more to deliver.

An infrastructure contribution system that reflects development costs in different settings can distribute infrastructure costs more fairly. It can help increase new home building in established suburbs and urban renewal areas. It can also help communities get the infrastructure they need faster.

Cost range, timing and funding

We estimate that reforming infrastructure contributions will cost $1 million to $5 million. This cost range includes assessing alternative contribution schemes, legislative impacts, consulting with stakeholders and developing guidelines. Government should use existing staff to do this work.

General Victorian Government revenue can fund this draft recommendation. Depending on the selected contribution scheme, this draft recommendation might generate more revenue than existing schemes.

We suggest the Victorian Government begins work to reform infrastructure contributions as soon as possible.

Draft recommendation 37

Improve asset management of all government infrastructure

> Fund asset managers to better understand the condition, use and performance standards of all government infrastructure. Use this information to develop asset management strategies and prioritise funding.

Government needs to better understand its infrastructure to improve asset management

The Victorian Government owns and manages infrastructure and land worth around $400 billion.[1086] The government needs to maintain this infrastructure throughout its life to make sure it is reliable, safe and provides value for money. Infrastructure lasts a long time. Its condition, operating requirements and use all change over time. Climate change will speed up this change. Infrastructure will face more extreme weather impacts more often.[1087] This makes asset management even more important.

Identifying how, when and what amount of money to spend on infrastructure maintenance and renewal is complicated. The asset management industry has developed guidelines to manage infrastructure efficiently. Software systems and smart technology make the task easier. But organisations need to understand their infrastructure to manage it well.[1088]

The Victorian Government does not report how much money it spends to renew and maintain its infrastructure. Using average depreciation rates, we estimate around $5 billion each year may be needed.[1089] If the government does not have data and information on the condition of its assets, it will not know where to invest for the best results. This wastes money and creates risk for people and businesses.

Government has taken steps to improve asset management

The Victorian Government introduced the *Asset management accountability framework* in 2016 to improve its asset management practices.[1090] The framework sets mandatory requirements for activities including resourcing, governance, risk management, performance monitoring and information management.[1091]

The government has still not met the performance levels it set itself. Departments assessed their asset management maturity in 2021 and 2024. In 2021, 4 departments did not comply with the framework and were still developing competence. This assessment did not change in 2024.[1092] These departments manage over $130 billion of critical infrastructure including hospitals, roads and public transport.

Government departments report that they often do not have good data on the condition and use of their assets.[1093] They do not have systems to collect and manage the data they need to make decisions. They often have few staff to manage the assets. As a result, the government is not well-prepared to respond to the challenges its infrastructure faces.[1094]

Victoria can do more to manage its infrastructure

The Victorian Government should fund its departments to improve asset management by 2027 and to comply with the framework by 2030 or earlier. In 2018, the government provided funding to the Department of Education to reform its asset management.[1095] The department now reports its asset management maturity as competent in all categories and it is delivering targeted maintenance to schools.[1096]

Agencies must assess and report their asset management maturity by 2027.[1097] Some departments manage multiple types of infrastructure. For example, the Department of Transport and Planning manages roads, and passenger train and bus infrastructure. These departments should assess each major type of infrastructure separately.

The Victorian Government should develop standards and systems and collect better data on asset condition. Once government better understands its infrastructure, it can develop asset management strategies. It should then prioritise funding for infrastructure maintenance and renewal over building new. It should allocate this funding on a rolling basis at least 3 years ahead to support delivery.

Cost range, timing and funding

We estimate that improving asset management will cost $150 million to $250 million over 5 years. This is around 0.05% of the $400 billion worth of infrastructure and land managed by the Victorian Government. Our cost estimate includes developing standards and systems and collecting asset condition data. It also covers developing asset management strategies and business cases for ongoing asset management investment. General government revenue can fund this draft recommendation.

Asset managers will need more funding to plan beyond 2030, and for future infrastructure upgrades and maintenance. Our estimates do not include costs to renew or maintain government infrastructure.

Draft recommendation 38

Prepare for more recycling and waste infrastructure

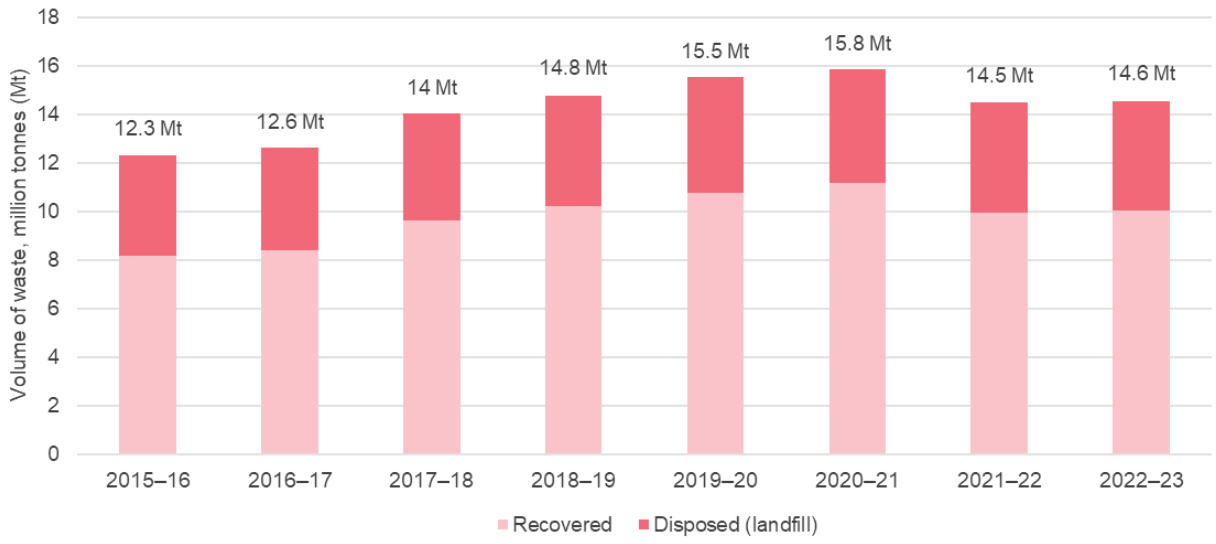
> Identify places for new recycling and waste infrastructure and publish them in the next update to the *Victorian recycling infrastructure plan*. Plan for waste and recycling sites together with other commercial and industrial land. Make changes to planning controls to allow for facilities where they are needed.

Victoria buries too much waste in landfill

Victorians produced 14.6 million tonnes of waste in 2022–23 and sent a third of it to landfill.[1098] Landfill is the least sustainable way to manage waste, and Victoria's landfills are filling up.[1099] Valuable resources are lost when they are thrown away.[1100] Recycling helps prevent this and creates jobs.

The Victorian Government wants to move towards a circular economy.[1101] This means reducing waste and recycling more. But this change will take time. In the meantime, pressure on landfills will continue (see Figure 21).

Figure 21: Victoria sends over 4 million tonnes of waste to landfill each year



Source: Infrastructure Victoria, adapted from Recycling Victoria, *Recycling Victoria data hub*, accessed 1 November 2024.

Victoria will need more waste and recycling infrastructure

Victoria needs more recycling facilities to reduce waste. This includes infrastructure for concrete and bricks, soils, paper, cardboard, soft plastics, electronic waste, textiles and metals.[1102] It will need facilities to recycle electronic waste, the fastest growing type of waste globally.[1103] Victoria also needs more waste to energy facilities to divert waste from landfill.[1104] This is supported by government's plan to increase Victoria's waste to energy cap to 2 million tonnes a year.[1105]

Victoria's transition to renewable energy will generate more electronic waste from used batteries, solar panels and wind turbines.[1106] The Australian Government is developing a mandatory product stewardship scheme to reduce the amount of electronic waste going to landfill.[1107] The Victorian Government will need to plan for the facilities where this waste can be recycled.

Finding suitable locations for waste and recycling facilities is hard. They need to be far away from homes, schools and hospitals.[1108] But they can be expensive to run if they are too far away due to transport costs.[1109]

The Victorian Government introduced new planning controls, like the Buffer Area Overlay, so that waste and recycling facilities do not affect communities.[1110] Some wastewater treatment plants have an overlay, but it has rarely been used for waste and recycling sites.[1111] Governments can consult with communities to find suitable locations.[1112]

Statewide planning can achieve a circular economy

A circular economy relies on local supply chains and access to sustainable materials.[1113] The Victorian Government should plan statewide for waste and recycling infrastructure to support the circular economy. Planning must factor in relationships between different councils, as well as local and regional needs. Leaving waste and recycling decisions up to the market has led to bad community outcomes such as odour and air pollution in the past.[1114]

The government should identify suitable places for new waste and recycling facilities in Melbourne and regional Victoria. It can co-locate infrastructure with other compatible industries and use existing planning buffers to protect residential areas. The government should publish these places in the next update of the *Victorian recycling infrastructure plan*.[1115]

The government can also update *Melbourne's industrial and commercial land use plan* so that enough land has the right planning zones and buffers.[1116] The updated plan should have guidance on how users of commercial and industrial land can better manage their waste and recycling to achieve circular economy outcomes. The government should use these documents to guide local planning for waste and recycling infrastructure, including Precinct Structure Planning and site rezoning.

Governments can apply the Buffer Area Overlay to protect communities from potential impacts. Planning for Eaglehawk Landfill in Bendigo included recycling and used the Buffer Area Overlay to reduce its impact on local residents.[1117] The overlay will have the most benefits when applied in new suburbs and regional areas.

Cost range, timing and funding

We estimate that preparing for more recycling and waste infrastructure will cost $1 million to $5 million over 5 years. This includes strategic planning, consulting with government authorities and business, community engagement and amending planning schemes. The Victorian Government can fund this draft recommendation through its Sustainability Fund.[1118]

Identifying suitable places for new waste and recycling facilities by 2027 means they can be incorporated in the next update to the *Victorian recycling infrastructure plan.*[1119] Existing government staff can carry out much of this work.

Draft recommendation 39

Use digital technologies to better design, build, operate and maintain government infrastructure

> Pilot digital technologies on government infrastructure projects and report on their progress. Use building information modelling on major infrastructure and housing projects. Improve capabilities in government agencies and review procurement processes to promote greater use of digital technologies.

Digital technologies can boost Victoria's productivity

Digital technologies can help Victoria do more with less. The Victorian Government already uses digital technologies to design, build, operate and maintain some infrastructure. For example, the Department of Transport and Planning's Smarter Roads project is improving traffic light network operations to help avoid the need for new roads (see draft recommendation 40).[1120] But governments and businesses have other opportunities to use digital technologies more often.

Our commissioned report *Digital technologies and infrastructure productivity* looked at technologies that can lift the productivity of Victoria's infrastructure. We found big benefits from using robotics, building information modelling and artificial intelligence.[1121] For example, using robotics to inspect and maintain the water network might provide Victoria with $3.5 billion of savings by 2055.[1122] Machine learning and artificial intelligence can help the government better design and build schools and kindergartens.[1123]

Victoria can get more from building information modelling

Infrastructure designers can use building information modelling to create a 3-dimensional digital model. This has more information than standard 2-dimensional construction drawings.[1124] Project teams can access information, collaborate and share data online.[1125] They can test design options and make changes in the model. This saves time and resources, particularly when projects use building information modelling without standard construction drawings (see case study – Design and construction of bridges with building information modelling).[1126]

Building information modelling can lower the costs of designing and building infrastructure.[1127] It helps reduce mistakes during design and construction. Our research found that using building information modelling to build public housing might provide Victoria with $1.9 billion of benefits by 2055. Applied to road construction, it might provide over $13 billion of benefits by 2055.[1128]

The Victorian Government should use building information modelling on major infrastructure and housing projects (see draft recommendations 1 and 3).

Pilot projects can help Victoria to better understand the benefits of digital technologies

Common barriers to adopting digital technologies include technology costs and a lack of digital skills.[1129] Trials and pilot projects can help by letting government and businesses test new technologies before rolling them out.[1130]

The Victorian Government should pilot digital technologies on infrastructure projects and report on their outcome. Our research identified building information modelling with online data sharing and a single 3-dimensional model as a good technology to pilot.[1131] Robotics, machine learning, artificial intelligence, advanced imaging and geospatial technologies also show good potential. The government can pilot these in sectors including transport, education, housing and water.

New skills and procurement processes can enable digital technologies

Government employees involved in planning, designing and procuring infrastructure will need new skills to understand the opportunities and manage use of digital technologies. The Victorian Government should build these skills to help integrate technology into the infrastructure lifecycle. This can give industry confidence that government will ask for and consider proposals that use digital technologies.

The Victorian Government can also set expectations on how businesses use technology in its procurement policy.[1132] The government should review procurement policies and frameworks so they encourage digital technology use. This can include the *Ministerial directions for public construction procurement* and the *Procurement – investment lifecycle and high value high risk guidelines.*[1133]

Cost range, timing and funding

We estimate that piloting digital technologies will cost $15 million to $30 million over 5 years. General government revenue can fund this draft recommendation.

