

# Submission on the 2023-24 ACT budget

I recommend the following budget allocations:

## NATURE CONSERVATION

- **\$1 million in 2023-24** to urgent research, to feed into the new ACT Nature Conservation Strategy, into:
  - (a) the ten-fold increase in numbers of extinct and threatened local species, that may result from climate change, and
  - (b) options for modifying the Nature Conservation Strategy to address the increasing level of those threats.

## CLIMATE

- **\$2 million in 2023-24** to investigate ways to meet the emissions targets of the [ACT Climate Strategy](#), and to investigate the potential for ACT Government actions to reduce the ACT's twenty-seven tonnes CO<sub>2</sub>-e per capita of Scope 3 emissions (which is four times the global all-scopes average of six and a half tonnes).
- **\$40 million per year** to support local businesses and accelerate the use of zero emissions buses, cars and bicycles.
- **\$1.2 million per year** to allow Transport Canberra to emulate Sydney Metro by offsetting its operational greenhouse emissions.
- **\$1 million per year** to tourism initiatives, such as promoting "staycations," that will retain money in the local economy while reducing transport emissions.

## TRANSPORT

- **\$100 million over three years for a *Fast Commuter Network*** to connect the five Town Centres plus Molonglo, Fyshwick and Canberra Airport/Majura Park with transit lanes and off road walking and cycling paths.
- **\$825 million for Rapid Public Transit Stages 2 and 3:** Bus rapid transit from Civic to Woden and Belconnen will complement light rail to Gungahlin, providing Canberra's first rapid public transit network, with twice the benefits, faster and more frequent services, and at lower cost, compared with extending light rail to make a single line from Gungahlin to Woden.
- **\$25 million per year for footpaths** to support walking, cycling (in particular for school children) and public transport, with a footpath along every suburban street by 2035.

I provide more detail in the following pages.

Warm regards

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## Contents

Nature conservation.....	2
Climate.....	2
Zero emissions buses, cars and bicycles.....	4
Tourism.....	6
Transport.....	7
Balanced and considered transport investments.....	7
Fast Commuter Network.....	8
Rapid Public Transport Stages 2 and 3.....	10
Footpaths.....	11

## Nature conservation

The [ACT threatened species list](#) identifies no local extinct species, and only fifty-four local species that are likely to become extinct in the foreseeable future.

[Global warming is likely to cause the extinction of several hundred local species.](#)

The ACT's [Nature Conservation Strategy 2013-23](#) does not address the issue of how to deal with such an increase in numbers of extinct, endangered or vulnerable local species.

**Recommendation:** allocate \$1 million to urgent research, to feed into the new ACT Nature Conservation Strategy, into

- (a) the increased level of threat to local species that is posed by climate change, and
- (b) options for modifying the Nature Conservation Strategy to address the level of those threats.

## Climate

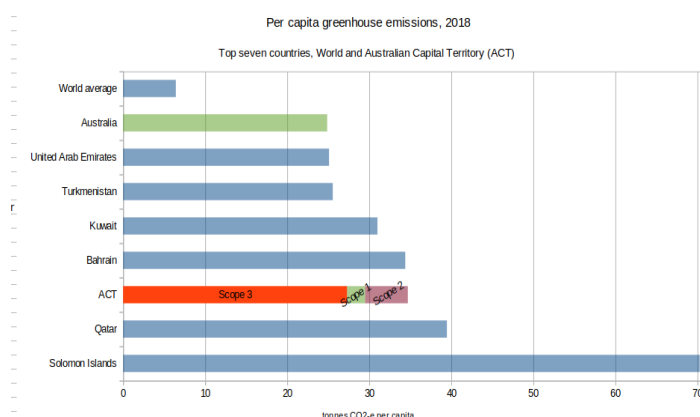
In 2019 the [world emitted the equivalent of 6.4 tonnes of carbon dioxide \(i.e. CO<sub>2</sub>-e\) per person.](#)

Professor Mark Howden (chair of the [ACT Climate Council](#)) and Professor Frank Jotzo advise that [the latest IPCC report shows that to limit warming to 2 degrees Celsius with a two-thirds likelihood, greenhouse gas emissions would need to fall in the order of 35 per cent by 2035 compared to 2019.](#)

That means reducing emissions to 4.2 tonnes per person by 2035.

