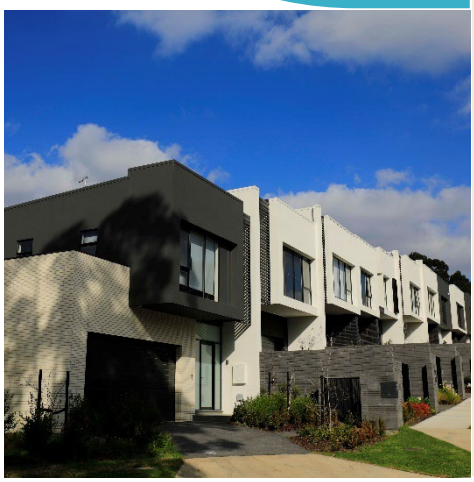
INFRASTRUCTURE VICTORIA



September 2025

Transport projects strategic evaluation

Strategic economic evaluation of key tram and train projects

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.

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

Victoria needs more transport choices for better access to housing, jobs and opportunities.

Victoria's population is growing faster than the national average.[1] It will reach up to 11.5 million by 2055.[2] This means Victoria will grow by about one million people each decade, for the next 3 decades.

More homes need to be built to make sure every Victorian has somewhere to live.[3] The Victorian Government has a target for 800,000 homes to be built in the next 10 years. It aims to have a greater focus on building houses in established areas of Melbourne.[4]

How and where homes are built will affect Victorians' quality of life, the economy, and the natural environment. Our *Choosing Victoria's future* research showed more compact cities – where people live and work closer together – are better for the economy, people and the environment.[5]

We found the capital cost of public infrastructure was $59,000 less per dwelling if more housing was built in established suburbs rather than growth areas.[6] But between 2022 and 2024 only half of new homes approved in Melbourne were in established suburbs.[7]

Access to trams can encourage more higher density housing. In Melbourne, apartments are often built in areas well served by public transport.[8] However, many Victorians choose to live in Melbourne's outer suburban growth areas.[9] Homes in these areas offer the features and community they want at a price they can afford.[10]

Between 2001 and 2024, Melton and Wyndham grew by about 300%. Melbourne grew by 50% over this period.[11] The government forecasts these 2 local government areas will have the most growth in the next 10 years.[12] However, in many places they do not have suitable roads or public transport.[13]

Fewer alternative transport choices mean more commuters have to drive. This increases congestion for all road users and causes more greenhouse gas emissions. It also makes it harder for people to access jobs, education, services and social connections.

We took a closer look at 3 projects in Melbourne recommended in our strategy

Multiple recommendations in *Victoria's infrastructure strategy 2025–2055* address these challenges. This report describes our strategic economic evaluation of 3 projects included in our recommendations:

- Melton electrification project (included in recommendation 11)
- Fishermans Bend trams (included in recommendation 8)
- Middle suburban tram extensions (included in recommendation 8).

Recommendation 11: Extend metropolitan trains and run more services in Melbourne's west

Extend and electrify metropolitan trains to Melton. Build 2 more tracks from Sunshine to Caroline Springs and new train stations at Thornhill Park and Mount Atkinson. Reallocate V/Line trains that serve Melton to other areas in Melbourne's west and regional Victoria. Deliver a new train station at Altona North and rezone nearby land.

Recommendation 8: Extend Melbourne's trams to encourage more new homes nearby

Increase services on key tram routes in activity centres that the government selected for more housing development. Extend trams in Melbourne's established suburbs in areas that can support more new homes Rezone land around the extended tram lines so more homes can be built.

Table 1: Summary of 3 projects we evaluated

Project	Scope	Core benefits
Melton electrification project	• Extending electrified metropolitan services to Melton. • Expanding the double-track section between Sunshine and Caroline Springs to 4 tracks. • Constructing 2 new stations at Thornhill Park (Paynes Road) and Mount Atkinson (Hopkins Road). • Reallocating V/Line trains that currently serve Melton to provide more services on the Wyndham Vale line.	• More frequent trains on the Melton and Wyndham Vale lines. • Melton services travelling direct to more places including Melbourne Metro Tunnel railway stations. • More local stations closer to where new residents people live. • Better travel times for Wyndham Vale, Geelong and Ballarat lines. • Reduced road congestion from 14,500 more public transport trips and 16,800 fewer car trips each day in 2031.*
Fishermans Bend trams project	Extending and rerouting 2 existing tram routes: 1 Route 11 Southern Cross Station to Fishermans Bend South. 2 Route 67 Anzac train station to Fishermans Bend North.	• Greater certainty for developers, institutions, employers and future residents to invest to support the achievement of the government's housing and jobs target for the precinct. • 250,000 more people will be able to access jobs at the employment precinct.** • Overcomes uncomfortable crowding on bus routes. • 6,300 more public transport trips and 7,500 fewer car trips that reduces road congestion on an average weekday in 2031.* • These route extensions do not require a new Yarra River bridge.^
Middle suburbs tram extensions project	Extending 4 existing tram routes: • Route 3 extended to Hughesdale via Chadstone. • Route 55/58 extended to Batman train station in Coburg. • Route 70 extended to Burwood East. • Route 68^^ extended from East Brighton to Moorabbin.	• Potential to enable over 32,000 new homes along 12 kilometres of new tram extensions. • Small extensions to nearby activity centres and railway stations save travel time and make public transport more attractive. • 4,500 fewer car trips and 3,800 more public transport trips each day in 2041.* • 136,000 more people will be able to access key employment centres and train stations in 2041.**

Notes on Table 1:
*The reduction in car trips is due to several factors. Some people switch to public transport, walking or cycling. Others can now reach new destinations by public transport where they can do more things at that one location. This means they can do one public transport trip and do more activities at that one location, rather than a number of short car trips to different locations.
** Note: within a 45-minute public transport journey in the morning peak.
^ Note: the tram routes in the 2018 *Fishermans Bend framework* and the previous 2021 infrastructure strategy required a new bridge. The tram routes in the 2025 *Fishermans Bend integrated transport plan* run via Southbank and do not require a new Yarra River bridge.
^^ Note: Tram route 64 currently operates between University of Melbourne and East Brighton terminus. For this evaluation a modified tram route 68 was used.

Source: Infrastructure Victoria

We assessed the costs and benefits of the 3 projects

We completed a strategic economic evaluation. Economic evaluation calculates a project's impacts on society. These impacts include all costs and benefits including economic, social and environmental.[14] The main purpose for carrying out an economic assessment is to inform government decision making.

A strategic evaluation is an early stage of project development. This means our project costs are order of magnitude estimates. We have not developed costs based on detailed designs. Our results show the benefits of the projects. They can inform the Victorian Government's investment decisions.

Our strategic economic evaluation uses a cost benefit analysis framework. It follows both the *Australian transport assessment and planning guidelines* and the Victorian Department of Treasury and Finance guidelines.[15] A cost benefit analysis measures the benefits and costs of projects in dollar terms in a consistent way. It aims to include all costs and benefits to society, even those that may not have a direct monetary impact such as environmental benefits. This allows government to make better decisions about which projects provide the best possible value and to understand the trade-offs in every project.[16]

A cost benefit analysis uses different measures to test if a project creates more benefits than costs. These measures include the benefit cost ratio and net present value. A benefit cost ratio above one indicates a project's measured benefits are greater than its cost. The net present value shows the overall value created by the project. Together, they help decision-makers compare options and judge value for money.

Both measures discount future costs and benefits. We use discount rates because people generally think one dollar today is worth more than one dollar in the future. Discount rates can also reflect risk and opportunity costs.

Decision-makers may also consider non-economic measures before proceeding with a project. This may include social disadvantage and access to jobs and services.

We have presented our cost benefit analysis results as a dollar range because this is a strategic evaluation. The government should carry out more detailed analysis for each project. This future analysis can refine the project scope, design and staging to make the most of benefits and ensure the projects deliver the best value to Victoria.

Melton electrification supports train passengers in Melbourne and Victoria

Melton and Wyndham local government areas have already experienced significant population growth. Government forecasts show even more growth. This increases demand for rail services to Melton and Wyndham Vale, which share the same pair of rail tracks as busy services to Geelong and Ballarat.

We assessed a Melton electrification project that extends electrified metropolitan services to Melton, replacing the current regional V/Line diesel services. The project also includes other infrastructure as outlined in Table 1. This allows more V/Line services to Wyndham Vale to achieve a frequency like many other metropolitan lines.

The Melton electrification project increases public transport use and reduces road congestion. Our modelling shows that it would produce 14,500 extra public transport trips and 16,800 fewer car trips on a typical weekday in 2031.[17] Roads in this part of Melbourne are used to transport goods interstate and to and from farms in western Victoria. The Melton electrification project also benefits businesses because it reduces road travel times for freight.

Separating train lines between Caroline Springs and Sunshine means regional trains can run express. They do not have to wait behind metropolitan trains. This shortens travel times for regional passengers on the Ballarat and Geelong lines, including those travelling on Wyndham Vale services.

Tram extensions in the right places can encourage more housing choices

Extending tram lines in Melbourne's inner and middle suburbs can support a more compact city. A more compact city also means shorter distances for people to travel to access jobs, services and social opportunities. If paired with appropriate planning zone changes, it encourages residential and commercial development along these tram lines.

Fishermans Bend

Fishermans Bend is Australia's largest urban renewal project. It covers approximately 480 hectares in inner Melbourne. By 2050, the government expects it will have approximately 80,000 residents and provide jobs for up to 80,000 people.[18]

Fishermans Bend residents and workers currently rely on cars for transport as public transport services and active transport infrastructure are limited.[19] Tram services are needed to realise the government's vision for Fishermans Bend.[20] The 2025 *Fishermans Bend integrated transport plan* does not set a date for when tram services will start. Within the plan, tram services are in the second delivery horizon.[21]

We identified 2 tram extensions to allow tram services to start by 2030.[22] They achieve a similar outcome to the 2025 integrated transport plan routes. The route extensions we tested could be delivered by 2030, in time to meet growing passenger demand.

Our modelling shows this would mean 7,500 fewer car trips and 6,300 more public transport trips each weekday in 2031.[23] This reduces road congestion and makes Fishermans Bend a more attractive place to live and work. It will also provide confidence for developers and institutions to deliver more homes and places to work and visit.

Middle suburbs of Melbourne

The middle suburbs tram extensions improve connectivity to employment centres, current train stations and the future Burwood Suburban Rail Loop train station. Collectively, these extensions can support denser housing development along transport corridors. They enable greater access to local jobs and services. They also connect to train services to make longer trips by public transport easier. Our modelling shows 136,000 more people will be able to access key employment centres and train stations by public transport in 2041.[24]

These tram extensions have the potential to encourage around 32,000 new homes along their routes.[25] This is about 5% of the Victorian Government's 2051 housing target for Melbourne's middle suburbs. [26]

The cost of providing public infrastructure is lower if residential development occurs in established suburbs rather than growth areas. [27] This creates a more compact city. Our strategic economic evaluation estimates these savings to between $1.1 billion and $1.4 billion for the middle suburbs tram extensions project. Increasing the proportion of housing built in established suburbs can also substantially lower overall congestion on roads.[28] Our results show these tram extensions need to be paired with land use planning zone changes to allow more homes to be built.

Our assessment shows all 3 projects provide benefits

Our strategic economic evaluation shows all 3 projects contribute to broader policy objectives. We found that that in most scenarios, projects provided more benefits to Victorians than the cost to build them. For example, we found that for each dollar invested in middle suburbs trams extensions, there would be a return of between $1.10 and $1.90. This indicates potential value for money. See Table 2.

Table 2: Summary of strategic economic evaluation results

	Melton electrification project	Fishermans Bend trams	Middle suburbs tram extensions
Total benefits (present value) (millions)	$4,424 – $8,072	$1,643 – $3,324	$1,924 – $3,011
Total costs (present value) (millions)	$5,540 – $4,741	$1,255 – $1,075	$1,808 – $1,578
Net present value (millions)	-$1,115 – $3,330	$388 – $2,249	$116 – $1,433
Benefit cost ratio	0.8 – 1.7	1.3 – 3.1	1.1 – 1.9

Notes on Table1:

The lower range uses a 7% discount rate, 8% wider economic benefits and a higher cost estimate. The upper range uses a 4% discount rate, 24% wider economic benefits and a middle cost estimate. Our wider economic benefits estimates are based on our *Major transport program strategic assessment* undertaken for the previous infrastructure strategy.

Source: Infrastructure Victoria analysis of AECOM modelling results and AECOM economic evaluation

We also found low cost opportunities to further increase the benefits of each of the projects. These were not included in our strategic assessment.

For example, Melton electrification could show more benefits if more bus services were also delivered, more homes were built closer to train stations, or more trains were provided to regional Victoria.

The middle suburbs tram extensions deliver more benefits if the surrounding established suburbs increased in residential density. Planning zone changes and other supporting infrastructure are needed to achieve these benefits.

We did not revise our modelling to include these opportunities because this is an initial strategic assessment.

The government should do a detailed assessment and engage with stakeholders when further considering these projects.

Introduction

The Victorian Government has an ambitious target to build 800,000 homes in Victoria over the next decade.[29] How and where homes and infrastructure for these people are built will impact Victorian's quality of life, the economy, and the natural environment.

Our *Choosing Victoria's future* research showed more compact cities – where people live nearer their workplace – are better for the economy, people and the environment.[30] A more compact city means shorter distances for people to travel to access jobs, services and social opportunities.

The Victorian Government is aiming for 70% of new homes to be built in established suburbs of Melbourne and 30% to be built in growth areas.[31] Yet between 2022 and 2024 only half of Melbourne's approved new homes were in established suburbs.[32]

Melbourne's west is growing rapidly. Melton and Wyndham have grown by 300% from 2001 to 2024, while all of Melbourne has only grown by 50%.[33] The Victorian Government forecasts that over the next 10 years the Melton local government area will grow by 44% and Wyndham will grow by 31%.[34] Melton and Wyndham will have the most population growth of all Victorian local government areas.[35] But new suburbs in these places do not have suitable roads or public transport.[36]

We completed a strategic economic evaluation of 3 projects

We have completed a strategic economic evaluation of 3 projects. Economic evaluation calculates a project's impact on society. These impacts include economic, social and environmental costs and benefits.[37] The main purpose of an economic assessment is to inform government decision making.

We have carried out a strategic evaluation. It is an early stage assessment. No detailed designs have been prepared for the projects. Therefore our costs are not based on detailed design. This means our project costs are order of magnitude estimates. It is intended to help the Victorian Government's prioritise its future investments in the transport network.

This report describes our strategic economic evaluations of 3 projects. These projects are recommended in *Victoria's infrastructure strategy 2025–2055*:

- Melton electrification (included in recommendation 11)
- Fishermans Bend trams (included in recommendation 8)
- Middle suburban tram extensions (included in recommendation 8).

Recommendation 11: Extend metropolitan trains and run more services in Melbourne's west

Extend and electrify metropolitan trains to Melton. Build 2 more tracks from Sunshine to Caroline Springs and new train stations at Thornhill Park and Mount Atkinson. Reallocate V/Line trains that serve Melton to other areas in Melbourne's west and regional Victoria. Deliver a new train station at Altona North and rezone nearby land.

Recommendation 8: Extend Melbourne's trams to encourage more new homes nearby

Increase services on key tram routes in activity centres that the government selected for more housing development. Extend trams in Melbourne's established suburbs in areas that can support more new homes Rezone land around the extended tram lines so more homes can be built.

We evaluated these projects as they had high costs, propose different routes with significant changes to costs and are new projects compared to our previous 2021 strategy. We also considered the greater choice these projects provide for some people to work or study from home. Improving transport access to work is a major benefit of the Melton electrification project. We have proposed new, lower-cost tram routes to Fishermans Bend compared to our previous 2021 strategy to allow the project to commence delivery by 2030. We tested that these projects are still beneficial even with these changed assumptions. The middle suburban tram extensions project is a new project.

These projects meet many objectives in Victoria's 30-year infrastructure strategy

We used 6 objectives to guide the development of our recommendations in *Victoria's infrastructure strategy 2025–2055*. See Figure 1. These objectives, developed in consultation with Victorians, helped us understand and prioritise issues important to them. They helped us navigate the trade-offs involved in recommending infrastructure projects and policies to the Victorian Government.

The recommendations can help Victoria achieve these objectives. Many recommendations in the strategy support multiple objectives. The recommendations provide practical advice to the Victorian Government to help Victoria meet its current and future infrastructure needs.

Figure 1: Victoria's infrastructure strategy 2025–2055 objectives

Source: Infrastructure Victoria, *Victoria's infrastructure strategy 2025–2055*, 2025, p 12.

The 3 projects we assessed contribute to the strategy objective ‘Victorians have good access to housing, jobs, services and opportunities’.

Each of the 3 projects provide more transport choices. This better connects people to work, study, recreational and social activities. The Fishermans Bend trams and middle suburbs tram extensions can support residential development in urban renewal and established areas. This gives Victorians more housing options.

The 3 projects also contribute to the strategy objective ’Victoria has a high productivity and circular economy’. Compact cities have better benefits that come from people, businesses and infrastructure located near one another.[38] These are benefits to businesses and workers from locating close to one another. This improves productivity. Businesses can learn and share knowledge and better match workers, businesses and customers.[39] For example, better transport connections allow businesses to access a greater pool of employees.

The 3 projects also contribute to the objective ‘Victoria is resilient to climate change and other future risks.’ Transport is the second largest and fastest-growing source of emissions in Victoria.[40] Road transport is responsible for approximately 87% of these transport emissions.[41] Increasing the use of public transport can reduce emissions and contribute to achieving the government’s net zero targets.

Our transport recommendations complement our other recommendations

The benefits of the 3 transport projects described in this report will be greatest if the Victorian Government delivers them alongside our other strategy recommendations. This is because they support other recommendations, particularly:

- Recommendation 7: Rezone locations near existing infrastructure for more home choices.
- Future option: Make more homes affordable near existing infrastructure.
- Future option: Phase out residential stamp duties.
- Recommendation 10: Build a new bus rapid transit network.
- Future option: Extend metropolitan trains to growth areas in Melbourne’s north and south-east.
- Recommendation 14: Make off-peak public transport cheaper and simplify regional fare zones.
- Recommendation 16: Build safe cycling networks in Melbourne and regional cities.
- Recommendation 25: Reduce greenhouse gas emissions from infrastructure.
- Future option: Charge people fairly to use roads.

The next section outlines our approach. We then present a summary of the strategic economic evaluations for each project, followed by our conclusions.

This report includes appendices with the detailed results of the strategic economic evaluations. Evaluation results for the Melton electrification project are in Appendix A. Evaluation results for Fishermans Bend trams and middle suburbs tram extensions projects are in Appendix B.

Our approach

Our strategic economic evaluation uses a cost benefit analysis framework. Cost benefit analysis is the Victorian Department of Treasury and Finance's preferred approach to economic evaluation.[42] It is also widely used by private industry.

A cost benefit analysis measures the benefits and costs of projects in dollar terms in a consistent way. It aims to include all costs and benefits to society, even those that may not have a direct monetary impact such as improved air quality. This allows government to make better decisions about which projects provide the best value and to understand the trade-offs in every project.[43]

We carried out cost benefit analysis to determine whether the 3 projects are worthy of further investigation by the Victorian Government. Cost benefit analysis is used to assess projects and their impacts as part of determining which projects to fund. It is also sometimes used to rank projects, but this is not the purpose of this report.

There are different guidelines available on how to do cost benefit analysis.

The *Australian transport assessment and planning guidelines* outline how to do a cost benefit analysis for transport projects.[44] The Victorian Government also has advice on how to carry out cost benefit analysis.[45] Our approach is consistent with both.

Projects have costs and benefits across many years. In cost benefit analysis, a discount rate is applied because different projects have benefits and costs at different points in time. It converts future costs and benefits into present-day values which means we can compare projects.[46]

We use discount rates because it is usual practice to assume one dollar today is worth more than one dollar in the future. Discount rates can also reflect risk and opportunity costs.[47]

Where a discount rate has been applied to a cost or benefit, this is called the 'present value.' In a cost benefit analysis, the present value of the benefits and present value of the costs are used to form 2 important measures:

- **Net present value**: the difference between the present value of the benefits and the present value of the costs.
- **Benefit cost ratio**: the ratio between the present value of benefits and the present value of costs.

A positive net present value or a benefit cost ratio above one indicates the total benefits to society are greater than the total costs.[48] That is, the project provides a net benefit.

Some benefits and costs are difficult to measure.[49] For example, it is hard to measure the value of green space or the costs of poor air quality. This can mean there is greater certainty around some estimates than others. In some cases, it is not possible to create a credible estimate at all. This can result in a low benefit cost ratio. However, the project may still be worthwhile for other reasons when considering all social, economic and environmental factors.

The discount rate used can have a big impact on the results. Higher discount rates make benefits further in the future worth much less than benefits closer to today. This means it is more difficult to get a high benefit cost ratio with larger discount rates. In the same way, lower discount rates place more value on benefits further in the future and often raise the benefit cost ratio of projects.[50]

Cost benefit analysis is not the only way to decide whether a project delivers a net benefit. It is a tool to use as part of a more detailed assessment that also includes:

- how it aligns to strategic objectives
- project risks and feasibility
- and other factors such as social disadvantage and unequal access to jobs and services.

Infrastructure Victoria chose to complete the evaluation of the Melton electrification project. The results are summarised in the next chapter. Full results are in Appendix A.

We engaged AECOM to perform an economic evaluation of the Fishermans Bend trams and middle suburbs tram extensions projects. We summarise their results in this report. See Appendix B for AECOM's full evaluation.

The Melton electrification project has interdependencies with other train projects and recent government announcements to achieve the services required. This is why we undertook the Melton electrification project evaluation. Both AECOM and Infrastructure Victoria used a consistent approach to the evaluations.

Our cost benefit analysis is presented as a range because our analysis is a strategic economic evaluation. The Victorian Government should conduct a more detailed cost benefit analysis for each project as part of a business case. This allows design changes to make the most of benefits. We have noted other considerations towards the end of each project section.

We assessed the potential use or demand assessed for each transport project

The benefits of transport projects are determined by the amount of potential use of or demand for transport services. We engaged AECOM to model future transport demand. See *Strategic transport modelling of tram and train projects to inform Victoria's infrastructure strategy 2025–2055*.[51]

AECOM used the Victorian Integrated Transport Model developed by the Department of Transport and Planning to forecast transport demand. It models trips by cars and public transport across all of Victoria at a specific future point in time.

The model estimates road use, congestion, and travel times. It also estimates public transport use, waiting times and crowding. These impacts were all used in our cost benefit analysis.

It is common to model transport projects at different years in the future. This helps us to understand the benefits and impacts of the project over time.

The transport model forecasts demand by creating 2 scenarios:

- the base case: the expected future transport network but without the project.' This is a comparison point to test the project against.
- the project case: the expected future transport network including the project.

Most of the model inputs are the same in both the base and project cases. For example, we use the same number of residents and jobs in Victoria in each scenario.

We also modelled a project case scenario separately for each of the 3 projects. We and compared them against the same base case. We evaluated the impact of each project by comparing the differences between the project and base cases.

We evaluated different types of benefits and estimated their value

The Department of Transport and Planning developed an economic evaluation module to work with the transport model to estimate benefits in dollar values. It uses outputs from the transport model to generate benefits and costs. These are described in Table 3.

Table 3: Description of each type of benefit included in the economic evaluation

Benefit type	Description
Consumer surplus: road users	Benefits to road users. For public transport projects, road users are better off when other road users switch to public transport. This means fewer cars on the road so there is less congestion. Drivers can reach their destination sooner.
Consumer surplus: public transport users	Benefits to public transport users can come from: • higher service frequency and reduced waiting times for services • faster travel for passengers • less crowding on public transport • fewer interchanges between trains, trams and buses –reducing the walking distance and the waiting time to the next service.
Road safety benefits	Car accidents may cause injury, property damage or loss of life. Lower road usage usually means there are fewer road accidents. Fewer accidents reduce heath, care and vehicle repair costs.
Active transport benefits	Active transport means walking or cycling. Evidence shows that active transport has many health benefits.[52] Using public transport often means people walk to and from public transport stops or stations. There are usually health benefits from people changing from driving to using public transport.
Environmental benefits	Environmental benefits are from lower greenhouse gas emissions and other pollution from road vehicles. These occur when a project reduces the total distance all cars drive on roads. The environment benefits from fewer pollutants in the atmosphere, reducing dangers to the climate and oceans.
Residual asset value	Residual asset value is the value of the infrastructure at the end of the project evaluation period. Residual asset value is based on the cost of the infrastructure. It is larger when an asset's cost is higher, and life is longer.
Wider economic benefits	Benefits to the economy from improving transport connections between businesses and employees. These benefits include people being able to reach more higher-paying jobs and businesses that have lower transport costs. More information is provided in the subsection below.
Public infrastructure cost savings	There is a reduced cost of public infrastructure (a saving to the government) if residential development occurs in established suburbs rather than growth areas. More information is provided in the subsection below.

See Appendix A and B for more information. The *Australian transport assessment and planning guidelines* provide a detailed description of how to calculate each of the benefits.[53]

We estimated the wider benefits of the projects

Wider economic benefits are effects that happen indirectly, through the economic activity made possible by the project. The *Australian transport assessment and planning guidelines* have methods to estimate 3 types of wider economic benefits:[54]

1. Agglomeration impacts: the benefits for businesses, workers and the community when they are closer together in more compact cities and neighbourhoods. The productivity gains from being closer together grow as it gets easier to travel between places.
2. Labour market tax impacts: the likely increase in tax collected because more people are willing to work. Shorter travel times from the project mean more people can access more jobs. Changes in the number of people who are willing to work is also called changed labour supply or changed workforce participation.
3. Imperfect competition impacts: improved profits for firms due to lower transport costs from the project.

For example, building a new railway line into a central business district allows more people to get to a location where offices are closer together. This increases the likelihood they can meet more people to discuss new ideas and foster innovation. This results in agglomeration benefits. The new railway line also allows people to change to a more productive job as they can access more jobs. This can lower business costs as there are more specialists to choose from. These benefits can allow the business to grow, invest more, and generate additional economic activity beyond the project itself.

The *Australian transport assessment and planning guidelines* state the size of wider economic benefits are strongly related to the size of conventional benefits.[55] Travel time and safety-related benefits are examples of conventional benefits. They have a widely accepted methodology and have been consistently applied in transport evaluations for a long time. The guidelines state 'it is not worth the effort of estimating wider economic benefits for small projects.'[56]

Wider economic benefits are not included in all transport cost benefit analyses. They were initially used in the 2000s and have progressively developed into guidelines since then. We did not calculate wider economic benefits specifically for the projects in this report. Instead, we estimated wider economic benefits using information from previous Infrastructure Victoria research (below).

Our *Major transport program strategic assessment* informed *Victoria's infrastructure strategy 2021–2051*.[57] As part of this assessment we estimated the wider economic benefits for 6 major transport projects.[58] We used this information to estimate the wider economic benefits for the projects in this report. We selected 2 projects from the *Major transport program strategic assessment* that are likely to have similar benefits to the 3 projects assessed in this report. See Table 4.

For the 2 selected projects, we calculated the proportion of total benefits that were from wider economic benefits. We applied the same proportions to the conventional benefits calculated for each of the 3 projects in this report to estimate their wider economic benefits.

We used a range to estimate the wider economic benefits. This is consistent with our strategic evaluation approach. Table 4 shows the proportion of benefits for each of the *Major transport program strategic assessment* projects.

Table 4: Estimates of wider economic benefits

Transport project in Victoria's infrastructure strategy 2021–2025	City Loop Reconfiguration and Northern Rail Corridor Upgrade	Western Rail Corridor Upgrade
Project description	A broad group of interrelated changes to the rail network facilitating increased service provision along the Craigieburn, Frankston and Glen Waverley corridors. Also includes new stations and electrification of the metro line towards Wallan.	Upgrades to the Melton rail corridor to support extension of the metropolitan rail services from Sunshine to a new station at Mount Atkinson. This would also enable increased capacity to the Pakenham/Cranbourne corridors in Melbourne's south-east.
Estimated wider economic benefit as a proportion of total benefits	8%	24%
Rationale for selection	Similar broad service frequency increases and construction of new stations to tram extensions projects.	Similar scope to the Melton electrification project although shorter electrification only to Mt Atkinson. We therefore think a further electrification to Melton is likely to have similar or greater wider economic benefits.

Measuring public infrastructure cost savings

Our *Choosing Victoria's future* report showed a compact city provides better benefits to residents, the economy and the environment. Infrastructure capital costs in greenfield areas can be up to 4 times higher than in established areas where existing infrastructure has the capacity to support growth.[59] This means there can be public infrastructure cost savings if residential development occurs in established suburbs rather than growth areas.

We found the capital cost of public infrastructure in a 'compact city' – where more housing was developed in established areas was $59,000 less per dwelling compared to a 'dispersed city' – where more housing was developed in growth areas.[60]

Transport projects can affect where people choose to live. They change where residential development occurs, influencing the shape and distribution of the city. The changes in where development occurs produce land use changes.

The Victorian Integrated Transport Model does not model land use changes from projects. We undertook additional modelling to estimate the public infrastructure cost savings and changes in travel choices from the land use changes for middle suburbs tram extensions. This project improves transport connectivity in established areas that have the capacity to accommodate higher density development beyond the land use forecast in the model.

We did not estimate public infrastructure cost savings for the Fishermans Bend trams or the Melton electrification projects. Fishermans Bend is an urban renewal site. The *Fishermans Bend framework* already accounts for high density development in Fishermans Bend. The population and employment forecasts for Fishermans Bend are the same in the framework and the model. We do not expect the Fishermans Bend trams project to achieve any additional urban consolidation beyond that which the Victorian Government is already expecting to achieve.

Where not explicitly estimated, potential public infrastructure cost savings are discussed qualitatively in individual project chapters. The Melton electrification project mostly impacts growth areas. Further analysis for the established suburbs along the Melton corridor between Deer Park and inner Melbourne could be done to identify additional benefits.

Including public infrastructure cost savings as a benefit in transport project cost benefit analysis is a recently developed approach. They have been included in the *Australian transport assessment and planning guidelines* since 2022.[61] They have been included in the cost benefit analysis for other major transport projects in Victoria.[62]

As public infrastructure cost saving benefits are a more recent development, there is greater uncertainty in the cost saving estimates than other benefits. Even so, our estimates show these savings can be significant benefits for some projects.

Further information on how we estimated public infrastructure cost savings is in Appendix B.

We estimated costs for each project

Infrastructure Victoria prepared costs to support the cost benefit analysis. The costs are strategic order of magnitude estimates. They are presented as a range rather than a single figure.

Order of magnitude estimates are initial cost estimates within a broad accuracy range. The Department of Treasury and Finance guidance recognises the accuracy of cost estimates improve as the project investment case develops.[63] The government should review and refine the costs during their detailed project assessment.

We calculated costs using public information from similar projects, as well as with previous Infrastructure Victoria research. Some costs have also been updated to reflect recent changes in construction costs.

We calculated a middle-cost estimate and a high-cost estimate in real dollars as of June 2025. We expect the actual cost in June 2025 dollars to be closer to the middle cost. The actual costs will also depend on how the project is scoped and delivered. We applied discount rates to the real cost estimates in the economic analysis if costs occurred in the future.

We developed capital and operating costs separately.

Capital cost estimates include:

- the cost of building the infrastructure
- contractor and client overheads for the project
- the cost of buying land if required
- industry benchmarked contingency costs
- the cost of buying new trams and trains.

Operating costs are the estimated costs to run the services including replacing trains and trams, staff, and tram and track maintenance.

We were consistent in our assumptions across the 3 projects

We assessed each project over a 30 year period. We assumed project construction can start in 2027. We estimated the middle suburbs tram extensions and Fishermans Bend trams are completed in 2029. We estimated the Melton electrification project is complete by 2030.

We modelled the projects and compared each to the base case in 2031 and 2041. We modelled a typical workday during the school term that is split into 4 time periods. These 4 periods model how people travel during the day. They include the morning peak, middle of the day, the afternoon peak and off peak.

The transport model uses forecasts and assumptions for key factors. We used forecasts about where people will live and how land will be used from Victoria in Future 2023. [64] The *Strategic transport modelling of tram and train projects to inform Victoria's infrastructure 2025–2055* has further details about the factors used in our evaluation. [65]

The choice of a future transport network influences the modelling results. We used a 'planning reference case' approach. This approach assumes the transport network will continue to develop over time.[66] This includes the current transport network, and other projects the government has committed to, funded or is building. It aligns with the approach the Department of Transport and Planning has used in assessing many projects.[67]

We included the West Gate Tunnel and North-East Link projects being open by 2031. We assumed Melbourne Airport Rail Link and sections of the Suburban Rail Loop will be operating by 2041.

Our modelled future transport network also accounted for other projects that government has not currently funded. This is because we assume the government will continue to improve transport services. The projects we assumed will be delivered include the Bulla Bypass, arterial road upgrades across Melbourne's west, and improvements to Werribee and Sandringham metropolitan rail services. Appendix A provides more detail about our assumptions for the future transport network.

An alternative way to model the future transport network is the "committed expenditure" approach. This approach includes only projects that are already committed and funded. Because this approach assumes fewer road and rail services in the future, particularly in growth areas, it assumes fewer future transport options compared to the planning reference case. When new projects are assessed, they often show stronger cost–benefit results because there are fewer alternative options to meet future demand. We chose a planning reference case approach because this is consistent with our past approaches and has been used by transport agencies in Victoria.[68]

We presented our results as a range

We presented the cost benefit analysis results as a range because this is a strategic economic evaluation. Table 5 outlines the assumptions used to calculate the upper and lower estimates of the range.

The Department of Treasury and Finance recommend both 4% and 7% discount rates to evaluate projects.[69] These rates have been used in recent major transport business cases including Melbourne Metro Tunnel, North East Link, and the Suburban Rail Loop.[70] We used both of these discount rates in our evaluation.

Our estimates of wider economic benefits are informed by modelling done as part of our *Major transport program strategic assessment* in 2021. We believe the combination of these parameters more accurately reflect the likely project impacts.

Table 5: Key assumptions for the cost benefit analysis

Parameter	Lower benefit cost ratio estimate	Upper benefit cost ratio estimate
Discount rate*	7%	4%
Wider economic benefits^	8%	24%
Cost	high cost	middle cost

* A 7% discount rate is consistent with guidance from Australian Transport Assessment Planning, the Department of Treasury and Finance, and Infrastructure Australia.[71] The United Kingdom assesses projects at a 3.5% discount rate and the SRL Business Case used 4%.[72]

^ We estimated wider economic benefits as a percentage increase on total benefits. The range is drawn from previous analysis on the Western Rail Corridor Upgrade and City Loop Reconfiguration. These projects are similar in scope and function to those assessed in this report.

We also tested how our results changed if we varied key assumptions. It is common to do this in cost benefit analysis. These tests are called sensitivity tests. For example, one test is to increase costs by 20% to see how this impacts the results. The results of these tests are included in the appendices.

The Melton electrification project

Melbourne's western suburbs have experienced significant population growth. In the 10 years to 2024, the local government area of Melton grew by 90,400 people, or 70%. Wyndham grew by 135,500 people, or 67%. These are the highest population growth rates in any Victorian local government areas over this period.[73]

The government forecasts population growth in Melbourne's west to continue. In the next 10 years, Melton and Wyndham will have the most population growth of all Victorian local government areas. Over this period, the Melton local government area is expected to grow by 44%, adding 107,000 people to reach a total of 350,000. Wyndham is projected to grow by 31%, adding 112,000 people to reach 472,000 over the same period.[74]

Highly crowded regional train services cannot meet demand

The local government areas of Melton and Wyndham have limited rail services. Wyndham is served by both the electric Werribee line in the south-west of Melbourne and V/Line regional trains to Geelong. The Melton local government area is not served by any electric train services and must rely on V/Line services on the Ballarat line.

These V/Line trains primarily serve Geelong and Ballarat. They do not always stop at all stations in Melbourne's west. Bus connections are poor and do not easily connect to other major centres such as Tarneit, Sydenham (the location of the Watergardens shopping centre) or Sunbury.

This means that communities in Melton, Thornhill Park and Mount Atkinson have fewer transport choices. Passengers commuting towards inner Melbourne must rely on regional V/Line services which are not designed for passengers on suburban commutes. They are designed to cater for passengers travelling into regional Victoria that take more than one hour. They have many comfortable seats but little standing room.

These regional services are heavily used and are increasingly crowded.[75] The Victorian Government has invested in infrastructure and new train carriages.[76] But they are not a suitable substitute for frequent suburban services to places such as Melton. Longer carriages let more people board, but they do not reduce wait times or give communities more travel choices.

The number of passengers on regional V/Line trains has been increasing in recent years.[1] Passengers on the Geelong and Ballarat lines grew by 27% between 2022–2023 and 2023–2024.[77] Growing populations in Geelong and Ballarat will continue to put pressure on rail services.[78]

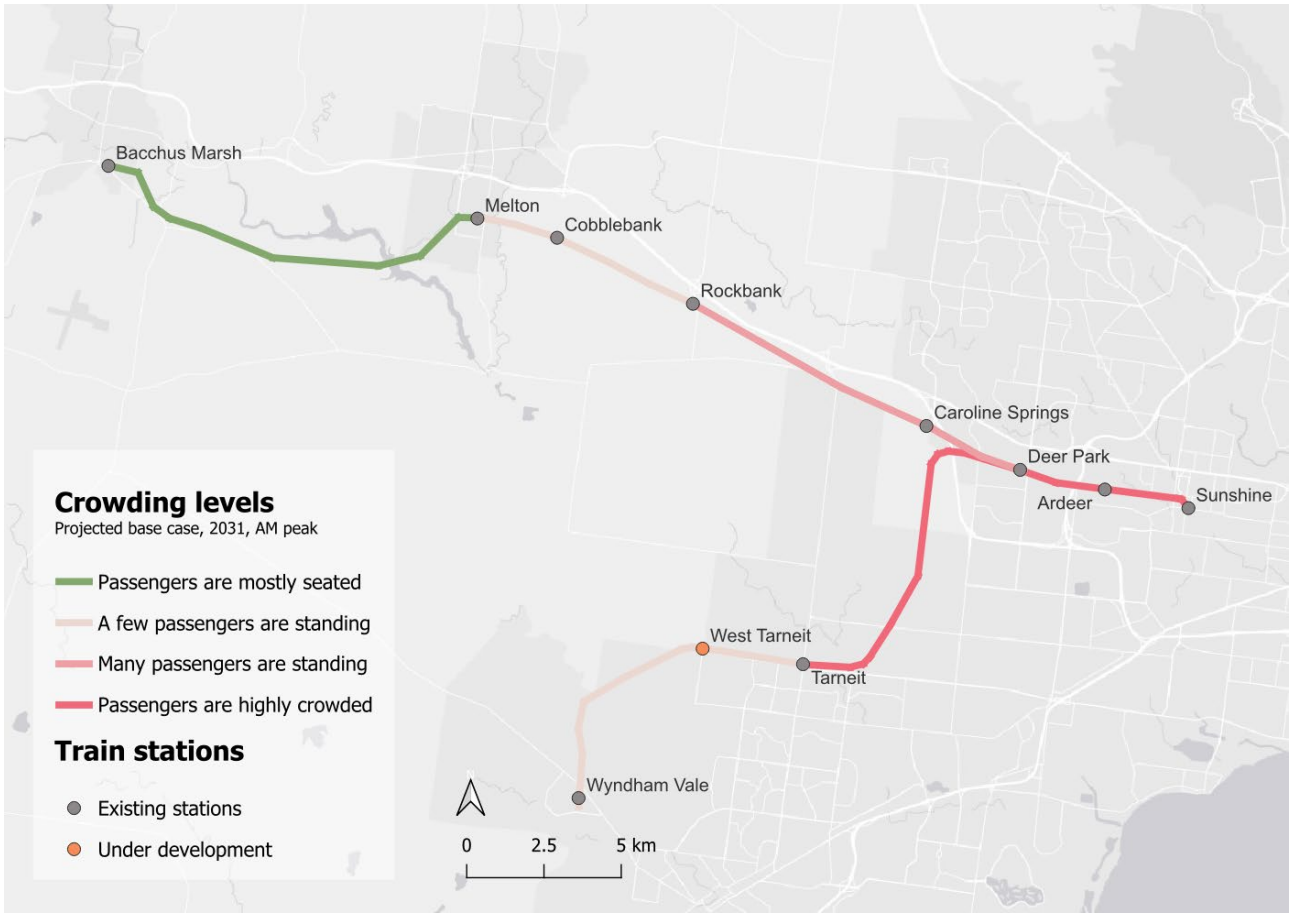
Figure 2 shows the forecast crowding levels of V/Line rail services in 2031 for Melton, Bacchus Marsh and Wyndham Vale services.

Passengers along the Melton corridor are forecast to experience crowded conditions between Rockbank station and the city in the morning peak. This means some passengers will be unable to board some services because the train is full. They will need to wait for the next train. Passengers on the Wyndham Vale line are expected to experience significant crowding from Tarneit station.

The Victorian Government has committed to funding longer, 9-car V/Line trains on the Melton and Wyndham Vale lines.[79] Our modelling assumes that these longer trains are in service by 2031. Figure 2 shows that even with this increase in train length, crowding is still a problem. Investment is needed to provide more trains to Melbourne's western suburbs via electrified metropolitan services to reduce high levels of crowding.