Our estimated cost range includes piloting various digital technologies, like using building information modelling on a major infrastructure project. Starting by 2030 means the government can select suitable projects, identify delivery models and develop specifications to engage designers and contractors.

This cost range also includes training and mentoring government and project staff, as well as monitoring and evaluation of the pilot.

Digital technologies can deliver significant cost savings on government infrastructure projects, especially on billion dollar projects. For example, using building information modelling to build public housing can save up to around 7% of project costs in reduced cost overruns and risks, or $76.5 million a year. Using robotics to inspect and maintain the water network can save up to $140 million a year in maintenance and avoided costs.[1134]

Case study

Design and construction of bridges with building information modelling

Randselva Bridge

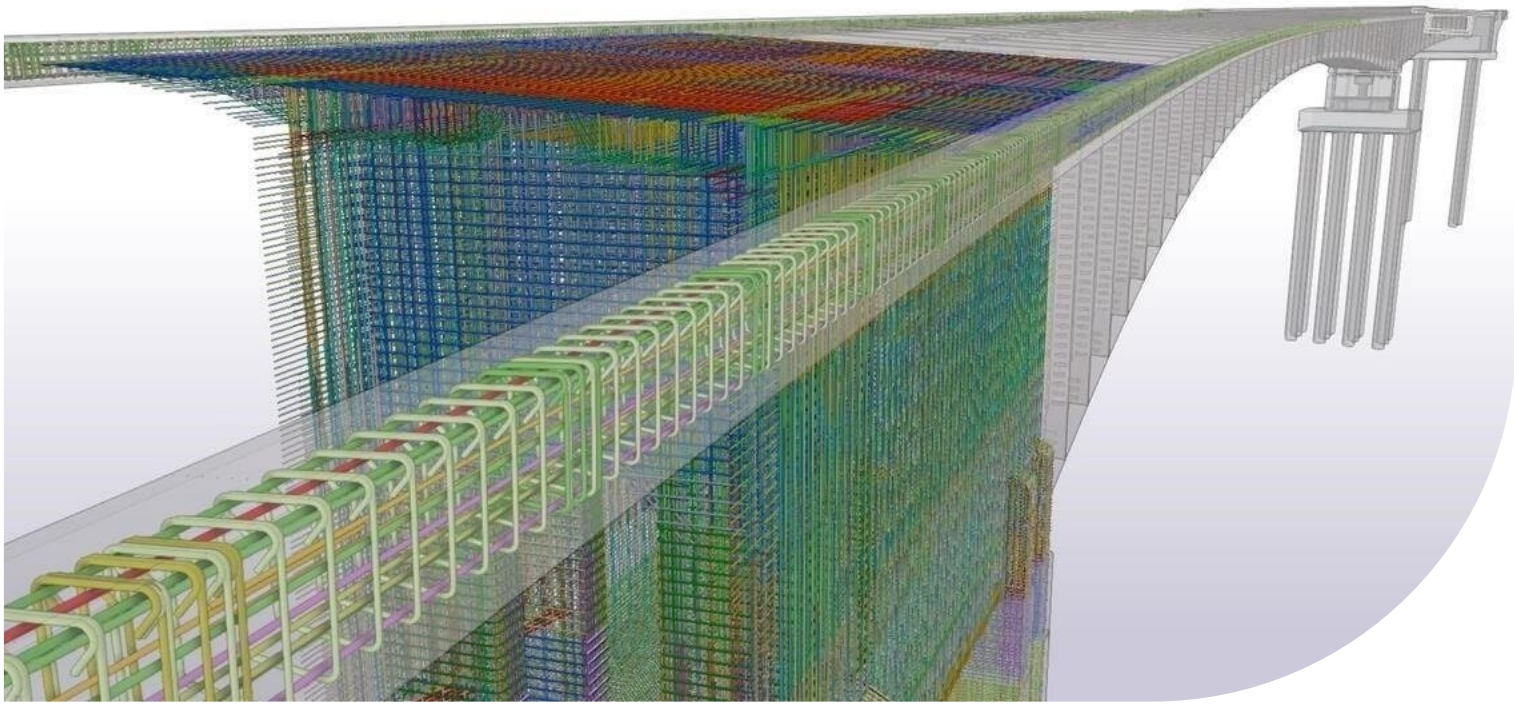
Randselva Bridge is a 634 metre long concrete bridge located about 50 kilometres from the Norwegian capital of Oslo. At its highest point the bridge is 55 metres above ground level.[1135]

The project team used building information modelling to create a detailed 3-dimensional information model for Randselva Bridge. This model holds all project information in a shared data base. It is the world's longest bridge built without 2-dimensional drawings.[1136]

The 3-dimensional information model was available online to all parties involved in the project. This allowed teams across 5 countries to easily collaborate and stay up to date during the different stages of design and construction.[1137] The project team could also use information from the model to order building materials.[1138]

Using building information modelling allowed the project team to make changes in the shared model. This enabled more efficient construction by ending the need to communicate the change and edit multiple drawings. It also reduced the number of errors made during design, reducing time and allowing better quality assurance.[1139]

Image below: Tekla, *Randselva Bridge*, Tekla website, n.d., accessed 12 December 2024.



Draft recommendation 40

Use modern traffic control technology for efficient and safe journeys

> Further extend modern traffic control technology like sensors and cameras along arterial roads in Victoria's largest cities. Begin expanding smart motorways into Melbourne's growth area freeways.

The road network is under pressure and building more roads is not a fix

Many arterial roads and freeways will reach capacity over the next decade.[1140] Growing congestion will lead to delays and longer travel times. It limits the opportunities that Victorians have access to, and costs businesses and the community money.[1141]

As more Victorians use roads, incidents like a freeway crash can delay thousands of people. They also risk leaving those involved with life-changing injuries and trauma.[1142]

Traffic control technology can deliver smoother and safer journeys. Victoria's roads carry more than cars. Improved journeys can reduce delays for buses, trams, pedestrians and trucks.[1143] On some tram routes, almost 20% of travel time is spent waiting at red lights.[1144]

Governments usually build bigger roads to manage congestion.[1145] But evidence from around the world confirms that expanding roads only works for a short time. The roads soon become congested again because more motorists start using them.[1146]

Traffic control technology can improve traffic flow on arterial roads

The Victorian Government's $340 million Smarter Roads program aims to keep traffic moving on arterial roads. It originally targeted Melbourne's west and south-east and brings together real-time transport data from devices like traffic sensors and cameras across the network.[1147] Engineers use this data to optimise traffic signals and improve traffic flow. Our modelling shows that more efficient roads can provide benefits of up to $14 for every dollar invested.[1148] These benefits can be delivered for under a third of the cost of major road projects.[1149]

The Victorian Auditor-General found that the government is not fully using the new data to make traffic flow better.[1150] For example, it can use the data to identify roads that can reduce congestion the most and change traffic flows on these roads first. This would increase the benefits of the investment in Smarter Roads technology.[1151]

The Victorian Government should extend Smarter Roads technology to more arterial roads in Melbourne, Ballarat, Bendigo and Geelong. It should then identify roads where congestion can be reduced the most. Traffic signals should be optimised to improve flow.

The government should also fund new traffic incident response teams near high-risk arterial roads to manage incidents quickly. Staff in the Victorian traffic control room can use the new cameras to direct the response teams to the incidents.[1152]

Our assessment found roads like Melbourne's Sydney Road, Bell Street and Ballarat Road carry large volumes of traffic. They are also significantly congested at peak hour.[1153]

The government should also consider demand management measures like changes to public transport and road pricing (see draft recommendation 13 and future option – Charge people fairly to use roads).[1154]

Traffic control technology on Victoria's roads

Traffic signal engineers use cameras and sensors to understand traffic patterns and behaviours on Victoria's roads.[1155]

Changing conditions like population growth or major events means traffic lights need to be updated. By optimising the amount of green time across traffic signals, engineers can provide a smoother and safer journey for all road users.[1156]

A well-optimised network can mean the difference between stop-start traffic and getting through intersections on a single green cycle. It can also reduce the amount of time pedestrians or public transport services wait at traffic signals, like around busy shopping strips.[1157]

Upgrades can improve traffic flow on Victoria's busiest motorways

The opportunity to improve traffic flow extends to Victoria's busiest motorways.[1158] Melbourne's Monash Freeway already uses smart motorway technology.[1159] This includes ramp signals, overhead lane and trip information signs, cameras and vehicle sensors.[1160] Upgrades have increased speeds by up to 28% and enabled more vehicles to travel on the freeway. Upgrades have also allowed operators to quickly respond to disruptions.[1161] This makes the freeway safer, reducing the crash rate by 30%.[1162]

New technology will help prepare Victoria's road network for automated vehicles.[1163] Upgrades can be staged as part of motorway improvement projects or included in assessments for future funding.[1164]

The government should complete the smart motorway network by extending the technology to Melbourne's growth area freeways. This includes the Princes, Western, Calder and Hume freeways to Werribee, Melton, Sunbury and Wallan, respectively.

Cost range, timing and funding

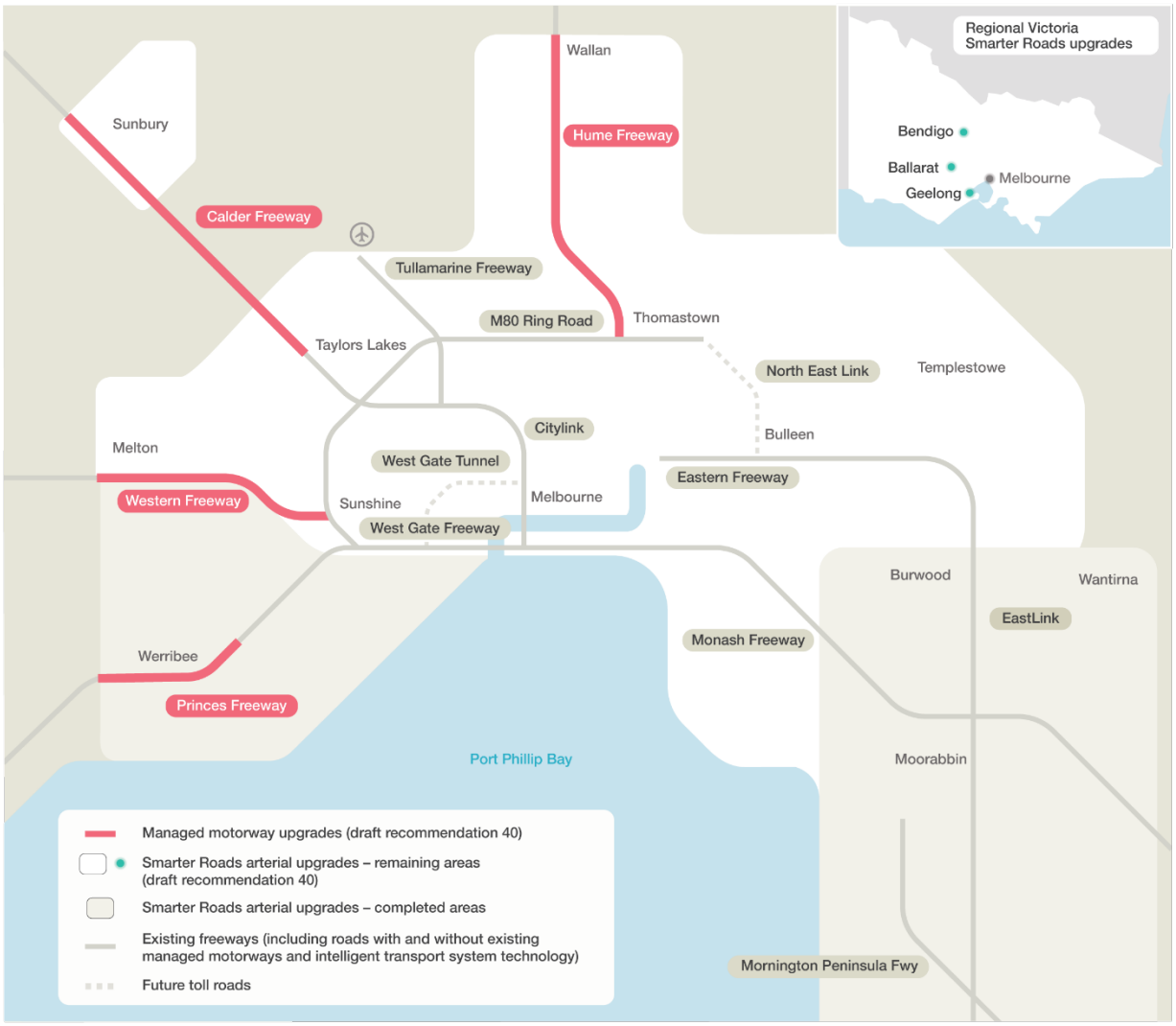
We estimate that using modern traffic technology on Victoria's roads will cost $2 billion to $3 billion over 10 years. This includes upgrades on 1,600 kilometres of Victoria's roads, covering new and upgraded traffic signals, trip information signs, cameras, sensors, support structures, power, communications and central control systems. General government revenue can fund this draft recommendation.