[The ACT's 2018 carbon footprint was 34.7 tonnes per capita](#), including 5.2 tonnes per person of Scope 2 emissions (which since 2020 have been fully offset), 27 tonnes of Scope 3 emissions, and 2.2 tonnes of Scope 1 emissions.

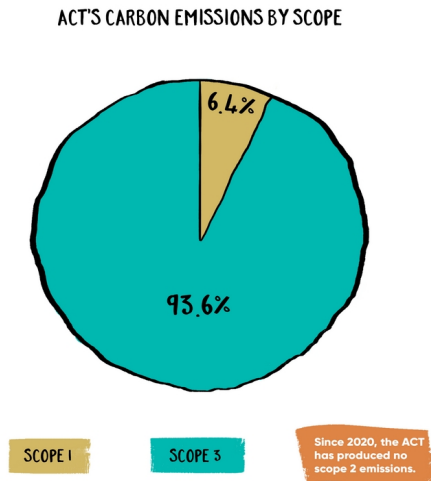
Only four countries - the Solomon Islands, Qatar, Bahrain and Kuwait – caused more than 26 tonnes of CO<sub>2</sub>-e emissions person in 2018.



## Scope 3 emissions

The ACT Government’s only active policy to address the ACT’s annual 27 tonnes per capita of [Scope 3 emissions](#) is, “[The ACT Government is working in partnership across state, territory and national governments and will discuss scope 3 emissions through existing arrangements and sub-national policy forums.](#)”

**Recommendation:** Allocate \$1 million in 2023-24 for investigations into the potential for ACT Government actions – including [actions recommended by the Commissioner for Sustainability and the Environment](#) - to reduce the ACT’s 27 tonnes CO<sub>2</sub>-e per capita of Scope 3 emissions (four times the global all-scopes total of six and a half tonnes per capita) that account for 94% of the ACT’s carbon footprint.



## Scope 2 emissions

Since 2020 the ACT Government has accounted for its annual 5 tonnes per capita (in 2018) of Scope 2 emissions, primarily by [surrendering millions of large scale renewable electricity generation certificates \(LGCs\)](#), worth [about \\$48 each](#), each year.

## Scope 1 emissions

The ACT [legislated emissions targets](#), which apply only to emissions “in the ACT” (Scope 1 emissions, are:

- to reduce greenhouse gas emissions in the ACT to 40% less than 1990 emissions by 30 June 2020.
- to reduce greenhouse gas emissions in the ACT to achieve zero net emissions by 30 June 2045.

The government [claims to have met the 2020 target](#). That questionable claim is based on 2019-20 Scope 1 emissions (1,684 kt CO<sub>2</sub>-e of emissions *in the ACT*) being 40% lower than the combined 1989-90 total of 2,016 kt of Scope 2 emissions (emissions *outside the ACT*, from generating electricity for use within the ACT) plus 1,082 kt of Scope 1 emissions *in the ACT*.

The ACT has no [legislated emissions target](#) for the period 2021 to 2049. Its [Climate Strategy](#) includes non-legislated targets to reduce Scope 1 and 2 emissions (based on 1990 levels) by:

- 50 to 60% by 2025 (corresponding to 1.2 to 1.5 Mt CO<sub>2</sub>e)
- 65 to 75% by 2030 (0.8 to 1.1 Mt)
- 90 to 95% by 2040 (0.2 to 0.3 Mt).

Those emissions fell by two percent per year (from 1.72 Mt 1.65 Mt) from in 2019-20 to 2021-22. That fall was partly caused by a temporary economic slowdown due to the Covid

pandemic. If the ACT is to reach its 2025 emissions target, it will need to reduce those emissions by three per cent per year from 2022-23. If it is to reach its 2030 target, it will need to reduce those emissions by four per cent per year.

**Recommendation:** allocate \$1 million to identifying ways to meet the emissions targets in the [ACT Climate Strategy](#).

