



ROAD CONGESTION IN AUSTRALIA



Australian
Automobile
Association

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Foreword

Road Congestion in Australia

No-one benefits from congestion, and everyone pays.

Smart government investment can help address this problem.

But to develop effective solutions for congestion, we first need a strong understanding of the problem.

This report confirms what most people living in and around our capital cities know all too well – traffic congestion is growing worse year after year.

Over this report's 5.5-year reference period (1 January 2013 to 30 June 2018), average driving speeds have declined markedly in Australia's capital cities. Speeds in Sydney and Brisbane fell by 3.6 per cent and 3.7 per cent respectively. In Melbourne, the slow-down was even worse - 8.2 per cent.

Without decisive action, these congestion problems will only get worse and Australians will spend even more time in traffic.

This isn't just bad for quality of life. It also harms the economy and the environment.

Traffic jams push up emissions and air pollution – damaging public health and the environment.

Business costs rise and productivity declines when workers and goods are stuck in traffic. These costs end up being passed on to consumers, feeding into our rising cost of living.

The Bureau of Infrastructure, Transport and Regional Economics estimated that congestion cost Australia \$16.5 billion in 2015.

Without major policy changes, congestion costs are predicted to reach between \$27.7 and \$37.3 billion by 2030.¹

Road Congestion in Australia is the first report aimed at benchmarking road congestion in all of the nation's capital cities. Delivering reliable, nationally consistent and regular reporting on road congestion will enable the AAA and its member clubs to advocate for greater investment in infrastructure and traffic management programs to enhance road networks. This report is intended to help stimulate discussion and problem-solving so that Australia can develop smart measures to address our growing traffic congestion.



Michael Bradley

Chief Executive
Australian Automobile Association

¹ Bureau of Infrastructure, Transport and Regional Economics, Information Sheet 74: Traffic and congestion cost trends for Australian capital cities (2015).



Section one

Introduction

Overview

The AAA's inaugural *Road Congestion in Australia* report is the first report to deliver and assess speed performance and reliability data to benchmark road congestion on arterial road networks across all Australian capital cities.

The AAA intends to release regular reports that analyse high-level changes in road performance across capital city networks in the areas of average speed performance, congestion and reliability. The analysis of key routes (given in Section 5 of this report) will be regularly updated to show a more detailed picture of how road performance affects users on key routes, including an airport route, across the network.

Economic consulting firm HoustonKemp (founder of Journey Analytics) developed the road performance metrics using data provided by HERE Technologies, a leading global navigation system mapping company that is developing technology to support the shift towards autonomous vehicles. In partnership with leading car manufacturers, HERE collects data from in-vehicle navigation systems and hand-held smart phones to provide speed information across Australia.

The data is provided for a road link (the length of road between any two intersections). It is available for every local and arterial road across Australia, from 1 January 2013 to yesterday, and for every 15-minute period. The report examines data collected from 1 January 2013 to 30 June 2018. The data's granularity and length of history provides rich insights to inform trends analysis down to specific road segments.

Several road agencies are now using HERE traffic data to inform the development of trend analysis, to support road safety programs, and to inform post-completion evaluation of road projects. The data also underpins the Infrastructure Performance Measurement Dashboard being developed by the Bureau of Transport and Regional Economics (BITRE), Infrastructure Australia and Data61¹. This dashboard is intended to report on high-level road performance trends in capital cities.²

By reporting on AM/PM peaks, free flow speeds and analysing key routes, this report will enable much deeper insights into how, where and when road performance is changing across the road network. This work uses the same data and methodology that BITRE will be using for its public reporting at the city-wide level.

Understanding this report

The capital city road performance results are for arterial roads in the Greater Capital City Statistical Areas (GCCSA), as defined by the Australian Bureau of Statistics. Because road performance measurements are based on a statistical boundary, they do not account for different configurations in road networks across Australia's capital cities. For example, the boundary does not account for variability of land use, population density and infrastructure availability.

Given the variability in network designs, some road performance indicators lend themselves more to intercity comparisons than others. For example, variability and the measurements for congestion (average speeds as a percentage of free flow speeds (POFF) and average speeds as a percentage of the speed limit (POSL)) compare road performance against the capacity of the city's network. On the other hand, different speed limits and network configurations mean average speeds do not lend themselves to direct inter-city comparisons.

The report will have the greatest value for intra-city comparisons, where performance of individual road networks can be tracked over time.

¹ Infrastructure Performance Dashboard accessed at: https://bitre.gov.au/data_dissemination/priority_projects/infrastructure_performance_dashboard.aspx

² National Infrastructure Data Collection and Dissemination Plan accessed at: https://bitre.gov.au/data_dissemination/files/National_Infrastructure_Data_Collection_and_Dissemination_Plan.pdf

Key definitions

This report measures several comparative performance metrics across Australia's capital cities, including:

- **Average speed** across capital city arterial road networks
- **Percentage of Speed Limit (POSL)** - average speeds as a percentage of the speed limit for the segment of road
- **Free flow speeds** - average observed speeds over a number of hours in an overnight period (i.e. congestion-free speeds)
- **Percentage of Free Flow (POFF)** - average speeds as a percentage of free flow speeds
- **Variability** - the coefficient of variation of average speeds. Highly variable average speeds reduce the reliability and predictability of journey time.

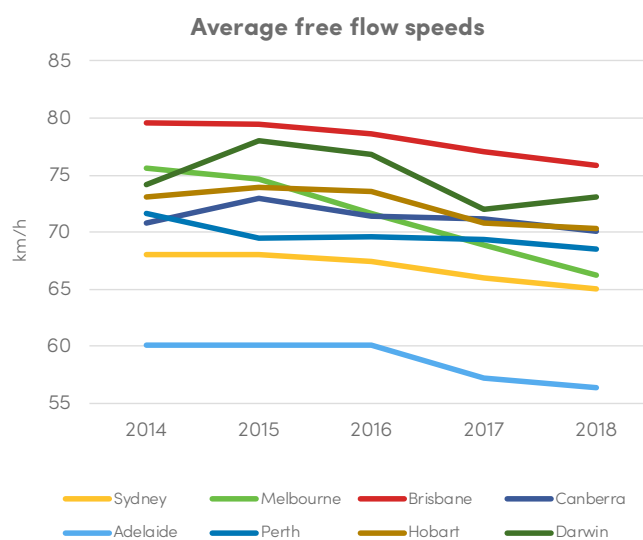
POSL is a useful medium-to-long-term road performance benchmark that reflects the impact of asset quality and network investment on road speed performance.

But acceleration and deceleration on the road network, and general road user behaviour mean that average free flow speeds are likely to always be lower than the speed limit. For example, traffic lights, intersections, roundabouts and other road limitations make it unachievable to consistently travel at the speed limit on many sections of the arterial road network.

Because a road's speed limit might not be a realistic benchmark for achievable speed performance, it is appropriate to include an alternative metric representing free flow speeds. The POFF metric is a more useful measure of the 'best' road performance that could be achieved without congestion.

POFF also provides a useful benchmark for comparing short-term road network performance between cities. It directly measures differences in speed performance as a consequence of traffic congestion.

However, the POFF metric can be affected by changes in free flow speeds that often mask increases in congestion. For example, improvements in POFF can be due to lower free flow speeds in a deteriorating network. The graph below tracks changes in free flow speeds over the reference period. On average across the capital cities, free flow speeds have declined by 4.8 per cent over the reference period.



The overall deterioration in free flow speeds clearly reveals that the underlying infrastructure, road quality and network configuration is not meeting road users' needs and is significantly impairing road performance. Not only is congestion hampering our road network - the network itself is also deteriorating.

Both POSL and POFF metrics have been included in the AAA report for comparative purposes. 2013 data is not available for the POFF metric because free flow speeds are calculated using a 365-day moving average, so the first data point available is for 2014.

The capital city road performance results are for arterial roads in the Greater Capital City Statistical Areas (GCCSA), as defined by the Australian Bureau of Statistics. The GCCSAs are designed to represent the functional extent of each of the eight state and territory capital cities. They represent each city's labour market and draw upon Census Travel to Work data.

Key findings

National congestion measurements - 2017 to 30 June 2018



AVG. SPEED

63.5 ^{KM}/_H ▼ 1.1%



CONGESTION (POFF)

94.8% ▼ 0.3%



VARIABILITY

24.0% ▲ 0.2%

Road performance across Australia is deteriorating. Average speed and reliability have declined and congestion is growing worse.

Melbourne has had the largest decline in **average speeds** - a fall of 8.1 per cent over the 5.5-year reference period. Melbourne's annual rate of reduction in speed is more than twice that of Sydney.

Brisbane had the second-largest decline in speed - 3.6 per cent since 2013. Sydney was close behind with a 3.5 per cent decline. Only Darwin achieved speed improvements, increasing by about 5.1 per cent.

Average monthly free flow speeds declined over the reference period. Adelaide has the lowest free flow overnight speeds. Melbourne had the greatest decline in free flow speed - a fall of 12.3 per cent over the reference period.

The measurement for congestion, **average speeds as a percentage of the posted speed limit** (POSL), shows congestion worsened in most capital cities over the reference period. This steady decline accelerated in 2017 and 2018. Melbourne has the lowest POSL results, closely followed by Adelaide and Sydney.

When **average speeds are measured against free flow speeds** (POFF), Sydney is the most congested city, closely followed by Melbourne and Adelaide, although the latter two cities recorded slight improvements from 2017 to 2018. Darwin and Brisbane had the greatest declines in this congestion metric from 2017 to 2018.

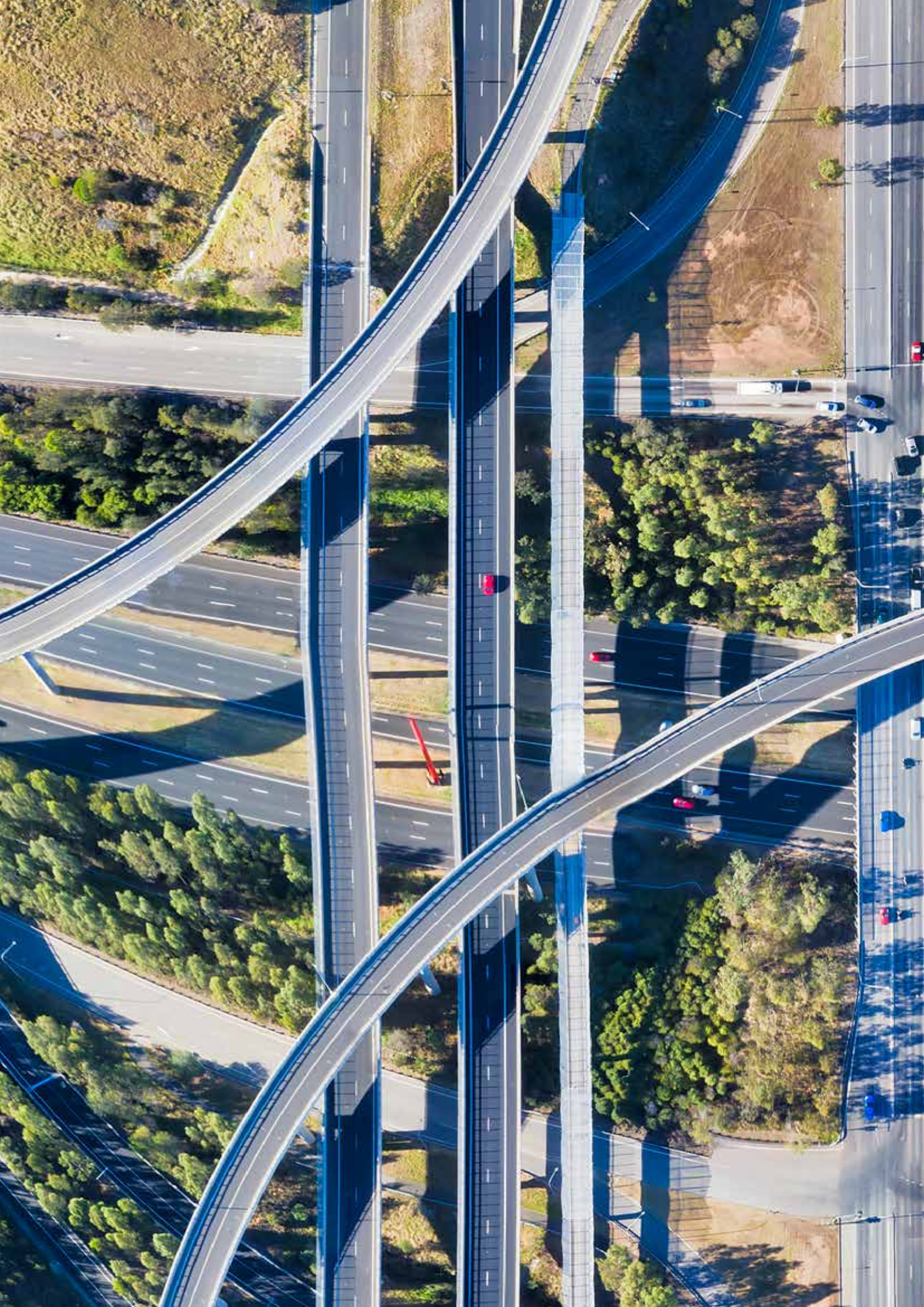
Overall, the POFF results have been relatively stable across the capital cities. But the consistent results for POFF are because free flow speeds declined over the reference period by an average of 4.8 per cent. Deteriorating free flow speeds can give cities misleadingly high performances in this metric.

Predictability of travel time is a key determinant for road performance. Predictability and variability are inversely related; a highly variable road performance makes travel less predictable and less reliable. If variability forces users to allot additional time for a trip, this affects productivity.

Melbourne has the most **variable results**, followed by Sydney. From 2017 to 2018, trip variability (reliability) improved in Adelaide and Sydney, while Brisbane and Canberra had the greatest deteriorations. Over 2013 to 2018, Darwin and Hobart had the greatest improvements in variability - reductions of almost 2 per cent.

Analysis of case study routes in Section 5 shows Melbourne's Tullamarine Airport route had the largest increase in congestion over the reference period. This road's congestion increased by almost 13 per cent over 2013 to 2018 and its variability is still notably higher than on any other airport route. Over 2017 to 2018, Brisbane Airport's route had the largest decline in average speed, while Melbourne and Sydney had slight increases in speeds.

The capital city case study routes had a wide range of results. Some routes' performances improved but others declined. Melbourne's Dandenong to CBD route had the largest increase in travel time (3.7 minutes), while Adelaide's South to CBD route had the biggest decrease in travel time (2.6 minutes).