Within 5 years, the Victorian Government can use traffic control systems to manage more arterial roads in Melbourne. We estimate this will cost $600 million to $800 million. Adding these systems on arterial roads in Geelong, Ballarat and Bendigo will cost around $150 million across the 3 cities.

After 2030, the government can expand the smart motorway network. This requires more complex systems and infrastructure. We estimate that adding another 82 kilometres of smart motorways to Melbourne's growth areas will cost $1.3 billion to $1.9 billion.

Both technologies can be introduced in stages. For example, a stage might cost $10 million for upgraded traffic control systems on an arterial road, or $30 million for a section of managed motorway. The government can also build on existing systems.

Figure 22: Roads in Victoria's largest cities can be upgraded with modern traffic control technology



Source: Infrastructure Victoria

Future option

Charge people fairly to use roads

> Introduce road charges that help manage congestion and improve productivity. Consider options such as car parking levies, off-peak freeway tolls, congestion pricing trials, or road user charging for all motorists with lowered fixed road charges. Work with the Australian Government on road pricing options.

Road congestion remains a big problem

Victoria's roads will get busier over time.[1165] More cars and trucks will mean longer, less predictable travel times.[1166] Inner Melbourne is the most congested part of the state.[1167] By 2030, Melbourne's traffic delays might cost over $14 billion each year in time, vehicle costs and extra pollution.[1168] Building more roads does not solve congestion, but changing how motorists pay to use roads can help reduce it.[1169]

Changing how we pay to use roads can help ease congestion

The Victorian Government's vehicle registration charges and stamp duties help pay for roads.[1170] The Australian Government also contributes using the tax raised by the fuel excise.[1171] Motorists pay fixed road charges regardless of how much they travel.[1172] These charges do not reflect the costs of infrastructure, congestion, pollution, emissions or road trauma.

As more motorists switch to electric and hybrid vehicles, the Australian Government will collect less fuel excise.[1173] This means it might have less infrastructure funding to allocate to Victoria, including for roads.

Our modelling shows that in 2031, pricing specific roads during peak periods might increase travel speeds by up to 25%.[1174] Travel during peak hours might fall by 8%, with 168,000 fewer car trips each day.[1175] Road pricing can encourage more people to use public transport, meaning less road congestion.[1176]

The Victorian Government can phase in road charges to help reduce congestion. By the 2030s around 40% of motorists will be driving electric cars.[1177] The government has several options to change how motorists pay for roads. For example, it can:

- further expand the reach and scope of Melbourne's congestion levy to include current and future higher density precincts and activity centres, following the recent expansion into inner-eastern suburbs in December 2024[1178]
- introduce cheaper tolls on freeways outside of peak hours
- trial low-emission zones or congestion charging at ports, in major precincts or inner Melbourne
- work with the Australian Government to introduce variable distance-based road user charging.

Motorists have paid tolls on Melbourne's freeways since the 1970s.[1179] Charging motorists based on how much, when and where they drive can change travel behaviour. It encourages people to travel at different times, to different places or to use public transport. Discounts for low-income or vulnerable Victorians or people living in rural areas help improve fairness.[1180]

Under road pricing, drivers can expect less congestion, more predictable travel times and higher productivity. It will also reduce emissions and improve road safety.[1181] Road pricing can delay the need for costly and disruptive infrastructure projects because it makes better use of existing infrastructure.

Road pricing reforms can also generate government revenue

Transport pricing reforms might generate over $7.5 billion in revenue for the Victorian Government.[1182] This can be used to improve public transport to meet increased demand. People are more likely to accept road pricing if they see that it pays for better public transport.[1183] Cheaper off-peak public transport fares can also support road pricing changes (see draft recommendation 13).

Trialling road pricing can help different options work together with public transport fare changes to build community acceptance.[1184] By making changes in stages, the government can show the benefits and find lessons for further reforms.

Cost range, timing and funding

We estimate that this future option costs $25 million to $160 million, depending on the selected approach. General government revenue can fund this work. Road pricing like tolls can help to cover some, or all, operational costs once the infrastructure and systems are in place.

Our cost range includes $5 million to $10 million for the government to plan, phase-in and track road pricing. This involves reviewing policies, changing legislation and regulations, and communicating any new charges to Victorians. The State Tolling Corporation can do this work if the government expands its role.[1185]

Congestion pricing or road user charging options will require some new infrastructure. A 2019 estimate found that introducing congestion pricing in Melbourne would cost around $100 million.[1186] New technologies can help to make this cheaper as they do not require barriers, gantries and detection points.[1187] Other options like expanding Melbourne's congestion levy or applying off-peak road tolls can be done at low cost as they require less infrastructure.

High Court decision on electric vehicle road user charging

In 2021, the Victorian Government passed the *Zero and Low Emission Vehicle Distance-based Charge Act 2021* (Vic). This charged zero and low emissions vehicle users up to 2.5 cents per kilometre to drive on public roads.[1188]

The High Court of Australia decided in 2023 that this charge was a duty of excise because it had a 'close relation to the production or manufacture, sale, distribution, or consumption of goods'.[1189] Under section 90 of the Australian Constitution, only the Australian Government can impose a duty of excise.

This decision made the *Zero and Low Emission Vehicle Distance-based Charge Act 2021* (Vic) invalid, which removes the Victorian Government's charge on zero and low emissions vehicles.

The High Court of Australia's decision challenges the Victorian Government's ability to charge people fairly to use Victoria's roads. It also affects government revenue, which it can use to improve public transport or fund road maintenance.[1190] To overcome this, the Victorian Government should work with the Australian Government on road pricing options.

Case study

Road pricing success stories around the world

Cities like London, Singapore, Stockholm, Milan and Oslo have successfully introduced transport pricing reforms. These reforms have reduced congestion, improved vehicle travel speeds and reduced emissions.[1191] Some cities have used funds from road pricing to build roads, tunnels, public transport infrastructure, and cycling and walking facilities.[1192] New York also recently introduced congestion pricing with promising initial results.[1193]

Scheme	Main features	Benefits
London Congestion Charge	• Daily area charge for central London. • 90% discount for residents inside the charging zone.[1194] • No charge for vehicles used by people with disability.[1195]	• 3 million fewer car trips.[1196] • 39% less private car traffic entering central London between 2002 and 2014.[1197] • Revenue used for transport improvements like public and active transport.[1198] • Fewer cars meant road space could be reused for sustainable transport modes.[1199]
Singapore Electronic Road Pricing	• Major roads tolled to achieve congestion targets. • Tolls regularly changed to get traffic speeds to match a target.[1200]	• 15% less daily traffic within the restricted zone throughout the day and 16% less at morning peak.[1201]
Stockholm Congestion Tax	• Cordon charge for central Stockholm. • Applies from 6:30am to 6:30pm, higher charge during peaks.[1202]	• 18–21% less traffic in the first 6 years.[1203] • 3% less emissions.[1204] • 5–10% fewer road accidents involving injuries.[1205]
Milan Area C Charge	• Cordon charge for central Milan. • Single charge on entry during the day.[1206]	• 15% fewer vehicle entries into charge area.[1207] • 6–17% less pollution.[1208]
Oslo toll rings	• Three tiers of toll points on major arterials from outer to inner Oslo.[1209] • Four tiers of vehicle fuel-based charge.[1210] • Higher tolls during peak hours 6.30am to 9am and 3pm to 5pm.[1211]	• Exemption from tolls for electric vehicles incentivised their uptake.[1212] • 15% less direct greenhouse gas emissions from road traffic.[1213] • 5% less congestion from cordon changes (2005 figure), but more electric vehicles offset some congestion benefits.[1214]

Draft recommendation 41

Make rail freight competitive, reliable and efficient

> Develop and publish a 30-year integrated rail freight network plan and fund a 10-year rail freight maintenance program. Develop a freight network coordination policy.

Victoria's freight is predicted to reach nearly 900 million tonnes in 2051 – more than double the volume in 2014.[1215] Improving how freight moves can boost Victoria's productivity, competitiveness and regional development.[1216]

Rail can produce 16 times less greenhouse gas emissions than road freight.[1217] Moving more freight by rail can help Victoria achieve its net zero emissions targets.[1218] Rail is also efficient for moving heavy goods over longer distances but can be less reliable and flexible than road for many freight tasks.[1219] However, rail can still be viable with the right infrastructure and set-up.[1220]

A long-term network plan will support rail freight growth

Rail freight demand is forecast to nearly quadruple between 2020 and 2050.[1221] Projects like the Port Rail Shuttle Network, Inland Rail and Beveridge Intermodal Freight Terminal will enable some of this growth. But some routes will still be congested, particularly into the Port of Melbourne and Dynon precinct from the west and south-east.[1222] The government will need to develop the network to meet growing demand.

The Victorian Government should publish a 30-year integrated plan for the rail freight network that:

- identifies land to set aside to expand network capacity, such as for intermodal terminals and empty container parks[1223]
- clarifies timing and responsibility for infrastructure projects like the rail link to Webb Dock[1224]
- outlines performance standards and aligns with national standards.

The plan will guide investment and improve connectivity and integration across Victorian and national rail networks.[1225]

Victoria's rail freight network is not well maintained

Recent maintenance funding has improved the rail freight network.[1226] Benefits include the removal of some speed restrictions, reduced travel times and increased load capacity.[1227] However, over 10% of V/Line assets will be near or past their design life by 2025.[1228] The overall network condition is still below the standards outlined in the 2018 freight plan. This means that heavy freight trains cannot always travel safely at speed.[1229]

Planned rail freight maintenance is 10% to 15% cheaper than ad hoc repairs.[1230] But Victoria does not have long-term funding for rail freight network maintenance.

The Victorian Government should develop a 10-year rail maintenance program. Annual funding of around $100 million for the next 4 years will allow V/Line to plan and deliver network maintenance.[1231] V/Line should assess and prioritise maintenance needs to inform longer-term funding and publish key network performance indicators.

Unreliable access is disruptive to rail freight businesses

Passenger services have priority over freight on the shared rail network.[1232] This means freight services can be cancelled when there is network disruption or conflict.[1233] Rail access to the Port of Melbourne is also

challenging. Multiple freight operators need to coordinate access and they have no agreed way to resolve conflicts.[1234]

Victoria does not have a policy to coordinate reliable freight access to the rail network. This increases business costs and affects efficiency.[1235] The government should develop a freight network coordination policy to guide freight access to the network. As a first step, it should include provisions for enough reliable freight access in passenger rail franchise agreements.

The government could increase the benefits of this draft recommendation by creating a rail freight coordinator to plan and schedule freight movements on rail. This coordinator can be government-led or industry-led (see case study – The Hunter Valley Coal Chain Coordinator).

Cost range, timing and funding

We estimate this draft recommendation will cost around $400 million over 4 years. This can be funded in different ways. General government revenue can partly fund ongoing regional rail freight maintenance when it provides wider benefits, such as avoided road transport costs and less pollution.

Freight operators already pay access fees to use Victoria's existing rail infrastructure.[1236] More private businesses can pay to use regional rail for freight because they directly benefit from the government's infrastructure investment.

Rail freight network maintenance and renewal will cost approximately $100 million a year for the 4 years to 2029, extending current funding. Recovered rail user charges can help offset rail freight maintenance costs.

The Victorian Government can spend around $5 million on a 30-year integrated plan for rail freight and rail freight network coordination policy, and around $5 million on a 10-year rail maintenance plan. The maintenance plan can set funding beyond 2029 once the government has a better understanding of how to get value for money.

Case study

The Hunter Valley Coal Chain Coordinator

The Hunter Valley Coal Chain Coordinator Limited is an independent body that oversees coal movement from mines to export terminals and domestic customers in the Hunter Valley region of New South Wales.[1237]

The coordinator functions as a business analyst, traffic coordinator, maintenance scheduler, network planner and investment manager.[1238] It was set up to address cancellations and queues caused by the lack of clear roles and responsibilities in coordinating coal movements through the region. This lack of coordination was increasing costs for businesses and creating investment uncertainty.

Membership of the coordinator includes all Hunter Valley coal producers, rail operators and port terminal operators, as well as the Australian Rail Track Corporation as the track owner.

Central planning and digital scheduling have achieved reliable and efficient performance for the rail network. Industry stakeholders consider this a model for rail freight.[1239]

Draft recommendation 42

Encourage off-peak freight delivery in urban areas

> Prepare for growing freight volumes in urban areas by piloting an off-peak freight delivery program in a high-density area of Melbourne. If successful, expand off-peak delivery for more productive and sustainable freight movement.