## Zero emissions buses, cars and bicycles

### Buses

[Electric buses are commercially available, economically viable, and popular with commuters. They have multiple advantages over diesel-fuelled buses, including reduced CO<sub>2</sub> emissions, noise, and air pollution.](#)

Transport Canberra's [460 buses](#) caused an estimated 34,000 tonnes of CO<sub>2</sub>-e emissions in 2021-22 - an average of 74 tonnes per bus per year.

At [\\$35 per carbon credit unit](#), it would cost \$1.2 million per year to offset those emissions.

Local transport emissions can be reduced by replacing fossil-fuelled buses with buses that operate on renewable electricity.

[The Zero-Emission Transition Plan for Transport Canberra outlines the pathway to achieve the ACT Government's ambition of a zero-emission public transport system by 2040.](#)

Transport Canberra's oldest buses (128 Renault buses that date from 1993) will almost certainly need replacing by 2040. Another 72 buses (Scania L94UB and Irisbus) date from 2004, and will be very close to replacement by 2040.

At about \$600,000 per bus, it will cost about \$120 million to replace those buses. At [\\$700,000 to \\$900,000](#) for an electric bus, replacing those buses with electric buses rather than fossil-fuelled buses will come at a net cost of about \$24 million.

Replacing the remaining 340 buses will cost about \$272 million.

If we ignore the effect of depreciation on existing buses, the planned achievement of a [zero-emission public transport system by 2040](#) will come at a net cost of about \$300 million, or about \$18 million per year.

Achieving a zero emissions public transport system by 2030, rather than by 2040, will reduce emissions by about 150,000 tonnes CO<sub>2</sub>-e, and will cost about \$370 million. That is only about \$70 million more than the cost of achieving a zero emissions public transport system by 2040.

### Recommendations:

- Allocate an additional \$20 million per year to replacing fossil-fuelled buses with electric buses, to achieve a zero emissions public transport system by 2030.
- Allocate \$1.2 million per year to allow Transport Canberra to emulate [Sydney Metro](#) by offsetting its operational greenhouse emissions.

## Cars

Local transport emissions can be reduced by replacing fossil-fuelled private vehicles with vehicles that operate on renewable electricity.

The uptake of electric vehicles can be promoted through a ten year *Practical Zero Emissions Vehicle* (PZEV) subsidy. PZEV would provide a subsidy, limited to \$1,000 per person, towards the purchase of a zero emissions electric vehicle. The subsidy will be up to \$1,000 per owner towards the cost of purchasing a new electric vehicle. Purchasers (including joint owners) may claim subsidies on behalf of their dependent children.

It should be noted that when these vehicles are recharged outside the ACT, they [currently cause more emissions per kilometre than do hybrid vehicles.](#)

In 2021 the ACT had 46,891 pre-2006 passenger vehicles, 56,708 passenger vehicles manufactured from 2006 to 2010, 79,144 manufactured from 2011 to 2015 and 82,010 manufactured from 2016 to 2021.

On that basis, Canberrans purchase about 20,000 new vehicles per year.

If we assume that half of those vehicles will be electric vehicles that qualify for PZEV, then PZEV subsidies for electric cars would cost about \$10 million per year.

**Recommendation:** allocate \$10 million per year for *Practical Zero Emissions Vehicle* (PZEV) subsidies for electric cars.

## Bicycles

Canberra has more bicycles than cars, but the average bicycle provides only one fiftieth as much travel as the average car.<sup>1</sup>

We would cycle more – and drive less – if our bicycles were more reliable and better equipped.

There are many cases where riding a bicycle is not a practical alternative to travelling by car. Most Canberra bicycles spray their riders with muddy water whenever they travel on wet roads, cannot safely carry even one bag of groceries, and cannot be legally ridden at night. Compared with a normal car, a normal road bicycle suffers punctures a hundred times as often and is designed to be serviced ten times as often, at three times the servicing cost per kilometre.<sup>2</sup>

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1 The ABS Motor Vehicle Census reports that there were 240,946 passenger vehicles in the ACT in 2016 and 259,701 in 2021. That indicates about 245,000 in 2017. The 2017 ACT and Queanbeyan Household Travel Survey reports that those vehicles provided 8,715,100 person-kilometres of travel (an average of 36 person-kilometres per vehicle) while 274,131 bicycles travelled 196,544 kilometres (an average of 0.72 kilometres per bicycle).