[1] Note that the regional fare cap was introduced in 2023 and is likely to be influencing patronage growth.

Figure 2: Crowding is forecast on V/Line services in 2031 even with longer 9-car trains



Source: Infrastructure Victoria analysis of AECOM modelling outputs.

Note: This diagram does not show some services that continue past Bacchus Marsh and Wyndham Vale, for example services to Waurn Ponds (Geelong) or Wendouree (Ballarat). This is because services run express in the morning peak at many stations.

Limited public transport services are forcing people to drive

The local government areas of Melton and Wyndham Vale in Melbourne's west do not have suitable public transport.[80] The V/Line train services that do exist have confusing stopping patterns. For example, between Melton and the city these services stop at some stations but not at others. Train services from Southern Cross station to the western suburbs often depart from different platforms. The same service can depart from different platforms on different days of the week.

Some recently built housing developments are not served by the public transport network. For example, Paynes Road is a main road in the suburb of Thornhill Park but it has no bus services. A student living in Thornhill Park and studying at Victoria University in St Albans has to walk over an hour to Rockbank station, with a total journey time of over 2 hours on public transport.[81]

The limited public transport services mean many residents have no option but to drive to work, school or other activities.[82] In Melbourne's outer suburbs and new growth areas, 63% of residents drive to work compared to 32% in inner Melbourne.[83] Public transport in inner Melbourne can provide access to jobs with a lower travel time than cars at a lower cost.[84]

More car use means busier roads and lower air quality.[85] It can also place households who have no other transport options in financial stress.[86] Residents who rely on public transport might have to accept lower-paid jobs that do not fully match their skills. This is because they cannot reach better paying jobs that match their skill set by public transport.[87]

Electrifying the Melton line means better local and regional services, improves jobs access and reduces congestion

Electrifying the Melton train line is not a new idea. The Victorian Government proposed electrifying the Melton corridor as part of the Western Rail Plan in 2018.[88] It is mentioned as a future opportunity in the Melbourne Metro Tunnel business case.[89] We recommended extending rail services in Melbourne's western growth areas in *Victoria's infrastructure strategy 2021–2051*.[90]

We assessed electrifying the Melton train line for *Victoria's infrastructure strategy 2025–2055*. We chose it because of recent population growth and rising demand for regional V/Line train services.

The Ballarat, Geelong, Melton, Wyndham Vale and Bendigo V/Line train services all share one pair of tracks between Sunshine and Southern Cross. This set of tracks and rail signals is called the Regional Rail Link.

The Regional Rail Link is currently near capacity. For example, increasing the number of Melton trains could require reducing the number of Geelong, Ballarat, Wyndham Vale or Bendigo trains so the Regional Rail Link is not overloaded.

Upgrading the capacity of the Regional Rail Link is complex. It involves balancing platform capacity at Southern Cross station, upgrading rail signals and junctions, and managing train speeds throughout the Regional Rail Link. Electrifying the Melton line would mean Melton trains would no longer use the Regional Rail Link. This creates space on the Regional Rail Link for more regional V/Line services.

We assessed a Melton electrification project that upgrades the network by:

- installing overhead wires and power poles on existing track between Sunshine and Melton and extending electrified metropolitan services to Melton to replace current V/Line diesel services
- expanding the double-track section between Sunshine and Caroline Springs to 4 tracks, separating regional trains and metropolitan trains by operating them on different track pairs in this section and allowing regional trains to travel faster
- constructing 2 new train stations at Thornhill Park (Paynes Road) and Mount Atkinson (Hopkins Road)
- upgrading Deer Park station to 4 platforms
- an additional or extended passing loop between Bacchus Marsh and Melton
- re-routing one bus service to Paynes Road station and adding bus services to Caroline Springs and Bacchus Marsh.

The Melton electrification project is shown in Figure 3 on the next page.

These infrastructure upgrades will enable:

- trains every 10 minutes or better to and from Melton for growing communities in Melbourne's west
- more services on the Wyndham Vale line by reallocating V/Line trains that currently serve Melton.

Figure 3: The Melton electrification project

Source: Infrastructure Victoria.

Electrification to Melton builds on existing or committed projects

Our assessment is based on construction of the Melton electrification project starting in 2027 with services starting in 2030. These timelines can take advantage of other big rail projects that are being built right now.

The Melbourne Metro Tunnel project will allow electric metropolitan trains from Melton to use the Metro Tunnel to the central business district.[91] This will also allow passengers from Melton to travel directly to Cranbourne, Pakenham and Westall without changing trains.

This new route through the city will connect many important precincts and activity centres identified in Plan for Victoria. For example, the Cobblebank Metropolitan Activity Centre will contain a new TAFE and Melton Hospital. After the Melton electrification project, it will share a common, frequent, rail line with activity centres at Middle Footscray and Tottenham. It will also connect to the Sunshine, Parkville and Arden priority precincts.[92]

Recent funding committed to upgrade Sunshine station will improve rail tracks in the west and let more trains run per hour. The upgrade of Sunshine will also provide an opportunity to interchange with the proposed Melbourne Airport Rail Link through Sunshine station. This will provide a significantly faster trip to Tullamarine airport compared to the current arrangements for passengers who must travel to Sunshine station to then change to Skybus to get to the airport.[93]

Melton electrification increases public transport use and reduces road congestion

Our modelling shows the Melton electrification project will increase public transport use along the corridor. It shows 3,500 additional daily station boardings in 2031 and 10,100 in 2041 across all stations.[94] In 2031 there are 14,500 extra public transport trips and 16,800 fewer car trips each day.[95]

Building 2 new stations at Thornhill Park (Paynes Road) and Mount Atkinson (Hopkins Road) is forecast to generate significant daily boardings in both 2031 and 2041. See Table 6. The boardings at new stations also include people who used the train in the base case but previously boarded at another station. Those people who are boarding at one of the new stations may have changed because it is closer to where they live. They may even have the option to walk to a new station instead of parking at a more distant station.

A student in Thornhill Park who studies at Victoria University in St Albans may expect a journey time of 40 minutes or less, compared to 2 hours with regional V/Line services.

As more people use public transport after the Melton electrification project, it shows there is significant demand for more transport connections. This will grow as future housing is developed along the corridor. If new stations are not built, future residents may rely on road transport on already congested roads.

Our modelling shows more frequent train services will reduce the distance travelled in cars by over 200,000 kilometres each day in 2031. By 2041 we estimate the distance travelled would decrease by 440,000 kilometres each day. This would reduce air pollution, noise pollution and greenhouse gas emissions.

Table 6: Daily boardings at new stations from the Melton electrification project

Station	Year 2031	Year 2041
Mount Atkinson (Hopkins Road)	1,000	5,400
Thornhill Park (Paynes Road)	3,400	5,000

Source: AECOM Strategic Modelling Report, p 46.

Note: daily boardings at new stations include people who have started using the train as well as people who used to board at another station.

Melton electrification improves job access for growth areas in Melbourne's west

The Melton electrification project enables train services to run every 10 minutes. This significantly increases access to jobs in the western suburbs for people without regular access to a car.

Table 7 shows the increase in the number of jobs accessible by public transport in the morning peak for selected suburbs along the Melton line. For example, a new station at Mount Atkinson (Hopkins Road) would mean someone living nearby could access over 120,000 more jobs by public transport in 2031. This large increase in job access shows how poor existing public transport connections are near Hopkins Road.

There is also an increase in access to job opportunities for communities served by existing stations at Rockbank, Cobblebank and Melton. This is due to trains stopping at more stations with nearby jobs, including more stations in inner Melbourne and the city.

Other suburbs along the Melton line show a similar pattern of increased access. This benefits both employees and employers. Employees have greater employment choice because they can access more jobs that fit their skills. Employers also have access to a wider pool of potential employees, which increases the chance of matching the right person to the role.

Table 7: Number of jobs accessible by public transport within 45 minutes after Melton electrification in the morning peak in base case and project case

Selected suburbs	2031 base case	2031 project case
Mount Atkinson (new station)	1,000	122,000 (+121,000)
Thornhill Park (new station)	1,000	38,000 (+37,000)
Rockbank	30,000	62,800 (+32,800)
Cobblebank	26,800	38,400 (+11,600)

Source: Infrastructure Victoria analysis of AECOM modelling outputs.

Note that Mt Atkinson and Thornhill Park do not currently have reliable public transport connections. This is why the '2031 base case' has very low job access on public transport.

Melton electrification means more services for Wyndham Vale

Electrifying regional train lines allows V/Line trains from these lines to be used on other lines that need them. This has been done before in Melbourne. When the Sunbury line was electrified in 2012, the V/Line rolling stock was used to add carriages on busy services and to add more services to Bacchus Marsh and Melton.[96]

Electrifying the Melton train line enables more regional services on other parts of the network. Transferring the V/Line trains to Wyndham Vale would allow an extra 26 services each way, every weekday between Wyndham Vale and Southern Cross. These additional services offer a 10-minute service frequency for most of the day. That means less time waiting and reduced crowding for those on the Wyndham Vale line.

We modelled 4 additional Wyndam Vale services in the morning peak. This is equivalent to reducing the average time between trains from 24 minutes to only 13 minutes. Up to 2,600 more people could travel to the city in the morning peak. Between 9am and 3pm, an additional 18 services could run between Wyndham Vale and Southern Cross. The average time between services would halve from 20 minutes to 10 minutes.

In the afternoon peak from 3pm to 6pm, an additional 4 services could run to Wyndham Vale. This allows 2,600 more people to return home from the city. It also reduces the average time between trains to 10 minutes, down from 13 minutes with the current timetable. These additional V/Line services upgrade Wyndham Vale to a service frequency experienced by several metropolitan train lines at peak times.

Melton electrification benefits both metropolitan and regional passengers

Extending electric metropolitan services to Melton and separating it from regional services benefits users of both services. Adding 2 new tracks between Sunshine and Caroline Springs will allow electric metropolitan services to operate on one pair of tracks and regional services to operate on the other pair.

Electric metropolitan trains can operate more often as they do not hold up faster moving regional trains. More frequent trains mean more people can catch them. Electric metropolitan train services are easy for commuters to understand and use because all services will stop at all stations. In contrast, regional V/Line services do not always stop at all stations in peak times and often depart from different platforms in the city.[97]

Regional trains from Ballarat will be able to operate express services all day. This is because they can skip stations between Melton and Sunshine now served by electric metropolitan services. On the eastern side of Mount Atkinson (Hopkins Road) station, these regional express services will be on separate regional tracks. This means they cannot be held up by trains stopping at metropolitan stations.

Electrifying the Melton train line means passengers on both metropolitan and regional train lines will experience travel time savings and reliability benefits. Additional benefits are discussed in Appendix A.

Melton electrification project will deliver large benefits

The Melton electrification project provides significant benefits for people living along the Melton corridor, particularly around the new stations at Mount Atkinson (Hopkins Road) and Thornhill Park (Paynes Road). These benefits are mostly from reduced wait time for trains, the ability to reach more destinations without changing trains, and providing transport access for users who previously did not have transport access. Bacchus Marsh passengers will also benefit from the project due to a reduction in crowding.

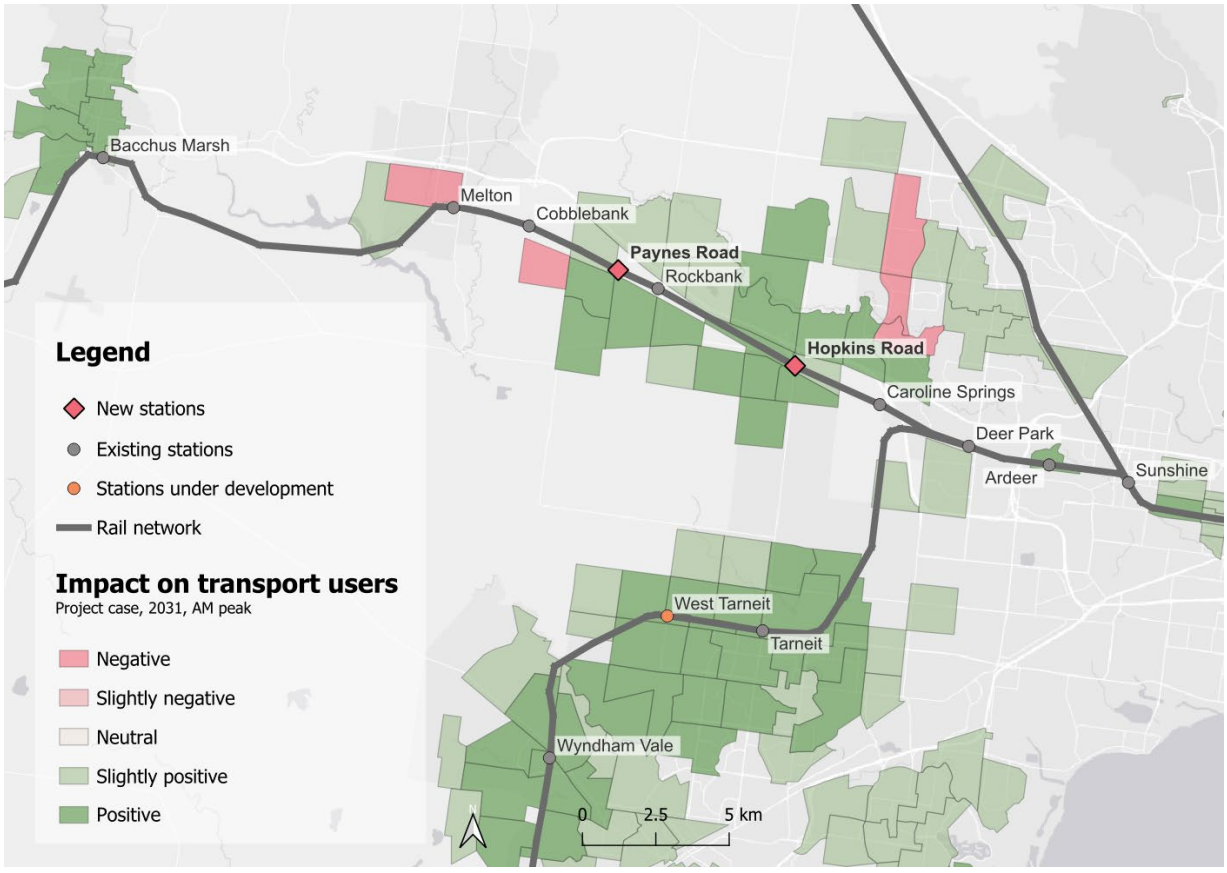
Figure 4 shows which areas benefit from the project's rail service improvements. It also shows a slight negative impact for passengers travelling to Melbourne's central business district from Melton or Cobblebank stations. These users will have a slightly longer journey time on the electric metropolitan service compared to the base case with regional V/Line services. This is because the electric train stops at more stations.

However, these passengers will have more reliable train services. Trains every 10 minutes mean that users will not have to worry about missing a train, they can just wait a few minutes for the next one. These communities will also have greater transport access overall because they can access more stations, including Metro Tunnel stations in the central business district.

For example, students using the Melton line to travel to Monash University in Caulfield will be able to save up to 10 minutes travel time. They will no longer need to change trains at Footscray as the service will continue direct to Caulfield. Likewise, a nurse living in the Arden precinct will be able to travel to work at the new Melton Hospital on one train service, also saving an additional connection through Southern Cross.

Figure 4 shows that re-allocating the V/Line trains from the Melton corridor to the Wyndham Vale corridor gives substantial benefits to users on the Wyndham Vale line. This benefit comes from reduced wait times and reduced crowding on each service.

Figure 4: Melton electrification impact for transport users in different parts of Melbourne in 2031



Source: Infrastructure Victoria analysis of AECOM modelling outputs. Impact on public transport users is for the morning peak on a typical weekday in 2031.

We estimate the total benefits from the Melton electrification project to be between $4.4 billion and $8.1 billion over the 30 year economic evaluation period, as shown in Table 8.

Road users are the largest beneficiaries of the project, driven by congestion benefits. This benefit arises as people who used to travel to work, shopping or education in cars can switch to the newly electrified train service. People who continue to drive will experience less congestion as well as significant safety and environmental benefits. This reduction in vehicle kilometres travelled (200,000 kilometres in 2031 and 440,000 kilometres in 2041) also provides significant safety and environmental benefits.

Road freight and other business vehicles will also benefit from reduced congestion in Melbourne's west. The Western Freeway is a major freight corridor for trucks to travel between Victoria, South Australia and even Western Australia. Reduced commuter traffic on the Western Freeway will improve travel time for goods, including for exports. This will benefit businesses and consumers who rely on the corridor.

Public transport users are expected to have significant benefits. We estimate these benefits are between $1.0 billion and $1.4 billion. These benefits come from reduced wait time for services, less fewer transfers between different public transport services to get to their destination, and travel time savings for those on express trains.

We estimate significant wider economic benefits from the project, ranging from $300 million to $1,600 million. As outlined earlier, this is based on a lower estimate of 8% and an upper estimate of 24% from our *Major transport program strategic assessment.*[98] These benefits come from thousands more workers now being able to more easily access employment in inner Melbourne and south-eastern suburbs by public transport. This increases the opportunities for businesses to hire more appropriately skilled workers. Likewise, employees have more job options.

Table 8: Economic benefits of the Melton electrification project

Benefit	**Lower estimate (7% discount rate)** *($ million)*	**Upper estimate (4% discount rate)** *($ million)*
Consumer surplus (roads): benefits for road users due to less road congestion	2,464	3,985
Consumer surplus (public transport): improved access to public transport services	1,013	1,447
Environmental externalities: environmental benefits from people using trains rather than cars. This includes lower greenhouse gas emissions, better air quality and less noise pollution	184	307
Crash cost savings: better road safety from fewer cars. This includes lower healthcare, emergency response and property damage costs due to fewer car accidents.	94	157
Active transport benefits: health benefits from walking or cycling to and from train station. The benefits also include reduced healthcare system costs.	159	254

Benefit	Lower estimate (7% discount rate) *($ million)*	Upper estimate (4% discount rate) *($ million)*
Residual asset value: the longer-term benefits beyond the evaluation period.	183	360
Wider economic benefits: benefits to the economy from improving transport connections between businesses and employees	328	1,562
Total project benefits	**4,424**	**8,072**

Estimates are present value 2025 dollars. Source: Infrastructure Victoria analysis of AECOM modelling results, see Appendix A

We estimated costs for the Melton electrification project

We estimate infrastructure works associated with electrifying the Melton line will have a capital cost between $4.2 billion and $5.5 billion in 2025 dollars. This estimate is not discounted.

Our capital cost estimate includes:

- building new tracks and electrifying existing tracks
- building new stations
- building new train depots and stabling facilities
- removing some level crossings and building new overpasses and accompanying road works
- purchasing new 7 carriage high capacity metro trains, including some additional costs to restart manufacturing of these trains as the order of trains to use the Metro Tunnel will have been completed before this project starts.

The project will also have operating costs. These are the costs to run the additional services including maintenance of trains, staff, electricity, and track maintenance. We estimate the operating costs will be between $60 million and $80 million each year.

We estimate the total project costs over the life of the project have a present value between $4.7 billion and $5.5 billion. This estimate has been discounted and include capital costs and operating costs. Cost estimates with discount rates applied are shown in Table 9. They assume construction starting in 2027 and finishing in 2030. The train services would start in 2030. Present value costs are for the whole 30-year evaluation period until 2060.

We have assumed works to enable the Melton electrification are covered by other committed projects. This includes works at Sunshine station as part of the Sunshine Superhub project and level crossing removal projects. These costs are not included in our economic evaluation.

To help meet the project's costs, the Australian Government may contribute funding as it supports broader national priorities regarding providing more housing.[99] The government should review and refine the project costs as part of further detailed planning for this project.

Table 9: Discounted project costs for Melton electrification

	High-cost estimate ($ million) *Costs for the lower benefit cost ratio result*	Middle-cost estimate ($ million) *Costs for the upper benefit cost ratio result*
Infrastructure costs	4,731	3,865
Operating costs	809	876
Total costs	**5,540**	**4,741**

Estimates are present value 2025 dollars. Source: Infrastructure Victoria analysis of AECOM modelling results

Note: We used the high-cost estimate to calculate the lower benefit cost ratio result. This is because larger costs reduce the benefit cost ratio. Higher discount rates also generally reduce the benefit cost ratio. We used a discount rate of 7% to calculate the lower benefit cost ratio. Therefore, we discounted the high-cost estimates using a rate of 7%. Higher discount rates lower the present value of cashflows that occur further into the future. This is why the discounted operating costs are lower in the high-cost estimate than the middle-cost estimate, even though the real or undiscounted values are higher. We discounted the middle-cost estimate using a 4% discount rate. See the section detailing consistent parameters and assumptions across the 3 projects.

Summary of strategic economic evaluation results for the Melton electrification project

Our strategic economic evaluation of the Melton electrification project found there are significant benefits across Melbourne's west. This includes that more people can access jobs, education and leisure. There were significant benefits for road users with less congestion and traffic. We also found providing more services to Melton and Wyndham Vale reduced crowding on those train lines while also helping users of regional trains. As Melton electrification is a large scale project we also found there is a significant cost.

We estimate the Melton electrification project could return up to $1.70 for every dollar invested. We estimate the project will return at least 80 cents for every dollar invested. This is presented in Table 10.

Table 10: Summary of strategic economic evaluation results for Melton electrification

	Lower estimate	Higher estimate
Total benefits (millions)	$4,424	$8,072
Total costs (millions)	$5,540	$4,741
Net present value (millions)	-$1,115	$3,330
Benefit cost ratio	0.8	1.7

Source: Infrastructure Victoria analysis of AECOM modelling results, see Appendix A

Our lower estimate shows a net cost. This is not surprising due to the strategic nature of the assessment and the size and scope of the project. Other major projects in Victoria have still proceeded with economic evaluations that included a net cost in some of the scenarios or sensitivity tests.[100]

There are opportunities for more benefits to be realised

When further developed and delivered, we expect the Melton electrification results to be towards the positive end of the range. As part of our assessment, we have identified additional low-cost opportunities to enhance the benefits of the project. We did not revise our modelling because this is an initial strategic assessment. The government should consider these opportunities as part of its detailed assessment of the project.

Specifically, we have identified opportunities for:

- Changing land use planning around existing stations such as Deer Park and Ardeer to enable more houses at these locations. These locations will become more attractive places to live as these stations will have better train service across the day. This may generate some public infrastructure cost savings if housing was built closer to train stations instead of greenfield developments further away.
- Re-routing existing bus services and adding new bus services to better move people from developing communities surrounding the Melton corridor. We think better bus services can further reduce road congestion and generate other benefits.
- Using the longer platforms of the Metro tunnel to upgrade to 10 carriage long high capacity metro trains. This would require extending and rebuilding platforms along the corridor. We suggest this could occur in the 2040s as electric metropolitan trains become congested on the Melton corridor. This would increase the carrying capacity of each service by several hundred passengers.
- Delivering new stations along the Wyndham Vale corridor to take advantage of increased frequencies. These new stations could be located to respond to new housing developments.
- Extending the high-capacity signalling system that is used in the Metro Tunnel further along the Melton corridor. This extension would allow trains to run closer together compared to signalling systems installed on other parts of the metropolitan network. This could enable higher frequencies without new rail tracks.
- Considering how to best take advantage of spare regional trains released from electrifying the Melton line. We have assumed these would be used on the Wyndham Vale line. However, further detailed planning of rail timetables may be able to take advantage of re-allocated rolling stock to add more services to regional Victoria.
- Staging the project to progressively realise benefits. This could include considering when new stations should be delivered and the progressive introduction of new services to better match demand.

We welcome government doing further analysis and stakeholder engagement as part of the next phase of the Melton electrification project. This should include detailed planning, design, and risk assessments to further sharpen cost estimates. There are also opportunities to refine rail service plans to realise more benefits. The Melton electrification project should be completed by 2030 to deliver better public transport to Melbourne's growing western suburbs.

Fishermans Bend trams

Fishermans Bend is Australia's largest urban renewal project. It is a priority precinct in *Plan for Victoria*.[101] This means the government is planning changes in the area to deliver new jobs and more homes.

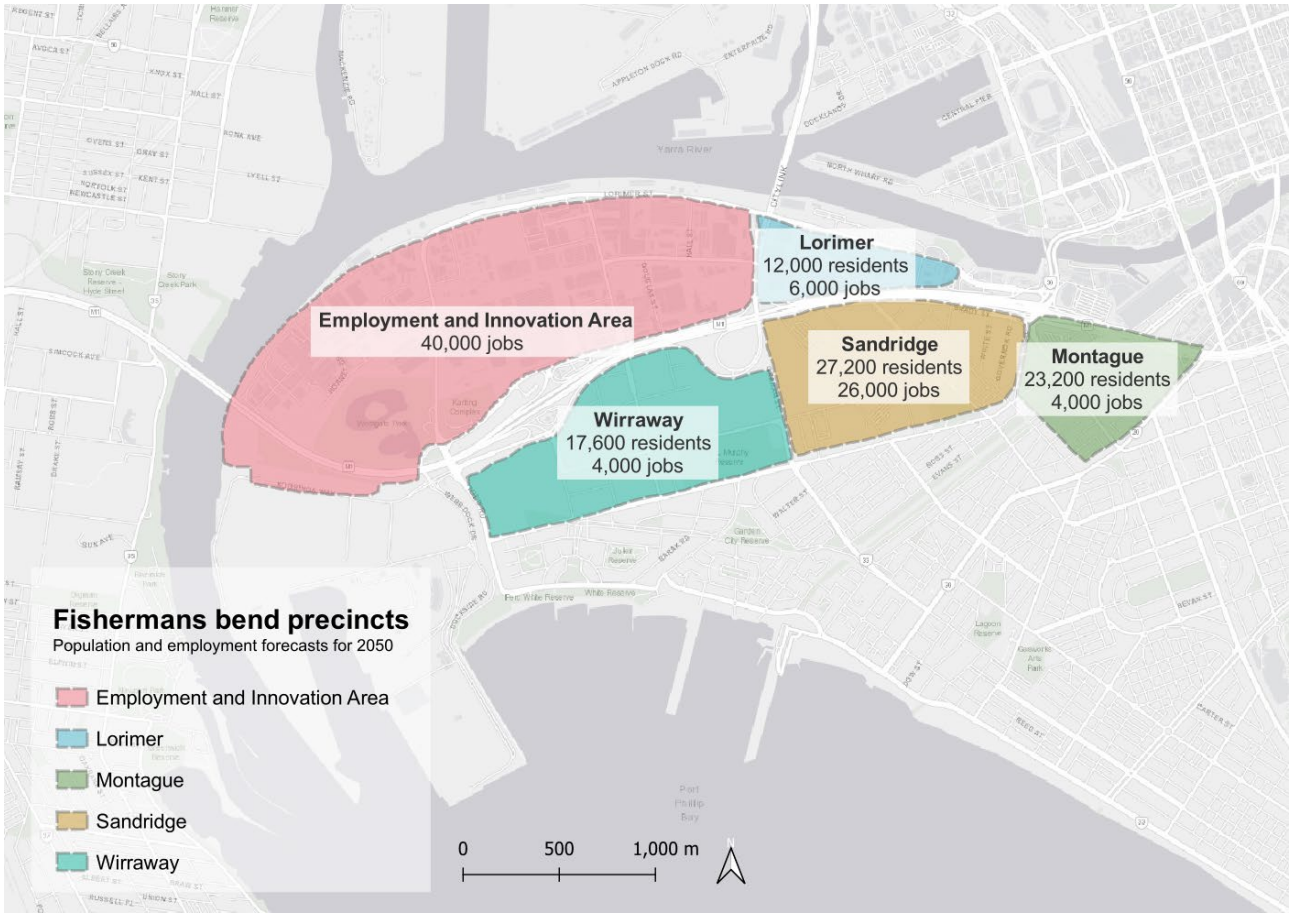
Fishermans Bend covers approximately 480 hectares in inner Melbourne. The Victorian Government's 2018 *Fishermans Bend framework* includes a target of 80,000 residents and 80,000 jobs by around 2050.[102]

The City of Melbourne has the highest housing target of all Victorian councils of 119,500 new dwellings, with Fishermans Bend being a key contributor to this target.[103] Fishermans Bend is also a key contributor to the City of Port Phillip's housing target.[104]

Within Fishermans Bend there are 5 precincts. The government has a different aim and planned use for each precinct.[105] Four of the 5 areas will have both jobs and housing, as shown in Figure 5. The remaining precinct is for jobs and innovation. It was added to the Fishermans Bend urban renewal plans in 2015.[106]

There are currently around 15,000 homes planned or under development. This represents just over 40% of the overall target. There are also proposals for buildings to accommodate 10,000 new jobs. This is in addition to the 30,000 jobs the government estimates are already in the precinct.[107]

Figure 5: Fishermans Bend has 5 housing and jobs precincts



Source: Victorian Government, *Fishermans Bend framework: the next chapter in Melbourne's growth strategy*, 2018, pp 8, 19, 68, 70, 72, 74, accessed 30 September 2025; Victorian Government, *Fishermans Bend framework – updated maps to reflect Integrated Transport Plan 2025*, September 2025, accessed 30 September 2025.

Without more public transport options, services will be more crowded

Fishermans Bend residents and workers currently rely on cars for transport as other reliable and safe travel ways to travel are limited.[108] Residents and workers in the Montague precinct can use St Kilda and Port Melbourne tram services to the city. Buses provide connections to the city and a local service to Port Melbourne and the Queen Victoria Market. [109] The Yarra River and the West Gate Freeway make it difficult to travel to and within Fishermans Bend.[110] Existing roads already experience congestion at peak periods.[111]

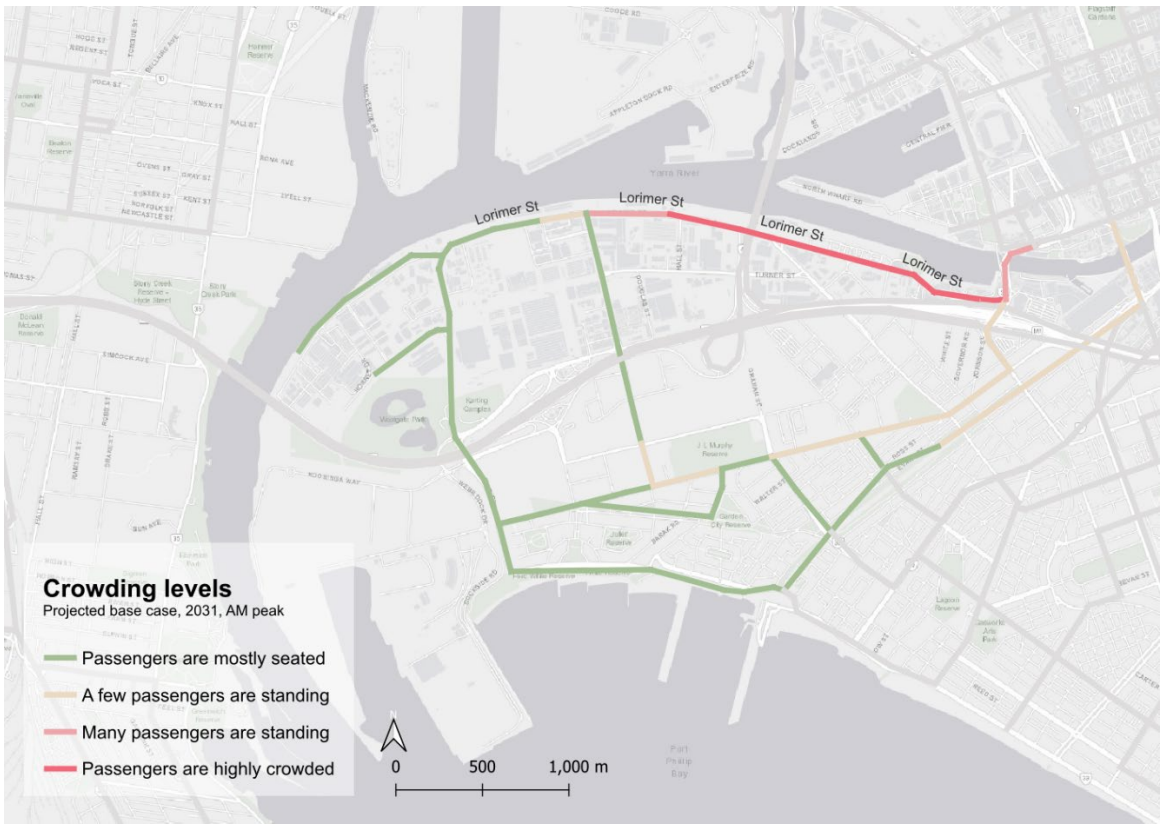
The Victorian Government estimates residential developments alone will create an extra 260,000 daily trips.[112] The limited road space and higher density of residents and employment in Fishermans Bend will limit the availability of parking.

Our modelling showed by 2031, bus services to the city along Lorimer Street will be over capacity. See Figure 6. This means that bus passengers will be standing in very uncomfortable conditions. Some passengers may have to wait for the next bus because they will not be able to get on.

There is more overcrowding on bus routes by 2041. See Figure 7. In the morning peak, buses to the city on Williamstown Road and the Port Melbourne tram service will now also be highly crowded.

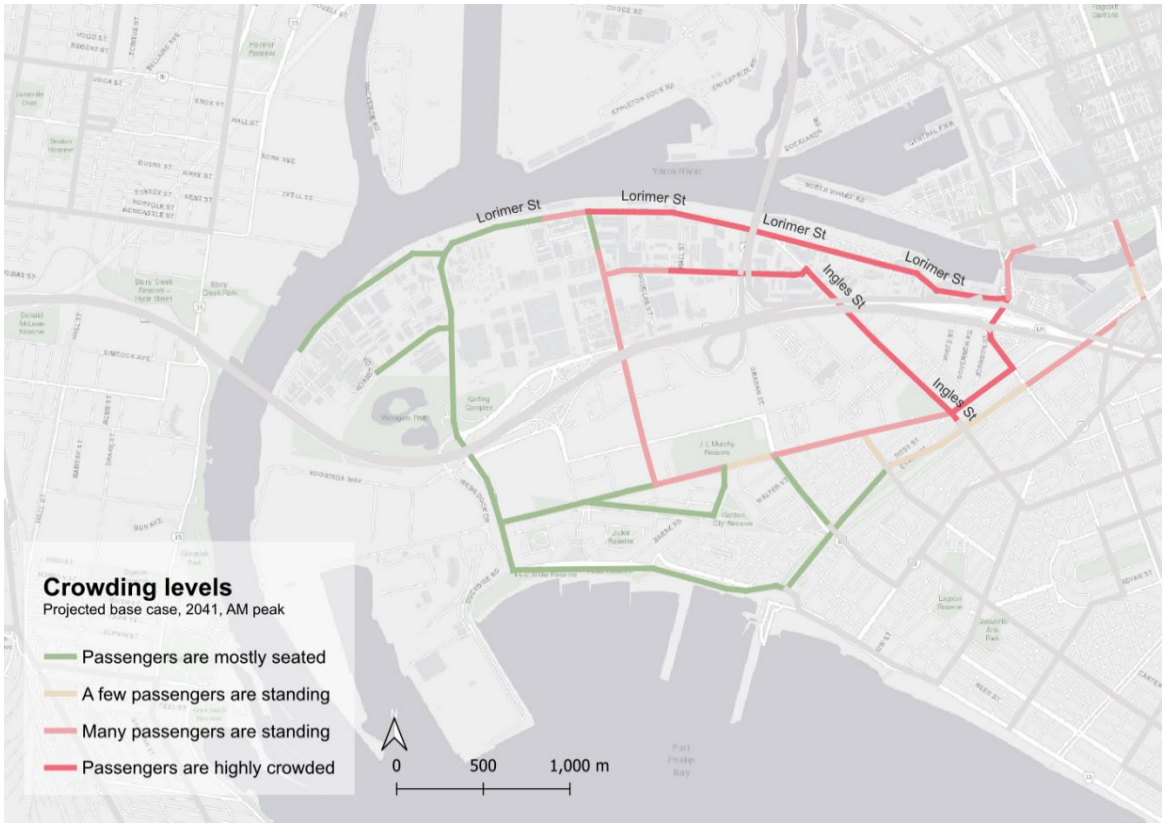
These forecasts include potential new bus routes, such as a new bus service along Ingles Street to connect passengers with trams in Port Melbourne. In 2041, this new bus service will also be overcrowded.

Figure 6: Forecast crowding on planned bus services in the morning peak in 2031 base case



Source: VITM Modelling undertaken by AECOM, February 2025

Figure 7: Forecast crowding on planned bus services in the morning peak in 2041 base case



Source: VITM Modelling undertaken by AECOM, February 2025

Our modelling also shows significant road congestion within and around Fishermans Bend. Travel speeds on Lorimer Street, Ingles Street, Salmon Street and the Docklands Highway are forecast to reduce to less than 10 kilometres per hour during the morning peak.

Government plans to improve public transport in 3 stages

The government plans to deliver new public transport infrastructure in order of capacity, complexity and cost. It plans to start with improving bus services, increasing capacity on existing nearby tram services and making walking and cycling routes better. This is followed by tram services to Fishermans Bend and finally trains. [113] The Victorian Government has recently improved the frequency of existing bus services to Fishermans Bend. Passenger demand on some weekend services increased by 165% in one year in response to the improvements. [114]

The 2018 *Fishermans Bend framework* set a target that 80% of trips will use public transport, walk or cycle. [115] Improving public transport connections between Fishermans Bend and inner Melbourne will be needed to achieve this target given the number of people moving within the precinct each day. The government recognises trams to Fishermans Bend are needed to realise its vision for the precinct. [116]

The 2018 *Fishermans Bend framework* included potential routes for 2 new tram services. One connected the employment and innovation area to Collins Street. The other connected the southern precincts to Collins Street. Both tram routes used a new Yarra River bridge. An audit of the delivery of infrastructure to Fishermans Bend revised the timelines for providing trams from 2025 out to 2034–2045. [117]

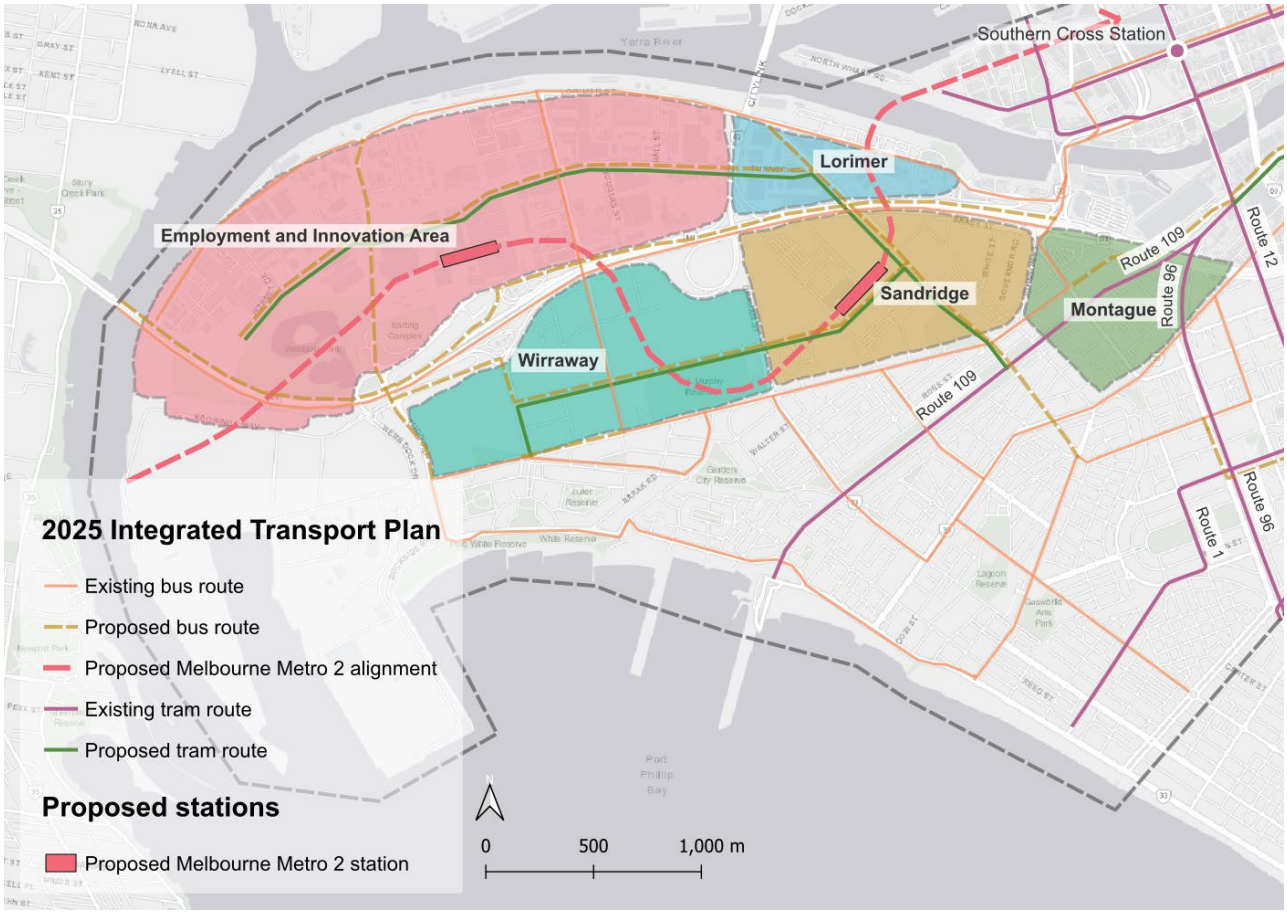
Our previous 2021 infrastructure strategy recommended the government fund the northern Fishermans Bend tram connection for delivery by 2026 and complete the planning for the southern route. [118] The recommendation was for the same routes as the 2018 framework. These routes required a new Yarra River bridge.

