

Economic assessment of the 2030 Draft Transport Strategy - Final

City of Melbourne

1 October 2019

Contents

| | |
|---|----|
| Executive summary | i |
| 1 Introduction and background | 1 |
| 1.1 Context | 1 |
| 1.2 Purpose and scope | 2 |
| 1.3 Our approach | 2 |
| 1.4 Limitations | 3 |
| 2 The Draft Transport Strategy and its benefits | 4 |
| 2.1 The City of Melbourne Draft Transport Strategy 2030 | 4 |
| 2.2 Overview of benefits of the Strategy | 5 |
| 2.3 Pedestrian safety | 6 |
| 2.4 Bicycle safety | 8 |
| 2.5 Land use productivity | 9 |
| 2.6 Uptake of Electric Vehicles | 10 |
| 2.7 Improved walking amenity in the central city | 11 |
| 2.8 Time savings | 11 |
| 2.9 Mode shift | 12 |
| 3 Valuing the benefits of the Draft Transport Strategy | 13 |
| 3.1 Pedestrian safety | 13 |
| 3.2 Bicycle safety | 14 |
| 3.3 Land use productivity | 15 |
| 3.4 Uptake of Electric Vehicles | 16 |
| 3.5 Improved walking amenity in the central city | 18 |
| 3.6 Time savings | 18 |
| 3.7 Mode shift | 19 |
| 4 Discussion | 21 |
| 4.1 Summary of benefits | 21 |
| 4.2 Discussion | 22 |
| Limitation of our work | 23 |
| General use restriction | 23 |

Tables

| | |
|---|----|
| Table 2.1 City of Melbourne Draft Transport Strategy Themes and Outcomes | 4 |
| Table 2.2 Summary of direct and measureable economic benefits achieved by Draft Transport Strategy 2030 | 5 |
| Table 2.3 Road crashes involving pedestrians, by severity, Melbourne central city, last five years | 7 |
| Table 2.4 Average annual cost of pedestrian road trauma in City of Melbourne, \$2019 | 7 |
| Table 2.5: Road crashes involving cyclists, by severity, City of Melbourne | 8 |
| Table 2.6 Average annual cost of cyclist road trauma in City of Melbourne, 2014-2018 (\$ million) | 9 |
| Table 3.1 Expected annual average cost of fatalities and injuries in Melbourne central city from road crashes under a 30 km/h speed limit | 14 |
| Table 3.2 Expected annual average cost of fatalities and injuries in the City of Melbourne with separated cycle lanes | 15 |
| Table 3.3 Current and 2030 target transport mode share to and from the City of Melbourne | 19 |
| Table 3.4 Summary of annual value of achieving target mode shift in 2019 | 20 |
| Table 4.1 Summary of economic benefits delivered by Strategy | 21 |

Figures

| | |
|---|----|
| Table 2.1 City of Melbourne Draft Transport Strategy Themes and Outcomes | 4 |
| Table 2.2 Summary of direct and measureable economic benefits achieved by Draft Transport Strategy | 5 |
| Table 2.3 Road crashes involving pedestrians, by severity, Melbourne central city, last five years ^(a) | 7 |
| Table 2.4 Average annual cost of pedestrian road trauma in City of Melbourne, \$2019 | 7 |
| Table 2.5: Road crashes involving cyclists, by severity, City of Melbourne | 8 |
| Table 2.6 Average annual cost of cyclist road trauma in City of Melbourne | 9 |
| Table 3.1 Expected annual average cost of fatalities and injuries in Melbourne central city from road crashes under a 30 km/h speed limit | 14 |
| Table 3.2 Expected annual average cost of fatalities and injuries in the City of Melbourne with separated cycle lanes | 15 |
| Table 3.3 Current and 2030 target transport mode share to and from the City of Melbourne | 19 |
| Table 3.4 Summary of annual value of achieving target mode shift in 2019 | 20 |
| Table 4.1 Summary of economic benefits delivered by Strategy | 21 |

Executive summary

The City of Melbourne has recently released its Draft Transport Strategy 2030 (the Strategy) for public consultation on 7 May 2019. The Strategy outlines 41 policy initiatives and 24 actions to deliver the three pillars of its vision by 2030, being:

1. creating a safe and liveable city
2. fostering an efficient and productive city
3. encouraging a dynamic and adaptive city.

The Strategy, if delivered as intended, is expected to result in a range of direct and measureable economic benefits to the Victorian community and City of Melbourne.

Overall, across seven types of benefits, Deloitte Access Economics estimates that approximately \$87.1 million in annual economic benefit to the Victorian community would be generated in 2019 if the Strategy were successfully in place today. Values presented reflect annual benefits in 2019. It is expected that these benefits will continue into the future so long as the Strategy continues to be fully implemented and transport congestion continues to exist. Furthermore, benefits would potentially get larger over time as Melbourne continues to grow and problems such as congestion and safety worsen in the absence of a Strategy.

Table E.1: Summary of estimated annual economic benefits delivered by the Draft Transport Strategy

| Economic Benefit | Description | Value (\$ million, 2019) |
|---|--|---------------------------------|
| Pedestrian safety | A reduction in vehicle speed limits from 40 km/h to 30 km/h is expected to halve pedestrian fatalities, and significantly reduce other pedestrian injuries and total collisions. | \$3.8 |
| Bicycle safety | Bicycle safety would be improved via reducing vehicular speed limits and providing an additional 90 km of dedicated bicycle lanes across the City of Melbourne. | \$2.4 |
| Land use productivity | Around half of the 45,000sq.m of kerbside car parking space is expected to be repurposed for alternative uses, unlocking significant land to be reallocated to other purposes. | \$14.9 |
| Electric vehicles | The provision of public charging infrastructure would help accelerate adoption of EVs, for trips made to Melbourne central city. However given Victoria's current fuel mix – Greenhouse Gas savings from this switch are modest. | \$0.06 |
| Increased walking amenity in the central city | Increasing the walkability of Melbourne central city is expected to induce additional international and interstate tourist visitation, leading to net economic gains to Victoria from their spending. | \$2.2 |
| Time savings | The Strategy would reduce travel times through the central city for trams and buses, and would reduce waiting times at intersections for walking and cycling trips. | \$40.2 |
| Mode shift | The Strategy will support mode shift from cars to public transport and active transport modes by implementing a range of policies and actions. This will result in a range of health and environmental benefits to commuters who shift from cars to public transport and active transport, and avoided road maintenance costs. | \$23.5 |
| Total quantified | | \$87.1 |

1 Introduction and background

1.1 Context

The City of Melbourne has recently released its Draft Transport Strategy 2030 (the Strategy) for public consultation on 7 May 2019. The Strategy outlines 41 policy initiatives and 24 actions to deliver the three pillars of its vision by 2030:

1. creating a safe and liveable city
2. fostering an efficient and productive city
3. encouraging a dynamic and adaptive city.

The City of Melbourne is seeking to undertake a high-level economic assessment of the Strategy to further support its engagement with key stakeholders to support the achievement of the outcomes set out within the Strategy.

Efficient, well-integrated urban transport systems drive economic prosperity and social inclusion. They contribute to making a city more liveable.¹ The approach to planning and investment in public, road, and active transport networks directly shapes the economic, social and environmental fabric of a city. Public transport, walking and cycling infrastructure that link people from where they live to employment opportunities, education, shopping, health and community services and leisure services enhances the liveability of our cities.² They ensure a city, and critically what it offers to its residents and visitors, are accessible for all. Moreover, a well-designed transport system gives people transport choice - walking, cycling, driving and public transport integrate seamlessly to enable the efficient movement of people and goods.

Transport systems that encourage and enable active transport over traditional car transport deliver significant economic benefits to society. These include improved public health benefits from increased walking and cycling, reduced car congestion, improved air quality and reduced greenhouse gas emissions, and reduced infrastructure maintenance costs.³

As Greater Melbourne continues to grow towards 8 million residents by 2051⁴ there is a risk that the existing approach to delivering transport solutions in the central city⁵ will be insufficient. As the economic and cultural heart of Greater Melbourne, the City of Melbourne is expected to see a significant increase in the number of people coming into the city each day. By 2036 it is anticipated that approximately 1.4 million people will use the central city each day, representing around 500,000 additional daily users of the city, compared to today. This increase is driven by the interplay of Greater Melbourne's growing population, the densification our inner city suburbs, growth in business and employment activities within the central city, and the continued attraction of the central city as Melbourne's cultural and entertainment heart.

A failure to rethink our approach to transport planning and delivery means we run the risk of imposing significant and avoidable economic, social and environmental costs on the community. These include a continued increase in road congestion and emissions, a reduction in pedestrian safety resulting in adverse health impacts, and an erosion of the social and cultural amenity that

¹ Arundel, Jonathan et. al. 2017, *Creating liveable cities in Australia: Mapping urban policy implementation and evidence-based national liveability indicators*, Centre for Urban Research, RMIT University.