National summary

1 January 2017 to 30 June 2018

DARWIN

 **AVG. SPEED** **72.2 KM/H** ▲

 **CONGESTED SPEED (% OF FREE FLOW)** **97.7%** ▼

 **VARIABILITY** **20.8%** ▲

PERTH


 **AVG. SPEED** **61.6 KM/H** ▼

 **CONGESTED SPEED (% OF FREE FLOW)** **94.8%** ▲

 **VARIABILITY** **24.3%** ▲

ADELAIDE


 **AVG. SPEED** **54.3 KM/H** ▼

 **CONGESTED SPEED (% OF FREE FLOW)** **93.9%** ▲

 **VARIABILITY** **24.5%** ▼

HOBART

 **AVG. SPEED** **65.0 KM/H** ▼




 **CONGESTED SPEED (% OF FREE FLOW)** **94.3%** ▼

 **VARIABILITY** **22.6%** ▲











BRISBANE

	AVG. SPEED	71.5 KM/H ▼
	CONGESTED SPEED (% OF FREE FLOW)	96.3% ▼
	VARIABILITY	21.7% ▲




SYDNEY

	AVG. SPEED	58.2 KM/H ▼
	CONGESTED SPEED (% OF FREE FLOW)	92.5% ▼
	VARIABILITY	26.0% ▼

CANBERRA

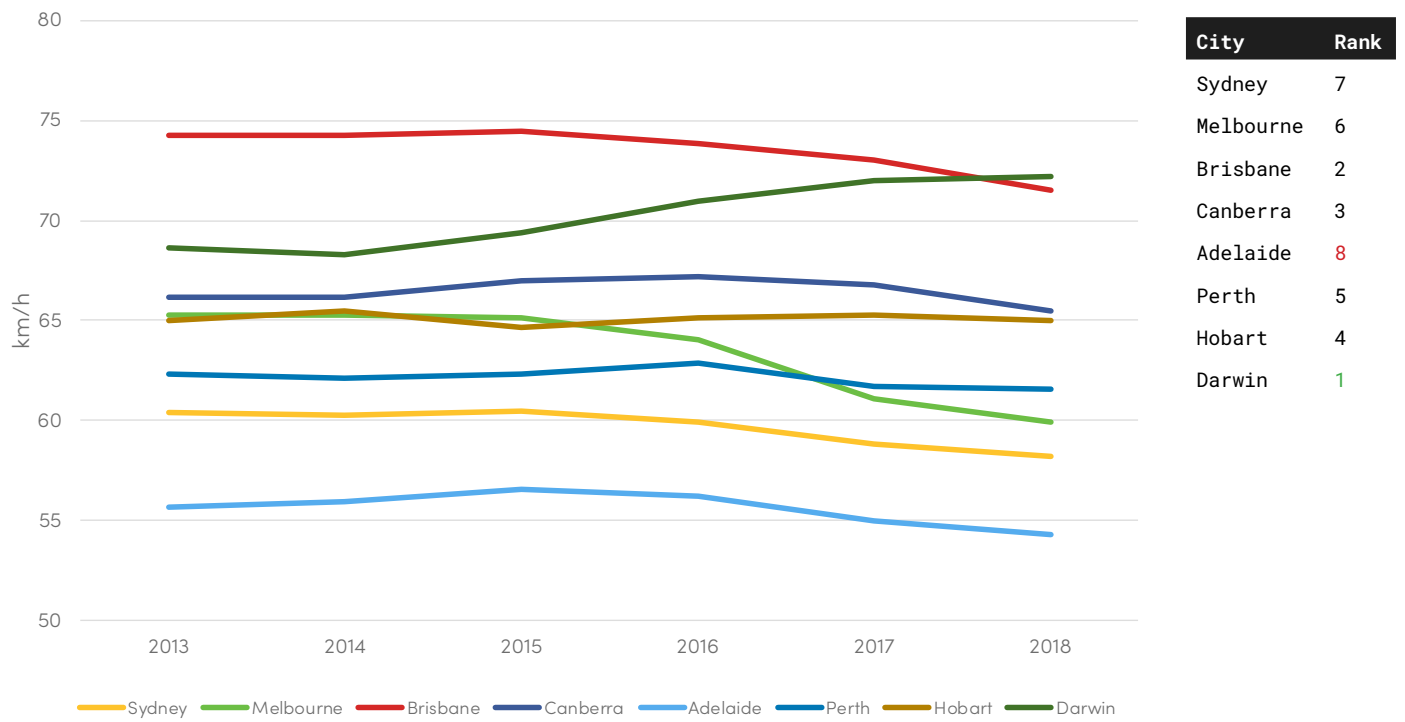
	AVG. SPEED	65.5 KM/H ▼
	CONGESTED SPEED (% OF FREE FLOW)	95.5% ▼
	VARIABILITY	23.9% ▲

MELBOURNE

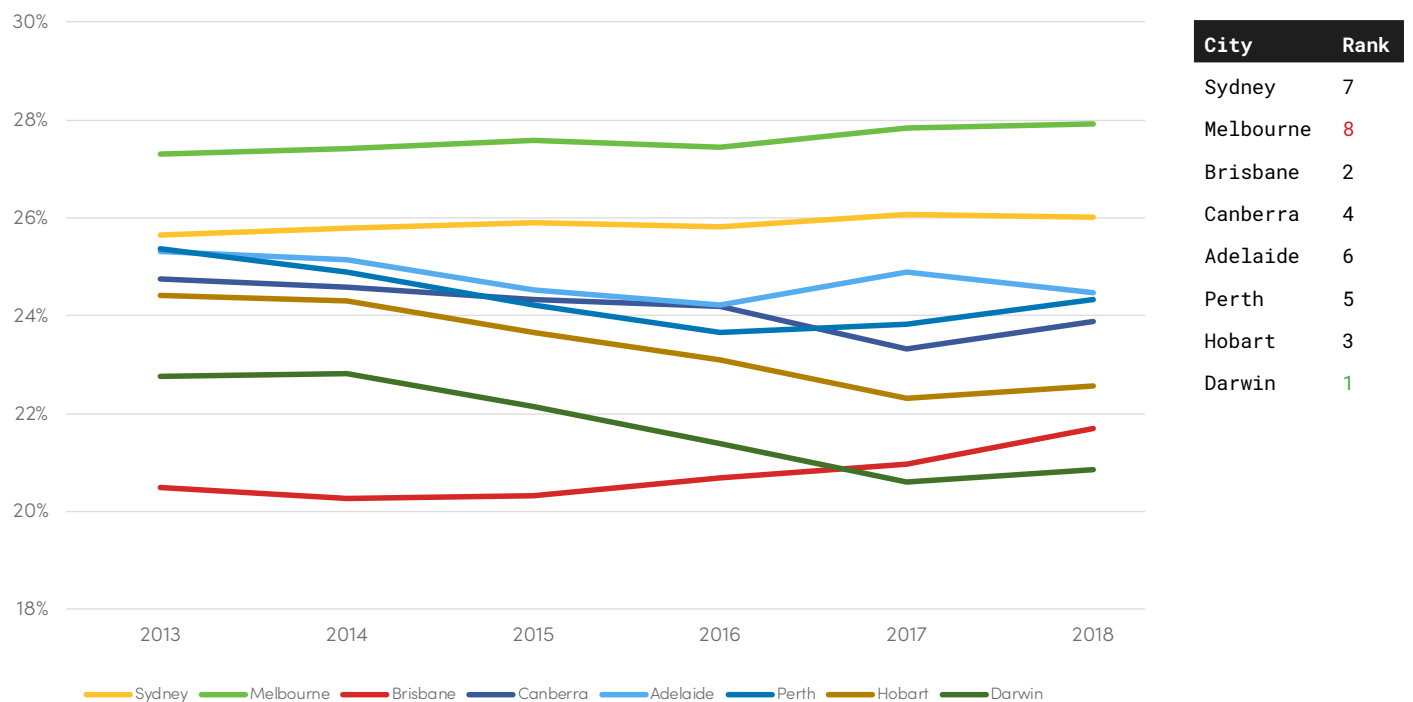
	AVG. SPEED	59.9 KM/H ▼
	CONGESTED SPEED (% OF FREE FLOW)	93.6% ▲
	VARIABILITY	27.9% ▲

■ = improved
■ = deteriorated

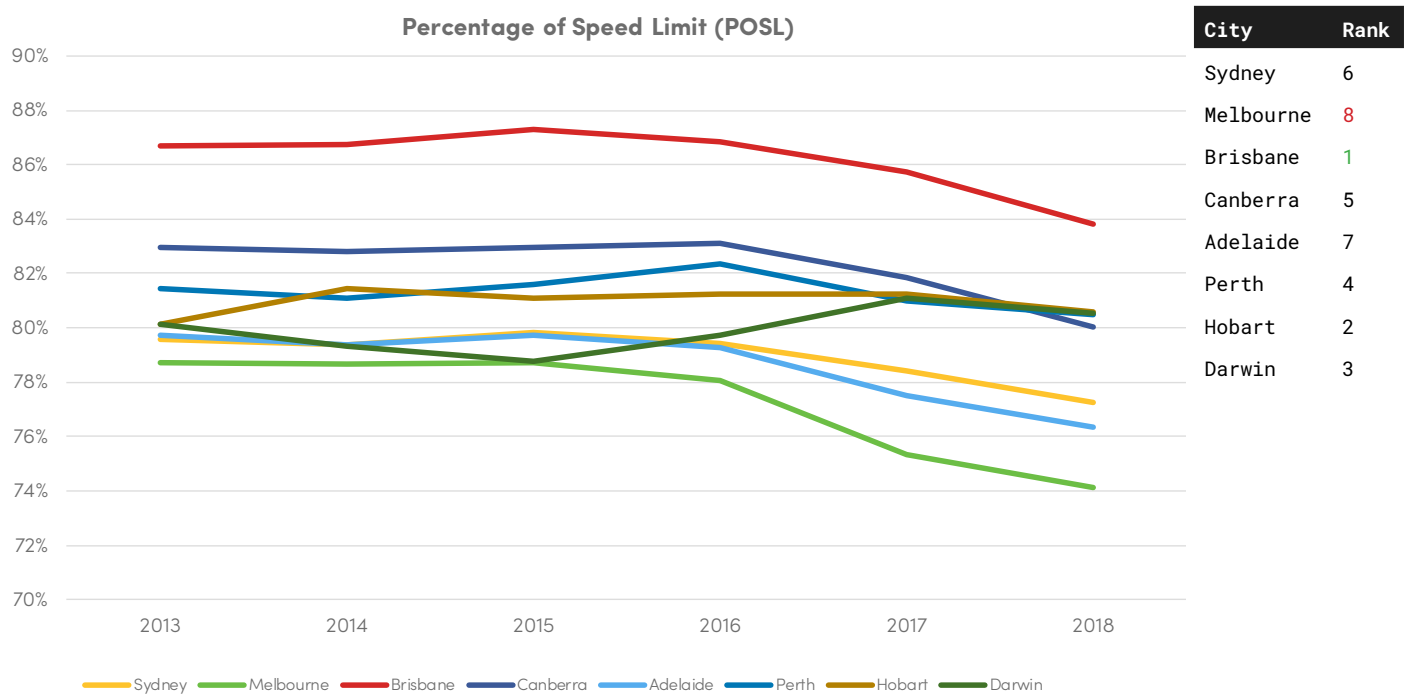
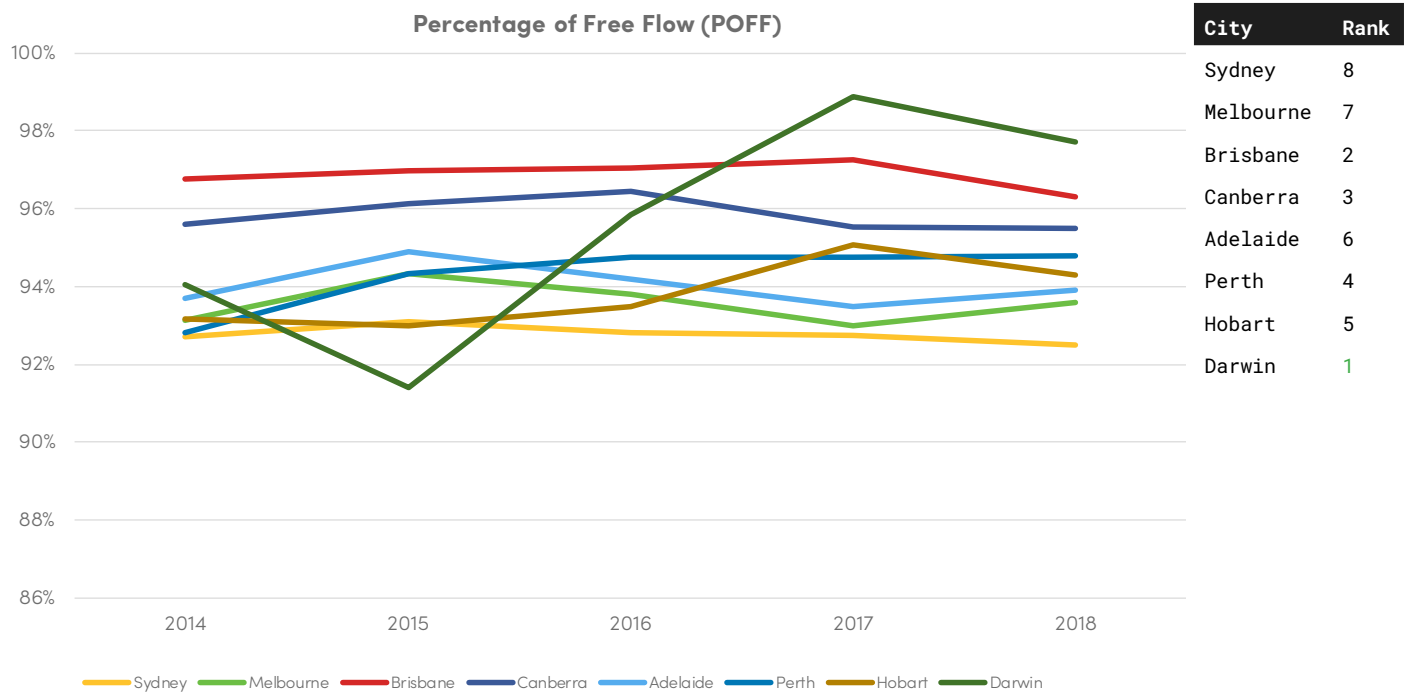
Average speeds



Variability



Congestion



City by city analysis

Sydney

1 January 2013 to 30 June 2018



PERCENTAGE CHANGE
IN AVERAGE SPEEDS

▼ 3.5%



TRAVEL TIME LOSS/
GAIN FOR 5KM TRIP

▲ 11 SEC



PERCENTAGE CHANGE
IN VARIABILITY

▲ 0.4%

Average speeds

Sydney's average speed (km/h) remained fairly static from 2013-2015. But since then, the average speed declined by over 2km/h to 58.2km/h in 2018.

Peak AM/PM speeds in Sydney have declined since 2015.

The average AM peak speed in 2018 was 55.7 km/h, compared to the average PM peak speed of 55 km/h in the same period.

Sydney has the second slowest average AM/PM peak speeds in 2018 compared to other cities in Australia.

Variability

As variability (measured as the coefficient of variation of speed) increases, reliability deteriorates. Variability has increased steadily, significantly impairing reliability between 2013-2018, although Sydney's traffic flow became slightly less variable in 2018.