In September 2025, the government released an updated *Fishermans Bend integrated transport plan*.[119] The transport plan includes 2 tram services to Fishermans Bend. These use different routes to those in the 2018 framework. The transport plan includes a southern tram line along Plummer Street and a northern tram line along Turner Street.[120] These tram lines are shown in Figure 88. They are included in the second stage of development but there is no set timeframe for delivery.[121]

The 2025 integrated transport plan tram routes are different to the tram routes in the 2018 framework. The 2025 tram routes connect Fishermans Bend to the central city via Southbank.[122] They do not require a new Yarra River bridge. This makes them less complex and less costly than the tram routes in the 2018 Fishermans Bend framework.

The government proposes train services and new stations for Fishermans Bend in the longer term.[123] The government is planning a high capacity and direct service from Fishermans Bend to Southern Cross and Flagstaff Stations on the Werribee line.[124] This forms part of the proposed Melbourne Metro 2 project. See Figure 8.

Figure 8: Victorian government's existing and proposed public transport routes for Fishermans Bend



Note: the existing route 109 tram line runs between Box Hill and Port Melbourne. The existing route 96 tram line runs between East Brunswick and St Kilda Beach. Both tram lines service parts of the Montague precinct.

Source: Victorian Government, *Fishermans Bend framework – updated maps to reflect Integrated Transport Plan 2025*, September 2025, Figure 4, accessed 30 September 2025.

Fishermans Bend tram routes that can be delivered by 2030

The September 2025 *Fishermans Bend integrated transport plan* does not set a timeframe for delivering tram services to Fishermans Bend.[125] It also does not indicate if Fishermans Bend tram services will be new tram routes or extensions of existing routes. Aligned to our strategic priority to 'do more with less', we explored how to make the project easier to deliver sooner.[126]

We tested the costs and benefits of extending 2 existing tram routes (Figure 9) to Fishermans Bend:

1. Southern Cross Station to Fishermans Bend South: The western end of tram route 11 is rerouted down Spencer Street, then west along Normanby Road and Williamstown Road into Fishermans Bend South. This represents an extension of 5.1 kilometres requiring 2.6 kilometres of additional track.
2. Anzac train station to Fishermans Bend North: The northern end of tram route 67 is rerouted west along Park Street, then north on Ingles Street into Fishermans Bend north. This represents an extension of 7.0 kilometres requiring 5.3 kilometres of additional track.

We tested these services before the 2025 integrated transport plan was released. They achieve a similar outcome to the 2025 integrated transport plan tram routes. The route extensions we tested could be delivered by 2030, in time to meet growing passenger demand.

The tram routes in the 2025 *Fishermans Bend integrated transport plan* are the same as the ones we have tested through the Employment and Innovation area, Lorimer, Sandridge and Wirraway precincts. This means they would run along the same streets and serve the same people, businesses and institutions. They also connect to the same Port Melbourne tram. One route we tested also provides a direct tram connection to Melbourne's city centre. This route is also in the *Fishermans Bend integrated transport plan*.

Figure 9: Modelled tram extensions to Fishermans Bend on routes 11 and 67

Source: Infrastructure Victoria

The second tram route that we tested provides a tram connection to Anzac Station and St Kilda Road. The 2025 integrated transport plan proposes this connection is provided by a bus service. A tram service can provide more capacity and a higher quality service than a bus. The government should consider the route extensions we tested when it develops the business case for the project.

Our proposed project assumes that earlier delivery of trams to Fishermans Bend can take advantage of the Melbourne Metro Tunnel project. The Metro Tunnel will build new stations along St Kilda Road and Swanston Street. This means some people who used to take the tram on St Kilda Road may now use the train instead.

This change in the way people travel means fewer trams may be needed to serve St Kilda Road once the Melbourne Metro Tunnel opens. Thus, some St Kilda Road tram routes could be diverted at Anzac station to Fishermans Bend. We also rerouted another tram service off St Kilda Road via Park St and Clarendon Street (in South Melbourne) to serve the Arden precinct as part of recommendation 8 within the *Victoria's infrastructure strategy 2025–2055*.

Diverting existing trams routes can result in lower costs compared to creating new tram routes. This is because existing trams travelling along Swanston Street are reallocated to Fishermans Bend tram lines. This means less new trams need to be purchased. This will lower the cost of the project and we have assumed this in our economic evaluation.

Providing trams to Fishermans Bend sooner can give investors, institutions and developers confidence in transport access. This can help to speed up the delivery of the current development pipeline of 15,000 dwellings.[127] It also supports planning for future growth.

Trams connect Fishermans Bend with more places

Our modelled routes provide connections to different places. One route provides a direct connection from the Montague, Sandridge and Wirraway precincts to Southbank and the city. Our second tram route provides a direct connection to the new Anzac Station and St Kilda Road corridor. See Figure 10.

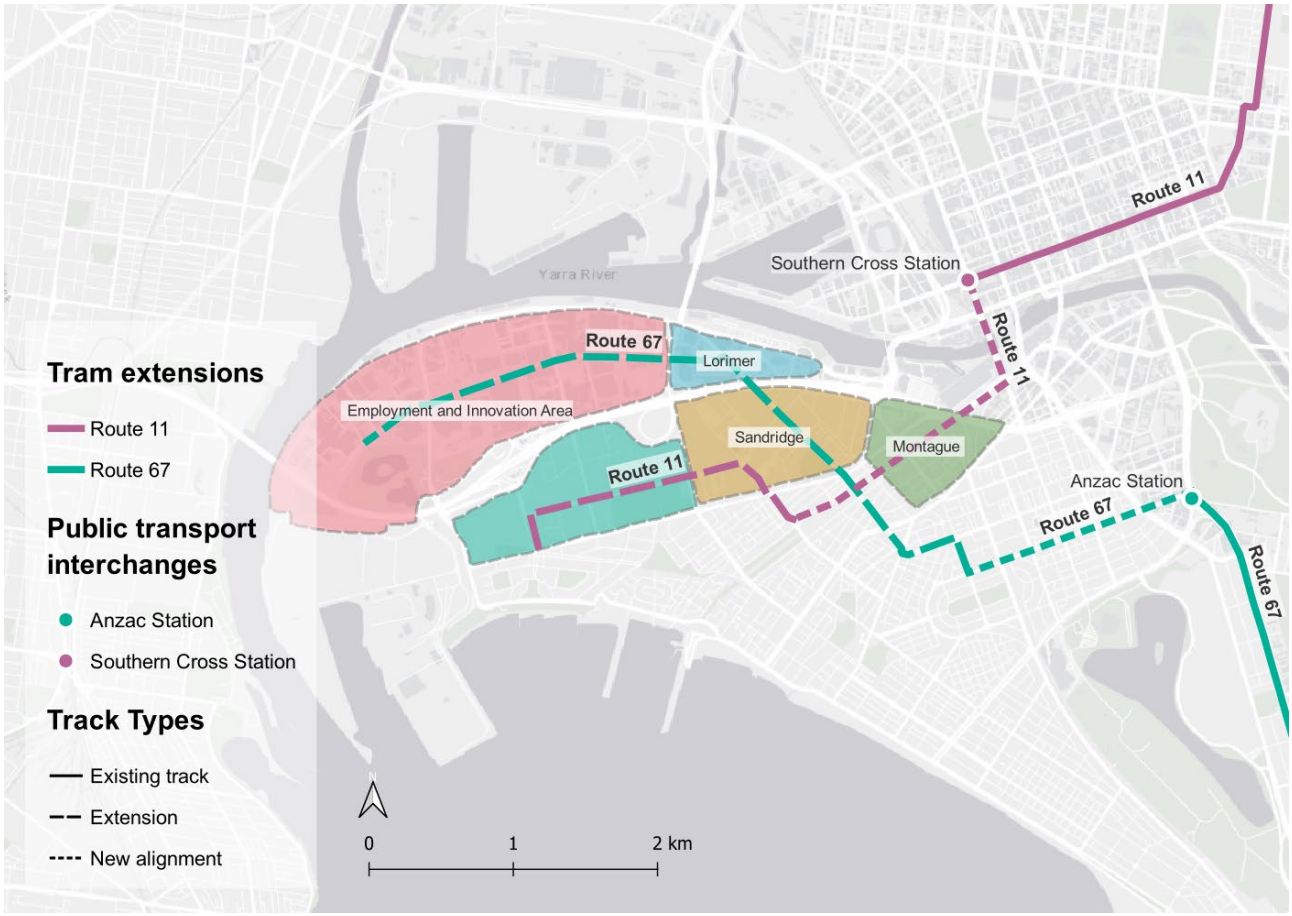
Anzac Station is one of Melbourne's newest public transport interchanges. This connection will allow Fishermans Bend residents to easily change to other tram routes and the Metro Tunnel train services. This provides better access to local shopping and entertainment areas at Port Melbourne and South Melbourne including the Melbourne Sports and Aquatic Centre. It will also increase access to jobs and services along St Kilda Road including the Alfred Hospital precinct. Changing to other public transport services at Anzac station will provide direct access to Monash and Melbourne Universities. It will also give access to a range of shopping streets including Toorak Road, Chapel Street and Acland Street.

The 2025 *Fishermans Bend integrated transport plan* includes new bus connections to Anzac station.[128] Our modelling shows that tram services to Anzac station are also attractive and become overcrowded in the 2041 peak periods. A tram service could also provide more capacity and a higher quality service than a bus. This can encourage more land use development. A tram connection should be considered by government as part of business case development for the project.

Our modelled tram routes also provide an easier connection to Fishermans Bend for people living in south-east Melbourne. This makes Fishermans Bend more attractive for work, education and leisure.

We recognise that some stakeholders may prefer different tram routes. These could be new tram routes or changes to existing tram routes. The 2025 integrated transport plan does not state what existing tram services would be reconfigured to accommodate the extensions to Fishermans Bend. Our aim is to support timely delivery and broader network benefits. We have identified 2 tram routes that provide significant benefits at a lower cost than the 2018 framework. The Victorian Government's updated integrated transport plan also has lower cost tram routes compared to the 2018 framework. We welcome the government reviewing, consulting on, and refining the specific routes during development of the business case.

Figure 10: Fishermans Bend tram extensions with the 5 Fishermans Bend precincts



Source: Infrastructure Victoria

Fishermans Bend trams project will deliver large benefits

Extending tram services into Fishermans Bend will significantly improve public transport services within this precinct. This will help address excess future demand for bus services and road congestion.

Our project case modelling results indicate there will be strong demand for both Fishermans Bend tram services. Many people will choose to use public transport rather than driving. Public transport users will now have a choice to get to Fishermans Bend by tram or bus. Some users will transfer onto these services from other tram, bus or rail services. This could include changing from a train service at Southern Cross to the route 11 tram or Lorimer Street bus heading towards Fishermans Bend.

In 2031, the Fishermans Bend trams project will mean 7,500 fewer car trips and 6,300 more public transport trips on an average weekday. These results are shown in Table 11. The *Strategic transport modelling of tram and train projects* report provides more detail on the Fishermans Bend trams transport modelling results.[129]

This project will increase access to public transport services within Fishermans Bend and other suburbs along these tram routes. This benefits residents of these areas as shown in Figure 11. Figure 11 uses a relative scale to demonstrate whether users are positively or negatively impacted by the project.

Most users are positively impacted with the introduction of the new tram services. This includes those whose trips start elsewhere in Melbourne and then change to use the tram services to get to Fishermans Bend. There are some people that are slightly negatively impacted. Some tram users on parts of St Kilda Road may have to wait for the next tram to get to the city as the route 67 tram will now go to Fishermans Bend rather than the city. There may also be some localised effects in Fishermans Bend where some people may have to walk slightly longer to get to their service or may potentially need to change trams.

Table 11: Change in travel from Fishermans Bend trams project

Change in travel from Fishermans Bend trams project (on an average weekday)	2031	2041
Change in daily public transport trips	+6,300	+12,600
Change in daily public transport hours travelled	+5,800	+8,300
Change in daily car trips	-7,500	-15,400
Change in daily car vehicle kilometres travelled	-88,400	-138,900

Source: AECOM Strategic transport modelling of tram and train projects, Table 21, p 52

Figure 11: Impacts of the Fishermans Bend trams project for residents in different parts of Melbourne (morning peak, Year 2031)

Source: Infrastructure Victoria analysis of AECOM transport modelling outputs

More tram services will deliver billions in benefits

We estimate the benefits from the Fishermans Bend trams project are between $1.6 billion and $3.3 billion present value in 2025 dollars. Around half of the benefits are from the increased access to public transport services. Road users also benefit from the project, even if they choose to continue to drive. This is due to reduced road congestion from other people using the new tram services rather than their cars. People using public transport instead of driving also provides environmental benefits, reduces the number of accidents, provides health benefits and other benefits to the economy.

The Fishermans Bend trams project will also benefit businesses and the economy. They will support clustering of businesses and employees within Fishermans Bend. They can also support broader workforce participation. Estimates of each benefit are shown in Table 12.

Table 12: Benefits from the Fishermans Bend trams project, present value 2025 dollars

Benefit	Lower estimate 7% discount rate ($million)	Upper estimate 4% discount rate ($ million)
Consumer surplus (roads): benefits for road users due to less road congestion	377	668
Consumer surplus (public transport): improved access to public transport services	829	1,418
Environmental externalities: environmental benefits from people using trams rather than cars. This includes lower greenhouse gas emissions, better air quality and less noise pollution	114	206
Crash cost savings: better road safety from fewer cars. This includes lower healthcare, emergency response and property damage costs due to fewer car accidents.	46	82
Active transport benefits: health benefits from walking or cycling to and from the tram or train station. The benefits also include reduced healthcare system costs.	121	218
Residual asset value: the longer-term benefits beyond the evaluation period.	34	89
Wider economic benefits: benefits to the economy from improving transport connections between businesses and employees	122	643
Total project benefits	**1,643**	**3,324**

Source: Infrastructure Victoria analysis of AECOM economic evaluation

We have not included public infrastructure cost savings in the Fishermans Bend evaluation. The 2018 *Fishermans Bend framework* is forecasting significant population and employment growth.[130] For this assessment, we have assumed these tram extensions will not encourage any further housing or other land use development beyond that already planned.

We estimated costs for the Fishermans Bend trams project

We estimate the infrastructure works for the Fishermans Bend trams project will have a capital cost between $1.1 billion and $1.5 billion in 2025 dollars. This estimate is not discounted. This is the cost to construct 7.9 kilometres of new tram tracks, new accessible tram stops, power systems, tram depots and other associated infrastructure including crossing over the West Gate Freeway. It also includes land costs for tram depots.

Fewer new trams need to be purchased for these tram extensions than new tram lines. This is because the project redirects trams that would have otherwise travelled along Swanston Street and St Kilda Road corridor. This follows the opening of the Melbourne Metro Tunnel which significantly increases public transport capacity on this corridor.

The project will also have operating costs. These are the costs to run the tram services. They include staff, electricity, and tram and track maintenance. We estimate the operating costs will be between $5.2 million and $7.2 million each year.

These are the construction and operations costs in today's values. Once discount rates are applied, we estimate the project costs to be between $1.1 billion and $1.3 billion. Cost estimates with discount rates applied are shown in Table 13.

Our cost estimates are based on construction starting in 2027 and finishing in 2029. The tram services would start in 2030. Present value costs are for the whole 30-year evaluation period until 2060.

To help meet these costs, the Australian Government may also contribute funding as it supports broader national priorities regarding housing and improving economic outcomes. In particular, high value industries and research facilities that make an important contribution to the national economy are located in the employment precinct.[131]

Table 13: Discounted project costs for Fishermans Bend trams, present value 2025 dollars

	High-cost estimate ($ million) *Costs for the lower benefit cost ratio result*	**Middle-cost estimate ($ million)** *Costs for the upper benefit cost ratio result*
Infrastructure costs	1,186	999
Operating costs	69	76
Total costs	**1,255**	**1,075**

Source: Infrastructure Victoria analysis of AECOM economic appraisal of tram projects

Note: We used the high-cost estimate to calculate the lower benefit cost ratio result. This is because larger costs reduce the benefit cost ratio. Higher discount rates also generally reduce the benefit cost ratio. We used a discount rate of 7% to calculate the lower benefit cost ratio. Therefore, we discounted the high-cost estimates using a rate of 7%. Higher discount rates lower the present value of cashflows that occur further into the future. This is why the discounted operating costs are lower in the high-cost estimate than the middle-cost estimate, even though the real or undiscounted values are higher. We discounted the middle-cost estimate using a 4% discount rate. See the We applied consistent parameters and assumptions across the 3 projects section.

Summary of strategic economic evaluation results for the Fishermans Bend trams project

This project has a positive benefit cost ratio range, with the majority of sensitivity tests indicating a positive outcome. We estimate the Fishermans Bend trams project could provide between $1.30 and $3.10 of benefits for every dollar spent. This evaluation assumed that tram services will start in 2030. See Table 14.

A range of sensitivity tests were undertaken for the project which showed the project would provide net benefits under a range of different scenarios. See Appendix B for more details.

Table 14: Summary of Fishermans Bend strategic economic evaluation results

	Lower estimate	Higher estimate
Total benefits (millions)	$1,643	$3,324
Total costs (millions)	$1,255	$1,075
Net present value (millions)	$388	$2,249
Benefit cost ratio	1.3	3.1

Note: All dollar values are present value totals

Source: Infrastructure Victoria analysis of AECOM economic evaluation

There are opportunities for more benefits to be realised

Our analysis has tested Fishermans Bend tram routes that are alternatives to the government's proposed routes and found they are economically beneficial.

Providing trams to Fishermans Bend sooner can give investors, institutions and developers confidence in transport access. This can help to speed up the delivery of the current development pipeline of 15,000 dwellings.[132]

There are opportunities to further increase the benefits of the project. These include:

- The Fishermans Bend tram extension to Anzac station involves developing a new tram corridor between Williamstown Road, Port Melbourne and Park Street, South Melbourne. There may also be further opportunities to provide additional housing and urban renewal along this corridor which the government should investigate as part of the next stage of this project.
- Our modelling shows our route 67 tram to Fishermans Bend will be overcrowded in the morning and afternoon peaks by 2041. Additional services may be needed to meet this demand. The 2025 *Fishermans Bend integrated transport plan* proposes that Anzac Station be connected to Fishermans Bend by bus. The Victorian Government should consider planning for a tram option.
- When looking at tram route options to Fishermans Bend, it is worth considering whether some existing city routes could be extended or redirected. In particular, sections of tram routes that have fewer passengers could be diverted to serve Fishermans Bend. This could reduce the need for new trams. Our economic assessment modelled diverting tram route 67 away from Swanston Street to Fishermans Bend, but there may be other opportunities.
- New tram tracks on Park Street between Kings Way and Clarendon Street could also be used for an additional tram route that is within recommendation 8 of *Victoria's infrastructure strategy 2025–2055*. This recommendation involves diverting one St Kilda Road tram route at Anzac Station onto Park and Clarendon Streets, and then through the city to Kensington. This is shown in Figure 12 as tram route 5. It

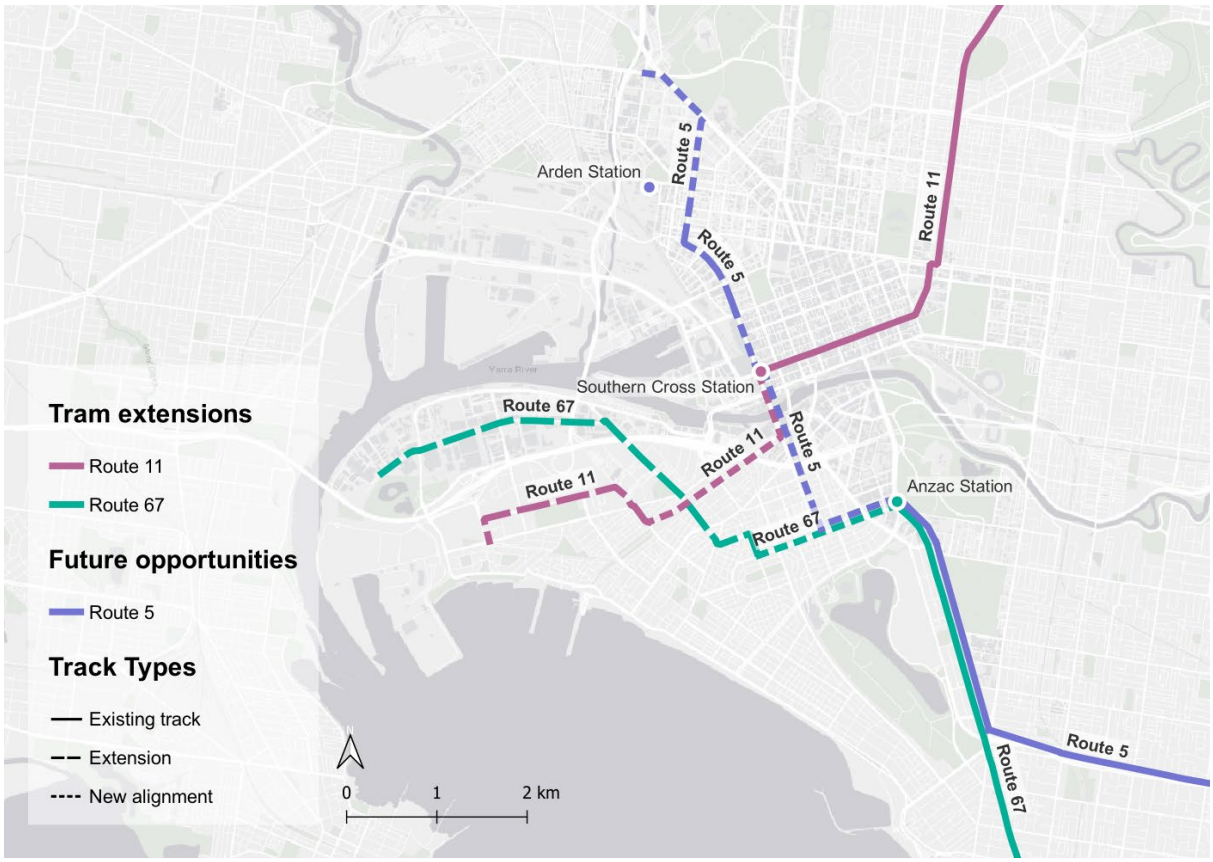
will also be within walking distance of the eastern parts of Fishermans Bend. There may be an opportunity to share costs between this project and the Fishermans Bend tram route.

Considering these and other potential tram network changes should be undertaken as part of planning and developing the finalised routes for extending trams to Fishermans Bend.

We welcome government undertaking further analysis and stakeholder engagement as part of the next phase of project development, including detailed planning to confirm the most suitable routes.

We recommend the government starts building tram extensions to Fishermans Bend by 2030 to ensure the continual delivery of more homes and jobs in inner Melbourne.

Figure 12: Further opportunities for the Fishermans Bend trams



Source: Infrastructure Victoria

Middle suburbs tram extensions

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

The Victorian Government has committed to building 800,000 more homes in Victoria in the next 10 years. It is aiming for 70% of new homes to be built in established suburbs and 30% to be built in growth areas.[133] The government estimates 2.24 million more homes need to be delivered by 2051.[134] Of these, 686,500 are proposed to be built in Melbourne's middle suburbs.[135]

Yet only half of Melbourne's new homes approved between 2022 and 2024 were in established suburbs.[136] This trend is creating a more dispersed city. Melbourne is one of the lowest population density cities in the world, with recent comparisons showing it is even lower than Los Angeles.[137] Melbourne has around half the population density of Paris, despite being about the same geographic size.[138]

Our research *Choosing Victoria's Future* showed more compact cities – where people live nearer their workplace – are better for the economy, people and the environment. More compact cities can give Victorians the best chance of living close to family and friends, jobs, education, shops and services. It can also mean businesses have more opportunities to find skilled workers and be closer to their potential and existing customers.

Our research *Our home choices* found one in 5 people would trade a larger house and land size to live in an established suburb in Melbourne in a medium density home, if it was available at a more comparable price to greenfield areas.[139]

The capital cost of public infrastructure is $59,000 less per dwelling in a compact city compared to a more dispersed city.[140] This means there can be public infrastructure cost savings if residential development occurs in established suburbs rather than growth areas.

The government has identified 60 train and tram activity centres to help deliver more than 300,000 more homes across Melbourne by 2051.[141] Train and tram activity centres target parts of Melbourne that have access to public transport services that can accommodate more passengers, or have projects that are planning or delivering additional public transport passenger capacity. In selecting these locations, the government also considered access to jobs and services, the ability for the market to deliver within the medium term, and avoiding local environment constraints such as flooding risks.[142] Many of these are located in the south-east, east and northern parts of Melbourne's middle suburbs.

Public transport connections to activity centres support more housing choices and a more compact city

Access to trams can be an important catalyst for higher density housing. A Melbourne study found apartments are more likely to be built in areas that are well served by public transport.[143]

But gaps in the public transport network – including between trams and trains – limit where people can travel to without a car. These limitations restrict people's access to jobs and services. Some of these gaps are located in areas close to where new activity centres have been designated. Addressing these connectivity gaps with incremental tram extensions can provide public transport users with significantly more choice as to where they can get to.

We identified 4 tram extensions[2] that can encourage new homes, improve access to jobs and increase public transport use. They can improve transport connectivity and support greater housing density. These tram extensions address gaps in the existing public transport network and connect to identified activity centres. In this report we refer to these 4 tram extensions as the middle suburbs tram extensions project. The tram route extensions are shown in Figure 13 and detailed in Table 15.

The middle suburbs tram extensions support a more compact city. They do this by improving connectivity to employment centres, current train stations and the future Burwood Suburban Rail Loop train station. They will give people more choice and greater access to opportunities. If accompanied by planning zone changes, this can encourage additional housing to locate beside these new links and along the existing tram routes. We estimate that there could be an additional 32,000 houses in 2041 in these areas compared to our base case, with an estimated 71,000 people living in those additional houses.

Figure 13: Activity centres and precincts near middle suburb tram extensions

Source: Infrastructure Victoria, Plan for Victoria

The middle suburbs tram extensions each link to an employment and activity precinct as shown in Table 15. The extensions are relatively small changes. Combined, they add 11.6 kilometres to the existing 250 kilometre tram network.[144] These small extensions significantly improve employment accessibility and opportunities to increase population density.

In our assessment, we assumed existing service frequencies are maintained after the routes are extended. This means a tram service every 8 minutes in the morning and afternoon peak periods, and every 10 to 15 minutes outside of this.

[2] We have treated the route 55 and 58 changes as one route extension as changes to these 2 routes enable the extension. The AECOM *Strategic transport modelling of tram and train projects* and *Economic appraisal of tram projects to inform Victoria's infrastructure strategy 2025-2055* referred to 5 projects because they count the Route 55 and 58 changes separately.

Table 15: Employment and activity centres connected to middle suburbs tram extensions

Existing Route	Extension	Activity centres	Opportunity
3: East Malvern to University of Melbourne	East Malvern to Hughesdale via Chadstone Tram tracks extended by 3.7 km from East Malvern Terminus to Hughesdale	Chadstone shopping centre Hughesdale Station East Malvern Station	• Chadstone shopping centre is also becoming a substantial employment and lifestyle destination. It has approximately 9,000 car parks and is well served by buses but not by train or tram. There are also commercial office towers and low-rise offices nearby. • There are also several activity centres along the Glen Waverly and Cranbourne/ Pakenham railway lines that would benefit from this connectivity to Chadstone. • There is an opportunity that this extension could catalyse the delivery of housing for an additional 11,500 people by 2041.
58: West Coburg to Toorak Note 1	Melville Road to Batman train station in Coburg / Toorak to Batman Station Tram tracks extended 2.6 km from West Coburg Terminus to Batman Railway Station	Nearest activity centre is Coburg.	• There are redevelopment opportunities at sites that include low density residential houses on large blocks south of Gaffney Street and industrial and commercial land to the north of Gaffney Street. • Tram route 58 currently terminates on Bell Street at West Coburg some distance away from Gaffney Street. Bell Street is expected to experience significant congestion by 2041 and there is limited room for priority bus lanes along Bell Street. • Extending tram 58 to Batman Station will improve connectivity and catalyse development along Gaffney Street. • There is an opportunity that this extension could catalyse the delivery of housing for an additional 5,500 people by 2041.
70: Wattle Park to Docklands	Wattle Park to Burwood East Tram tracks extended 1.3 km from Wattle Park Terminus to Burwood Highway and Elgar Road. Existing tram tracks from Elgar Road to Burwood East would be used for this service extension.	Burwood East and future Suburban Rail Loop station and activity centre	• There are several sites along the Burwood Highway and northern parts of the Deakin University campus that a tram could catalyse. • The SRL vision for Burwood is to renew the established neighbourhoods and create more residential diversity, amenity and provide more employment opportunities. • The new Burwood SRL station will significantly improve access to Deakin University and Melbourne's middle suburbs and key destinations. This tram extension will provide access to SRL. • Tally Ho Business Park in Burwood East is a major employment area. • There is an opportunity that this extension could catalyse the delivery of housing for an additional 36,300 people by 2041.

Existing Route	Extension	Activity centres	Opportunity
68: East Brighton (Note 2)	East Brighton to Moorabbin Tram tracks extended 4.0 km from East Brighton Terminus to Moorabbin	Moorabbin	• Many larger sites on the eastern side of Nepean Highway that could be transformed to provide higher density housing and mixed use. These sites have their frontage facing a service road which will make property access less disruptive to traffic • Providing direct access to Moorabbin's destinations will help catalyse development along the tram route extension. Moorabbin has a mix of commercial, civic and residential land uses in the activity centre and its catchment. The route would continue to the Holmesglen Institute of TAFE and Holmesglen Private Hospital. • Moorabbin has a busy train station and a variety of bus services. Currently, the Route 64 terminates at Hawthorn Road/Nepean Highway, leading to a 3 kilometre walk or multiple bus transfer to Moorabbin Station. • There is an opportunity that this extension could catalyse the delivery of housing for an additional 18,100 people by 2041.

Source: AECOM Strategic transport modelling of tram and train projects

Note 1: Tram 58 currently operates from West Coburg to Toorak. It travels directly along Toorak Road to St Kilda Road. A new tram route 55 has been modelled in future years to operate from West Coburg to South Yarra. It follows the same alignment from West Coburg to Anzac station, then deviates onto Domain Road and Park St, South Yarra.

Note 2: Currently, tram route 64 is from East Brighton to the University of Melbourne. Route 68 has been modelled in future years to travel from East Brighton to Kew along Hawthorn and Glenferrie Roads

Note 3: Opportunities for further housing was considered in a sensitivity test.

Accessibility improvements drive demand and benefits

Our modelling results show more people travelling on all 4 tram extensions.[145] It shows 3,800 more public transport trips and 4,500 fewer car trips each day. This means the overall distance travelled on all 4 routes increases by 22% on a typical weekday in 2041.

The reduction in car trips is due to several factors. Some people switch to public transport, walking or cycling[3]. Others can now reach new destinations by tram where they can do more things at that one location. This means they can do one tram trip, rather than a number of short car trips to different locations.

Table 16 and Table 17 show a summary of the modelling results. More detail is included in the *Strategic transport modelling of tram and train projects* report.[146]

[3] Note: The transport model focuses on motorised trips by private vehicles and public transport trips. It calculates the mode share of walking and cycling trips but does not model them onto the network.

Table 16: change in travel from middle suburbs tram extensions project

Change in travel from middle suburbs tram extensions project (on an average weekday)	2031	2041
Change in daily public transport trips	+5,300	+3,800
Change in daily public transport hours travelled	+6,100	+3,000
Change in daily car trips	-6,100	-4,500
Change in daily car vehicle kilometres travelled	-57,200	-54,400

Source: AECOM Strategic transport modelling of tram and train projects, Table 21, p 52

Table 17: Change in tram passenger kilometres travelled from the middle suburbs tram extensions

Tram route number	Tram extension	Increase in kilometres travelled	Percentage increase
3	East Malvern to Hughesdale via Chadstone	21,200	27.7%
55 / 58	Melville Road to Batman train station in Coburg / Toorak to Batman Station	18,700	6.9%
68	East Brighton to Moorabbin	20,300	44.8%
70	Wattle Park to Burwood East	44,400	60.2%
Total		**104,600**	**22.3%**

Source: AECOM Strategic transport modelling of tram and train projects, Table 27, p 56

The middle suburbs tram extensions improve access to key employment centres and train stations. Our modelling indicates 136,000 more people will be able to access these places. This represents a 7% increase in 2041 when compared with the base case. For example, there is a 20% increase in the number of people who can access Coburg North, including along Gaffney Street. See Table 18 below.

Table 18: Changes to access for key employment centres and train stations from the middle suburbs tram extensions project

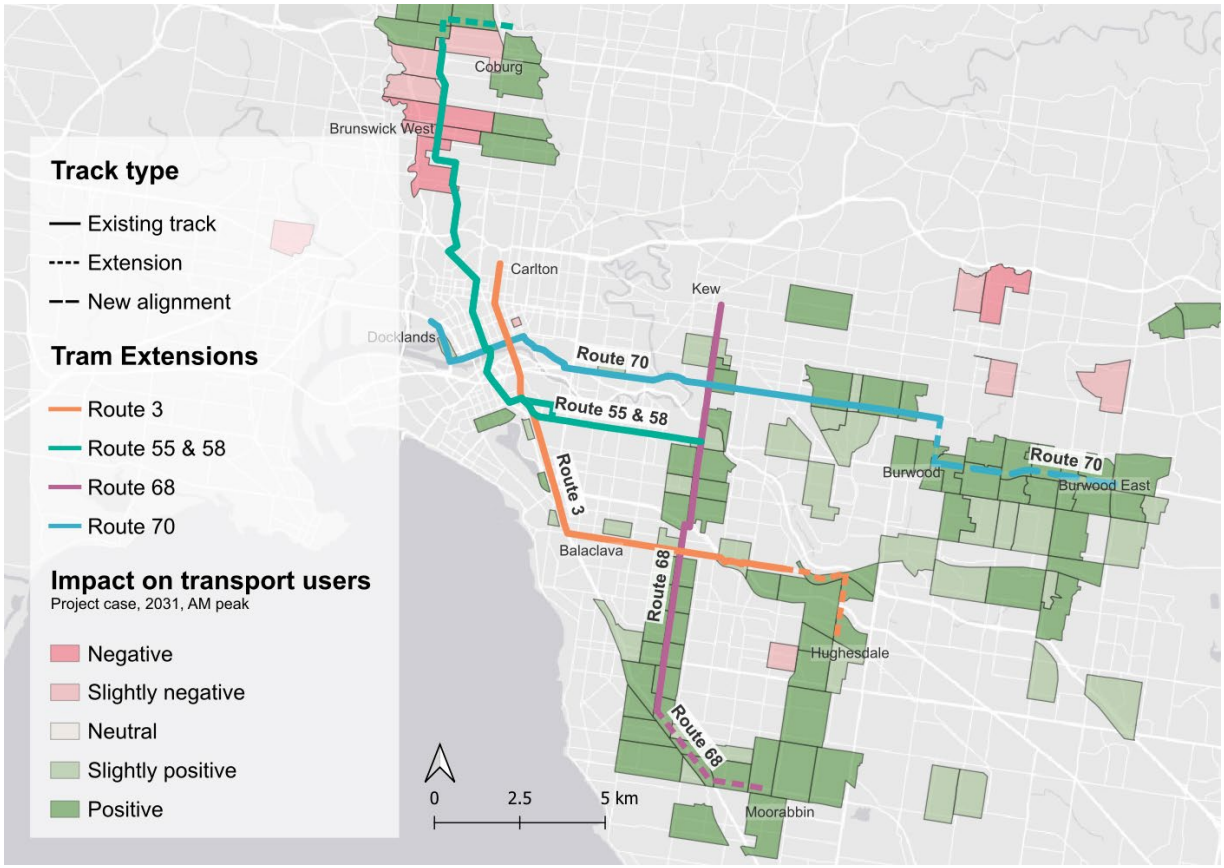
Tram route number	Tram extension	Place	Number of people who can reach the place within 45 minutes using public transport (2041) * Base case	Population within 45 minutes using public transport (2041) * Project case	Increase in accessibility	Percentage increase
3	East Malvern to Hughesdale via Chadstone	Chadstone shopping centre	845,000	883,000	38,000	4.5%
55 / 58	Melville Road to Batman train station in Coburg / Toorak to Batman Station	Coburg North / Gaffney Street	214,000	256,000	42,000	19.6%
68	East Brighton to Moorabbin	Holmesglen TAFE	391,000	400,000	9,000	2.3%
70	Wattle Park to Burwood East	Burwood East (Tally Ho)	520,000	567,000	47,000	9.0%
Total			**1,970,000**	**2,106,000**	**136,000**	**6.9%**

Source: AECOM Strategic transport modelling of tram and train projects, Table 29, p 57

* Note: This is by a public transport journey that may require changing from one public transport trip to another, such as changing from tram to train or bus.

In most areas, the tram extensions led to overall transport benefits. Figure 14 shows areas with an overall benefit or positive impact in green and areas with negative impacts in pink. There are positive impacts in the south eastern suburbs associated with the extensions to Hughesdale, Burwood East and Moorabbin. There are small areas expected to be slightly negatively impacted by the project, such as on parts of the route 58. This is likely to be due to a higher demand from the tram extension to Batman Station causing some existing passengers having to stand rather than getting a seat.

Figure 14: Impact on transport users from the middle suburbs trams extension project for residents in different parts of Melbourne (morning peak, Year 2031)



Source: Infrastructure Victoria analysis of AECOM transport modelling outputs

Trams support more housing in middle suburbs and saves infrastructure costs

This project could catalyse new housing that is not currently in the government's plans. This could help to realise the government's housing targets. Planning zone adjustments would need to be part of the project scope to allow this. See recommendation 7 Rezone locations near existing infrastructure for more home choices in *Victoria's infrastructure strategy 2025-2055*.

Encouraging more development in established suburbs can lead to benefits associated with a more compact city. One example is public infrastructure cost savings. Our *Choosing Victoria's future* found the capital cost of public infrastructure in a 'compact city' was $59,000 less per dwelling compared to a 'dispersed city'.[147] This means there can be public infrastructure cost savings if residential development occurs in established suburbs rather than growth areas. See the section on public infrastructure cost savings in this report.

We recognise that in some places existing local community infrastructure may need to be expanded to serve this growing population. More funding will be needed for schools, kindergartens, open space and community infrastructure in more compact development settings. But this is offset by lower costs for other types of infrastructure including transport and utilities.

There are also different approaches to providing community infrastructure in established suburbs. Our *Getting more from school grounds* report showed opening school grounds could enable nearly half a million more Melburnians to access a community sports field in a 10-minute walk.[148] Our *Learning for life* report found adding more relocatable buildings to existing schools and constructing new buildings at existing schools could reduce the infrastructure costs of providing extra school places.[149]

While estimating public infrastructure cost savings in transport project cost benefit analysis is relatively new, there is increasing interest in considering them. They have been included in the cost benefit analysis for project business cases that have been funded and are now in delivery, such as Suburban Rail Loop.[150]

Middle suburbs tram extensions can deliver big benefits

We estimate the benefits from the middle suburbs tram extensions project are between $1.9 billion and $3.0 billion. Estimates of each benefit are shown in Table 19. The project benefits include public infrastructure cost savings between $1.1 billion and $1.4 billion. This is the largest benefit in our assessment, which highlights the significant value of a more compact city.

The project also provides $681 million to $1.1 billion of benefits for people using public transport and roads. It also provides environmental benefits and reduces the number of accidents because some motorists switch to public transport. Although the modelling shows lower health benefits, they are relatively small as some people that may have walked or cycled may now use the tram for some of their local trips. We have also estimated wider economic benefits.

Table 19: Benefits from the middle suburbs tram extensions project

Benefit	Lower estimate 7% discount rate ($ million)	Upper estimate 4% discount rate ($ million)
Consumer surplus (roads): benefits for road users due to less road congestion	519	840
Consumer surplus (public transport): improved access to public transport services	162	262
Environmental externalities: environmental benefits from people using trams rather than cars. This includes lower greenhouse gas emissions, better air quality and less noise pollution	33	54
Crash cost savings: better road safety from fewer cars. This includes lower healthcare, emergency response and property damage costs due to fewer car accidents.	13	20
Active transport benefits: health benefits from walking or cycling to and from the tram or train station. The benefits also include reduced healthcare system costs.	-3	-8
Residual asset value: the longer-term benefits beyond the evaluation period.	42	111
Wider economic benefits: benefits to the economy from improving transport connections between businesses and employees	61	307
Public infrastructure cost savings: infrastructure cost savings if residential development occurs in established suburbs rather than greenfield sites	1,096	1,426
Total project benefits	**1,923**	**3,011**

Source: Infrastructure Victoria analysis of AECOM economic evaluation

We estimated the costs for the middle suburbs tram extensions project

We estimate the middle suburbs tram extensions infrastructure will have a capital cost between $1.5 billion and $2.0 billion in 2025 dollars. This estimate is not discounted. This is the cost to construct 11.6 kilometres of new tram tracks, new or upgraded accessible tram stops, upgraded signalling, power systems, tram depots and other associated infrastructure. It also includes land costs for tram depots.