² Infrastructure Australia 2018, *Planning Liveable Cities: A place-based approach to sequencing infrastructure and growth*.

³ Department of Infrastructure and Transport 2013, *Walking, Riding and Access to Public Transport: Supporting active travel in Australian communities*.

⁴ Department of Environment, Land, Water and Planning 2018, *Victoria in Future 2016*.

⁵ The central city includes the area bounded by the central business district, Dockland and Southbank. It is not an official geography, but rather represents a colloquial area that refers to the portion of Melbourne where most of the employment, social and cultural activity occurs.

Commercial-in-confidence

underpins Melbourne's status as one of the world's most liveable cities. In short, we run the risk of negatively impacting the economic prosperity and liveability of Melbourne.

1.2 Purpose and scope

Deloitte Access Economics has been engaged by the City of Melbourne to undertake a high-level economic assessment of the Strategy. The overarching objective of the economic assessment is to quantify, to the extent possible and appropriate, the economic benefits of the City of Melbourne delivering the policies and actions outlined in the Strategy.

This report presents a summary of the economic benefits to the Victorian community from the successful implementation of the City of Melbourne's Strategy.

The value of benefits are presented in annual terms as of today (2019), assuming the desired outcomes and targets (where relevant) of the Strategy have been successfully achieved, and the Strategy was operating now. That is, this report presents the annual value of the benefits assuming that the City of Melbourne has successfully achieved the objectives and outcomes of its Strategy, today.⁶ In doing so, the annual gross benefit to the community represents the value to society of getting integrated transport planning and delivery 'right' in the central city.

Deloitte Access Economics has not undertaken a formal cost-benefit assessment of the Strategy as part of this project. This project has also not involved a detailed assessment of the likely costs involved in implementing the Strategy.

1.3 Our approach

This report has involved the high-level quantification of economic benefits resulting from the successful implementation of the Strategy. This has involved undertaking a review of the policies and actions to be delivered by the Strategy and identifying those economic benefits where a direct and measurable benefit to the community can be reasonably demonstrated. The approach undertaken to identifying and assessing the economic benefits of the Strategy involved:

- a detailed review of the Strategy and proposed policies and actions, and other relevant documentation provided by City of Melbourne
- identification and confirmation of the economic benefits to be delivered from delivery of the Strategy
- identification, sourcing and analysis of relevant data, including from Australian Bureau of Statistics (ABS), Bureau of Infrastructure, Transport and Regional Economics (BITRE), Victorian Integrated Survey of Travel and Activity (VISTA) and other relevant data sources
- establishing a 'business-as-usual' scenario based on existing transport mode share and daily users of the central city
- high-level quantification and modelling of the economic benefits of the Strategy relative to the 'business-as-usual' scenario.

The business-as-usual scenario (also known as the counterfactual or base case) is based on current use of the City of Melbourne, population, transport mode share and walker and cycle safety. It represents the current state of transport today.

Economic benefits delivered by the Strategy have been assessed at an aggregate level. That is, benefits have been identified and quantified based on a whole-of-Strategy perspective, not on an individual policy of action basis.

Benefits have been measured in terms of impacts on the Victorian community as a whole, rather than assessing the economic impact to the City of Melbourne. This is because many of the benefits of the Strategy that enhance the central city will, in fact, be realised outside of the boundaries of the City of Melbourne, to wider Melbourne and Victoria.

⁶ An assessment of benefits in 2030 introduces too many uncertainties with respect to the number of users of the City of Melbourne, mode share, pedestrian and bicycle safety and other measures. By measuring benefits in 2019 it is possible to provide a direct comparison of a world 'without the Strategy' and a world 'with the Strategy'.

Commercial-in-confidence

The Draft Transport Strategy 2030 does not include explicit targets for many initiatives. However, the City of Melbourne is in the process of developing targets for the final iteration of the Strategy. Where targets do not exist in the Draft Strategy, Deloitte Access Economics has assessed the benefits of hypothetical measurable changes to the city's form or function.

As such, the economic benefits assessment should be considered a 'what if' assessment, not any sort of forecast or estimate of net economic benefits that will occur.

1.4 Limitations

The following limitations should be noted in considering the findings of this report:

- This study has not sought to assess or review the potential implementation costs to the City of Melbourne from delivering the Strategy.
- This study has not modelled the intersection and interrelationship of individual initiatives. This would require detailed transport modelling which is beyond the scope of this project.
- No formal review or assessment of the suitability and appropriateness of the targets, policies or actions outlined in the Strategy and related documentation has been undertaken.
- A range of policies and actions outlined in the Strategy are beyond the City of Melbourne's ability to directly influence. These policies and initiatives have not been assessed.
- The economic benefits assessment undertaken is based on the Strategy as publicly released on 7 May 2019. It is noted that elements of the Strategy may change and evolve as it progresses through stakeholder and community engagement.
- The quantification of economic benefits, in some instances, has been reliant on the provision of information by the City of Melbourne. Deloitte Access Economics has not undertaken an independent review or verification of any information provided to it for the purposes of this study.

2 The Draft Transport Strategy and its benefits

2.1 The City of Melbourne Draft Transport Strategy 2030

The City of Melbourne's Draft Transport Strategy 2030 (the Strategy) seeks to support the transport preferences and needs of users within the central city and further encourage mode shift by reallocating space away from road users to other forms of transport. It presents a vision for how the community moves, lives, works and plays in the central city – by prioritising walking, active transport and public transport over cars, and unlocking barriers to further uptake of these modes of transport.

The Strategy seeks to create a city that is even more vibrant, prosperous, accessible, connected, safe, comfortable, sustainable, and yet still quintessentially Melbourne. In doing so, the Strategy seeks to allow the best part of the central city to thrive – its people – by making the place move better. The Strategy identifies a range of policies and actions to deliver 13 outcomes across three themes (Table 2.1).

Table 2.1 City of Melbourne Draft Transport Strategy Themes and Outcomes

| Theme | Strategy outcomes |
|--|--|
| <p>A safe and liveable city</p> <p>Safe, walkable streets support the knowledge economy, which is dependent on face-to-face interaction and the sharing of ideas and information. Cities with streets which support convenient, comfortable and safe transport have healthier populations and a more equitable society. Streets designed for people attract investment and promote economic growth.</p> | <ul style="list-style-type: none"> • Safe streets for people • Safe streets for bike riding • Public transport hubs as welcoming people places • Fewer non-essential vehicles in the municipality |
| <p>An efficient and productive city</p> <p>The efficient movement of people and goods is critical to the function of our city. Economic growth and productivity is powered by efficient transport. The walking economy has been key to the success of the central city as a place to do business, visit and live. Moving more people and goods efficiently in the same amount of space is a significant challenge we must address in partnership with the Victorian Government.</p> | <ul style="list-style-type: none"> • Reduced delays for people using efficient transport • More people riding bikes • Productive kerb space • Efficient and reliable public transport for everyday life • Integrated transport planning |
| <p>A dynamic and adaptive city</p> <p>As our population grows and transport challenges become more complex, there are real opportunities for technology, trials and innovative policy to be part of the solution. Our streets, public spaces and transport network must be adapted to meet the travel demands of the future while ensuring we continue to put people first in a liveable, prosperous and sustainable Melbourne.</p> | <ul style="list-style-type: none"> • New technologies delivering a net community benefit • Vehicle innovation supporting a people focused city • Zero emissions transport • Equitable and efficient transport pricing |

Source: City of Melbourne

Commercial-in-confidence

The Strategy contains a range of direct policies and actions on the part of the City of Melbourne. Examples include the delivery of a dedicated network of bicycle lanes across the municipality, reducing car speed limits to enhance safety in the central city, and upgrading tram stop designs and improving traffic signal efficiency in the central city.

The Strategy also involves a range of indirect policy and actions that involve City of Melbourne working with and supporting State Government departments and agencies. For example, the City of Melbourne is advocating for improvements to the rail network to boost capacity during peak times.

2.1.1 Previous studies

The Strategy 2030 builds upon a range of policies and actions previously undertaken by the City of Melbourne that seek to broadly:

- encourage a mode shift away from vehicles to active modes of transport and increase walking and bicycle trips into the central city
- prioritise walking and enhance walker safety
- enhance bicycle safety
- enhance the walkability of the central city
- enhance the amenity and liveability of the City of Melbourne.

Key previous strategies that have informed the development of the Strategy include:

- City of Melbourne Transport Strategy 2012
- City of Melbourne Road Safety Plan
- City of Melbourne Climate Change Mitigation Strategy
- Cost of Pedestrian Delay in Melbourne CBD
- City of Melbourne Pedestrian Counting System.

2.2 Overview of benefits of the Strategy

This report focusses on those policies and actions where it can most reasonably be demonstrated will have a direct and measurable economic benefit to the Victorian community. A summary of the direct and measurable economic benefits that are expected to be achieved from the successful and complete implementation of the Strategy are outlined in Table 2.2.