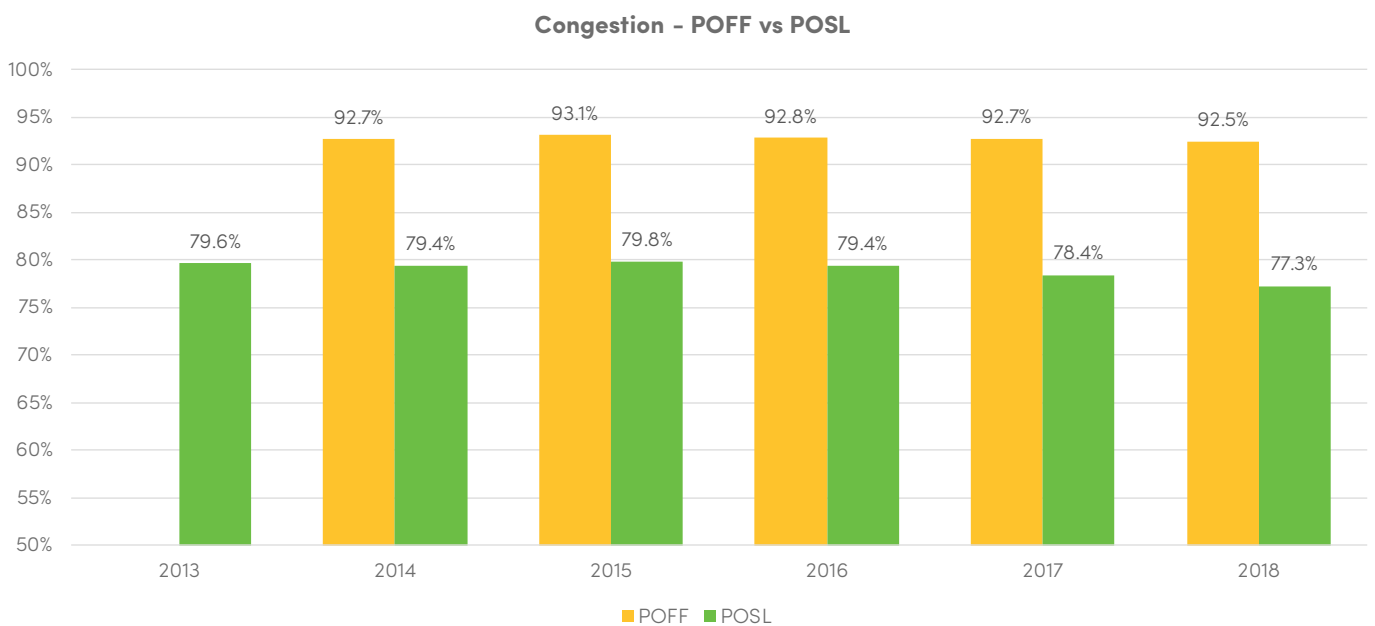
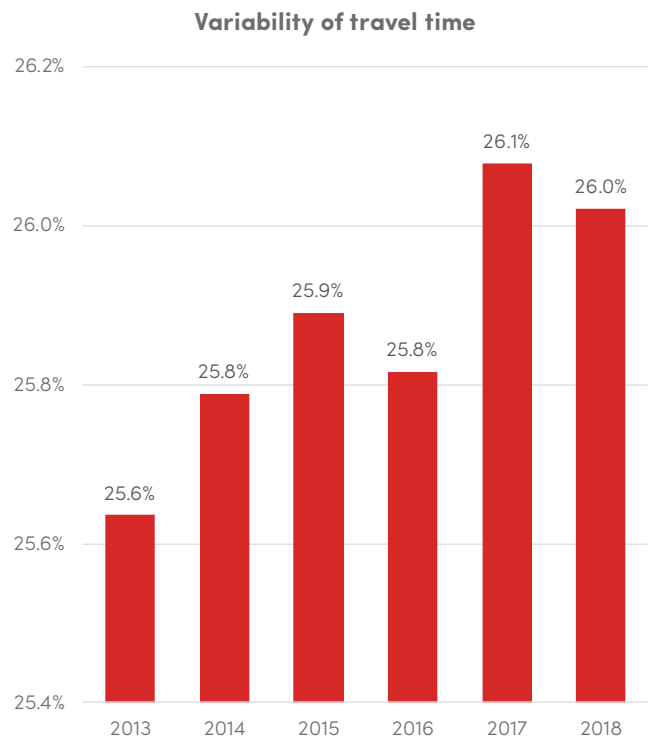
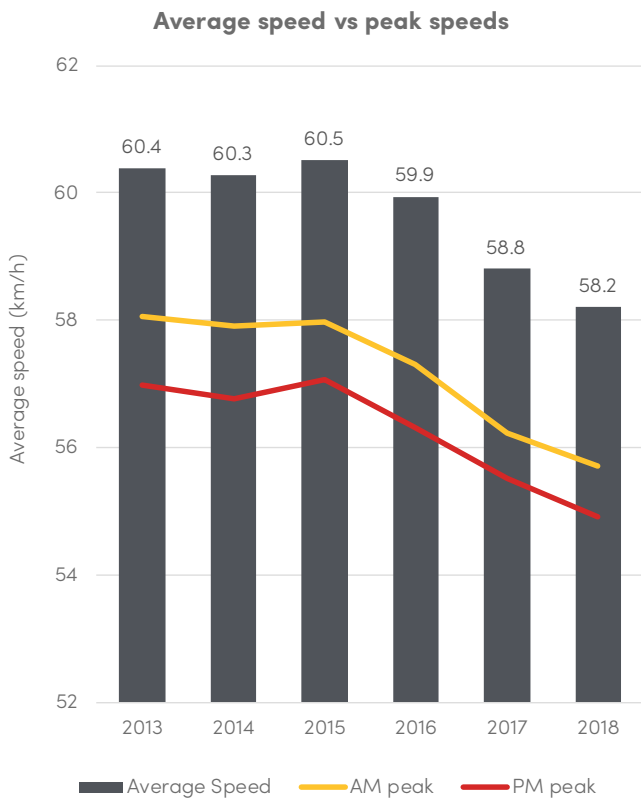
Congestion

The measurement for congestion, percentage of free flow (POFF) speeds, improved in 2015, reaching 93.1 per cent. But it has steadily declined since then, falling to 92.5 per cent in 2018.

Sydney is Australia's most congested city when average speeds are compared to free flow speeds.

The alternative measurement for congestion, the percentage of posted speed limit (POSL) has similarly declined from 2015-2018.

Under this metric, Sydney is the third most congested city (77.3 per cent) after Melbourne and Adelaide.



Melbourne

1 January 2013 to 30 June 2018



PERCENTAGE CHANGE
IN AVERAGE SPEEDS

▼ 8.1%



TRAVEL TIME LOSS/
GAIN FOR 5KM TRIP

▲ 24.4^{SEC}



PERCENTAGE CHANGE
IN VARIABILITY

▲ 0.6%

Average speeds

Melbourne's average speeds barely changed from 2013 to 2015, but there has been a marked decline since 2016. The city's 8.1 per cent fall in average speeds is the worst decline among all capitals.

Peak periods (AM/PM peak) also show similar trends to average speeds. Melbourne has the third-slowest average speeds over peak periods.

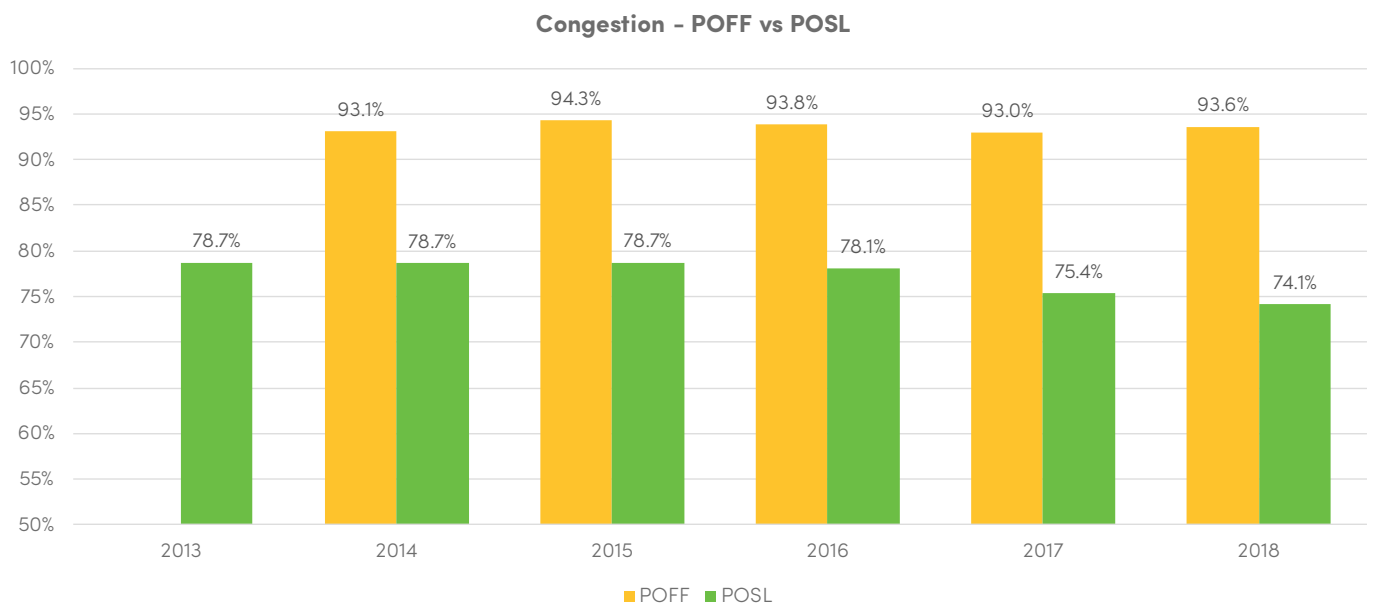
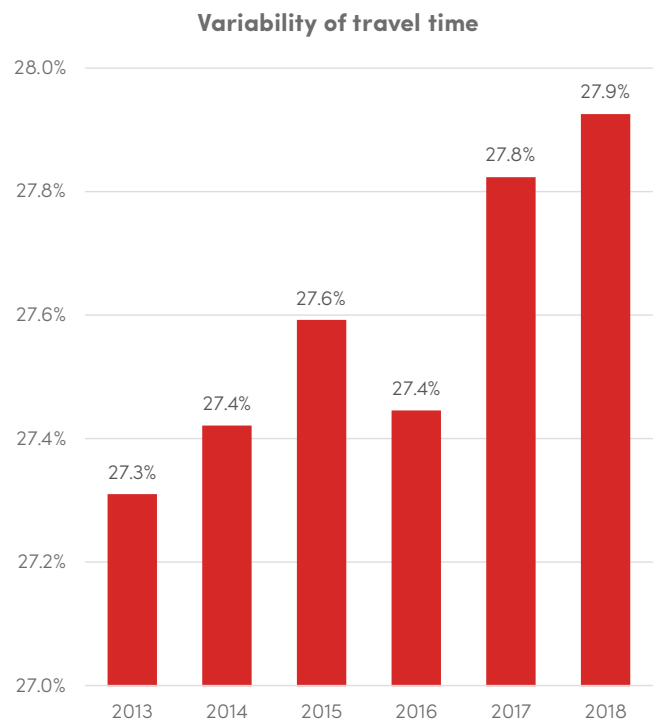
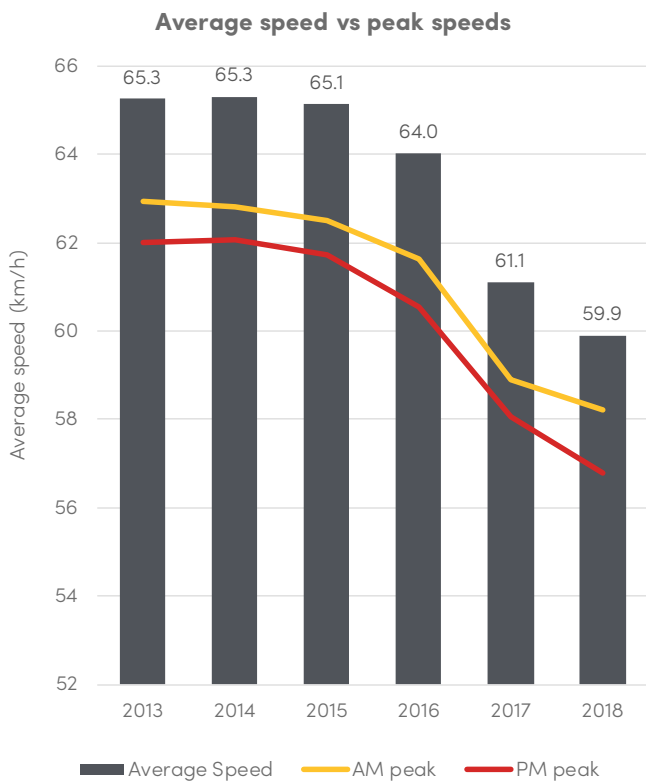
Variability

As variability (measured as the coefficient of variation of speed) increases, reliability deteriorates. Melbourne's reliability has been declining over time. In 2018, Melbourne recorded the worst road variability results among all other capital cities.

Congestion

When looking at the metrics for congestion (the Percentage of Free Flow (POFF) and Percentage of Speed Limit (POSL)) the results are more variable. When average speeds are compared against free flow speeds (the POFF metric), 2018 saw an improvement in congestion. But when average speeds are compared against posted speed limits (the POSL metric), congestion increased in 2018 compared to 2017. This difference in results between the two congestion metrics is because Melbourne's free flow speeds declined by 3.8 per cent from 2017 to 2018.

Melbourne is the most congested capital city under the POSL metric and the second most congested under the POFF metric.



Brisbane

1 January 2013 to 30 June 2018



PERCENTAGE CHANGE
IN AVERAGE SPEEDS

▼ **3.7%**



TRAVEL TIME LOSS/
GAIN FOR 5KM TRIP

▲ **9.4^{SEC}**



PERCENTAGE CHANGE
IN VARIABILITY

▲ **1.2%**

Average speeds

Average speed (km/h) remained relatively static in Brisbane until 2016. Since then average speeds have steadily declined. Average speed decreased by a total of 3.7 per cent between 2013-2018.

Peak AM and PM speeds in Brisbane have declined since 2015.

