

**FACTSHEET**

# TRANSPORT EMISSIONS: DRIVING DOWN CAR POLLUTION IN CITIES

## KEY FINDINGS

- › Transport is Australia's third largest source of greenhouse gas emissions, with the highest rate of growth.
- › Cars are responsible for roughly half of Australia's transport emissions. Australian cars emit about the same as Queensland's entire electricity supply.
- › An international scorecard ranked Australia second-worst for transport energy efficiency.
- › Key climate solutions for transport involve:
  - providing viable alternatives to driving, such as expanding access to reliable, comfortable public transport.
  - electrifying and powering cars, buses, trains and trams with 100% renewable energy.
  - adopting stringent, mandatory greenhouse gas emissions standards for cars and other vehicles.

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## FACTSHEET

# Transport Emissions: Driving Down Car Pollution in Cities

## INTRODUCTION

**Cars are a major source of greenhouse gas pollution in Australian cities.**

Transport is Australia's third largest source of greenhouse gas emissions (96MtCO<sub>2</sub>e per year, 17% of total emissions) (Australian Government 2017a).

Transport emissions have grown more than any other sector, increasing nearly 60% since 1990 (Australian Government 2017a).

Cars are responsible for roughly half of all transport emissions (Australian Government 2017b; Figure 1). Collectively, Australian cars emit roughly the same per year (43MtCO<sub>2</sub>e) as Queensland's entire coal and gas fired electricity supply (Australian Government 2017b; Queensland Renewable Energy Expert Panel 2016).

In ratifying the Paris Agreement, Australia committed to rapidly reduce our carbon emissions, by reducing emissions by 26-28 percent on 2005 levels by 2030 and transitioning to zero emissions before 2050. A number of state governments have also committed to zero net emissions targets by 2050. Despite these pledges to tackle climate change, Australia's emissions continue to rise, particularly from the transport sector.

**Transport is Australia's  
third largest emitter,  
highest emissions growth.**

Collectively, cars in Australia emit the same as Queensland's entire fossil-fuelled electricity supply.

Figure 1: Cars, the major source of transport emissions.



## HOW DOES AUSTRALIA COMPARE ON TRANSPORT EMISSIONS?

Australia lags well behind the global pack on tackling transport emissions. Australia's per capita transport emissions are 45% higher than the OECD average (IEA 2016).

An international scorecard comparing 23 of the largest energy-using countries, ranked Australia second-worst for transport energy efficiency due to:

- › High emitting cars, and the lack of greenhouse gas emissions standards in place for cars or heavy vehicles.
- › The relatively high distances travelled by car per person, compared to similar countries.
- › Low use of public transport (12% of trips).
- › Low ratio of spending on public transport compared to roads (ACEEE 2016; Figure 1).

### TRANSPORT ENERGY EFFICIENCY SCORECARD



Spending money on new roads encourages more people to drive and worsens congestion (Beck and Bliemer 2015). Australian infrastructure data indicates that four dollars are spent on roads for every dollar spent on rail (Table 1).

**Table 1:** 2015-16 Value of engineering construction work by the private sector for (\$ billion).

	Roads and Bridges	Rail
By the private sector for the public sector	7.48	2.32
By the private sector for the private sector	4.60	1.07
By the public sector for the public sector	3.93	0.24
<b>Total</b>	<b>16.01 (82%)</b>	<b>3.63 (18%)</b>

Source: Department of Infrastructure and Regional Development 2016.

## SOLUTIONS TO REDUCE TRANSPORT EMISSIONS

### Key climate solutions to drive down transport emissions involve:

- › providing viable alternatives to driving, such as expanding access to reliable, comfortable public transport, cycling and walking alternatives.
- › electrifying and powering cars, buses, trains and trams with 100% renewable energy.
- › adopting stringent, mandatory greenhouse gas emissions standards for cars and other vehicles (and strengthening these over time).