Melbourne's population growth and increasing density will mean more freight deliveries to urban areas.[1240] More people shop online, further increasing freight traffic in business and residential suburbs.[1241]

Trucks move most of the freight in urban areas. They currently make up 15% to 20% of city traffic.[1242] Trucks contribute to congestion, traffic accidents, and air and noise pollution.[1243] Moving freight in cities can also be expensive. Deliveries are not coordinated and parking is restricted.[1244] The 'last mile' of freight delivery (the final stage of delivery to customers) can account for over half of total delivery costs.[1245]

The freight industry is complex. It involves many stakeholders, including customers, governments, freight operators, communities and retailers.[1246] The Victorian Government can work with stakeholders to test ways to improve freight productivity and reduce negative impacts, including greenhouse gas emissions. Victoria will need to reduce emissions from urban freight to meet its target of net zero emissions by 2045.[1247] Small trucks and vans carry most freight in urban areas. They produce around one-fifth of transport emissions.[1248]

Delivering goods outside peak hours reduces congestion and increases productivity

Delivering goods outside peak hours when roads are less congested can save time and money.[1249] It makes better use of existing infrastructure and increases productivity.[1250] Freight providers can cover more distance and make more deliveries in less time with less equipment.[1251]

Other cities have seen the benefits of moving more freight in off-peak hours. For example, off-peak delivery trials in Sydney reduced freight travel and service times by up to 50%.[1252] New York expanded its off-peak program in 2024 due to significant efficiency and environmental benefits (see case study – Delivering goods outside of peak hours).[1253]

Modelling shows that moving 30% of Victorian freight to off-peak hours by 2051 might result in:[1254]

- 155,000 fewer hours spent on the road for Victorian cars every day
- 800,000 fewer kilometres travelled by trucks each day while delivering the same amount of freight across Victoria.

There are many barriers to moving more freight in off-peak hours. These include truck curfews, local laws against after-hours deliveries, and higher staff and security costs.[1255] Research shows that major fashion retailers, supermarkets, food services and convenience stores have the most potential for off-peak delivery.[1256]

Pilot projects can test the benefits of off-peak freight delivery

The Victorian Government can encourage stakeholders to work together to overcome barriers and explore changes to delivery times. By 2030, it should set up a pilot in Melbourne for off-peak freight delivery to test feasibility and confirm benefits. The pilot should:

- target dense residential and commercial areas, such as inner Melbourne
- focus on a single sector

- remove barriers to participation, for example by relaxing truck access restrictions and helping freight receivers upgrade storage and security.[1257]

Lessons learned from the pilot can help determine how to expand the program in the future.

Cost range, timing and funding

We estimate that piloting an off-peak freight delivery program will cost $1 million to $5 million over 5 years. This includes costs to design, run and evaluate the program. We assume existing government staff will do this work.

General government revenue can fund this draft recommendation.

Case study

Delivering goods outside of peak hours

Delivering and collecting goods outside peak hours in busy areas makes better use of existing infrastructure and increases efficiency. There have been many trials around the world, including in Australia.[1258]

In 2016, the New South Wales Government worked closely with businesses to trial off-peak deliveries and collections. The trials involved companies from the supermarket, waste and hardware sectors.[1259] The benefits of scheduling some activities to occur at night instead of during the day included:[1260]

- travel time savings of up to 50% to reach Sydney's central business district
- between 15% and 40% fewer kilometres travelled within the city centre
- time savings of 30% to 50% to load and unload goods after parking
- productivity improvements of between 30% and 40% due to faster vehicle turnaround.

The New South Wales Government continues to help connect businesses with service providers to trial and implement off-peak delivery.[1261]

In 2009, New York piloted an off-peak delivery program in Manhattan's central business district to help businesses receive goods between 7pm and 6am. Participating businesses were eligible for a US$2,000 incentive if they shifted multiple weekly deliveries to off-peak hours and committed to the program for at least 6 months.[1262]

The pilot successfully shifted deliveries for over 400 businesses.[1263] It reduced congestion, lowered emissions, and improved efficiency for delivery companies and customers.[1264] The pilot estimated annual business savings of US$100 million to $200 million through reduced congestion and improved delivery efficiency.[1265]

In 2010, New York City made the off-peak delivery program permanent. Around 1,120 locations currently receive off-peak deliveries.[1266] The city allocated $6 million to expand the program in 2024, aiming to reach 5,000 locations by 2040.[1267]

Future option

Plan for more efficient and sustainable urban freight

> Develop a network of urban freight delivery precincts in Melbourne to improve freight productivity and reduce emissions.

Urban freight contributes to congestion and greenhouse gas emissions

Growth in urban freight is expected to continue in line with population growth, increasing e-commerce, and changing customer expectations.[1268] 'Last mile' delivery is the final stage of freight delivery to customers. It is inefficient in urban areas because roads are more congested and it can be difficult for trucks to move.[1269] Some businesses can shift deliveries to off-peak hours (see draft recommendation 42). But this will not work for all.

As cities attract more people and businesses, and become more compact, there will be less land available in inner suburbs for freight operators to use.[1270] This is likely to increase freight costs.[1271] Governments will need to integrate freight industry needs into land use planning to help boost the economy, make roads safer and improve local amenity (see draft recommendation 35).[1272]

Urban freight also contributes to greenhouse gas emissions. Emissions from last mile deliveries in the world's largest cities might increase by over 30% by 2030.[1273] Low or zero emission freight vehicles can help achieve Victoria's goal of net zero emissions by 2045.[1274]

Innovation can improve freight productivity and reduce emissions

Policymakers in Australia and worldwide are exploring innovative urban freight solutions to reduce congestion and pollution, or to promote zero emission vehicles. Some aim to do both (see case study – Innovative solutions for urban freight). Suitable initiatives for Victoria include:

- developing urban freight consolidation centres near busy urban areas, where larger trucks drop off their loads for smaller vehicles to handle last mile delivery
- setting up zero emission zones that restrict or charge entry for petrol and diesel vehicles
- providing delivery parking and loading zones for zero emission commercial vehicles in high-density areas.

By 2035, the Victorian Government can create a network of urban freight delivery precincts in Melbourne to improve urban freight, boost productivity and cut emissions. The Victorian Government is targeting 50% of small truck and van sales to be zero emission vehicles by 2030.[1275] This timing will also support the population growth expected in key activity centres.[1276]

To prepare for increased freight volumes in urban areas, the government can work with industry and local governments to identify opportunities to boost productivity and reduce freight pollution. These are likely to be places where housing density and congestion are increasing, such as *Victoria's housing statement* priority precincts, activity centres, Suburban Rail Loop precincts and areas close to the Port of Melbourne.[1277] The government can consider population and freight demand forecasts, access to the Principal Freight Network, industrial precincts and local businesses, and levels of air pollution when selecting specific locations.

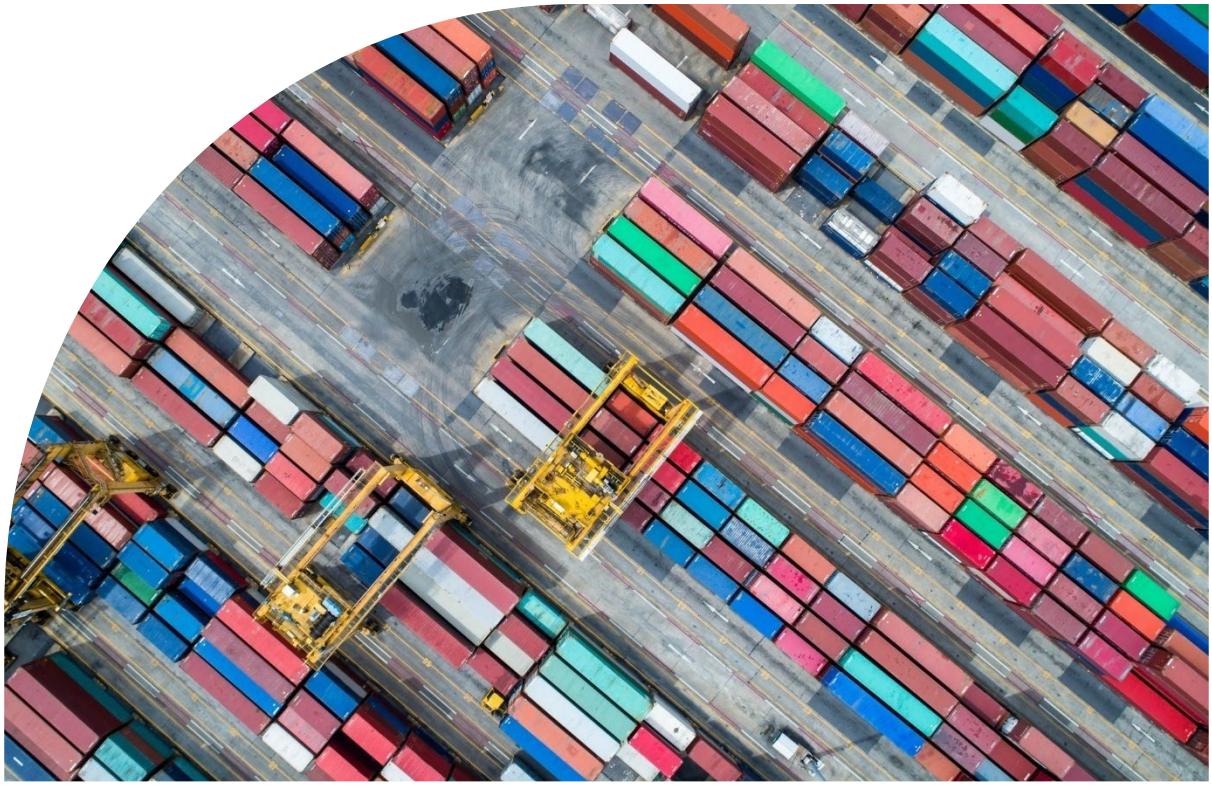
The government can also complete a feasibility study to test effective urban freight solutions for different precincts and decide how and when to action them. Some areas might need a mix of solutions. The government can start by testing urban freight consolidation centres and zero emission zones.

Empowering local governments to create and enforce urban freight delivery precincts can also help the government prepare for more freight. This might include updating land strategies and engaging with industry, businesses and local communities.

Cost range, timing and funding

We estimate that planning for more efficient and sustainable urban freight will cost $1 million to $5 million over 5 years from 2030. General government revenue can fund this future option.

The Victorian Government can work with local governments and stakeholders to find opportunities and test solutions. The cost range includes consultation with stakeholders, development of guidelines and standards, and grant funding for pilot initiatives. Charges collected from petrol and diesel vehicles entering zero emission zones could be used to support freight operators to transition to zero emission vehicles. The costs for this future option might be higher if government needs to buy or lease land to trial urban freight solutions.



Case study

Innovative solutions for urban freight

Many initiatives can improve urban freight. Government policies like road pricing, vehicle restrictions, and low emission zones can help address urban logistics challenges. Infrastructure such as freight hubs can improve city logistics. Freight operators can combine deliveries and improve truck loading.[1278]

Urban freight consolidation centres

Urban freight consolidation centres can boost productivity with faster vehicle turnaround and higher driver efficiency.[1279] They can reduce congestion and emissions by using smaller, low emission vehicles for last mile deliveries.[1280] They can also improve road safety in local areas.[1281]

In 2019, 62 urban freight consolidation centres operated in Europe. They work best when government and industry collaborate, when they are within 1 kilometre to 3 kilometres of the end destination and when they have easy access to key freight routes.[1282] Government typically provides the land for the centres, alongside other regulatory and financial support.[1283] For example, Paris has reserved over 60 sites for future logistics hubs.[1284]