Table 2.2 Summary of direct and measurable economic benefits achieved by Draft Transport Strategy 2030

| Economic benefit | Description of economic benefit |
|---|---|
| Improved walker safety | Avoided emergency services costs, hospitalisation and other medical costs, lost labour and household earnings, reduced quality of life and other costs from reduced incidence and severity of pedestrian road trauma within the central city. |
| Improved bicycle safety | Avoided emergency services costs, hospitalisation and other medical costs, lost labour and household earnings, reduced quality of life and other costs from reduced incidence and severity of bicycle road trauma within the City of Melbourne. |
| Enhanced land use productivity | Land value of the area of kerbside car parking reallocated to other beneficial social uses such as walking, seating, trees and other uses. |
| Accelerated adoption of electric vehicles | Avoided greenhouse gas emissions from accelerated adoption of electric vehicles relative to traditional internal combustion engine vehicle. |

| Economic benefit | Description of economic benefit |
|--|--|
| Improved walking amenity in the central city | Increased interstate and international visitation due to increase in walkability, amenity and quality of experience in the central city. |
| Time savings to walkers and public transport users | Time savings for walking trips and public transport users from improved traffic signalling that prioritises the movements of walkers over vehicles and improved efficiency of tram and bus operations within the central city. |
| Mode shift | Health and environmental benefits associated with a mode shift away from private vehicles to active modes of transport into the central city. |

These economic benefits, and the how the Strategy will achieve them, are discussed in greater detail below.

2.3 Pedestrian safety

The City of Melbourne has proposed a range of initiatives in its Strategy to improve the safety of walking trips within the central city⁷. The proposed actions that are expected to contribute to improved walker safety include:

- Measures that slow the movement of cars in the central city including:
 - reducing speed limits from 40 km/h to 30 km/h
 - creating shared zones on some city streets
 - introducing traffic calming measures in high pedestrian zones such as narrowing traffic lanes.
- Measures that seek to enhance walker safety, including:
 - widening existing footpaths and reallocating space to pedestrians in intersections in the busiest walking areas
 - removing obstructions from existing footpaths
 - prioritising the movement of pedestrians during construction activity in the central city
 - designing streets to enable safe, informal crossing where formal crossing are distant.

The implementation of the above pedestrian safety measures has the potential to **reduce the incidence and extent of pedestrian road trauma within the central city.**

Nature of the current problem

Pedestrians make up nearly a fifth of the lives lost on Victorian roads. In 2018, 37 pedestrians were killed on Victorian roads, equating to 19% of all Victorian road fatalities.⁸

Within the central city, while the absolute number of pedestrian fatalities represents a small proportion of the state-wide total, there are still a significant number of serious and other injuries resulting from road trauma.

The table below outlines the number of pedestrian fatalities, serious incidents⁹ and other incidents¹⁰ in the central city¹¹ over the last five years, including the five year annual average.

⁷ City of Melbourne 2019, *Draft Transport Strategy 2030*.

⁸ TAC, *Lives lost – Annual: Calendar year to midnight 31 December 2018* <http://www.tac.vic.gov.au/road-safety/statistics/lives-lost-annual>

⁹ Defined as requiring hospitalisation of 14 days or more.

¹⁰ Defined as requiring less than 14 days hospitalisation.

¹¹ As defined by VicRoads as the Hoddle Grid.

Commercial-in-confidence

Table 2.3 Road crashes involving pedestrians, by severity, Melbourne central city, last five years

| Year | Fatal accident | Serious injury accident | Other injury accident |
|---|----------------|-------------------------|-----------------------|
| 2014 | 0 | 13 | 40 |
| 2015 | 1 | 17 | 37 |
| 2016 | 0 | 22 | 33 |
| 2017 | 1 | 20 | 32 |
| 2018 | 0 | 6 | 28 |
| March Quarter 2019^(b) | 0 | 2 | 6 |
| Five year annual average 2014-2018 | 0.4 | 15.6 | 34.0 |

Notes: (a) Fatalities and injuries from car attacks are not included in this data. This data also excludes collisions with trams
 (b) 2019 numbers are calendar year to 31 March 2019, and have not been included in the five year annual average.
 Source: VicRoads, *Crash Stats - Data Extract* (7 June 2019) <https://discover.data.vic.gov.au/dataset/crash-stats-data-extract>

Based on the cost of emergency services, hospitalisation and other medical care, lost labour and household earnings, a reduction in quality of life and other costs, **the current average annual cost to the Victorian community from pedestrian road trauma in the central city is \$9.6 million** (Table 2.4).

Table 2.4 Average annual cost of pedestrian road trauma in City of Melbourne, \$2019

| | Fatal accident | Serious injury accident | Other injury accident | Total |
|--|----------------|-------------------------|-----------------------|--------------|
| Average yearly casualties 2013-2018 | 0.4 | 15.6 | 34.0 | |
| Casualty costs per person^(a) | \$2.1 | \$0.5 | \$0.02 | |
| Annual cost of incidents | \$0.9 | \$8.0 | \$0.7 | \$9.6 |

Notes: (a) Casualty costs per person include the cost of emergency services, hospital and other medical care, lost labour earnings in the workplace and household, reduction in quality of life, criminal proceedings, insurance and vehicle costs including travel delays following loss of access to a vehicle.
 Source: BITRE, *Social Costs of Road Crashes in Australia: The Case for Willingness-to-pay Vales for Road Safety* (2015) https://austroads.com.au/publications/road-safety/ap-r438-15/media/AP-R438-15_Social_Cost_of_Road_Crashes.pdf

2.4 Bicycle safety

The Strategy proposes a range of initiatives aimed directly at improving bicycle safety, and supporting a mode shift to cycling. Specifically, the measures have the potential **to reduce the incidence and severity of cyclist road trauma within the City of Melbourne**. The proposed measures include:

- Measures that seek to physically separate bicycles from traffic including:
 - physical separation of bicycle riders and motorists through expanding the network of dedicated cycle lanes into and through the central city with the delivery of an additional 90 kilometres of dedicated bicycle lanes
 - redesign of intersections to make them safer and more attractive to more people riding bicycles
 - prioritisation of bicycle movements through intersections via head-starts and dedicated traffic light sequences.
- Measures that slow the movement of motorised vehicles through the central city including:
 - a reduction of speed limits in the Hoddle street grid from 40 km/h to 30 km/h
 - the introduction of traffic calming measures on streets where cycle lanes cannot be physically separated from traffic.

Nature of the current problem

In 2018, seven cyclists lost their lives on Victorian roads, accounting for 3% of the total road deaths.¹²

In the City of Melbourne, no cyclists were killed in road collisions over this period. However, four cyclists were seriously injured in road incidents¹³, while a further 65 cyclists suffered other injuries over the year to November 2018.¹⁴ There has been a trend of increased bicycle rider injuries within the City of Melbourne over the past five years, with a 50% total increase in the number of riders suffering other injuries over the five years to November 2018.

A summary of cyclist fatalities and injuries over the last five years within the City of Melbourne presented below (Table 2.5).

Table 2.5: Road crashes involving cyclists, by severity, City of Melbourne

| YTD 30 November | Fatalities | Serious injury ^(a) | Other injury ^(b) |
|------------------------------------|------------|-------------------------------|-----------------------------|
| 2014 | 0 | 2 | 44 |
| 2015 | 0 | 2 | 39 |
| 2016 | 0 | 2 | 55 |
| 2017 | 1 | 3 | 62 |
| 2018 | 0 | 4 | 65 |
| Five year annual average 2014-2018 | 0.2 | 2.6 | 53 |

Notes: (a) We have assumed that the hospitalisation category 14 days or more is equivalent to VicRoads serious injury category, (b) We have assumed that the hospitalisation category 14 days or less is equivalent to VicRoads other injury category.

Source: TAC, *Searchable road trauma statistics* (5 June 2019) <http://www.tac.vic.gov.au/road-safety/statistics/online-crash-database>

¹² TAC, *Lives lost – Annual: Calendar year to midnight 31 December 2018* <http://www.tac.vic.gov.au/road-safety/statistics/lives-lost-annual>

¹³ Defined as requiring hospitalisation of 14 days or more.

¹⁴ Defined as requiring less than 14 days hospitalisation.

Commercial-in-confidence

Based on the cost of emergency services, hospitalisation and other medical care, lost labour and household earnings, a reduction in quality of life and other costs, **the current average annual cost to the Victorian community from cyclist road trauma in the City of Melbourne is \$2.8 million** (Table 2.6).

Table 2.6 Average annual cost of cyclist road trauma in City of Melbourne, 2014-2018 (\$ million)

| | Fatal accident | Serious injury accident | Other injury accident | Total |
|--|----------------|-------------------------|-----------------------|--------------|
| Average five year annual casualties 2014-2018 | 0.2 | 2.6 | 53 | |
| Casualty costs per person^(a) | \$2.1 | \$0.5 | \$0.02 | |
| Annual cost of incidents | \$0.4 | \$1.4 | \$1.1 | \$2.8 |

Notes: (a) Casualty costs per person include the cost of emergency services, hospital and other medical care, lost labour earnings in the workplace and household, reduction in quality of life, criminal proceedings, insurance and vehicle costs including travel delays following loss of access to a vehicle.