## SHIFTING OUT OF CARS AND ONTO PUBLIC TRANSPORT

**In most large economies, public transport provides a much greater share of transport requirements (as high as 72% in China) than in Australia where buses, trains, trams and ferries account for around 10% of distance travelled (ACEEE 2016; BITRE 2014).**

Travel on all forms of public transport involves fewer emissions per person per kilometre than the average Australian car (Table 2).

Expanding access to high quality public transport is a proven way to reduce car use and its associated emissions. People who live in communities with accessible public transport tend to own fewer vehicles, drive less and rely more on public transport than other areas (Litman 2010). Rail based transport (trains and light rail/trams) has the greatest impact on reducing car dependence (McIntosh et al 2014).

Research has found a 'high shift' approach to transport spending – where investment is directed towards public and active transport and away from roads and parking – found equivalent mobility can be achieved while reducing overall public and private spending on transport, and dramatically reducing greenhouse gas emissions (Replogle and Fulton 2014).

Providing reliable, accessible public transport infrastructure (relevant to people's needs) can drive significant numbers of people to switch from driving to taking the tram, train or bus (e.g., Figure 2). Rail based transport is known to have the greatest impact on reducing car use (McIntosh et al 2014).

Table 2: Emissions for different forms of transport.

Transport	Average emissions per kilometre (gCO <sub>2</sub> /km)
Metro train systems	3-21 (per person) <sup>1</sup>
Light rail	4-22 (per person) <sup>1</sup>
Bus rapid transport systems	14-22 (per person) <sup>1</sup>
Average car sold in 2015	184 <sup>2</sup>

1 Sims et al 2014. 2 National Transport Commission 2016.

Emissions from public transport can be reduced even further if operators move to electric vehicles (trains, trams and buses) powered by 100% renewable energy. For example, Canberra's Capital Metro Light Rail project will be fully powered by renewable electricity, as a result of the Australian Capital Territory Government's 100% renewable energy target (ACT Government 2015). Similarly, Melbourne's trams will be powered by two new large-scale solar plants in regional Victoria – Bannerton Solar Park and Numurkah Solar Farm (Herald Sun 2017).

Directing investment to new public transport can drive a high shift away from car use and dramatically reduce greenhouse gas emissions.

Figure 2: Melbourne tram.



## 100% RENEWABLE POWERED ELECTRIC VEHICLES

**Electrifying our transport, and powering it by 100% renewable energy is critical for positioning Australia on the road to zero emissions by 2050 (ClimateWorks 2014).**

Electric cars run on electricity and plug-in rechargeable batteries. Globally, the rollout of electric cars is picking up speed, going from almost zero cars on the road in 2010, to passing two million electric cars in 2016. China, the United States, the Netherlands and Norway dominate the electric vehicle market (IEA 2017). Falling battery costs together with supportive government policies is driving global growth in electric vehicles (The ICCT 2015).

In Norway, nearly a quarter of cars sold are now electric (IEA 2016). Contrast this to Australia, where electric vehicles make up 0.08% of new vehicles sold (National Transport Commission 2016).

The source of electricity for electric cars charging is critical to reducing emissions (this is particularly a problem given Australia's coal dominated electricity grid).

Electric vehicles powered entirely on renewable energy have negligible emissions (as low as 6gCO<sub>2</sub>/km), compared to an average new car (184gCO<sub>2</sub>/km) (The ICCT 2015; National Transport Commission 2016).

In addition, charging an electric vehicle with renewable energy - be it rooftop solar panels or 100% GreenPower purchased from an electricity retailer - is substantially cheaper than the cost of fuel for an equivalent petrol car (AECOM 2015).

The uptake of electric vehicles in Australia is being held back by the lack of policy support or incentives, higher upfront cost, choice of available electric vehicles for sale in Australia, and the availability of public vehicle-charging infrastructure (Choice 2014; Car Advice 2015; Business Insider 2016; Figure 3).

**Globally there are more than a million electric cars on the road.**

Most electric cars can comfortably cover the average commuting needs (work, shopping, school pick-ups) for a city driver.

