### Assessment consultation papers – Tranche 2 – 2025 Methodology Review

**Queensland submission** 

4 March 2024



### **Contact officer:**

Matthew Nalder Principal Treasury Analyst Economic Strategy Queensland Treasury (07) 3035 1818 Matthew.Nalder@Treasury.qld.gov.au

# Contents

Prefa	ce5
Sumr	mary 6
Quee	nsland commentary on other States' Tranche 1 submissions 12
1.	Mining revenue 12
2.	Transport 20
3.	Health 44
4.	Justice
Prior	ity assessments 59
5.	Investment 59
6.	Regional costs and remoteness 80
Reve	nue assessments
7.	Payroll tax
8.	Gambling tax
9.	Other Revenue
Expe	nse assessments 88
10.	Housing 88
11.	Welfare 90
12.	Roads 92
13.	Services to communities - Natural disaster relief

14.	Services to industry	
15.	Other expenses	99
16.	Net borrowing	
Other		102
17.	Adjusted budget	102
18.	Administrative scale	104
19.	National capital	106
Δnner	ndix A: Supplementary evidence for Queensland's	transport

### Preface

This submission provides Queensland's recommendations in response to the Commission's proposed changes in the tranche 2 consultation papers. It also further elaborates on several positions raised in Queensland's tranche 1 submission in order to address comments and views raised by other states.

Additionally, Queensland provides detailed cases for change across a number of assessments, including investment (in relation to the transport assessment), and administrative scale. Our view is that these changes will reflect a substantial improvement compared with existing methods and we encourage the Commission to give these proposed changes appropriate consideration.

As always, we welcome further discussion with the Commission if required to ensure that all our positions are fully understood.

Queensland remains committed to ensuring that the Commission's assessments are rigorous, and that horizontal fiscal equalisation and the supporting principles are upheld.

### Summary

A summary of Queensland's positions is provided in the following table with further detail in the submission below.

#### SUMMARY OF QUEENSLAND POSITIONS

Tranche 1 papers – Response to other States' submissions				
Assessment	Claim/proposal by other State/s	Queensland response		
	Queensland is the only state with significant reserves of coal seam gas (CSG) and other states have no known or limited reserves.	<b>Do not support</b> the view that other states have no reserves.		
Mining revenue	As the bans in other states related to hydraulic fracturing (fracking), an EPC treatment should only apply to gas obtained through this method of extraction.	Do not support		
	A tiered system should be adopted with varying levels of EPC treatment depending on the level of restrictions present.	Do not support		
Transport	PWD calculations in the urban transport model should be based on SA2s rather than SA1s.	Do not support		
	Urban transport model should include socio- demographic composition (SDC).	Support		
	The Commission should change its methodology for calculating the substitutable expenses for the non state sector (NSS) adjustment, and increase the substitutability rates for all components to reflect this change.	Do not support		
Health	Separate to the proposed change above, the Commission should change the substitutability rate of the NSS adjustment.	Do not support		
	The Commission should change the current method of National Weighted Activity Unit averaging.	Support		
Justice	A central policing costs component should be introduced and remoteness costs should be reduced/removed.	Do not support		

	The Commission should change the variables in the prisons regression and separately assess non-custodial sentences.	Do not support
	Tranche 2 papers	
Assessment	Commission question	Queensland response
	Do states support smoothing user population growth to reduce volatility, with an associated reduction in contemporaneity?	Do not support
	If user population growth were to be smoothed, do states support a 3-year moving average of growth rates?	Do not support
	Do states support freezing the component shares of the value of assets for the life of the 2025 Review?	Do not support
	Proposals raised by Quee	nsland
Investment	Discontinue the use of the urban transport regression model and population-squared variable in the urban transport investment assessments.	
	Differentially assess states' urban school transport task.	Support
	Differentially assess states' non-urban school transport task.	Support
	Assess remaining urban transport investments as 50 per cent urban population and 50 per cent number of concession card holders.	Support
Regional costs and remoteness	Do states support continuing the current methodology for estimating regional costs and service delivery scale effects?	Support, with adjustments and requesting the Commission review regional costs and remoteness as a priority issue for the 2030 Methodology Review.
	Can states identify any data to measure differences in non-wage costs between major cities?	None identified
Pavroll tax	Do states support assessing revenue from payroll tax surcharges on the same basis as payroll tax?	Support
- uy - en un	Do states support retaining the 2020 Review assessment method and data sources, noting that the Commission will continue to explore	Support

	the feasibility of an assessment based on data from BLADE and/or PLIDA?	
	Do states support the assessment method including scope for the Commission to move to BLADE and/or PLIDA data in a future update, in consultation with states, if those data would improve the assessment?	Do not support
Gambling tax	Do states agree there is no reliable method of differentially assessing gambling taxes? If not, what do states consider to be a reliable method of assessing state gambling taxes?	Support
	Do states agree that state gambling taxes should be assessed equal per capita in the other revenue category?	Support
Other reverse	Do states agree with the revenues classified to the other revenue category?	Support
	Do states agree that other revenue should be assessed equal per capita?	Support
	Do states agree that the housing assessment remains fit for purpose notwithstanding recent developments in the housing market?	Support
	Do states agree that there should be separate assessments for public and community housing if it results in a material change in GST distribution?	Do not support
Housing	Is the ABS census data on households with members that have long-term health conditions a suitable proxy for households that have high service needs?	Do not support
	Do states have data on the cost of servicing different household types that would enable the calculation of a cost gradient?	Availability of data to be determined through the data request process.
	Do states agree that the state NDIS contributions can be collected from the Commonwealth Budget papers rather than from the states?	Support
Welfare	Do states agree that the current NDIS assessment is fit for purpose?	Support
	Do states support the development of a homelessness services assessment?	Do not support
	Will states be able to identify spending on homelessness services and identify where	No GFS classification exists to identify spending

	that spending is reported in the Government Finance Statistics classifications?	
	Do states support the proposed drivers to assess homelessness spending, noting further work is to be undertaken on mental health conditions as a potential driver?	<b>Do not oppose</b> <b>Do not support</b> a mental health driver
	Do states support combining the other welfare, non-NDIS aged care and National Redress Scheme components and assessing spending using the 2020 Review method for other welfare (equal per capita assessment method with regional and wage cost factors)?	Do not oppose
	Do states support the Commission ceasing to collect state spending on the National Redress Scheme?	Support
	Do states support retaining the 2020 Review method of assessing urban road length, using population as the driver for large towns?	Support
Roads	Do states agree that the 2020 Review synthetic rural road network should not be updated?	Support
	Do states agree that traffic volume should continue to be assessed using data from the Bureau of Infrastructure and Transport Research Economics and the National Transport Commission?	Support
Services to communities - Natural disaster relief	Do states support the continuation of the natural disaster relief assessment in its current form?	Support
	Do states support replacing total factor income as measure of industry size with the chain volume measure of industry value-add to assess the need for spending on industry regulation?	Do not support
Services to industry	Do states support the development of an average or representative base year to index changes in the chain volume of production?	<b>Support</b> use of an average
	Do states support the reintroduction of the number of businesses as a driver of need for regulatory spending if it is material?	<b>Do not oppose</b> , subject to consideration of its appropriateness on an industry by industry basis, along with the inclusion of other relevant measures

	Will states be able to identify spending on the net-zero transition and provide it to the Commission to develop an assessment?	Extent to which all relevant spending can be clearly identified is unknown at this stage. A clear framework for considering net zero spending is needed and a full review of government programs is required.
Net zero transition – Grants to industry	Can states identify and provide data on potential drivers of state spending on the net- zero transition?	Drivers are likely to include: volume of emissions to be abated and costs per tonne of abatement. Availability of data to be determined through a data request process.
	Do states expect there to be a sufficient increase in state net-zero transition spending to warrant a separate assessment, within or outside of the business development assessment?	<b>Support</b> the view that the net zero transition will significantly increase spending – but noting the complexity of identifying and assessing specific expenditure related to net zero transition.
Other expenses	Do states agree with the expenses classified to the other expenses category?	Support
	Do states agree that other expenses should be assessed equal per capita?	Support
	Do states agree that the conceptual basis for the net borrowing assessment remains unchanged?	Do not support
Net borrowing	Do states support smoothing population growth to reduce volatility in the net borrowing category if a change is made to smooth population growth in the investment assessment?	Do not support
	Do states agree with the Commission's preliminary view to use:	
	<ul> <li>ABS preliminary Government Finance Statistics data for year 3</li> </ul>	
Adjusted budget	<ul> <li>A state's year 3 data if the ABS preliminary data are not available</li> </ul>	Support
	<ul> <li>The final ABS Government Finance Statistics data for the first 4 assessment years (year minus 1 to year 2).</li> </ul>	

	Do states consider the proposed process for implementing adjustments in the 2025 Review adjusted budget is appropriate?	<b>Support</b> , subject to appropriate consultation with states before implementing any new adjustments.
Administrative scale	Do states support the continuation of the administrative scale expense assessment in its current form?	<b>Do not support</b> the level of the current adjustment and recommend applying a 12.5% discount.
National capital	Do states support discontinuing the national capital assessment if the assessment is immaterial?	Support

### Queensland commentary on other States' Tranche 1 submissions

### 1. Mining revenue

#### **Proposed issues**

In response to the Commission's proposed position in the Tranche 1 consultation paper that equal per capita (EPC) treatment should be applied to coal seam gas (CSG), some other state submissions made the following claims or put forward the following views or proposals:

- Queensland is the only state with significant reserves of CSG and other states have no known or limited reserves.
- As the bans in other states related to hydraulic fracturing (fracking) an EPC treatment should only apply to gas obtained through this method of extraction.
- A tiered system should be adopted with varying levels of EPC treatment depending on the level of restrictions present.

#### Summary – Queensland response and position

Queensland's Tranche 1 submission provided clear support to the Commission's proposal to assess coal seam gas and all onshore gas on an equal per capita basis. As the Commission identified in its consultation paper, the revenue base for this resource is heavily impacted by state policy restrictions and is highly uncertain.

Some other states have raised objections to this proposed treatment, and have claimed that other states have limited or no gas reserves. It was also proposed by another state that an EPC treatment, if applied, should be limited to gas extracted by 'fracking', given this was a focus of many state restrictions.

Queensland disagrees strongly with these arguments and considers they are flawed and inaccurate representations of Australian gas reserves, the relevance of various extraction methods, and the extent to which individual state's policy decisions have impacted on their potential gas production.

We consider that EPC treatment should apply to *all* forms of onshore gas, including CSG. The mineral by mineral approach is clear that minerals should be assessed as a single resource, and therefore the method of extraction is not a valid basis for applying different assessment treatments, especially considering that from a market and end user perspective they are producing exactly the same end product or resource. There are several key reasons why applying the Commission's proposed EPC treatment to all onshore gas is appropriate:

- Most states possess reserves of onshore gas and several states possess substantial reserves, as independent data shows. However, policy restrictions in several states have created a misleading picture around the quantity (and reliability) of reserve estimates.
- Policy decisions to ban or restrict exploration or production of various types of gas in other jurisdictions are highly likely to have acted as a substantial disincentive to gas companies investing in the broader exploration and development of gas reserves in those states.
- Continuation of the current approach, or any move to a differential non-EPC treatment of CSG in contrast to gas found in other locations or produced through other extraction methods, will continue to compound the impact of state bans and restrictions by dis-incentivising those states, and companies, from investing in the development of onshore gas resources in states where the bans and restrictions apply or have applied.
- Applying an EPC treatment only to gas obtained via fracking conflicts with the practicality principle and cannot be achieved with available data. In Queensland, it would not be possible to directly attribute specific production volumes or royalty values to fracking activity, as royalty returns are

provided at an operations level and do not capture information that enables a split by individual well or petroleum lease, or by extraction method.

Queensland's arguments highlighting the limitations and issues with the arguments put forward by other states are outlined in detail below.

#### **Queensland position**

Applying the Commission's proposed EPC treatment to all onshore gas is appropriate and aligned closely with HFE principles. Any alternative approach, as proposed by some other states in their Tranche 1 submissions, would be inconsistent with HFE and introduce substantial policy contamination, unreliability and complexity to the assessment.

The Commission's Mining Revenue consultation paper, provided as part of the Tranche 1 papers, outlined a range of important issues related to its current approach to banned minerals and provided a substantial rationale for a proposed change to the current methodology to move to equal per capita (EPC) treatment of onshore gas revenue.

As outlined in Queensland's Tranche 1 submission, Queensland strongly supports the Commission's proposal related to the EPC treatment of coal seam gas.

However, in response to the Commission's paper, some other states argued against this proposal in their Tranche 1 submissions and suggested that an EPC treatment should not apply given their claims that other states have no known or limited gas reserves.

While a range of references in the Commission's paper are to coal seam gas (CSG) when discussing issues related to the current onshore gas revenue assessment method, the issues outlined in the Commission's paper are clearly not limited to CSG and relate to all onshore gas production and resources.

The references to CSG in the Commission's paper were appropriate in so far as they highlighted CSG as the readily identifiable example because CSG production currently plays an important role in onshore gas production. However, to focus only on CSG (or to treat CSG in any way differently to other forms of gas) in the context of the onshore gas revenue assessment would be inappropriate, misleading and inconsistent with key principles of HFE, in particular the key principle of ensuring assessments are not unduly influenced by state policy decisions.