Source: BITRE, Social Costs of Road Crashes in Australia: The Case for Willingness-to-pay Vales for Road Safety (2015) https://austroads.com.au/publications/road-safety/ap-r438-15/media/AP-R438-15_Social_Cost_of_Road_Crashes.pdf; TAC, Searchable road trauma statistics (5 June 2019) <http://www.tac.vic.gov.au/road-safety/statistics/online-crash-database>

2.5 Land use productivity

The central city has approximately 45,000 sq.m of kerbside parking space, currently concentrated in the northern and eastern side of the central city (see Figure 2.1). The Strategy aims to optimise the use of this scarce land within the central city and reallocate a proportion of kerbside parking space to alternative uses to enhance the amenity and attractiveness of the city.

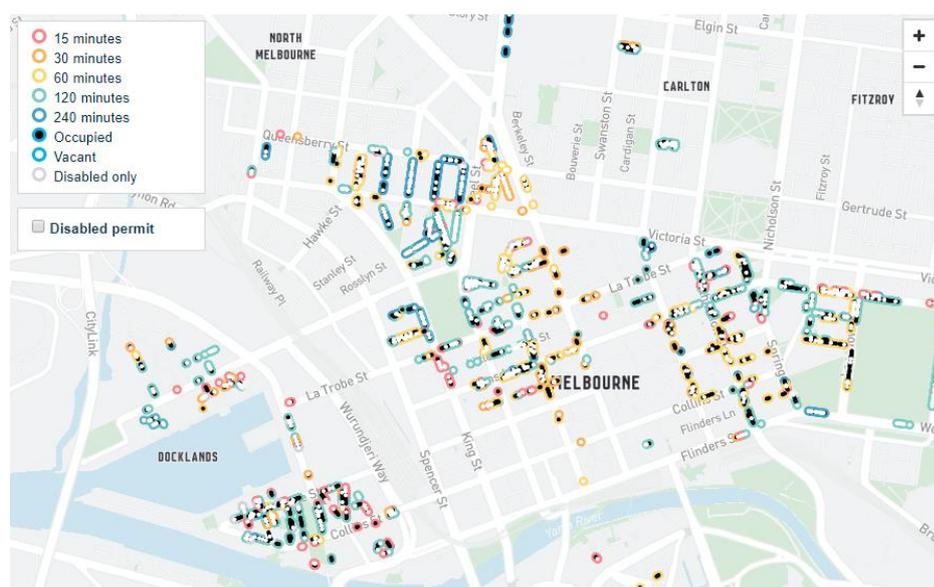
Nature of the current problem

In a constrained city, dedicated kerbside car parking spaces result in an inefficient use of highly valuable land which could be dedicated to alternative, competing uses. This may include bicycle lanes, footpath-widening, trees and urban greening, additional alfresco dining or other forms of open space that could enhance the amenity and attractiveness of the central city.

Analysis by the City of Melbourne to inform the Strategy demonstrated that approximately 53% of street space in the Hoddle Grid is allocated to roads and on-street car parking. In contrast, only 26% of all street space in the Hoddle Grid is allocated to footpaths, but 89% of all trips within the Hoddle Grid are made on foot.¹⁵ Furthermore, a significant proportion is taken up by street furniture, bins, poles, trading and bike, motorcycle parking, and other uses.

¹⁵ City of Melbourne 2019, *Draft Transport Strategy 2030*.

Figure 2.1 Kerbside parking space across the central city



Source: City of Melbourne on street parking data, available [here](#).

2.6 Uptake of Electric Vehicles

Consistent with the broader Victorian government goal, the Strategy aims for transport trips across the City of Melbourne to be emissions-free by 2050. A key pillar of this is the facilitation of the uptake of electric vehicles (EVs), assisting to phase out internal-combustion engine based vehicles. Traditional combustion engine powered vehicles account for almost 100% of all private vehicles in Victoria, and 39% of all trips to/from the central city.^{16,17}

The Strategy aims to accelerate the uptake of EVs by facilitating the increased provision of charging stations. It aims to do so by supporting off-street electric car charging, leveraging the 13,000 unoccupied off-street residential parking spots across the City of Melbourne. Enhancing the availability of public charging stations is expected to accelerate the adoption of EVs by those who use their private vehicle as the dominant mode of transport to and from the central city, particularly for residents without access to dedicated charging infrastructure at home.¹⁸

Nature of the current problem

EVs have the potential to assist with Victoria's transition towards a net zero emissions by 2050 target.¹⁹ Transport is estimated to be the second highest contributor to Victorian greenhouse gas (GHG) emissions (19.5% of total emissions), behind electricity generation (52%) and ahead of agriculture (12.2%). A fall in Victorian transport emissions could therefore assist in the move towards the Victorian Government's 2020 GHG reduction target, and the net zero 2050 target thereafter.²⁰

Currently, EVs account for only an estimated 0.4% of all new vehicles sold as of 2019. This is equivalent to 1,600 daily trips being made by EVs to the municipality.²¹ There is an opportunity to support the adoption of EVs by facilitating the provision of public charging EV stations throughout the central city. Such measures will assist in overcoming perceptions of 'range anxiety' among potential EV buyers, knowing they can readily charge their vehicle while visiting the central city or while at work.

¹⁶ Energeia for ARENA (2018), Australian EV market study, page 7. Available [here](#).

¹⁷ City of Melbourne (2012), Draft Transport Strategy 2030. Available [here](#).

¹⁸ Energeia for ARENA (2018), Australian EV market study, page 4-5. Available [here](#).

¹⁹ Department of Environment, Land, Water and Planning (DELWP) 2019. Emissions Targets. Available [here](#).

²⁰ DELWP (2019), Victorian Greenhouse Gas Emissions Report 2018. Available [here](#).

²¹ Energeia for ARENA (2018), Australian EV market study, page 7. Available [here](#).

Commercial-in-confidence

2.7 Improved walking amenity in the central city

The Strategy includes a range of initiatives to enhance the walkability of the central city and make it a more amenable place to visit, traverse, and spend time in. It aims to do so by:

- improving the quality of the walking experience, for example via widening footpaths to create additional space for walking, seats, trees and street trading
- increasing pedestrian safety through delivery of innovative urban design
- converting 'Little' streets into pedestrian priority shared zones
- facilitating a permeable and more connected street network.

Nature of the current problem

Work undertaken by the City of Melbourne indicates that Melbourne's footpaths and laneways are often narrow, overcrowded and uncomfortable. This negatively impacts walking amenity, enjoyment and safety. Melbourne is globally recognised for its laneway 'culture', offering visitors a unique walking, shopping and dining experience.

However, with a significant projected increase in daily visitors to Melbourne central city over the next 15 years, there is a risk that pedestrian overcrowding and discomfort may lead to an erosion of the social and cultural amenity that underpins Melbourne's status as one of the world's most liveable cities.

2.8 Time savings

The Strategy proposes a range of policies and actions to enhance the efficiency of the movement of people within the central city, in particular enhancing the efficiency of walking, buses and trams. In doing so, the Strategy aims to lift the productivity of the central city and encourage greater use of these modes of transport. Specific policies and actions identified by the Strategy to enhance walking and public transport efficiency include:

- upgrading tram stops to reduce time spent stopped
- programming traffic signals to give public transport priority at intersections
- implementing new signal technology to prioritise trams
- rationalising stops within the tram network
- providing dedicated bus and tram lanes
- reducing incidence of vehicles blocking intersections.

Nature of the current problem

The transport network within the central city currently prioritises the movement of private motorised vehicles over walking trips and public transport modes. While Melbourne has the largest tram network in world, it is among the slowest in the world due to the need to share its network with vehicular traffic across the majority of the network. The average speed across Melbourne's tram network is 16 km/h, and this drops further to 11 km/h in the central city.²² The impact on the movement of people through the central city is significant. For example, a full E-Class tram moving 210 people can be delayed by a small number of single-occupant vehicles in front of it. Trams are also significantly delayed by traffic signals and physical proximity of tram stops within the central city.

Furthermore, traffic lights within the central city are not programmed to prioritise walking trips. Many signals do not change frequently enough, resulting in a build-up of pedestrians waiting to cross, particularly around stations at peak hours. This results in delays to pedestrians, in addition to overcrowding which also presents a risk to pedestrian safety.

As visitation to the central city continues to grow, these pressures will increase overtime, making it more challenging to move through the city and negatively impacting the productivity of the central city.

²² City of Melbourne 2019, *Draft Transport Strategy 2030*.