2 My car tyres have suffered punctures about once every eighty thousand kilometres. In 60,000 kilometres of bicycle commuting and a year of managing the Australian Greenhouse Office bicycle fleet, I have found that bicycles with standard road tyres suffer punctures about once every five hundred kilometres. Puncture resistant bicycle tyres can eliminate 90% of those punctures. In contrast, most cars are designed to be serviced once a year or every 15,000 kilometres, whichever comes first. [ACT vehicles travel an average of 11,800 kilometres per year.](#) At [\\$290 per service](#), that costs two and a half cents per kilometre. A bicycle service costs about \$80. Many bicycles (including Giant, Trek and Avanti) are designed to be serviced at least once every fifty hours of riding. That corresponds to about 1,000

A *Practical Zero Emissions Vehicle (PZEV) subsidy* of up to \$500 per person each five years, can support local businesses by subsidising the purchase and maintenance of bicycles that are more reliable, and that are equipped to carry groceries at night on wet roads.

PZEV would operate in a similar way to [ChooseCBR](#) and the [Spectacles Subsidy Scheme](#). [ChooseCBR](#) provided up to half of the cost (to a daily limit of \$80) of purchases at participating local businesses. The [Spectacles Subsidy Scheme](#) provides eligible ACT residents with a subsidy of up to \$200 once every two years.

PZEV would provide a bicycle maintenance subsidy, and subsidise the extra costs of purchasing a new bicycle (or upgrading an existing bicycle) with lights, mudguards, puncture-resistant tyres and a luggage basket or saddlebags.

It costs about \$700 to equip a bicycle with lights, mudguards, puncture-resistant tyres and a luggage basket or saddlebags.

PZEV could provide each eligible person with:

- one \$50 subsidy, limited to once every two years, towards the cost of servicing a bicycle; and
- a \$400 subsidy, limited to once every five years, towards either:
  - the cost of purchasing a new bicycle that is equipped with lights, mudguards, puncture-resistant tyres and a luggage basket or saddlebags; or
  - the cost of equipping an existing bicycle with lights, mudguards, puncture-resistant tyres and a luggage basket or saddlebags.
- purchasers may claim subsidies on behalf of their dependent children. A parent's and a child's subsidy may be combined for the purchase or upgrade of a bicycle that is designed to carry both the parent and the child.

### **How much would PZEV for bicycles cost?**

PZEV for bicycles would cost about \$10 million per year

The [2021 National Walking and Cycling Participation Survey](#) reported that around 99,400 of ACT residents (23%) rode a bicycle (including e-bicycles) in the previous week and 189,200 (44%) over the previous year. If 100,000 residents were to take full advantage of PZEV over five years, the scheme would cost about \$10 million per year.

**Recommendation:** allocate \$10 million per year for *Practical Zero Emissions Vehicle* (PZEV) subsidies for qualifying bicycles.

## **Tourism**

Tourism is worse than a zero sum game.

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kilometres of travel. Those bicycles require servicing ten times as often as cars, at three times the cost.

When people travel as a tourists, they spend money that they might otherwise spend at home. Only some of that money benefits people along the route or at their destinations. The remainder goes to fossil fuel companies.

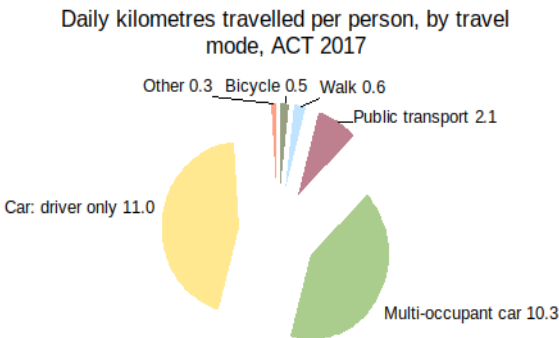
Transport, postal and warehousing accounted for 16.8% (2.5 Mt CO<sub>2</sub>e, or 6 tonnes per capita) of the ACT’s carbon footprint in 2018. Sixty per cent of these emissions occurred outside the ACT, including from tourist travel by road, rail and air. [“Based on household expenditure data \(ABS, 2017\) it is estimated that 13% of household expenditure in this category is air travel, approximately 0.37 t CO<sub>2</sub>-eq per person per year.”](#)

**Recommendation:** Allocate \$1 million per year to initiatives, such as promoting “staycations,” to reduce tourism emissions and to keep more money in the local economy.