CSG simply refers to the geological location of gas reserves in certain places, which in turn can influence the extraction method required to access the gas reserves. While technical and production cost challenges compared with established conventional gas sources initially prevented its large-scale development, the opportunity to use CSG as the feedstock for liquified natural gas helped to unlock the potential of this resource, thereby driving investment.

Importantly, from both a gas market perspective and in terms of the end product and end user, there is <u>no distinction</u> between CSG and other forms of gas (i.e. gas is gas). Therefore, it would be inappropriate for the Commission to treat CSG differently or separately to any other type of onshore gas in its assessment methods.

Potential concerns around a lack of commerciality or viability of developing onshore gas resources in other states vis-à-vis Queensland are not based on a logical rationale, given that the limited production in several other states is a direct result of deliberate policy decisions taken by other jurisdictions which have inhibited commercial pathways for this resource.

Any claims that other jurisdictions have limited or no viable gas reserves are also not supported by evidence as, contrary to these claims, many other jurisdictions hold substantial proven and probable reserves based on discovered petroleum in place, as outlined in detail later in this chapter of this submission.

Any arguments that an EPC treatment should only be applied to onshore gas that is extracted through fracking, due to the nature of bans being focussed primarily on that form of extraction in some

jurisdictions, are misconceived. The reality is that policy decisions to ban or restrict exploration or production of various types of gas in other jurisdictions are highly likely to have acted as a substantial disincentive to gas companies investing in the broader exploration and development of gas reserves in those states.

If not all options of extraction are available to producers, and in the context of uncertain and restrictive policy regimes targeted at limiting onshore gas development, these policy decisions have likely created substantial uncertainty for potential investors.

Furthermore, while some states have subsequently lifted some specific bans on gas production, it can be expected that establishment and development of an industry takes time, and there will be a period before the benefits of development of gas reserves are realised. The Reserve Bank noted this in a 2021 publication into the gas market<sup>1</sup> and from Queensland's own experience this was noted to have taken decades from the first commercial production of CSG.

Nevertheless, this is not a justification for leaving this assessment unchanged, which would inappropriately and unfairly penalise Queensland substantially, to the benefit of other states who have previously made deliberate policy decisions to inhibit or ban gas development and production.

Given the lack of exploration in these jurisdictions, reflecting those policy decisions, this also results in substantial challenges in terms of data collection, which mean it is difficult to determine the potential share of revenue that is due to fracking extraction versus other forms of extraction (see discussion below on restricting EPC treatment to fracking for more detail).

Unless the change is made to treat all onshore gas revenue as EPC, the current approach to this assessment, or any move to a differential non-EPC treatment of CSG in contrast to gas found in other locations or produced through other extraction methods, will continue to compound the impact of state bans and restrictions by dis-incentivising those states, and companies in those states, from investing in the development of onshore gas resources in states where the bans and restrictions apply or have applied.

Given the critical role of gas as an essential transition resource in the move to net zero, it is not appropriate that the current assessment method should continue to pro-actively discourage development of gas reserves across many states. Worse still, the current approach substantially penalises states, such as Queensland, that have facilitated development of this critical national industry and, as a result, supply substantial amounts of gas to interstate markets and end users, including to states that have imposed bans on their own home-grown gas production.

By restricting onshore gas exploration and development, these states are benefitting from the equalisation of Queensland gas royalties because they are assessed as having limited to no capacity to raise royalty revenue. This is clearly inconsistent with the Commission's key principles underpinning HFE, which the Commission highlighted in its consultation paper as part of the clear rationale for seeking to correct this inconsistency and unfair treatment by shifting to an EPC treatment for coal seam gas.

Importantly, the distortions and inequitable outcomes related to the current treatment were clearly highlighted by the Australian Productivity Commission (PC) in its previous review<sup>2</sup> into horizontal fiscal equalisation, which concluded that distortions arising from the treatment of resource restrictions could have large financial implications for some States.

Further, in its submission to the PC's Inquiry into *Horizontal Fiscal Equalisation 2017*, the then Australian Petroleum Production and Exploration Association (APPEA), now known as Australian Energy Producers (AEP) states:

<sup>&</sup>lt;sup>1</sup> Reserve Bank of Australia, <u>Understanding the East Coast Gas Market</u> | <u>Bulletin – March 2021</u> | <u>RBA</u>

<sup>&</sup>lt;sup>2</sup> Productivity Commission, Inquiry Report – Horizontal Fiscal Equalisation, released May 2018, https://www.pc.gov.au/inquiries/completed/horizontal-fiscal-equalisation/report

"This encouragement of substantial development has, however, impacted the GST distribution process to the point where jurisdictions that promote and facilitate the development of their petroleum resource bases are being disadvantaged relative to those that have imposed restrictions or moratoria on the same economic activity.

This is particularly the case for gas, whereby some jurisdictions continue to promote the consumption of gas, but at the same time restrict exploration and production activities within their own jurisdictions. Indeed, the HFE system offers perverse incentives to prohibit or limit gas activities for non-scientific reasons, as the loss of revenue from such decisions is in part shielded by increased shares of GST revenue.

Not only is this hampering economic development, it is placing even further pressure on those states and territories that have chosen not to impose restrictions. Such an outcome is inequitable."

More recently, the impact of these states' policy decisions on onshore gas development and energy markets have also been highlighted by key industry stakeholders. Santos Managing Director and CEO, Kevin Gallagher, outlined a range of key issues related to states' policy decisions in his address to the Melbourne Mining Club on 2 June 2022, including:

"We are watching an energy crisis play out in Europe right now, but we have on our east coast a prime example of what happens if the energy transition is focused only on stopping new oil and gas projects.

We've had a decade of moratoriums, shutdowns and lockouts in resource-rich states and territories."

Mr Gallagher also stated that:

"Shortages in the domestic market and the price shocks we have seen in recent weeks have nothing to do with the behaviour of gas producers or exporters, who are doing everything they can to support the market right now.

This is the consequence of more than a decade of energy policy failure that has stopped the industry developing more gas supply in a timely manner".

#### State restrictions on onshore gas exploration and development

Over a period of more than a decade, several states have implemented various bans on gas exploration, extraction and various practices related to onshore gas industry development and production. In addition, between 2015 and 2017, several states applied moratoriums on gas extracted via hydraulic fracturing ('fracking'), pending scientific inquiries. Although some of these moratoriums have since been lifted, others remain in place or have been extended.

A range of key policy decisions by state governments restricting onshore gas development include:

- In New South Wales, the Government will only support limited gas projects, specifically the Narrabri Gas Project and its potential extensions. Additionally, the NSW Government has significantly scaled back the area where gas exploration and production will be permitted in NSW. This has resulted in a 77 per cent reduction in the total area currently covered by Petroleum Exploration Licenses.
- 2. In Victoria, an administrative moratorium was placed on all onshore gas exploration and development in 2012. Legislation remains in place to permanently ban fracking and coal seam gas extraction.<sup>3</sup> In July 2021, the Onshore Conventional Gas sector restarted, however since November 2021 no exploration permits have been issued for onshore exploration or production.
- 3. In Western Australia, fracking practices are not permitted in over 98 per cent of the State, is prohibited within two kilometres of public drinking sources, and traditional owners and farmers have rights to say no to production using these methods.<sup>4</sup>

<sup>&</sup>lt;sup>3</sup> Victoria State Government, Earth Resources: <u>Restart of onshore conventional gas industry in Victoria</u>

<sup>&</sup>lt;sup>4</sup> Government of Western Australia, Department of Mines, Industry Regulation and Safety: <u>Hydraulic fracturing remains banned on 98 per cent of WA</u>

4. In **Northern Territory**, hydraulic fracturing of onshore unconventional shale gas reservoirs may only proceed under very strict condition and in tightly prescribed areas. There will be no hydraulic fracturing in National Parks, Conservation Areas, Indigenous Protected Areas, towns, residential and strategic assets, and areas of high cultural, environment or tourism value.<sup>5</sup>

#### Estimates of onshore gas reserves

It is difficult to accurately determine the size and scale of onshore gas reserves nationally and, in particular, across specific states, given specific states have banned or heavily restricted or disincentivised exploration of gas resources over many years. However, it is clear that the potential resource is significant.

The extent of exploration and extraction activity can be influenced, to varying degrees, by a wide range of policies relating to geological surveying, exploration licensing, approval processes, environmental regulation, and the provision of economic and social infrastructure.'

Estimates released by Geoscience Australia in 2023 (Figure 1.1) show there are expected to be substantial gas reserves and resources spanning most states and territories, even after excluding offshore reserves.



Figure 1.1: Australian Gas Reserves and Production, 2021

Sources: Geoscience Australia; GPInfo. Pipeline routes from the GPInfo petroleum database Note: I NG = liquefied natural cas. P.I = Petajoules

Source: Geoscience Australia, Australia's Energy Commodity Resources 2023

<sup>&</sup>lt;sup>5</sup> Northern Territory, Government, Onshore Gas in the Northern Territory, <u>Government Response to Hydraulic Fracking Inquiry</u>

Furthermore, EnergyQuest reporting in the Energy Quarterly: December 2023 Report highlights that, while Queensland accounts for the majority of 'proven' (1P) CSG reserves<sup>6</sup>, there are extensive proven *and* probable (2P) reserves of Australian natural gas and ethane in other jurisdictions, with Queensland only accounting for 28% of the Australian total.

Similarly, Queensland only accounts for 30% of contingent (2C) gas resources.

Combining the estimates for various states of both 2P and 2C reserves, this data implies that the Western and Northern Australian region has approximately double the volume of the Eastern and Southern Australia region. For context, Western and Northern Australia region comprises basins located in Western Australia and Northern Territory and Eastern and Southern Australia region comprises basins located in New South Wales, Victoria, Queensland, South Australia and Tasmania.

However, these estimates are likely to significantly underestimate the potential gas reserves in some jurisdictions. In many cases, complete information on gas reserves in other states is unavailable due to a lack of exploration and data collection gaps. Therefore, while a detailed understanding of Queensland's gas resources and reserves is readily available, more exploration is likely required in other Australian jurisdictions to achieve comparable knowledge.

As detailed by APPEA in its 2017 briefing to COAG<sup>7</sup>

"The often-cited lack of "proven and probable" reserves in Victoria is misleading; a reserve cannot be considered proven or probable unless there is government approval and commercial pathway for development. Government prohibitions on industry exploration prevent the work required to convert contingent resources into 'bankable' 2P reserves."

Indeed, in making its decision to lift its blanket ban on onshore conventional gas exploration in 2021, the Victorian Government commissioned new scientific work to explore potential reserves of onshore gas, *The Victorian Gas Program*. That study<sup>8</sup> concluded that *"there is likely to be 128-830 petajoules of commercially feasible onshore conventional gas yet to be discovered in the state"* and that *"Production of the estimated gas resources could generate around \$300 million annually for regional economies"*.

Thus, Victoria's bans and restrictions imposed over many years have stifled gas exploration which means that current estimates are unreliable and likely much lower than reality.

# While this evidence demonstrates that reserves do exist, this is not to suggest that the Commission should attempt to estimate this capacity or use incomplete published data as the basis for a revenue assessment, as some states have asserted.

Published resource estimates tend to include wide estimate ranges to reflect the different methodologies, assessment areas and data inputs in the resource assessment process. They are also subject to frequent revision based on new exploration techniques. The Commission has previously acknowledged the impracticalities of this approach and Queensland agrees with this position. Demonstrating that there are potentially very significant reserves in jurisdictions (regardless of precision around the quantity of those reserves) is an important step to establish the legitimacy on an EPC assessment given the importance of policy neutrality.

#### **Queensland's recommendations**

Continuing to apply the current onshore gas methodology will continue to reward states for their policy choices to limit or ban onshore gas development and continue to disincentivise states from developing their gas industries and resulting revenue bases.

<sup>&</sup>lt;sup>6</sup> Reserves are differentiated according to classifications such as 'proved', 'probable', 'possible' and 'contingent' based around the level of certainty around recovery and increasing chance of commerciality. For example, 1P reserves are proven commercial reserves, 2P reserves are proven and probable commercial reserves and 2C resources are proven and probable sub commercial resources.

 <sup>&</sup>lt;sup>7</sup> Australian Petroleum Production and Exploration Association Limited, Report to the CoAG Energy Council, Unconventional Gas in Australia, November 2017
 <sup>8</sup> Geological Survey of Victoria, 'Victorian Gas Program Progress Report No 5', December 2020

At a time when East Coast electricity markets continue to face substantial supply challenges, there is growing acknowledgement that gas will need to be a key transition fuel to achieve net zero commitments.

A study by Ernest & Young<sup>9</sup> found that, even under a strong renewables scenario, demand for gas will continue to increase to 2030 while independent analysis by McKinsey and partners, and noted in APPEA's 2017 briefing<sup>10</sup>, indicated that \$50 billion may be required to fund new supply to 2030. The Commission needs to ensure that its assessment is not creating, or increasing, barriers to the development of a necessary increase in national gas supply.

As noted in the Australian Government's Annual Climate Change Statement 2023, released 30 November 2023:

"The energy transformation is unfolding rapidly, but not instantly. While we invest in cleaner and cheaper energy for the future, gas will continue to play a role in supporting the transition to renewables, particularly as coal-fired generation leaves the system. Australian gas will also help support regional stability, energy security and international partners' plans to reduce their emissions."

The Commission's proposed position in its consultation paper to change to an EPC treatment of coal seam gas is entirely appropriate and aligns with its principle of policy neutrality. This principle is intended to ensure that a State's own policies or choices do not directly influence its GST share.