Commercial-in-confidence

2.9 Mode shift

A key pillar of the Strategy involves encouraging commuter mode shift from private motorised vehicle to alternative forms of transportation, notably active transport and public transport. Specifically, the Strategy involves a range of intersecting policies and actions that seek to encourage a shift away from private motorised vehicles, including:

- measures that slow the movement of cars within in the Hoddle Street Grid, including reducing the speed limit to 30 km/h from 40 km/h
- initiatives that seek to physically separate cyclists from traffic, including the provision of an additional 90 kilometres of dedicated cycle network within the City of Melbourne
- Initiatives that prioritise the movement of pedestrians and cyclists over cars within the Central City, including re-programming traffic signals
- measures that enhance the efficiency of public transport within the central city, including upgrading and rationalising tram stops within the central city.

Nature of the current problem

By 2036, the City of Melbourne estimates that approximately 1.4 million people will use the central city each day. This represents an increase of around 500,000 additional daily users of the central city, or a 55% increase compared to 2019.

A failure to encourage a more sustainable and balanced transport mix risks imposing significant and avoidable economic, social and environmental costs on the community. These include a continued increase in road congestion and emissions, and a reduction in pedestrian safety resulting in adverse health impacts. Furthermore, there is a risk that the social and cultural amenity that underpins Melbourne's status as one of the world's most liveable cities is eroded.

3 Valuing the benefits of the Draft Transport Strategy

This section presents the value of the economic benefits achieved from the successful implementation of the Strategy. It is important to note that in some instances the City of Melbourne has not set targets with respect to specific policies and actions, though targets are being developed. Where targets are not available, Deloitte Access Economics has measured economic benefits based on an incremental change. All benefits presented below represent the annual value to the whole of Victoria in 2019 if the Strategy were to be fully implemented today.

3.1 Pedestrian safety

The economic benefits of improved pedestrian safety have been calculated by estimating the potential reduction in pedestrian road trauma associated with a reduction in the speed limit within the Hoddle Grid from 40 km/h to 30 km/h. Specifically the proposed reduction in speed limits is expected to have a two-fold benefit:

- Slower speed limit reduces the risk of fatalities and serious injury due to the lower force of impact in the event of a collision.²³
- The 30 km/h speed limit reduces the overall incidence and severity of collisions.²⁴ This is expected to benefit all road users, not just vulnerable users such as pedestrians.

The Roads and Traffic Authority of New South Wales estimates that survival rates for pedestrian road trauma victims approximately double from a reduction in speed limits from 40 km/h to 30 km/h.²⁵ Another study notes that at 30 km/h pedestrians have a 90% chance of survival when hit by a car, while at 45 km/h this chance of survival is just 50% (1.8 times more likely to survive).²⁶ A third study estimates the chance of survival to improve by approximately 60%.²⁷

Deloitte Access Economics has estimated the potential average annual reduction in incidence and severity of pedestrian road trauma in the central city achieved under a 30 km/h speed limit scenario based on the following assumptions:

- A doubling in the survival rate, or equivalently a halving in the fatality rate, based on the mid-point survival of the above studies, which equates to 0.2 fewer fatalities on average per annum.
- A reduction in serious pedestrian injuries of 40%, which equates to 6.24 fewer injuries on average per year.²⁸
- A reduction in other injuries of 20%, which equates to 6.8 fewer injuries on average per annum.²⁹

²³ Institute for Road Safety Research 'Vulnerable Road Users' (July 2012)

https://www.swov.nl/sites/default/files/publicaties/gearchiveerde-factsheet/uk/fs_vulnerable_road_users_archived.pdf

²⁴ A car travelling at 40 km/h requires approximately 30 metres to stop on a wet road with a one second reaction time, while a car travelling at 30 km/h only requires 20 metres under the same conditions. <https://www.itf-oecd.org/sites/default/files/docs/speed-crash-risk.pdf>

²⁵ Roads and Traffic Authority New South Wales 'How does speeding increase the chances and severity of a crash?' (Fact Sheet 4, Speeding- Did you Know?, July 2011)

https://www.rms.nsw.gov.au/saferroadsnsw/speeding_and_crashes.pdf

²⁶ Kröyer, Jonsson and Varhelyi, 2014 as cited in <https://www.itf-oecd.org/sites/default/files/docs/speed-crash-risk.pdf>

²⁷ Austroads, *Guide to Road Safety Part 3: Speed Limits and Speed Management* (2008)

https://austroads.com.au/publications/road-safety/agrs03/media/AGRS03-08_Guide_to_Road_Safety_Part_3_Speed_Limits_and_Speed_Management.pdf

²⁸ Austroads, *Guide to Road Safety Part 3: Speed Limits and Speed Management* (2008)

https://austroads.com.au/publications/road-safety/agrs03/media/AGRS03-08_Guide_to_Road_Safety_Part_3_Speed_Limits_and_Speed_Management.pdf

²⁹ Ibid.

Commercial-in-confidence

It is expected that the overall number of collisions will also reduce with many of the current collisions becoming near-misses.

The estimated average annual cost of pedestrian road trauma under a 30km/h scenario within the Hoddle Grid is outlined in Table 3.1.

Table 3.1 Expected annual average cost of fatalities and injuries in Melbourne central city from road crashes under a 30 km/h speed limit

| 30 km/h speed limit | Fatal accident | Serious injury accident | Other injury accident | Total |
|--|----------------|-------------------------|-----------------------|--------------|
| Expected annual average casualties | 0.20 | 9.36 | 27.20 | |
| Casualty costs per person^(a) | \$2.1 | \$0.5 | \$0.02 | |
| Average annual cost of incidents | \$0.4 | \$4.8 | \$0.5 | \$5.8 |

Source: Austroads, *Guide to Road Safety Part 3: Speed Limits and Speed Management* (2008)
https://austroads.com.au/publications/road-safety/agrs03/media/AGRS03-08_Guide_to_Road_Safety_Part_3_Speed_Limits_and_Speed_Management.pdf

The adoption of a 30 km/h limit within the Hoddle street grid is expected to result in an estimated annual average pedestrian road trauma cost of approximately \$5.8 million. This compares to the current average annual cost of approximately \$9.6 million.

This would represent an average annual economic benefit of approximately \$3.8 million to the community from avoided pedestrian road trauma in 2019. This represents the savings to existing walkers within the central city. It does not include an assessment of the impact to future walkers who may be encouraged to shift from alternative modes of transport.

The above estimate should be considered conservative as we have not included the potential reduction in pedestrian road trauma associated with other safety initiatives proposed to be implemented under the Strategy, for example widening footpaths and implementing traffic calming measures. In reality, these are also expected to contribute to a reduction in pedestrian road trauma.

Furthermore, we have also not included the mental health costs from being involved in road trauma or witnessing road trauma. Nor have we accounted for the benefits to motor vehicle users in the form of avoided collision costs.

3.2 Bicycle safety

The economic benefits of improved cyclist safety have been calculated by estimating the potential reduction in cyclist road trauma associated with the City's proposed measures to physically separate cyclists from motor vehicles.

The implementation of physically separated bicycle lanes has been found to be significantly safer than cyclists riding alongside traffic. For example, a 2016 study found that cyclists using separated cycle lanes in Vancouver and Toronto in Canada are 89% safer than those riding on streets with parking and no cycling infrastructure.³⁰

Currently the City of Melbourne has six kilometres of on-road, protected cycle lanes, but intends to implement an additional 90 kilometres of on-road protected cycle lanes under the Strategy. Based on the existing network of cycle lanes and current incidence of bicycle road accidents, the implementation of an additional 90 kilometres of cycle lanes in the City of Melbourne is expected to result in an 83% reduction in the frequency of bicycle road incidents. The estimated average

³⁰ Pucher and Bueler 'Safer Cycling Through Improved Infrastructure' (2016) 106(12) *AJPH editorials* 2089.

Commercial-in-confidence

annual cost of bicycle road trauma with the implementation of an enlarged cycle lane network is outlined in Table 3.2.

Table 3.2 Expected annual average cost of fatalities and injuries in the City of Melbourne with separated cycle lanes

| Separated cycle lanes | Fatal accident | Serious injury accident | Other injury accident | Total |
|--|----------------|-------------------------|-----------------------|--------------|
| Expected annual average casualties | 0.03 | 0.43 | 8.78 | |
| Casualty costs per person^(a) | \$2.1 | \$0.5 | \$0.02 | |
| Average annual cost of incidents | \$0.1 | \$0.2 | \$0.2 | \$0.5 |

Source: Austroads, *Guide to Road Safety Part 3: Speed Limits and Speed Management* (2008) https://austroads.com.au/publications/road-safety/agrs03/media/AGRS03-08_Guide_to_Road_Safety_Part_3_Speed_Limits_and_Speed_Management.pdf; Pucher and Bueler 'Safer Cycling Through Improved Infrastructure' (2016) 106(12) *AJPH editorials* 2089.

Based on this safety uplift, we estimate an annual average cost of bicycle road trauma within the City of Melbourne of approximately \$0.5 million following the implementation of the protected cycle network. This compares to a current estimated annual cost of \$2.8 million.