The project will also have operating costs. These are the costs to run the services including maintaining the extra trams needed for this project, replacing these new trams at the end of their operating life, staff, electricity, and tram and track maintenance. We estimate the operating costs will be between $15.4 million and $21.6 million each year.

Once discount rates are applied, we estimate the total project costs to be between $1.6 billion and $1.8 billion. The total cost estimates include both capital and operating costs and have discount rates applied are shown in Table 20.

Our cost estimates are based on construction starting in 2027 and finishing in 2029. The tram services would start in 2030. Present value costs are the whole 30-year evaluation period until 2060. We assumed that service frequencies would not change.[151]

To help meet these costs, the Australian Government may contribute funding as it supports broader national priorities regarding providing more housing.[152] The government should review and refine the project costs as part of further detailed planning for this project.

Table 20: Discounted project costs for middle suburbs tram extensions, present value 2025 dollars

	High-cost estimate ($ million) *Costs for the lower benefit cost ratio result*	**Middle-cost estimate ($ million)** *Costs for the lower benefit cost ratio result*
Infrastructure costs	1,603	1,350
Operating costs	205	228
Total costs	**1,808**	**1,578**

Source: Infrastructure Victoria analysis of AECOM economic evaluation

Note: We used the high-cost estimate to calculate the lower benefit cost ratio result. This is because larger costs reduce the benefit cost ratio. Higher discount rates also generally reduce the benefit cost ratio. We used a discount rate of 7% to calculate the lower benefit cost ratio. Therefore, we discounted the high-cost estimates using a rate of 7%. Higher discount rates lower the present value of cashflows that occur further into the future. This is why the discounted operating costs are lower in the high-cost estimate than the middle-cost estimate, even though the real or undiscounted values are higher. We discounted the middle-cost estimate using a 4% discount rate. See the We applied consistent parameters and assumptions across the 3 projects section.

Summary of strategic economic evaluation results for the middle suburbs tram extensions project

We estimate the middle suburbs tram extensions project provides between $1.10 and $1.90 of benefits for each dollar spent. The results of our evaluation are shown in Table 21.

A range of sensitivity tests were undertaken for the project which showed that the project would provide net benefits under a range of different scenarios. See Appendix B for more details.

Table 21: The Middle suburbs tram extensions show a positive cost benefit

	Lower estimate	Higher estimate
Total benefits	$1,924 million	$3,011 million
Total costs	$1,808 million	$1,578 million
Net present value	$116 million	$1,433 million
Benefit cost ratio	1.1	1.9

Source: Infrastructure Victoria analysis of AECOM economic evaluation

Delivering more homes near tram extensions can deliver even more benefits

Our main assessment of the middle suburbs tram extensions included public infrastructure cost savings from reduced development in outer suburban growth areas. It did not include any transport benefits of having fewer residents and less travel in the outer suburban growth areas. These transport benefits would include further road congestion relief in outer suburban growth areas in addition to that in the main assessment.

These transport benefits are not included in our main assessment because they are very sensitive to which specific housing locations people are choosing between. They are also sensitive to the way in which people relocate houses. For example, individual people may not choose to relocate directly from a house in an outer suburban growth area to a house in one of these middle suburbs. Rather, a series of house relocations by multiple different people may collectively result in more people living in these middle suburbs and fewer people living in the outer suburban growth areas. This is often referred to as a vacancy chain.[153]

Our research *Our home choices* found one in 5 people would choose to live in a medium density home in an established suburb, if it was available at a more comparable price to greenfield areas.[154]

As part of the middle suburbs tram extension assessment, we modelled a scenario where residents chose to live in established suburbs instead of the northern and south-eastern growth areas. We modelled a sensitivity test which in 2041 had around 71,000 people living in these middle suburban tram corridors, rather than outer suburban growth areas of Melbourne. This is equivalent to about 32,000 more homes or 5% of the middle suburbs' 2051 housing target.[155] The number of additional people by each tram extension is presented in Table 22. The total population of Melbourne remained the same, so the scenarios were comparable. It was only where some people lived that changed between the scenarios.

In this sensitivity test, there are more cars in the middle suburbs due to the increase in people living there. We assume households that relocate from growth areas would own a similar number of cars per household to those who already live near existing tram lines.[156] Residents in middle suburbs also typically drive less than those living in outer suburban growth areas. The combined impact means there would be fewer cars on the road, resulting in less congestion across Melbourne. Some residents switch their travel mode from car to public transport because of additional tram services provided by the project. This results in further congestion relief from the relocated households.

We found adding this further congestion relief to the other benefits in our main assessment, a benefit cost ratio of up to 6.3 is likely. This estimate uses a discount rate of 7% and a middle-cost estimate.

Including urban consolidation benefits within economic evaluations is a more recent development. There is greater uncertainty in the estimates of these benefits than other benefits of the project. Despite this uncertainty, we think the project can achieve further benefits if it combined with land use planning zone changes that allow additional homes to be built. Reducing compulsory minimum parking requirements for these areas surrounding the tram extensions can also lower the cost of building housing and reduce car travel in the area, reducing road congestion.[157]

Table 22: Changes to local population in 2041

Tram route	Tram extension	Increased local population
3: East Malvern to University of Melbourne	East Malvern to Hughesdale via Chadstone Tram tracks extended by 3.7 km from East Malvern Terminus to Hughesdale	11,500
58: West Coburg to Toorak (Note 1)	Melville Road (West Coburg) to Batman train station in Coburg Tram tracks extended 2.6 km from West Coburg Terminus to Batman train station	5,500
70: Wattle Park to Docklands	Wattle Park to Burwood East Tram tracks extended 1.3 km from Wattle Park Terminus to Burwood Highway and Elgar Road	36,300
68: East Brighton (Note 2)	East Brighton to Moorabbin Tram tracks extended 4.0 km from East Brighton Terminus to Moorabbin	18.100
Total		**71,400**

Source: AECOM Strategic transport modelling of tram and train projects

Note 1: Tram 58 currently operates from West Coburg to Toorak. It travels directly along Toorak Road to St Kilda Road. A new tram route 55 has been modelled in future years to operate from West Coburg to South Yarra. It follows the same alignment from West Coburg to Anzac station, then deviates onto Domain Road and Park St, South Yarra.

Note 2: Currently, tram route 64 is from East Brighton to the University of Melbourne. Route 68 has been modelled in future years to travel from East Brighton to Kew along Hawthorn and Glenferrie Roads

There are opportunities for more benefits to be realised

We estimated that, for each dollar invested, the middle suburbs tram extensions project would provide benefits between $1.10 and $1.90. But we think there are opportunities for much higher benefits. The realised benefits of the project depend on how many more homes are built along the tram corridors and if this reduces development in outer growth areas.

We estimate this project can catalyse the delivery of around 32,000 new homes in Melbourne's middle suburbs.[158] This is about 5% of the middle suburbs' 2051 housing target of 686,500 new homes.[159]

Realising these benefits will require planning zone changes and related policy measures to enable denser housing development along these tram extensions. This should include reducing compulsory minimum parking requirements for these areas to support lower car ownership.[160]

Our assessment has shown that this project has strong merit, but there are opportunities to further increase the benefits of the project. These include:

- The sensitivity test has shown there are significant benefits if reduced car ownership can be realised. The Victorian Government should encourage this by providing higher quality walking and cycling infrastructure and reducing compulsory minimum parking requirements for these areas.[161] This will help ensure that active transport is an attractive choice for shorter trips. Mixed use developments that offer additional housing and a broader range of retail and other services within walking distance will also support this outcome. The Victorian Government should consider opportunities for land use planning and zoning changes as part of planning for these tram extensions.

- Further improvements to bus services could also expand the number of destinations accessible by public transport. Some metropolitan railway lines connected to these tram extensions, such as the Upfield line which includes Batman Station also need upgrades to accommodate more public transport users as the population grows (See strategy recommendation 12 upgrade train infrastructure and run more services in Melbourne's north).

- Additional community infrastructure to support population growth may also be required, which could include expanding existing facilities, such as surrounding schools for open space.

We encourage the government to consider opportunities to realise further benefits associated with these tram routes as it plans activity centres that these tram routes pass through or nearby to. This can be done through further analysis and stakeholder engagement as part of the next phase of project development.

We recommend the government starts building the middle suburban tram extensions by 2030 to help support their stated goal for more housing in Melbourne's established suburbs.

All 3 projects have the potential to provide overall benefits

The results of our strategic economic evaluation show all 3 projects have economic, social and environmental benefits.

We completed a strategic economic evaluation of 3 projects. These projects are recommended in *Victoria's infrastructure strategy 2025–2055*:

- Melton electrification (included in recommendation 11)
- Fishermans Bend trams (included in recommendation 8)
- Middle suburban tram extensions (included in recommendation 8).

A summary of the projects is provided in Table 23.

The results of our strategic economic evaluation show all 3 projects have economic, social and environmental benefits. The positive net present values and benefit cost ratios above one show this. They indicate strong potential value for money. See Table 24.

For the middle suburbs trams extensions, for each dollar invested, there would be a return of between $1.10 and $1.90.

We expect the Melton electrification results to be positive once the government's planning and assessment has been further developed. As part of our assessment, we identified low-cost opportunities which are likely to add to the benefits of the project such as improved access to stations and urban infill opportunities. These factors were not modelled in our strategic assessment. Costs may also be refined with design and mitigation of risks.

Our additional modelling showed the middle suburbs tram extensions project could create significantly more benefits than those in Table 24. These are urban consolidation benefits from encouraging residential development in established suburbs rather than growth areas. This results in significant reductions in road congestion, especially in growth areas. Achieving these benefits requires planning zone changes and related policy measures along these tram extensions. This should include reducing compulsory minimum parking requirements for these areas to support lower car ownership.[162]

Table 23: Summary of 3 projects we evaluated

Project	Scope	Core benefits
Melton electrification project	• Extending electrified metropolitan services to Melton. • Expanding the double-track section between Sunshine and Caroline Springs to 4 tracks. • Constructing 2 new stations at Thornhill Park (Paynes Road) and Mount Atkinson (Hopkins Road). • Reallocating V/Line trains that currently serve Melton to provide more services on the Wyndham Vale line.	• More frequent trains on the Melton and Wyndham Vale lines. • Melton services travelling direct to more places including Melbourne Metro Tunnel railway stations. • More local stations closer to where new residents people live. • Better travel times for Wyndham Vale, Geelong and Ballarat lines. • Reduced road congestion from 14,500 more public transport trips and 16,800 fewer car trips each day in 2031.*
Fishermans Bend trams project	Extending and rerouting 2 existing tram routes: 3 Route 11 Southern Cross Station to Fishermans Bend South. 4 Route 67 Anzac train station to Fishermans Bend North.	• Greater certainty for developers, institutions, employers and future residents to invest to support the achievement of the government's housing and jobs target for the precinct. • 250,000 more people will be able to access jobs at the employment precinct.** • Overcomes uncomfortable crowding on bus routes. • 6,300 more public transport trips and 7,500 fewer car trips that reduces road congestion on an average weekday in 2031.* • These route extensions do not require a new Yarra River bridge.^
Middle suburbs tram extensions project	Extending 4 existing tram routes: • Route 3 extended to Hughesdale via Chadstone. • Route 55/58 extended to Batman train station in Coburg. • Route 70 extended to Burwood East. • Route 68^^ extended from East Brighton to Moorabbin.	• Potential to enable over 32,000 new homes along 12 kilometres of new tram extensions. • Small extensions to nearby activity centres and railway stations save travel time and make public transport more attractive. • 4,500 fewer car trips and 3,800 more public transport trips each day in 2041.* • 136,000 more people will be able to access key employment centres and train stations in 2041.**

Notes on Table 1:
*The reduction in car trips is due to several factors. Some people switch to public transport, walking or cycling. Others can now reach new destinations by public transport where they can do more things at that one location. This means they can do one public transport trip and do more activities at that one location, rather than a number of short car trips to different locations.
** Note: within a 45-minute public transport journey in the morning peak.
^ Note: the tram routes in the 2018 *Fishermans Bend framework* and the previous 2021 infrastructure strategy required a new bridge. The tram routes in the 2025 *Fishermans Bend integrated transport plan* run via Southbank and do not require a new Yarra River bridge.
^^ Note: Tram route 64 currently operates between University of Melbourne and East Brighton terminus. For this evaluation a modified tram route 68 was used.

Source: Infrastructure Victoria

Table 24: Summary of strategic economic evaluation results

	Melton electrification	Fishermans Bend trams	Middle suburbs tram extensions
Total benefits - present value (million)	$4,424 – $8,072	$1,643 – $3,324	$1,924 – $3,011
Total costs -present value (million)	$5,540 – $4,741	$1,255 – $1,075	$1,808 – $1,578
Net present value (million)	-$1,115 – $3,330	$388 – $2,249	$116 – $1,433
Benefit cost ratio	0.8 – 1.7	1.3 – 3.1	1.1 – 1.9

Source: Infrastructure Victoria analysis of AECOM modelling results and AECOM economic evaluation

The Melton electrification project should be completed by 2030 to deliver better public transport to Melbourne's growing western suburbs. The government should start building the Fishermans Bend trams and middle suburbs tram extensions projects by 2030 to encourage new homes nearby.

This is a strategic economic evaluation. We have presented our cost benefit analysis results as a range to reflect this. The government should undertake a more detailed cost benefit analysis for each project as part of a business case. This will allow refinements to the designs to make the most of each project.

Appendix A: Melton electrification economic evaluation

Melton electrification economic evaluation

This appendix covers the details of the Melton electrification project. In this section we:

- provide additional information about the project, including further detail on population growth and proposed service plans
- introduce Infrastructure Victoria's approach to modelling and evaluating this project
- detail our assumptions regarding other transport projects included in our model and how they interact with Melton electrification
- explain the drivers of key transport benefits
- highlight future opportunities to improve project benefits.

Project context and description

The Melton electrification project electrifies the current V/Line railway to Melton to provide frequent, all day services through the Metro Tunnel. The existing tracks would be electrified along the current duplicated section from Caroline Springs to Melton. This involves adding power poles and overhead wires along the tracks.

Two additional tracks would be constructed from Caroline Springs to Sunshine stations. This would bring the total to four tracks in this section. Two of the 4 tracks between Caroline Springs to Sunshine stations would be electrified. The additional 2 tracks would allow newly electrified Melton trains to run on separate tracks to the remaining regional V/Line trains.

Two new stations at Paynes Road and Hopkins Road would be constructed to support recent and planned housing developments in the area. These two new stations would have car parking and bus interchanges.

The project also includes bus service improvements to better connect buses with train services. This includes realigning a feeder service to Paynes Road station, an additional service to Caroline Springs, and two feeder services to Bacchus Marsh station.

Alignment with Plan Victoria, Activity Centre Program and other key places

Cobblebank has been designated a Metropolitan Activity Centre.[163] Planning is currently underway to support a significant regional centre with office, commercial and recreational uses, including a planned stadium, oval and pavilion. A new TAFE facility is under construction in Cobblebank which is due to be completed in 2028.[164]

Cobblebank will also be the location for the new Melton Hospital, a multi-billion dollar project to increase health care access in Melbourne's west.[165] Melton Hospital will be a short walk from the train station. It will feature a new 24-hour emergency department, over 250 hospital beds and the capacity to treat over 130,000 people each year.[166] Construction has begun with an expected completion date of 2029.

The project would allow Melton residents easier access to several priority precincts as identified in Plan for Victoria.[167] Frequent train services will provide residents easy access to Sunshine, Arden, Parkville and the future Suburban Rail Loop precinct at Clayton without changing train services. The government has identified Sunshine as an area for increased employment and designated it a National Employment and Innovation Cluster.[168]

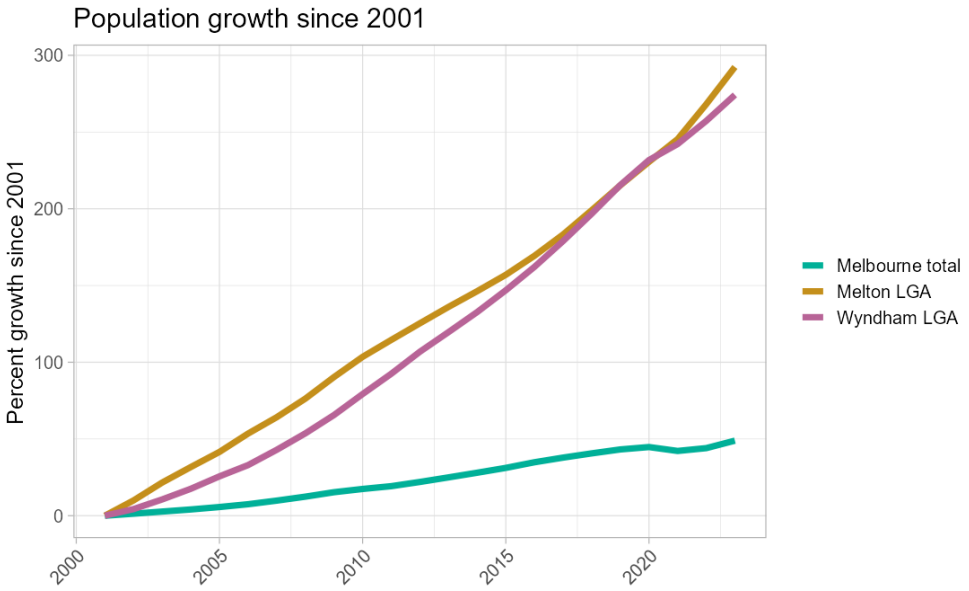
As part of the Activity Centres Program, the Victorian Government has identified 60 centres located around train and tram lines as priority areas for further housing development. Tottenham and West Footscray have both been identified as places for more housing.[169]

Historic population growth

The local government areas of Wyndham and Melton have experienced rapid growth in the past decades. Wyndham has grown from 85,000 people in 2001 to approximately 324,000 in 2024. Melton has grown from 52,000 to 206,000 in the same period.[170]

Figure 1 shows that both Melton and Wyndham local government areas have grown by about 300 percent from 2001 to 2024. These two LGAs are growing much faster than Melbourne in general, with all of Melbourne only growing by 50 percent in the same time.

Figure 1: Forecast increases in population growth from 2026 to 2036



Source: Population estimates by LGA, Significant Urban Area, Remoteness Area and electoral division 2001 to 2024, Australian Bureau of Statistics

Note: Melbourne is defined as the Melbourne Significant Urban Area (SUA).

The rapid population growth has strained the transport networks in these two local government areas. There has been investment through the Regional Rail Link and other road improvements. However, these growing local government areas still have limited transport choices given the size of their population.

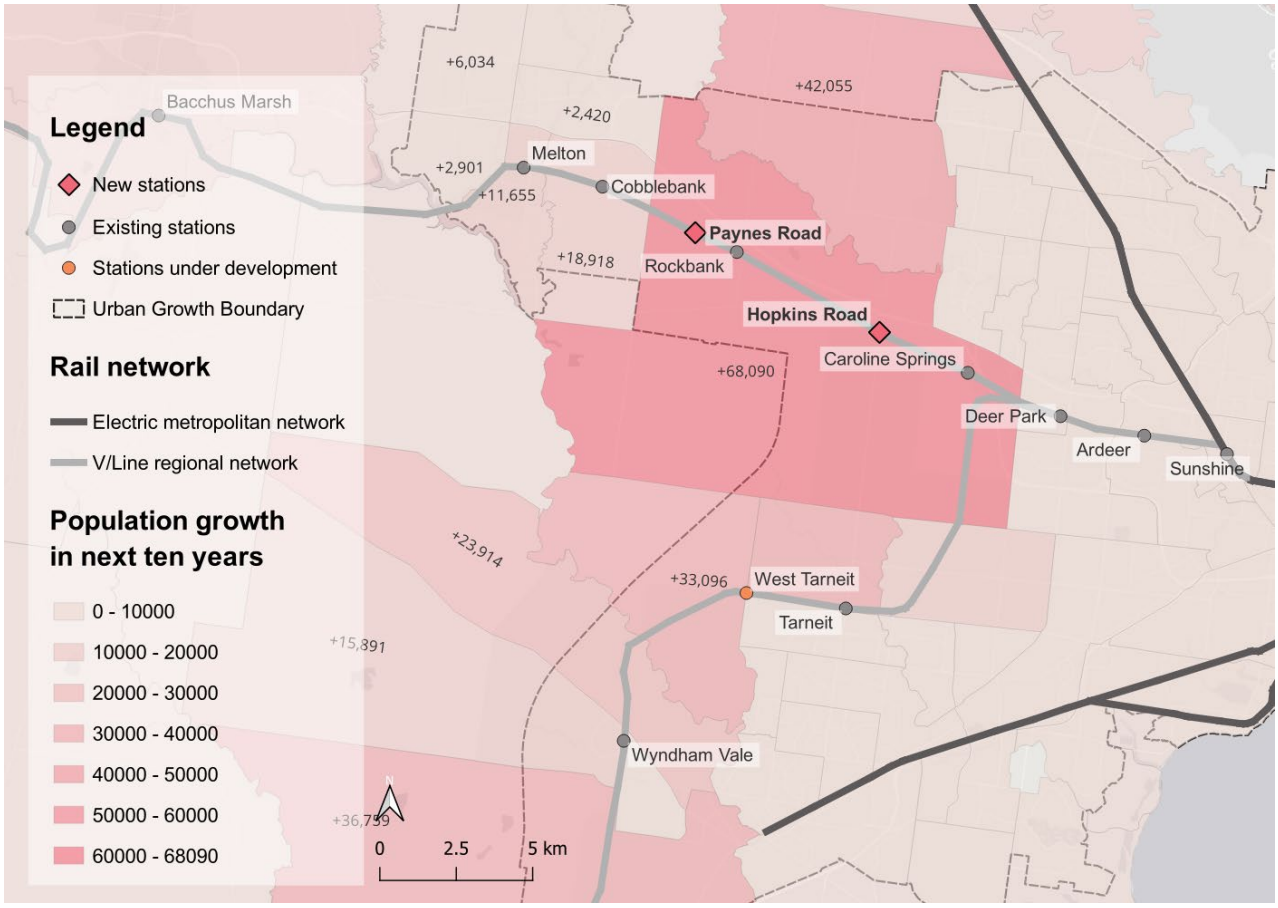
Future population growth

These local government areas are expected to continue growing rapidly over the next 10 years.

Figure 2 shows the expected population growth in Melbourne's west from 2026 to 2036. There is substantial population growth along both the Wyndham Vale and Melton rail corridors. In 2036, it is estimated that 550,000 people will live in areas serviced by these corridors.[171]

Rockbank – Mount Cottrell, is expected to add 68,000 additional residents in the next 10 years to 2036. This corresponds to a growth rate over 100%. Most other areas shown in the figure above have growth rates above 50%, higher than most other growth areas in Melbourne.

Figure 2: Forecast increases in population growth from 2026 to 2036



Notes:
1. Forecasts presented at Australian Bureau of Statistics, Statistical Area 2 level
2. Tarneit West is under construction

Source: Victoria in Future 2023, SA2 level.

Congestion and rail overcrowding will increase without the project. Road congestion is already an issue in these growing western suburbs. With continued poor provisions of public transport services, road congestion will worsen significantly as residents have limited other available options.

V/line services from Melton in the morning peak will become highly crowded by 2031 as shown in Figure 3. This crowding is despite V/Line trains being extended in 2031 from 6 to 9 carriages to carry more passengers.

It is currently not possible to increase the number of V/Line trains serving Melton because the existing rail infrastructure is reaching capacity. This is because of signalling and track limitations. Similarly, Wyndham Vale services will be highly crowded as shown in Figure 4.

Figure 3: Crowding on city bound Melton services in 2031 morning peak, base case.

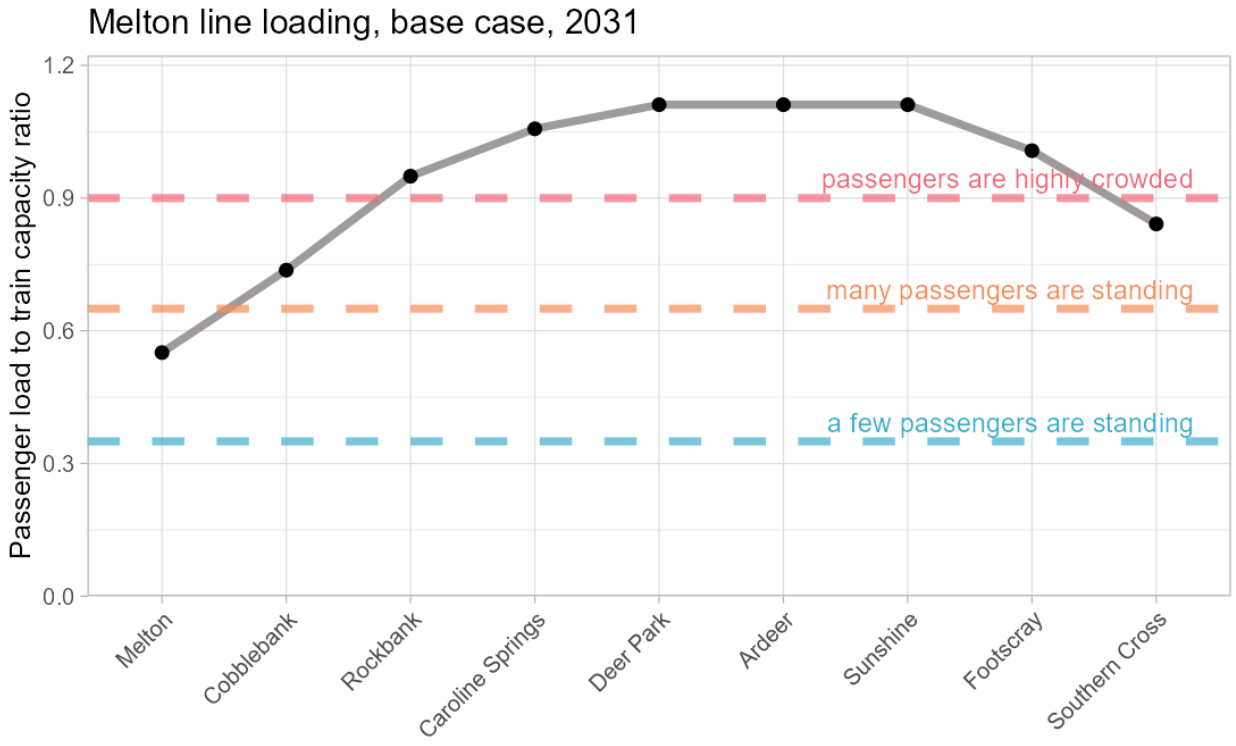
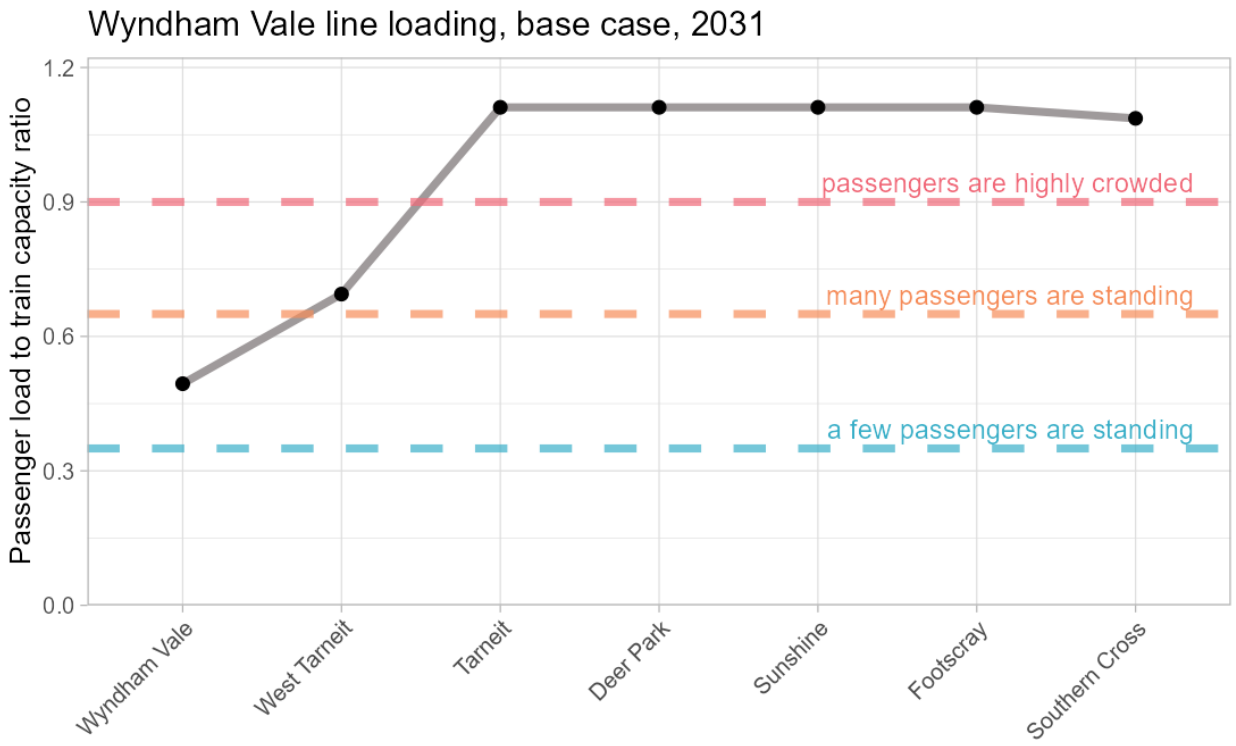


Figure 4: Crowding on city bound Wyndham Vale services in 2031 morning peak, base case.



Rail services with Melton electrification project

Melton services

Building two additional tracks between Sunshine and Caroline Springs and electrifying two tracks between Sunshine and Melton enables more services along the Melton line. Electric metropolitan rail services are proposed to be every 10 minutes, all day, in both 2031 and 2041. This is a significant improvement compared to current frequencies. In some cases, waiting time for passengers will be halved.

In 2031, our modelling has metropolitan rail services operating from Melton to Westall using the Metro Tunnel. In 2041, these trains run all the way to East Pakenham. The new Melton rail service would stop at all the stations along the way into the Metro Tunnel stations. It will then run express from Anzac to Caulfield stations and stopping all stations after Caulfield. Melton services will no longer stop at Southern Cross station. Detailed rail timetable planning may alter the final destination of Melton services beyond Caulfield.

This timetable is an improvement over the current, complex stopping patterns in the current timetable. The current timetable has some services stopping at Deer Park, some at Cobblebank and others at Rockbank. It also enables passengers along the Melton line to reach more places without changing trains such as the new Parkville and State Library stations.

In the project, we have modelled regional rail services from Bacchus Marsh that have been altered to run between Bacchus Marsh and Melton as a shuttle service instead of running directly into the city. This retains the same number of services from Bacchus Marsh as is in the 2024 train timetable. These shuttles are modelled to operate every 40 minutes in the morning and afternoon peak periods only. Passengers using Bacchus Marsh station are still able to board services from Ballarat line services and travel direct to the city in all time periods. The project will also construct a short section of double track (also called a passing loop) between Melton and Bacchus Marsh to allow for timetable flexibility and reduce the impact of disruptions so train services travelling in opposite directions can pass each other.

Wyndham Vale Services

The project allows 4 regional V/Line services that would have run on the Melton line to be reallocated to the Wyndham Vale line in the morning peak. This means that Wyndham Vale will have 9 services instead of 5 in the AM peak. This reallocation reduces average time between services from 24 minutes to 13 minutes on the Wyndham Vale corridor, providing a significant capacity boost for passengers travelling into the city.

The modelled frequencies in the morning peak period are a slight adjustment to what was modelled as part of the strategic modelling report from AECOM.[172] This change reflects updated advice provided to Infrastructure Victoria about signalling constraints on the current network in the morning peak period.

The project would also re-allocate rolling stock during the interpeak and afternoon peak periods. This would add 18 new Wyndham Vale services between 9am and 3pm and 4 extra services between 3pm and 6pm. This would reduce the average frequency of the Wyndham Vale line in these time periods to a train every 10 minutes. This change gives the Wyndham Vale line a frequency like similar to a number of metropolitan train services in Melbourne.

Depot and maintenance facilities

The new depot for electric trains will be located at Cobblebank and requires the installation of overhead wires as part of the electrification of the line. This depot will make use of existing depot facilities for V/Line trains at Cobblebank. This depot is currently being upgraded to support future electric services, with additional stabling being added and likely electrical infrastructure.[173]

An expanded depot at Wyndham Vale to stable the increased Wyndham Vale services is also provided as part of this project. The new electric trains procured for the Melton line will use other depots with major maintenance facilities elsewhere along the line, such as at Pakenham East.

New stations for growing locations

Hopkins Road and Paynes Road were chosen as the best locations for new railway stations because they are currently experiencing a large build-up of housing development with new housing estates.

These stations serve surrounding communities of Mt Atkinson and Thornhill Park which are predicted to experience a surge in population growth. These communities are predicted to more than double in size between 2026 and 2036 and add 68,000 people.

Both areas have precinct structure plans, which provide guidance, objectives and targets for sustainable development in the area. The Mt Atkinson precinct structure plan includes a potential future station, with local transport built to accommodate this development.[174] The Thornhill Park structure plan also contains a railway reserve for 'direct access to a modernised, electrified Melton line'.[175]

Modelling approach

Infrastructure Victoria has undertaken a strategic economic evaluation to support the Melton electrification project. Our analysis has followed the Australian Transport Assessment and Planning (ATAP) guidance on evaluating transport projects with a cost benefit analysis. We have also used local and international research on evaluation parameters, including for crowding, which better reflects the specific trains used in assessing the Melton project while remaining consistent with appraisal guidance

We used strategic transport modelling from AECOM to inform our analysis. This modelling is presented in the AECOM Strategic Modelling Report. This modelling uses the Victorian Integrated Transport Model to model the transport behaviour changes from the project. We also used outputs from the economic module attached to the strategic transport model, in addition to economic modelling done by Infrastructure Victoria.

The Melton electrification project is particularly complex. It relies on other network interdependencies across Victoria's rail network like track configuration, power and signalling, and train service scheduling. We used in-house technical expertise and resources to undertake the strategic economic evaluation.

We have modelled a base case scenario, which assumes that the project will not be built. This is compared against a project case scenario that includes Melton electrification. The differences between these two scenarios are used to determine the benefits of project. We have prepared forecasts for 2031 and 2041 and have interpolated and extrapolated these results to develop a 30-year benefit stream.

We have also undertaken additional transport modelling on top of the provided model outputs from AECOM's strategic modelling report. This is because we received advice about signalling and network capacity constraints in the morning peak period. This advice made us alter service plans and therefore the number of vehicle kilometres travelled by private vehicles. These changes mean that certain figures cited in this report may differ from those published in the strategic modelling report.

Crowding parameters applied for this assessment

Infrastructure Victoria has looked at evidence and guidance from Australia and overseas to calculate crowding benefits for this project.

High capacity electric trains and regional VLocity trains are designed for different purposes. Electric trains are designed for lots of stops and the ability to handle many standing passengers. VLocity trains are designed for long distance regional services. They have many seats and not a lot of standing area.

The Australian guidelines for calculating crowding benefits only have one type of train.[176] This singular crowding model is based on a double decker suburban train from Sydney. ATAP also has guidance for calculating benefits for buses and light rail vehicles.

We think that the double decker train from Sydney does not represent either a high capacity metro train or a V/line VLocity. These trains have different number of doors, different amount of time stopping at stations and different amounts of standing areas. We found that international guidance does not treat all train types the same. The purpose and layout of different trains are key factors in international guidance.[177]

For the reasons outlined above, we have modelled all high capacity metro train services using guidance from ATAP for light rail, or trams. We think this is appropriate because of the similar floor layout and seat to standing area ratios. For regional train services, we have modelled their crowding benefits using ATAP guidance for bus services. This is because buses have limited standing room and a lot of seats typically with a small aisle, like a regional VLocity train.

Our base case network

The road and rail network in future years will not be identical to the road and rail network today. It will change as new projects are constructed. The other projects elsewhere in the network that are assumed to be built within the project appraisal period are important as they can raise or lower the benefits of a transport project.

There are many changes to the transport network that could affect project benefits. For example, if a rail line was being assessed and a new highway was assumed to open right next to the transit line at the same time, it is likely that the rail line would have lower benefits compared to the highway not being there. This is because making it easier to drive and reducing congestion through an upgraded highway reduces the patronage of the rail line. These interactions are why it is crucial to choose an appropriate level of assumed projects.

The ATAP guidelines distinguish between two methods for estimating what the road and rail network will look like in the future:[178]

- The 'committed expenditure' approach only includes road and rail projects that have been explicitly funded by state, local or federal governments. It does not account for future funding commitments that may happen over the appraisal period.
- The 'planning reference case' approach specifies reasonable assumptions of how the future transport network might evolve. This reference case considers known commitments and manages uncertainty regarding future projects that are not currently funded. This approach may include projects that do not end up receiving funding.

This assessment uses the planning reference case approach to assume a realistic expectation of what the transport network will look like in 2031 and 2041. We note that some other assessments may take a different approach.

We started by looking at which projects are committed and funded to form our baseline of assumed projects. We then expanded upon the committed projects list by assessing which projects we believed were necessary to the functioning of the transport network. We looked at precinct structure plans, growth area corridor plans and other material to inform our choice about the feasibility and likelihood of future projects.

Road projects in our base case network

We first include in our modelling the major road projects that have either been committed to or already funded. We included the West Gate Tunnel, North East Link, Monash Freeway upgrades and the Western Roads Upgrade package. These formed our core assumptions of the future road network.

We then consider major road projects that are not committed or not yet funded and could have a substantial impact on the Melton electrification appraisal or be an alternative to the Melton electrification. We therefore did not include:

- The construction of the Outer Metropolitan Ring Road / E6

- The widening of the Western Freeway to Melton[4]
- Further widening of the M80 ring road

We considered which projects we thought were essential for reasonable operation of the future road network. We included road projects if we assessed that it was likely that these projects would be committed and funded in the future. This includes projects such as the Bulla Bypass as the project is currently in planning.[179]

Most of the projects we have included in our base case are not yet funded are arterial roads in growth areas. A select few projects are[5]:

- An east-west arterial road south of the rail line between Ferris Road and Paynes Road. This would continue through Rockbank to join Greigs Road. This arterial is in the Toolern precinct structure plan, with a reserved corridor.[180]
- An east-west arterial road north of the rail line that would connect Taylors Road in Aintree to Federation Drive and Melton Highway in Melton. This road would intersect with Mt Cottrell Road. A version of this proposed arterial is in the draft precinct structure plan.[181]
- A north-south connection that connects Hopkins Road above the Western Freeway to Taylors Road and Plumpton Road in the north. This is a major arterial connection in the Koroit precinct structure plan.[182]
- An upgrade and extension of Ison Road in Wyndham Vale to connect Black Forest Road near Wyndham Vale station to Sewells Road near Tarneit station. This arterial would connect existing, smaller roads and form a parallel path south of the Wyndham Vale line. This is in the Westbook precinct structure plan.[183] Ison Road upgrade is also in the Black Forest North structure plan.[184]
- A new road to link Armstrong/Hobbs Road near Wyndham Vale station to both Hobsons Road and Sewells Road in Tarneit. This would form an arterial road parallel south of the Wyndham Vale line. The road would make it easier to drive from Tarneit to Wyndham Vale. It is in the Ballan Road and Riverdale precinct structure plans.[185]

The examples above are all present in the West Corridor Growth Plan.[186] We believe they are likely to be delivered within the appraisal period as they are all contained in detailed precinct structure plans.

Rail infrastructure in our base case network

Melbourne Metro Tunnel

Melbourne Metro Tunnel is a project that creates new tracks between South Yarra and South Kensington. Instead of using the City Loop, the Cranbourne and Pakenham lines will travel directly through the tunnel to connect with the Sunbury line near Footscray station. This will create a train line that travels from Sunbury in Melbourne's north-west to Cranbourne and East Pakenham in Melbourne's south-east.

Removing the Cranbourne, Pakenham and Sunbury lines from the busy City Loop means there will be more space available across the network. This means that other train lines can run more services in peak times.[187]

The project also creates five new stations in inner Melbourne. Two of these new stations connect directly to Flinders Street Station and Melbourne Central to let passengers change to city loop trains easily.

Metropolitan train services from an electrified Melton line will use this tunnel through the city to link with the Cranbourne and Pakenham lines. We assume that the Metro Tunnel will be operational in our base case.

[4] We acknowledge that there are investments across this corridor to improve safety although there are no funded commitments that would widen the road in long sections.

[5] Note that these alignments are indicative and for modelling purposes only. See the precinct structure plans for more detail on specific alignments.

Sunshine Superhub

The Victorian government has committed to upgrade Sunshine station and surrounding tracks into the 'Sunshine Superhub.'[188] This project will add two additional platforms to Sunshine station and build two more tracks to West Footscray.