According to the Commission's position on fiscal equalisation, supporting principles and assessment guidelines, a second aspect of this principle is that "the Commission's assessments should not create incentives or disincentives for states to choose one policy over another".

The current gas mining assessment clearly does not meet this principle. The design of the current assessment, which assesses states that do not explore or develop their gas resource as having no revenue raising capacity, does not reflect reality in terms of the potential revenue being foregone clearly and directly as a result of policy decisions in those states.

While the Commission must take a balanced approach to HFE in the context of the various supporting principles, it is clear that, for the onshore gas assessment, policy influences by various states have a far more substantial impact than in many other assessments.

If the Commission does not proceed with its own proposed position as advocated in its consultation paper in relation to an EPC treatment, then Queensland strongly recommends that a 50 per cent discount is applied to the current assessment to address the substantial data limitations and policy influences on the current assessment, which the Commission has already acknowledged. The current assessment is leading to perverse HFE outcomes, as well as contributing to negative and potentially damaging broader national economic and emissions reduction outcomes.

## Suggestion by other state/s: **An EPC treatment should be restricted to gas obtained via fracking, or** *adjusted to reflect the level of restrictions present across jurisdictions.*

In response to the Commission's paper, alternative options from other states for the treatment of gas have been proposed. These include:

- Restricting the use of an EPC treatment to gas extracted via fracking methods, noting that not all fracked gas is coal seam gas.
- Applying a tiered system to an EPC treatment based around the level of restrictions that apply.

In addition to the substantial arguments outlined above as to why EPC should apply to all onshore gas revenues, these alternative options for specific changes in the assessment approach would introduce an additional, significant layer of complexity to the assessment. This would contradict the practicality

<sup>&</sup>lt;sup>9</sup> Australian Energy Producers, 'The future role of natural gas in Australia and the region', 27 November 2023

supporting principle and would also require access to a granular level of data across jurisdictions that is not readily or reliably available.

In the case of restricting the treatment to gas extracted by fracking methods, this would likely require access to operations data from individual mines, assuming that this data is collected and able to be shared, and the potential reserves that could be extracted through fracking in the absence of policy decisions by states to ban or limit fracking.

In Queensland, not all gas or oil operations undertake fracking, and fracking is not necessary for each individual well. Whilst gas operations are required to notify the Department of Resources of any fracking activities, <u>it would not be possible to directly attribute specific production volumes or royalty values to fracking activity</u>, as royalty returns are provided at an operations level and do not capture information that enables a split by individual well or petroleum lease, or by extraction method.

As Queensland produces most of the gas nationally that is currently obtained via fracking, an inability to obtain reliable or meaningful data on this aspect of gas production in Queensland renders this option unworkable.

The option of introducing a tiered system is also complex and would necessitate regular and ongoing reviews of policy settings in all jurisdictions which apply restrictions and, in jurisdictions not applying restrictions, an assessment of the treatment of any projects that had been rejected. This second option would also introduce subjective judgements into the assessment around the level of EPC treatment that should apply.

Based on these substantial limitations and issues related to these options proposed by other states, Queensland considers that neither of these options are considered viable or meaningful alternative approaches, and that the Commission should implement the EPC treatment as proposed in its consultation paper.

### 2. Transport

#### **Proposed changes**

In response to the Commission's Tranche 1 consultation paper, some other state submissions put forward the following views or positions:

- *PWD* calculations in the urban transport model should be based on SA2s rather than SA1s.
- The urban transport model should include socio-demographic composition (SDC).

#### Summary – Queensland response and position

#### Context

Queensland's Tranche 1 submission presented a detailed critique of the urban transport model. This critique outlines how the model is not fit for purpose, not policy neutral, not contemporaneous, and producing outcomes inconsistent with HFE.

Given these concerns, Queensland <u>recommended</u> the Commission assess urban transport according to urban population shares. This methodology would enable a policy neutral assessment which is relevant and related to the actual urban transport task each state faces.

Other states also provided views on the urban transport regression, with WA, NT, SA, and Tasmania all broadly agreeing with Queensland's recommendation to move towards assessing urban transport need using urban population shares.

NSW was the only state to clearly support the current model. Following the release of other state submissions, NSW produced a supplementary transport assessment submission defending the current model and methodologies.

NSW's supplementary submission repeatedly misrepresented Queensland's and other states' arguments and asserted that Queensland's *Tranche 1 submission* did not provide sufficient evidence to support the position that the urban transport model is not fit for purpose. In fact, Queensland's Tranche 1 submission included a significant literature review, coupled with substantive and detailed data analysis. Further clarifying evidence is provided below, while a comprehensive literature review and analysis further highlighting the validity of Queensland's arguments in both the Tranche 1 and Tranche 2 submission is provided in Appendix A.4

In contrast, the NSW supplementary submission provided limited evidence to support the validity of the urban transport model. In particular, NSW claims their urban transport task is higher because of the increased commuter demand for public transport. This focus on demand fails to acknowledge the significant role economies of density have in urban transport networks.

As such, commuter travel in a dense Significant Urban Area (SUA) can be provided at a much higher level of efficiency than urban transport services in less dense SUAs. These increases in efficiency should enable NSW to decrease net expenses and have lower per capita costs than other states. This issue will be further discussed below.

Overall, the NSW supplementary submission does not effectively address any of the key issues identified in Queensland's *Tranche 1 submission*. Queensland considers that the urban transport model is not fit for purpose, policy contaminated, and materially impacting on equalisation outcomes.

NSW also suggested changing the geographies used in the assessment from SA1s to SA2s. Queensland <u>does not support</u> this proposal. Based on Queensland Treasury analysis, adopting this proposal would <u>not</u> <u>improve the fitness for purpose of the urban transport model.</u>

Another proposed methodology change raised by Tasmania was to include an assessment of sociodemographic composition (SDC) in the urban transport model. Queensland <u>supports</u> this proposal and <u>suggests</u> the inclusion of concession card holders as a variable in the assessment. A significant proportion of the urban transport task is to provide a safety net to those who have no other means of transport, including seniors, school students, and concession card holders. These individuals also have a limited ability to afford transport services, meaning a state with a larger proportion of their task coming from concessions will have lower ability to generate user charge revenues. This will increase the net expense of running urban transport services.

#### Assessing SDC factors, including the number of school students and concession card holders, would be an accurate and policy neutral measure of the differential need for states to provide and subsidise urban transport.

These two issues are discussed in detail below.

#### Issue 1: Should PWD calculations in the urban transport model be based on SA2s rather than SA1s?

(Note: A detailed methodology discussion related to the data and calculations provided throughout this discussion is provided in Appendix A).

Queensland <u>does not support</u> the proposal by NSW to use SA2s for PWD calculations in the urban transport model rather than SA1s.

This proposal does not address any of the fundamental weaknesses with the urban transport model and would have only a minimal impact on reducing the inappropriate overreliance of the model on PWD. Indeed, some identified issues would be exacerbated by this proposal.

All analysis presented in Queensland's *Tranche 1* submission remains valid and relevant, **demonstrating** that the urban transport regression model would remain not fit for purpose if SA2 geographies are used. Changing the data source for PWD calculations would have no impact on the substantial shortcomings of the existing model.

However, there are two specific issues highlighted and discussed in Queensland's Tranche 1 submission that are addressed in further detail below to highlight the limitations in NSW's proposal:

- State policies impacting on efficiency.
- Population weighted density is not comparable between SUAs.

#### State policies impacting on efficiency.

This proposal will have no impact on the substantial policy contamination which is inequitably skewing the assessment to favour the dominant SUAs of Sydney and Melbourne.

# Overall, regardless of whether SA1s or SA2s are used, the model will remain over reliant on the PWD variable, which will continue to be highly sensitive to the policy decisions impacting Sydney and Melbourne public transport systems.

Table 2.1 below illustrates the difference between using SA1s and SA2s. As highlighted, Sydney will retain a significantly higher PWD than all other SUAs, with the move to SA2s having only minimal impact on ratios of PWD in other capitals compared to Sydney.

As such, the model will continue to be largely determined by Sydney's influence and the impacts of previous and ongoing NSW policy decisions will continue to significantly skew the assessment.

	Sydney	Melbourne	Brisbane	Perth	Adelaide	Hobart	Canberra	Darwin
SA1 (people per km2)	7,196	5,125	3,397	2,649	2,518	1,990	3,315	2,690
Ratio to Sydney	1.00	0.71	0.47	0.37	0.35	0.28	0.46	0.37
SA2 (people per km2)	3,725	2,720	1,912	1,779	1,812	1,224	1,864	1,655
Ratio to Sydney	1.00	0.73	0.51	0.48	0.49	0.33	0.50	0.44

Table 2.1: Comparison of using SA1 geographies and SA2 geographies for calculating PWD.

Source: NSW Submission to Tranche 1 consultation papers.

As discussed in Queensland's *Tranche 1* submission, academic literature indicates that Sydney's public transport system is likely servicing demand at a higher level relative to need compared to other Australian and international networks.<sup>10</sup> This will continue to influence the urban transport model by assessing Sydney as having greater need, even if the data for PWD is revised to be based on SA2s. As such, policy decisions will continue distorting equalisation through this model.

#### Population weighted density is not comparable between SUAs when using SA2 geographies.

Under the existing approach, the PWD of an SUA is the weighted sum of the population density of each individual SA1. The PWD is derived by multiplying the SA1's population density by the SA1's share of the total population of the SUA.

Therefore, a distortion in the overall PWD calculation occurs when a particularly low population density area is included in the same SA1 as a high population density area. As a result, the overall PWD of the SUA is lower than it would have been if the boundaries were defined differently by the ABS to separate the non-residential space from the more densely populated area in two separate SA1s (i.e. the overall PWD is distorted as a result of the way the geographical boundaries are defined).

This distortion occurs across a range of SUAs due to the presence of various non-residential land uses or urban green space, in new developments and in rural residential areas.

As discussed in Queensland's *Tranche 1 submission* there are inconsistent levels of PWD distortion between different SUAs at an SA1 level, and the extent to which this distortion occurs (both in terms of the number of impacted SA1s and the overall level of distortion) is materially different between jurisdictions, in particular between Queensland and New South Wales.

Queensland Treasury analysis found that a shift to using SA2s would not resolve this issue. Indeed, the net overall difference in PWD distortion between Brisbane SUA and Sydney SUA increases with the use of SA2 geographies. A summary of this analysis is displayed in Table 2.2 below:

Table 2.2: Per cent decrease in PWD from distortions, Sydney & Brisbane,
comparing SA1 and SA2 geographies. <sup>11</sup>

	Geographic & planning factors (Issue 3a & Issue 3e)	New developments ( <i>Issue 3c</i> )	Rural residential ( <i>Issue 3b</i> )	Total distortion	
SA1 geographi	es				
Brisbane	41%	18%	2%	62%	
Sydney	9%	4%	0%	14%	
Difference	32%	14%	2%	48%	
SA2 geographies					
Brisbane	125%	49%	14%	188%	
Sydney	107%	10%	3%	120%	
Difference	18%	39%	11%	68%	

Source: Queensland Treasury (Refer to Appendix A.1, Table A.17).

As can be seen in Table 2.2, using SA2 geographies would still result in Brisbane SUA suffering from significantly higher level of PWD distortion compared to Sydney SUA. As such, using SA2 geographies would also materially impact on the assessment, confirming that it is a not fit for purpose variable. A detailed discussion of the analysis and calculations shown in Table 2.2 is presented in Appendix A.1.

<sup>&</sup>lt;sup>10</sup> C. Tsai, C. Mulley, & R. Merkert 2015. "Measuring the cost efficiency of urban rail systems." *Journal of Transport Economics and Policy*. 49(1): 17-34. Imperial College London Transport Strategy Centre 2020. *Sydney Trains Update 2020: Comparison with International Benchmarking Groups.;* A full literature review for both urban transport expenses and urban transport investment is provided in Appendix A.4.

<sup>&</sup>lt;sup>11</sup> A full methodology for how figures in Table 2.2 is provided in Appendix A.1, with results shown in Table A.17.

Consequently, if SA2 geographies were used, Queensland will continue to have its assessed need for urban transport severely underestimated compared with NSW.<sup>12</sup> The substantial limitations of the model and the continued redistribution demonstrates the inadequacy of using SA2 geographies.

Further evidence demonstrating this and discussing the changes in PWD distortion across each geographic factor shown in Table 2.2 is provided in more detail below, including a range of matters related to: geographic and planning factors impacting PWD; inconsistencies in the classification of ABS boundaries affecting PWD; the impacts of new developments on PWD; and other issues highlighting the limitations of New South Wales' proposed approach and the existing approach to assessing the urban transport need.

#### Geographic & planning factors impact PWD.

While using SA2 data would decrease the issue of inconsistency over the inclusion of non-residential land (planning factors) affecting PWD, **it does not resolve this issue**.<sup>13</sup> Indeed, there remain multiple examples of large areas of non-residential land use being excluded from residential SA2s in New South Wales while similar sized non-residential land uses are not excluded in other states.

To demonstrate this, Figure 2.1 shows a comparison of Centennial Parklands in Sydney (which is excluded from immediately adjoining residential areas using SA2 geographies) with the treatment of Roma Street Parklands, South Bank Parklands, and the City Botanical Gardens in Brisbane (which are included in SA2s with high density residential areas), resulting in significant PWD distortion. The consequence of this inconsistent treatment reduces the PWD of Brisbane SUA compared to Sydney SUA at an SA2 level.





Source: ABS Maps.