# Transport

## Balanced and considered transport investments

**Public transport:** Transport Canberra and Capital Metro together provide about 5% of local person-kilometres travelled, cause one fifteenth as much traffic congestion per person as driver-only cars<sup>3</sup>, and cause more than two kilograms of CO<sub>2</sub>-e emissions per person per average 10.8 kilometre trip.



The Budget is expected to accommodate [more than \\$960 million](#) worth of public transport upgrades, subsidise Transport Canberra’s operations by \$80 million per year<sup>4</sup>, cover about \$35 million per year of light rail payments, and support the achievement of a zero-emissions public transport fleet by 2040.

The Transport Minister says that [the government needs to make "balanced and considered investments" in public transport, roads and active travel](#). A [balanced and considered](#) budget would provide:

- **\$9 billion, plus \$1 billion per year, for roads** for use by buses, by freight vehicles that provide [276 million tonne kilometres of local freight movements per year](#), and by multi-occupant cars that provide 48% of local person kilometres travelled, cause less than half as much traffic congestion per person as driver-only cars, and cause about 1.4 kilograms of CO<sub>2</sub>-e emissions per person per 10.8 kilometre trip.

3 The Transit Lane Warrants Study reported an average bus occupancy of 45. A bus occupies about the same road space as three cars.

4 The 2021-22 Transport Canberra and City Services Annual report states that Transport Canberra provided 11.9 million boardings, at a government subsidy of \$6.80 per passenger boarding.

- **At least \$480 million plus \$55 million per year, for walking** that provides 14% of local trips and 2.5% of local person-distance travelled, provides greater health benefits than public transport<sup>5</sup> and causes no net direct greenhouse emissions<sup>6</sup>.
- **At least \$350 million plus \$40 million per year, to cycling** that provides 2.7% of local trips and 1.9% of local person-distance travelled, provides greater health benefits than public transport<sup>7</sup> and causes no net direct greenhouse emissions<sup>8</sup>.
- **Up to \$10 billion plus \$1 billion per year, for driver-only car travel** that provides 45% of person-distance travelled, and causes almost 3 kilograms of CO<sub>2</sub>-e emissions per 10.8 kilometre trip.