These two new tracks will help Sunshine Station handle services from Melton, Sunbury and Melbourne Airport operate more efficiently. The upgrade will enable up to 40 trains per hour to pass through Sunshine.[189]

The reconstruction of Sunshine and the surrounding tracks are a necessary precondition for electrifying the Melton line. Without a rework of Sunshine, the two new tracks from Sunshine to Caroline Springs as part of the Melton electrification project will not have a separate pair of tracks to connect into. This means that there will be no peak period capacity to run the additional services proposed by the Melton electrification project.

Upgrades to Sunshine are committed projects and funded by the Victorian and Australian governments.[190] This project is assumed to be operational in our base case. We have not included these costs in our project estimates. We have assumed costs for the quadruplication of track between Sunshine and Caroline Springs from just west of Sunshine station, at Anderson Road.

Melbourne Airport Rail Link

Melbourne Airport Rail Link is a project that will deliver electric metropolitan train services to Melbourne Airport (Tullamarine). The project involves building additional tracks to the airport and constructing new stations in Keilor East and Melbourne Airport.

These trains will stop at Sunshine. This will allow passengers from the Ballarat and Geelong lines, including Melton and Wyndham Vale to change trains easily onto the Melbourne Airport Rail Link.

The Melbourne Airport Rail Link has received funding from the Victorian and Australian governments. It has been included in our base case.[191]

Level Crossing Removals

A new station is under construction at Melton as part of removing the level crossings at Coburns Road and Exford Road. This station is being constructed with four platforms in anticipation of electrification of the Melton line. Two of these new platforms will be reserved for electric metropolitan trains. Delivery is expected in 2026.[192]

Four level crossings are being removed from the Melton line, with the project currently in delivery. Coburns and Exford Roads will be removed with rail bridges and Ferris and Hopkins Road will be removed with a road bridge.[193]

Because these projects are in delivery, we assume them to be operational in our appraisal period. These projects are not included in our cost estimates for this project.

However, there will be additional costs in constructing the two new tacks that are separated from existing roads as part of quadruplicating tracks between Sunshine and Caroline Springs. These have been included in our cost estimates.

New rolling stock and platform upgrades

We assume that rolling stock upgrades that have been committed by the Victorian Government will be operational by 2031. Importantly, we assume that all V/Line services to Melton will use longer 9-car VLocity sets by 2027.[194] This involves upgrading platforms at Deer Park, Caroline Springs, Rockbank and Cobblebank to accommodate these longer trains.

The Victorian Government has been trialling the operation of 9-car VLocity sets in peak periods in the Wyndham Vale line.[195] This means that all platforms can receive these longer trains. There is a funded commitment to purchase more rolling stock.[196] We assume that these longer VLocity trains will be running all day by 2031.

These upgrades have implications for base case crowding due to different vehicle capacities. An upgrade to a 9-car VLocity train from a current 6-car VLocity will increase capacity by 50%.

New train stations

Our modelling assumes that three new stations will be delivered along the Wyndham Vale line by 2041.

Two of these stations have been committed to and funded. We have included these in our 2031 base case:

- West Tarneit Station is under construction between Tarneit Station and Wyndham Vale station to connect the growing community.[197] It will feature 400 car parks and is expected to open in 2026.
- We assume that a new station will be constructed at Truganina, between the current stations of Tarneit and Deer Park. Because planning works have started for Truganina, we assume it will finish construction by 2031.[198]

We also assume that an additional station will be delivered at Black Forest Road along the Wyndham Vale line sometime in the 2030s. There is growing residential demand for a station in this area with area reserved for a station in the precinct structure plan.[199] This is assumed to be present by 2041 although it is not yet committed or funded.

Changes in service frequencies in our base case network

Werribee line upgrades

Our modelling assumes that there are train frequency uplifts across the network by 2031 in the base case. These frequency uplifts have not been funded by the Victorian Government. We have modelled a 10 minute service from 7am to midnight between Werribee and Laverton. This may influence the demand for the Wyndham Vale line.

We modelled this frequency upgrade to maintain the service frequency of North Melbourne station after the Metro Tunnel opens. This is because during the interpeak period, the current 3 trains per hours on the Sunbury line wouldn't serve North Melbourne. Adding an extra 3 trains per hour to the Werribee line maintains the current trains services per hour. This doesn't require significant capital expenditure.

Benefits

This section provides further details about the main drivers of benefits. An overview of monetised benefits is available in the main body chapter of this report.

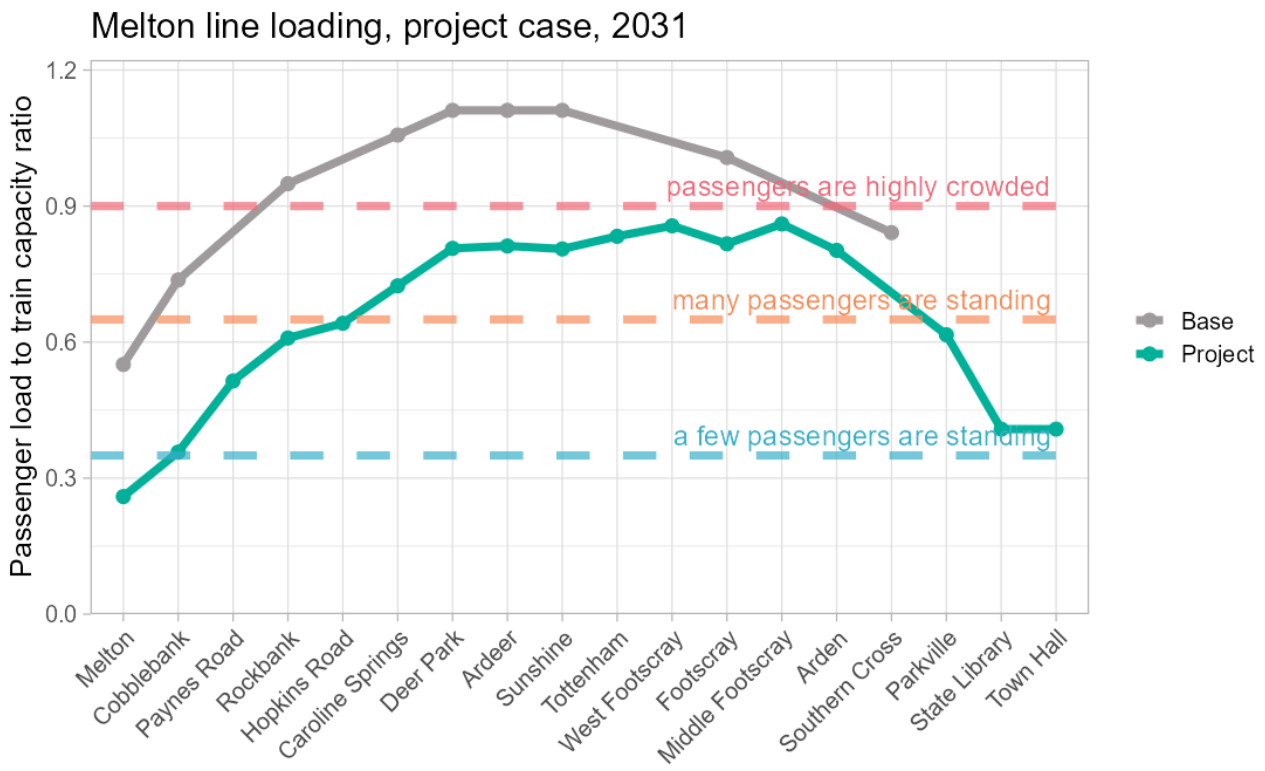
Reduced crowding along the Melton corridor

The project significantly improves the experience of passengers on inbound Melton services in the morning. Without the project, passengers are expected to experience extreme crowding between Deer Park and Ardeer, with passengers unable to board the train in 2031. This is despite longer 9-car VLocity trains operating on the Melton corridor in 2031.

The project improves crowding on morning services significantly, where all passengers can board and many can sit down. Figure 5 shows that crowding in the project case is improved relative to the base case. There are no points along the journey that are designated 'highly crowded' in the project case.

These benefits mostly come from being able to run 12 trains to Melton in the morning peak, compared to only five in the morning in the base case. Each of these electric trains can carry more people than a 9-car VLocity.

Figure 5: Crowding on Melton electric high capacity metropolitan train services in the 2031 morning peak, inbound



Other benefits of electric trains for Melton

There are other benefits of electric trains apart from larger passenger capacities. Electric services spend less time stopped at stations compared to regional V/Line services.[200] This is because they have more doors, and the doors are larger, compared to V/Line services. This allows passengers to board and alight faster. Reducing the amount of time trains stop at each station allows network operators to run more services per hour.[201]

Regional trains with diesel engines have slower acceleration compared to electric trains. When diesel trains stop frequently in a suburban or commuter context, they cannot get to full speed between stations. This means they spend a lot of time speeding up and slowing down, making the overall journey longer for passengers. In contrast, electric services can be at full speed very quickly after departing.

Electric trains are designed for the type of travel in this scenario, whereas regional V/Line trains are not. Electric trains are less noisy for passengers travelling on them, have less vibrations and do not emit diesel fumes when waiting at stations. Further, the layout of the seats on high capacity metro trains have more room for bikes and other mobility devices, along with more hand holds for standing passengers.

Diesel trains also cost more to operate compared to electric services. This includes that there are fewer staff on metropolitan trains because there is no need for a conductor to check tickets. Electricity is also cheaper to purchase than diesel.

More trains and less crowding for Wyndham Vale users

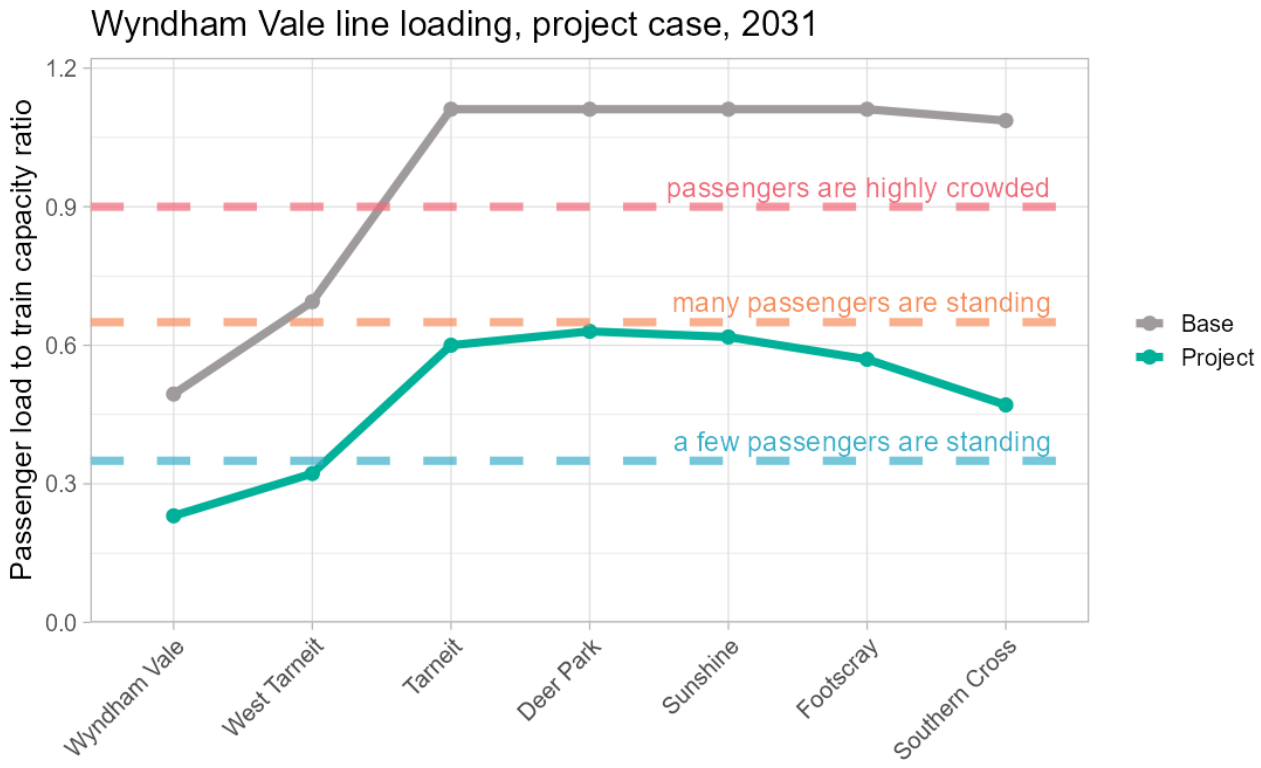
Further benefits for Geelong line users come from a re-allocation of rolling stock from Melton towards running short services to Wyndham Vale.

The main benefit of this increase in frequency is for those who use Wyndham Vale, West Tarneit and Tarneit stations, where the average time between trains in the morning peak will decrease to under 13 minutes from previously 24 minutes. This increase in frequency will reduce crowding on the Wyndham Vale line.

Figure 6 shows that crowding with the project is lower with Melton electrification. Instead of highly crowded conditions as soon as the service starts at Wyndham Vale, many passengers from Wyndham Vale and Tarneit will be able to sit down.

The increase in service will also help those travelling from further than Wyndham Vale, such as Little River, Lara or Geelong experience a less crowded service. There will be less people boarding these trains from Wyndham Vale as those passengers have more trains to catch.

Figure 6: Crowding on Wyndham Vale train services in the 2031 morning peak with additional services (project case), inbound



Services can be upgraded to express

Ballarat line users who board services beyond Melton are likely to experience travel time savings. Most Ballarat services currently stop at all intermediate stations from Melton to Southern Cross, such as Ardeer and Deer Park. With the separation and electrification of the Melton line, trains from Ballarat no longer need to stop at these intermediate stations as they are served by the Melton electrified services. Express regional trains will mostly travel on a different pair of tracks compared to stopping all station tracks.

We estimate that removing these stops from Ballarat services may reduce the travel time of specific Ballarat to Southern Cross services by around six minutes.

Flat junction improvements in reliability

Currently, Geelong line trains and Ballarat line trains cross each other at a flat junction near Deer Park. Because both lines are at ground level, trains going to and from the city occasionally need to cross over each other. This can cause delays as trains need to stop and wait for another train to cross in front of it before it is safe to continue. These delays can often cause further delays to other trains as the network is busy.

Building two new tracks from Sunshine to Caroline Springs (slightly west of Caroline Springs station) and a rail flyover at Deer Park West will remove this problem by elevating tracks for one line onto a bridge to go over the other. This reduces the risk of a delayed outbound train, delaying and inbound train at the flat junction and those delays spreading across the network.

Travel time savings from less network congestion

Regional trains from the Bendigo, Ballarat and Geelong lines come together at Sunshine and travel on a dedicated pair of tracks to North Melbourne. The increased demand for regional V/Line services and increased service provision to meet the demand has strained the capacity of this section of track. Currently, this part of the regional network is operating at close to full capacity.

Operating at full capacity means that a delay or disruption to any regional service is likely to cascade throughout the network because there is no time to spare between services and little capacity to adapt to disruptions. The network often gets congested in the morning peak. The current service timetable accounts for a travel time between Southern Cross and Footscray of about 10 minutes. Although the actual journey doesn't take this long, the extra time is to account for potential congestion.

The electrification of the Melton line would shift users onto electric trains and onto tracks currently used by the Sunbury line. This means that Melton line users will no longer be exposed to potential network congestion from regional trains. This improves the reliability of the line for Melton users.

The improvements to the flat junction discussed above, as well as simplified stopping patterns for Ballarat will make timetabling regional trains less complicated. A timetable with less complex stopping patterns has more flexibility in case of minor disruptions. This will generate reliability benefits for users of other regional lines.

Confusing stopping patterns replaced by simple ones

There are a mix of services that operate on the Ballarat line in morning and evening peak. Some services originate at Ballarat, some at Melton, and others at Bacchus Marsh.

Not all of these services stop at every station on the way. In peak times, some services alternate stations; one service will stop at Rockbank and Deer Park but not stop at Caroline Springs or Ardeer, and the next service will stop at Caroline Springs and Ardeer but not Deer Park and Rockbank.

These stopping patterns are confusing for commuters as it is difficult to know which trains will stop at which stations without scrutinising an information display or timetable. In case of disruptions, this effect is compounded as some services run while others do not. This is an issue in both morning and evening travel.

Electrification of the Melton line will replace these stopping patterns that are difficult to understand by rail users with simple, regular and predictable services that stop at all stations. Users of intermediate stations along the Melton corridor will benefit by knowing that there will be a train every ten minutes that stops all stations to the city. Likewise, passengers on the afternoon peak will be confident in knowing that trains will always be at the same platform in the Metro Tunnel stations and will always stop at their station.

Monetised benefits

Individual monetised benefit categories are discussed in greater detail in the main body of this report.

We found that electrifying the Melton line and delivering more services to Wyndham Vale will generate between 80 cents and $1.70 for every dollar invested in the project.

Table 1: Summary of strategic assessment of Melton electrification

	Lower estimate	Higher estimate
Total benefits (millions)	$4,424	$8,072
Total costs (millions)	$5,540	$4,741
Net present value (millions)	-$1,115	$3,330
Benefit cost ratio	0.8	1.7

Sensitivity tests

We have undertaken sensitivity tests against our strategic estimates of benefits and costs for the Melton electrification project. These are shown in Table 2. For each plausible sensitivity condition, we provide a range of outcomes that align with the presentation of the economic benefits. In each table cell, we first present our 'high estimate' at a 4% discount rate followed by our 'low' estimate at a 7% discount rate.

We find that electrifying the Melton line is broadly robust to a variety of different scenarios with our high estimate providing a positive return for every dollar invested in all scenarios.

Table 2: Assorted sensitivity tests against benefits and costs

PV, P50	PV costs ($ millions)	PV benefits ($ millions)	NPV ($ millions)	BCR
Costs +20%	5,690 - 6,650	8,070 – 4,420	2,380 – (-2,220)	**1.4 – 0.7**
Costs -20%	3,790 – 4,430	8,070 – 4,420	4,280 – (-10)	**2.1 - 1.0**
Benefits + 20%	4,740 – 5,540	9,690 – 5,310	4,950 – (-230)	**2.0 – 1.0**
Benefits - 20%	4,740 – 5,540	6,460 – 3,540	1,720 – (-2,000)	**1.4 – 0.6**

Note: For each table cell, the number to the left is associated with the high BCR calculation and the number to the right with the low BCR calculation.

Opportunities to maximise benefits

We have identified opportunities to improve the benefits of the project through land use changes or future additional transport investments.

More housing around stations with better rail services – public infrastructure cost savings

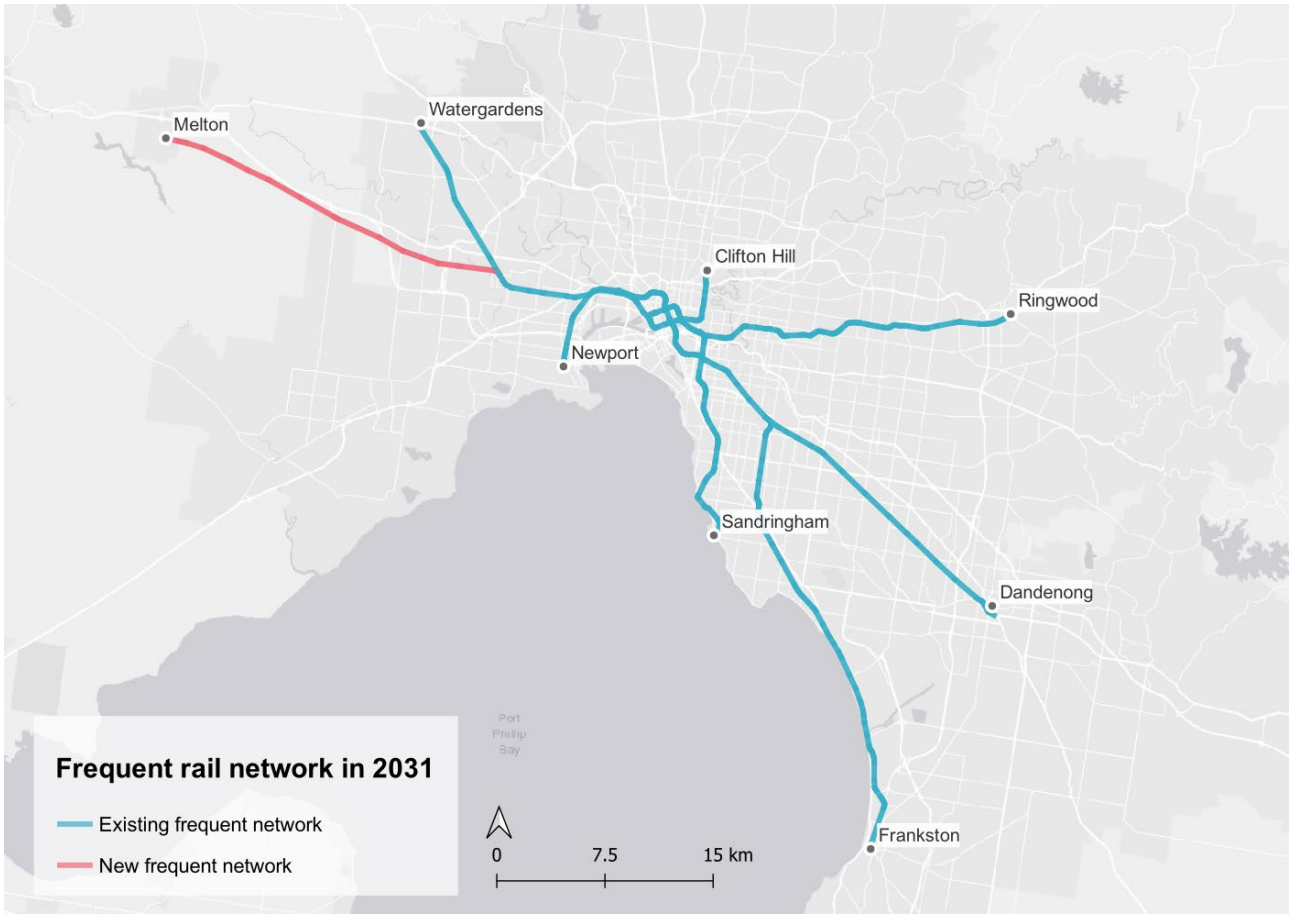
Stations along the Melton corridor will be upgraded and have significant frequency improvements. They will change from those receiving sporadic regional diesel train services with complex stopping patterns to stations receiving regular and frequent services every 10 minutes.

Figure 2 shows the metropolitan train network with high frequencies with the Melton electrification project. The time it takes for Melton residents to get to any point on the frequent network will be substantially reduced.

This improvement in frequency and capacity offers a chance to optimise land use planning and land use integration surrounding these stations. Housing supply and amenity could be increased along the corridor. This could be actioned as part of the Victorian Governments' Activity Centre Program.[202]

While not explicitly costed in this assessment, there is an opportunity for the Victorian Government may be able to reduce infrastructure costs by shifting development closer to these new stations instead of greenfield development further away.

Figure 6: Corridors with 10 minute frequencies or better after Melton electrification project.



Note: The 10 minute frequencies shown on the map represent a 10 minute frequency from 7am to midnight on weekdays.

Note: The 10 minute frequency to Ringwood is a mix of express trains and trains that stop at all stations. Not every station to Ringwood is likely to receive a 10 minute frequency.

Case study: Ardeer station

Ardeer is 14 kilometres from the central business district and will be a 20-25 minute train trip to Town Hall when the train service is electrified. This makes Ardeer about the same distance from the city as Carnegie or Oakleigh, which both support medium density housing, shops, and other amenities around their stations. Ardeer currently does not support these types of land uses because of the infrequent transit network.

The Melton electrification project will add grade separated crossings of the rail line. This will make it easier to get around Ardeer with active transport. Coupled with upgraded 10 minute frequencies across the day, there will be clear opportunities to provide the community with increased amenity and potentially higher density development close to the station.

10-car high capacity metro trains

Our forecasts indicate that there will be crowding on the Melton corridor in the 2040s even with the Melton electrification project that we have assessed.

The high capacity metro trains that will on an electrified Melton line have an opportunity to be upgraded to longer, 10-car versions in the future. Currently, high capacity metro trains operate as 7 car sets. However, platforms in the Metro Tunnel have been built long enough to accommodate 10 car sets in the future.

There is an opportunity to upgrade stations along the Melton corridor when demand is high enough to necessitate it in the future. This would involve re-building certain stations and extending platforms at others.

Signalling and communications upgrades

The Melbourne Metro Tunnel project has introduced High Capacity Signalling across the core part of the Melbourne rail network. [203] High Capacity Signalling is a type of digital signalling technology that relies on computerised rail signals to deliver signals directly to the on board computer on the train.[204]

These computerised signalling upgrades allow trains to run closer together and therefore at higher frequencies compared to traditional colour light signalling. High Capacity Signalling is now installed from West Footscray to Clayton and can only operate on the new high capacity metro trains.[205]

The installation and existing use of High Capacity Signalling on the Metro Tunnel corridor enables an opportunity to extend high capacity signalling along the Melton corridor in the future.[206] This future extension would allow even higher frequencies on the Melton corridor without requiring new physical rail infrastructure.

Existing bus networks could be re-routed to better integrate with stations

There is an opportunity to create new bus routes and re-route existing routes to best take advantage of increased train frequencies and new train stations. Train stations are only useful if residents can access them easily. If access is difficult or time-consuming, residents may drive or not travel.

Car parking at train stations is useful, but it is impractical to provide enough parking for everyone. A well located bus route that collects residents from new housing estates is an efficient way of delivering passengers to the newly electrified network. Currently, the bus network in the western growth areas is not adequate, with large areas of new housing not connected to the bus network. Sometimes houses are nearby bus routes, but these routes do not go directly to train stations.

Infrastructure Victoria has modelled minor bus service changes as part of the project. This includes a re-aligned a feeder service to Paynes Road, a new service to Caroline Springs, and two new feeder services in Bacchus Marsh. However, these minor service plan changes are not enough to deliver a substantial uplift in passenger numbers.

The housing developments under construction are planned with Precinct Structure Plans, which set out targets for street design and access to public transport. For example, the Mount Atkinson Precinct Structure Plan states that:

- 95% of households should be located within 400 metres of public transport services or bus capable roads
- Bus stops must be provided which enable convenient access to activity generating land uses
- All roads, intersections and roundabouts must accommodate ultra-low-floor buses and be shown as 'bus-capable'.[207]

Therefore, there should be little new additional physical infrastructure required to enhance the bus network in these precincts. Additionally, there is a potential to enhance the night bus network, which currently operates routes in the area. With Melton receiving a frequent evening and off peak service, night buses are essential to move residents from stations to their homes.

Optimising re-allocation of rolling stock

We modelled a re-allocation of V/Line rolling stock from the Melton corridor to the Wyndham Vale corridor as a part of this project. We assumed that these trainsets would move lines from Melton to Wyndham Vale.

There are opportunities to further assess the rolling stock requirements of the new service levels for Wyndham Vale and the Bacchus Marsh shuttles.

It might be possible to alter slightly the timetables of Geelong and Ballarat services to best make use of existing rolling stock. This could allow one or two additional 3-car train sets to be made available for additional services across regional Victoria.

Delivering the project in stages

There are limited opportunities to stage the project to maximise benefits of Melton electrification. The delivery of new stations and the service frequency of the newly electrified line could be delivered to best match demand.

We have not proposed staging the electrification of the rail infrastructure to Melton. This is because we propose to stable and depot new metropolitan rolling stock in Cobblebank to take advantage of infrastructure under construction for electric trains.[208] This requires an extension of electrified services to at least Cobblebank to use the stabling yard.

If electrification is proposed to Cobblebank there is little reason not to extend electrification to Melton. Not using the stabling at Cobblebank would require the construction of a new depot elsewhere at a high cost, defeating the point of staging the project.

Appendix B: Economic appraisal of tram projects

Prepared for
Infrastructure Victoria
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AECOM

Economic appraisal of tram projects to inform Victoria's infrastructure strategy 2025-2055

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IV167 - Transport modelling and advisory
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Economic appraisal of tram projects to inform Victoria's infrastructure strategy 2025-2055

Client: Infrastructure Victoria

ABN: 83 184 746 995

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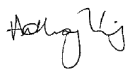
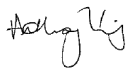
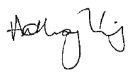
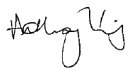
			Name/Position	Signature
1	29-Nov-2024	Draft report version 1	Anthony King Technical Director	
2	24-Jan-2025	Draft report version 2	Anthony King Technical Director	
3	29-April-2025	Draft report version 3	Anthony King Technical Director	
4	06-Jun-2025	Final report version 1	Anthony King Technical Director	

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Executive summary

Purpose and scope of the report

This report provides an economic appraisal of two transport infrastructure initiatives, commissioned by Infrastructure Victoria (IV) as part of the development of the *Victoria's 30-year infrastructure strategy 2025-2055*. Originally released in 2016 and subsequently updated in 2021, the strategy provides a long-term, evidence--based view of Victoria's infrastructure needs. In 2023, Infrastructure Victoria consulted over 500 Victorians and identified six objectives for the 2025 strategy update. Two of these objectives were strongly related to transport: ensuring Victorians have good access to housing, jobs, services and opportunities; and Victoria having high productivity and developing a circular economy.

Targeted tram extensions and upgrades have been identified as ways to support these outcomes, particularly in areas where higher-density development is feasible. To evaluate their potential impact, Infrastructure Victoria engaged AECOM to provide strategic demand modelling and economic appraisal services.

The report focuses on the economic evaluation of transport projects, carried out via a cost-benefit analysis (CBA). Almost 50 projects were initially examined[1], with two high-priority tram projects selected for detailed economic analysis. A separate (sensitivity) analysis examining population density and car ownership was also conducted for one of the projects. Thie detailed investigation and evaluation of these two projects is the key focus of this report.

The CBA assessed the economic feasibility and strategic value of the shortlisted initiatives relative to a base case scenario, which represents the status quo without the proposed project. Two key metrics were derived from the CBA to assess the economic viability of the initiatives, these being:

- Net Present Value (NPV): The difference between the present value (PV) of total benefits and total costs. A positive NPV indicates the project may be economically viable.
- Benefit-Cost Ratio (BCR): The ratio of the PV of total benefits to total costs. A BCR greater than one indicates that monetised benefits outweigh monetised costs, although projects with a lower BCR may still have merit if they deliver significant non-monetised or strategic benefits.

The findings from this appraisal informed Infrastructure Victoria's recommendations for the 2025 strategy update.

Overview of initiatives

Both initiatives address critical transport and accessibility challenges, responding to Melbourne's rapid population growth, road congestion, and public transport demand. The initiatives are described below:

- **Fishermans Bend tram extensions:** This project would reroute and extend tram services into Fishermans Bend, Melbourne's largest urban renewal precinct, which is anticipated to support 50,000 residents and 80,000 jobs by 2041. It involves:
    - Tram Route 11: Extends 2.6 km from Spencer Street to Fishermans Bend South via Normanby Road and Williamstown Road.
    - Tram Route 67: Extends 5.3 km from Anzac Station to Fishermans Bend North via Park Street, Ingles Street, and Mountain Street.

[1] See Strategic transport modelling of tram and train projects to inform Victoria's infrastructure strategy 2025-2055, February 2025

Figure 1 Fishermans Bend tram extensions

- **Suburban tram extensions:** This initiative combines five tram extension projects across Melbourne's middle suburbs designed to improve connectivity to employment hubs and provide links to existing train stations, supporting Melbourne's transition to a more compact city:
    - Route 3 (Malvern East to Hughesdale): Extends 3.7 km to provide direct tram access to Chadstone Shopping Centre, the largest shopping and employment destination in Victoria.
    - Route 55/58 (West Coburg to Batman Station): Extends 2.6 km to connect residential and industrial areas in Coburg North to the rail network at Batman Station, enhancing public transport accessibility.
    - Route 68 (Brighton East to Holmesglen TAFE and Hospital): Extends 4.0 km to improve public transport connections to Moorabbin, an Activity Centre identified for growth under Victoria's Housing Statement.
    - Route 70 (Wattle Park to Burwood East): 1.6km of new track to allow a 6.7 km extension to the planned Suburban Rail Loop (SRL) station at Burwood East, providing better access to Deakin University and connecting to the Camberwell activity centre.

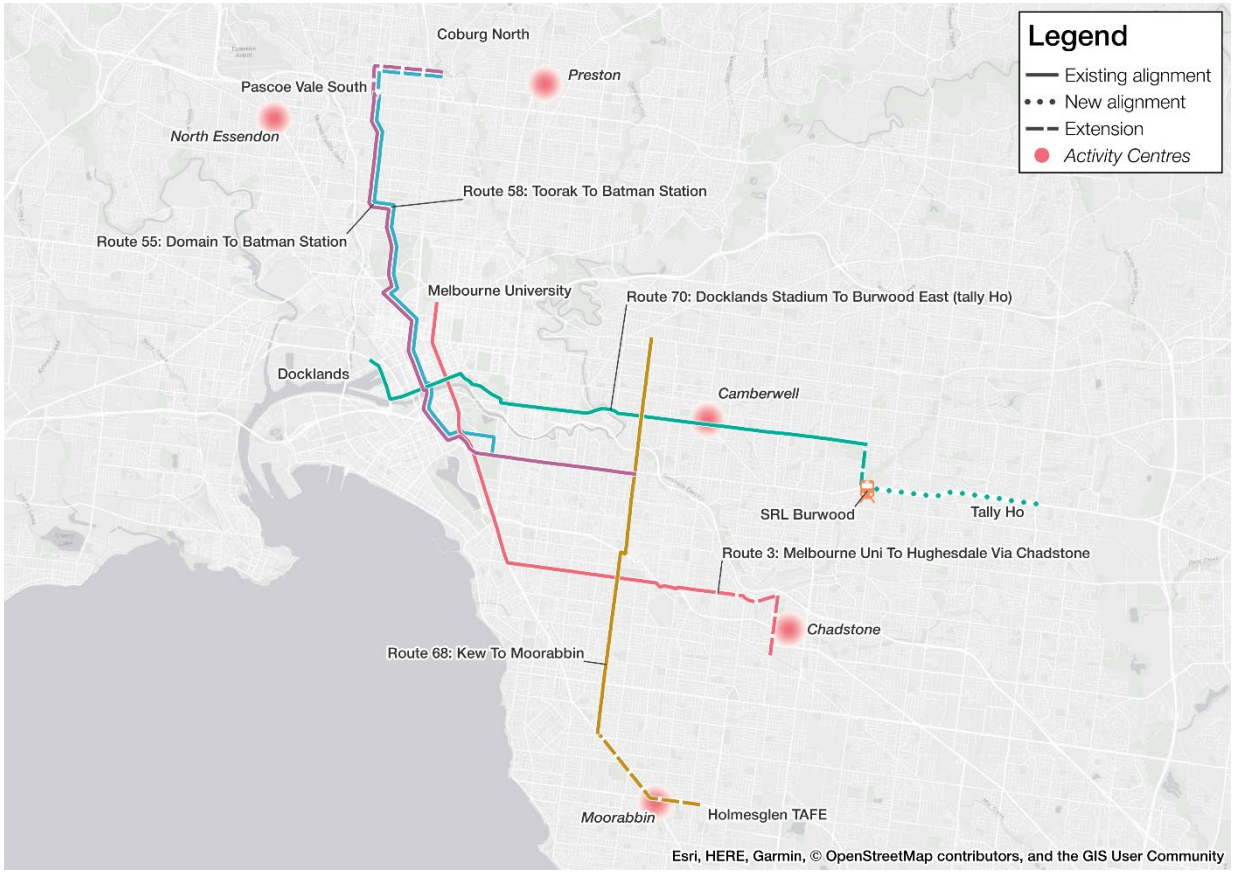


Figure 2 Suburban tram extensions route map

In addition to the two core projects, a **Suburban tram extensions sensitivity test** was developed to explore the impact of increased residential density and reduced car ownership along the proposed tram extensions. It is based on research that demonstrates that public transport infrastructure may lead to land use changes and increased housing. This is because people and families value better access to jobs, schools and services, and they can obtain these benefits by living along tram corridors. Increased housing delivers increased population in that location. The average number of cars per household is lower in areas currently serviced by trams, resulting in a reduced level of car dependency.

CBA outcomes

A summary of the CBA results for each project are contained in the table below.

Table 1 CBA results (P50, PV, 7% Discount rate, FY2025)

Component	Fishermans Bend tram extension	Suburban tram extensions	Suburban tram extensions sensitivity
Total Project Costs	$961.4m	$1,379.5m	$1,379.5m
Total Project Benefits	$1,521.2m	$1,862.2m	$8,619.6m
KPI			
NPV ($m)	$559.8m	$482.6m	$7,240.1m
BCR	1.58	1.35	6.25

The analysis demonstrates positive economic outcomes across the initiatives. The Fishermans Bend tram extensions and Suburban tram extensions deliver notable returns on investment, with BCRs of 1.58 and 1.35 and NPVs of $559.8 and $482.6 million, respectively. These results highlight the value of targeted, cost-efficient investments in high-density urban areas, where public transport enhancements align closely with strategic urban planning objectives.

The Suburban tram extensions sensitivity illustrates the transformative potential of integrated transport and land use strategies. It achieves a BCR of 6.25 and a NPV of $7,240.1 million, highlighting the benefits of increased population density and reduced car dependency in driving road user benefits ($6,167.2 million) and environmental gains ($457.7 million).

Key insights

- Economically viable projects: The Fishermans Bend tram extensions and the Suburban tram extensions are estimated to deliver strong economic returns while addressing critical transport and land use challenges. These projects support the development of a more compact city, efficiently use the current network and demonstrate the benefits of integrating transport planning with urban development.
- Policy implications of sensitivity analysis: The Suburban tram extensions sensitivity offers insights into the long-term potential of integrated transport and land use policies. By demonstrating the economic benefits of densification and reduced car dependency, the scenario provides a basis -for reshaping Melbourne’s urban dynamics to promote sustainability and equity.

Investment prioritisation

The findings from the economic appraisal demonstrate that the Fishermans Bend tram extensions and the Suburban tram extensions are worthy of investment prioritisation. Beyond their economic viability, these tram packages could be prioritised as a result of their alignment with Melbourne’s long-term growth and sustainability goals. As infrastructure investments beyond the transport sector are prioritised by Government, transport projects which can demonstrate ‘doing more with less’ should be to prioritised. These two tram projects align strongly with this priority. The Suburban tram extensions sensitivity test shows how impactful combining land use policy changes with public transport infrastructure investment can be. It makes a strong case for including densification and tram extensions as core parts of future infrastructure planning.

1.0 Introduction

1.1 Project background

Victoria's 30-year infrastructure strategy ('the strategy') was first released in 2016 by Infrastructure Victoria (IV) and updated in 2021. The strategy provides a long-term, evidence-based view of Victorian infrastructure needs across a broad range of public policy areas. IV recently released a draft version of the next 30-year strategy, Victoria's Infrastructure Strategy 2025-2055 ('the 2025 strategy').

For the 2025 strategy update, the emerging themes most relevant to the transport sector that Victorians have good access to housing, jobs, services and opportunities, and that Victoria has a high productivity and circular economy. IV identified that targeted tram network extensions could play a critical role in supporting these outcomes, particularly in areas that complement and accelerate higher-density development.

To assess the effectiveness of different transport infrastructure scenarios, IV engaged AECOM to provide strategic demand modelling and economic appraisal services. The strategic demand modelling is documented in AECOM's *IV-167 Strategic Transport Modelling Report*. It utilised a multi-stage research approach which is briefly described below:

- **Stage 1** – an extensive list of almost 50 transport projects was reviewed against planning policies, transport connectivity, and housing and accessibility opportunities, generating a long-list of projects that warranted further analysis.
- **Stage 2** – long-listed transport projects were modelled at two future time periods (2031 and 2041).
- **Stage 3** – high priority projects identified for further investigation were shortlisted using a multi-criteria analysis (MCA).
- **Stage 4** – detailed modelling of the shortlisted projects was completed. The modelling results from Stage 4 feed into the economic appraisal presented in this report. The findings inform the recommendations outlined in the 2025 strategy.

For a more detailed explanation of these steps, refer to Strategic transport modelling of tram and train projects to inform Victoria's infrastructure strategy 2025-2055, February 2025.

1.2 Purpose of this report

The purpose of the economic appraisal is to assess the economic value and feasibility of shortlisted tram initiatives being considered as part of IV's 2025 strategy.

1.3 Scope of the economic appraisal

The economic appraisal focused on two shortlisted initiatives, these being:

- Fisherman Bend tram extensions
- Suburban tram extensions.

The selection and analysis of the tram projects considered in this report were specifically targeted towards the objectives of IV's 2025 strategy update and broader alignment with the current land-use and planning context described in the sections below. Projects not shortlisted in this study may still have applicability to other infrastructure and development scenarios within Victoria.

A sensitivity test on the Suburban tram extensions project was also undertaken to examine assumptions relating to population density and car usage. Details of this sensitivity are described in detail in Appendix C Suburban tram extensions sensitivity testing.