<sup>&</sup>lt;sup>12</sup> For simplicity, the analysis shown in Table 2.2 only compares Brisbane & Sydney. Initial Queensland Treasury analysis indicates that other SUAs across Queensland will also have higher proportional levels of PWD distortion compared to Sydney.

<sup>&</sup>lt;sup>13</sup> The calculations for non-residential land use PWD distortion only apply to SA1s where greater than 50 per cent of land use is non-residential. Any SA1 where urban green space makes up greater than 50 per cent of an SA1 area is included in this calculation. For SA2 geographies, PWD distortion because of non-residential land use (excluding urban green space) is assumed to be equal across all SUAs. For simplicity and because of difficulties disaggregating the data, PWD distortion from urban green space is included in the geographic factors' calculations for SA2 geographies.

Figure 2.1 presents a clear example of the inconsistent exclusion of non-residential land uses for SA2 geographies. Other examples in Sydney where non-residential land uses have been largely excluded from residential SA2 areas, thereby minimising PWD distortion, include Royal National Park, Rookwood Cemetery, Millenium Court Industrial Estate, and Western Sydney Parklands. Examples of similar exclusion in Brisbane are highly limited. The consequence of this is that PWD in Sydney is boosted compared to Brisbane because of the inconsistent classification of urban green space using ABS SA2 geographies.

Additionally, different SUAs have different geographies resulting in different land uses. For example, Brisbane has substantially higher levels of urban green space and urban areas that cannot be used for residential purposes because of flooding and natural disaster risk compared to Sydney or Melbourne.<sup>14</sup> The assessed urban transport need of Brisbane, using PWD as a key factor in driving that assessment, will decrease because of these factors.

This increased PWD distortion can be observed using ABS mapping data. Figure 2.2 shows two Brisbane floodplains – the Tingalpa Channel and the Oxley Wedge. There are residential areas on the boundaries of these floodplains. The blue outlines show SA2 boundaries, with red outlines showing SA1 boundaries. The largest SA1s in Figure 2.2 are where flooding risk is most severe.

These areas have very few residents given the impracticalities and geographical difficulties of building on floodplains. As such, using SA1 boundaries to calculate PWD produces minimal distortion from these floodplains.

However, as can be seen in Figure 2.2, these floodplain SA1s are amalgamated into SA2s with multiple other residential use SA1s. This means that using SA2 geography will result in significant PWD distortion from these floodplains.

<sup>&</sup>lt;sup>14</sup> Rachel Carson Centre for Environment and Society 2019. Virtual Exhibitions 2019, Number 3: Drought, Mud, Filth, and Flood: Water Crises in Australian Cities, 1880s–2010s.

## Figure 2.2: Increased PWD distortion using SA2 geographies compared to SA1 geographies caused by floodplains.



#### Source: ABS Maps

Using SA2 geographies would mean that almost all urban green space and land not suitable for residential buildings (such as floodplains) will be included in PWD calculations.

A significant proportion of this is land is excluded or has its distortionary impacts lessened when using SA1 geographies.<sup>15</sup> Queensland's higher proportion of urban green space and land not suitable for residential buildings will result in the state being disproportionately impacted by PWD distortion when SA2 geographies are used.<sup>16</sup>

#### Inconsistencies in the classification of ABS boundaries affect PWD.

Another key issue to be considered is that the classification of rural residential areas as urban centres and localities (UCLs) is inconsistent between SUAs. For example, rural residential areas are less likely to be included in the Sydney SUA than rural residential areas in SUAs in other states, including Queensland,

<sup>&</sup>lt;sup>15</sup> These affects are not completely mitigated. Most of the differential between Queensland and NSW for urban green space is shown as non-residential land uses for SA1 geographies.

<sup>&</sup>lt;sup>16</sup> Any SA1 where urban green space makes up greater than 50 per cent of an SA1 area are included in the non-residential land use for SA1 geographies. For SA2 geographies, PWD distortion because of non-residential land use (excluding urban green space) is assumed to be equal across all SUAs. PWD distortion from urban green space is included in the urban green space calculations for SA2 geographies. Approximately 50 per cent of non-residential land use PWD distortion is caused by urban green space. This means the net difference in PWD distortion across both from using SA2 geographies instead of SA1 geographies urban green space and non-residential land uses is a slight per capita increase in NSW's PWD distortion compared to Queensland's.

Northern Territory, South Australia, and Western Australia. These inconsistencies also extend to the classification of areas including mostly agricultural uses.

The proposed use of SA2 boundaries would exacerbate this issue. Firstly, SA2 boundaries are not aligned with UCL boundaries. As such, in calculating PWD, the Commission would be required to include areas that are outside of UCLs.

Further, SUAs with higher proportions of rural communities on their outskirts would have a material reduction in PWD compared to other SUAs. This can be easily observed in South East Queensland SUAs, and is illustrated in Figure 2.3, which shows two examples of where the use of SA2 level geography will increase PWD distortion in rural localities.

One of these images shows the Beaudesert SA2 in the Brisbane SUA and the other shows the Noosa Hinterland SA2 in the Sunshine Coast SUA. If SA1 geographies are used, only the areas outlined in red (UCLs) would be included in the PWD calculation. However, using SA2 geographies to calculate PWD would result in the whole SA2 area being included, reducing population density and distorting the PWD of the entire SUA.

# Figure 2.3: Additional area included for PWD calculations using SA2 geographies compared to SA1 geographies impacting rural localities.



Source: ABS Maps.

Queensland has multiple rural localities surrounding major cities. In addition to the towns shown in Figure 2.3, other rural residential towns within in SEQ SUA's include Dayboro, Rosewood, Caboolture, Elimbah, and Beachmere. Whilst the use of SA1 geographies already results in a significant PWD distortion because of these rural localities, as illustrated in Figure 2.3, using SA2 geographies would result in an even greater distortion.

Indeed, Queensland Treasury analysis on the amount of PWD distortion caused by rural localities in the Moreton Bay Region of Brisbane found that changing from SA1 geography to SA2 geography would result in a 497 per cent increase in the level of PWD distortion from rural residential areas.<sup>17</sup>

<sup>&</sup>lt;sup>17</sup> Analysis presented in Appendix A.1 and displayed in Tables A.13-16.

#### New developments affect PWD.

The issue of Greenfield developments distorting PWD is significantly more pronounced in SA2s compared to SA1s. Faster growing and less dense SUAs such as Brisbane, the Sunshine Coast and the Gold Coast have significantly more Greenfield developments per capita compared to SUAs such as Sydney and Melbourne. Consequently, changing the regression to use SA2 geographies would materially impact the assessment and further underestimate Queensland's need relative to New South Wales.

This is illustrated in Figure 2.4. This figure shows two examples in which using SA2 level geography will increase PWD distortion because of new developments. One of these images shows the Caloundra West SA2 in the Sunshine Coast SUA and the other shows the Yarrabilba SA2 in the Brisbane SUA.

If SA1 geographies were used, only the areas outlined in red (UCLs) would be included in the PWD calculation. However, using SA2 geographies to calculate PWD would result in the whole SA2 area being included, distorting population density and the PWD of the entire SUA.

## Figure 2.4: Additional area included for PWD calculations using SA2 geographies compared to SA1 geographies impacting new developments.



Source: ABS Maps.

Other major development areas that will be impacted by these same issues include Ripley, Flagstone, Pelican Waters, Cedar Grove, Cedar Vale, Jimboomba, Caboolture, Morayfield, Burpengary, and Palmview. Using SA1 geographies already results in a significant PWD distortion because of these new developments. However, as illustrated in Figure 2.4, using SA2 geographies would result in an even greater distortion because the surrounding areas that are yet to be developed would reduce the density. Indeed, analysis of new developments in Caloundra West found that the use of SA2 geographies instead of SA1 geographies would increase PWD distortion from new developments by 169 per cent.<sup>18</sup>

#### Other issues

As discussed above, all other issues outlined by Queensland in the *Tranche 1 submission* remain fundamentally unaddressed by NSW's proposal to use SA2 geography, as discussed in further detail below.

<sup>&</sup>lt;sup>18</sup> Analysis presented in Appendix A.1 and displayed in Tables A.9-12.

- Issue 1a from Tranche 1 submission Economies of density and scale.
  - This proposal will have no impact on the model's incorrect assumption that diseconomies of scale are present in Australia, particularly in heavy rail networks. This assumption is strongly refuted by international literature. Instead, the model incorrectly associates policy decisions with increased need.
- Issue 2 from Tranche 1 submission PWD variable lacks explanatory validity.
  - As outlined in detail in Queensland's Tranche 1 submission, PWD's correlation with public transport usage is largely driven by the dominant SUAs of Sydney and Melbourne, and this will continue if SA2 geographies are used. Whether using SA1s or SA2s, SUAs with very similar PWD have very different commuter public transport usage, despite the Commission's assertion that PWD is the most significant driver of urban transport need. These inconsistencies demonstrate that PWD lacks explanatory validity and is not a fit for purpose variable to assess urban transport need.
- Issue 4 from Tranche 1 submission The model is no longer contemporaneous.
  - As highlighted in Queensland's Tranche 1 submission, the COVID-19 Pandemic has resulted in a permanent shift in work from home habits and commuter modes. As such, the public transport task has changed and assuming that the number of commuters is an accurate proxy of public transport need is no longer justified. Furthermore, there has been a disproportionate level of change in the extent of commuting in Sydney and Melbourne compared to other SUAs, which is likely affecting the assessment.
  - Changing from SA1s to SA2s will not address in anyway the fact that these permanent shifts in travel patterns have rendered the Commission's current model (based primarily on commuter demand for public transport) as non-contemporaneous and not fit for purpose.
- Issue 5 from Tranche 1 submission The model has design limitations.
  - The development of the urban transport regression model as part of the 2020 Methodology Review was impacted by the quality and availability of data. This resulted in a model being developed with inadequate data for the assessment task, which also means the model is not fit for purpose.
  - Changing the geographies used from SA1s to SA2s, especially given the issues discussed in this submission, would further question the level of quality assurance of the urban transport model by replacing a not fit for purpose variable with another not fit for purpose variable.

#### Issue 2: Should SDC be assessed in the urban transport model?

#### Context

Queensland <u>supports</u> Tasmania's proposal to assess socio-demographic composition (SDC) in the urban transport model. Assessing these factors would produce an appropriate policy neutral measure of the differential need for states to provide and subsidise urban transport services. The need for urban transport related to SDC and equity of mobility raises three further issues with the urban transport assessment, as discussed in detail below:

- Importance of urban transport as a service providing equity of mobility.
- Importance of urban transport in regional urban centres as a service providing equity of mobility.
- Importance of school transport as a government service.

#### Key Issues

#### Urban transport as service providing equity of mobility.

#### Summary of Issue

Principles violated:

- Practicality fit for purpose.
- What states do.
- Policy neutrality.

A key role of government in the provision of urban transport services is to promote equity of mobility. **As** such, commuters are not a representative proxy of the urban transport task.

Furthermore, the proportion of concession card holders will materially impact on the user charge revenue capacity of a network. **Overall, the lack of recognition of the urban transport task related to equity of mobility make the current assessment not fit for purpose, not policy neutral, and delivering outcomes inconsistent with equalisation.** 

#### Detailed discussion of issue

(Note: A detailed methodology discussion for the data and calculations provided throughout this discussion is provided in Appendix A).

The provision of urban transport to improve equity of mobility is targeted at those people who cannot access private transport options (e.g. cannot drive) or for whom car ownership and related costs such as parking and fuel, is too expensive. These individuals are primarily concession card holders, including younger, older, and disabled people; people on low incomes; and school and tertiary students. A state with an above average share of concession card holders and students will therefore have an increased urban transport task.

An estimation of the proportion of the urban transport task related to concession card holders compared to commuters travelling to work can be derived for the Newcastle-Sydney-Wollongong (NSW) region and the South East Queensland (SEQ) region. Comprehensive ticketing data from both networks and statistics from the NSW *Household Travel Survey*, and the *How Queensland Travels report* have been used to deliver a robust and accurate estimate of the urban transport. Table 2.3 shows the estimated breakdown of weekly trips by type of passenger and purpose of travel in both NSW and SEQ.

	NSW	SEQ
Non-concession card holding residents	64%	46%
For work	36%	36%
For all other purposes	28%	11%
Concession card holding residents	26%	44%
For work	1%	1%
For all other purposes	26%	43%
Non-resident trips <sup>20</sup>	10%	10%

#### Table 2.3: Estimated proportion of weekly trips by passenger type and purpose of travel, 2023.<sup>19</sup>

Source: Queensland Treasury (Refer to Appendix A.2, Table A.26).

As can be seen in Table 2.3, only 37 per cent of the urban transport task is for work purposes (i.e. trips for work for both non-concession card holders and concession card holders). It is highly probable that proportion of the task related to commuters is an even lower proportion in other Australian cities. For example, the *Metro Tasmania Annual Report, 2022*, suggested only up to 30 per cent of overall public

<sup>&</sup>lt;sup>19</sup> This analysis is presented in detail in Appendix A.2 with calculations compiled and summarised in Tables A.19-25. Table A.26 presents a more disaggregated illustration of this data.