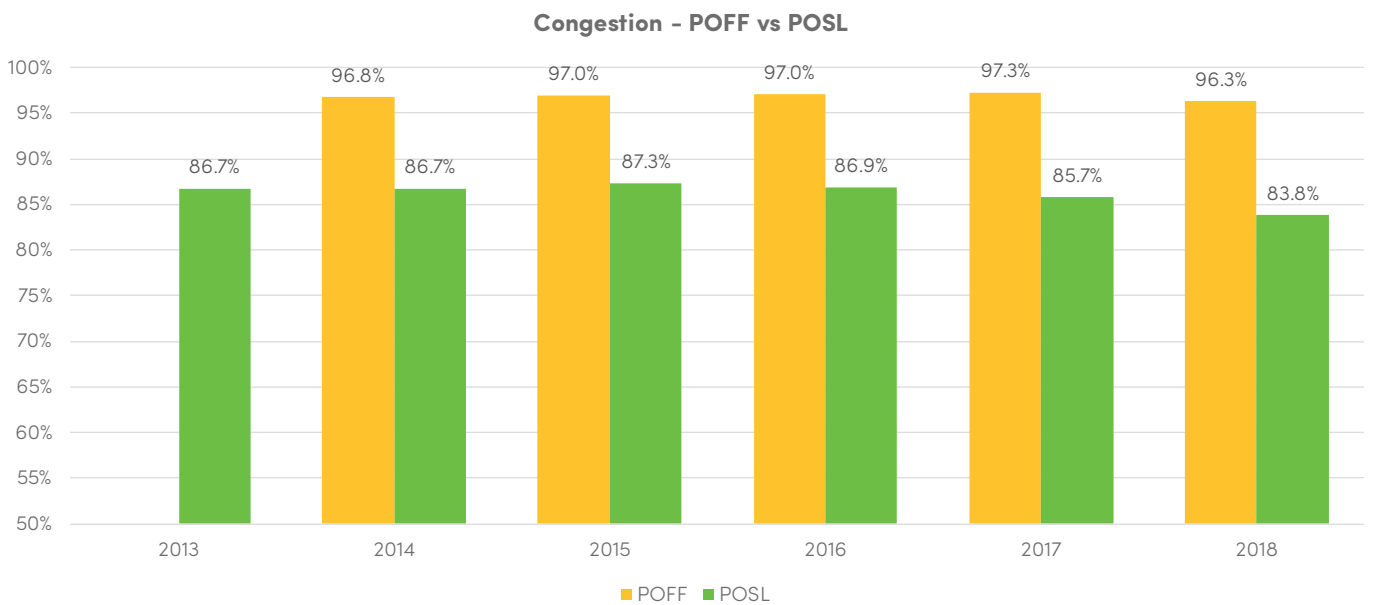
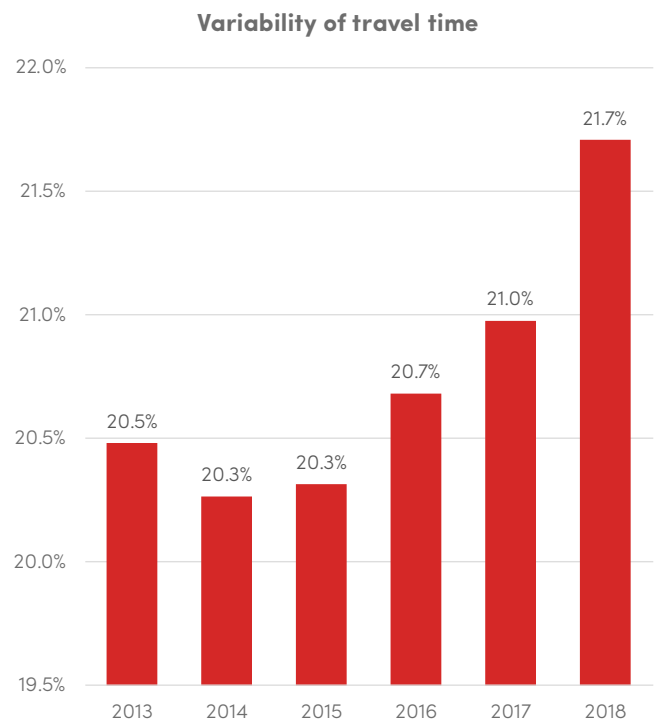
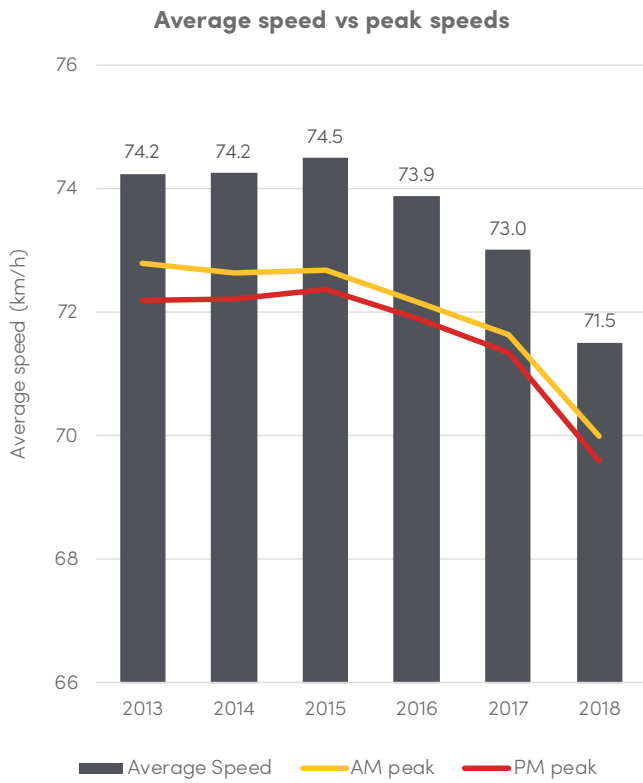
Variability

As variability (measured as the coefficient of variation of speed) increases, reliability deteriorates. Brisbane's reliability has been steadily declining. Brisbane's variability has worsened by a greater percentage than any other capital city.

Congestion

Brisbane's percentage of free flow (POFF) speeds improved from 2014 to 2017, but declined significantly in 2018.

The alternative measurement for congestion, the percentage of posted speed limit (POSL) remained relatively stable between 2013-2016, but declined to 83.8 per cent in 2018.



Canberra

1 January 2013 to 30 June 2018



PERCENTAGE CHANGE
IN AVERAGE SPEEDS

▲ 1.0%



TRAVEL TIME LOSS/
GAIN FOR 5KM TRIP

▲ 2.8^{SEC}



PERCENTAGE CHANGE
IN VARIABILITY

▼ 0.9%

Average speeds

Average speed (km/h) in Canberra improved until 2016, after which it gradually declined. Average speed fell by 1 per cent over the period 2013 to 2018. Canberra has relatively fast average speeds compared to other cities; it is the third fastest under this metric.

Peak AM/PM speeds have declined since 2016 and this decline became much sharper in 2018.

Canberra tends to perform worse in the AM peak than in the PM peak period.

Variability

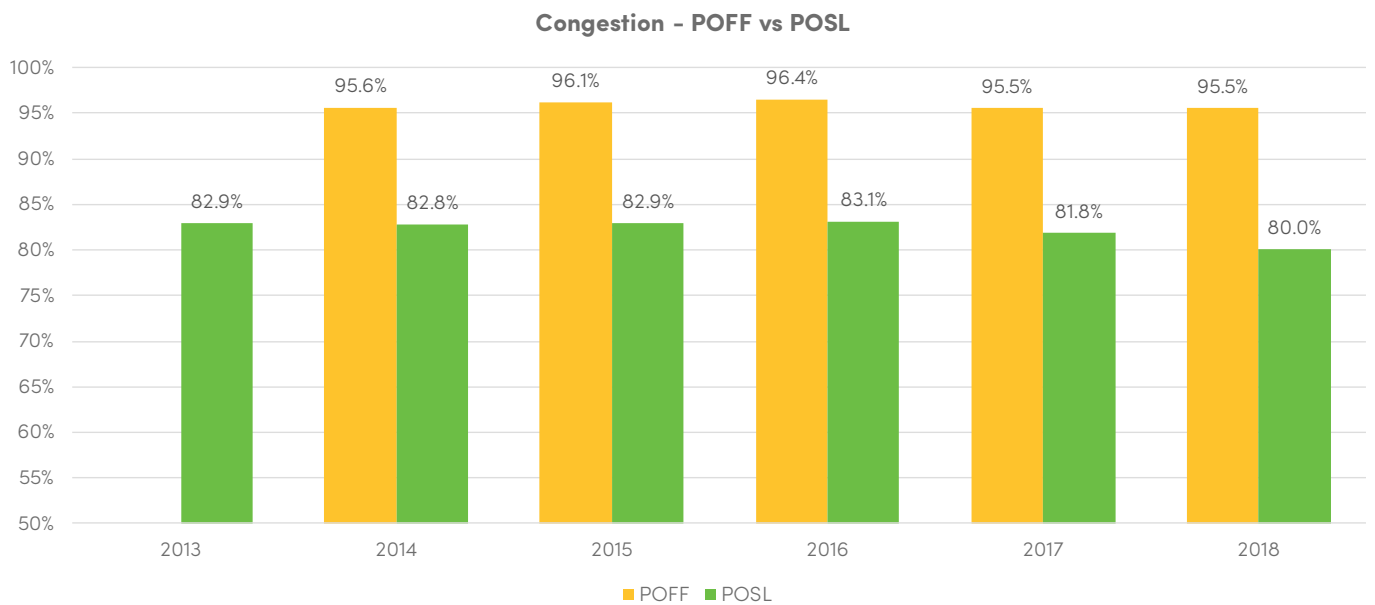
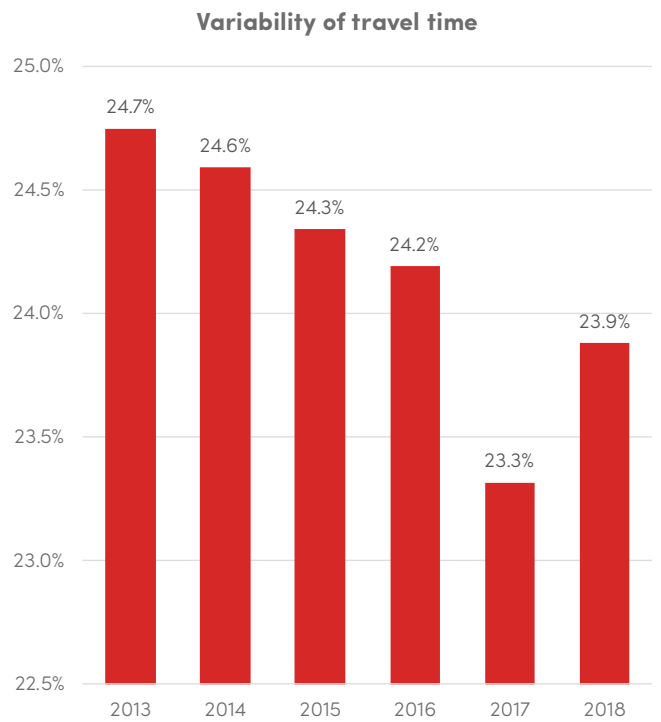
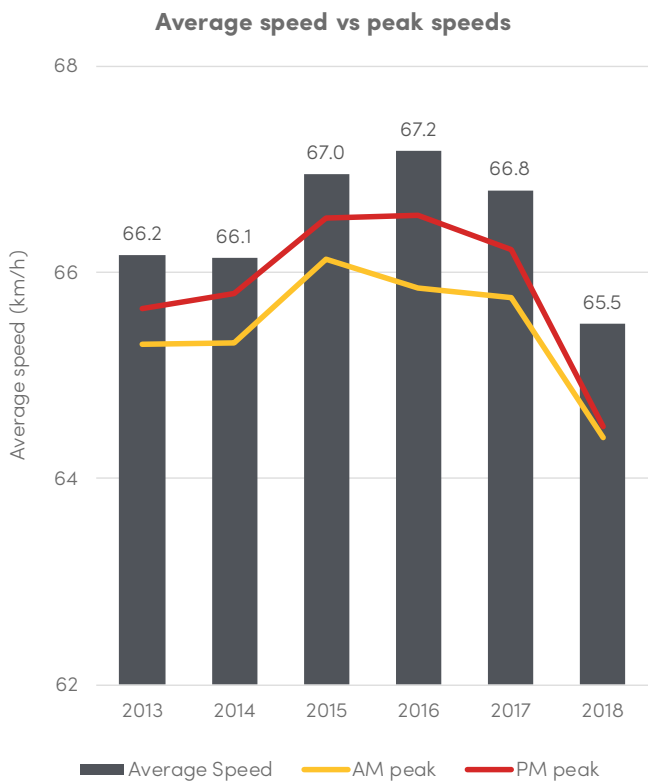
As variability (measured as the coefficient of variation of speed) increases, reliability deteriorates. Canberra's reliability has been increasing over time, but deteriorated slightly in 2018. Canberra has the fourth-least variable road network among Australian capitals.

Congestion

The measurement for congestion, percentage of Free Flow (POFF) speeds, has deteriorated significantly since 2016.

Despite this, Canberra is Australia's third-least congested city (behind Brisbane and Darwin) when POFF speed is considered (95.5 per cent).

The alternative measurement for congestion, percentage of posted speed limit (POSL) has remained relatively static until 2016. Since then, there has been a considerable decline in POSL. As with POFF speeds, Canberra performs relatively well compared to other capital cities, ranking fifth.



Adelaide

1 January 2013 to 30 June 2018



PERCENTAGE CHANGE
IN AVERAGE SPEEDS

▼ 2.5%



TRAVEL TIME LOSS/
GAIN FOR 5KM TRIP

▲ 8.9^{SEC}



PERCENTAGE CHANGE
IN VARIABILITY

▼ 0.9%

Average speeds

Average speed (km/h) improved slightly from 2013 to 2015, but has declined since then. It has decreased by a total 2.5 per cent from 2013-2018.

AM/PM peak speeds have declined since 2015. Adelaide performs worse on congestion during the PM peak compared to AM peak periods.

Adelaide has the slowest peak speeds among all capital cities - about 53.5 km/h.