This would represent **an annual economic benefit of \$2.4 million to the Victorian community from avoided cyclist road trauma as a result of protected cycle lanes in 2019**. This represents the savings to existing bicycle riders within the City of Melbourne. It does not include an assessment of the impact to future bicycle riders who may be encouraged to shift from alternative modes of transport.

This is likely a conservative estimate as studies have previously found that not only does safer cycling infrastructure attract more cyclists, but individual cyclists are safer as the number of other cyclists increases. However, it is not known exactly what drives this relationship, although it is likely that greater awareness of cyclists on the part of motorist is a driving factor.³¹

The health benefits expected as a result of more commuters choosing to cycle to work over sedentary modes of transport like driving as a result of mode shift are discussed in Section 3.7.

Comparatively, the reduction in the speed limit within the Hoddle Grid from 40 km/h to 30 km/h is not expected to benefit cyclists to the same extent as pedestrians. This is because recent fatalities and injuries in the City of Melbourne have mostly occurred on roads outside the Hoddle Street grid, where proposed speeds will on average be higher than 30 km/h.³² Nevertheless, the reduction is still expected to contribute to an improvement in overall cyclist safety within and around the municipality.

3.3 Land use productivity

The Strategy seeks to reallocate kerbside car parking to alternative uses in line with the projected proportional decline of car trips within the central city. Based on the Strategy and targets set by the City of Melbourne in the previous 2012 Transport Strategy, this equates to a relative decline of 42.5% in the number of daily car trips to the central city. This equates to 19,150 sq.m of kerbside parking to be reallocated to other beneficial uses.

³¹ Robinson, D. L., 'Safety in numbers in Australia: more walkers and bicyclists, safer walking and bicycling' (2005) 16 *Health Promotion Journal of Australia* 47. Marshall, W. E. & Ferenchak, N. N., 'Why cities with high bicycling rates are safer for all road users' (2019) *Journal of Transport and Health* 2214.

³² Of the total cyclist road trauma within the City of Melbourne, 100% of fatalities, 60% of serious injuries and 94% of other injuries are estimated to have occurred outside the Hoddle Street grid.

Commercial-in-confidence

Based on the City of Melbourne’s estimate for the capital unimproved value of land in the central city (approximately \$10,500 per sq.m), the 19,150 sq.m of kerbside car parking in the central city has an **estimated total value of \$201.1 million**.

The sale value of kerbside parking can be thought of the present value of a future stream of economic rents derived from this total parcel of land if it were to be allocated to alternative use.

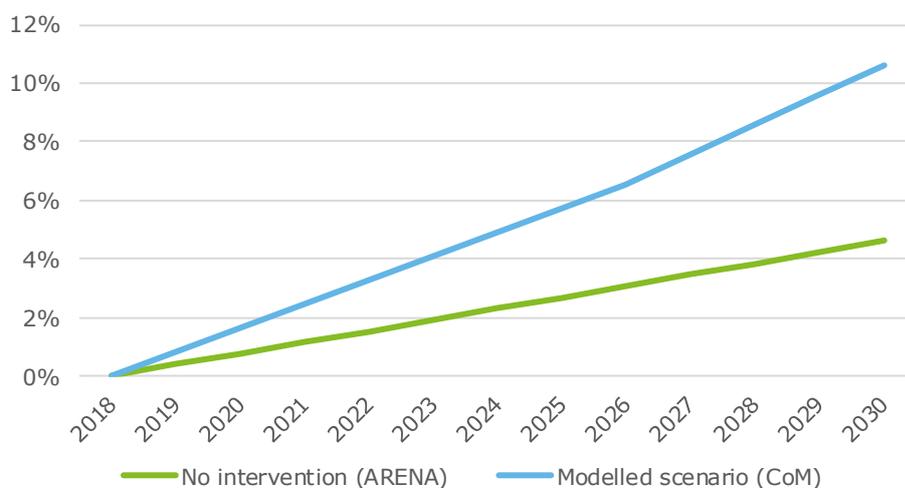
Based on an average annual yield of 6.5%³³, the repurposing of kerbside car parking in the central city would represent **an annual economic benefit to the community in 2019 of \$14.9 million**.

3.4 Uptake of Electric Vehicles

A recent study by Energeia for the Australian Renewable Energy Agency (ARENA) is used as a basis to estimate EV uptake. Energeia model a range of scenarios for EV adoption across Australia, each representing different assumptions around technical barriers/capabilities, consumer sentiment, policy and regulatory outlooks, and physical constraints. Key among these is the provision of EV charging stations.

The facilitation of the provision of charging stations under the Strategy is assumed to accelerate adoption of EVs by those who commute daily to the central city by motor vehicle by approximately 6%. This would equate to an additional **26,300 EVs commuting to the central city on a daily basis in 2019 if charging stations were to be implemented today**.³⁴ Figure 3.1 below illustrates the adoption curves.

Figure 3.1 EV uptake for workers driving to City of Melbourne, modelled scenario compared to ARENA modelling



Source: Deloitte Access Economics based on Energeia for ARENA

This equates to an additional **6.8 million annual** trips made by EVs to the central city (and conversely, a reduction in 6.8 million annual trips made by combustion engine vehicles), travelling an average distance of **20 kilometres** per round trip³⁵, resulting in an additional **137 million kilometres** driven by EVs instead of traditional combustion engine vehicles in 2019.

³³ 6.5% yield reflects the current average yields for a typical Real Estate Investment Trust. It is used as a proxy for the expected annual return for a potential acquirer.

³⁴ Calculated as the difference in 2030 adoption between “no intervention” (4.6% EVs) and “modelled scenario” (10.6%), applied to 2019 car trips. In other words, we model the impact of incremental adoption as at 2030, if this occurs as at 2019.

³⁵ Based on a review of VISTA data, the weighted average return vehicle trip to Melbourne central city is approximately 20 kilometres.

Commercial-in-confidence

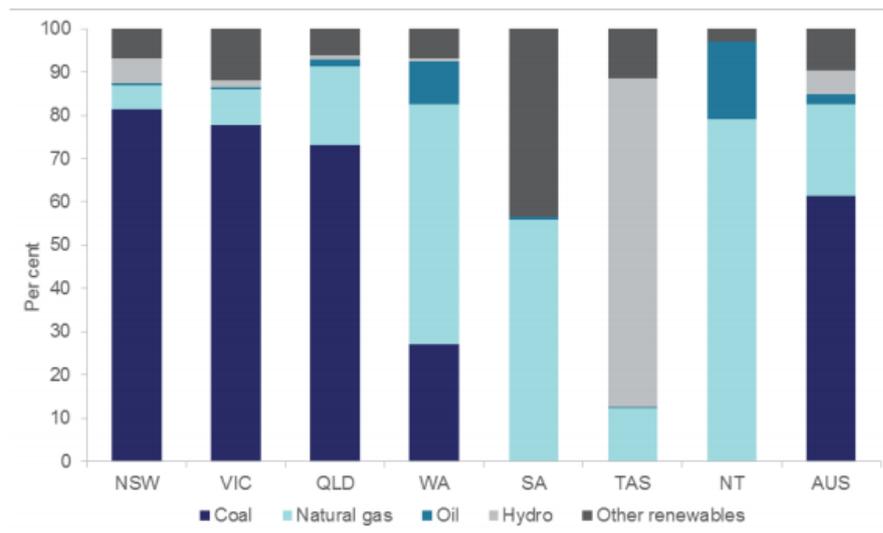
The net reduction in GHG emissions achieved from accelerating the uptake of EVs is dependent on the emissions intensity of Victoria’s electricity generation mix. Victoria is highly dependent on brown coal for electricity generation, which is emissions intensive (see Figure 3.2).

Based on a comparison of the per kilometre carbon emissions of a typical popular small combustion engine vehicle³⁶ (Mazda 3, 154gm CO₂e³⁷ per km) versus a small current generation EV (Nissan Leaf, 140gm CO₂e per km) and the current electricity generation mix in Victoria, **an EV is estimated to reduce GHG emissions in Victoria by 14gm of CO₂e per kilometre in 2019.**³⁸ This approach is consistent with the recent Victorian Parliamentary inquiry into electric vehicles.^{39,40}

Consistent with Commonwealth Government Treasury guidance, an abatement cost of \$32.03/tCO₂e (2019) has been used to estimate the avoided costs of GHG emissions from accelerating the uptake of EVs in Melbourne.

Based on the above assumptions, the installation of EV charging stations in the central city under the Strategy has the potential result in **an annual economic benefit to the community of \$0.06 million in 2019 in avoided GHG emissions.** The value of this benefit reflects Victoria’s current energy generation mix.