<sup>&</sup>lt;sup>20</sup> Non-resident trips is the estimated number of weekly trips taken by visitors to the area.

transport demand in Hobart was from commuters,<sup>21</sup> whilst only 25 per cent of all fares for the Adelaide Metro in 2021-22 were for adult customers.<sup>22</sup>

In contrast, concession card holders comprised almost half of the urban transport task in SEQ (see *Table 2.3*). This share of the task is even more pronounced in other urban areas, such as Adelaide, where up to 74 per cent of the task is related to travel for equity of mobility.<sup>23</sup>

Given that across Australian urban areas, commuter travel is between 20 and 40 per cent of the urban transport task, this clearly indicates that commuter data is not a fit for purpose proxy for the overall urban transport need. The other 60 to 80 per cent of the urban transport task is related to travel for other purposes.

Furthermore, as shown in Table 2.3, concession card holders, students, and seniors make up approximately 20 per cent of the population, however they account for 41 per cent of the non-commuter urban transport trips in NSW, and 68 per cent of the non-commuter urban transport trips in Queensland. **This demonstrates that concession card holders represent a disproportionately large part of the urban transport task.** Additionally, the proportion of the urban transport task related to concession card holders and equity of mobility is differential in different states.

Meanwhile, low urban density will materially **increase** an SUA's task in providing public transport as means of ensuring equity in terms of mobility. In a lower density area, public transport services **must** travel further to provide **an equal access to services.**<sup>24</sup>

The substantial impact of economies of density and differential shares of concession card holders has on the relative public transport task in the NSW and SEQ networks is illustrated in Figure 2.5.





Source: Household Travel Survey NSW; How Queensland Travels report.

Figure 2.5 uses per capita passenger kilometres in each respective network. These per capita values were calculated using data displayed in Table 2.3 and average kilometres per trip on public transport data from the *How Queensland Travels report* and the *NSW Household Travel Survey*. Overall, this data indicates that while the task for commuters is marginally higher in NSW compared to SEQ, the urban transport task related to concession card holders and equity of mobility is approximately 75 per cent greater in SEQ

<sup>&</sup>lt;sup>21</sup> Metro Tasmania 2022. *Metro Tasmania Annual Report*. Tasmanian Government: Hobart.

<sup>&</sup>lt;sup>22</sup> Department for Infrastructure and Transport 2022. 2021-2022 Annual Report. South Australian Government: Adelaide.

<sup>&</sup>lt;sup>23</sup> Department for Infrastructure and Transport 2022. 2021-2022 Annual Report. South Australian Government: Adelaide.

<sup>&</sup>lt;sup>24</sup> D. Graham, A. Fidalgo do Couto, W. Adeney, & S. Glaister 2003. "Economies of scale and density in urban rail transport: effects on productivity."

Transportation Research Part E: Logistics and Transportation Review. 39(6): 443-458.

# than NSW. This clearly demonstrates that excluding concession card holders from the assessment will materially impact on equalisation outcomes, unfairly penalising less dense SUAs with a higher share of concession card holders.

Furthermore, providing urban transport services for equity of mobility is more costly than providing urban transport for commuters. This is for two key reasons:

- 1. The consistent policy across states to have concession fares set at a much lower level than general fares.<sup>25</sup> This reduces the amount of user charge revenue that can be generated.
- 2. Whilst commuter travel is concentrated during peak periods, thereby providing economies of scale in delivering transport services, travel by individuals eligible for concessional fares is much more spread out across the day.<sup>26</sup> As such, services run to meet the demands of concession card holders have lower average occupancy levels and, therefore, increased costs per passenger.<sup>27</sup>
- 3. Urban employment is highly geographically concentrated, further establishing economies of scale for many commuter services. In the 2016 census, 30% of the people who caught public transport to work nationally worked in only two SA2s (the Sydney and Melbourne CBD) and only 9 SA2s account for more than half.<sup>28</sup> The destinations of non-work trips for shopping, community and accessing essential services any much less concentrated and require a much more complex, less well-patronised web of public transport services.

# This highlights that a fit for purpose method for assessing urban transport need should include assessing the task related to transporting concession card holders, rather than only commuters.

However, using trips or passenger kilometres will not provide a policy neutral measure of the urban transport task for different urban areas. This is for a variety of reasons, including:

- Policy decisions to provide more direct routes rather than using hub-and-spoke methods will materially decrease the average travel time of travellers.<sup>29</sup> As discussed, these routes are less efficient because they result in lower average occupancy on public transport. This will not impact on the urban transport task.
- Policy decisions to provide more frequent services will also materially decrease the average travel time of travellers. Again, this will result in lower average occupancy on public transport, whilst not impacting on the urban transport task.
- In less dense SUAs, public transport services will have to travel further to provide an equal level of service. As public transport is provided as a safety net for equity of mobility, and its users include the elderly and the disabled, it is not a policy choice to run routes through suburban streets. These routes **must** be easily accessible for all members of society. This will materially increase average travel time and the overall transport task.

None of the above factors will impact the total distance to the destination, which is currently the only measure of network complexity in the Commission's model. As such, using distance travelled is an inappropriate measure as policy decisions in one SUA to provide more services relative to need compared to another SUA could materially impact assessed need. This shortcoming is currently embedded in the urban transport model and further demonstrates its lack of fitness for purpose and the high level of policy contamination within the assessment.

<sup>&</sup>lt;sup>25</sup> Concession fares apply in every Australian capital. Generally, these fares are at least 50 per cent lower than a non-concessional fare. Consistently, concession fares apply for children aged 14 and under; secondary students; concession card holders; DVA Health card or gold Veteran Card holders; Senior card holders; tertiary and post-secondary students; low-income health card holders; asylum seekers; and vision impaired individuals.

<sup>&</sup>lt;sup>26</sup> Department of Main Roads and Transport 2020. *Queensland Household Travel Survey*. Queensland Government: Brisbane.

<sup>&</sup>lt;sup>27</sup> D. Horcher & A. Tirachini 2021. "A review of public transport economics." Economics of Transportation. 25: 100196.

<sup>&</sup>lt;sup>28</sup> Australian Bureau of Statistics. 2016 Census.

<sup>&</sup>lt;sup>29</sup> A. Gschwender, S. Jara-Diaz, & C. Bravo 2016. "Feeder-trunk or direct lines? Economies of density, transfer costs and transit structure in an urban context." Transport Research Part A: Policy and Practice. 88: 209-222; K. Gkiotsalitis 2022. "Coordinating feeder and collector public transit lines for efficient MaaS services." *EURO Journal on Transportation and Logistics*. 11: 100057.

Per capita minutes on public transport would be a more policy neutral measure that better reflects the relative task faced in different SUAs. This is as per capita minutes on public transport can:

- Better measure the urban transport task because it reflects each networks complexity, accounting for the need for less direct routes and necessary use of slower modes in lower density SUAs and SUAs with a higher proportion of the urban transport task dedicated to concession card holder trips.
- Be a more policy neutral measure of the task because it adjusts for higher levels of service, offsetting the generation of induced demand.

To illustrate the current model's shortcomings, using the data in Table 2.3, a potential policy neutral fare revenue raising capacity between NSW and SEQ can be derived. The differential fare revenue raising capacity of the two networks is shown in Table 2.4:

	NSW	SEQ	Percent difference
Relative fare revenue capacity per trip (ratio)	1.00	0.84	16%
Relative fare revenue capacity per passenger km (ratio)	1.00	0.60	40%
Relative fare revenue capacity per passenger travel hour (ratio)	1.00	0.40	60%

#### Table 2.4: Fare revenue raising capacity in NSW & SEQ.<sup>30</sup>

Source: Queensland Treasury (Refer to Appendix A.2, Table A.32).

As displayed in Table 2.4, there are three measures that needed to be calculated to derive each networks' fair revenue raising capacity from a policy neutral perspective:

- Fare revenue raising capacity by trip. This measure accounts for the differences in fare revenue raising capacity given the differential proportion of concession card holders in the NSW and SEQ networks. It shows that fare revenue raising capacity per trip (excluding any network complexity measure) is **16 per cent lower** in SEQ than NSW.
- Fare revenue raising capacity by passenger kilometres. This measure demonstrates the difference in fare revenue raising capacity because of economies of density, and the increased task facing SEQ compared to NSW given lower population densities and more dispersion. This measure indicates that revenue raising capacity is **40 per cent lower** in SEQ than NSW. This calculation implicitly includes the differential generated by concession card holder fares.
- Fare revenue raising capacity by passenger minutes on public transport. This measure demonstrates the difference in fare revenue raising capacity if both networks provided the same level of services. This indicator suggests that fare revenue raising capacity per travel hour is **60 per cent lower** in SEQ compared to NSW. This calculation implicitly includes the differential generated by concession card holder fares and economies of density.

Only the third method will provide a policy neutral and fit for purpose measure of NSW's and SEQ's relative fare raising capacity. Overall, this analysis indicates that fare revenue raising capacity is substantially lower in SEQ compared to NSW because of higher concessional travel need, economies of density, and differences in levels of servicing. The analysis is further discussed in *Appendix A*.

In contrast to their capacity to raise two and a half times as much fare revenue as in SEQ, the actual farebox recovery ratio was only 18 per cent higher in NSW compared to SEQ.<sup>31</sup> Indeed, as was discussed

<sup>&</sup>lt;sup>30</sup> Further analysis and discussion of this issue is provided in Appendix A.2 with calculations compiled and summarised in Tables A.27-32. Fare revenue per 25 passenger kilometres and per travel hour uses average length of trip data for NSW and SEQ.

<sup>&</sup>lt;sup>31</sup> This figure is from before COVID-19. The calculations in Table 2.4 and Table 2.5 represent relative farebox recovery ratios in 2023. As was discussed in Queensland's *Tranche 1 submission*, commuter numbers have materially decreased in Sydney compared to Brisbane as a result of the COVID-19 Pandemic. This means that if conditions returned to as they were in 2017-18, NSW's farebox recovery ratio relative to SEQ's would **increase** compared to the calculations shown in Table 2.3 (in the NSW (modelled) column).

at length in Queensland's *Tranche 1 submission*, net operating expenses in Sydney (NSW) are significantly higher than in comparable international networks.<sup>32</sup>

Using the analysis shown in Table 2.4, the farebox recovery ratio of the NSW network if it was servicing at an equal level as the SEQ network can be estimated. These estimates are displayed in Table 2.5:

	SEQ	NSW
Farebox recovery ratio (actual)	0.21	0.25
Farebox recovery ratio (equalised servicing)	0.21	0.53

#### Table 2.5: Farebox recovery ratios in SEQ and NSW.<sup>33</sup>

Source: The Independent Pricing and Regulatory Tribunal of NSW; TransLink; Queensland Treasury (Refer to Appendix A.2, Table A.31).

Based on the farebox recovery ratios derived in Table 2.5, **if the NSW network was servicing at the same level as the SEQ network, it would be able to raise 115 per cent more fare revenue** than is currently being raised. This would increase the farebox recovery ratio from 25 per cent to 53 per cent for the NSW network, whilst the farebox recovery ratio for SEQ would be 21 per cent in both scenarios.<sup>34</sup>

Therefore, based on this analysis, this suggest that if NSW's transport network was servicing at the same level as Queensland's urban transport network, it is estimated its fare revenue collected would increase by **over \$1.7 billion per annum.**<sup>35</sup> Table 2.6 displays the assumed per capita urban transport need in NSW and Queensland under a range of scenarios.

### Table 2.6: Estimated urban transport per capita assumed need under different assessment conditions.<sup>36</sup>

	NSW	QLD	Difference
Current assessment	719	432	- 287
EPC	657	657	0
Urban population shares	663	640	- 23
Blended concession card holders and urban population	655	669	14
Actual	741	559	- 181
Equalised servicing	527	559	33

Source: Commonwealth Grants Commission for Current assessment, EPC, Urban population shares, Blended, and Actual; Queensland Treasury for Equalised servicing (Refer to Appendix A.2, Tables A.27-A.32).

As can be seen, given the increased fare revenue NSW could raise if they serviced public transport at the same level as Queensland (shown as the *equalised servicing* row in Table 2.6), actual urban transport net expenses would be **\$33 per capita higher in Queensland compared to New South Wales.** 

However, in stark contrast, currently, the urban transport assessment assesses Queensland as having **\$287 per capita less urban transport need** compared to NSW.

Indeed, of all the other scenarios shown in Table 2.6, the closest to correctly assessing the comparative urban transport need is under a blended approach between urban population shares and concession card holder shares. This method would still underestimate Queensland's urban transport need compared to NSW's, likely correlated with Queensland's higher share of school students (*discussed further in Issue 3*).

<sup>&</sup>lt;sup>32</sup> Infrastructure Australia 2018. *Outer Urban Public Transport – Improving accessibility in lower-density areas*. Australian Government: Canberra; The Independent Price and Regulatory Tribunal of NSW 2015. *Efficiency of NSW public transport services*. NSW Government: Sydney; C. Tsai, C. Mulley, & R. Merkert 2015. "Measuring the cost efficiency of urban rail systems." *Journal of Transport Economics and Policy*. 49(1): 17-34.

<sup>&</sup>lt;sup>33</sup> The Independent Pricing and Regulatory Tribunal of NSW 2020. *Final Report: Maximum opal fares 2020-2024*. NSW Government: Sydney; TransLink 2018. *TransLink Tracker*. Department of Transport and Main Roads: Brisbane. This is based on pre-COVID farebox recovery ratios.