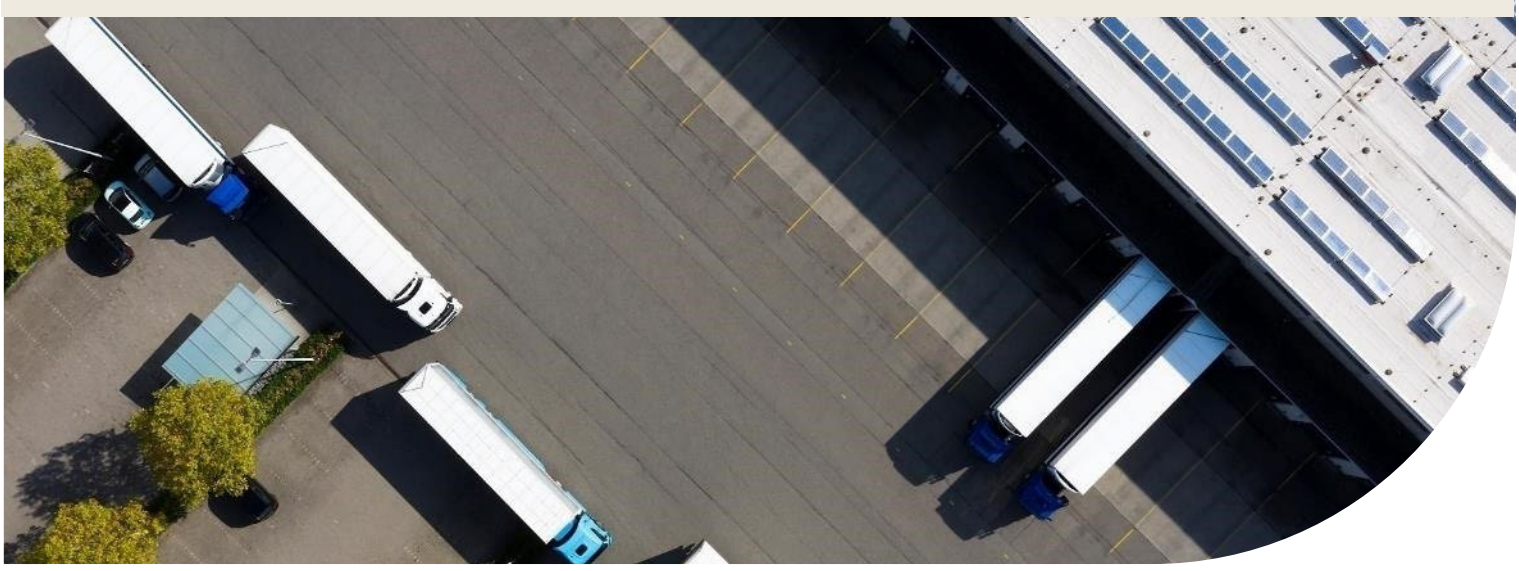
The City of Sydney and Transport for New South Wales trialled a free courier hub in a carpark near Sydney's central business district.[1285] Transport companies delivered goods faster and reduced their operating costs. The value of community benefits was 5 times more than total project costs.[1286]

Zero emission zones

From 2025, Dutch cities can introduce zero emission zones to reduce emissions from freight.[1287] Around 30 zero emission zones will cover city centres and nearby areas.[1288] Businesses are notified at least 4 years in advance so they can prepare.[1289] All new vans and trucks must be zero emission vehicles. The government offers subsidies of up to €5,000 to help with the cost of buying zero emission vans or trucks.[1290]

Zero emission parking and loading zones

Santa Monica trialled USA's first voluntary zero emission delivery zone in 2021.[1291] It provided priority kerb space in a one square mile area. This zone covers nearly 16,000 residents and 2 commercial districts with about 30,000 workers.[1292] The program aimed to address congestion and pollution from transport. It monitored vehicle activity in curb zones to study efficiency, safety, congestion and emissions. It also provided real-time parking data to zero emission drivers.[1293]



Draft recommendation 43

Create and preserve opportunities for future major infrastructure projects

> Create and preserve opportunities to build major infrastructure projects which might be required in the long term. This includes expanding desalination capacity, City Loop reconfiguration, extending and electrifying metropolitan trains to growth areas in Melbourne's north and south-east, Melbourne Metro 2, the Bay West port, the outer metropolitan road and rail corridor and connecting western intermodal freight terminal.

The government has limited ability to invest in new major infrastructure projects in the short-term

The Australian economy faces shortages in the skills and materials needed now for infrastructure projects.[1294] At the same time, the Victorian Government has limited capacity to fund new major projects.[1295] Reflecting these challenges, the government expects annual capital spending to fall in the next few years from recent highs.[1296]

In the short term, there are many ways the government can get more out of existing infrastructure without building large new projects. Many of the draft recommendations we make in this strategy will help the government achieve this.

In the long term, a larger population means that Victoria will still need to invest in new projects to expand infrastructure capacity. Victoria's road and public transport networks will be under increasing strain with more people travelling.[1297] A growing population will demand more goods, putting pressure on Victoria's freight network and ports.[1298] Victorians will also need more water from a range of different sources.[1299]

Our draft recommendation to prepare and publish infrastructure sector plans to shape Victoria's cities (draft recommendation 35) will help the government plan and sequence the infrastructure needed to support this growth.

Victoria can plan now for future infrastructure needs

The government should prepare now for major infrastructure projects that Victoria is likely to need in the long term. It should:

- complete a detailed business case to expand the existing Victorian Desalination Plant to support meeting water demand until 2035 (see future option – Plan for and invest in manufactured water)
- complete a preliminary business case and detailed engineering assessment to reconfigure the City Loop (see future option – Reconfigure the City Loop for more frequent trains)
- complete detailed assessments to extend and electrify metropolitan trains to Melbourne's north and south-east growth areas (see future option – Extend metropolitan trains to growth areas in Melbourne's north and south-east)
- complete a preliminary business case for the Melbourne Metro 2 tunnel project, confirm its route and protect the land needed to build it
- apply planning protection for transport corridors and buffers for a future Bay West port, particularly for future road and rail connections, and monitor and report on the environmental conditions and triggers to develop a new port
- determine project staging to build the outer metropolitan road and rail corridor and connecting western intermodal freight terminal.

These projects respond to the long-term infrastructure needs we have identified in our work (see box – Why these projects?).

Why these projects?

We have identified several projects that might be needed in the future. This work includes our *Major transport program strategic assessment report* and *Advice on securing Victoria's port capacity*. The 5 projects in this draft recommendation are long-term projects that require the government to start preparing now. This will keep the opportunity open to pursue them in the future.

Victorian Desalination Plant expansion

Victoria's largest cities will need more water in coming decades.[1300] Our future option - Plan for and invest in manufactured water shows that Victoria will need a range of water sources in the long term. A first step might be to use the existing Victorian Desalination Plant's full capacity. The plant's design allows for a 50 gigalitre expansion to deliver 200 gigalitres each year to Melbourne.[1301]

City Loop reconfiguration

The Metro Tunnel will add capacity to the metropolitan train network and reduce the impact of disruptions.[1302] But even after that project is complete, some parts of the train network will reach capacity in the next decade.[1303] The Craigieburn and Upfield lines will still share one City Loop track, limiting the number of train services on each line as passenger demand continues to grow.[1304] Engineering and service planning work needs to take place, including on where capacity is best provided south or east of the city centre. Our future option – Reconfigure the City Loop for more frequent trains explains how changing the way the City Loop works can add substantial capacity to the train network.

Extend and electrify metropolitan trains to growth areas in Melbourne's north and south-east

Our draft recommendation to extend metropolitan trains to Melbourne's west (draft recommendation 11) will better connect communities in western suburbs to jobs and services. However, rapidly growing communities in Melbourne's north and south-east also have limited public transport. Our future option – Extend metropolitan trains to growth areas in Melbourne's north and south-east outlines how extending train lines to Clyde and towards Kalkallo can help address transport needs for more of Melbourne's growth area communities.

Melbourne Metro 2

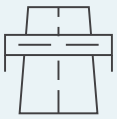
Our draft recommendation to extend Melbourne's trams to encourage more new homes nearby (draft recommendation 8) shows strong demand for tram services in Fishermans Bend. Our research shows the proposed Fishermans Bend tram will reach capacity in peak hours during the mid-2030s.[1305] To achieve the 80,000 jobs and 80,000 residents anticipated for the precinct, Fishermans Bend will need a new train line.[1306] The Melbourne Metro 2 project provides this. It will help address train network capacity issues and improve access to National employment and innovation clusters.[1307] Key issues for a business case to explore are route alignment and the type of train technology to use.

Bay West port

Our advice on Victoria's ports found that growing freight volumes can be met by continuing to boost capacity at the Port of Melbourne.[1308] The Victorian Government should continue to collaborate with the Port of Melbourne in developing its capacity. However, Victoria will need a second major container port at around 2055.[1309] Detailed planning for this will need to begin around 2040, or when triggered by changes such as faster growth in demand, congestion, amenity impacts or cost changes.[1310] Short-term action is needed to secure transport connections to the future port as there are significant land development pressures within the Urban Growth Boundary in Melbourne's west that might restrict future access.[1311] Monitoring and assessing environmental conditions around the Bay West site will improve environmental outcomes and support regulatory approvals.[1312]

Outer metropolitan road and rail corridor

Growing freight volumes will add to road congestion in coming decades. By 2051, the M80 Ring Road will see up to 1,800 more trucks in the morning peak alone.[1313] The outer metropolitan road and rail corridor will help accommodate this growth. It improves connections to current and future industrial and logistics precincts with international and interstate transport terminals. This includes the proposed Bay West port, western and Beveridge intermodal freight terminals, Melbourne and Avalon airports, and the Port of Geelong.[1314] The government has done some initial planning including a preliminary business case.[1315] A public acquisition overlay is in place.[1316] More needs to be done to confirm which sections of the project have the greatest benefit to inform how it can be staged and connected to the western intermodal freight terminal.



Preparing now will keep Victoria's opportunities open

Planning and preparing now keeps the opportunity open to start these projects in the future. Preparing now can reduce total project costs, prevent conflicting land use and allow others to plan accordingly.[1317]

When the need for these projects arises, this draft recommendation will ensure that projects are ready to start quickly, and the community can see the benefits sooner.

Cost range, timing and funding

We estimate this draft recommendation will cost $125 million to $150 million. General government revenue can fund this draft recommendation. We assume existing government staff will do some of this work.

Completing environmental and technical studies, consulting with Victorians, and developing business cases within the next 5 years means Victoria is prepared if these projects are required in the long term. Existing government staff can lead this work.

Our estimated cost range includes $15 million to $30 million to update existing overlays or apply new public acquisition overlays to protect land. We have not included the cost of buying land as it may be many years between when government applies a public acquisition overlay and buys the land.

Developing Victoria's second major container port at Bay West will require time and attention to assess and manage impacts on sensitive coastal habitats.[1318] Our cost range includes $40 million to $50 million for environmental assessment and monitoring costs for the future port over the 10 years to 2035.

Future option

Reconfigure the City Loop for more frequent and reliable trains

> Reconfigure the City Loop by splitting 2 City Loop tunnels into 2 separate cross-city train lines. Build around 3 kilometres of new train tunnels and upgrade related power and signalling. Increase service frequency on the Craigieburn, Upfield and Frankston lines.

Melbourne's northern suburbs are growing and have worse access to jobs and services

The Victorian Government forecasts 850,000 more people will live in Melbourne's growth areas by 2036, but these places will have only 250,000 more jobs.[1319] People living in these places are less likely to be able to access jobs within reasonable travel times compared to those living in Melbourne's inner and middle suburbs.[1320] This can mean travelling further for work, or accepting lower paid, lower skilled work. When more people travel further, the road network becomes congested and rail services become crowded.

The City Loop consists of 4 sets of tracks that circle central Melbourne. The northern part of the City Loop is a bottleneck and cannot support many more trains.[1321] This limits how often train services run on the Craigieburn and Upfield lines. Using only current infrastructure, all morning peak Craigieburn services will be overcrowded by the mid-2030s.[1322] Regional train services on the Shepparton and Seymour lines also have high demand at V/Line stations north of Craigieburn, like Donnybrook and Wallan.[1323]

Reconfiguring the City Loop provides more frequent and reliable cross-city train services

After 2030, when train services are expected to be crowded, the Victorian Government can build around 3 kilometres of new train tunnels. This would enable the redesign of 2 City Loop tracks and create:

- a pair of cross-city tunnels from Richmond to North Melbourne via Flagstaff
- a separate pair of tracks from Richmond to North Melbourne via Southern Cross.

Reconfiguring the City Loop would separate the Craigieburn and Upfield lines and remove the current bottleneck. It would allow trains to run through the city and continue onto other lines, such as the Frankston, Ringwood, Alamein or Glen Waverley lines. This separation would mean the 2 lines no longer share the same City Loop track. It would reduce the risk of disruptions on one line affecting others.