State governments and industry in Australia are starting to roll out electric vehicle charging networks, such as the RAC (2016) Electric Highway between Perth and Augusta, and Tesla's (2016) charging stations along the route between Melbourne, Sydney and Brisbane. However such charging infrastructure is well below that available overseas.

Electric vehicles powered entirely on renewable energy are practically zero emissions.

Figure 3: Electric cars run on electricity and plug-in rechargeable batteries.



## MANDATORY EMISSIONS STANDARDS

**Australia is among a small minority of countries without mandatory greenhouse gas emissions standards in place for cars, despite this being identified as a key action by the Federal Government to meet its 2030 emissions targets (Australian Government 2016d).**

Mandatory greenhouse gas emissions standards for cars now cover 80% of the global car market (including the United States, Europe, Japan, Korea, China, India, Canada and Mexico) (CCA 2014).

The lack of mandatory emissions standards here has meant that in 2015, new cars sold in Australia emitted 43% more CO<sub>2</sub>/km on average compared with new cars sold in Europe (National Transport Commission 2016).

The sooner mandatory emissions standards are introduced, and rapidly strengthened, the greater the impact. If strict standards are introduced, Australia can prevent up to 65 MtCO<sub>2</sub> of emissions by 2030 (Australian Government 2017c). Urgency is key.

Mandatory emissions standards have wider benefits, reducing fuel bills for car owners, saving an estimated \$8,500 over a vehicle's lifetime (CCA 2014).

**Mandatory greenhouse gas emissions standards cover 80% of the global car market, but are not in place in Australia.**

## CASE STUDIES - CITIES SUSTAINABLE TRANSPORT

### International Case Study

#### Washington, D.C. - transport targets and actions

Washington DC (population 643,000) is the capital city of the United States and its 24<sup>th</sup> largest city (Office of the Mayor 2016). In 2012, the city embarked on an ambitious and comprehensive plan "Sustainable DC", to tackle the city's key sustainability challenges of jobs and economic growth; health and wellness; equity and diversity; and climate and environment (Sustainable DC 2016). The plan includes a target for 50% of city's power use (both council operations and the community) to come from renewable energy sources by 2032.

Transportation was identified as one of the Sustainable DC plan's seven key areas. Specific targets were set for trips within the city by 2032 - with car travel to decrease to less than 25% of trips, public transport trips to increase to 50%, and biking and walking to increase to 25%. The goals and targets were underpinned by a detailed action plan (Table 3).

As a result of its actions, 2016 saw Washington DC become the equal first out of 50 US cities (tied with Boston) for the proportion of commuters walking or cycling, and second best (after New York) when public transport was included (Alliance for Biking and Walking 2016). The city was one of two major cities (with Portland, Oregon) to make a significant gain in the share of commuters biking and walking (Alliance for Biking and Walking 2016).

Nearly 39% of Washington DC residents now commute by public transport, nearly

13% walk and 4% ride (Alliance for Biking and Walking 2016). These shares are significantly higher than the average mode shares for Australian cities - 14% by public transport, 3.8% walk and 1.3% ride on average (Australian Government 2013).

Figure 4: Washington DC Capital bike share scheme.