Figure 3.2 Australian electricity generation fuel mix, calendar year 2017



Source: Department of the Environment and Energy - Australian Energy Update 2018⁴¹

In addition the above benefits, a switch from traditional combustion engine-based cars to can also improve urban air quality. This is via emission of particulate matter, primarily PM₁₀ and PM_{2.5}. Particulate matter can negatively impact health, including resulting in detrimental respiratory symptoms, fibrosis, cancer and irritation of mucous membranes.⁴² The accelerated adoption of EVs

³⁶ The 'small' car segment is the most popular passenger car segment in Australia, and accounts for approximately 48% of total passenger car sales as of May 2019 from the Federal Chamber of Automotive Industries. The small car segment includes popular models such as the Mazda 3, Toyota Corolla and Hyundai i30.

³⁷ Carbon dioxide equivalent is a standard unit for measuring carbon footprints and expresses the impact of different greenhouse gases in terms of the amount of carbon dioxide that would have the same impact on climate change.

³⁸ If Victoria manages to deeply decarbonise its electricity network (i.e. switch from brown coal to renewables), then emissions for EVs fall correspondingly. For example, Climateworks estimates emissions of 0.03kg/CO₂e for a Nissan Leaf under a "deep decarbonisation" scenario, by 2030.

³⁹ Parliament of Victoria (2019) *Inquiry into electric vehicles*. Available [here](#).

⁴⁰ CO₂e is the short form for "Carbon Dioxide equivalent", which is a term for describing different greenhouse gases in a common unit. Tailpipe emissions for combustion-engine based vehicles include Carbon Dioxide (CO₂), Nitrous Oxide (N₂O) and Methane (CH₄). All three of these are greenhouse gases, and their impacts are converted to a single scale (CO₂e) for ease of comparison.

⁴¹ Department of the Environment and Energy (2018) Australian Energy Update 2018. Available [here](#).

⁴² Department of the Environment and Energy (2019) National Pollutant Inventory. Available [here](#).

Commercial-in-confidence

will contribute to Melbourne achieving its particulate matter targets, improving air quality and reducing (or avoiding) resultant impacts on human health.

3.5 Improved walking amenity in the central city

A growing body of research indicates a direct link between improved walkability experience and increased tourist visitation and improved quality of the tourist experience. Some themes uncovered in a scan of the literature includes:

- increased walkability can increase tourist spending⁴³
- sightseeing/roaming around the city being a key attractor and highly-ranked tourism activity⁴⁴
- walking is the preferred way by tourists to explore urban spaces⁴⁵
- increased place attachment from more walkable neighbourhoods, in part due to increased possibility of authentic, serendipitous encounters.⁴⁶

It is not possible to estimate with any certainty the likely impact of the Strategy on tourist visitation to Melbourne.

However, to provide an indication as to the potential economic benefits from increased tourist visitation to Melbourne as a result of the Strategy, we have modelled the effects of a **0.1% increase in tourist visitation** to Melbourne. For the purpose of this report, only additional interstate and international visitation has been estimated. Our analysis has not included any impact on domestic daytrip visitors as these visitors would have been visiting (and spending) elsewhere in Victoria. It is assumed that all additional interstate and international visitors to Melbourne are likely to visit the central city.

The spending by interstate and international visitors represents additional expenditure/activity that occurs in Melbourne, that wouldn't otherwise have happened. In other words, there is a net gain in economic activity to Melbourne from additional interstate and international visitors.

Additional spending by these cohorts is captured as a benefit by estimating the additional gross operating surplus⁴⁷ in the Victorian economy as a result of the Strategy.

Currently, an interstate overnight visitor spends \$304 per night while an international overnight visitor spends \$122 per night in Melbourne. A 0.1% increase in interstate and international visitors equates to an additional **25,400** interstate visitor nights and **57,600** international visitor nights in 2019.⁴⁸ This would result in a total increase in visitor expenditure in Melbourne of **\$14.8 million in 2019**.

Adjusting this to capture the gross operating surplus likely to flow to the Victorian economy, a 0.1% increase in interstate and international tourists visitation is estimated to result in an **annual economic benefit to the community of \$2.2 million in 2019**.

It should be noted that the exact impact on tourism visitation from the Strategy is difficult to estimate. However, the above estimate provides an indication as to the size of the potential economic benefits that on offer from enhancing the walkability and amenity of the central city.

3.6 Time savings

For the purposes of this report, time savings to pedestrians and public transport users have been calculated by assessing the potential reduction in travel times from reprogramming traffic signals to prioritise the movement of pedestrians and increasing the average speed of trams in the central city to by 20% (i.e. to 13.2 km/h from 11 km/h).⁴⁹

⁴³ Heart Foundation (2011) The benefits of making streets more walking and cycling friendly. Available [here](#).

⁴⁴ Ashworth and Page (2011) Urban tourism research: Recent progress and current paradoxes. Available [here](#).

⁴⁵ Farkic and Peric (2013) The importance of walking and walkability in urban tourism development. Available [here](#).

⁴⁶ Ujang and Muslim (2014) Walkability and attachment to tourism places in the City of Kuala Lumpur, Malaysia. Available [here](#).

⁴⁷ Gross operating surplus is equal to Gross Value Added less the value of wages and salaries. It represents the additional value to economy created from the production of a good or service minus the value of wages and salaries.

⁴⁸ Based on Tourism Research Australia (2017) *National Visitor Survey and International Visitor Survey*. Available [here](#) and [here](#).

⁴⁹ City of Melbourne (2019) *Draft Transport Strategy 2030*.

Commercial-in-confidence

Previous investigation undertaken by the City of Melbourne indicated that pedestrians incur an average delay of 34 seconds at signalled intersections along Spencer Street.⁵⁰ Applying this average delay across the whole Hoddle Grid and adjusting for existing traffic signal programming provides **an estimated average delay of 27 seconds to walkers** at signalled intersections throughout the central city. Analysis undertaken on behalf of the City of Melbourne estimated that pedestrian delays at signalled intersections could be reduced by approximately 32% by reprogramming traffic signals.

A count of pedestrian trips recently undertaken by the City of Melbourne estimated approximately 556,000 daily pedestrian trips within the central city.

By reprogramming signalled traffic intersections to prioritise pedestrians throughout the central city, **there is the potential to generate an annual economic benefit of \$15.4 million in 2019 in the form of travel time savings to walkers.** This estimate is based on the current proportion of worker and non-worker users within the the City of Melbourne⁵¹, and Australian Transport Assessment and Planning (ATAP) guidelines⁵² for travel time savings.

In addition to the above, increasing the average speeds of trams travelling through the Central Time by 20% **has the potential to generate an annual economic benefit of \$24.8 million in 2019.** This estimate is based on the current mode share and number of daily users of the City of Melbourne as reported in the Strategy, and assumes that the average tram commuter travels for a kilometre within the central city (approximately equivalent to travelling from Elizabeth Street to Spring Street).

Overall, the Strategy has the potential to result **in \$40.2 million in travel time savings to pedestrians and tram users in the central city in 2019** by implementing a range of initiatives to increase the efficient movement of pedestrians and trams through the city. This benefit will continue to accrue in future years.

However, it should be noted that the above benefit to pedestrians and tram users will come at a direct cost of increased travel time to road users, including private vehicles and freight vehicles. That is, the above benefit should be considered a gross benefit, not a net benefit. This report has not sought to estimate the additional travel time cost incurred by road users. However, it is likely any such cost to road users will be material.

3.7 Mode shift

The City of Melbourne has a stated aspiration of encouraging transport mode shift away from private car use towards public transport and active transport modes. The target transport mode share identified by the City of Melbourne and the current transport mode share is outlined in Table 3.3.

Table 3.3 Current and 2030 target transport mode share to and from the City of Melbourne

| Mode | Today | 2030 Target | Change |
|------------------|-------|-------------|--------|
| Walking | 3% | 8% | +5% |
| Cycling | 4% | 12% | +8% |
| Private car | 47% | 20% | -27% |
| Public transport | 46% | 60% | +14% |

Source: Adapted from City of Melbourne 2019, Draft Transport Strategy 2030; City of Melbourne 2012, Transport Strategy 2012.

⁵⁰ MRCagney 2018, *Measuring Pedestrian Delay*, prepared on behalf of City of Melbourne.

⁵¹ City of Melbourne 2019, *Draft Transport Strategy 2030*.

⁵² Australian Transport Assessment and Planning Guidelines, available at: <https://www.atap.gov.au/user-guide/>.

Commercial-in-confidence

The achievement of the above changes in transport mode share will result in the following economic impacts:

- **Health benefits:** existing car drivers that shift towards active transport modes are expected to gain health benefits from increased activity and reduced sedentary. The value of the benefit is measured in terms of Health-Adjust Life Years (HALYs).
- **Private travel costs:** existing car users that shift to public transport will save on car fuels costs but incur additional public transport ticket costs. This assessment ignores any flow-on vehicle and public transport asset depreciation and capital expenditure costs.
- **Travel time:** shifts in transport modes will reduce/ increase the travel time experienced by the commuter, for example some mode shifts will incur additional travel time. The value of time has been calculated as per the ATAP guidelines.⁵³
- **Parking costs:** existing car drivers who shift to alternative modes of transport will avoid car parking costs within the City of Melbourne. Parking costs are estimated based on the average 'early bird' parking fee within the central city of approximately \$16 per day.
- **Avoided vehicle emissions:** the shift of existing car drivers towards public and active modes of transport will result in avoided GHG and other particulate emissions. The value of avoided emissions has been estimated based on the GHG emissions of an average 'small' car⁵⁴ and an abatement cost of \$32.03/tCO₂e (2019) as per Australian Treasury guidance.⁵⁵
- **Road maintenance:** reduced annual road maintenance costs incurred by the City of Melbourne from the proportional decrease in car trips undertaken within the municipality, based on annual road maintenance costs provided by City of Melbourne.