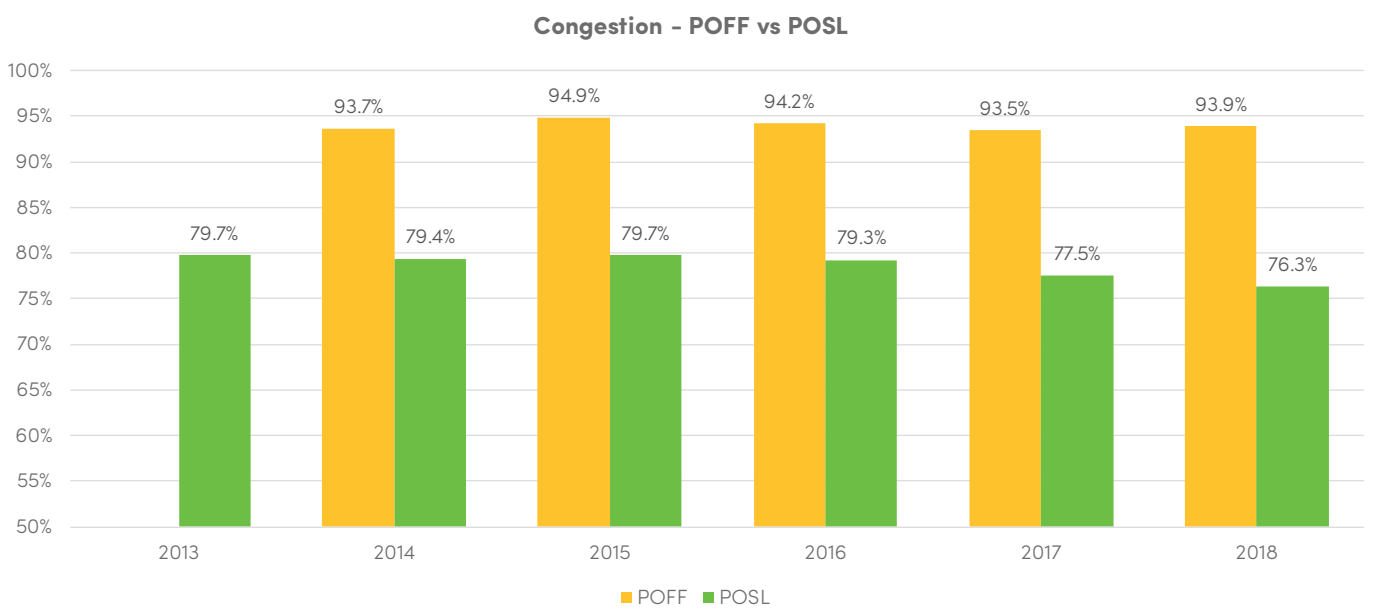
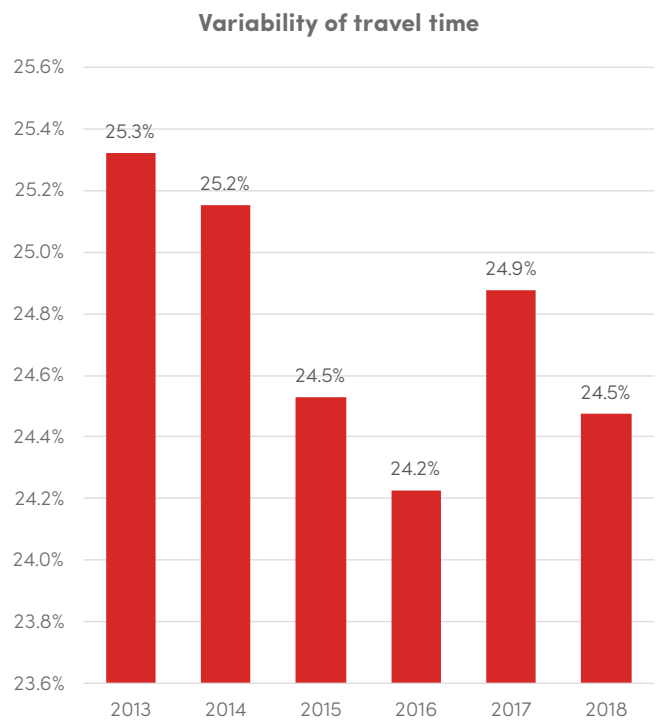
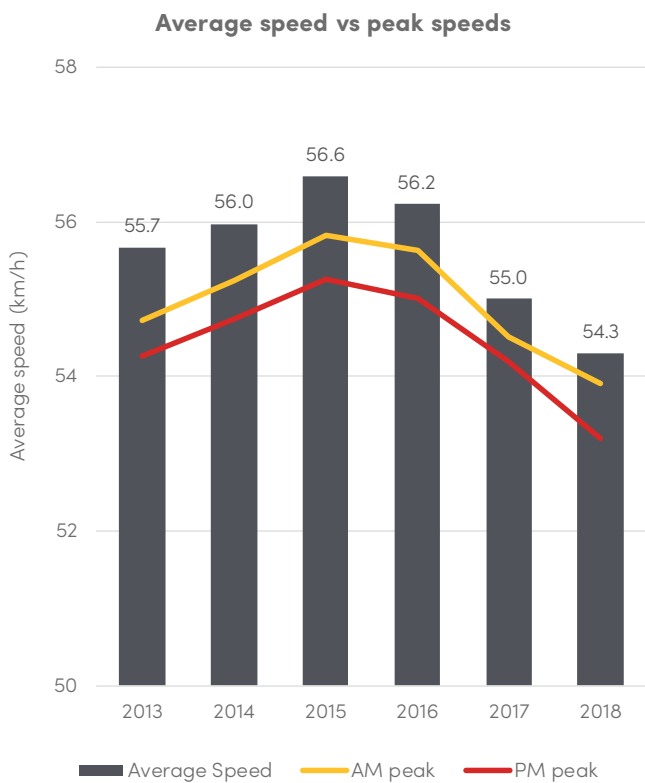
Variability

As variability (measured as the coefficient of variation of speed) increases, reliability deteriorates. Adelaide's reliability improved from 2013 to 2016, but deteriorated slightly in 2017. Compared to other capital cities, Adelaide has third most variable network, behind Melbourne and Sydney.

Congestion

The measurement for congestion, percentage of free flow (POFF) speeds decreased until 2017. A small improvement was noted in 2018. Adelaide is the third most congested city under this metric behind Sydney and Melbourne.

The alternative measurement for congestion, percentage of posted speed limit (POSL) remained largely stagnant until 2016, but has declined significantly over the last two years. Under this metric, Adelaide is the second most congested city after Melbourne and is slightly worse than Sydney.



Perth

1 January 2013 to 30 June 2018



PERCENTAGE CHANGE
IN AVERAGE SPEEDS

▼ 1.1%



TRAVEL TIME LOSS/
GAIN FOR 5KM TRIP

▲ 3.1^{SEC}



PERCENTAGE CHANGE
IN VARIABILITY

▼ 1.0%

Average speeds

Average speeds in Perth improved in 2016 but have deteriorated in 2017 and 2018. Perth has the fourth slowest average speeds among all capital cities - 61.7 km/h.

AM/PM peak speeds during the same time period show a similar trend. Until recently, Perth's AM peak congestion was worse than during the PM peak, but in 2018 AM peak speeds improved while PM peak speeds declined.

Perth has the fourth slowest peak speeds - about 60.3 km/h.

Variability

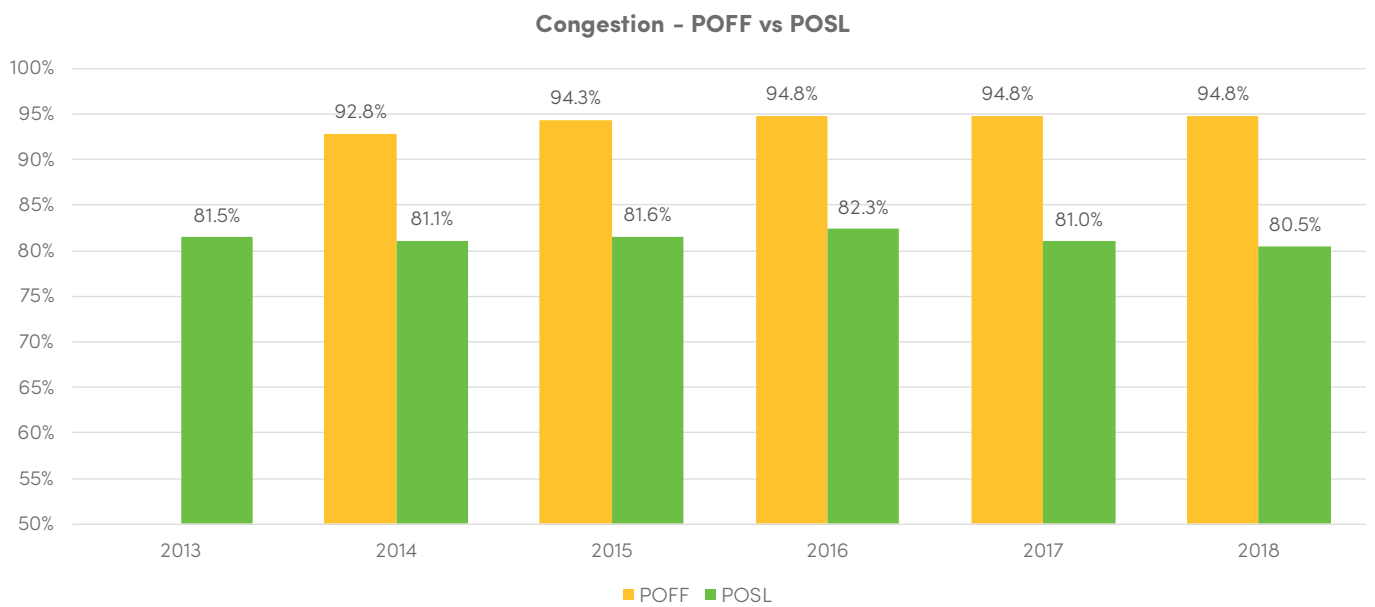
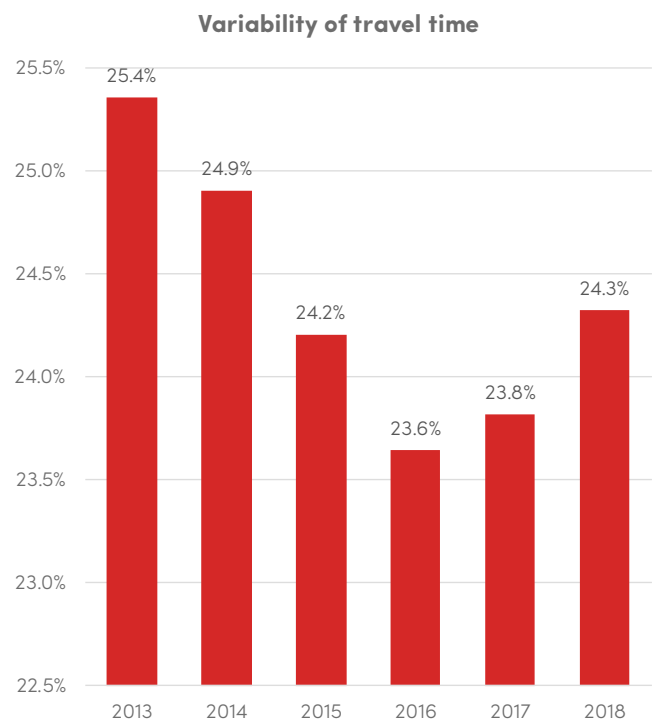
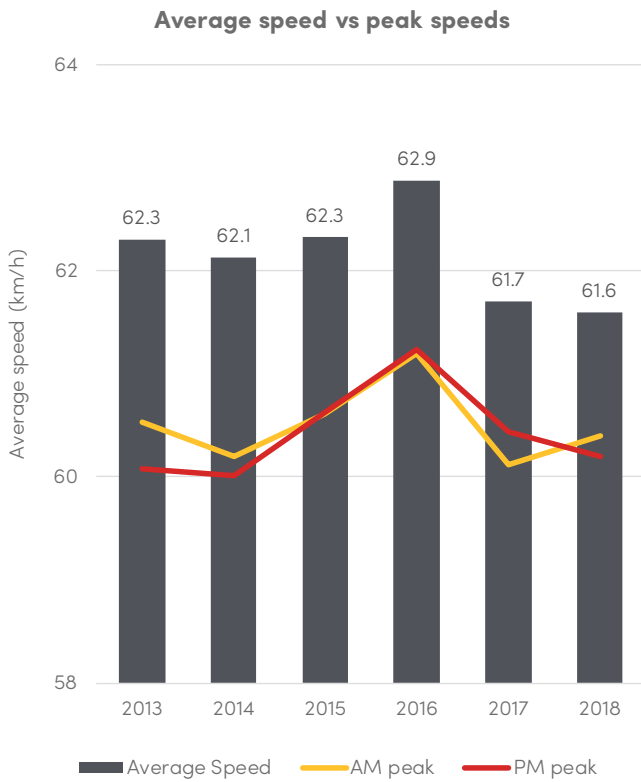
As variability (measured as the coefficient of variation of speed) increases, reliability deteriorates. Perth's reliability improved from 2013 to 2016 but has deteriorated since then. Perth has the fourth most

variable network (Melbourne, Sydney and Adelaide have worse results).

Congestion

The measurement for congestion, percentage of free flow (POFF) speeds has increased over the last four years, meaning that congestion has improved. Compared to other capital cities, Perth ranks favourably under this metric.

The alternative measurement for congestion, percentage of posted speed limit (POSL), increased in 2016, but has declined significantly over the last two years. Under this metric, Perth ranks close to the national average.



Hobart

1 January 2013 to 30 June 2018



PERCENTAGE CHANGE
IN AVERAGE SPEEDS

▼ 0.1%



TRAVEL TIME LOSS/
GAIN FOR 5KM TRIP

▲ 0.2^{SEC}



PERCENTAGE CHANGE
IN VARIABILITY

▼ 1.9%

Average speeds

Hobart's average speed (km/h) fluctuated from 2013 to 2018. Average speeds significantly declined in 2015, improved in 2016 and 2017, and declined again in 2018.

AM/PM peak speeds during the same time period show a similar trend.

From 2013 to 2017 Hobart performed worse during PM peak compared to AM peak periods, but this shifted from 2018 as AM peak performed worse.

Hobart has the third fastest capital city peak speeds - 65 km/h.