**Table 3:** Sustainable DCs Transportation Goals, Targets and Actions.

Goals	Targets	Actions
Improve connectivity and accessibility through efficient, integrated, and affordable transit systems	Increase use of public transit to 50% of all commuter trips	<ul style="list-style-type: none"> <li>› Complete 60 kilometres of tram networks</li> <li>› Improve transit connections to employment and activity centers from underserved areas</li> <li>› Define and secure permanent funding for transit planning and improvements</li> <li>› Design transit systems for resilience to extreme weather events</li> </ul>
Expand provision of safe, secure infrastructure for cyclists and pedestrians	Increase biking and walking to 25% of all commuter trips	<ul style="list-style-type: none"> <li>› Develop a citywide, 100-mile bicycle lane network</li> <li>› Expand the Capital Bikeshare program by 200 stations</li> <li>› Partner with community organizations to deliver bike and pedestrian safety education</li> <li>› Collect data to improve understanding of cyclist and pedestrian travel patterns</li> <li>› Program crosswalks and traffic lights for improved safety and convenience of pedestrians and cyclists</li> </ul>
Reduce traffic congestion to improve mobility	Reduce commuter trips made by car or taxi to 25%	<ul style="list-style-type: none"> <li>› Implement an expanded Performance-Based Parking program</li> <li>› Expand car-sharing programs to low-income residents using financial tools</li> <li>› Encourage private businesses to offer incentives for employee travel by transit, walking, or biking</li> <li>› Encourage and promote telecommuting and alternative work schedules for employees</li> <li>› Study the feasibility of a regional congestion fee for travel during peak hours</li> </ul>
Improve air quality along major transportation routes	Eliminate all “unhealthy” air quality index days, including “unhealthy for sensitive groups”	<ul style="list-style-type: none"> <li>› Strictly limit idling engines.</li> <li>› Require District Government, and encourage private businesses, to purchase clean fuel, low-emission fleet vehicles</li> <li>› Expand electric vehicle charging infrastructure throughout the city</li> <li>› Offer incentives to avoid driving and other emission-generating activities on predicted Code Red and Orange air quality days</li> <li>› Track and report mileage data from clean fuel, low-emission, and electric vehicles</li> </ul>

Source: Sustainable DC 2016.

## CASE STUDIES - CITIES SUSTAINABLE TRANSPORT

### Australian Case Study 1

#### Moreland, Victoria - integrated transport strategy

The city of Moreland in inner urban Melbourne has developed an integrated strategy for transport which aims to achieve a shift to more environmentally sustainable travel behaviour; support transport access for all parts of the community; and improve safety and support development around transport hubs (with access to trains, trams, bicycle and walking paths) in Moreland.

Moreland supports car sharing services for residents who don't own a car. In 2012, the council installed Victoria's first electric

vehicle charging station, it now has three charging points throughout the city, and is integrating electric cars into its council fleet (Figure 5). The council has strategies to encourage walking, cycling and public transport in Moreland (City of Moreland 2017).

**City of Moreland installed Victoria's first electric vehicle charging station.**

Figure 5: One of Moreland City Council's electric vehicle charging points.



## CASE STUDIES - CITIES SUSTAINABLE TRANSPORT

### Australian Case Study 2

#### Gold Coast, Queensland – public transport

Expanding access to high quality public transport is a proven way to reduce car use and its associated emissions. People who live in communities with accessible public transport tend to own fewer vehicles and drive less.

The City of Gold Coast funded a new 13-kilometre light rail project comprising 16 stops from Broadbeach to Gold Coast University Hospital (Figure 19). The project was funded by the City of Gold Coast in conjunction with state and federal governments. The council recoups its funding for the project through rates and a public transport levy (Bourke M 2017).

Since opening in July 2014, the Gold Coast Light Rail, dubbed “the G”, now has more passenger trips per month than the permanent population of the Gold Coast. In 2016, patronage reached almost 640,000 passengers a month – far exceeding expectations - and continues to grow (Gold Linq 2016). Further stages of the project are in development to be completed prior to the Commonwealth Games in 2018.

In addition to the benefits of improved public transport access for Gold Coast residents and visitors, research has found that the new light rail has increased property values near the project (Bourke M 2017).

Figure 6: Gold Coast Light Rail.



## CASE STUDIES - CITIES SUSTAINABLE TRANSPORT

### Australian Case Study 3

#### City of Hobart - electric vehicle charging and bicycle sharing

The City of Hobart (2016) has installed electric vehicle charging in the Hobart Central Carpark, is installing a further chargepoint at the Argyle Street Carpark, and is investigating the further roll-out of electric vehicle charging stations.

Hobart City Council (City of Hobart 2017) also supports "Artbikes" - a series of free bicycles available to ride around Hobart, and bike parking facilities at key cultural and art institutions. The bicycles come with free helmets, locks and a map (Figure 7).



Figure 7: "Charlie the Bike Rack" Hobart City Artbikes.

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