A summary of the individual scope items included in each initiative is provided in the table below:

Table 2 Initiative scope summary

Initiative	Scope
Fisherman Bend tram extensions	• Fishermans Bend tram extensions: o Route 11 – Rerouting and extension to Fishermans Bend South (Plummer Street) via Port Junction o Route 67 – Rerouting and extension to Fishermans Bend North (Turner Street) via Park and Ingles Street
Suburban tram extensions	• Suburban tram extensions: o Route 3 – Extension from East Malvern to Hughesdale via Chadstone o Route 55/58 – Extension from West Coburg/Pascoe Vale South to Batman Station and Sydney Road o Route 64/68 – Extension from East Brighton to Moorabbin TAFE via Moorabbin station o Route 70 – Extension from Wattle Park (Box Hill South) to Burwood East (Tally Ho) via Deakin University

The appraisal was carried out in line with the economic framework developed for this engagement, detailed in Appendix A Economic Appraisal Framework, which should be read alongside this report. Additionally, the IV-167 Strategic Transport Modelling Report was prepared as part of this engagement and serves as a complementary document to this report.

2.0 Overview of project initiatives

2.1 The Base Case

The CBA compares the costs and benefits of a project against a 'base case,' which represents a realistic assessment of what would have happened over time in the absence of the initiative. The benefits, costs, and results in the CBA are calculated based on the incremental changes between the 'base case' and the 'project case.'

An overview of assumptions for each shortlisted project is provided below in the sections below. For comprehensive transport modelling assumptions associated with these projects, please refer to the IV-167 Strategic Transport Modelling Report.

2.2 Fishermans Bend tram extensions

Extending tram services into Fishermans Bend will significantly improve the public transport connectivity for this important precinct. This project involves rerouting the western end of Route 11 down Spencer Street, then west along Normanby Road and Williamstown Road into Fishermans Bend South. Additionally, the northern end of tram Route 67 is rerouted west along Park Street, then north on Ingles Street into Fishermans Bend North. The locations of the tram extensions are shown in Figure **3** and the extension particulars are shown in Table 3.

Table 3 Fishermans Bend route extension

Tram route	Route name	Extension	Additional track (kilometres)	Extension distance (kilometres)
11	West Preston to Fishermans Bend South	Bridge Street to Plummer Street, down Prohasky Street	2.6	5.1
67	Carnegie to Fishermans Bend North	Anzac station on St Kilda Road then Park Street to Ingles Street via Mountain Street, Turner Street to Wharf Road	5.3	7.0

Figure 3 Fishermans Bend tram extensions

2.2.1 Project context

The Fishermans Bend precinct is three times the size of the Melbourne CBD and consists of four mixed use precincts and an employment precinct. The employment region is identified as a National Employment and Innovation Cluster (NEIC) in Plan Melbourne 2017-2050.

In 2018, across all precincts, the area supported a population of just under 1,000 people and 33,000 jobs. By 2041, it is anticipated that the area will support a residential population of 50,000 people and approximately 80,000 jobs.[2] As such, strong public transport connectivity between Fishermans Bend and the CBD will be essential to the success of this urban renewal project.

[2] Victoria State Government, 2018, *Fishermans Bend Framework*, https://www.fishermansbend.vic.gov.au/framework

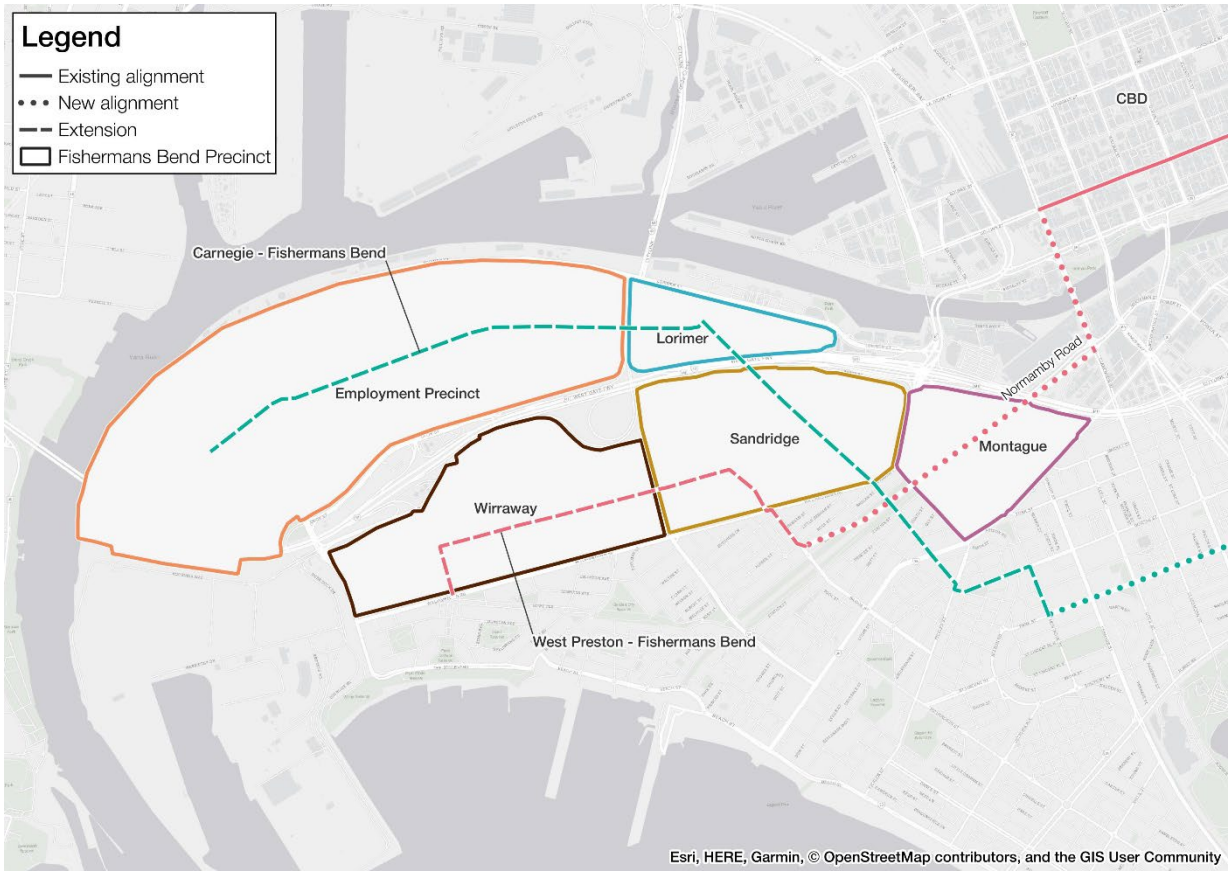


Figure 4 Fishermans Bend precincts

Much like the CBD itself, the high density of employment in the precinct will constrain private vehicle commuting and parking. As a result, employment and other activities in the precinct will need to be serviced by reliable public transport.

Currently, the medium-term expectation for public transport in Fishermans Bend involves the provision of bus routes to service the precinct. The Fishermans Bend Framework also sets out potential tram and metropolitan rail routes, both of which require new infrastructure to cross the Yarra River.[3]

The proposed Fishermans Bend tram extensions are designed to establish whether there is a positive economic outcome of providing tram connections to Fishermans Bend, without a new crossing of the Yarra River (i.e. using existing connections). The proposed tram extensions would serve to provide reliable connections between the precinct and Melbourne's north and south-east suburbs and bring forward the expected timeline for tram services for Fishermans Bend.

2.3 Suburban tram extensions

The Suburban tram extensions encompasses five tram extension projects that all support a more compact city by enhancing connectivity to employment centres, current train stations, and the future Burwood (SRL) train station.

More compact cities – where people live and work closer together – are better for the economy, people and the environment. More compact cities can give Victorians the best chance of living close to family and friends, jobs, education, shops and services. It can also mean businesses have more opportunities to find skilled workers and be closer to markets and their customers.[4] The proposed tram extension projects aim be the catalyst for denser housing development along transport corridors, in part by

[3] Victoria State Government, 2018, *Fishermans Bend Framework*, https://www.fishermansbend.vic.gov.au/framework

[4] Infrastructure Victoria, October 2023, *Choosing Victoria: Five urban development scenarios*, https://www.infrastructurevictoria.com.au/resources/choosing-victorias-future

adjustment zoning, supporting the achievement of the benefits associated with compact cities. This housing increased housing along the tram extensions was tested in a modelling sensitivity test, refer to Appendix C Suburban tram extensions sensitivity testing.

The Suburban tram extensions package includes a series of route extensions (providing new track to extend existing routes) and new alignment (rerouting of existing services). The extensions are all relatively modest in scope, with the longest (Route 68) adding approximately four kilometres of new track. The upgrades to Route 70 involve a 1.6km extension to connect Wattle Park at Elgar Road to Burwood Highway, which will allow the Route 70 services to be extended 6.7kms to follow a new alignment along the existing Route 75 tracks, extending to Burwood East (Tally Ho).

The locations of the five tram routes are shown in Figure 5 and details of the extensions are provided in Table 4.

It should be noted that, in the Network Development Scenario[5] which formed the base of the strategic transport modelling that informs the economics appraisal, some alterations to the tram network are included. This includes some tram routes that are impacted by these extensions changing their route number and destination. One of these is the Route 55 service from Domain near Anzac station to West Coburg, and some alterations to St Kilda Road tram services which allows for the creation of a new service (Route 68) from Kew to East Brighton via Glenferrie and Hawthorn Roads.

Table 4 Suburban tram extensions route extensions

Tram Route	Route name	Extension	Additional track (kilometres)	Tram service extension distance (kilometres)
3	Melbourne Uni to Hughesdale via Chadstone	Malvern East to Hughesdale	3.7	3.7
55	Domain to Batman Station	West Coburg to Batman Station / Tram route 19	2.6	2.6
58	Toorak to Batman Station			
68	Kew to Moorabbin	Brighton East terminus along Nepean Highway then South Road to Holmesglen Tafe and Hospital	4.0	4.0
70	Docklands Stadium to Burwood East (Tally Ho)	Wattle Park at Elgar Road to Burwood Highway to Springvale Road (Tally Ho)	1.3	6.7

[5] Represents reasonable assumptions about how the future transport network will develop. It comprises a combination of: projects completed or under construction since the 2018 Base Year, funded and committed projects, non-committed projects that may play a role in meeting forecast travel demand. It also includes future land use forecasts consistent with Victoria in Future, the Victoria state government's population projection.

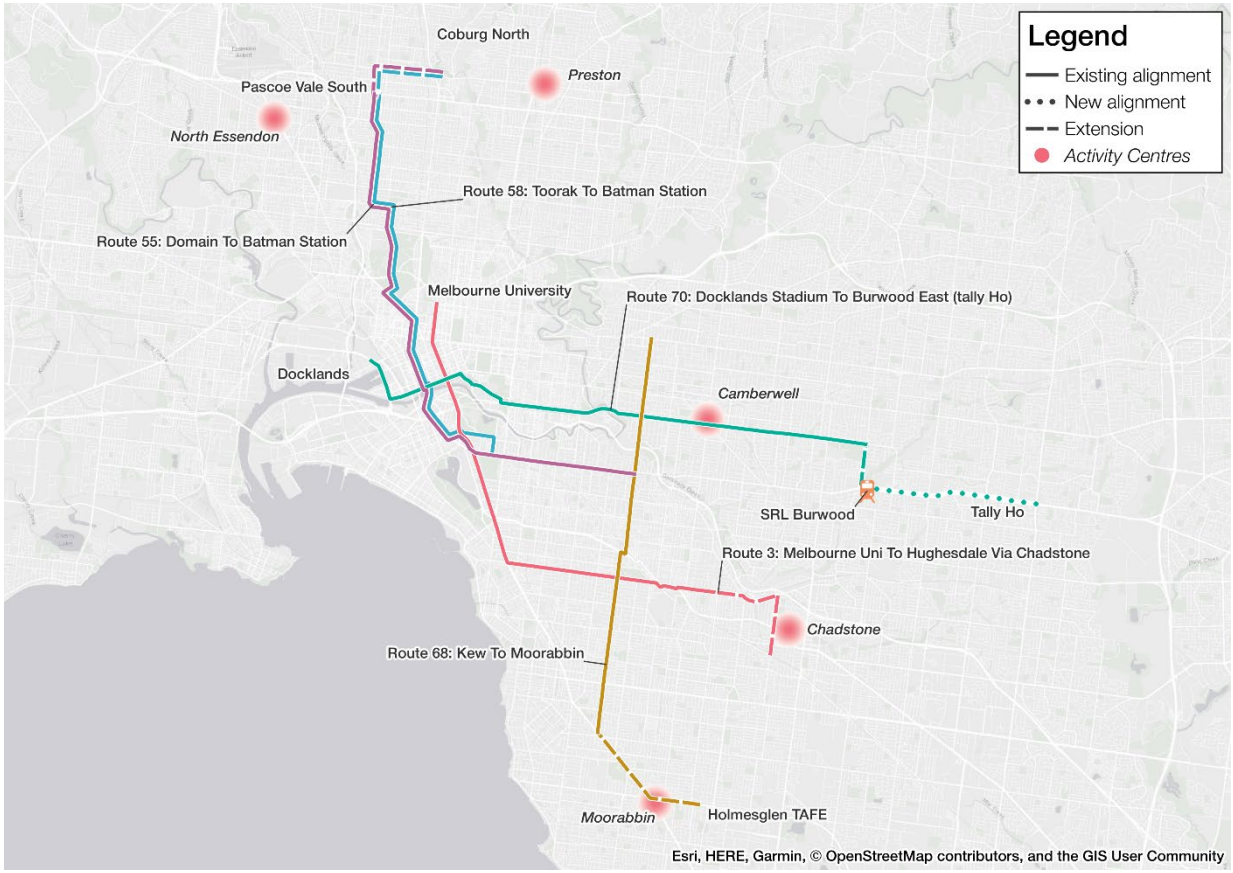


Figure 5 Suburban tram extensions route map

2.3.1 Project context

The Suburban tram extensions project focused on testing relatively small changes to the tram network to improve employment accessibility and encourage increased population density within metropolitan Melbourne. Notably, each of the proposed extensions links to an existing employment and activity precinct. The project context for each route is described in detail below.

- **Route 3 (Chadstone shopping centre)**

  The proposed Route 3 extension will provide a direct tram connection to Chadstone Shopping Centre in East Malvern. This route operates between Melbourne University and East Malvern. Chadstone is the largest shopping centre in Australia and is a major employment hub and shopping destination. There are also commercial office towers and low-rise offices nearby. The shopping centre contains approximately 9,000 car parks and, while well serviced by suburban bus routes, has no direct tram or train connections. The closest train stations are all beyond a reasonable walking distance to a shopping centre from a station: Hughesdale Station (one kilometre) and Oakleigh Station (1.8 kilometres) on the Cranbourne / Pakenham train line, and East Malvern Station (two kilometres) on the Glen Waverley train line.

- **Routes 55 and 58 (Coburg north)**

  The Route 58 tram services currently terminate on Melville Road at Bell Street, a busy arterial road with little walking amenity that is only served by bus services. This route operates between West Coburg and Toorak. This is an issue, as modelled peak travel speeds on Bell Street are expected to fall from approximately 30 kilometres per hour in 2018 down to 20 kilometres per hour in 2041, with little physical space to install priority bus lanes. Many tram services, such as Routes 11, 86 and 19 in Melbourne's north, have strong interfaces with rail or other tram corridors. Route 58 requires improvement. To provide more streamlined public transport interfaces and greater connectivity in and around Coburg North, the proposed extension to Routes 55 and 58 will connect to Batman Station. The area around the proposed extension is characterised by low-density

residential houses on large blocks south of Gaffney Street and industrial and commercial land to the north of Gaffney Street.

- **Route 68 (Moorabbin)**

  Currently, the Route 68 tram terminates at Hawthorn Road/Nepean Highway East Brighton, which requires a three kilometre walk or multiple bus transfers to access the nearest train station (Moorabbin). As with many centres located along existing rail corridors, public transport access to Moorabbin is largely radially-focused, with north-south connections facilitated by a variety of bus services. Moorabbin is one of the Activity Centres that is being fast-tracked for a more flexible zoning system as part of Victoria's Housing Statement[6]. Moorabbin has a mix of commercial, civic and residential land uses in the activity centre and its catchment. There are also anchor institutions including the Holmesglen Institute of TAFE and Holmesglen Private Hospital nearby.

- **Route 70 (Burwood East, future Suburban Rail Loop station and activity centres)**

  The planned SRL station in Burwood East is set to bring together key transport networks in addition to acting as a primary point of access to Deakin University. It would be served by the Route 75 tram along Burwood Highway, while the Route 70 tram currently terminates approximately 1.5 km to the north at Elgar Road/Riversdale Road. Further east, Tally Ho is a key major activity centre identified in the Plan Melbourne 2017-2050 strategy. Tally Ho is currently served by the Route 75 tram and two bus services (Routes 732 and 902). The SRL vision for the Burwood East precinct is to renew the established neighbourhoods and create more residential diversity, amenity and provide more employment opportunities.[7] This extension also provides more tram services from Burwood and Burwood East to the Camberwell activity centre (as identified in Place for Victoria in the activity centre program).

2.3.2 Suburban tram extensions sensitivity test

A sensitivity test was conducted on the Suburban tram extensions in order to test the potential densifying impacts of the tram extensions. This sensitivity altered the land use (population) and car ownership assumptions in the Victorian Integrated Transport Model (VITM):

- Land use density: Population densities were increased in transport zones along the proposed tram extension corridors, reflecting development patterns observed along existing tram routes. To maintain a consistent total population across the model, population was proportionally reduced in outer growth areas, particularly in parts of Casey and Cardinia.
- Car ownership rates: Car ownership levels were reduced in areas served by the proposed tram extensions, in line with observed ownership rates along current tram corridors. This increased the proportion of households considered 'captive' to public transport, leading to a higher propensity for public transport use.

These changes aimed to test how the tram extensions could influence travel behaviour and land use patterns under a more compact urban form scenario. For further information regarding the methodology and results of the sensitivity test, refer to Appendix C Suburban tram extensions sensitivity testing.

[6] Victoria State Government, September 2024, *Victoria's Housing Statement*, https://www.vic.gov.au/more-homes

[7] Suburban Rail Loop East, December 2024, *The Vision for Burwood*

3.0 Economic appraisal approach

3.1 Economic appraisal approach

The economic appraisal methodology uses a Cost Benefit Analysis (CBA) approach. This is a well-established and widely accepted methodology used to evaluate the economic value of a project by identifying and monetising (as far as practical) it's costs and benefits.

The CBA measures the incremental costs and benefits involved in each initiative, relative to a scenario without the proposed initiative (the 'base case'), over the course of a defined appraisal period. It converts future costs and benefits to a common time dimension (the 'present value') using a specified discount rate, reflecting the economic concept that future costs and benefits have less value compared to current costs and benefits.

In line with best practice, such as the Australian Transport Assessment and Planning (ATAP) Guidelines, the CBA distinguishes between economic costs (which include opportunity costs) and financial costs (monetary expenditures). Opportunity costs, defined as the value of resources in their next best alternative use, ensure that the analysis captures the full economic implications of each initiative for society. It is also important to note that economic costs presented in the economic appraisal are expressed as real values which have been adjusted from the nominal costs to remove the effects of inflation over time. These differ from financial costs, which retain the effects of price changes over time.

The CBA produces two key metrics which are used to indicate the net economic benefits that will be provided by an initiative and assess its return on investment. These key metrics are:

- **Net Present Value (NPV):** the difference between the present value (PV) of total incremental benefits and the PV of the total incremental costs. A positive NPV indicates that the incremental benefits of the initiative exceed the incremental costs.
- **Benefit Cost Ratio (BCR):** the ratio of the PV of total incremental benefits to the PV of total incremental costs. A BCR greater than one indicates that quantified benefits of an initiative exceed its cost, and thus the initiative has economic merit. However, initiatives with BCRs less than one may still have economic merit if some benefits cannot be fully captured and monetised within a CBA framework. They may also have broader strategic merit. In this instance, decision makers should weigh up the results of the CBA alongside a suite of other social, economic and environmental criteria.

The central analysis adopted a (real) discount rate of seven percent to calculate the PV of benefits and costs, which is consistent with ATAP, Victorian Department of Treasury and Finance (DTF) and Infrastructure Australia (IA) guidelines. In addition, sensitivity analysis was undertaken using discount rates of four percent and ten percent. The four per cent sensitivity test enables the analysis to give greater weight to future costs and benefits, thereby emphasising the significance of long-term impacts. Considering the long-term nature of the costs and benefits associated with these projects is particularly important given their long-term benefits horizons and importance in serving future populations. Further information regarding the sensitivity analysis approach and its results is available in Appendix D Sensitivity analysis.

Additionally, the economic appraisal reviewed distributional impacts. This component of the analysis considers how the costs and benefits of an initiative are distributed among different stakeholder groups, recognising that not all groups are equivalent or affected equally. In this appraisal, a qualitative assessment of distributional impacts was conducted to provide insight into the incentives and outcomes for various groups. This qualitative approach highlights disparities and identifies opportunities for prioritised decision-making, ensuring that benefits are more equitably distributed.

Section 3.2 and Section 3.3 provide a high level overview of the economic benefits and costs assessed within this economic appraisal. Appendix A Economic Appraisal Framework provides further detail as to the economic appraisal approach, including key inputs, assumptions and quantification methodologies.

3.2 Economic benefits

The initiatives under consideration are expected to deliver a range of economic benefits to the Victorian community by delivering improvements to the public transport system. Table 5 provides an overview of the economic benefits that were assessed as part of this economic appraisal.

Benefits are categorised as:

- 'Conventional benefits', those which are typically included within a transport CBA and were calculated using VITM outputs and modelling parameters.
- 'Other benefits', improvements in economic welfare, productivity or other impacts associated with changes in accessibility or land use that are not captured in traditional CBA.

Each of the benefits identified have been assessed quantitative (and thereby monetised for inclusion in the CBA), or via a qualitative assessment.

Table 5 Benefits framework

Benefits	Description	Assessment approach	
Conventional benefits		**Quantitative**	**Qualitative**
Consumer surplus (changes in generalised costs)	Travel costs or generalised costs including time, cost and inconvenience associated with travel are typically a disincentive to travel. Savings in generalised cost considers the following factors: • Travel time • Public transport overcrowding relief • Resource corrections for vehicle operating costs (including car parking costs, road tolls, vehicle maintenance and operating costs for private vehicles) and public transport fares.	✓	
Safety benefits	Benefit associated with the reduction in crashes from road users.[8]	✓	
Environmental externalities (emission cost savings)	Benefits associated with a reduction in transport emissions through reduced vehicle kilometres travelled (VKT), including lower greenhouse gas emissions, improved air quality, reductions in noise and water pollution and urban separation.	✓	
Active transport benefits	Benefits associated with increased physical activity due to induced active transport, which leads to health improvements for individuals and communities.	✓	
Residual asset value	The remaining value of infrastructure assets at the end of the appraisal period. This differs from P50 cost estimates to P90 cost estimates as these cost estimates represent different levels of confidence in project cost outcomes.	✓	

[8] The crash costs are based on the willingness-to-pay approach, rather than the human capital approach

Benefits	Description	Assessment approach	
Other economic benefits		**Quantitative**	**Qualitative**
Potential changes in residential density	The potential changes in residential density as a result of each project and, based on these outcomes, the extent to which this change could lead to benefits such as savings in the cost of public infrastructure provision.	✓[9]	
Wider Economic Benefits (WEBs)	WEBs arising from the projects will be assessed qualitatively to provide insights into their potential impacts. The analysis will focus on the two WEBs considered most relevant and likely to be generated by these types of projects: • Agglomeration economies: productivity gains arising from businesses and workers being closer together, facilitated by improved transport connectivity. • Labour market benefits: productivity and economic benefits, such as increased tax revenue, resulting from better access to jobs for workers and a larger labour pool for employers.		✓
Increased land value	Increase in land values due to improved amenity and access to transportation infrastructure.		✓
Benefits associated with induced demand	Benefits which accrue to new users of the transportation network who previously elected not to travel, however are 'induced' to travel by an improvement which makes a travel mode more attractive.		✓

[9] Monetised using per dwelling infrastructure cost savings of more compact cities in Infrastructure Victoria's *Choosing Victoria's Future'*.

3.3 Economic costs

The CBA considers the following costs:

- Capital costs (CAPEX) – all capital expenditure including planning, construction, materials, labour, land acquisition costs, inherent/contingent risk allowance and real escalation.

  Both P50 and P90 capital cost estimates have been provided for each project, with P50 costs used for the central case. The P50 cost is the cost estimate for which there is a 50 percent certainty that the incurred cost will not surpass the estimated value. The P90 cost is the cost estimate for which there is a 90 percent certainty that the incurred cost will not surpass the estimated value.

  P50 costs are used for the central case because it should be the closest to the expected cost, just as the benefits estimate is a central, best estimate. The difference between a P50 and a P90 cost essentially relates to different levels of risk and escalation from the application of a risk assessment. Pairing the central benefits with P90 costs presents a more conservative scenario to demonstrate the project outcomes in the event of cost overruns.

- Operating and maintenance costs (OPEX) – relating to operating and lifecycle maintenance expenditure for the project evaluation period, including the costs for periodic and ongoing maintenance.

PV costs used in the CBA are calculated by discounting future year real costs cash flows using a real discount rate of seven percent (with sensitivity analysis at four and ten percent). The cost and timing associated with each of the projects can be found in Appendix B Cost and timing.

3.4 Limitations

The economic assessment relied on outputs from two related, but separate, analytical exercises:

- P50 and P90 cost estimates, which were provided by IV.
- Strategic transport modelling using VITM, which was completed by AECOM and documented in the IV-167 Strategic Transport Modelling Report.

With this in mind, the key limitations for this report include the following:

- Some benefits are not able to be monetised – certain benefits, such as increased community amenity as a result of changed travel patterns, or impacts on socio-economic equity, are not able to be monetised in this CBA because they are challenging to quantify in monetary terms using available data and standardised methods. In particular, these benefits often lack robust market proxies or empirical valuation studies relevant to the local context, and the tools available in this study (such as the VITM) are not designed to capture these qualitative or distributional outcomes.

  Additionally, road and public transport user benefits have been calculated using the VITM, which measures the redistribution of trips given changes to travel costs brought about by a project. As a result, the quantitative analysis excludes benefits associated with induced demand, this being the benefits that accrue to people undertaking additional trips on the network who previously elected not to travel. While these benefits are excluded, they can be material depending on the scale and nature of the project. For example, in the case of the Level Crossing Removal Project in Melbourne, the inclusion of induced demand in supplementary modelling was shown to increase total transport user benefits by up to 15–20% in some corridors, particularly where public transport accessibility and reliability were significantly improved.[10] This highlights that the exclusion of induced demand may result in a conservative estimate of the total economic benefits.

- Taking into account long term economic and societal changes – all CBA models rely on extrapolations about future demand and supply behaviours, such as transport modelling results. All future demand scenarios, however, are estimates and it should be recognised that their accuracy may be impacted by long term changes in the economy and society that are not yet recognised or sufficiently understood to account for in a model.
- Impacts of construction cost increases: Rising construction costs present significant challenges to project delivery and impact the economic viability of infrastructure projects. A report from Oxford Economics found that cost escalation indices for road and rail infrastructure construction reached ten percent and eight percent per annum, respectively, in FY2023, driven by labour shortages, supply chain disruptions and material price volatility.[11] While cost escalation pressures are easing following a period of very high construction cost escalation during and directly after the COVID-19 pandemic, the lingering high prices and limited tram infrastructure investments make estimating the likely cost of more difficult than it has been in prior decades..

[10] Victorian Auditor-General's Office (2022), "Major Transport Infrastructure: Planning and Measuring Benefits".

[11] Oxford Economics Australia, June 2024, *Research Note: Cost escalation pressures are easing but key risks remain,* https://www.oxfordeconomics.com.au/resource/cost-escalation-pressures-are-easing-but-key-risks-remain-construction-and-infrastructure/

4.0 Economic appraisal of projects

4.1 Fishermans Bend tram extensions

4.1.1 Monetised benefits

Table 6 summarises the value of benefits for the Fishermans Bend tram extensions, using a seven percent discount rate over a 30 year appraisal period.

Table 6 Fishermans Bend tram extensions economic benefits (PV [7 percent], FY$2025)

Benefit	$m (PV, 7%)	Key insights
Consumer surplus benefits (road)	$377.4m	This represents reductions in road congestion as commuters shift to the extended tram network. This includes travel time savings, lower vehicle operating costs, and enhanced road network reliability, particularly in and around Fishermans Bend.
Consumer surplus benefits (PT)	$829.1m	This is the largest benefit category, reflecting substantial improvements in public transport access, reliability, and convenience for residents and workers in Fishermans Bend. It highlights the value of enhanced connectivity to Melbourne's CBD and surrounding suburbs, supporting increased public transport patronage and greater modal shift.
Environmental externalities	$114.0m	This represents reduced greenhouse gas emissions, driven by a modal shift from private vehicles to tram, which has a lower carbon footprint. These benefits include lower greenhouse gas emissions, reduced noise pollution, and improved urban air quality, aligning with sustainability objectives
Crash cost savings	$45.8m	This reflects improved road safety outcomes as fewer trips are made by car. It includes savings in accident-related costs such as healthcare, emergency response, and property damage.
Active transport benefits	$121.2m	This category accounts for increased physical activity (walking, cycling) from shifting passengers from road to rail. Active travel includes private benefits – users who experience lower morbidity due to increased exercise (walking / cycling to stations), and societal benefits due to the reduced burden of health system costs.
Residual asset value	$33.7m	This reflects the long-term value of the tram extensions, ensuring continued utility for Melbourne's public transport network beyond the appraisal period.
Total project benefits	**$1,521.2m**	**-**

The Fishermans Bend tram extensions deliver a total quantified benefit of $1,521.2 million (PV, seven percent), reflecting the project's potential to enhance urban connectivity, environmental outcomes, and transport efficiency.

The monetised benefits of the Fishermans Bend tram extensions highlight its value as an urban renewal and transport initiative. Public transport consumer surplus benefits dominate the outcomes, underscoring the critical role of the project in improving accessibility and reliability for commuters. Substantial road user benefits, along with notable environmental and safety gains, further enhance the project's value proposition. The residual asset value ensures the tram extensions provide long-term benefits, supporting the development into a vibrant, connected, and sustainable urban precinct.

4.1.2 CBA outcomes

Outlined in Table 7 are the results of the CBA conducted for the Fishermans Bend tram extensions using a seven percent discount rate.

Table 7 Fishermans Bend tram extensions CBA outcome summary (PV [7 percent], FY$2025), by economic cost

	7 per cent		4 per cent
	P50	P90	P50
Costs			
Capital expenditure	$912.4m	$1,186.1m	$998.5m
Operational expenditure	$48.9m	$68.5m	$76.4m
Total project costs	**$961.4m**	**$1,254.7m**	**$1,074.9**
Benefits			
Consumer surplus benefits (road)	$377.4m	$377.4m	$668.4m
Consumer surplus benefits (PT)	$829.1m	$829.1m	$1,418.1m
Environmental externalities	$114.0m	$114.0m	$205.7
Crash cost savings	$45.8m	$45.8m	$81.7
Active transport benefits	$121.2m	$121.2m	$218.3
Residual asset value	$33.7m	$43.9m	$88.7
Total project benefits	**$1,521.2m**	**$1,531.3m**	**$2,681.0m**
Key Performance Indicators			
NPV ($m)	**$559.8m**	**$276.6m**	**$1,606.1m**
BCR	**1.58**	**1.22**	**2.49**

Key insights

The CBA results for the Fishermans Bend tram extensions highlight its strong economic performance, with total benefits significantly exceeding costs under both cost scenarios. Below is an analysis of the key outcomes.

- **Costs vs benefits**
    - *Central discount rate (7 per cent discount rate):* Total project costs: costs range from $961.4 million (P50) to $1,254.7 million (P90), reflecting the investment required for infrastructure upgrades, operational needs (such as staffing and timetabling), and rolling stock procurement. Total benefits: the project generates substantial benefits, ranging from $1,521.2 million (P50) to $1,531.3 million (P90). It should be noted that the PV of benefits changes between P50 and P90 estimates is only due to differences in the residual asset value.
    - *Four per cent discount rate*: The total project costs were $1,074 million (P50) and the total project benefits were $2,681.0 million (P50).
- **NPV**
    - *Central discount rate:* The project achieves a positive NPV of $559.8 million (P50) and $276.6 million (P90), indicating strong net economic benefits under both cost scenarios.
    - *Four per cent discount rate:* The project achieves a positive NPV of $1,606.1 million, indicating a strong net economic benefit under the four per P50 scenario.
- **BCR**
    - *Central discount rate:* The BCR ranges from 1.58 (P50) to 1.22 (P90), demonstrating robust economic viability even under higher P90 costs.

- *Four per cent discount rate:* The BCR is 2.49, indicating strong economic viability under this discount rate.

The CBA outcomes for the Fishermans Bend tram extensions reflect its strong economic case, with benefits outweighing costs and delivering a positive NPV and high BCR under both cost scenarios under the central discount rate and also under the P50 cost scenario for the four per discount rate. Public transport consumer surplus benefits highlight the critical role of the tram extensions in enhancing connectivity and accessibility for Fishermans Bend. The project offers road user benefits as well as notable environmental and safety gains. It also supports Melbourne's long-term goals of sustainable urban renewal and reduced reliance on private vehicles.

These results reinforce the Fishermans Bend tram extensions as a valuable investment, supporting the precinct to evolve into a well-connected and economically productive urban priority precinct .

4.1.3 Distributional impacts

The distributional impacts assessment for the Fishermans Bend tram extensions provides valuable insight into how the costs and benefits of the initiative affect various stakeholder groups.

Key distributional insights

- Local residents and communities:
  - Direct beneficiaries: residents in Fishermans Bend and its surrounding suburbs will benefit from improved public transport access, particularly those living in mixed-use and employment precincts within the area. By 2041, it is anticipated that the area will support a population of 50,000 people and approximately 80,000 jobs.
  - Disadvantaged groups: the tram extensions provide affordable and reliable transport options for lower-income households, students, and individuals without access to private vehicles, reducing barriers to mobility and employment.
- Commuters and transport users:
  - Public transport users: commuters using the tram network will experience enhanced connectivity between Fishermans Bend and key areas like Melbourne's CBD and south-east suburbs. This results in shorter travel times and better integration with other transport modes.

    By 2031, daily public transport trips are projected to increase by 6,300 per average weekday (compared to the base case), with public transport hours travelled rising by 5,800. By 2041, these benefits grow further, with public transport trips increasing by 12,600 and daily public transport hours rising by 8,300 (compared to the base case).
  - Road users: indirect benefits accrue to road users as reduced congestion eases travel times and lowers vehicle operating costs, particularly in areas with high traffic volumes.

    By 2031, total daily car trips are expected to decrease by 7,500 (compared to the base case), leading to a reduction of 88,400 daily car vehicle kilometres travelled (VKT). By 2041, car trips are projected to decline by 15,400, with daily car VKT dropping significantly by 138,900 (compared to the base case).
- Business and economic stakeholders:
  - Employers and employees: improved tram connectivity strengthens access to Melbourne's CBD and other major employment hubs.
  - Developers and landowners: property developers and landowners near the tram corridor are likely to benefit from increased property values, driving further investment and urban development.
- Environmental and community stakeholders:
  - Local communities: the shift from private vehicles to tram reduces emissions and improves air quality, benefiting the broader environment and public health.

- Community liveability: reduced traffic congestion and enhanced public transport access improves liveability for residents.

- Government and taxpayers:
  - Cost responsibility: while taxpayers bear the costs of construction and operation, the long-term benefits of reduced congestion, environmental improvements, and enhanced economic productivity justify the investment.
  - Strategic gains: governments benefit from achieving broader urban renewal and transport planning objectives, such as supporting sustainable growth and reducing reliance on private vehicles.

The distributional impacts of the Fishermans Bend tram extensions highlight its potential to deliver benefits across a range of stakeholders, from local residents and commuters to businesses and environmental advocates. The project is particularly valuable for vulnerable groups, providing affordable and reliable transport options while supporting the precinct's transformation into a well-connected, high-density urban hub.

In terms of geographic spread of consumer surplus benefits, Figure 6 illustrates the projected change in consumer surplus for public transport users in 2041, highlighting the impact of the Fishermans Bend tram extensions. These benefits are most concentrated in the Fishermans Bend region, with smaller gains extending into the surrounding areas.

Figure 6 Fishermans Bend tram extensions: Change in consumer surplus for Public Transport users, 2041

4.1.4 Wider Economic Benefits

The Fishermans Bend tram extensions will likely deliver benefits beyond the monetised outcomes captured in the CBA, offering non-monetised advantages that underscore their broader strategic importance. These potential benefits required further validating through the form of additional modelling. They include social and economic impacts, particularly in the form of agglomeration effects, labour market impacts, and labour supply improvements, which together support Melbourne's long-term vision for sustainable urban growth and economic resilience [12]. The benefits include:

- Agglomeration benefits arise from improved connectivity between Fishermans Bend, Melbourne's CBD, and surrounding suburbs. These tram extensions enhance accessibility to one of the city's most significant urban renewal precincts, enabling businesses, employees, and residents to cluster in closer proximity. This clustering fosters collaboration, innovation, and economic synergies, boosting productivity and attracting investment to Fishermans Bend. Enhanced transport links also support the precinct's role as a National Employment and Innovation Cluster, driving further economic output and strengthening Melbourne's position as a global city.
- Labour market impacts reflect the project's role in expanding workforce participation, potentially enabling job transitions, and supporting broader economic productivity. Reliable and accessible tram services will improve connectivity to the 80,000 jobs anticipated in Fishermans Bend by 2041, while also providing opportunities for workers in surrounding areas to access the CBD and other employment hubs. Vulnerable groups, including those without private vehicle access and lower-income households, benefit significantly from affordable and efficient public transport options, reducing reliance on costly or less reliable alternatives. By shortening commutes and improving connectivity, the tram extensions enable workers to transition into higher-productivity roles, better aligned with their skills. Transitions such as this could foster career progression, boost earnings, and provide businesses with access to a more diverse and skilled talent pool, however further modelling would be necessary to better understand this. An additional minor impact could be the increased workforce participation and higher earnings generate expanded payroll tax revenues, supporting government finances and vital public services.
- Labour supply benefits will amplify these impacts by improving job flexibility and reducing commuting stress. The tram extensions will potentially enable a broader segment of the population, including underrepresented groups such as caregivers and part-time workers, to engage in economic activities, fostering inclusivity and social equity, however, further consideration would be needed to actively ensure these groups gained these benefits. These benefits will likely play a critical role in enabling Fishermans Bend to develop into a thriving employment and innovation hub, while promoting equitable access to opportunities across the region.The tram extensions could also support the development of a necessary compact urban form within Fishermans Bend. Its geography means that reducing reliance on private vehicles will help it grow and will aid in encouraging higher-density, mixed-use developments. By aligning with Melbourne's strategic goals for vibrant and connected precincts[13], these changes maximise economic and social outcomes.

These benefits highlight the strategic importance of the Fishermans Bend tram extensions. The project supports Melbourne's urban renewal objectives and fosters sustainable growth, ensuring equitable access to opportunities and a stronger, more resilient economy.

While WEBs have only been described qualitatively in this analysis, past project experience[14] has found the application of WEBs to rail projects may increase project benefits in the range of eight to 28 per cent higher than estimates without WEBs. The potential impacts of WEBs on the economic results for the

[12] Victoria State Government, 2017, *20-minute neighbourhoods*, https://www.planning.vic.gov.au/guides-and-resources/strategies-and-initiatives/20-minute-neighbourhoods

[13] Ibid.

[14] Projects assessed by AECOM as part of the previous strategy update, including the City Loop Reconfiguration, Northern Rail Corridor Upgrade, Melbourne Metro Two, Direct Geelong Rail Line, and the Western Rail Corridor Upgrade.

project are provided in Table 8 (for reference and comparison only), displaying the assumptions that total benefits with WEBs is eight or 28 per cent higher than total benefits without WEBs[15].

Table 8 Economic outcomes comparison exercise – benefits estimate with/without WEBs (P50 estimate)

	Total project benefits (core results, exc. WEBs)	Total project benefits (incl. low range WEBS)	Total project benefits (incl. high range WEBS)
Total project benefits	$1,521.2m	$1,642.9m	$1,947.1m
NPV ($m)	$559.8m	$681.5m	$985.8m
BCR	1.58	1.71	2.03

4.1.5 Discussion

The total project benefits for the Fishermans Bend tram extension are $1,521.2 million (PV, seven percent discount rate), with the greatest benefits being accrued from the public transport consumer surplus benefits The CBA outcomes show that the NPV for this project is positive and the BCR is above one for both P50 and P90 cost scenarios, indicating that the total benefits exceed the total costs for this project.

The VITM outputs are a key factor to consider the project's viability. They show that the Fishermans Bend tram extension will result in an increased number of daily public transport trips (average weekday) by 6,300 people by 2031 and an additional 12,600 by 2041. The number of daily car trips (on an average weekday) will decrease by 7,500 by 2031 and by a further 15,400 by 2041. The daily car VKT will decrease by 88,400 by 2031 and by an additional 138,900 by 2041. Overall, the project will increase daily public transport trips, decrease daily car trips, and decrease VKT.

The distribution impact analysis highlighted the key stakeholders likely to be impacted by the project. This included the local residents surrounding Fishermans Bend who gain improved public transport access, as well as commuters who gain greater access to the tram network. It also benefits business and economic stakeholders as employers, and employees will have improved connectivity to employment hubs. Additionally, local communities benefit from broader environment and public health factors caused by reduced emissions as the result of decreased VKT.