<sup>&</sup>lt;sup>34</sup> This would put Sydney's farebox recovery ratio at a level to comparable cities in Canada. For example, the pre-COVID farebox Recovery Ratio for the Toronto Transit Commission was 68 per cent for 2018. The PWD of Toronto at the Census Tract level is 2,881. This is roughly equivalent to SA4 subdivisions, for which Sydney SUA has a PWD of 2,674. Statistics Canada 2020. "Archived – Proximity to Public Transportation in Canada's Metropolitan Cities, and related Commuting Data." 2 June. Accessed 18 December. Available at https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2310028601; Toronto Transit Commission 2018. *Annual Report*. Toronto Transit Commission: Toronto. Other Farebox Recovery Ratios include 58 per cent in Montreal (PWD of 2,728) and 54 per cent in Vancouver (PWD of 2,619). Canadian Urban Transit Association 2023. *Re-Attracting Customers Through Fare Policy*. CUTA: Ottawa.

<sup>&</sup>lt;sup>35</sup> Detailed methodologies are summarised in Appendix A.2 and summarised in Table A.32 based on analysis presented in Tables A.27-31.

<sup>&</sup>lt;sup>36</sup> The blended approach uses 50 per cent concession card holder shares and 50 per cent urban population shares. Detailed methodologies are summarised in Appendix A.2 and summarised in Table A.31.

These substantial differences are present because **the urban transport model is based solely on commuter need and heavily skewed by policy choices**. Meanwhile, the data in Table 2.6 further demonstrates that fare subsidy policies and overservicing in the NSW network is materially contributing towards increased net expenses.

Overall, this analysis clearly demonstrates that the current urban transport assessment is not adequately assessing relative urban transport need. As such, the urban transport regression model should be replaced in both the expense and investment assessments.

A substantial driver of the higher cost of providing urban transport in SEQ compared to NSW is the proportion of the task **related to providing services to concession card holders.** As such, it is imperative the Commission recognises the need for urban transport as a service for equity of mobility in their assessment. Continuing to use commuters as a proxy for urban transport need will deliver outcomes inconsistent with equalisation. These factors indicate the most appropriate assessment method for urban transport would include a blending of urban population shares and concession card holder shares.

#### Importance of urban transport in regional urban centres as a service providing equity of mobility.

#### Summary of Issue

Principles violated:

- Practicality fit for purpose.
- What states do.

The use of commuters as a proxy for urban transport need is even more problematic in regional urban areas, where the public transport services are primarily provided for concession card holders and as a means for equity of mobility. This highlights that the current urban transport model, including when applied to regional urban areas, is not fit for purpose or a reflection of what states do.

#### Detailed discussion of Issue

Those who cannot drive or cannot afford to drive in regional areas **must still be able to access essential services. This requires a minimum level of government provision of urban transport in regional centres.** 

Meanwhile, the proportion of the urban transport task being for concessional travel is significantly higher in regional urban centres compared to major cities. In these centres, urban transport is run less frequently and fulfils specific community service needs. For example, only 1 per cent of workers commute by public transport in regional Queensland compared to 14 per cent in Brisbane.<sup>37</sup>

This will result in higher net operating expenses per capita in these regional centres given the lower fare revenue raising capacity from concession card holders. As such, the urban transport need in these centres is being severely underestimated by any urban transport assessment using commuters as a proxy.

Urban transport as a government service providing equity for mobility occurs in two forms:

- 1. The provision of public transport. Public transport is subsidised in almost all urban areas in Australia. Outside of major cities there is a very limited urban transport task but still a significant concession card holder urban transport task providing equity of mobility.
- 2. Taxi and rideshare subsidy schemes. These schemes are operated in every state and provide transport for those who require assistance for mobility. In general, a 50 per cent subsidy of the total taxi fare up to a cap with an additional loading for wheelchair users. A total of 1.2 million trips are undertaken annually through the taxi subsidy scheme in Queensland.

There will be a need for subsidised taxi services in all areas, including major cities, to provide services to those who cannot access public transport. However, the provision of accessible public transport in urban

<sup>&</sup>lt;sup>37</sup> Department of Transport and Main Roads 2017. How Queensland Travels report. Queensland Government: Brisbane.

areas can divert demand for these schemes. In less dense regional SUAs it is not practical for public transport to run to all localities, resulting in an increased provision of taxi subsidisation services. As taxi subsidy schemes are significantly more expensive per trip, more dense urban areas in major cities should have **lower costs** associated with the provision of equity of mobility for concession card holders compared to regional urban areas.<sup>38</sup>

These costs are still a reflection of the urban transport task and reflect the need for states to provide services for equity of mobility regardless of where individuals live. None of this need is captured by the current urban transport model.

Overall, the higher net cost of running services in regional urban areas and the increased reliance on taxi subsidy schemes to provide equity of mobility will increase urban transport costs in regional SUAs. As such, it is important for the Commission to assess the needs of these areas using urban population shares **and** concession card holder shares for all SUAs in Australia so that true urban transport need can be assessed. Overall, this further demonstrates that the most appropriate assessment of urban transport need would blend urban population share and concession card holder shares.

#### Importance of school transport as a government service.

#### Summary of Issue

Principles violated:

- Practicality fit for purpose.
- What states do.

The provision of school transport services is not determined by the number of concession card holders or by urban population share. The need for school transport is similar across major cities and regional urban areas, however there is an increased need for school transport in non-urban areas.

Overall, the inclusion of both urban and non-urban school transport within the urban transport assessment is not appropriate and does not reflect the need for these services. A fit for purpose assessment of school transport need would differentially assess urban and non-urban school transport based on school student shares.

#### Detailed discussion of Issue

A significant proportion of the urban transport task is providing services for school students. For example, in 2022-23, Queensland's *School Transport Assistance Scheme* alone cost \$211 million. This task is equal, if not larger given economies of scale, in regional urban centres compared to major city urban centres.

Indeed, Queensland *Household Travel Survey* data demonstrates that the regional urban centres of Hervey Bay (33 per cent) and Cairns (66 per cent) both have a higher proportion of school trips on public transport than Greater Brisbane (30 per cent).<sup>39</sup> This indicates that the usage of public transport for school trips is either steady or increases as urban density decreases and is needed across all urban areas. As with concession card holders, the cost recovery capacity for transporting school students is limited.

Given different states have significantly different shares of school students, the relative task of transporting school students will vary across states. As such, assessing school transport need using the urban transport regression or urban population is not an accurate reflection of the urban or non-urban school transport task.

Furthermore, the urban transport assessment currently assesses non-urban school transport. Whilst the need for school transport is generally equivalent across urban areas, there are additional pressures

 <sup>&</sup>lt;sup>38</sup> As discussed, public transport services have an ability to cost recover, particularly in major cities. This is not the case for the taxi subsidy scheme.
 <sup>39</sup> Department of Transport and Main Roads 2017. *How Queensland Travels report*. Queensland Government: Brisbane.

increasing need in non-urban areas. This was illustrated by the *Household Travel Survey 2017* which found higher patronage on public transport for school trips in all rural (non-urban) areas compared to Greater Brisbane, including 52 per cent in Mackay, 47 per cent in Bundaberg, and 41 per cent in Whitsunday.<sup>40</sup>

This is largely driven by a lower level of active transport in these areas given the larger distances needed to be travelled.<sup>41</sup> These increased travel distances will also result in higher cost for delivery of non-urban school transport services. As such, states with a larger non-urban population will have an increased need for non-urban school transport.

Overall, this further demonstrates the need for a detailed review and renewal of the urban transport assessment. Given the substantially different tasks facing states, both because of differential shares of urban and non-urban school students, the Commission should differentially assess these components separately to the rest of the urban transport expenses and investments.

#### Summary of principles affected

For the Commission to justify an assessment method, it should be aligned with its guiding principles. As was discussed in Queensland's *Tranche 1 submissions*, the current urban transport assessment violates the key principles of practicality, policy neutrality, and contemporaneity. The issues related to the assessment not considering concession card holders as part of the task also violates the principle of what states do, as well as further violating the practicality and policy neutrality principles.

#### Practicality – fit for purpose

As discussed above, the current urban transport assessment only uses commuters to proxy total urban transport need. This is not an accurate proxy for urban transport need, with commuters only accounting for 30 to 40 per cent of urban transport need. Furthermore, providing urban transport for commuters generally has a higher level of cost recovery, given the concentration of travel during peak hours and that higher farebox revenues can be raised compared to concession card holders and school students.

Given this, the current urban transport model is only assessing a fraction of the total urban transport task. This makes the assessment not fit for purpose.

#### What states do

# The current urban transport assessment assumes that the urban transport task – what states do – is provide public transport only for commuters. This is not reflective of what states do.

Provision of commuter services represents a small portion of the state task, with an important part of what states do being the provision of urban transport, including for pensioners and other concessional travellers, in order to provide equity of mobility. The cost of providing these services is significantly greater than the cost of providing services to commuters, while these passengers also require a higher level of government subsidy per trip. Furthermore, the need for mobility in regional urban areas means that the urban transport task is present across all SUAs.

#### **Policy neutrality**

The current assessment assumes that states have an equal ability to cost recover despite significantly differential proportions of passengers being concession card holders. This violates the policy neutrality principle.

As discussed above, the proportion of concession card holders, economies of density, and the level of servicing substantially impacts the farebox recovery ratio. A principled urban transport assessment would assess urban transport need if states serviced public transport at an equal level. The urban transport

<sup>&</sup>lt;sup>40</sup> Department of Transport and Main Roads 2017. *How Queensland Travels report.* Queensland Government: Brisbane.

<sup>&</sup>lt;sup>41</sup> Department of Transport and Main Roads 2017. How Queensland Travels report. Queensland Government: Brisbane.
regression model's inability to assess the task in a policy neutral manner is materially affecting equalisation outcomes.

#### Changes to assessment sought

Given the urban transport assessment is currently not fit for purpose, equalising to policy decisions rather than need, and is not assessing need for most of the urban transport task, Queensland considers the urban transport assessment is actively undermining equalisation efforts.

Queensland considers it imperative to change the urban transport assessment. Fundamentally, this assessment would need to measure the underlying need for urban transport in each SUA in a policy neutral manner and recognise the pivotal role state government plays in providing urban transport as a means of equity of mobility. Given the policy contamination of the public transport expenses data, it is the view of Queensland that it would be impractical and inappropriate to develop any alternative model for the urban transport assessment using this data.

## To develop a policy neutral and fit for purpose urban transport assessment, Queensland <u>recommends</u> the Commission make the following changes:

- Change 1 Discontinue the use of the urban transport regression model and population-squared variable in the urban transport expenses and urban transport investment assessments.
- Change 2 Differentially assess states' urban school transport task.
- Change 3 Differentially assess states' non-urban school transport task.
- Change 4 Assess remaining urban transport expenses and investments as 50 per cent urban population and 50 per cent number of concession card holders.

Along with these changes, Queensland also recommends that the Commission re-evaluate the allocation of GFS codes between components.

Given these recommendations, Queensland's proposed positions and changes required to key elements of the transport expenses and investment assessments are outlined in Tables 2.7.

Further, a table detailing proposed changes to specific GFS codes related to variables in the model to further improve the validity and specification of the model is included in Appendix A.3 to this submission.

Drivers	Commission justification for inclusion or exclusion of driver in current assessment	Queensland recommendation	Queensland position
Urban transport expenses			
Urban centre characteristics (Urban transport regression model)	The driver is supposed to assess the demand for and cost of providing urban transport according to city specific characteristics. In the current assessment it is weighted 75 per cent.	The model is not fit for purpose and is redistributing GST based on policy decisions rather than urban transport need. Queensland recommends that the Commission removes the model as a driver in the transport assessment.	Do not support

#### Table 2.7: Urban transport component expenses – Queensland positions

Urban population	This driver assesses the proportion of the state population living in urban centres. In the current assessment it is weighted at 25 per cent.	This driver recognises that states with a higher proportion of their population living in urban areas will have a greater urban transport task for commuters and non- concessional travel. To assess this component of the urban transport task, Queensland recommends that urban population shares are weighted at 50 per cent for the urban transport expenses assessment.	Support
Concession card holders	This driver is not currently assessed, with the current methodologies ignoring the urban transport task related to equity of mobility.	This driver recognises the increased need for public transport services for concession card holders, and the increased net expense associated with providing public transport services to concession card holders. To assess for the proportion of the task related to equity of mobility, Queensland recommends that concession card holder shares are weighted at 50 per cent for the urban transport expenses assessment.	Support
	Urban school transp	oort expenses <sup>[Note 1]</sup>	
Urban population	This driver assesses the proportion of the state population living in urban centres. In the current assessment it is weighted 25 per cent.	This driver is inappropriate for assessing school transport need, as urban population shares are not necessarily correlated with number of urban school students.	Do not support
Number of school students in urban areas	This driver is not currently assessed, with the current methodologies ignoring the urban transport task related to providing services for school students.	This driver recognises that states with a higher proportion of urban school students have an increased need to provide urban school transport services. Queensland recommends that this driver is weighted at 100 per cent for this component.	Support
Non-urban school transport expenses [Note 1]			
Urban population	This driver assesses the proportion of the state population living in urban centres. In the current assessment it is weighted 25 per cent.	This driver is inappropriate for assessing rural school transport need, as these students do not live in urban areas.	Do not support