The government can boost passenger capacity by upgrading power and signalling on the Craigieburn and Upfield lines at the same time, or earlier. This would support over 18 more train services each hour, increasing both frequency and reliability.[1324]

This project will generate significant benefits for a relatively low cost

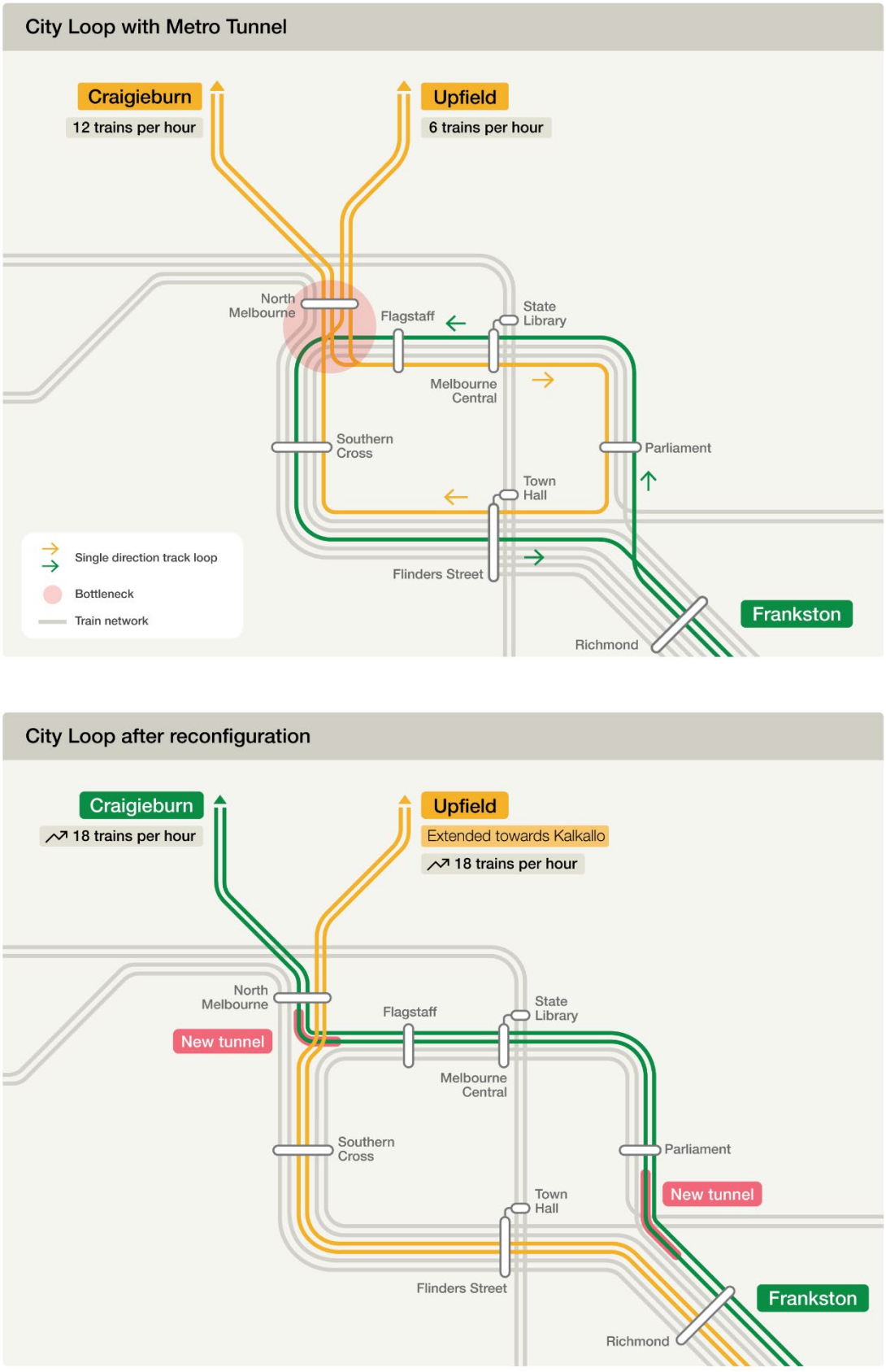
This project allows more trains to enter Melbourne's city centre at a relatively low cost.[1325] Providing up to 18 trains an hour in each direction on the metropolitan train network would be the equivalent of building a 16-lane freeway.[1326]

We estimate this project would generate $5 billion to $13 billion in benefits for public transport and car users.[1327] Our modelling shows it can attract more jobs and housing along train lines in the north, including in Coburg and Broadmeadows.[1328]

This future option can work alongside other train network expansions (see draft recommendation 11), including extending and electrifying the Upfield line towards Kalkallo via Craigieburn (future option – Extend metropolitan trains to growth areas in Melbourne's north and south-east), to improve public transport access in outer suburbs.

Draft recommendation 43 calls for the government to complete a preliminary business case for reconfiguring the City Loop.

Figure 23: Reconfiguring the City Loop allows for more cross-city services and reduces disruption



City Loop layout in this figure is indicative only and does not show all detailed platform, track and junction configurations.
Source: Infrastructure Victoria

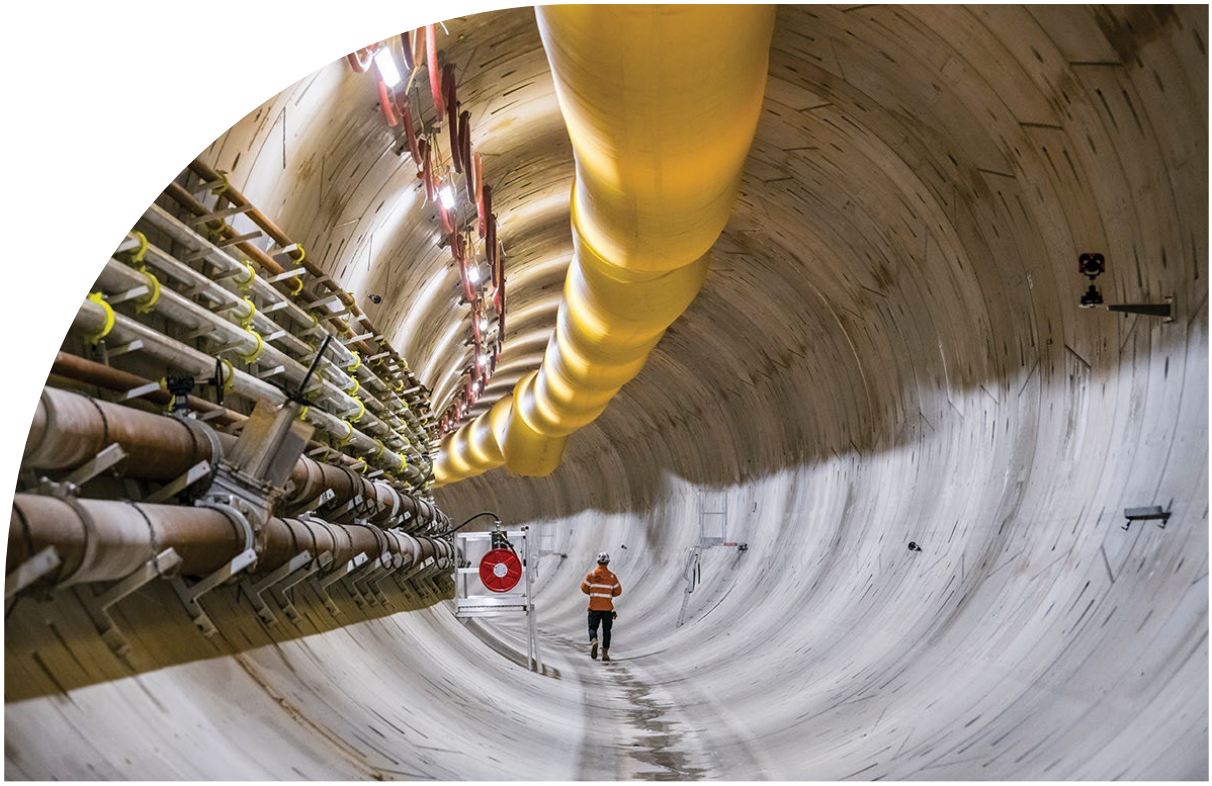
Cost range, timing and funding

We estimate that reconfiguring the City Loop will cost $2.2 billion to $5.9 billion. This includes building new tunnels and upgrading connecting train lines. An additional approximately $2 billion is required for new rolling stock and supporting infrastructure like train depot and maintenance facilities.

General government revenue is likely to be a major funding source for this future option. Public transport fares can help offset the operating costs of public transport upgrades. The Victorian Government can also seek additional funding from the Australian Government.[1329]

We have provided a broad cost range as the project can be implemented in various ways to provide best value for money. This requires further analysis by the Victorian Government. Our cost estimates are based on 2020 prices, adjusted to reflect today's higher costs.[1330]

We estimate it will cost $40 million to $50 million each year to operate more trains through a reconfigured City Loop. This includes the cost to run more train services, and to maintain and renew train lines and rolling stock.



Future option

Extend metropolitan trains to growth areas in Melbourne's north and south-east

> Extend and electrify metropolitan trains to Clyde and towards Kalkallo to support growth in new suburbs.

Melbourne's north and south-east suburbs are growing with a congested transport network

Melbourne's western suburbs are seeing the city's fastest population growth (draft recommendation 11), but new suburbs in Melbourne's north and south-east are also growing rapidly. Over 612,000 new residents are expected to live there by 2041.[1331] But these areas are only expected to have 238,000 new jobs.[1332] Many residents will need to travel elsewhere for work.

More people and more car use means busier roads. Between 25% and 40% of major roads will be congested during morning peak hours by 2041.[1333] This means longer journey times without better public transport options.[1334]

Extending the train network can improve access to local jobs

Extending metropolitan train lines to Clyde and towards Kalkallo can help address the need for public transport in Melbourne's north and south-east. Draft recommendation 43 calls for the government to complete detailed assessments of these extensions and electrifications to enable metropolitan train services.

After 2030, when construction has started on other train network expansions, the Victorian Government can begin:

- electrifying the Craigieburn line towards Kalkallo, including extending the Upfield line to Roxburgh Park to allow trains to run towards Kalkallo via Upfield, and building 2 new stations
- extending and electrifying the Cranbourne line to Clyde and building 4 new stations.

Our modelling shows that these extensions will improve access to jobs and services for growth area residents. In Melbourne's south-east, extending the Cranbourne line to Clyde and building a new Dandenong South station means that residents could access around 50,000 more jobs in 45 minutes.[1335]

In Melbourne's north, Kalkallo residents could access 74,000 more jobs in 60 minutes with the extension from Craigieburn.[1336] People living near the new station at Campbellfield could access up to 120,000 more jobs in 45 minutes.[1337]

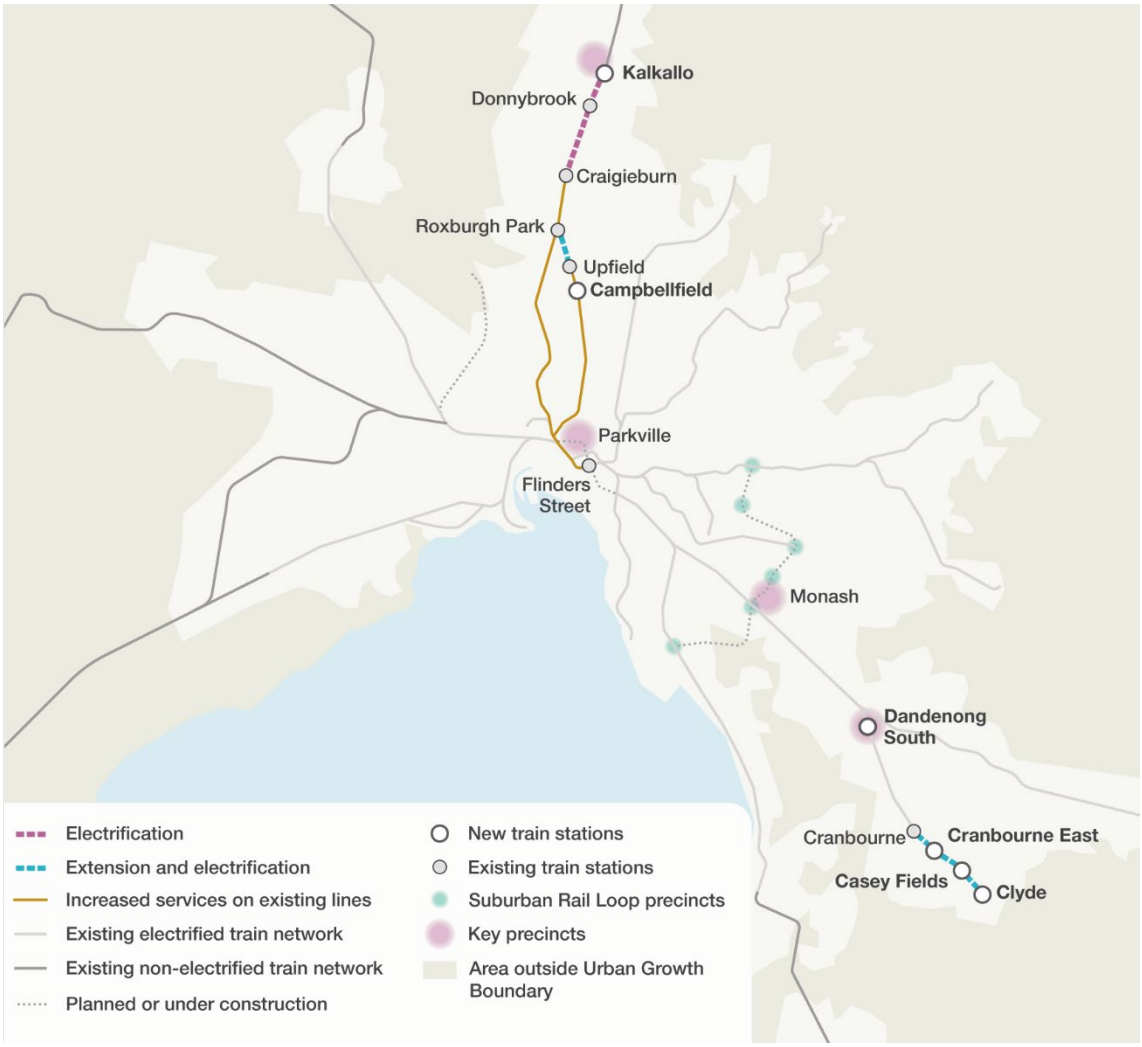
Network benefits result when people's public transport journeys are seamless

These extensions would reduce congestion on many roads during morning peak hours.[1338] Our modelling shows that these extensions would result in up to 13,000 more train boardings and 10,700 fewer car trips each day by 2041.[1339]

These new rail extensions service large areas, as alternative train lines are a long distance away. Frequent bus services to connect with trains are essential for seamless public transport journeys. Our draft recommendation to run more bus services in Victoria's largest cities (draft recommendation 9) outlines the needs and cost.