Improved connectivity between Fishermans Bend, Melbourne CBD and surrounding suburbs will support agglomeration benefits by enabling the clustering of businesses, employees and residents. Greater accessibility to this major urban renewal precinct – projected to host over 80,000 jobs by 2041 – reinforces its potential as a significant employment and innovation hub. By reducing travel times and expanding access to job opportunities, the tram extensions can help workers find roles that are better matched to their skills, contributing to higher productivity. In addition, shorter, less stressful communities may enhance labour supply by making it easier for more people, particularly those with caregiving responsibilities or other constraints, to participate in the workforce.

[15] This is the high range estimation, and should not be used as indicative of expected benefits for this project.

4.2 Suburban tram extensions

4.2.1 Monetised benefits

The value of benefits for the Suburban tram extensions is shown in Table 9, using a seven percent discount rate over a 30-year appraisal period.

Table 9 Suburban tram extensions economic benefits (PV [7 percent], FY$2025)

Benefit	$m (PV, 7%)	Key insights
Consumer surplus benefits (road)	$519.1m	This represents a significant reduction in road congestion as commuters shift to tram travel for short and medium-distance trips. This includes travel time savings, reduced vehicle operating costs, and improved road reliability in areas with high traffic volumes, such as Bell Street and the Nepean Highway.
Consumer surplus benefits (PT)	$162.1m	This reflects the improved accessibility and reliability of tram services provided by the extensions. This would enhance connectivity to key employment and activity hubs such as Chadstone Shopping Centre, Burwood East, and Moorabbin, supporting shorter and more efficient and reliable trips.
Environmental externalities	$33.0m	This represents reduced greenhouse gas emissions, driven by a modal shift from private vehicles to tram, which has a lower carbon footprint. These benefits also include reduced noise pollution, and improved urban air quality, aligning with sustainability objectives
Crash cost savings	$12.7m	This benefit reflects improved road safety outcomes as fewer trips are made by car. It includes savings in accident-related costs such as healthcare, emergency response, and property damage.
Active transport benefits	-$2.7m	This category accounts for increased physical activity (walking, cycling) from shifting passengers from road to rail. Active travel includes private benefits – users who experience lower morbidity due to increased exercise (walking / cycling to stations), and societal benefits due to the reduced burden of health system costs.
Residential density benefits (public infrastructure cost savings)	$1,095.9m	The project reduces the need for costly infrastructure upgrades and maintenance in high-demand corridors by promoting development in established areas rather than greenfield locations, where infrastructure provision is more expensive. By leveraging the capacity of Melbourne's existing tram network, the Suburban tram extensions minimises the cost of accommodating growth, delivering savings in public infrastructure investment.
Residual asset value	$42.2m	This reflects the long-term infrastructure value of the tram extensions at the end of the appraisal period at a P50 value. It represents the enduring utility of the extensions for Melbourne's public transport network.
Total project benefits	**$1,862.2m**	

The Suburban tram extensions delivers a total quantified benefit of $1,862.2 million (PV, seven percent) under the P50 scenario, underscoring its potential to improve urban mobility, environmental outcomes, and infrastructure efficiency.

Key drivers include substantial consumer surplus for road and public transport users, notable public infrastructure cost savings, and environmental and safety benefits. These benefits position the project as a critical investment in Melbourne's transition to a compact, sustainable, and well-connected urban environment, supporting economic growth and liveability.

4.2.2 CBA outcomes

Summarised in Table 10 are the results of the CBA conducted for the Suburban tram extensions project using a seven percent discount rate.

Table 10 Suburban tram extensions CBA outcome summary (PV [7 percent], FY$2025)

	7 per cent		4 per cent
	P50	P90	P50
Costs			
Capital expenditure	$1,233.3m	$1,603.3m	$1,349.6m
Operational expenditure	$146.2m	$204.7m	$228.3m
Total project costs	**$1,379.5m**	**$1,808.0m**	**$1,578.0m**
Benefits			
Consumer surplus benefits (road)	$519.1m	$519.1m	$839.7m
Consumer surplus benefits (PT)	$162.1m	$162.1m	$262.3m
Environmental externalities	$33.0m	$33.0m	$53.6m
Crash cost savings	$12.7m	$12.7m	$20.0m
Active transport benefits	-$2.7m	-$2.7m	-$8.3m
Public infrastructure cost savings	$1,095.9m	$1,095.9m	$1,426.0m
Residual asset value	$42.2m	$54.9m	$111.0m
Total project benefits	**$1,862.2m**	**$1,874.8m**	**$2,704.3m**
Key Performance Indicators			
NPV ($m)	**$482.6m**	**$66.8m**	**$1,126.4m**
BCR	**1.35**	**1.04**	**1.71**

Key insights

The CBA results for the Suburban tram extensions highlight the project's potential to deliver net benefits. Below are the key findings from the analysis:

- **Costs vs benefits**
    - *Central discount rate (seven per cent)*: Costs range from $1,379.5 million (P50) to $1,808.0 million (P90), encompassing capital expenditure for tram extensions, stop upgrades, rolling stock, and associated infrastructure, as well as operational expenditure over the appraisal period. The project generates benefits of $1,862.2 million (P50) to $1,874.8 million (P90).
    - *Four per cent discount rate*: The cost for the four per cent P50 results was $1,578.0 million and the benefits accrued to $2,704.3 million.
- **NPV**
    - *Central discount rate*: The project achieves a positive NPV of $482.6 million (P50) and $66.8 million (P90), indicating that benefits exceed costs under both cost scenarios.

- *Four per cent discount rate*: The project achieves a positive NPV of $1,126.4 million and a BCR of 1.71.

- **BCR**
  - *Central discount rate*: The BCR ranges from 1.35 (P50) to 1.04 (P90), indicating that the project is economically viable in both the P50 and P90 scenarios, with benefits outweighing costs.
  - *Four per cent discount rate:* The BCR is 1.71 indicating that the benefits outweigh the costs under the P50 scenario.

The CBA results for the Suburban tram extensions highlight its strong and robust economic performance, particularly under the P50 scenario. The project delivers a positive return on investment which is driven by public infrastructure cost savings and improved consumer surplus for road and public transport users. Additionally, there are environmental and safety benefits, as more road users are converted to public transport users this can result in reduced environmental impacts.

Beyond the quantified outcomes, the Suburban tram extensions support Melbourne's broader goals of fostering urban density, enhancing accessibility to employment centres, and promoting sustainable transport options. These outcomes reinforce the project's strategic importance and its ability to deliver long term economic, social, and environmental value.

4.2.3 Distribution impact

The Suburban tram extensions generates a range of distributional impacts, reflecting how the costs and benefits are shared among different stakeholder groups. This qualitative assessment provides insights into the disparities and opportunities to enhance equity and prioritise decision-making.

Key distributional insights

- Local residents and communities:
  - Direct beneficiaries: residents in areas served by the tram extensions, such as Chadstone, Coburg North, Moorabbin, and Burwood East, benefit from improved accessibility to local jobs, services, and education facilities. This is particularly valuable in high-density urban areas where alternative transportation modes like driving may be less desirable.

    The increase in passenger kilometres travelled for each route is anticipated to grow by:
    - Route 3: 21,200 (27.2%) by 2041
    - Routes 55/58 (combined): 18,700 (6.9%) by 2041
    - Route 68: 20,300 (44.8%) by 2041
    - Route 70: 44,400 (60.2%) by 2041.
  - Disadvantaged groups: vulnerable groups, including individuals without access to private vehicles, students, and lower-income households, gain access to affordable and reliable public transport options, enhancing their mobility and opportunities.
- Commuters and transport users:
  - Public transport users: improved tram services provide greater mode choice with improved connections to employment hubs and activity centres. This benefits users with shorter travel times and enhanced reliability.

    By 2031, daily public transport trips are projected to increase by 5,300 per average weekday (compared to the base case), with public transport hours travelled rising by 6,100. By 2041, these impacts continue, with public transport trips further increasing by 3,800 and daily public transport hours further growing by 3,000 (compared to the base case).
  - Road users: indirect benefits accrue to road users as reduced congestion eases travel times and lowers VOCs, particularly in areas with high traffic volumes such as Bell Street and Nepean Highway.

By 2031, total daily car trips are expected to decrease by 6,100 (compared to the base case), leading to a reduction of 57,200 daily car VKT. By 2041, car trips are projected to decline by 4,500, with daily car VKT dropping significantly by 54,400 (compared to the base case).

- Business and economic stakeholders:
    - Local business and employers: enhanced transport connectivity to key economic hubs, such as Chadstone Shopping Centre, Moorabbin, and Burwood East, supports workforce mobility and increases foot traffic, driving economic activity in these centres.
    - Developers and landowners: property developers and landowners near the tram extensions benefit from likely increased land and property values, incentivising further urban development and investment[16].
- Environmental impacts:
    - Local communities: reduced reliance on private vehicles may lead to fewer trips by car and more trips by public transport. This in turn could lead to lower greenhouse gas emissions, improved air quality, and less noise pollution, contributing to a healthier urban environment.
    - Local communities along the road network: reduced road congestion and traffic volumes enhance safety and liveability for residents near busy corridors.
- Government and taxpayers:
    - Cost responsibility: while taxpayers bear the capital and operational costs, the broader community benefits from the project's long-term value, including reduced strain on infrastructure and lower public infrastructure costs.
    - Strategic gains: governments gain progress toward achieving urban densification and sustainability goals, supporting Melbourne's vision of a compact, liveable city.[17]

Figure 7 visually illustrates the change in consumer surplus in terms of public transport users for 2041. The primary direct public transport user beneficiaries are located in Coburg North, Burwood East, Chadstone and Moorabbin.

The red areas in the map indicate zones where some users experience a reduction in consumer surplus following the implementation of the tram extensions. These disbenefits may arise from changes to generalised travel costs, such as increased transfer times or route reconfiguration. In some cases, users outside the immediate tram catchment may not benefit from improved services but still experience secondary effects from broader network changes. While these impacts are relatively minor and localised, they are captured in the model as part of a comprehensive network-wide assessment of travel utility.

[16] Parliament of Australia, 2016, *Property development – creation of value.* https://www.aph.gov.au/Parliamentary_Business/Committees/House/Former_Committees/ITC/TransportConnectivity/Report_1/section?id=committees%2Freportrep%2F024018%2F24071#:~:text=3.3,say%20American%20and%20Australian%20cities.

[17] Department of Environment, Land, Water and Planning, 2019 , *20-minute Neighbourhoods: Creating a more liveable Melbourne*

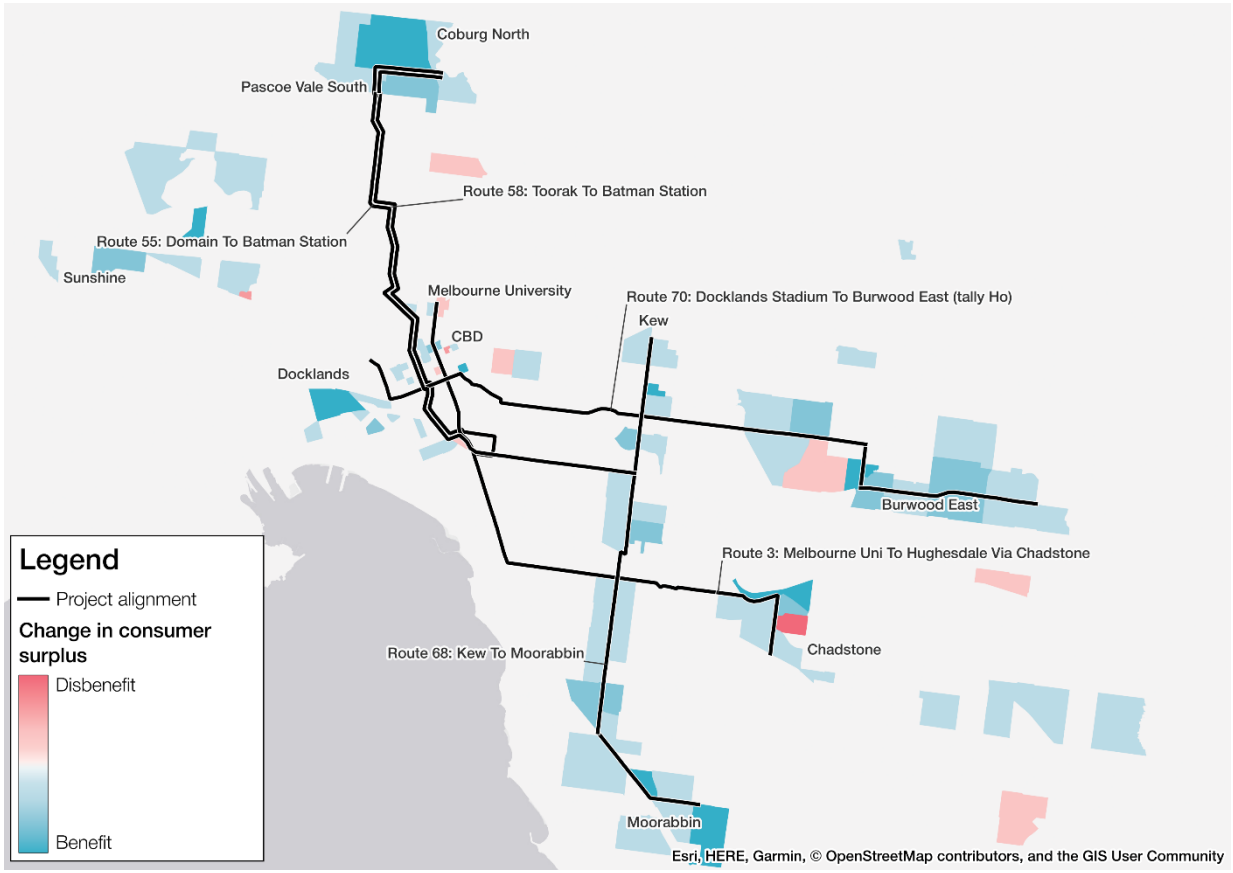


Figure 7 Suburban tram extensions: Change in consumer surplus for Public Transport users, 2041

4.2.4 Wider Economic Benefits

The Suburban tram extensions package will likely deliver benefits beyond the outcomes captured in the CBA, offering non-monetised advantages that highlight its broader strategic value. These benefits encompass significant social and economic impacts, particularly in terms of agglomeration effects, labour market impacts, and labour supply improvements, which together support sustainable urban development, enhance regional productivity, and promote social equity. These benefits would require further validation to determine their magnitude and impact through additional modelling. While these WEBs have not been quantified, they assist in understanding the Suburban tram extensions' broader value.

- Agglomeration benefits stem from enhanced proximity between businesses, workers, and activity hubs, facilitated by improved transport connectivity. The Suburban tram extensions package strengthens links to key employment and activity centres such as Chadstone Shopping Centre, Moorabbin, and Burwood East. By fostering closer interactions between businesses, workers, and markets, the project drives productivity, supports economic synergies, and attracts further investment. Enhanced connectivity encourages business clustering and innovation, boosting economic output and regional resilience in suburban centres.
- Labour market impacts reflect additional productivity gains resulting from changes in workforce participation, job transitions, and associated tax benefits. The tram extensions reduce commuting costs and barriers, encouraging greater workforce participation, particularly among vulnerable groups such as students, lower-income households, and part-time workers. This expanded labour supply provides businesses with access to a more diverse and skilled talent pool, supporting economic activity and addressing skill gaps. Improved access to suburban centres and employment hubs enables workers to transition into higher-productivity roles better aligned with their skills, potentially fostering career progression and higher earnings. These transitions may stimulate economic growth, generate increased output, and attract investment to key precincts. Furthermore, if higher earnings and expanded workforce participation occur, they contribute to increased payroll and income tax revenues, strengthening government finances and supporting public services as an additional minor impact
- Labour supply benefits further amplify these impacts. The tram extensions improve job flexibility, reduce commuting stress, and enable workforce participation among underrepresented groups, such as caregivers and women returning to the workforce. By enhancing access to affordable and reliable transport options, the project ensures that a broader population can engage in economic activities, driving resilience and inclusivity.
- Additionally, the tram extensions promote compact urban development by encouraging infill within established areas, reducing reliance on urban sprawl. This supports Melbourne's long-term vision by facilitating the creation of higher-density, mixed-use precincts along well-connected corridors.[18] Concentrating growth in these areas increases foot traffic, supports local businesses, and fosters vibrant, sustainable communities that align with the city's vision for sustainable urban growth.

These WEBs including agglomeration effects, labour market impacts, increased tax revenues, labour supply improvements, and support for compact urban development underscore the Suburban tram extensions' strategic importance. The project enhances Melbourne's economic resilience, promotes equity, and creates a more connected, sustainable urban environment that meets the city's long-term needs.

The potential impacts of WEBs on the economic results for the project are provided in the table below (P50 results only) for reference and comparison only, under the assumptions that total benefits with WEBs is eight percent or 28 percent higher than total benefits without WEBs[19].

Table 11 Economic outcomes comparison exercise – benefits estimate with/without WEBs (P50 estimate)

[18] Victoria State Government, 2017, *20-minute neighbourhoods*, https://www.planning.vic.gov.au/guides-and-resources/strategies-and-initiatives/20-minute-neighbourhoods

[19] This is the high range estimation, and should not be used as indicative of expected benefits for this project.

	Total project benefits (core results, exc. WEBs)	Total project benefits (incl. low range WEBS	Total project benefits (incl. high range WEBS)
Total project benefits (including WEBS)	$1,862.2m	$2,011.1m	$2,383.6m
NPV ($m)	$482.6m	$631.6m	$1,004.0m
BCR	1.35	1.46	1.73

4.2.5 Discussion

The total project benefits for the Suburban tram extensions amount to $1,862.2 million (PV, seven percent). These benefits are derived largely from consumer surplus benefits from the road as well as public infrastructure cost savings. CBA outcomes show that the NPV for this project is positive with a BCR above one in the P50 and P90 cost scenario, indicating that the benefits are greater than the costs. .

A key consideration in understanding the project's viability is the VITM estimates which aid in demonstrating the project's strategic merit. The estimates show the Suburban tram extensions package will result in an increased number of daily public transport trips (average weekday) by 5,300 people by 2031 and an additional 3,800 by 2041. The number of daily car trips (on an average weekday) will decrease by 6,100 by 2031 and by a further 4,500 by 2041. Daily car VKT will decrease by 57,200 by 2031 and by an additional 54,400 by 2041. Overall, the estimates highlight that the project will increase the number of daily public transport trips, and decrease both the number of daily car trips and the VKT.

The distribution impact analysis outlined the different stakeholders impacted by the project. The key stakeholders impacted includes local residents, disadvantaged groups, public transport users and local businesses and employers. The residents in areas served by the tram extensions such as Chadstone, Coburg North, Moorabbin and Burwood East are direct beneficiaries of the project due to potentially improved accessibility to local jobs, services and education facilities. Disadvantaged groups may also benefit with increased mobility due to access to affordable and reliable public transport options. Public transport users and road users will likely both benefit from ease of transport and easement of road congestion respectively. Access to local employment hubs, such as Chadstone Shopping Centre, will benefit local businesses and employers through increasing accessibility to the centre for employees and for consumers. This may lead to increased patronage to centre from consumers.

Links between key employment and activity centres will likely be strengthened by the project, illustrating the proximity between businesses, workers and activities hubs from which agglomeration benefits stem . The encouragement of clustering from improved connectivity aids in boosting economic output for suburban centres. The tram extensions have labour market impacts because they reduce commuting costs and barriers which can encourage greater workforce participation, especially in underrepresented groups, which results in a greater diversity of skills and labour in the workforce. The reduction of commuting stress and increased workforce participation can be indicative of labour supply benefits.

The tram extensions encourage infill within established areas which can promote compact urban development. Concentrated growth in areas can increase foot traffic, support local businesses and foster sustainable urban environments.

4.3 Summary

The CBA outcomes for the projects considered provide critical insights into the economic performance and strategic value of both initiatives, highlighting key considerations for investment prioritisation.

The Fishermans Bend tram extensions delivers a positive BCR of 1.58 and an NPV of $559.8 million (P50 results), highlighting the value of enhanced public transport connectivity in a high-density growth precinct. Similarly, the Suburban tram extensions package achieves a BCR of 1.35 and an NPV of $482.6 million (P50 results), with noteworthy public infrastructure cost savings ($1,095.9 million) and road user benefits ($519.1 million) showcasing the efficiency of densification in established areas.

The P90 results for Fishermans Bend tram extensions delivers a positive BCR of 1.22 and an NPV of $276.6 million, reflecting greater project costs with a slightly higher residual asset value for the rolling stock. The Suburban tram extensions under the P90 results displays a BCR of 1.04 and a NPV of $66.8 million, with higher project costs and a greater residual asset value also reflected.

The high-performing nature of both projects demonstrates the potential of targeted, cost-efficient investments that leverage existing networks and align with urban planning objectives. These projects demonstrate the value of integrating transport planning with land use policies, enabling efficient use of public funds while maximising societal benefits.

The CBA outcomes for the projects are summarised in Table 12 (P50 results) and Table 13 (P90 results) below. Note that the non-monetised benefits of these project should also be considered in conjunction with the CBA results provided in these tables.

Table 12 Comparison of CBA outcomes (P50, PV, 7% discount rate, FY$2025)

Metric	Fishermans Bend tram extension	Suburban tram extensions
Costs ($m, PV)		
Capital expenditure	$912.4m	$1,233.3m
Operational expenditure	$48.9m	$146.2m
Total Project Costs	**$961.4m**	**$1,379.5m**
Benefits ($m, PV)		
Consumer surplus benefits (road)	$377.4m	$519.1m
Consumer surplus benefits (PT)	$829.1m	$162.1m
Environmental externalities	$114.0m	$33.0m
Crash cost savings	$45.8m	$12.7m
Active transport benefits	$121.2m	-$2.7m
Public infrastructure cost savings	-	$1,095.9m
Residual asset value	$33.7m	$42.2m
Total Project Benefits	**$1,521.2m**	**$1,862.2m**
KPIs		
NPV ($m)	**$559.8m**	**$482.6m**
BCR	**1.58**	**1.35**

Table 13 Comparison of CBA outcomes (P90, PV, FY2025)

Metric	Fishermans Bend tram extension	Suburban tram extensions
Costs ($m, PV)		
Capital expenditure	$1,186.1m	$1,603.3m
Operational expenditure	$68.5m	$204.7m
Total Project Costs	**$1,254.7m**	**$1,808.0m**
Benefits ($m, PV)		
Consumer surplus benefits (road)	$377.4m	$519.1m
Consumer surplus benefits (PT)	$829.1m	$162.1m
Environmental externalities	$114.0m	$33.0m
Crash cost savings	$45.8m	$12.7m
Active transport benefits	$121.2m	-$2.7m
Public infrastructure cost savings	-	$1,095.9m
Residual asset value	$43.9m	$54.9m
Total Project Benefits	**$1,531.3m**	**$1,874.8m**
KPIs		
NPV ($m)	**$276.6m**	**$66.8m**
BCR	**1.22**	**1.04**

Appendix A Economic Appraisal Framework

This Economic Appraisal Framework builds upon the approach outlined in Section 3.0 of this report, and provides additional context as to the key inputs, assumptions and quantification methodologies.

Relevant guidelines

The economic appraisal has been completed in consideration of a relevant economic guidelines and literature across State and National jurisdictions. The key guidelines that have been referenced in developing the economic appraisal approach include the following:

- Australian Transport Assessment and Planning (ATAP) guidance:
    - T2 Cost Benefit Analysis, April 2022
    - T3 Wider Economic Benefits, August 2023
    - M1 Public Transport, August 2021
    - M2 Road Transport, August 2021
    - M4 Active Travel, July 2023
    - O8 Land Use Benefits, April 2022
    - O9 Bus Rapid Transit and Light Rail Transit Cost Benefit Analysis, August 2022
    - PV2 Road Parameter Values, August 2016
    - PV5 Environmental Parameter Values, May 2024
- Department of Transport and Planning (DTP) guidance:
    - The Standard Approach to Transport Modelling and Economic Evaluation, October 2021
- Department of Treasury and Finance (DTF) guidance:
    - Economic Evaluation for Business Cases Technical Guidelines, 2013
    - Investment Lifecycle and High Value High Risk (HVHR) Guidelines: Stage 2 (February 2015)
- Infrastructure Australia (IA) guidance:
    - Guide to economic appraisal, July 2021
    - Review of CBA methodology, February 2022
    - Valuing emissions for economic analysis, February 2024
- Infrastructure Victoria (IV) guidance:
    - Choosing Victoria's future: Five urba development scenario, October 2023
- Transport for New South Wales (TfNSW) guidance:
    - Cost Benefit Analysis Guide, April 2023
    - Economic Parameter Values, August 2023.

Key inputs

The robustness of the CBA is highly dependent on quality of the inputs informing the CBA modelling. The key inputs for the economic analysis are outlined in the sections below:

Demand modelling outputs

Outputs from the Victorian Integrated Transport Model (VITM) were used to inform the quantification of the conventional economic benefits and, as far as possible, other economic benefits.

Conventional economic benefits were estimated using VITM's Economic Evaluation Module (EEM). The EEM provides changes in generalised time for different impacts upon which parameters are then applied to value the impacts.

The EEM is owned by the Department of Transport and Planning (DTP) and was created to promote consistent and reliable estimation of transport impacts and economic benefits across project and policy work undertaken for the Victorian Government. The economic parameters are broadly in line with Australian Transport Assessment and Planning (ATAP) guidance and are regularly reviewed and updated by DTP.

The EEM compares the differences in a range of VITM metrics between a base and project scenario to calculate conventional economic benefits. The VITM metrics include changes in travel time, vehicle kilometres, vehicle operating costs, parking costs, toll costs, public transport travel times, fares and public transport crowding.

The outputs of the EEM include changes in consumer surplus, vehicle travel distance and fuel use. Metrics are provided on perceived and actual impacts on public transport and road users.

Land use scenarios

Two land use scenarios were developed by IV and used to underpin the transport modelling and inform the economic appraisal, these being the Victoria In Future (VIF) scenario and the Compact city scenario. Details as to what constitutes these scenarios are provided in the Strategic transport modelling of tram and train projects to inform Victoria's infrastructure strategy 2025-2055, February 2025.

Cost inputs

The cost estimates were provided by IV and were estimated using costs for each asset type provided by DTP. Operational expenditure was calculated based on the additional service kilometre. These costs are reported for each project initiative

Model parameters

Model parameters refer to the values used in different components of the economic modelling. A number of economic assumptions relating to input values were used to undertake the appraisal, including:

- Financial year 2025 (i.e. 2024-25) was used as the base year (year 0) of the assessment, meaning future costs and benefits are discounted back to this year for present value calculations
- The evaluation period included 30 years of benefits appraisal from the commencement of operation for each project.
- A (real) discount rate of seven percent was applied to calculate the present value of benefits and costs, consistent with ATAP, Victorian Department of Treasury and Finance (DTF) and Infrastructure Australia guidelines. Sensitivity tests occurred at four percent and ten percent.

The general model parameters that were used in the CBA are shown in Table 14.

Table 14 General appraisal parameters and assumptions

Parameter	Value	Source
Base year for discounting	FY2025	Model assumption
Real discount rate per year	7%, with sensitivities at 4% and 10%	IA (2021)
Evaluation period	Construction + 30 years operating	ATAP T2 (2022)
Construction period	Fishermans Bend tram extension - FY27-FY29 Suburban tram extensions- FY27-FY29 Suburban tram extensions sensitivity - FY27-FY29	IV advice
First full year of benefits (opening year)	Fishermans Bend tram extension - FY2030 Suburban tram extensions- FY2030 Suburban tram extensions sensitivity - FY2030	IV advice
Traffic model years	2018, 2031, 2041	VITM
Interpolation between modelling years	Straight line, based on the average annual change between key model years.	ATAP M2 (2021)
Benefits growth rate (beyond final modelled year)	Linear extrapolation beyond final modelled year based on average annual growth rate between 2031 and 2041*	Model assumption
Daily to Annual expansion factor	Tram projects: 333	Analysis of 'Monthly Average Patronage by Day Type and by Mode' data (see data.vic.gov.au)
Residual value	Straight line depreciation method	ATAP T2 (2022)
VOT growth	Non-business trips: 0.75 Business trips: 1.50	The Standard Approach to Transport Modelling and Economic Evaluation
Public infrastructure cost savings	Benefit accrues once construction ends (2029) through to 2041	IV assumption

* For non-travel time related benefits. Travel time benefits instead assumed to grow only in line with VOT growth rate provided in table.

Assessment approach: conventional benefits

Conventional transport benefits were calculated using the EEM.

The EEM calculates the generalised cost savings (measured in time units, i.e. minutes) for both road and public transport modes based on consumer surplus methodology. This enables changes in benefits for each mode to be estimated based on time unit impacts.

The EEM also produces network performance metrics such as the travel distance change between a project and the base case, which can be used to estimate the savings in crash costs and environmental externality costs.

The approach to quantifying transport benefits within the CBA is provided in the sections below:

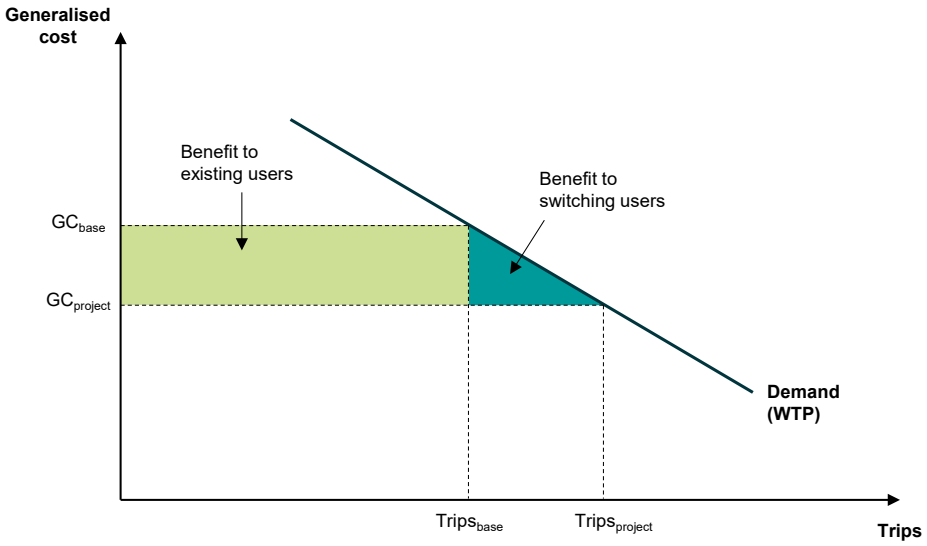
Consumer surplus (generalised cost savings)

Travel cost or generalised cost including time, cost and inconvenience associated with travel is typically a disincentive to travel. Consumer surplus benefits result from a reduction of generalised transport costs in a project case compared to a project base case. This is illustrated in Figure 8. Benefits from a transport project will accrue to:

- Existing users, benefits derived from a reduction in transport costs to existing users (represented by the shaded rectangle in the figure below)
- New and lost users, which can be users either diverted from other modes of transport or generated as a result of a project. New or lost users are defined as those who change their mode. This benefit is calculated as the triangle area in the figure below.

  Note that estimates of new and lost user benefits are based on the rule-of-a-half, applying half of the change in travel cost to the new and lost users.

Figure 8 Change in consumer surplus[20]



Savings in generalised cost considers the following factors:

- Travel time
- Public transport overcrowding relief on public transport and at stations
- Resource corrections for vehicle operating costs (including car parking costs, road tolls, vehicle maintenance and operating costs for private vehicles) and public transport fares.

The generalised cost savings were calculated separately for highway users and public transport users as the way they perceive their cost is different.

For private vehicle users, the following calculation method was used:

$$GC = VOC \times Distance + VOT_{private\ vehicle} \times Time + Parking + Tolls$$

Where:

GC = Generalised cost ($)

VOC = Vehicle Operating Cost ($ / km)

VOT = Value of Time ($ / min)

[20] Australian Transport Assessment and Planning Guidelines-T2 Cost Benefit Analysis, April 2022

For public transport users, the following calculation method will be used:

$$GC = VOT_{public\ transport} \times [(T_{access} \times W_{access}) + (T_{wait} \times W_{wait}) + (T_{in-vehicle} \times W_{in-vehicle}) + (T_{xfer} \times W_{xfer}) + (N_{xfer} \times P_{xfer})] + Fare$$

Where:

GC = Generalised cost ($)

T = Individual travel time components (access, wait, in-vehicle and transfers)

W = Weighting

N_{xfer} = Number of transfers

P_{xfer} = Transfer penalty time

Daily generalised cost savings, expressed in minutes, were converted into monetary terms by first applying the appropriate expansion factors in Table 14 to get an annual figure, and then multiplying by the value of time (VOT) specific to each mode of transport expressed in Table 15.

As provided in Table 14, VOT for non business trips is assumed to grow at 0.75 per cent per annum, while VOT for business trips is assumed to grow at 1.5 per cent per annum.

Table 15 Generalised cost saving benefit parameters[21]

Parameter	Value
Business travel	
Car and public transport	$64.10
Light Commercial Vehicle (LCV)	$33.80
Heavy Commercial Vehicle (HCV)	$62.20
Air passenger	$82.10
Non-Business travel	
Car and public transport (PT)	$19.70
Airport Passenger - non-business trip	$35.00
Commercial Vehicles	
Light Commercial Vehicle (LCV)	$33.80
Heavy Commercial Vehicle (HCV)	$62.20
Light Rigid	
Urban	$31.60
Non-urban	$30.80
Medium Rigid	
Urban	$35.10
Non-urban	$32.30
Heavy Rigid	
Urban	$47.50
Non-urban	$39.20

[21] VOT parameters were sourced from The Standard Approach to Transport Modelling and Economic Evaluation (DTP, 2021) and indexed to FY2025 values using Average Weekly Earnings (AWE).

Parameter	Value
Articulated 6 axle	
Urban	$80.90
Non-urban	$56.60

Resource cost corrections

The change in consumer surplus theory outlined above is based on consumers' willingness to pay (WTP) and can only be applied where changes to costs are fully perceived by the user. In the context of travel, transport users fully perceive time, comfort aspects (e.g., overcrowding relief), and out-of-pocket costs such as fuel, public transport fares, and car parking. These factors influence their choice of mode and, consequently, the benefits enjoyed by those who change their travel behaviour.

Transport user benefits, derived from the change in consumer surplus outputs (for both public transport and road), reflect perceived costs and therefore include the perceived disbenefit of paying fares, car parking, or road tolls. However, transport users do not perceive that these costs, such as fares, tolls, or parking charges, are transferred to the rest of the economy. In economic terms, these exchanges are financial transfers rather than economic costs.

In the case of public transport, these transfers occur from the user to the public transport operator, with fares collected to recover some of the operating and capital costs of providing services (which are resource costs). Given that the CBA explicitly includes the capital and operating costs associated with the project, a resource cost correction is required to avoid double counting of resource costs.

Resource costs differ from perceived costs for the following components of travel costs, requiring a resource cost correction:

- VOCs (non-fuel costs)
- Car parking costs
- Road tolls
- Public transport fares.

The inputs for the CBA model were sourced from the VITM EEM. This module provides detailed outputs that include travel times, distances, and costs, which are essential for distinguishing perceived costs (borne by the transport user) from resource costs (associated with the provision and operation of transport services). The resource cost correction is applied by reconciling these inputs within the CBA model to ensure that only the actual resource costs already accounted for in the capital and operating cost components of the analysis are included, avoiding any double counting of these expenditures.

Safety benefits

Accidents occur on the transport network for numerous reasons, including road surface quality and geometry, speed limit, congestion and other factors. Each crash may cause property damage, injury and/or loss of life. These aspects can be attributed with an economic value using the WTP method.

Crash cost savings were calculated based on changes in vehicle kilometres travelled (VKT) between the project and base case and the parameters were converted to June 2025 values using the Consumer Price Index (CPI).

Table 16 Accident costs per km travelled (June $2025)[22]

Crash Rate	Unit	Value
Accident cost (undivided road)	cents/VKT	6.20
Accident cost (freeway)	cents/VKT	6.56
Proportion of vehicles on undivided road	%	67.0%
Proportion of vehicles on freeway road	%	33.0%

Savings in environmental externalities (emission cost savings)

The transport network is a significant contributor to Victoria's net greenhouse gas emissions. It also impacts the urban and natural environments through noise, visual and other pollutants.

Impacts on environmental externalities are estimated through changes in VKT. Externalities are valued in the CBA using parameter values sourced from ATAP PV5 Environmental Parameter Values (Table 5-1 [cars, buses, passenger rail] and Table 5-9 [freight]). These values have been converted to dollar-per-VKT values and indexed by CPI to June 2025 values for use in the CBA.

In addition, externalities related to greenhouse gas emissions (climate change and WTT emissions) were adjusted to reflect the escalating cost of carbon emissions. The $ per tonne of CO2-e values used for this calculation were estimated by IA (2024) based on the estimated future costs of abatement necessary for the Australian economy to meet emissions reduction targets. Carbon emissions values range from $66 per tonne CO2-e in FY2025 to $377 per tonne CO2-e in 2050, according to the central case estimates.

Table 17 Environmental externality costs for urban areas, $ per vehicle km, June $2025[23]

Externality	Car	Heavy vehicles	Bus
Air pollution	$0.011	$0.090	$0.137
Climate change	$0.005	$0.038	$0.052
Well to Tank (WTT) emissions	$0.002	$0.011	$0.014
Noise	$0.086	$0.056	$0.061
Soil and water	$0.004	$0.039	$0.043
Nature and landscape	$0.001	$0.005	$0.005
Urban effects	$0.006	$0.029	$0.019
Biodiversity	$0.001	$0.014	$0.007
Total	**$0.116**	**$0.284**	**$0.337**

Alongside the quantification of environmental externalities in the CBA, the AECOM emissions model was run separately to calculate the total carbon dioxide equivalent (CO_2e) values for greenhouse gas emissions (climate change) across the given transport network. These results were provided as supplementary information to the CBA, rather than being used as direct inputs, because the outputs of the emissions model do not align with the specific categories required for monetisation under the ATAP guidelines.

The detailed results of the AECOM emissions model can be found in the Strategic transport modelling of tram and train projects to inform *Victoria's Infrastructure Strategy 2025-2055*, February 2025.

[22] DTP, October 2021, *The Standard Approach to Transport Modelling and Economic Evaluation*

Active transport benefits

Improvements in the availability and accessibility of public transport infrastructure may increase an individual's propensity to access public transport via walking or cycling. For example, and individual may elect to walk to a tram stop rather than drive.

There is strong empirical evidence that suggests that physical activity has a positive impact on health and wellbeing and can reduce the risk of non-communicable diseases such as coronary heart disease, high blood pressure and type 2 diabetes. The health benefits derived from an increase in physical activity levels can be categories as:

- Reduced health system costs
- Reduced morbidity and mortality costs.

In line with ATAP guidance, health system cost savings benefits are considered 'non-user' benefits as these cost savings accrue to all members of society who (through Government) fund the public healthcare system. As such, these benefits are applied across the project. As reduced morbidity and mortality costs are considered benefits that accrue directly to private users who change mode in response to the project (i.e. people who now travel via walking), the 'rule of half' is applied to these user benefits. Under the 'rule of half', benefits are valued at half the unit of benefits to existing users.

The number of additional walking/cycling trips was estimated based on VITM outputs (change in public transport access, transfer and egress kms), and using assumptions regarding the mode share between walking and cycling (68 percent and 32 percent of active transport trips, respectively[24]).It should be noted that this analysis excludes the increase in active transport trips which don't involve PT (for example, someone who uses PT to get to work might be more inclined to walk for other trip purposes during the day, such as walking to get lunch rather than driving).

The parameter values used to monetise the health benefits of active travel are provided in the table below:

Table 18 Walking benefit per kilometre (June $2025)

	Health system benefit: Reduced health system costs ($/km)	Health private benefit: Reduced morbidity and mortality costs ($/km)
Walking	$1.59	$3.25
Cycling	$0.79	$1.63

Source: ATAP M4 Active Travel, Table 6 Physical activity health unit benefit per kilometre travelled (2022 dollars), indexed to FY2025 using the CPI

Residual asset value

Residual asset value (RAV) recognises that there is typically some value remaining in infrastructure at the end of the appraisal period. Calculating the RAV of an initiative relies upon capital cost estimates and economic life parameters which were informed from ATAP and are provided in Table 19 the table below:

Table 19 Asset life parameters

Asset	Economic life
Infrastructure	50
Rolling stock	30

Assessment approach: Other economic benefits

Residential density benefits (public infrastructure cost savings)

[24] DTP, October 2021, *The Standard Approach to Transport Modelling and Economic Evaluation,* based on the Victorian Integrated Survey of Travel and Activity (2018)

A key focus of this assignment was to identify and quantify, as far as possible, the potential impact of each shortlisted project on residential density. Estimates were derived for potential changes in population density resulting from each relevant project and, based on these outcomes, the assessment included the impacts that could lead to savings in infrastructure provision costs. These estimates were included as benefits in the CBA. Note that residential density benefits were only calculated for the Suburban tram extensions project (and the Suburban tram extensions sensitivity), as this option was considered most likely to drive densification, due to the projects being located in long established suburbs rather than new growth areas.