Number of scho students in non areas	ool -urban	This driver is not currently assessed, with the current methodologies ignoring the transport task related to providing services for rural school students.	This driver recognises that states with a higher proportion of non- urban school students have an increased need to provide non- urban school transport services. Queensland recommends that this driver is weighted at 100 per cent for this component.	Support
		Non-urban trans	sport expenses	
Population		This is an equal per capita assessment.	An EPC assessment is not appropriate for non-urban transport. It does not appropriately recognise inherent drivers of non- urban transport need.	Do not support
Population livin than 400kms fro GCCSA.	g more om the	This driver is not currently assessed, with the current methodologies ignoring need for non-urban transport related to travelling from regional and rural areas of a state to the capital city to access services.	This driver recognises that states with a higher proportion of their population living outside of the GCCSA will have a greater non- urban transport task. Queensland recommends that population living outside GCCSA shares are used as the driver of need for the non- urban transport assessment.	Support
Urban transport investment				
Urban centre characteristics (Urban transport regression model)	The drive demand urban tra specific c assessme	er is supposed to assess the for and cost of providing ansport according to city characteristics. In the current ent it is weighted 75 per cent	The model is not fit for purpose and is redistributing GST based on policy decisions rather than urban transport need. Queensland recommends that the Commission removes the model as a driver in the transport assessment.	Do not support
Population- squared variable	The drive demand urban tra In the cu weighted	er is supposed to assess the for and cost of providing ansport given population size rrent assessment it is I 25 per cent.	<ul> <li>The model is not fit for purpose and is redistributing GST based on policy decisions rather than urban transport need.</li> <li>Queensland recommends that the Commission removes this variable as a driver in the transport investment assessment.</li> </ul>	Do not support
Urban population	This drive	er is not currently assessed.	This driver recognises that states with a higher proportion of their population living in urban areas will have a greater urban transport task. To assess this	Support

		component of the urban transport task, Queensland recommends that urban population shares are weighted 50 per cent for the urban transport investment assessment.	
Concession card holders	This driver is not currently assessed, with the current methodologies ignoring the urban transport task related to equity of mobility.	This driver recognises the increased need for public transport services for concession card holders, and the increased net expense associated with providing public transport services to concession card holders. To assess for the proportion of the task related to equity of mobility, Queensland recommends that concession card holder shares are weighted 50 per cent for the urban transport investment assessment.	Support
	Urban school transport	investment <sup>[Note 1]</sup>	
Number of school students in urban areas	This driver is not currently assessed, with the current methodologies ignoring the urban transport task related to providing services for school students.	This driver recognises that states with a higher proportion of urban school students have an increased need to provide urban school transport service investment. Queensland recommends that this driver is weighted at 100 per cent for urban school transport investment.	Support
Non-urban school transport investment [Note 1]			
Number of school students in non-urban areas	This driver is not currently assessed, with the current methodologies ignoring the transport task related to providing services for rural school students.	This driver recognises that states with a higher proportion of non- urban school students have an increased need to provide non- urban school transport service investment. Queensland recommends that this driver is weighted at 100 per cent for non-urban school transport investment.	Support
Non-urban transport investment			
Population	This is an equal per capita assessment.	An EPC assessment is not appropriate for non-urban transport. It does not appropriately recognise inherent	Do not support

		drivers of non-urban transport need.	
Population living outside GCCSA	This driver is not currently assessed, with the current methodologies ignoring need for non-urban transport related to travelling from other areas of a state to the capital city to access services.	This driver recognises that states with a higher proportion of their population living outside of the GCCSA will have a greater non- urban transport task. Queensland recommends that population living outside GCCSA shares are weighted 50 per cent in the investment assessment.	Support

Note 1: Urban school and non-urban school transport are currently assessed with urban transport. As such, they are currently assessed using the not fit for purpose urban transport regression model and population-squared variable in the expenses and investment assessments. Queensland does not support the use of these drivers in any assessment, including the school transport assessments.

#### Rationale underpinning key changes sought by Queensland

Change 1 – Discontinue the use of the urban transport regression model and population-squared variable in the urban transport expenses and urban transport investment assessments.

A detailed discussion for the discontinuation of the urban transport regression model is provided in the transport section of Queensland's Tranche 1 submission.

The urban transport regression model is not policy neutral, contemporaneous, quality assured, fit for purpose, simple, or a reflection of what states do. The continued usage of this model to assess urban transport expense or investment need would undermine fiscal equalisation.

As the population-squared variable used in the urban transport investment assessment represents a simplistic version of the regression model, its usage should also be discontinued. (*This is further discussed in the Investment section of this submission*).

#### Change 2 – Differentially assess states' urban school transport task.

Note: Currently, expenses for both non-urban and urban school transport are assessed in the urban transport assessment.

As discussed above, a significant proportion of the urban transport task is transporting school students. As discussed above, the need for urban school transport services is either steady or increases as urban density decreases. As such, these services are needed across all urban areas. Given this, the urban school transport task is likely directly related to the number of school students in a state. Therefore, urban population shares would not be an accurate reflection of the urban school transport task.

Consequently, Queensland <u>recommends</u> the Commission differentially assess states' urban school transport needs based on their share of the number of school students in urban areas (based on the location of the school).

#### Change 3 – Differentially assess states' non-urban school transport task.

Note: Currently, expenses for both non-urban and urban school transport are assessed in the urban transport assessment.

There are additional pressures increasing school transport need in non-urban areas. This was illustrated by the *Household Travel Survey 2017* which found higher patronage on public transport for school trips in all rural (non-urban) areas compared to urban areas.<sup>42</sup> Furthermore, the average travel distance to school is significantly higher in non-urban areas, which will also result in higher cost per capita for delivery of

<sup>&</sup>lt;sup>42</sup> Department of Transport and Main Roads 2017. How Queensland Travels report. Queensland Government: Brisbane.

non-urban school transport services. As such, states with a larger non-urban population will have an increased need for school transport.

As such, Queensland <u>recommends</u> the Commission differentially assess states' non-urban school transport needs separately to urban school transport needs. This assessment should be based on states' share of the number of school students in non-urban areas (based on the location of the school).

### Change 4 – Assess remaining urban transport expenses and investments as 50 per cent urban population and 50 per cent number of concession card holders.

The arguments discussed above outline Queensland's rationale for recommending that 50 per cent of non-school urban transport expenses be assessed using the number of concession card holders. As discussed, concession card holders are more likely to travel outside of peak which is associated with higher delivery costs due to economies of scale. Furthermore, given the policy consistent position to provide services to concession card holders at a lower rate than commuters, there is a decreased ability for states to raise user charge revenue from these passengers. Overall, this will result in higher net operating costs for states with a higher share of concession card holders.

The remaining 50 per cent of urban transport expenses should be assessed according to urban population share. Queensland believes that there is a valid conceptual case for assessing commuter urban transport need using population and that it would improve the urban transport assessment. This is for a range of reasons, including:

- The substantial volume of academic literature that suggests the presence of constant returns to scale for urban transport networks. This would suggest that costs are the same regardless of population size.<sup>43</sup> Thus, an assessment according to urban population share is the most appropriate method.
- The substantial volume of academic literature and international experience that unanimously suggests economies of density in heavy rail networks. This would suggest that costs would be higher in lower PWD SUAs.<sup>44</sup> Assessing urban transport need according to urban population shares would ensure there are no policy influenced distortions that are currently driving redistribution that are in contrast to economies of density.
- The significant literature that suggests that Sydney's urban transport network is providing more services relative to need compared to other urban transport networks Australian and global cities. The costs being associated with PWD in the model are largely driven by this level of servicing policy as opposed to actual need.<sup>45</sup> Given Sydney's dominance in the current assessment, states are funding policy decisions to increase servicing levels, meaning Sydney is being incentivised to increase public transport expenditure above actual need. Assessing urban transport need according to urban population shares would prevent this perverse distortion.

Assessing urban transport need according to urban population share and share of concession card holders would prevent further undermining of fiscal equalisation by the not fit for purpose and policy contaminated urban transport model. It would produce an assessment based on need for urban transport

<sup>&</sup>lt;sup>43</sup>This literature includes (1) D. Graham 2008. "Productivity and efficiency in urban railways: Parametric and non-parametric estimates." *Transportation Research Part E: Logistics and Transportation Review*. 44(1): 84-99; (2) I. Savage 1997. "Scale economies in United States rail transit systems." *Transportation Research Part A: Policy and Practice*. 31(6): 459-473; (3) D. Graham, A. Fidalgo do Couto, W. Adeney, & S. Glaister 2003. "Economies of scale and density in urban rail transport: effects on productivity." *Transportation Research Part E: Logistics and Transportation Review*. 39(6): 443- 458. A comprehensive literature review is provided in Appendix A.4.

<sup>&</sup>lt;sup>44</sup> This literature includes (1) F. Mizutani 2004. "Privately owned railways' cost function, organisation size and ownership." *Journal of Regulatory Economics*. 25(3): 297-322; (2) P. Sanchez & J. Villaroyya 2000. "Efficiency, technical change and productivity in the European rail sector: a stochastic frontier approach." *International Journal of Transport Economics*. 27(1): 55-76; (3) N. Wills-Johnson 2010. "Cost functions for Australia's railways." *Journal of Infrastructure Systems*. 17(1): 1-14. A comprehensive literature review is provided in Appendix A.4.

<sup>&</sup>lt;sup>45</sup> This literature includes (1) Infrastructure Australia 2018. *Outer Urban Public Transport – Improving accessibility in lower-density areas.* (2) The Independent Pricing and Regulatory Tribunal of NSW 2015. *Efficiency of NSW public transport services.* (3) C. Tsai, C. Mulley, & R. Merkert 2015. "Measuring the cost efficiency of urban rail systems." *Journal of Transport Economics and Policy.* 49(1): 17-34. A comprehensive literature review is provided in Appendix A.4.

in a policy neutral manner, ensuring that there is no distortion of GST relativities, and no compensation or incentivisation of public transport policy decisions.

#### Proposed changes to non-urban transport assessment – in support of position in Tranche 1 submission

Queensland's *Tranche 1 submission* recommended that non-urban transport need be assessed using regional population shares. After undertaking further detailed investigations to clarify Queensland's position on this proposed change, Queensland <u>recommends</u> that the most appropriate data to measure regional population would be the population share of those living more than 400km outside of a Greater Capital City Statistical Area.

This population corresponds with each states need to transport individuals from outside capital city areas into these areas to access specialised essential services. It recognises that there is a limited task in providing transport for people living in capital cities to other areas of the state.

#### Proposed changes and GFS COFOG-A codes for transport assessments

The above proposed changes necessitate adjustments to the current allocation of GFS expense categories.

As indicated above, a detailed table is included in Appendix A.3 of this submission, outlining the specific changes to GFS categories and codes required to help facilitate these changes.

### 3. Health

#### **Proposed issues**

In response to the Commission's Tranche 1 consultation paper, some other states, primarily Western Australia, put forward a range of proposals. In particular, these proposals raised the following questions in relation to the Health assessment:

- Should the Commission change its methodology for calculating the substitutable expense for the non-state sector (NSS) adjustment, and increase the substitutability rates for all components to reflect this change?
- Separate to the proposed changes above, should the Commission change the substitutability rate of the NSS adjustment?
- Should the Commission change the current method of National Weighted Activity Unit (NWAU) averaging?

#### Summary – Queensland response and position

In its Tranche 1 submission Queensland broadly supported the overall approach to assessing health subject to a number of specific changes (changes in volume driver and applying a discount to NHRA Commonwealth payment).

Western Australia, through its submission, has argued for changes to the non-state services (NSS) adjustment to the assessment, suggesting that the Commission should focus on state expenses that have already been replaced by existing non-state services, rather than expenses that could be replaced if the non-state sector were to grow. Queensland considers that this relationship is more nuanced than Western Australia's analysis would suggest and that any non-state sector service provision is likely to be at the margin. Thus, the current proportions already likely reflect a ceiling for this activity.

The changes proposed to the substitutable expenses formula by Western Australia are based around the assumption that the majority of NSS activity could be absorbed by the state sector. However, capacity constraints would indicate that only part of existing public sector activity would be displaced. Further proposed changes from Western Australia to include self-funded patients in the substitutability rate are also not supported, as this group is not considered to be comparable with patients covered by private health insurance (who are removed from the assessment).

Any reductions in the discount applied to the substitutability rate are also not supported, as Queensland agrees with the Commission's assessment that the level of potential substitutability is likely overstated.

Northern Territory, in its submission, has proposed that the Commission should place greater weighting on actual NWAU. Queensland supports this change, noting that NWAU are a more genuine reflection of underlying health needs while current averaging processes mask meaningful variations among states.

Each of these proposed changes and Queensland's position on them is discussed in further detail below.

Question raised by another state: Should the Commission change its methodology for calculating the substitutable expense for the NSS adjustment, and increase the substitutability rate for all components to reflect this change?

#### **Queensland position**

Queensland <u>does not support</u> the proposed changes to the substitutable expense calculation of the NSS adjustment for all health components, nor the associated proposed changes to the substitutability rates.

#### Key issues and detailed explanation of rationale supporting Queensland's position

The CGC applies a NSS adjustment to health services to account for different levels of private sector provision in similar regions between states, based on the proportion of state spending on services that could potentially be provided by the NSS.<sup>46</sup>

The NSS adjustment occurs at the margin between state and NSS provision; with the bulk of the adjustment to the health assessment performed by the socio-demographic characteristics (SDC) assessment, which captures differences in the ability to access NSS health services, and increased state activity in regions where the NSS does not exist.

Nevertheless, the NSS adjustment *could* be broadly interpreted as a judgement about the degree to which the NSS relieves an ostensible health services "burden" that the public sector would otherwise have to bear. Some states (e.g., Western Australia) argue that the very existence of NSS reduces the volume of state health activity, however Queensland considers the reality of health service provision is more nuanced.