Without frequent bus services, more people drive to stations in Melbourne's growth areas. This increases the need for expensive car parks.[1340] Stations with high-quality bus connections can see over 25% of passengers switching between buses and trains.[1341]

Figure 24: Extending metropolitan trains to Melbourne's north and south-east will help to support future population growth



Source: Infrastructure Victoria

Table 3: Additional weekday train boardings at stations on line segments (with train extensions)

Train extension	Year 2031	Year 2041
Extend the Craigieburn line to Kalkallo, including extending the Upfield line to Roxburgh Park to allow trains to run to Kalkallo via Upfield, and build 2 new stations (Kalkallo/Lockerbie and Campbellfield)	3,900	6,100
Extend and electrify the Cranbourne line to Clyde and build 4 new stations (Dandenong South, Cranbourne East, Casey Fields, and Clyde)	3,700	6,900

Cost range, timing and funding

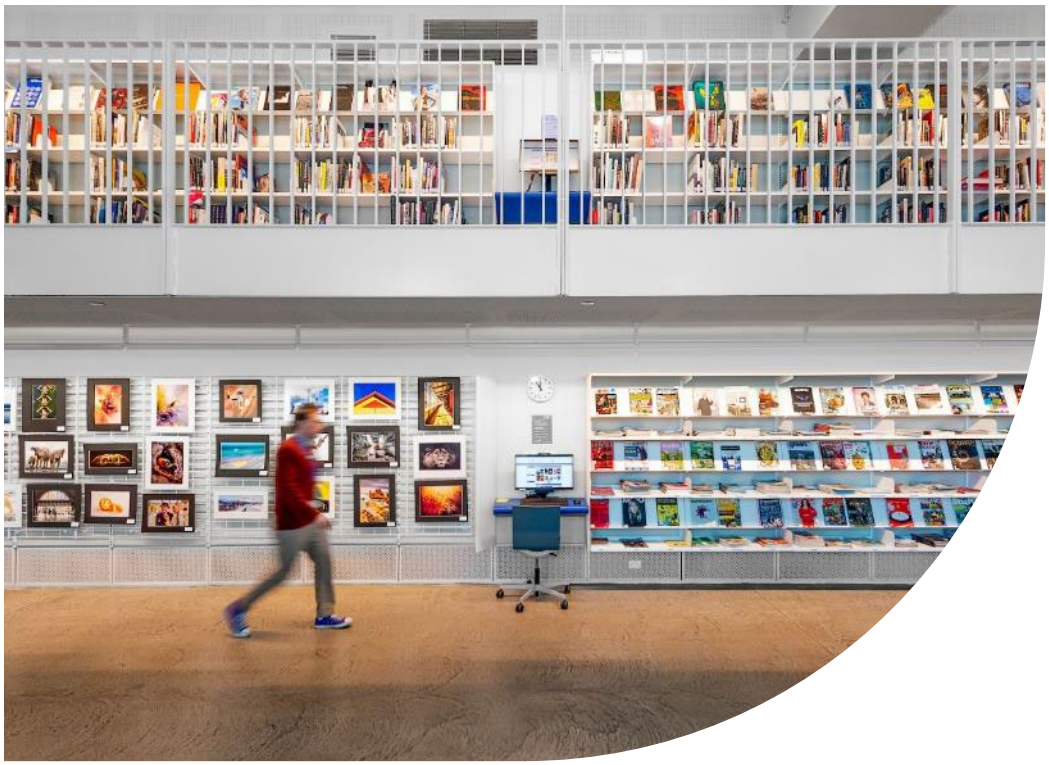
We estimate that extending metropolitan trains to Melbourne's growth areas will cost $5 billion to $7 billion by 2035. The Victorian Government can consider a mix of funding mechanisms, including value capture. General government revenue is likely to be a major funding source. Public transport fares can help offset operating costs. The Victorian Government can also seek additional funding from the Australian Government.[1342]

Our cost estimates include:

- $3 billion to $4 billion to electrify the Craigieburn line towards Kalkallo, including extending the Upfield line to Roxburgh Park to allow trains to run towards Kalkallo via Upfield, and building 2 new stations
- $2 billion to $3 billion to upgrade and extend the Cranbourne line to Clyde.

The cost includes upgrading the train line and buying new rolling stock. Our cost ranges are broad as each extension or upgrade can be implemented in various ways to provide best value for money. Each cost estimate is approximate and based on 2020 estimates adjusted to reflect today's higher costs.[1343] The government can extend train lines as separate smaller project packages, rather than one project. Overall costs will require further analysis by the government.

We estimate this draft recommendation will then cost government $50 million to $75 million each year to operate. This includes asset renewal of the train corridor and rolling stock. It also includes maintenance costs.



How we developed the draft strategy

We heard from Victorians and spoke with stakeholders

Our draft recommendations are based on evidence and engagement. We heard from thousands of Victorians and spoke with stakeholders.[1344] We analysed policy, literature and data, and commissioned advice on complex issues.

More than 500 people helped shape the strategy objectives. Our call for submissions encouraged individuals and organisations to share their ideas. They told us about the future they want and suggested how infrastructure can help achieve it. During workshops and discussions, we captured the perspectives of Victoria's First Peoples, regional Victoria's infrastructure challenges and opportunities, and the views of young Victorians.

This consultation informed our strategy objectives (see section – Victoria's infrastructure strategy objectives) and helped us develop our draft recommendations. Through our research program we heard from 18,500 Victorians on important infrastructure issues. This included housing options, gas infrastructure, better buses and social infrastructure.

Our draft recommendations address infrastructure priorities for the next 30 years

We researched major infrastructure challenges and opportunities

We assessed the current state of Victoria's infrastructure and researched how infrastructure can help respond to existing and future challenges. We analysed trends in data, looked at Australian and international literature, found case studies and talked with stakeholders from industry. We spoke extensively to policymakers in government departments and agencies who shared their work on the challenges and opportunities for Victoria's future infrastructure.

We reviewed *Victoria's infrastructure strategy 2021–2051* to see how the government is implementing our earlier recommendations, and what infrastructure issues remain (see *Review of 2021 recommendations*).

We researched specific issues, like:

- different urban growth patterns for Melbourne and major regional cities in *Choosing Victoria's future: 5 urban development scenarios*
- actions to better prepare Victoria's infrastructure for more frequent and extreme weather in *Weathering the storm: adapting Victoria's infrastructure to climate change*
- how Victoria can make the most of its gas infrastructure in *Towards 2050: gas infrastructure in a net zero emissions economy*
- actions the Victorian Government can take to make emissions count as part of infrastructure decision-making in *Opportunities to reduce greenhouse gas emissions of infrastructure*
- how buses can give more people access to good public transport in *Fast, frequent, fair: how buses can better connect Melbourne*
- giving Victorians more access to open space in *Getting more from school grounds: sharing places for play and exercise*
- investing in education infrastructure that benefits all Victorians in *Learning for life: preparing kindergarten, school and TAFE infrastructure for the future*.

We commissioned advice to add to our evidence base

We commissioned technical advice on infrastructure issues. This supported our research and helped us develop draft recommendations. The advice included economic analysis, desktop reviews, spatial mapping, and transport and energy modelling. Technical reports are available on our website, including reports on:

- how digital technologies can improve infrastructure productivity in *Digital technology and infrastructure productivity*
- the risks to Victoria's energy transition and how Victoria can mitigate them in *Victoria's energy transition risks and mitigation actions*
- the impact of different scenarios on Victoria's energy transition in *Infrastructure Victoria energy transition analysis*
- opportunities for First Peoples' self-determination in infrastructure projects in *Self-determination in infrastructure*
- opportunities to extend tram and train services in middle and outer suburbs in *Strategic transport modelling of tram and train projects to inform Victoria's infrastructure strategy 2025-2055*
- the future need for primary and secondary schools in Victoria in *Estimating primary and secondary school provision*
- the future need for kindergartens in Victoria in *Estimating kindergarten provision*
- the cost of land in different regions and how this affects the value of school outdoor sports facilities in *Cost of land for different regions in Victoria*
- how Victorians use social infrastructure in *Consumer research – access to school sports grounds consumer research*, *Accessibility mapping for outdoor school grounds*, *Consumer research – access to TAFE* and *Mapping access to TAFE*.

We developed draft recommendations

This strategy update focuses on what the Victorian Government can do to address Victoria's most pressing infrastructure challenges, in addition to the measures it has already announced. Our draft recommendations point to actions the government can start in the 5 years to 2030 that will deliver long-term benefits. Taken together, these recommendations will help advance the strategy objectives and position Victoria for the next 30 years.

The draft strategy also includes some actions the Victorian Government can start in the longer term, beyond 2030. We present these as future options for government. We believe these will also help achieve the strategy objectives, but they do not require the government's immediate attention.

In selecting our draft recommendations, we scoped the major problems and opportunities in each infrastructure sector. We analysed these alongside existing Victorian Government policy directions, and other policy and external developments. This helped us identify the infrastructure priorities our draft recommendations should respond to, and where Victorian Government action can make a difference.

We then assessed these against the strategy objectives, to make sure each of our draft recommendations further the goals most important to Victorians. We show how our draft recommendations relate to the strategy objectives in the section – *Our draft recommendations each span multiple objectives*.

We also used Infrastructure Victoria's strategic priorities to guide our draft recommendations. These are the problems that Infrastructure Victoria aims to make a significant impact on across all our work:[1345]

- doing more with less
- navigating change and disruption
- improving social equity through access
- mitigating and adapting to our changing climate.

Each of our draft recommendations directly responds to at least one of these strategic priorities.

We estimated the cost of each draft recommendation

Our draft recommendations have many economic, social and environmental benefits. We estimate that implementing all 43 draft recommendations can result in over $155 billion worth of benefits to Victorians.[1346] But these benefits also come with a financial cost to the Victorian Government. We present our cost estimates as approximate ranges under each recommendation.

A long-term infrastructure strategy can help the Victorian Government achieve a stable investment profile. Our cost estimates help the government make informed decisions about infrastructure investments, project sequencing and delivery timelines. Before making an investment decision, the government should assess the costs and benefits of a project or policy based on its final design.

The Victorian Government will need to do more work to fully detail the costs of the proposed infrastructure, policies and reforms. This further planning and development can include design, procurement, construction, operation and maintenance of infrastructure.

Our estimates include once-off and yearly costs

Some draft recommendations include capital costs, like the costs to design, procure, build and upgrade infrastructure. Some include the costs to develop policy or introduce reforms. Some include a yearly operating cost to run and maintain new infrastructure.

We also include the costs of staff or consultancies to develop and deliver plans or policies, or provide technical advice. In many cases, existing Victorian Government staff can help to deliver our draft recommendations. These staffing costs might also be absorbed by general government spending through reprioritising available resources.

Our estimates do not include the costs of providing the services from social infrastructure. For example, we do not include the salaries of nurses providing care in upgraded hospitals, or teachers in new schools. However, we do include the costs of running additional transport services like trains, trams and buses as they are part of the infrastructure in our draft recommendations.

Many of our costs are presented as ranges and are strategic order of magnitude estimates.[1347] They are approximate and generally based on similar earlier projects, using limited data. Our estimates may be narrow or wide depending on our level of certainty. We include sources for our cost data, except where we have used confidential information.

All cost estimates are in real dollars as of June 2024. For example, this could be the cost of signing a contract to build infrastructure or starting a new policy in June 2024. To do the same thing in future years would require escalation to be added to the 2024 cost.

Estimating the cost of our draft recommendations

Order of magnitude estimates are initial cost estimates within a broad accuracy range and based on historical information. They are commonly applied in early stages of a business case where few details are available. Order of magnitude estimates are helpful in comparing high-level alternatives to determine the most feasible solutions.[1348]

Real dollars measure the cost of something without increasing prices for future inflation.[1349] All our cost estimates are in real dollars. We have used real dollars to avoid introducing future price inflation as an additional source of uncertainty.

Escalation adjusts the cost of something for future price inflation.[1350] We have not applied escalation to our cost estimates.