Transport projects were found to encourage households to move closer to the improvements, as people valued better access to jobs, schools, and services. Households primarily chose where to live based on the ease of reaching important destinations. Improved access reduced travel times for residents, which in turn raised land values. This increase in land value incentivised developers to invest in areas offering good access to employment, education, and recreational opportunities. This effect was captured in a previous Infrastructure Victoria report, 'Automated and Zero Emissions Vehicle Land Use Scenarios.'

The method used measured "effective density", assessing how accessible a region was to a range of services and overall economic activity, rather than just jobs. It assumed no overall change in the total number of households or homes in Victoria. Instead, the analysis considered that homes locating around the tram projects would result from a redistribution of dwellings within Melbourne rather than an overall increase in housing stock.

It was assumed that the estimated shift in households around the tram projects would originate from Melbourne's new growth areas; as more people occupied newly available properties around tram projects, this would create a vacancy chain, freeing up homes across Victoria. This, in turn, would reduce the demand for new housing in Melbourne's growth areas. However, this redistribution did not represent a direct shift of one household from growth areas to tram project-adjacent locations. Instead, it reflected an aggregate relocation pattern, where the vacancy chain redistributed households from growth areas to regions around the tram projects.

The approach to quantifying this impact is detailed below:

- For each transport project, an appropriate impact area was calculated. The impacted areas was assumed to be the length of the existing and new tram route where there was a change in job accessibility as shown in the transport modelling undertaken for the tram extensions. for this analysis, the impact area was assumed to be a 400 metre radius from the tram alignment.
- The change in the relative effective density of tram projects was derived from the VITM. This was calculated according to the current Australian Transport Assessment Planning (ATAP) Guidelines.
- The change in relative effective density in the impact areas was used to estimate the number of households that would relocate there. To estimate this, the level of regression coefficients estimated in the IV report '*Automated and Zero Emissions Vehicle Land Use Scenarios'* were used.
- The impact was monetised using assumptions about the differences in infrastructure provision costs between established areas and new growth areas. This was based on infrastructure cost savings per relocated household, as outlined in the Infrastructure Victoria report 'Choosing Victoria's Future: Five Urban Development Scenarios.' These benefits were then included in the final CBA.
- It is noted that public infrastructure cost savings may conceivably generate benefits (cost savings) prior to construction of the project, noting the catalytic nature of such investments. As a conservative estimate however, this benefit has only been calculated between construction completion (2029) and the final VITM model year (2041).

Public infrastructure cost savings

Public infrastructure cost impacts refer to the changes in the costs of providing and maintaining public infrastructure due to changes in land use and transportation patterns. For example, when mode-shift occurs from car users to public transport, given all else is equal, there will be a reduction in the wear and tear on road infrastructure, leading to lower maintenance costs. In addition, public transport may encourage higher density development, which may be more cost efficient than delivering low density, sprawling developments. The capital cost (per dwelling) of public infrastructure for greenfield and brownfield areas was derived from IV's Choosing Victoria's future report (2023). This report estimates the cost saving (per dwelling) to be $59,000 (FY2023) in a 'compact city', compared to a 'dispersed city'. The benefit (public infrastructure cost saving) was calculated as the difference in costs of providing public infrastructure to greenfield (base case) and brownfield (project case) dwellings.

Given the generalised natured of this methodology and input assumptions, the following limitations should be noted:

- The assumptions used in the calculations, such as the infrastructure costs per dwelling, are broad estimates that may not reflect specific local conditions or variations in costs due to unique project factors. For example, geographic, demographic, and economic conditions can vary significantly between regions, potentially impacting the cost-effectiveness of higher density versus lower density developments.
- The estimation of change in the number of dwellings has been completed without land-use modelling and so has not been undertaken using best practice, rather a rules based calculation method (as described above).

WEBs

WEBs arising from the project were assessed qualitatively, with a focus on the two key WEBs most likely to be generated by the project: agglomeration economies and labour market benefits.

Agglomeration benefits:

Agglomeration benefits refer to the productivity and economic efficiency benefits arising from firms and workers being located in close proximity to one another (agglomerating). Sources of agglomeration can be categorised into the following three groups:

- Sharing – economies of scale and scope, sharing indivisible goods and facilities
- Matching – suppliers and customers better matched to each other in product markets
- Learning – knowledge generation and diffusion.

By lowering travel costs and enabling land use densification, transport projects can have significant flow on impacts on agglomeration. In particular, transport interventions can alter the level of agglomeration by affecting transport network performance (static clustering) and the location choices of firms (dynamic clustering).

Agglomeration benefits can be estimated by combining the below elements[25],

- Changes in generalised costs with land use held constant (static)
- Changes in the location of employment (land use)
- Second round changes to generalised costs caused by demand changes, following from land use changes.

As the density quantification discussed above takes into consideration changes in employment accessibility, agglomeration has been assessed qualitatively to avoid the potential for double counting. The qualitative assessment focuses on areas most influenced by the project initiatives (for example

[25] UK Department for Transport, 2024, *TAG Unit A2.4 Appraisal of Productivity Impacts*, TAG unit A2.4 appraisal of productivity impacts (publishing.service.gov.uk)

employment precincts adjacent to the tram lines), taking into consideration the density outcomes of relevant routes in/around these precincts.

Labour market benefits:

Labour market benefits refer to the productivity and economic gains (including increased tax revenues) arising from improved access to jobs for workers and to a larger, more diverse labour pool for employers. These benefits contribute to better job matching, increased labour mobility, and economic growth. Key sources of labour market benefits can be categorised into the following groups:

- Increased accessibility: enhanced connectivity enables workers to access a broader range of job opportunities and employers to attract talent from a wider geographical area.
- Reduced friction in job matching: improved transport infrastructure facilitates better matching between worker skills and employer needs, increasing overall productivity.
- Economic participation: by reducing travel barriers, transport projects can encourage higher workforce participation rates, especially among underserved or disadvantaged groups.

Transport interventions influence labour market benefits by reducing travel costs, improving travel times and expanding the effective size of labour markets. This enables workers to reach jobs more efficiently and employers to draw from a more diverse labour pool, improving both workforce mobility and economic efficiency.

Labour market benefits have been assessed qualitatively in this analysis, with a focus on the areas most influenced by the projects which experience accessibility improvements and the potential for expanded labour market reach.

Increased land value

When new or enhanced public transport infrastructure is introduced to an area, nearby properties are likely to experience an increase in value. This is explained by two mechanisms:

Firstly, land value uplift may result from the increased convenience of access to public transportation (i.e. demand driven uplift). This heightened accessibility is attractive for residential and commercial tenants and underpins growth in demand (and therefore prices) for properties within the area.

- As this type of land value uplift inherently includes the capitalisation of benefits (e.g. reduced travel costs) into land values, it is excluded from the CBA to avoid double counting. However, for completeness, the potential magnitude of these impacts was explored through an examination of relevant available literature (for example, BITRE [2015], TfNSW [2020]).
- Secondly, higher value land use may be realised when a transport initiative unlocks development constraints and allows for more floor space (i.e. higher density) on a fixed amount of land. This reflects a supply-driven impact where there is an increase in the supply of floor space (holding the price of land constant). This impact is addressed separately in the residential density benefit stream.

Induced demand benefits (non-quantified)

Road and public transport user benefits have been calculated using VITM, which measures the redistribution of trips given changes to travel costs brought about by a project. Therefore, the quantitative analysis excludes benefits associated with induced demand (that is, benefits to new users of the network who previously elected not to travel). Sources of induced demand include:

- Latent demand for public transport: individuals who previously did not travel due to high costs or poor accessibility, but now use the network
- New trip generation: increased convenience and reduced travel times can lead to discretionary trips that previously would not have been undertaken
- Mode shifts: travellers who previously used private vehicles or other modes of transport may now switch to public transport, contributing to reduced travel costs in other modes (e.g. reduced congestion on roads), which may subsequently induce additional demand for this mode i.e. through a feedback loop mechanism.

Induced demand and its broader impacts have not been quantified in this assessment; however, it is important to recognise its potential significance in shaping the overall impacts of the project. In particular, induced demand may contribute to increased network utilisation, contributing to greater user benefits (in aggregate) and enhancing the economies of scale of projects. Furthermore, enhancing the mobility of individuals may contribute economic benefits through fostering greater participation in economic and social activities.

Sensitivity analysis

The results of the economic appraisal are dependent on a range of inputs and assumptions, including demand forecasts, cost estimates and economic parameters. To test the robustness of results, sensitivity testing was carried out to estimate the impact associated with changes to various assumptions within the economic model, as outlined in the table below:

Table 20 Sensitivity test overview

Sensitivity test	Description
Discount rate	As with any economic appraisal, the outcomes were critically dependent on the discount rate used to calculate the present value of costs and benefits. Consistent with DTP and DTF guidance, the core analysis used a 7 percent discount rate, while sensitivity tests were conducted using discount rates of 4 percent and 10 percent.
Cost estimation	As noted above, the economic appraisal relied upon P50 capital cost estimates and therefore actual costs may differ from those currently estimated. To test the impact of cost savings or overruns, sensitivity tests were undertaken assuming over/under estimation of costs by 20 percent.
Demand analysis	Demand forecasting is a key element in estimating the benefits provided by the initiative. While the demand analysis effectively modelled varying degrees of demand response, standard demand sensitivity tests (i.e., +/- 20 percent benefits) were conducted to provide a benchmark for measuring the project's sensitivity to demand.

Appendix B Cost and timing

Fishermans Bend tram extensions

Key dates that have been assumed for the purposes of this assessment for the Fishermans Bend tram extensions are as follows:

- Construction is assumed to occur over the period 2027-2029 (financial years)
- Operations assessment has been undertaken for the period 2030-2059 (financial years).

The Fishermans Bend tram extensions have been costed by accounting for critical components, including the 7.9 kilometres of new tram tracks, accessible stops, upgraded signalling, and power systems. Costs also include procuring additional trams to meet demand and constructing or modifying bridge infrastructure to cross the Yarra River.

In order to reflect this the capital costs provided were divided into the infrastructure cost and the rolling stock cost. This is reflected in the P50 and P90 capital estimates in Table 21 and Table 22 respectively

The following assumptions were made in determining the cost estimates for the project:

- The P50 values were calculated in FY2024 dollars and then adjusted by a factor of 1.036 to account for inflation, bringing the costs up to FY2025 dollars.
- A full quantitative P90 estimate was not completed. Rather, it was assumed that P90 costs were greater than P50 costs by a factor of thirty per cent, as advised by IV.

Table 21 Fishermans Bend Capital Estimates P50 (FY2025, millions)

	Infrastructure cost	Rolling stock cost	Total
Route 11 Fishermans Bend South via Port Jcnt	$217.1m	$144.9m	$362.1m
Route 67 Fishermans Bend North	$613.5m	$145.0m	$758.4m
New Depot	$11.0m	$0.0m	$11.0m
Sub Total	**$841.6m**	**$289.9m**	**$1,131.5m**

Table 22 Fishermans Bend Capital Estimates P90 (FY2025, millions)

	Infrastructure cost	Rolling stock cost	Total
Route 11 Fishermans Bend South via Port Jcnt	$282.2m	$188.4m	$470.7m
Route 67 Fishermans Bend North	$797.6m	$188.4m	$986.0m
New Depot	$14.3m	$0.0m	$14.3m
Sub Total	**$1,094.1m**	**$376.8m**	**$1,471.0m**

The capital and operational costs for the Fishermans Bend tram extensions are outlined for both P50 and P90 estimates in Table 23.

Table 23 Fishermans Bend tram extensions – CAPEX & OPEX summary (FY$2025)

Cost type	P50	P90
CAPEX	$1,131.5m	$1,471.0m
OPEX (p.a.)	$5.2m	$7.2m

The CAPEX profile of the Fishermans Bend tram extensions is outlined in Table 24, expressed in both P50 and P90.

Table 24 Fishermans Bend tram extensions - CAPEX profile (FY$2025)

	Year					
Option	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
Fishermans Bend tram extensions (P50)	-	-	$226.3m	$452.6m	$452.6m	-
Fishermans Bend tram extensions (P90)	-	-	$294.2m	$588.4m	$588.4m	-

Table 25 outlines the projected economic costs for the Fishermans Bend tram extensions, expressed in present value terms discounted at a seven percent discount rate, with all values recorded in FY2025.

Table 25 Fishermans Bend tram extensions - economic costs (PV [7 percent], FY$2025)

	Cost type		
Option	PV CAPEX	PV OPEX	PV total cost
Fishermans Bend tram extensions (P50)	$912.4m	$48.9m	$961.4m
Fishermans Bend tram extensions (P90)	$1,186.1m	$68.5m	$1,254.7m

Suburban tram extensions

Key dates that have been assumed for the purposes of this assessment for the Suburban tram extensions project are as follows:

- Construction is assumed to occur over the period 2027-2029 (financial years)
- Operations assessment have been undertaken for the period 2030-2059 (financial years).

The Suburban tram extensions package has been costed by accounting for all critical components necessary for the delivery and operation of the five tram extensions. This includes infrastructure upgrades, such as laying new tram tracks, constructing and upgrading stops with modern amenities, and installing advanced signalling and power systems to ensure safe and efficient operations. Additionally, integration costs have been considered to seamlessly connect the new extensions with Melbourne's existing tram, train, and bus services, providing streamlined travel options for commuters.

A key component of the cost analysis is the procurement of new rolling stock, recognising the need for additional trams to meet increased service demand and ensure operational reliability. This includes upgrades or construction of depot facilities to house and maintain the expanded fleet.

As such the capital costs provided were divided into the infrastructure cost and the rolling stock cost. This is reflected in the P50 and P90 capital estimates in Table 26 and Table 27.

Table 26 Suburban tram extensions Capital Estimates P50 (FY2025, millions)

	Infrastructure cost	Rolling stock cost	Total
Route 68 Kew to Moorabbin*	$261.5m	$144.9m	$406.4m
Route 3 – Melbourne Uni to Hughesdale via Chadstone	$346.3m	$82.8m	$429.1m
Route 70 Docklands Stadium to Burwood East (Tally Ho)	$158.3m	$103.5m	$261.8m
Route 55/58 Domain/Toorak to Batman	$268.9m	$144.9m	$413.9m
New Depot	$18.3m	$0.0m	$18.3m
Sub Total	**$1,053.2m**	**$476.3m**	**$1,529.4m**

* previously Route 64 Melbourne University to East Brighton - now discontinued

Table 27 Suburban tram extensions Capital Estimates P90 (FY2025, millions)

	Infrastructure cost	Rolling stock cost	Total
Route 68 Kew to Moorabbin	$339.9m	$188.4m	$528.4m
Route 3 – Melbourne Uni to Hughesdale via Chadstone	$450.1m	$107.7m	$557.8m
Route 70 Docklands Stadium to Burwood East (Tally Ho)	$205.8m	$134.6m	$340.4m
Route 55/58 Domain/Toorak to Batman	$349.6m	$188.4m	$538.0m
New Depot	$23.7m	$0.0m	$23.7m
Sub Total	**$1,369.1m**	**$619.1m**	**$1,988.3m**

Table 28 outlines the P50 and P90 capital and operational costs associated with the Suburban tram extensions. Note that the costs and timing for the Suburban tram extensions sensitivity are the same as the Suburban tram extensions, encompassing infrastructure upgrades, rolling stock procurement, and operational adjustments. However, the strategic transport modelling assumptions differ. The Suburban tram extensions sensitivity tests different assumptions around land use density (population) and car ownership rates.

Table 28 Suburban tram extensions – CAPEX & OPEX summary (FY$2025)

Cost type	P50	P90
CAPEX	$1,529.4m	$1,988.3m
OPEX (p.a.)	$15.4m	$21.6m

The CAPEX profile of the Suburban tram extensions is shown in Table 29, expressed in both P50 and P90.

Table 29 Suburban tram extensions CAPEX profile (FY$2025)

	Year					
Option	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
Suburban tram extensions (P50)	-	-	$305.9m	$611.8m	$611.8m	-
Suburban tram extensions (P90)	-	-	$397.7m	$795.3m	$795.3m	-

The projected economic costs for the Suburban tram extensions, expressed in present value terms discounted at a seven percent discount rate with all values reported in FY2025 dollars, is shown in Table 30.

Table 30 Suburban tram extensions economic costs (PV [7 percent], FY$2025)

	Cost type		
Option	PV CAPEX	PV OPEX	PV total cost
Suburban tram extensions (P50)	$1,233.3m	$146.2m	$1,379.5m
Suburban tram extensions (P90)	$1,603.3m	$204.7m	$1,808.0m

Appendix C Suburban tram extensions sensitivity testing

Overview of project initiative

Transport and land use outcomes are tightly linked in policymaking. As part of Infrastructure Victoria's broader advocacy towards more compact land use outcomes,[26] and to test potential densifying impacts of the tram extensions, a sensitivity test was conducted on the Suburban tram extensions. This sensitivity altered the land use (population) and car ownership assumptions in the Victorian Integrated Transport Model (VITM). This reflects the tendency for greater population density and lower car ownership rates in areas with improved public transport accessibility. The sensitivity test assumes zoning in the impact areas allows higher density housing to be built.

Assumptions

This sensitivity had two assumptions that were adjusted at a zonal level to test transport outcomes:

1. Land use density (population).
2. Car ownership rates.

Figure 9 shows the areas that were identified for intervention in both inputs.

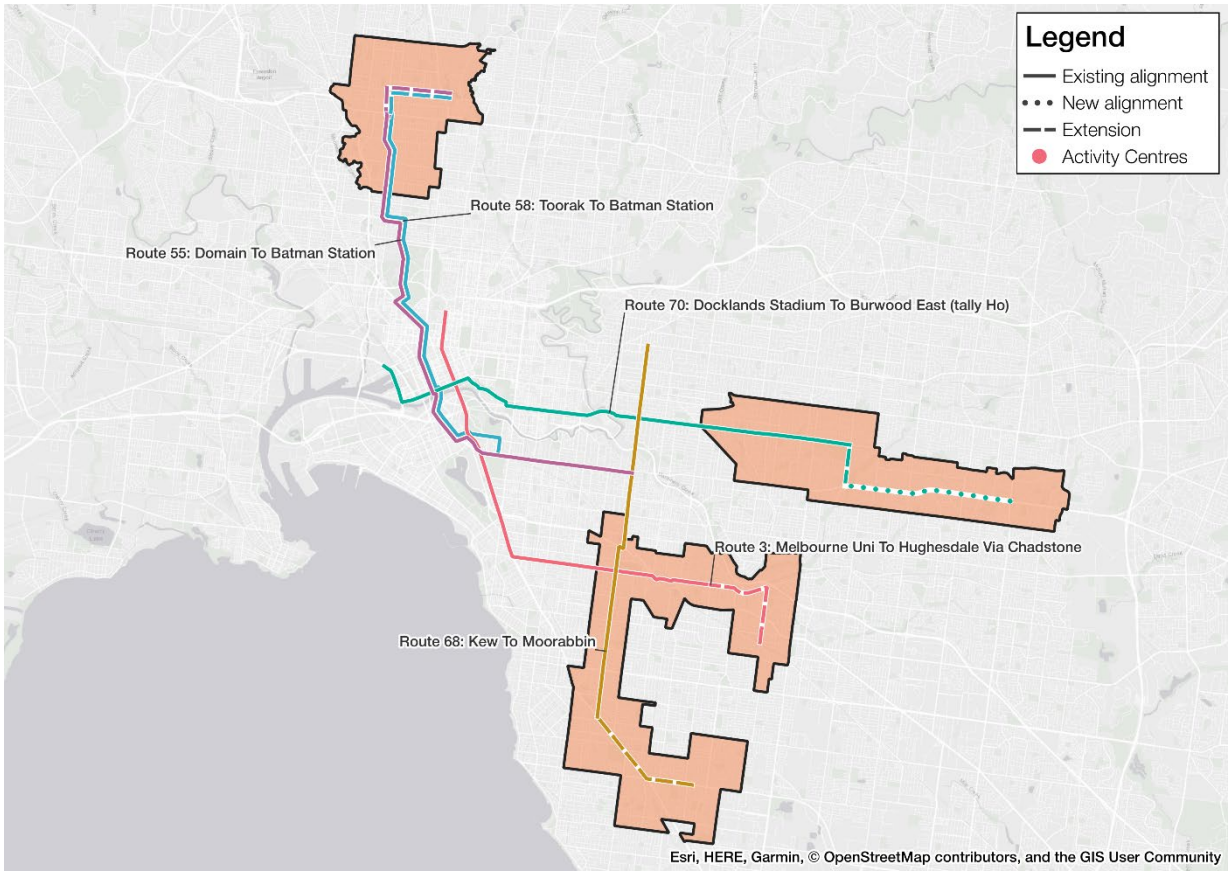


Figure 9 Land use impact areas (source: Infrastructure Victoria)

In each of these areas, the population density of transport zones was increased to reflect the improved accessibility created by the tram extensions. This reflects an increase in demand for housing within the impact areas and less demand for new housing in growth areas.

It is expected that this demand will shift from growth areas within the same corridor. The tram extensions are modelled in the northern and south-eastern corridors of Melbourne. Therefore, households have been redistributed from the northern and south-eastern growth areas only. This

[26] Choosing Victoria, 2023, Infrastructure Victoria

includes Hume, Whittlesea, Casey and Cardinia local government areas. This maintains a consistent total population with the other Network Development scenarios (NDS).

Table 31 Changes to population by impact corridor | Suburban tram extensions sensitivity

Tram corridor	2031		2041	
	NDS population	Sensitivity population	NDS population	Sensitivity population
3	54,700	57,900	62,700	74,200
55 / 58	69,500	71,000	79,100	84,600
68	78,300	88,400	84,100	120,400
70	78,300	83,300	89,200	107,300
Total	**280,800**	**300,600**	**315,100**	**386,500**

Additionally, the assumptions on the rates of car ownership in the impact areas were adjusted to reflect the car ownership rates currently seen adjacent to existing tram lines. Within the VITM, car ownership is modelled by estimating the proportion of households where the number of adults exceeds the number of cars owned by a household. These households are deemed to be 'captive' to public transport, and as a result will be more likely to choose public transport compared to a household that is not captive. Figure **10** shows the reduced car ownership assumptions for the impacted areas which were applied to the Suburban tram extensions sensitivity.

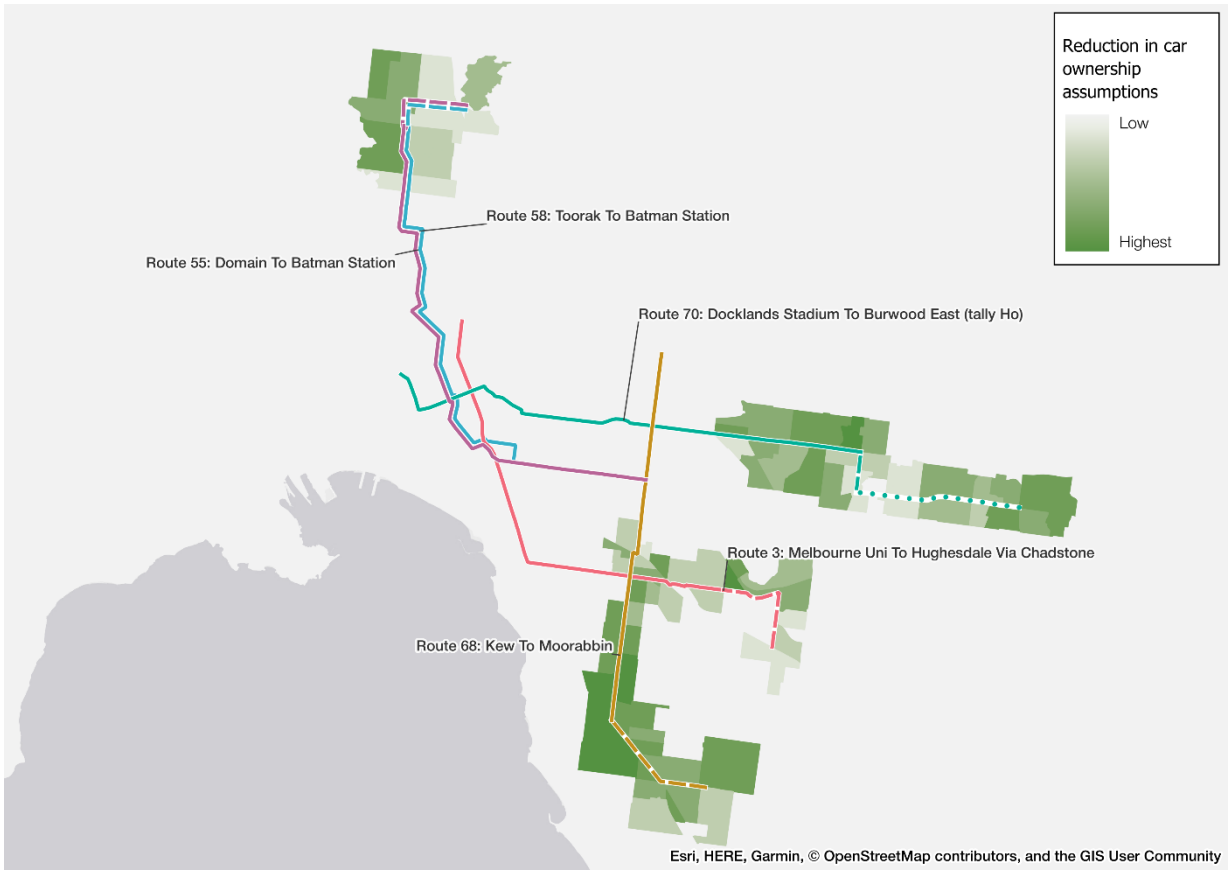


Figure 10 Reduction in car ownership (Suburban tram extensions sensitivity)

Monetised benefits

Table 32 outlines the value of the benefits of the Suburban tram extensions sensitivity, expressed with a seven percent discount rate over a 30-year appraisal period.

Table 32 Suburban tram extensions sensitivity economic benefits (PV [7 percent], FY$2025)

Benefit	$m (PV, 7%)	Key insights
Consumer surplus benefits (road)	$6,167.2m	This represents the most significant benefit, driven by dramatic reductions in road congestion due to a shift towards public transport. It includes travel time savings, lower vehicle operating costs, and enhanced road reliability, particularly in growth areas.
Consumer surplus benefits (PT)	$443.2m	This reflects improved accessibility, reliability, and convenience of tram services, particularly for residents in areas experiencing increased population density. It highlights the value of enhanced public transport as a competitive alternative to private vehicles in denser urban areas.
Environmental externalities	$457.7m	This represents environmental gains from reduced VKT due to a shift from car use to trams. It includes lower greenhouse gas emissions, reduced noise pollution, and improved urban air quality, aligning with sustainability objectives.
Crash cost savings	$186.4m	This benefit reflects improved road safety outcomes as fewer trips are made by car. It includes savings in accident-related costs such as healthcare, emergency response, and property damage.
Active transport benefits	$227.1m	Health benefits monetised in the CBA are split into two categories, both of which from increased physical activity driven by public transport investments and induced active transport. These categories are the benefit realised by individuals who experience lower morbidity due to increased physical activity as well as the benefit to all society members due to the reduced burden and health system costs.
Residential density benefits (public infrastructure cost savings)	$1,095.9m	This benefit reflects the cost efficiencies from accommodating growth in established areas with higher densities rather than sprawling greenfield developments. This has the effect of reducing demand for costly road, education, utilities infrastructure upgrades and maintenance in greenfield areas.
Residual asset value	$42.2m	This reflects the long-term infrastructure value of the tram extensions at the end of the appraisal period at a P50 value.
Total project benefits	**$8,619.6**	

Key insights

The Suburban tram extensions sensitivity demonstrates significantly higher monetised benefits, totalling $8,619.6 million (PV, 7%), compared to the base Suburban tram extensions scenario. This reflects the transformative impact of higher population densities and lower car ownership rates on transport outcomes. Below is a breakdown of the benefits.

The monetised benefits of the Suburban tram extensions sensitivity underscore the significant impact of strategic assumptions around land use density and car ownership rates on the project outcomes. It generates substantial road user benefits, reflecting the transformative potential of reduced congestion

and travel time savings. Environmental and safety benefits further highlight its alignment with Melbourne's sustainability and urban liveability goals.

The inclusion of public infrastructure cost savings underscores the broader efficiency gains from more compact urban development patterns. These results demonstrate the critical importance of integrating transport and land use policies to maximise the value of public transport investments and support Melbourne's transition to a denser, more sustainable urban form.

CBA outcomes

The CBA results are shown in Table 33 for the Suburban tram extensions sensitivity using a seven percent discount rate.

Table 33 Suburban tram extensions sensitivity CBA outcome summary (PV [7 percent], FY$2025)

	P50	P90
Costs		
Capital expenditure	$1,233.3m	$1,603.3m
Operational expenditure	$146.2m	$204.7m
Total project costs	**$1,379.5m**	**$1,808.0m**
Benefits		
Consumer surplus benefits (road)	$6,167.2m	$6,167.2m
Consumer surplus benefits (PT)	$443.2m	$443.2m
Environmental externalities	$457.7m	$457.7m
Crash cost savings	$186.4m	$186.4m
Active transport benefits	$227.1m	$227.1m
Public infrastructure cost savings	$1,095.9m	$1,095.9m
Residual asset value	$42.2m	$54.9m
Total project benefits	$8,619.6m	$8,632.3m
Key Performance Indicators		
NPV ($m)	**$7,240.1m**	**$6,824.3m**
BCR	**6.25**	**4.77**

Key insights

The CBA outcomes for the Suburban tram extensions sensitivity highlight its transformative potential, with significantly higher benefits compared to the base Suburban tram extensions scenario. The analysis demonstrates exceptional economic performance, driven by strategic assumptions around increased land use density and reduced car ownership rates. Below is a detailed breakdown of the results:

- **Costs vs benefits**
    - Costs range from $1,379.5 million (P50) to $1,808.0 million (P90), reflecting the same infrastructure, operational, and rolling stock expenditures as the base Suburban tram extensions scenario.
    - The project delivers exceptional benefits, ranging from $8,619.6 million (P50) to $8,632.3 million (P90).
- **Net Present Value (NPV)**
    - The project achieves an exceptionally high NPV of $7,240.1 million (P50) and $6,824.3 million (P90), reflecting the significant excess of benefits over costs under both scenarios.

- **Benefit-Cost Ratio (BCR)**
    - The BCR ranges from 6.25 (P50) to 4.77 (P90), indicating high returns on investment, even under the higher-cost scenario (P90).

The CBA outcomes for the Suburban tram extensions sensitivity showcase its potential to deliver significant economic returns, with benefits far exceeding costs. The exceptionally high road user benefits underscore the transformative impact of increased population density and reduced car ownership on transport outcomes. Significant environmental and safety benefits, along with public infrastructure cost savings, further strengthen the project's value proposition.

These results reinforce the critical role of integrated transport and land use planning in maximising public transport investments. By promoting densification and sustainable travel patterns, the Suburban tram extensions sensitivity aligns with Melbourne's broader goals of reducing urban sprawl, improving liveability, and advancing environmental sustainability.

Distribution impacts

The distributional impacts assessment for the Suburban tram extensions sensitivity provides valuable insight into how the costs and benefits of the initiative affect various stakeholder groups. The distribution of impacts on stakeholders generated by the Suburban tram extensions (sensitivity analysis) are similar as to the base Suburban tram extensions project (see Section 4.2.3), albeit with a different scale of impacts. To illustrate the difference in scale the impacts of the project on PT users and private vehicle users, as a comparison to the base case and the NDS Suburban tram extensions, is described in the table below:

Table 34 Change in tram passenger kilometres travelled by route (Suburban tram extensions sensitivity)

	Compared to Base		Compared to NDS Suburban tram extensions	
Metric	**Y2031**	**Y2041**	**Y2031**	**Y2041**
Change in daily public transport trips (average weekday)	+17,900	+21,700	+12,600	+17,900
Change in daily public transport hours travelled	+12,600	+7,800	+6,400	+4,700
Change in daily car trips (average weekday)	-39,900	-53,800	-33,700	-49,300
Change in daily car vehicle kilometres travelled	-385,200	-972,600	-328,000	-918,300

Wider Economic Benefits

The Suburban tram extensions sensitivity offers non-monetised benefits that build on the broader strategic value of the Suburban tram extensions. By assuming higher population densities and lower car ownership than the baseline scenario, this approach amplifies positive social and economic outcomes linked to agglomeration effects, labour market improvements, and sustainable urban development.

Agglomeration benefits arise as denser urban environments and enhanced public transport accessibility bring businesses, workers, and services closer together. These changes not only bolster productivity through collaboration and innovation but also stimulate local economic activity in precincts such as Chadstone, Moorabbin, and Burwood East. Improved tram connections, coupled with reduced reliance on private vehicles, drive foot traffic, support local businesses, and promote vibrant, mixed-use precincts that better align with Melbourne's long-term urban growth objectives.

Labour supply benefits are equally significant. By providing reliable, frequent tram services within densified areas, the project reduces commuting barriers and offers a more affordable alternative to private vehicle travel. This improved connectivity broadens employment opportunities, particularly for lower-income households, students, and other groups who benefit from cost-effective public transport while encouraging higher workforce participation. Shorter, more predictable journeys also increase flexibility in the labour market, allowing workers to pursue roles that better match their skills and aspirations. This stimulates economic resilience, addresses skill gaps in key hubs, and enhances overall liveability in Melbourne's suburban centres.

In addition, the higher-density, lower-car-ownership focus of the sensitivity tests supports a more compact urban form, and reinforcing the city's commitment to sustainable growth. By strategically concentrating development along tram corridors, the project helps create walkable, amenity-rich neighbourhoods that reduce car dependence, ease congestion, and lower environmental impacts. This integrated land use and transport approach ensures the region remains economically dynamic, socially inclusive, and better able to accommodate future growth.

The potential impacts of WEBs on the economic results for the project are provided in the table below (P50 results only) for reference and comparison only, under the assumptions that total benefits with WEBs are eight per cent and 28 per cent higher than total benefits without WEBs[27].

Table 35 Economic outcomes comparison exercise – benefits estimate with/without WEBs (P50 estimate)

	Total project benefits (core results, exc. WEBs)	Total project benefits (incl. low range WEBS)	Total project benefits (incl. high range WEBS)
Total project benefits (including WEBS)	$8,619.6m	$0.309.2m	$11,033.1m
NPV ($m)	$7,240.1m	$7,929.6m	$9,653.6m
BCR	6.25	6.75	8.00

Discussion

The total project benefit for the Suburban tram extensions sensitivity is $8,619.6 million (PV, seven percent). The CBA outcomes show that the NPV for this project is positive for both P50 and P90 scenarios and that the BCR is greater than one (in both P50 and P90), indicating that the total benefits exceed the costs for this project. By comparison the total project benefit for the base Suburban tram extensions scenario is $1,862.2 million (PV, seven percent). The CBA outcomes show that the NPV for the base scenario is positive for both P50 and P90 scenarios and that the BCR is greater than one (in both P50 and P90).

The comparison of these results indicates that both projects are economically viable with the benefits outweighing the costs, however the benefits from the sensitivity are significantly greater especially when the BCR for the base Suburban tram extensions scenario (1.35 at P50 and 1.04 at P90) is compared to that of the sensitivity (6.25 for P50 and 4.77 at P90). This highlights how the value placed on land use can change the benefits considered.

Relative to the base Suburban tram extensions, the VITM estimates show that the Suburban tram extensions sensitivity will result in an increased number of daily public transport trips (average weekday) by 12,600 people by 2031 and an additional 17,900 by 2041. The number of daily car trips (on an average weekday) will decrease by 33,700 by 2031 and by a further 49,300 by 2041. The number in daily car VKT will decrease by 328,000 by 2031 and by an additional 918,300 by 2041.

The distribution impact analysis and qualitative assessment of WEBs for the sensitivity test of the Suburban tram extensions is largely similar to that of the base Suburban tram extensions, although these impacts are expected to be on a larger scale in the sensitivity test given the higher expected public transport usage/lower private vehicle usage. For more detail on these impacts as they relate to the Suburban tram extensions, refer to Section 4.2.3 (distributional impacts) and Section 4.2.4 (WEBs).

A key consideration in determining the project's viability are the VITM estimates. The VITM estimates show that the Suburban tram extensions sensitivity will result in an increased number of daily public transport trips (average weekday) by 17,900 people by 2031 and an additional 21,700 by 2041. The number of daily car trips (on an average weekday) will decrease by 39,900 by 2031 and by a further 53,800 by 2041. The number in daily car VKT will decrease by 385,200 by 2031 and by an additional 972,600 by 2041.

[27] This is the high range estimation, and should not be used as indicative of expected benefits for this project.

Appendix D Sensitivity analysis

Outlined in this appendix is the sensitivity analysis for each project that is described in IV167 Economic Report.

Fishermans Bend tram extensions: Sensitivity analysis

Outlined in Table 36 Table 36are the results for the Fishermans Bend tram extension sensitivity analysis. The central scenario shows a NPV of $559.8 million and a BCR of 1.58, indicating strong economic viability. Sensitivity tests reveal the project remains viable under most variations, though viability is marginal at a 10% discount rate (BCR 1.06). The project is most sensitive to changes in benefits, with a 20% increase in benefits raising the NPV to $864.1 million and BCR to 1.90.

Table 36 Fishermans Bend tram extensions sensitivity analysis (P50, PV, FY$2025)

P50				
Scenario	PV costs	PV benefits	NPV	BCR
Central scenario	$961.4m	$1,521.2m	$559.8m	1.58
Discount rate - 4%	$1,074.9m	$2,681.0m	$1,606.1m	2.49
Discount rate - 10%	$869.5m	$921.5m	$52.0m	1.06
Costs + 20%	$1,153.6m	$1,521.2m	$367.6m	1.32
Costs - 20%	$769.1m	$1,521.2m	$752.1m	1.98
Benefits + 20%	$961.4m	$1,825.4m	$864.1m	1.90
Benefits - 20%	$961.4m	$1,217.0m	$255.6m	1.27

Outlined in Table 37 are the P90 sensitivity analysis results for the Fishermans Bend Tram extension. Under the P90 central scenario the project has a modest NPV of $276.6 million and a BCR of 1.22. The project becomes less favourable under a ten per cent discount rate or a 20 per cent reduction in benefits, with negative NPVs and BCRs below 1.0. However, it performs well under more favourable assumptions, particularly with lower costs or higher benefits

Table 37 Fishermans Bend tram extensions sensitivity analysis (P90, PV, FY$2025)

P90				
Scenario	PV costs	PV benefits	NPV	BCR
Central scenario	$1,254.7m	$1,531.3m	$276.6m	1.22
Discount rate - 4%	$1,405.0m	$2,681.0m	$1,276.0m	1.91
Discount rate - 10%	$1,133.7m	$921.5m	-$212.2m	0.81
Costs + 20%	$1,505.6m	$1,531.3m	$25.7m	1.02
Costs - 20%	$1,003.7m	$1,531.3m	$527.6m	1.53
Benefits + 20%	$1,254.7m	$1,837.6m	$582.9m	1.46
Benefits - 20%	$1,254.7m	$1,225.1m	-$29.6m	0.98

Suburban tram extensions: Sensitivity analysis

Table 38 shows the P50 sensitivity analysis for Suburban tram extensions. The central scenario shows a positive NPV of $482.6 million and a BCR of 1.35, indicating a strong economic viability. Under the sensitivity tests the project remains viable with the least favourable condition shown under the ten per cent discount rate or the 20 per cent decrease in benefits.

Table 38 Suburban tram extensions sensitivity analysis (P50, PV, FY$2025)

P50				
Scenario	PV costs	PV benefits	NPV	BCR
Central scenario	$1,379.5m	$1,862.2m	$482.6m	1.35
Discount rate - 4%	$1,578.0m	$2,704.3m	$1,126.4m	1.71
Discount rate - 10%	$1,229.7m	$1,352.9m	$123.2m	1.10
Costs + 20%	$1,655.4m	$1,862.2m	$206.7m	1.12
Costs - 20%	$1,103.6m	$1,862.2m	$758.5m	1.69
Benefits + 20%	$1,379.5m	$2,234.6m	$855.1m	1.62
Benefits - 20%	$1,379.5m	$1,489.7m	$110.2m	1.08

Table 39 outlines the P90 sensitivity analysis for Suburban tram extensions. The central scenario shows a positive NPV of $66.8 million and a BCR of 1.04, indicating the projects modest economic viability. The project becomes unfavourable under a ten per cent discount rate, a 20 per cent increase in costs, or a 20 per cent decrease in benefits, all resulting in negative NPVs and BCRs below 1.0. Positive outcomes are only seen with reduced costs or increased benefits, where BCRs reach up to 1.30.

Table 39 Suburban tram extensions sensitivity analysis (P90, PV, FY$2025)

P90				
Scenario	PV costs	PV benefits	NPV	BCR
Central scenario	$1,808.0m	$1,874.8m	$66.8m	1.04
Discount rate - 4%	$2,074.2m	$2,704.3m	$630.2m	1.30
Discount rate - 10%	$1,608.6m	$1,352.9m	-$255.7m	0.84
Costs + 20%	$2,169.6m	$1,874.8m	-$294.8m	0.86
Costs - 20%	$1,446.4m	$1,874.8m	$428.4m	1.30
Benefits + 20%	$1,808.0m	$2,249.8m	$441.8m	1.24
Benefits - 20%	$1,808.0m	$1,499.9m	-$308.1m	0.83

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