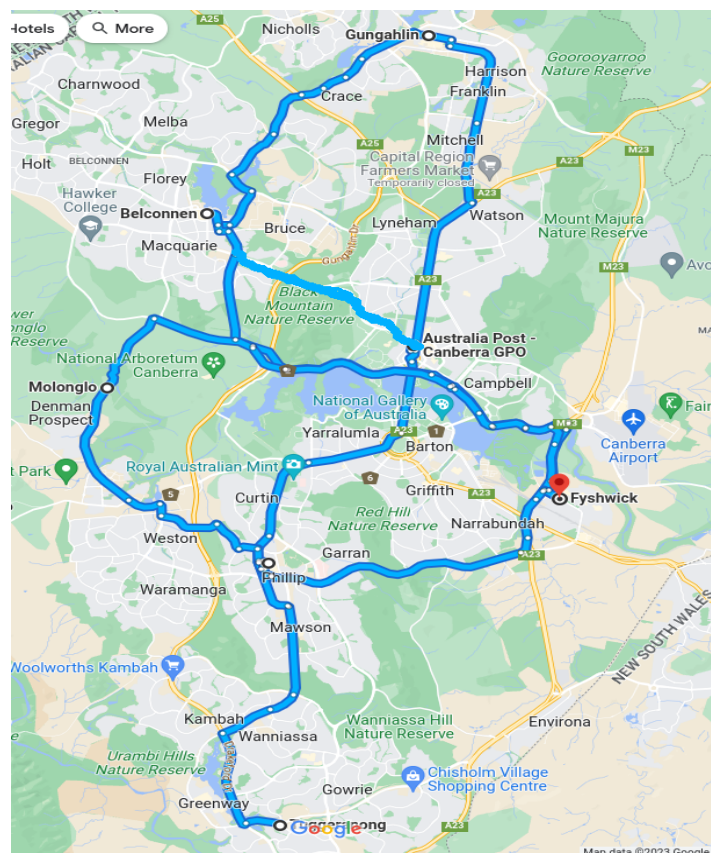
## Fast Commuter Network

The *Fast Commuter Network* will connect the five Town Centres (Gungahlin, Belconnen, Civic, Woden and Tuggeranong), Molonglo, Fyshwick and Canberra Airport/Majura Park to reduce travel delays and cut greenhouse emissions.

### What is a Fast Commuter Network?

A fast commuter network prioritises multi-occupant vehicles, bicycles and walking, with a combination of improved intersection designs, T2 and T3 transit lanes, separated bicycle lanes, shared paths and footpaths.

Multi-occupant vehicles include trams, buses and cars with two or more occupants. These vehicles



*Fast Commuter Network*

- 5 2.5 to 5 hours per week of brisk walking can provide the [recommended amount of physical activity for an adult](#). If each Canberran were to replace 24 km of motorised travel per week with four hours of brisk walking, health would improve and the ACT's transport emissions would fall by eight per cent.
- 6 Walking causes no net direct carbon dioxide emissions, because the CO<sub>2</sub> that is exhaled due to walking was previously absorbed from the atmosphere by plants. [Walking has been estimated to cause 260 grams of indirect CO<sub>2</sub>-e emissions per kilometre](#).
- 7 1.5 to 2.5 hours per week of fast cycling can provide the [recommended amount of physical activity for an adult](#). If each Canberran were to replace forty km of motorised travel per week with two hours of fast cycling, health would improve and the ACT's transport emissions would fall by thirteen per cent.
- 8 Cycling causes no net direct carbon dioxide emissions, because the CO<sub>2</sub> that is exhaled due to cycling was previously absorbed from the atmosphere by plants. [Cycling has been estimated to cause 140 grams of indirect CO<sub>2</sub>-e emissions per kilometre](#).



contribute less than half as much congestion, per person, as driver-only cars. A multi-occupant car causes [less emissions per person, on average, than public transport](#).

At many intersections pedestrians and some cyclists currently have to wait through an extra traffic light cycle, because the lights turn red while they are crossing the median strip. Better intersection design can allow them to cross in a single phase of the traffic lights. At some intersections, delays can be reduced by simply reprogramming the pedestrian signals.

T2 and T3 transit lanes, bus lanes, bus rapid transit and light rail (with the exception of the proposed stage 2 of light rail<sup>9</sup>) provide faster public transport, and thus encourage more car drivers to become public transport passengers.

Public transport subsidies and investments have failed since 2011 to reduce the proportion of commuting cars. The proportion of ACT commuters who drove cars all the way to work increased from 71.8% in 2011 to a record high of 72.5% in 2016, and to a new record high of 79% in 2021. The proportion who travelled all the way to work as car passengers (without adding to traffic congestion or emissions) fell from 6.4% in 2011 to 5.4 and partially recovered to 5.8% in 2021.

Unlike bus lanes, bus rapid transit or light rail, T2 and T3 transit lanes further reduce transport emissions and traffic congestion, by encouraging car drivers to become car passengers.

### **How high occupancy (HOV) lanes work**

In congested traffic, a vehicle that is within 200 metres of an intersection when the traffic signals turn green will get through the intersection before the lights turn red. A vehicle that is more than 200 metres from the intersection will move forward in the queue, but will have to wait for the green phase in the next two minute cycle of the traffic lights.

An effective HOV lane works by delivering multi-occupant vehicles to within 200 metres of an intersection, so that they can pass through in the next green phase of the traffic signals. A 200 metre T2 or T3 lane can reduce travel delays by up to two minutes.

A [bus lane](#) can carry 250 buses per hour through a signalised intersection, and is available to buses, taxis and motorcycles. Canberra's bus lanes are grossly utilised, because few if any of Canberra's bus routes carry more than forty buses per hour.