Variability

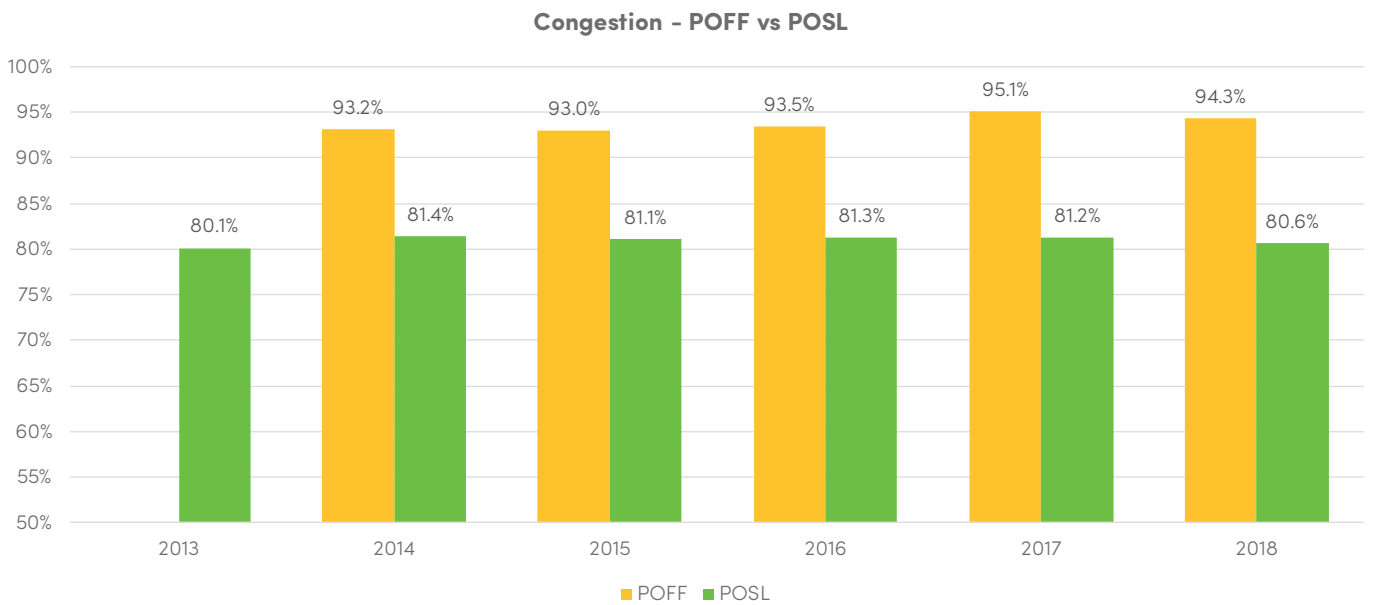
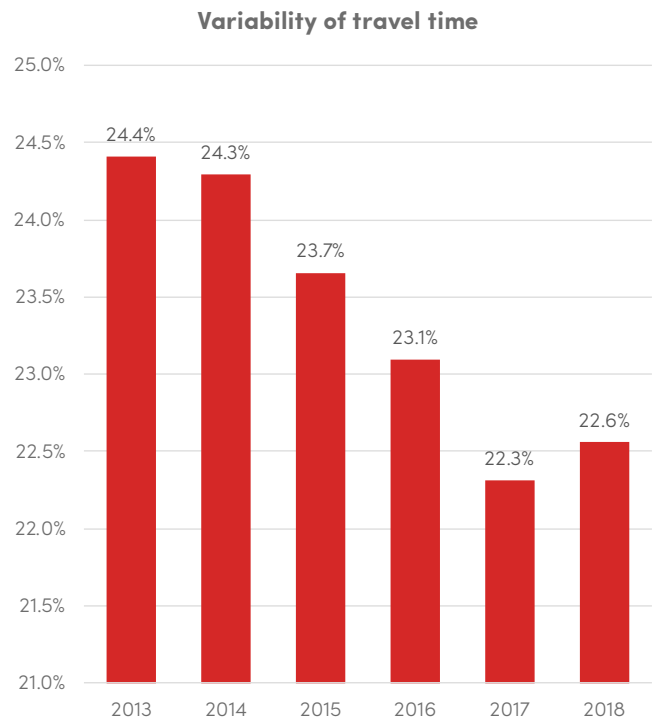
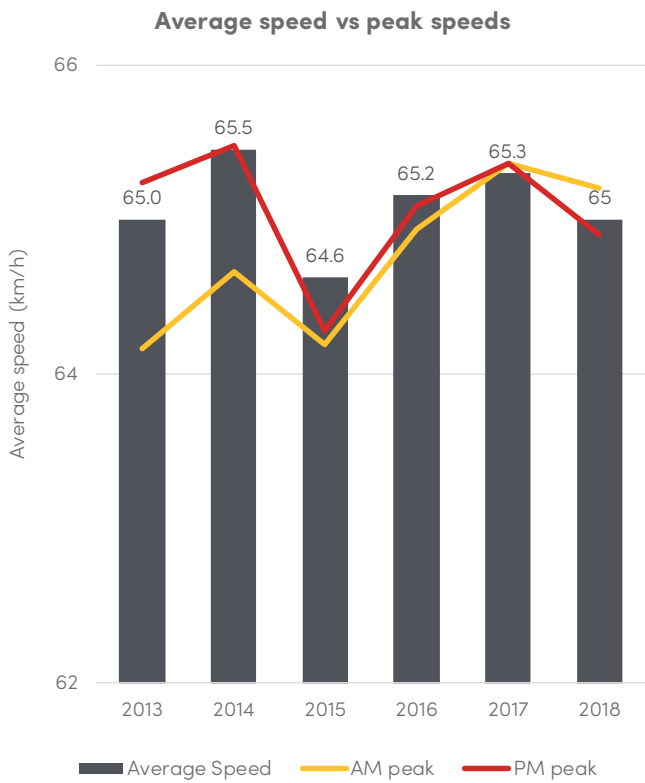
As variability (measured as the coefficient of variation of speed) increases, reliability deteriorates. However, a reliable network may still be predictably congested. Hobart's reliability has improved over time, but there has been a slight deterioration in 2018. Despite this, Hobart's road network is the third least variable among all capital cities.

Congestion

The measurement for congestion, percentage of free flow (POFF) speeds, increased over the first three years of the reference period, but decreased in 2018. Compared to other capital cities, Hobart is the fourth most congested city after Melbourne, Sydney and Adelaide.

The alternative measurement for congestion, percentage of posted speed limit (POSL), improved significantly from 2013 to 2014, remained relatively stable for several years, and then deteriorated in 2018. Hobart's POSL rating increased over the reference period, indicating that congestion had decreased slightly.

Under this metric, Hobart is the second least congested city. People in Hobart are more likely to drive closer to the posted speed limit than other cities, but they are less likely to achieve free flow speeds as found when analysing the alternative congestion metric (POFF).



Darwin

1 January 2013 to 30 June 2018



PERCENTAGE CHANGE
IN AVERAGE SPEEDS

▲ 5.1%



TRAVEL TIME LOSS/
GAIN FOR 5KM TRIP

▼ 12.8^{SEC}



PERCENTAGE CHANGE
IN VARIABILITY

▼ 1.9%

Average speeds

Darwin's average speeds have improved year on year over the reference period. Darwin now has the fastest average speeds compared to all other capital cities, recently overtaking Brisbane.

AM/PM peak speeds have improved over the reference period. Darwin performs worse on congestion during AM peak compared to PM peak periods.

Darwin has the fastest AM/PM peak speeds when compared to all other capital cities at 72.7 km/h.

Variability

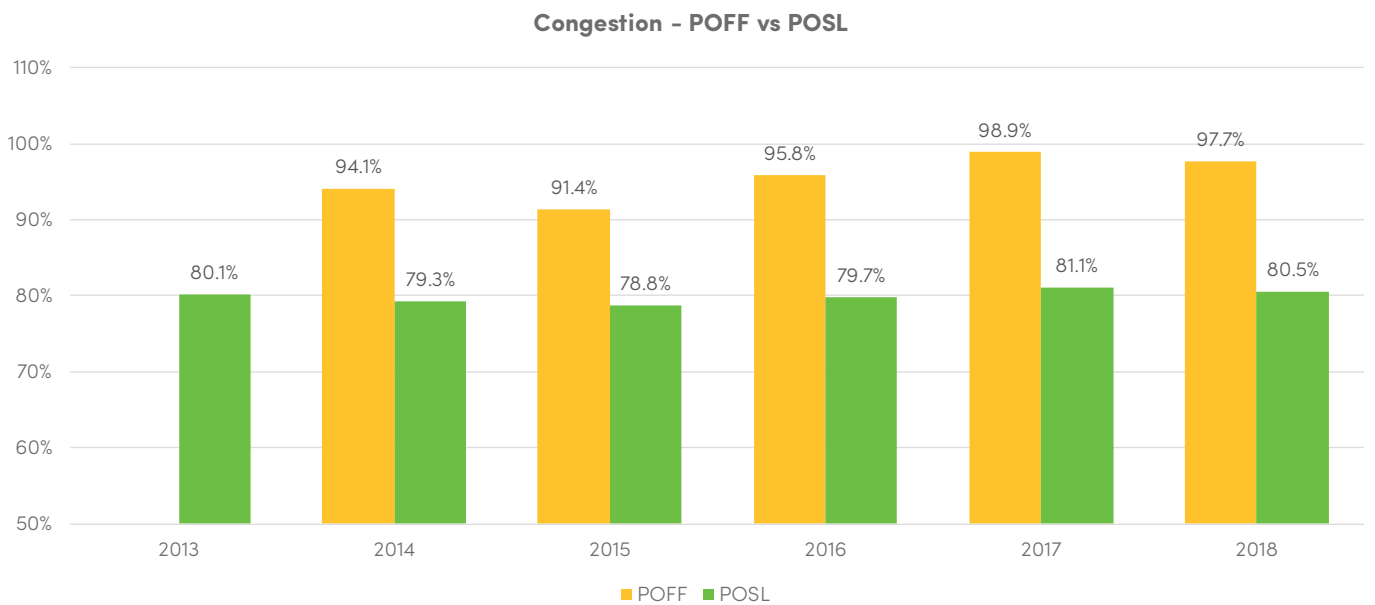
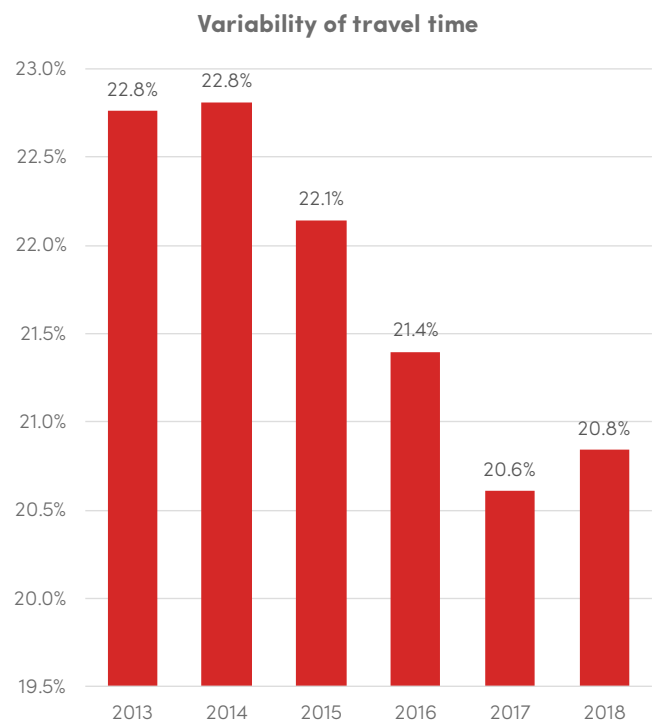
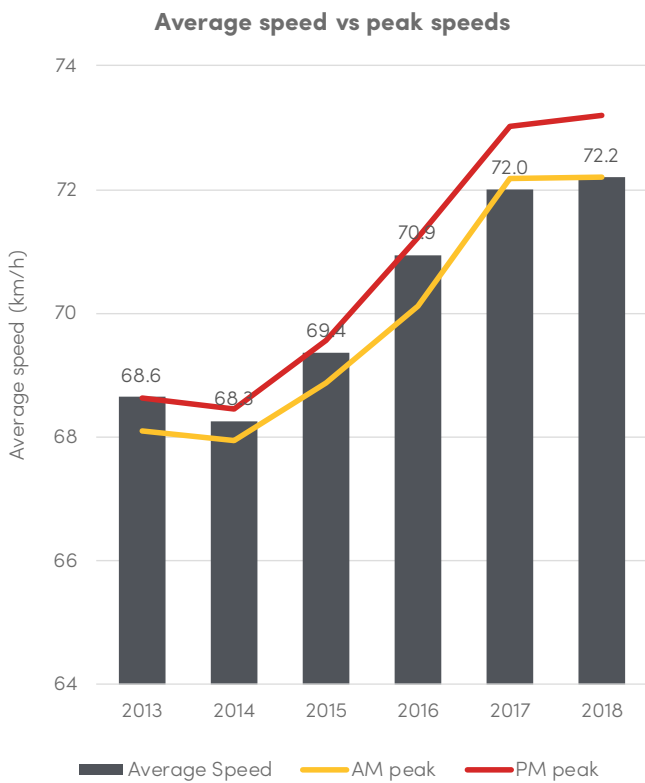
As variability (measured as the coefficient of variation of speed) increases, reliability deteriorates. Darwin's reliability has improved significantly over the reference period, but there has been a slight deterioration in 2018. Despite this, Darwin has the least variable capital city road network.

Congestion

The measurement for congestion, percentage of free flow (POFF) speeds has increased over the first three years of the reference period, but decreased in 2018. Under this metric, Darwin is Australia's least congested city.

Darwin's rating under the alternative measurement for congestion - percentage of posted speed limit (POSL) - decreased over the first three years of the reference period, increased in 2016 and 2017, and then declined again in 2018. Over the reference period, it increased slightly.

Under this metric, Darwin ranks equal third, performing worse than the POFF congestion metric. This may mean network constraints make it difficult to drive to the posted speed limit.



Section four

Case study journeys

Overview

The capital city results are designed to give policymakers an understanding of how city networks are performing overall, but users of the road network are well aware that some routes are more congested than others.

In this section of the report several 'case studies' routes have been selected to track over time. The results track road performance from 1 January 2013 to 30 June 2018.

These routes do not form the basis of the high level results for each capital city but are designed to give road users additional detail about routes they may use on a regular basis.

The routes are broadly based on net migration flows drawn from journey to work data and intend to capture major transit routes in each capital city.¹

Some variations to the migration flows identified in the journey to work data have been used to ensure a range of transit routes are covered.

Airport routes are also analysed because these routes are likely to directly affect the productivity of a city as they often form 'pinch points' in the road network. Unreliable travel to airports compromises access to key markets and restricts economic growth.

Airport routes

Average speeds

Speeds on capital city airports decreased by about 6.1 percent on average since 2013. Perth was the only city that recorded an improvement in average speeds over the reference period.

Average speeds between the Melbourne CBD and Tullamarine Airport have declined significantly since 2013 - far more than on any other route. In fact, average speeds are deteriorating more than three times faster than another other route to an airport from the CBD.

Variability

Most airport routes were more unreliable than capital city averages. The drive between Tullamarine Airport and Melbourne CBD was the most variable route - at 40.1 per cent - making it less reliable than any other route in Australia. The Brisbane, Hobart, and Adelaide airport routes were also unreliable. The most reliable airport route was between Canberra Airport and Civic, closely followed by the Darwin route.

Congestion

On the POFF metric, the Brisbane CBD to airport route was the most congested, followed by the Melbourne and Adelaide airport routes. Canberra, Darwin, and Sydney had the least congested airport routes.