We proposed ways to fund each draft recommendation

Funding is the money needed to pay for infrastructure. Victorian Government funding can come from the community through taxes, from charging people when they use infrastructure, by shifting government spending from other initiatives, or from debt. The Australian Government also raises money through taxes and can share some of this money with the states. This often helps fund infrastructure.

We assume the Victorian Government can start to include funding for our draft recommendations in its May 2026 budget. We assume the government will start spending that money from the 2026–27 financial year. We also assume the government will start acting on our draft recommendations within 5 years. Some of these draft recommendations may be delivered over a longer period beyond the initial 5 years.

The government can explore other funding sources to help pay for infrastructure

Our draft strategy suggests alternative ways to fund some infrastructure. New or upgraded infrastructure can help some groups of people or businesses. A logistics firm might save money because a new road lets them move goods faster and at lower cost. New infrastructure can make land more valuable. Asking those who benefit to help pay can be fairer than all Victorians paying taxes to fund infrastructure from general government revenue.

Policies and reforms can encourage people to use infrastructure more efficiently. They might use infrastructure at different times or in different ways. This can help the Victorian Government save money by using infrastructure in better, fairer ways.[1351]

The Victorian Government can also partner with the Australian Government, and private and not-for-profit sectors and share infrastructure costs. For example, commercial businesses can lease parts of hospitals and their rents can go towards running those hospitals.

Victorian Government departments and agencies should look at alternative funding sources when they plan infrastructure investments. These might only partly fund an infrastructure project, but they can help.

We estimated the total cost for Victoria's 30-year infrastructure strategy recommendations

Victorian Government infrastructure investment is now at record levels. It will average $19.3 billion each year from the 2024–25 to the 2027–28 financial years. The government's investment was approximately $15 billion in the 2020–21 financial year. The government aims to get back to this level by the 2027–28 financial year.[1352]

Only 27 of our 43 draft recommendations need Victorian Government capital investment. Very few are large-scale major projects that require high upfront investment. Many upgrade or replace infrastructure that is not running efficiently. The other 16 draft recommendations need policy work, legislative reform and better planning.

We estimate that the total cost of implementing all draft recommendations is around $60 billion to $75 billion. Most of this spending will happen before 2035. Around 75% of the total cost is from 6 draft recommendations with capital-intensive projects that improve social housing, kindergartens, schools, public transport and hospitals.

Funding for our draft recommendations does not need to come from the Victorian Government alone. The Victorian Government can partner with the Australian Government (see box – Making the case for strategic and evidence-based infrastructure funding) and other organisations, or funding can come through other sources like charging infrastructure users.

Federal partnerships, along with smarter use of existing government land, can help reduce the Victorian Government's costs of implementing our draft strategy recommendations to around $55 billion, with average spending of approximately $5 billion each year for the next 10 years.

Our future options would add around $10 billion in capital works after 2030.

Making the case for strategic and evidence-based infrastructure funding

The 2023 *Infrastructure policy statement* details the Australian Government's commitment to delivering high-quality and nationally significant land transport infrastructure that meet a set criteria.[1353] This includes investing in proposals that are supported by evidence and long-term strategic plans.

A recently reformed Infrastructure Australia will also support improved infrastructure evaluation and decision-making.[1354]

Many of our draft recommendations on land transport are strongly aligned with the Australian Government's focus on productivity, sustainability and liveability for infrastructure investment.[1355]

The Australian Government has committed $19.2 billion to Victoria over the next 10 years under the Infrastructure Investment Program.[1356] Although this funding has already been committed to projects, maintaining this level of investment in Victoria would result in Australian Government funding of approximately $1.9 billion each year.[1357]

Continued partnership between the Victorian and Australian governments could help to reduce the cost of delivering our future options by around $5 billion.

We estimated overall costs, but this strategy is not a budgeting exercise. The Victorian Government's published budget figures are for the next 4 years only. Government needs to consider the state's financial position and the fiscal policy situation to make decisions on how to raise revenue and spend money on infrastructure.

Implementing our draft recommendations is realistic and achievable within the planned government infrastructure investment range. Some of our draft recommendations might only use funds that are regularly spent on social and transport infrastructure anyway. Some of our draft recommendations include large scale investment in infrastructure like kindergartens, schools and hospitals (for example, draft recommendations 1, 2 and 20). We designed these draft recommendations to meet current and future infrastructure needs that are difficult to avoid and are necessary investments to achieve key Victorian Government policies.

Similarly, many of our draft transport recommendations (see draft recommendations 8, 9, 10, 11, 12 and 40) improve access to opportunities for Victorians already living in new suburbs on the city's fringes based on

past planning decisions. They also support more homes in inner and middle suburbs and help achieve the Victorian Government's housing targets.

Investing in social housing (draft recommendations 1 and 22) to meet the current and future housing needs of low-income Victorians is one of our highest cost draft recommendations, even when delivered over a longer period. The higher costs of meeting needs for more transport, housing, and social infrastructure demonstrate that the Victorian Government will need to carefully balance its policy ambitions with available funding over the coming years.

Have your say

Every decision on infrastructure shapes Victoria's future. Your input will help shape Victoria's infrastructure strategy for the next 30 years. The draft strategy provides recommendations to the Victorian Government and Parliament on how to deliver new infrastructure where it is needed most and get the best use from the state's existing infrastructure.

We are seeking your feedback and evidence on our draft recommendations. Get involved in our public consultation at: https://engage.vic.gov.au/victorias30yearinfrastructurestrategy.

The updated infrastructure strategy will be tabled in the Victorian Parliament at the end of 2025.

Our draft recommendations each span multiple strategy objectives

This updated infrastructure strategy is structured around the 6 objectives. We placed each of the 43 draft recommendations under the strategy objective that they help to advance the most.

The table below shows how our draft recommendations align with each of the strategy objectives. We use a green circle (●) to show the primary objective for each draft recommendation. But many of our draft recommendations also respond to multiple objectives. We use an orange circle (●) to show the additional objectives advanced by each draft recommendation.

● *: Primary objective*
● *: Additional objective*

#	Recommendation	Victorians have good access to housing, jobs, services and opportunities	Victorians are healthy and safe	Aboriginal people have self-determination and equal outcomes to other Victorians	Victoria has a thriving natural environment	Victoria is resilient to climate change and other future risks	Victoria has a high productivity and circular economy
1	Build more social housing	●	●	●			
2	Facilitate markets and invest in kindergarten infrastructure	●	●				●
3	Plan and deliver expanded and new schools	●	●				●
4	Expand TAFE in Melbourne's growth areas and some large regional centres	●					●
5	Build libraries and aquatic centres for Melbourne's growing communities	●	●				
6	Make government infrastructure more accessible	●	●				
7	Rezone locations near existing infrastructure for more home choices	●					●
8	Extend Melbourne's trams to encourage more new homes nearby	●					
9	Run faster bus services, more often, in Victoria's largest cities	●					
10	Build a new bus rapid transit network	●					

● : *Primary objective*
● : *Additional objective*

#	Recommendation	Victorians have good access to housing, jobs, services and opportunities	Victorians are healthy and safe	Aboriginal people have self-determination and equal outcomes to other Victorians	Victoria has a thriving natural environment	Victoria is resilient to climate change and other future risks	Victoria has a high productivity and circular economy
11	Extend metropolitan trains and run more services in Melbourne's west	●					
12	Run more bus and coach services in regional Victoria	●		●			
13	Make off-peak public transport cheaper and simplify regional fare zones	●					
14	Make local streets safer for children and communities	●	●				
15	Build safe cycling networks in Melbourne and regional cities	●	●				
16	Help government schools share their grounds	●	●				
17	Invest in maintenance, upgrades and expansions of community health facilities	●	●				
18	Build more residential alcohol and other drug treatment facilities	●	●	●			
19	Invest in digital healthcare	●	●				
20	Upgrade critical public hospital infrastructure	●	●			●	
21	Better use prisons and invest more in health facilities and transition housing	●	●	●			
22	Invest in secure homes for Aboriginal Victorians	●	●	●			
23	Fund better health and wellbeing infrastructure for Aboriginal Victorians	●	●	●			
24	Reduce greenhouse gas emissions from infrastructure				●	●	●

● : Primary objective
● : Additional objective

#	Recommendation	Victorians have good access to housing, jobs, services and opportunities	Victorians are healthy and safe	Aboriginal people have self-determination and equal outcomes to other Victorians	Victoria has a thriving natural environment	Victoria is resilient to climate change and other future risks	Victoria has a high productivity and circular economy
25	Advance integrated water management and use more recycled water				●	●	●
26	Better use government land for open space and greenery		●		●	●	
27	Better prepare infrastructure for climate change		●			●	
28	Use new flood maps to revise planning schemes		●		●	●	
29	Coordinate faster delivery of key energy infrastructure				●	●	
30	Improve environmental assessments and site selection for energy projects				●	●	
31	Invest in home, neighbourhood and big batteries for more energy storage				●	●	
32	Determine long duration energy storage needs				●	●	
33	Develop regional energy plans, guide transition from fossil gas and maintain reliable gas supply				●	●	
34	Speed up household energy efficiency and electrification		●		●	●	
35	Prepare and publish infrastructure sector plans to shape Victoria's cities	●					●
36	Reform infrastructure contributions	●					●
37	Improve asset management of all government infrastructure	●	●				●
38	Prepare for more recycling and waste infrastructure				●		●

● : Primary objective
● : Additional objective

#	Recommendation	Victorians have good access to housing, jobs, services and opportunities	Victorians are healthy and safe	Aboriginal people have self-determination and equal outcomes to other Victorians	Victoria has a thriving natural environment	Victoria is resilient to climate change and other future risks	Victoria has a high productivity and circular economy
39	Use digital technologies to better design, build, operate and maintain government infrastructure					●	●
40	Use modern traffic control technology for efficient and safe journeys	●	●				●
41	Make rail freight competitive, reliable and efficient						●
42	Encourage off-peak freight delivery in urban areas						●
43	Create and preserve opportunities for future major infrastructure projects					●	●

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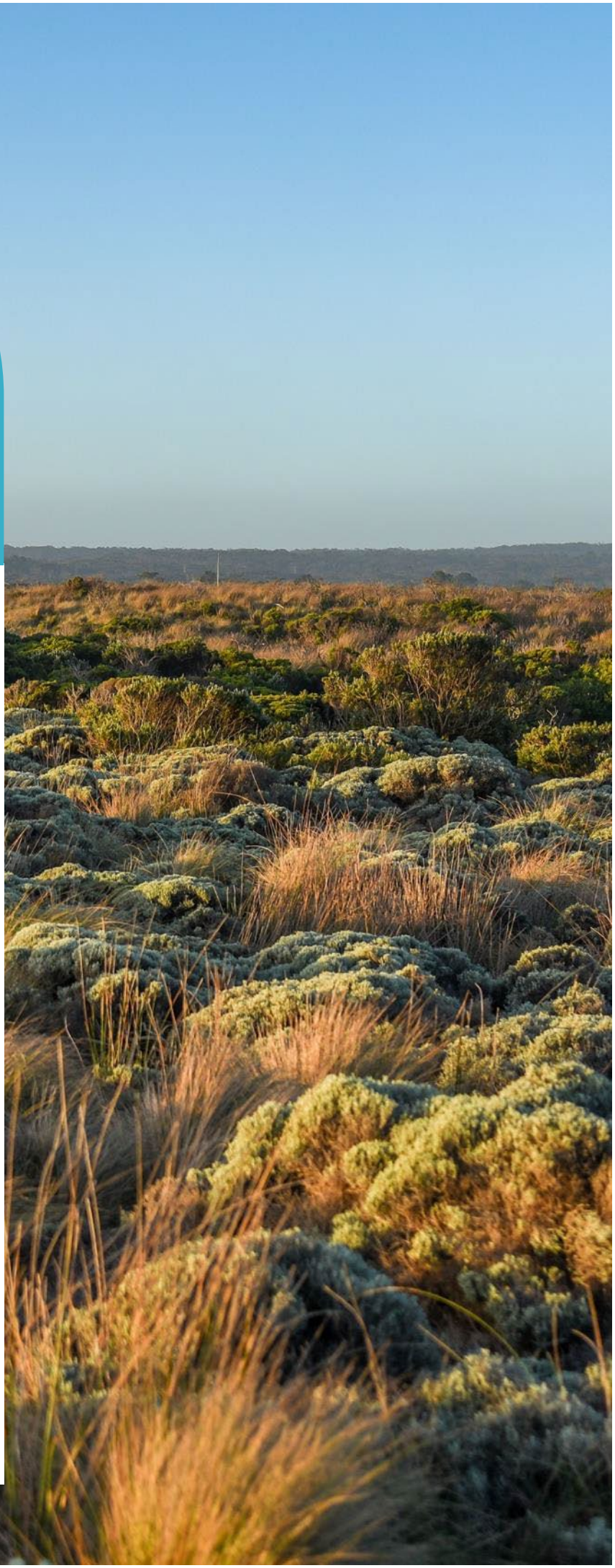

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