A [T3 lane](#) is available to buses, taxis, motorcycles and cars with three or more occupants. It can carry up to 600 vehicles per hour through a signalised intersection. The Transit Lane Warrants Study recorded peak flows on Adelaide Avenue of about 220 vehicles per hour that qualify to use T3 lanes.

A [T2 lane](#) is available to buses, taxis, motorcycles and cars with two or more occupants. The Transit Lane Warrants Study recorded peak flows on Adelaide Avenue of about 900 vehicles per hour that qualify to use T2 lanes. Those traffic volumes would warrant two T2 lanes.

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9 Buses currently travel between Woden and the CBD in under 20 minutes. The Business Case for Stage 2A of light rail estimates light rail travel time at 25-30 minutes, plus 1 to 2.5 minutes for wire-free operation (that is required by the National Capital Authority).

## Costs

An existing traffic lane can be converted to a transit lane for the cost of changing a few road signs.

[It costs about \\$150/m<sup>2</sup> to re-lay tarmac footpaths.](#) That is about \$400,000 per kilometre for a 2.5 metre wide shared walking/cycling path.

No construction costs are incurred in re-timing pedestrian signals.

The costs of re-designing intersections for the purposes of the Fast Commuter Network can be minimised by prioritising intersections that are being redesigned for other reasons.

**Recommendation:** Allocate \$100 million over three years to convert strategic sections of general traffic lanes into effective transit lanes along trunk routes connecting Gungahlin, Belconnen, Civic, Woden, Tuggeranong, Molonglo, Fyshwick and Canberra Airport/Majura Park, to provide separate walking and cycling lanes or paths, and to improve intersection designs and pedestrian signal timing.

## Rapid Public Transport Stages 2 and 3

Bus rapid transit from Civic to Woden and Belconnen will complement light rail to Gungahlin to provide Canberra's first true rapid public transit network, with twice the benefits, faster and more frequent services, and at lower cost than extending light rail to make a single line from Gungahlin to Woden.

The following results, from the ACT Government's 2012 submission to Infrastructure Australia and its Business Case for Stage 2A of Light Rail, confirm that bus rapid transit is a much better investment than light rail.

### Comparisons based on business as usual

	<b>Bus rapid transit</b> stage 1 (2012)	Light rail stage 1 (2012)	Light rail stage 2 (2019)
Total cost	\$249m	\$524m	\$1,173m plus cost of wire-free operation
<b>Total benefits</b>	<b>\$492m</b>	\$535m	\$751m
<b>Net benefit</b>	<b>\$243m</b>	\$11m	<-422m
<b>Benefit-to-cost ratio</b>	<b>1.98</b>	1.02	<0.64

### Comparisons based on higher density land use/wider economic benefits

	<b>Bus rapid transit</b> stage 1 (2012) Higher density land use	Light rail stage 1 (2012) Higher density land use	Light rail stage 2 (2019) Wider economic benefits
<b>Total cost</b>	<b>\$249m</b>	\$524m	\$1,173m plus cost of wire-free operation
<b>Total benefits</b>	<b>\$1,188m</b>	\$1,225m	\$1,217m
<b>Net benefit</b>	<b>\$939m</b>	\$701m	<\$44m
<b>Benefit-to-cost ratio</b>	<b>4.78</b>	2.34	<1.14

I estimate that Stage 2 of rapid public transit (11 km between Civic and Woden) will cost \$450 million to construct as bus rapid, or more than \$1 billion as light rail.

I estimate that Stage 3 of rapid public transit (9.2 km of bus rapid transit between Civic and Belconnen) will cost \$375 million.

**Recommendation:** that \$825 million be allocated, to be paid over twenty years, to the construction of of Rapid Public Transit Stages 2 and 3.

## Footpaths

I estimate that 1,000 kilometres of Canberra's streets have no footpaths.

[It costs about \\$150/m<sup>2</sup> to re-lay tarmac footpaths.](#) That is about \$250,000 per kilometre for a 1.5 metre wide footpath.

### **Recommendations:**

- Allocate \$25 million per year to provide at least one footpath along every suburban street by 2035, to support walking, cycling (especially for school children) and public transport.