Airport route details

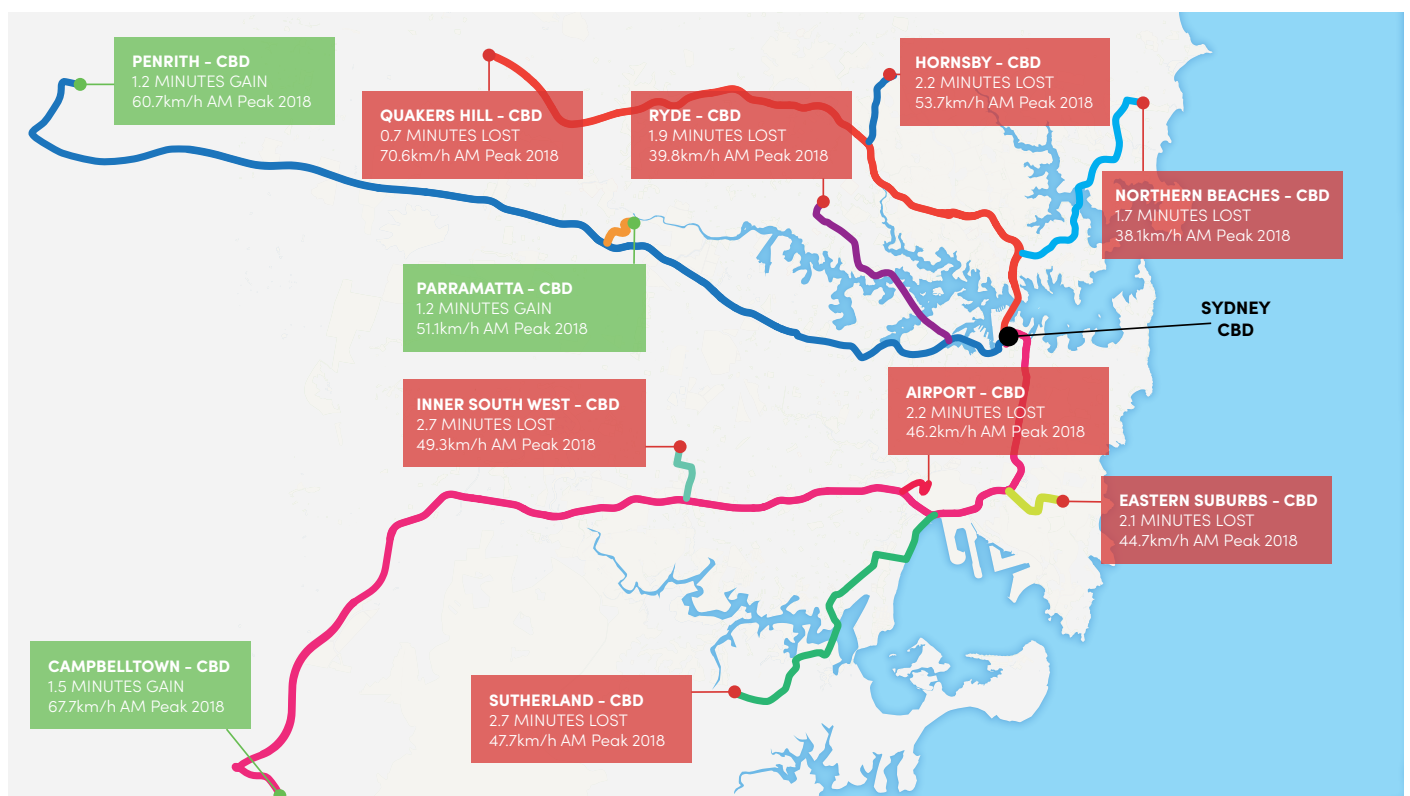
City	avg. Speed (km/h)	avg. AM peak speed (km/h)	avg. PM peak speed (km/h)	POFF	Variability	Total percentage change in average speed 2013-2018	Travel time loss/gain for 5km trip (mins) 2013-2018
Sydney	53.6	46.3	51.3	97.7%	28.5%	-5.9%	+1.1
Melbourne	53.0	51.1	52.2	85.9%	40.1%	-19.7%	+5.1
Brisbane	44.7	43.3	44.9	84.6%	33.4%	-3.2%	+0.7
Canberra	56.4	55.5	54.5	102.8%	23.3%	-4.8%	+0.5
Adelaide	37.3	35.9	36.0	86.1%	30.4%	-4.8%	+0.5
Perth	56.9	53.7	54.7	96.0%	28.0%	0.9%	-0.1
Hobart	60.7	58.5	60.4	87.8%	30.5%	-3.6%	+0.7
Darwin	54.3	53.6	53.7	98.4%	24.5%	-4.8%	+0.6

¹ Journey to work in Australia: accessed at: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2071.0.55.001~2016~Main%20Features~Feature%20Article:%20Journey%20to%20Work%20in%20Australia~40>

Sydney

Sydneysiders travelling to the CBD via Inner South West or the Sutherland routes lost an average 2.7 minutes during the AM peak period.

In contrast, people living in Penrith, Parramatta and Campbelltown gained an additional 1.2 to 1.5 minutes when travelling to the CBD in the AM peak period.



Sydney case study routes - 1 January 2013 - 30 June 2018

Melbourne

The Dandenong route to the Melbourne CBD has had the greatest increase to average trip times, adding an additional 3.7 minutes to the trip. Ormond to the Melbourne CBD and Melbourne airport to the CBD also had an additional 3.5 minutes added to the trip due to deteriorating road performance.

Routes from Ravenhall and Hoppers Crossing to the Melbourne CBD, from Kew to Parkville and from Bundoora to Nunawading also had slower trip times over the reference period. No routes analysed had an improvement in travel time.

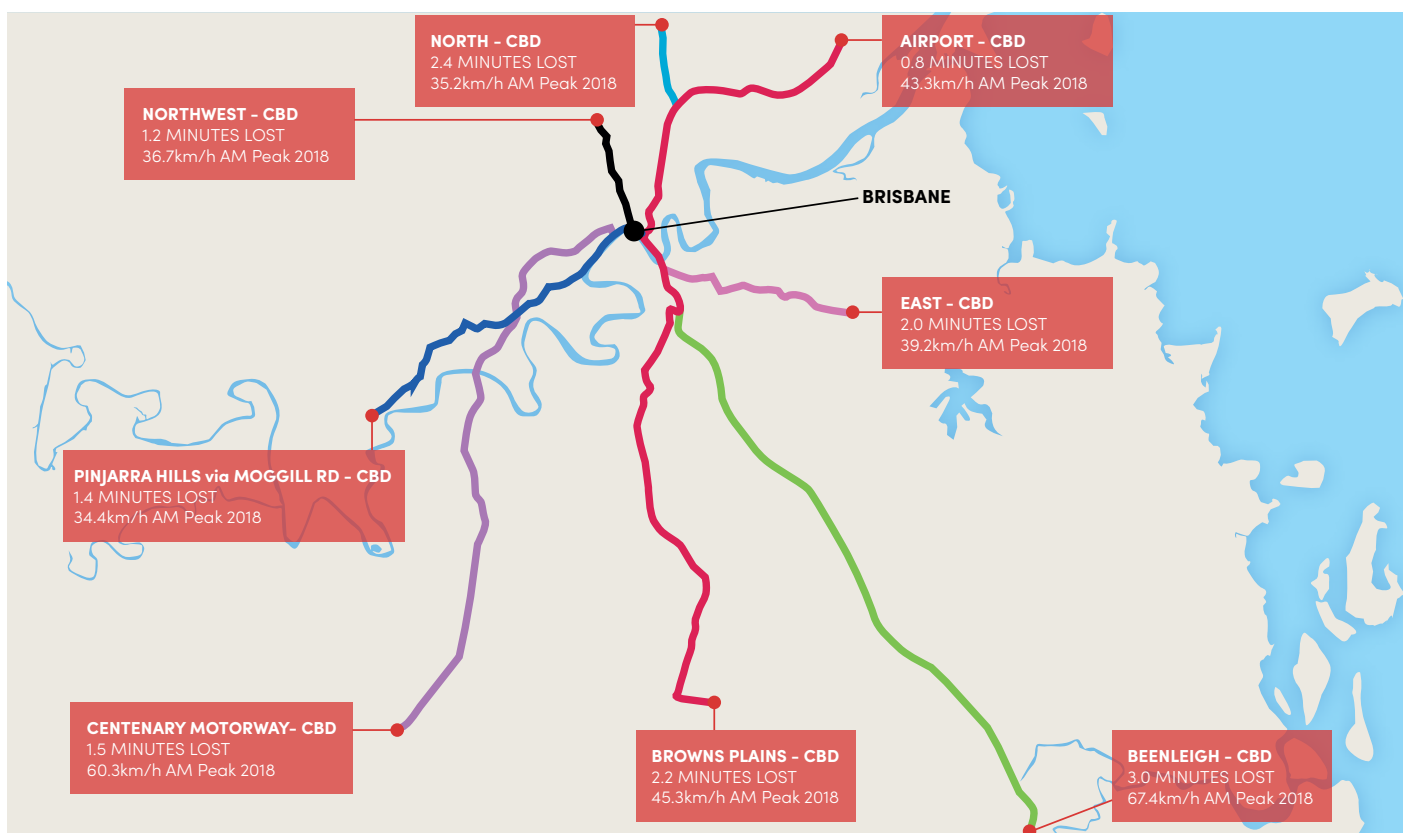


Melbourne case study routes - 1 January 2013 - 30 June 2018

Brisbane

The Beenleigh-CBD route was among Brisbane's most congested routes, with an average 3.0 minutes lost in the AM peak from 2013-2018. Similarly, motorists travelling from North to CBD or Brown Plains to CBD lost between 2.4 to 2.2 minutes in AM peak periods.

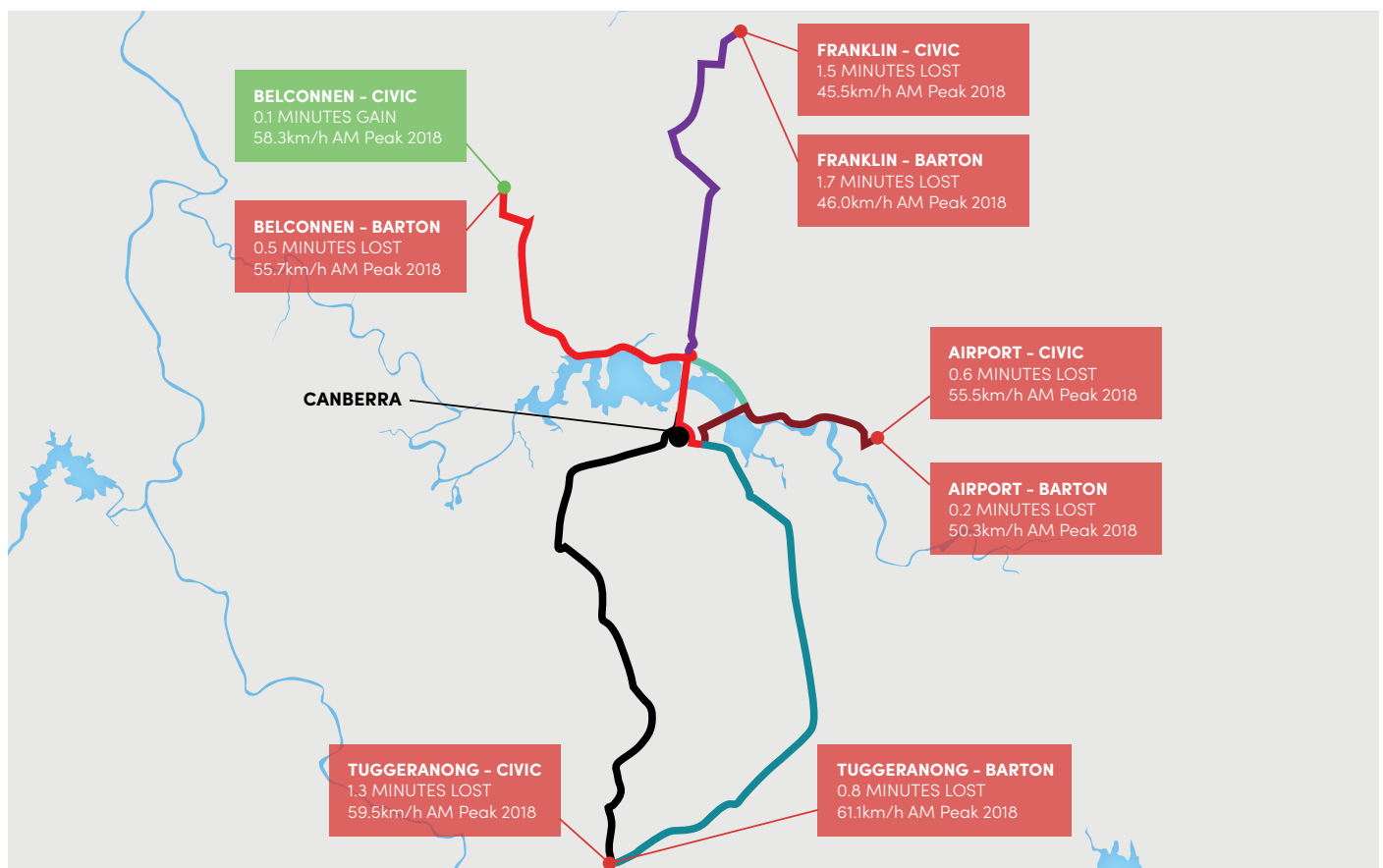
In contrast to most other cities, no travel-time gains were reported for any of the major routes selected in Brisbane from 2013-2018.



Brisbane case study routes – 1 January 2013 - 30 June 2018

Canberra

Canberrans travelling on the Franklin-Barton route lost 1.7 minutes on average, but people travelling from Belconnen to Civic gained 0.1 minutes during AM peak periods.

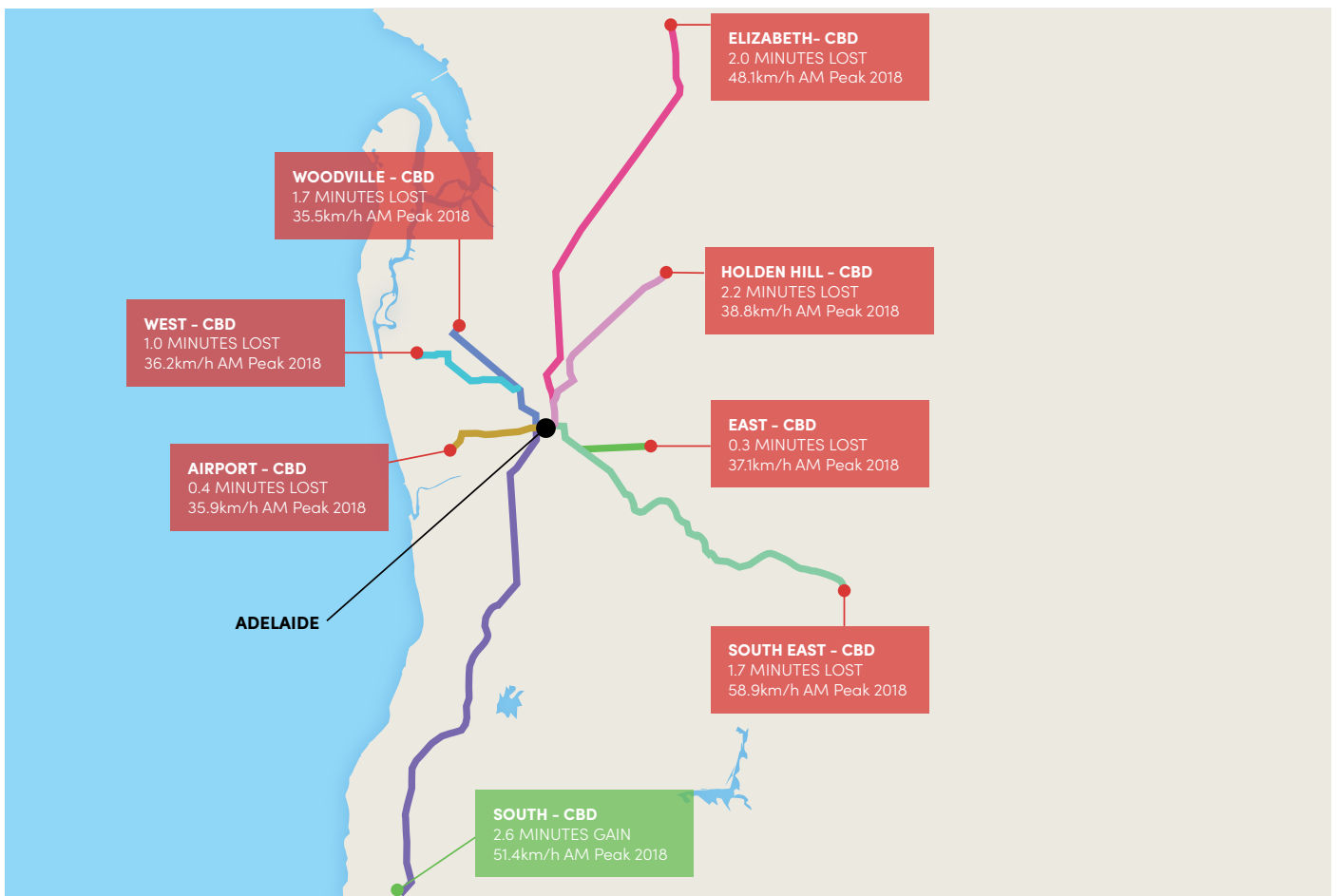


Canberra case study routes – 1 January 2013 - 30 June 2018

Adelaide

Travel-time losses were the greatest for the Holden Hill-CBD route (2.2 minutes lost) between 2013-2018.