The weighted average trip distance travelled by a daily commuter to the City of Melbourne is approximately 10 kilometres (or 20 kilometres for a return trip).⁵⁶ Deloitte Access Economics has estimated the potential economic benefits achieved from a mode shift by calculating the average travel time of travelling 10 kilometres from four geographical dispersed points throughout Melbourne (Maidstone, Pascoe Vale South, Kew East, and Armadale).

Based on the existing number of daily users of the City of Melbourne, the achievement of the City of Melbourne's transport mode share targets would result in an annual economic benefit of **\$23.5 million to the Victorian community in 2019**. This benefit would be expected to continue to accrue over time, although the benefit would change over time as the number of daily commuters to the City of Melbourne continues to grow over time. The benefits/costs from a mode shift are summarised in Table 3.4.

Table 3.4 Summary of annual value of achieving target mode shift in 2019

| Benefit (cost) | 2019 annual impact (million) |
|---|-------------------------------------|
| Health benefits | \$12.0 |
| Private travel costs | -\$0.7 |
| Travel time | -\$1.0 |
| Parking | \$4.0 |
| Avoided car emissions | \$5.7 |
| Avoided road maintenance to City of Melbourne | \$3.6 |
| Total value of mode shift benefits | \$23.5 |

⁵³ Australian Transport Assessment and Planning Guidelines, available at: <https://www.atap.gov.au/user-guide/>.

⁵⁴ For example, a Mazda 3, Toyota Corolla or Hyundai i30.

⁵⁵ Australian Treasury 2011, *Strong Growth Low Pollution: Modelling a carbon price*.

⁵⁶ Based on a review of most recently available Victorian Integrated Survey of Travel and Activity (VISTA) data.

4 Discussion

4.1 Summary of benefits

The Strategy, if delivered as intended, is expected to result in a range of direct and measureable economic benefits to the Victorian community and to the City of Melbourne.

Overall, based on the assumptions reported in Section 3, Deloitte Access Economics estimates that approximately **\$87.1 million** in annual economic benefits could potentially be delivered to the Victorian community in 2019 if the Strategy were successfully in place today. Values presented are 2019 annual benefits – these benefits would be largely expected to recur each year into the future as the measures outlined in the Strategy continue to be in place and problems related to transport congestion continued to exist. Furthermore, benefits would potentially get larger over time as Melbourne continues to grow and problems such as congestion and safety worsen in the absence of a Strategy.

Table 4.1 Summary of economic benefits delivered by Strategy

| Economic benefit | Description of economic benefit | Value (\$ million, 2019) |
|---|--|--------------------------|
| Pedestrian safety | A reduction in vehicle speed limits from 40 km/h to 30 km/h is expected to halve pedestrian fatalities, and significantly reduce other pedestrian injuries and total collisions. | \$3.8 |
| Bicycle safety | Bicycle safety would be improved via reducing vehicular speed limits and providing an additional 90 km of dedicated bicycle lanes across the City of Melbourne. | \$2.4 |
| Land use productivity | Around half of the 45,000sq.m of kerbside car parking space is expected to be repurposed for alternative uses, unlocking significant land to be reallocated to other purposes. | \$14.9 |
| Electric vehicles | The provision of public charging infrastructure would help accelerate adoption of EVs, for trips made to Melbourne central city. However given Victoria's current fuel mix – Greenhouse Gas savings from this switch are modest. | \$0.06 |
| Increased walking amenity in the central city | Increasing the walkability of Melbourne central city is expected to induce additional international and interstate tourist visitation, leading to net economic gains to Victoria from their spending. | \$2.2 |
| Time savings | The Strategy would reduce travel times through the central city for trams and buses, and would reduce waiting times at intersections for walking and cycling trips. | \$40.2 |
| Mode shift | The Strategy will support mode shift from cars to public transport and active transport modes by implementing a range of policies and actions. This will result in a range of health and environmental benefits to commuters who shift from cars to public transport and active transport, and avoided road maintenance costs. | \$23.5 |
| Total quantified | | \$87.1 |

Source: Deloitte Access Economics based on City of Melbourne Draft Transport Strategy targets

4.2 Discussion

This high-level assessment of the economic benefits of the Strategy demonstrates that, if fully implemented today, it would generate a range of significant annual economic benefits to the Victorian community in 2019. The economic benefits calculated are based on the achievement of specific targets and incremental changes. They provide an indication as to the potential benefits that may flow to the Victorian community.

This report demonstrates the value of implementing policies and actions that prioritise walking, active transport and public transport over traditional road use and the benefits of enhancing the overall amenity and liveability of the City of Melbourne.

Importantly, the annual benefits calculated in this study will continue to accrue in future years for as long as the policies and actions are maintained. Furthermore, as Melbourne's population continues to grow and the number of daily visitors to the City of Melbourne increases, greater congestion will result in the above benefits potentially growing larger over time.

Finally, this report demonstrates the potential economic benefits foregone if the Strategy were not implemented, or implemented to its full extent. In the absence of the Strategy, there is a risk of a range of avoidable economic, social and environmental costs being imposed on the community. These include an increase in road congestion and emissions, a reduction in pedestrian and bicycle safety resulting in adverse health impacts and avoidable road trauma, and an erosion of Melbourne's status as one of the world's most liveable cities.

However, the implementation of the Strategy is not without its costs. The Strategy will involve direct implementation costs on the part of the City of Melbourne, which have not been assessed. Additionally, many of the benefits discussed in this report will come at a cost. In some instances, this cost is to existing road users. For example, by prioritising the movement of walkers and public transport users, road users will incur additional travel times. Furthermore, the reallocation of kerbside parking will also negatively impact existing road users. In some instances, additional or avoided costs to commuters have been captured as part of the discussion and calculation of benefits (for example, the avoided hospitalisation costs of bicycle road trauma), however other costs have not been captured such as increased car travel times. As such, the benefits presented in this report should not be considered the net benefits of the Strategy, but rather the gross benefits.

Limitation of our work

General use restriction

This report is prepared solely for the internal use of the City of Melbourne. This report is not intended to and should not be used or relied upon by anyone else and we accept no duty of care to any other person or entity. The report has been prepared for the purpose as set out in the Letter of Acceptance dated 31 May 2019 and our corresponding quotation. You should not refer to or use our name or the advice for any other purpose



Deloitte Access Economics is Australia's pre-eminent economics advisory practice and a member of Deloitte's global economics group. For more information, please visit our website: www.deloitte.com/au/deloitte-access-economics

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited ("DTTL"), its global network of member firms, and their related entities. DTTL (also referred to as "Deloitte Global") and each of its member firms and their affiliated entities are legally separate and independent entities. DTTL does not provide services to clients. Please see www.deloitte.com/about to learn more.

Deloitte is a leading global provider of audit and assurance, consulting, financial advisory, risk advisory, tax and related services. Our network of member firms in more than 150 countries and territories serves four out of five Fortune Global 500® companies. Learn how Deloitte's approximately 286,000 people make an impact that matters at www.deloitte.com.

Deloitte Asia Pacific

Deloitte Asia Pacific Limited is a company limited by guarantee and a member firm of DTTL. Members of Deloitte Asia Pacific Limited and their related entities provide services in Australia, Brunei Darussalam, Cambodia, East Timor, Federated States of Micronesia, Guam, Indonesia, Japan, Laos, Malaysia, Mongolia, Myanmar, New Zealand, Palau, Papua New Guinea, Singapore, Thailand, The Marshall Islands, The Northern Mariana Islands, The People's Republic of China (incl. Hong Kong SAR and Macau SAR), The Philippines and Vietnam, in each of which operations are conducted by separate and independent legal entities.

Deloitte Australia

In Australia, the Deloitte Network member is the Australian partnership of Deloitte Touche Tohmatsu. As one of Australia's leading professional services firms, Deloitte Touche Tohmatsu and its affiliates provide audit, tax, consulting, and financial advisory services through approximately 8000 people across the country. Focused on the creation of value and growth, and known as an employer of choice for innovative human resources programs, we are dedicated to helping our clients and our people excel. For more information, please visit our web site at <https://www2.deloitte.com/au/en.html>.

Liability limited by a scheme approved under Professional Standards Legislation.
Member of Deloitte Asia Pacific Limited and the Deloitte Network.