In contrast, people travelling on the South-CBD route gained an average of 2.6 minutes in AM peak periods from 2013-2018.

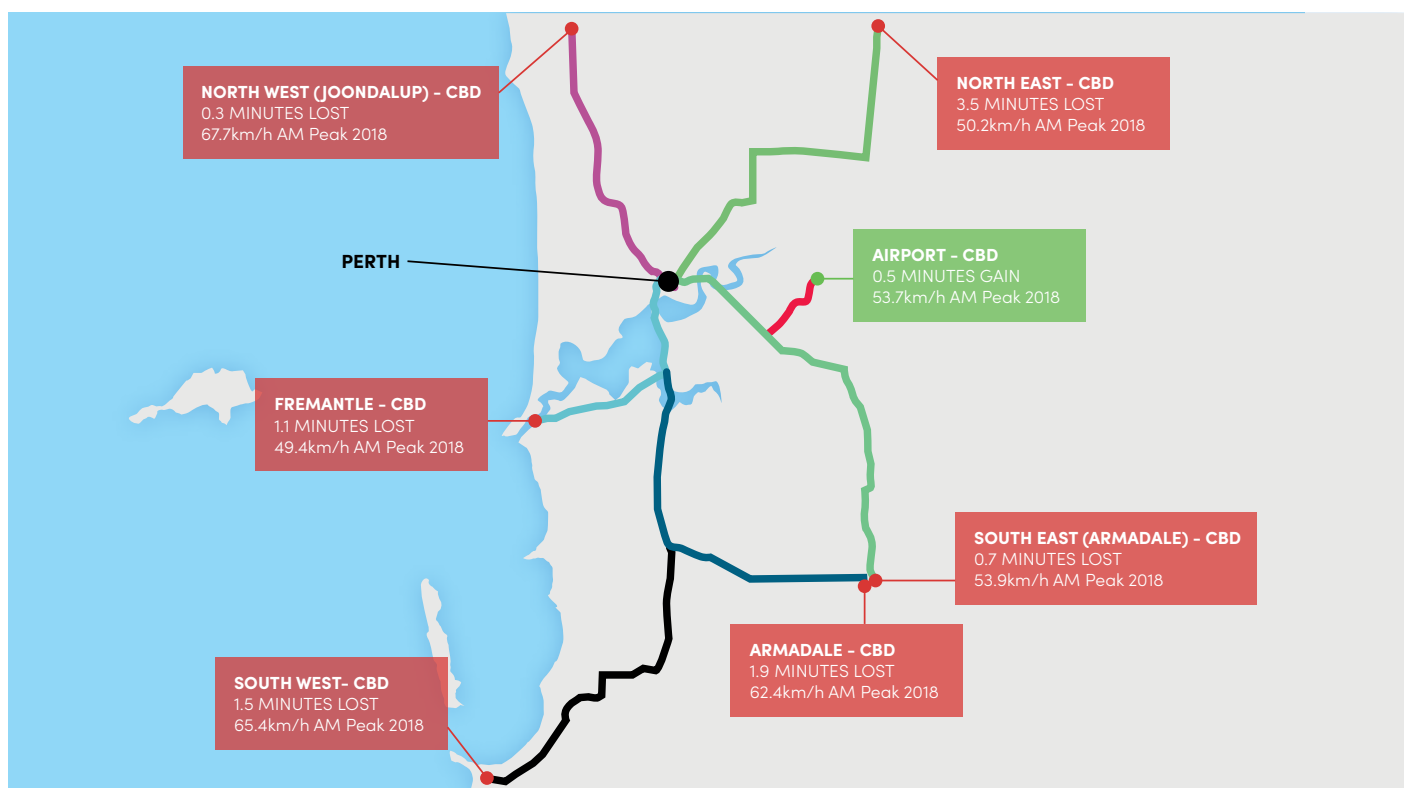


Adelaide case study routes – 1 January 2013 - 30 June 2018

Perth

The North East to the CBD route had the worst deterioration in trip time - 3.5 minutes. The second largest decline was in the Armadale to CBD route - 1.9 minutes lost.

The Airport to CBD route was the only route that improved - a 0.5 minute gain.

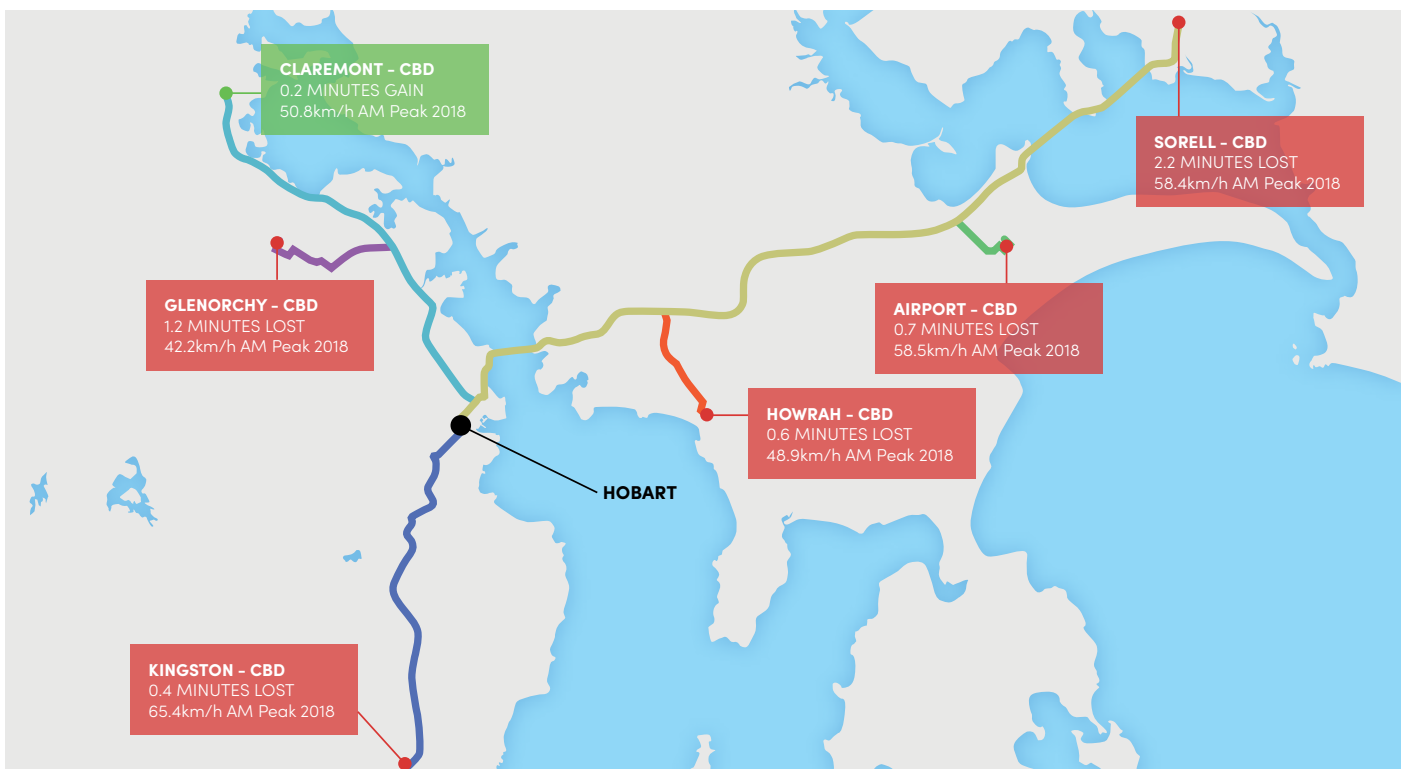


Perth case study routes - 1 January 2013 - 30 June 2018

Hobart

The Sorell to Hobart CBD route had the greatest increase in travel time - motorists lost an average of 2.2 minutes in AM peak time. People using the Glenorchy to Hobart CBD route lost an average 1.2 minutes.

Among the selected routes, only Claremont to Hobart CBD reported a travel time gain - 0.2 minutes.

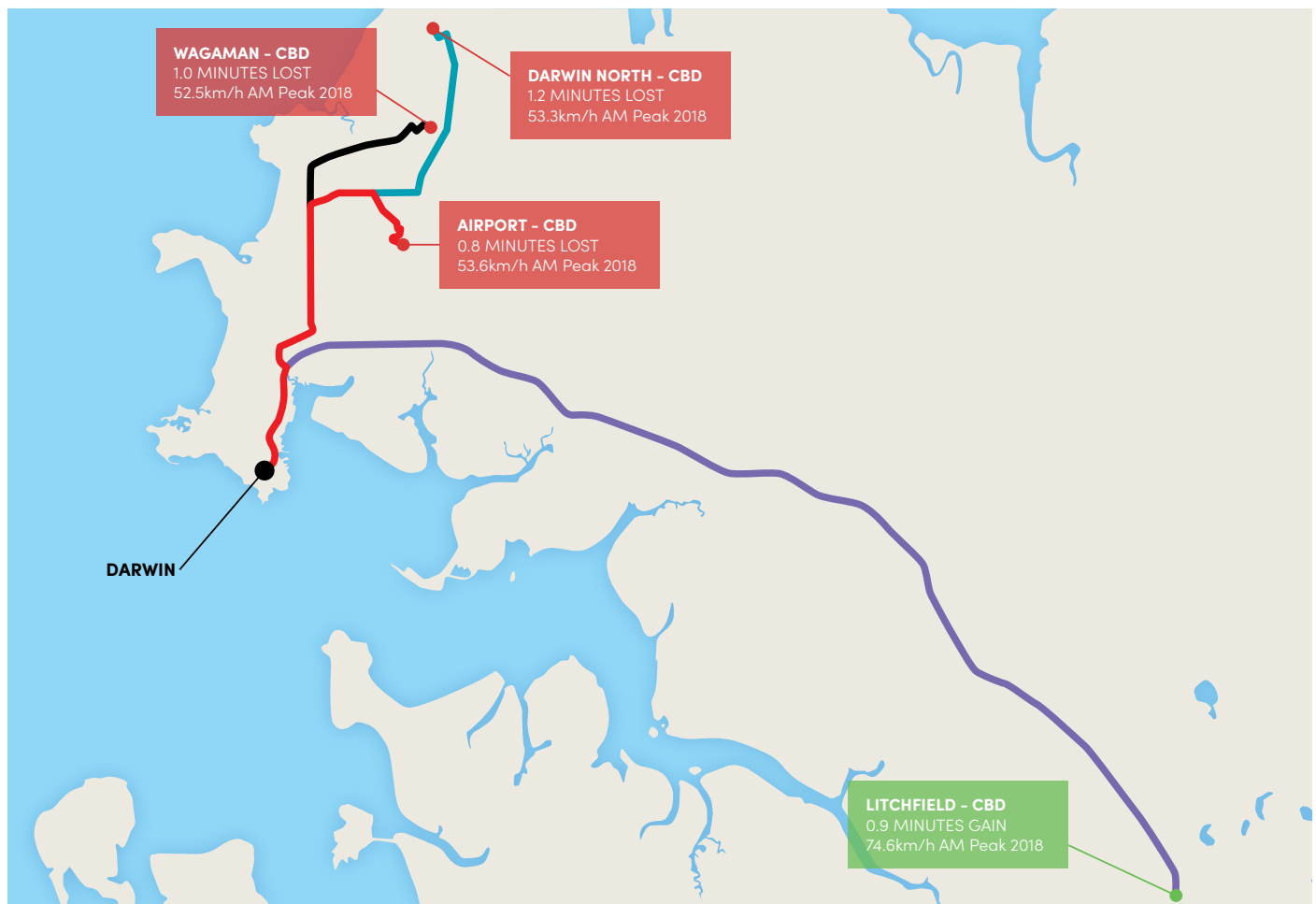


Hobart case study routes – 1 January 2013 - 30 June 2018

Darwin

The Darwin North to CBD route had the worst increase in travel time - an average 1.2 minutes lost in AM peak periods from 2013 to 2018. The Wagaman to CBD route also had a slower travel time, with an average 1.0 minute added to the trip.

But the Litchfield to CBD route had a quicker travel time, with motorists gaining an additional 0.9 minutes on average.



Darwin case study routes - 1 January 2013 - 30 June 2018

Section five

About the data

The measures of road performance set out in this report were developed by HoustonKemp using speed data provided by HERE Technologies.

The data is collected from GPS probes, which provide information on speed and the speed distribution for road segments across Australia since 1 January 2013. The data is updated daily.

HERE uses information collected from a variety of devices, including: vehicle sensor data, smartphones, portable navigation devices, road sensors and connected cars.

The HERE traffic speed data covers all of Australia. It includes 6 million road segments, providing measures of:

- average speed (km/h);
- speed by decile band (km/h)
- speed limit by road link

HoustonKemp use the HERE data to produce hourly road performance metrics for all roads in Australia. These can be reported for any road, collection of roads, point-to-point routes, or geographic areas (for example, local government area or capital city). This enables an analysis of trends in traffic speed, free flow speeds, and the prevalence of speeding. The data can also provide insights on congestion hot-spots, how traffic incidents and road changes affect traffic speeds, and overall road performance.

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