Queensland acknowledges there is a link between state and NSS service provision, however it exists at the margin, and is unlikely to exist at large. Instead:

Some of the activity performed in the state sector *could* be performed by the NSS, although:

- it is likely to be a small proportion of state sector activity, even in theory.
- the proportions already estimated by the CGC likely represent the ceiling, in practice, of potential substitutability.

Unmet need still exists within the 'public sector' as broadly defined, including individuals who are unable to afford private services and extending to universal waiting lists and untreated conditions. That is, the state sector is *less of a substitute and more a critical safety net* for the NSS, which by its nature pursues commercial returns.

Numerous academic studies suggest that the existence – or enlargement – of the NSS does *not* significantly reduce activity, wait times, or costs incurred in the state sector. The link and interaction between the state and NSS is an essential assumption in the NSS adjustment methodology, and this should be considered more broadly when estimating substitutability. (Duckett 2020, Melbourne Institute 2023).<sup>47,48</sup>

Figure 3.1 below shows a visualised representation of the Commission's current NSS adjustment methodology (depicted in green), as well as WA's proposed changes (depicted in red). It indicates how the Commission's existing methodology already is designed to calculate the marginal adjustment required to capture the impact of the differences in NSS size between states that is not already captured by the SDC assessment. As such, the proposal for change from Western Australia is not necessary or appropriate, as the impact is already reflected in the SDC adjustment.

<sup>&</sup>lt;sup>46</sup> Queensland also notes that the NSS adjustment is unique to the health assessment and is not performed in other sectors, such as education, where public and private services are both provided.

<sup>&</sup>lt;sup>47</sup> The Consequences of Private Involvement in Healthcare – The Australian Experience, Stephen J Duckett. <u>Commentary: The Consequences of Private</u> Involvement in Healthcare – The Australian Experience - PMC (nih.gov)

#### Figure 3.1: Visualised representations of the current and proposed NSS adjustment methodology



In a hypothetical scenario where a NSS ceased to exist nationally – as the submission from WA outlines – it is highly unlikely that the NSS activity would be immediately absorbed by the state sector. Capacity constraints within the public system driven by state's actual need mean that the previous NSS activity would partly displace *existing* public sector activity, partly be added to a waiting list, and partly be withdrawn. This change in activity would simply be captured in public activity within the SDC adjustment.

#### Substitutable expense

Western Australia proposes that the total substitutable expense, for all components of the NSS adjustment, be calculated as:

Total substitutable expense = f(total admitted patient expense) × private patient separations = average state cost per separation × private patient separations

#### Issue 1 – The proposed change weakens the link to the objective of the NSS adjustment

Queensland notes that the objective of the NSS adjustment is to reflect different levels of service provision *at the margin* – that is, where the SDC adjustment has failed to sufficiently account for SES characteristics, remoteness, and access to non-state services on both demand and supply sides. The WA proposal undermines the intent of the adjustment, implying that the majority of NSS activity could readily be absorbed by the state sector. As outlined above, this is not a realistic assumption.

*Issue 2 – It is likely that the average state cost per separation will be considerably overstated* 

Queensland argues that the WA proposal would considerably overstate the total substitutable expense, as:

- Using average state cost per separation assumes that private patient separations have the same average cost as the highly complex and resource-intensive state sector separations. In reality, AIHW data suggests that the average cost per state separation is 14 per cent higher than for private separations.<sup>49</sup>
- It assumes the state would incur the total average state cost per separation both fixed and variable

   if it were to provide the "substituted" NSS activity. However, the state is more likely to incur the
   (much lower) marginal cost.

<sup>&</sup>lt;sup>49</sup> AIHW data suggests the average cost weight of acute separations in 2019-20 for public and private hospitals was 0.95 and 0.82, respectively. Source: Admitted patient care 2019-20, Cost and funding: Table 7.1 Average cost weight of acute separations(a), public acute(b) and private hospitals (2015-16 to 2019-20).

 Interface issues with the Commonwealth sector, which compel states to provide certain volumes of certain services, while leaving states to self-fund other necessary services, inflate the admitted patient expense that would be used to calculate the average state cost per separation.<sup>50</sup>

#### Substitutability rate

Western Australia proposes that, if the NSS ceased to exist, 90 per cent of total NSS activity would be directed to the state sector.

Queensland does not agree with this logic or assumption. The NSS adjustment occurs only at the margin between state and NSS provision; with the bulk of the adjustment to the health assessed expense captured through the SDC assessment.

The WA proposal seeks to consolidate vastly different services. The intent of the NSS adjustment is not to calculate a cost for the entire NSS, as WA proposes, but to instead determine an appropriate *average* level of substitutability (e.g., 15 per cent for admitted patients), and use the component volume driver (i.e., private patient separations) to determine whether states are above or below the average substitutability rate, and therefore have a larger or smaller NSS than average.

As noted above, the WA proposal fails to recognise that NSS activity is, on average, much less complex and resource-intensive than state sector activity. In particular:

- private hospitals receive fewer than 1 per cent of total emergency admissions, instead focusing on generally less complex elective procedures.
- the state sector almost exclusively bears the brunt of more costly and complex services (e.g., reconstructive surgeries required as part of emergency admissions).

Queensland also reiterates that out-of-pocket costs, private health insurance coverage, capacity constraints and waiting times all act to reduce the potential substitutability between sectors.

Question raised by another state: Separate to the proposed changes above, should the substitutable rate of the NSS adjustment be changed?

#### Queensland position

Queensland **<u>does not support</u>** the proposed changes to the substitutability rates.

#### Key issues and detailed explanation of rationale supporting Queensland's position

#### *Issue 1 – Self-funded patients are not substitutable.*

Queensland does not agree with WA's proposed increase to the admitted patient substitutability rate from 15 per cent to 16.4 per cent. The increased rate aligns with WA's proposed inclusion of self-funded patients in the volume driver of the NSS adjustment.

WA argued that self-funded separations *replace* public patient separations in the same way as private health insurance-funded separations do. In effect, WA argues these patients could be considered self-insured.

Queensland does not agree with including self-funded patient separations in the volume driver of the adjustment and considers that the logic underpinning WA's proposal is flawed. The NSS adjustment methodology already removes non-substitutable services, including on grounds of incomparable costs.

Patients choosing to self-fund their private admission pose an even greater cost comparability problem than patients covered by private health insurance (who are removed from the assessment). Self-funding

<sup>&</sup>lt;sup>50</sup> The analysis in Queensland's Tranche 1 health submission, supporting the proposed change to the NHRA Commonwealth payment suggests the cost impact is 20.8 per cent to 23.6 per cent for Queensland. Other states and territories also experience these interface issues.

patients choose to pay significant out-of-pocket costs to receive enhanced service (e.g., reduced waiting time, choice of doctor, higher-quality facilities).

A such, Queensland does not support the inclusion of self-funded patient separations and, therefore, does not support the changes to the substitutability rate proposed by WA as a result.

*Issue 2 – The current discount rate applied in the substitutability rate calculation methodology is appropriate.* 

WA additionally proposed a change to the discount rate applied in the substitutability rate calculation methodology, from the current 33 to 44 per cent to either 12.5 per cent or 25 per cent.

The Commission calculates the current admitted patient component substitutability rate based on two assumptions:

- 1. That private hospitals provide only limited emergency-type admitted services; therefore, only non-emergency admitted services (50–60 per cent of total public admitted patient separations) can be considered substitutable.
- 2. That only 44.9 per cent of the national population has Private Health Insurance (PHI) hospital cover, and a person without PHI will rarely attend a private hospital, regardless of the availability of private health services in their state. The Commission therefore assumes that the upper limit of potential substitutability would be:

 Non-emergency admitted patient separations share × private health insurance hospital coverage
 50-60% × 44.9%
 22-27%

The Commission has stated that it believes this upper limit is overstated, so they reduce the rate of potential substitutability to 15 per cent (thus discounting the above range by between 33 to 44 per cent). WA argues that this discount should be reduced.

Queensland does not support changing the effective discount rate applied to the substitutability rate methodology, as we strongly agree with the Commission's view that the 22–27 per cent range is likely overstated.

The private health insurance coverage rate currently used by the Commission is the best available measure to calculate the admitted patient substitutability rate, however it is important to recognise that PHI policies vary significantly by level of cover and the associated out-of-pocket costs.

PHI utilisation is a more appropriate metric when considering substitutability, but this is not widely reported on. The CGC's discount is applied to recognise and account for this and remains appropriate.

Fewer than 11 per cent of separations in public hospitals are funded by PHI, which suggests that although patients may have PHI coverage, they cannot utilise their policy or choose not to utilise it (due to, for example, out-of-pocket costs or exclusions).<sup>51</sup>

Question raised by another state: Should the CGC change the current method of NWAU averaging?

In response to the Tranche 1 discussion paper, Northern Territory proposed a change to increase the reliance placed on actual NWAU, with less reliance being placed on cohort-averaged NWAUs.

<sup>&</sup>lt;sup>51</sup> Admitted patient care 2021–22; Table S7.3: Separations by funding source, public and private hospitals, states and territories, 2021–22.

#### **Queensland position**

Queensland <u>supports</u> NT's proposed change, and supports better recognition of health need through the blending of actual and assessed NWAU, echoing NT's position, that "the design of the NWAU already alleviates policy neutrality concerns through national price averaging and accounting for the complexity of activity. NWAUs reflect the average cost of treatment of genuine underlying heath needs."

#### Key issues and detailed explanation of rationale supporting Queensland position

#### Issue 1 – Actual NWAU reflects actual need

Queensland's population has a disproportionally higher underlying health need, compared to the average of other states.

The 2017-18 National Health Survey found that, in age-standardised terms, 46.8 per cent of Queenslanders had at least one chronic condition, the third-highest prevalence among all states and territories. The 2022 National Health Survey found that Queensland's rate and relative position had both increased, to 51.7 per cent and the second highest of all jurisdictions respectively.

Despite the disproportionate and challenging health need in Queensland, the current averaging process assesses the state as having a healthier population than it actually does, and attributes higher health activity to a policy choice that implies an "overservicing" of Queenslanders' health needs. The current assessment fails to rationalise why, despite this implied overservicing, Queenslanders continue to have poorer health outcomes than the national average.

A more consistent view, and one that is supported by additional evidence, is that the current averaging process masks both meaningful variation among, and additional need within, states. For Queensland, this greater need is reflected in higher demand for services across the whole health system – including the NSS, which is considered not to be affected by state policy.

Taking hospital services as an example, Queensland's share of total national separations is higher than the state's population share would suggest (Figure 3.2**Error! Reference source not found.**). However, the *proportion* of private separations relative to public hospital separations in Queensland is comparable to that of other states (Figure 3.3), suggesting that Queensland's larger hospital system, private and public, is addressing genuine need.

Figure 3.2: Total hospital separations in Queensland are higher than the state's population share would predict



Figure 3.3: Private hospital separations as a share of total are comparable to that of other states



Sources: Admitted patients - Australian Institute of Health and Welfare (aihw.gov.au) – Table S7.3: Separations by funding source, public and private hospitals, states and territories, 2021–22; National, state and territory population, June 2023 | Australian Bureau of Statistics (abs.gov.au) – States and Territories, Population at 30 June 2023.

Notes: The 45-degree line represents a proportionate share of hospital separations to total population. Tas, ACT and NT private separations data was not available separately and therefore have been grouped.

#### Issue 2 – External factors, reflecting actual need, increase actual NWAU

As referenced in Queensland's Tranche 1 state submission, analysis undertaken in 2022 by Queensland Treasury Corporation into interface issues and their impact on the health care system highlight external factors that contribute to a higher actual NWAU in Queensland.

These factors also reflect actual conditions within the state, rather than policy decisions. The challenges that limit access to primary care, mental health care and aged care services, as observed particularly in Queensland and other states with significant regional and remote populations, drive additional hospital demand, and contribute to a higher actual NWAU.

The combination of Queensland's justifiably higher NWAU per capita, and the Commission's NWAU averaging approach to its SDC assessment unfairly penalises states with higher underlying need. Queensland urges the Commission to consider NT's proposal, which is strongly supported by Queensland, to investigate alternatives to better recognise the difference in health need between states.

### 4. Justice

#### Proposed issues

In response to the Commission's Tranche 1 consultation paper, other state submissions put forward a range of proposals discussing the following positions:

• A central policing costs component should be introduced and assessed EPC while sociodemographic and remoteness costs should be reduced or removed for components of the assessment.

#### Summary - Queensland response and position

Queensland's Tranche 1 submission outlined shortcomings with the justice assessment. In particular, the submission addressed the lack of appropriate assessment of sociodemographic needs for community policing, the need for regional costs to be applied to criminal policing, and the need to introduce a juvenile detention cost weight in the prisons component. Making any, or all, of these changes would be consistent with the Commission's HFE principles and would improve equalisation outcomes.

New South Wales and Victoria both submitted arguments for reducing the assessment of sociodemographic factors in the justice assessment and lowering regional costs, Overall, the major proposed changes from these two submissions were:

- Police
  - Carve out central policing costs from other policing costs and redistribute on an EPC basis without a remoteness weighting.
  - Carve out preventative policing costs and remove sociodemographic drivers.
- Prisons
  - Delay or remove the introduction of a juvenile detention cost weight.
  - Change the cost-weights applied in the prisons model.
  - Assess non-custodial corrective services separately from full-time prisoners.
- Across all components (police, other legal services, criminal courts, prisons)
  - Recognise costs associated with providing justice services in major cities.

Queensland <u>does not support</u> any of these proposed changes as they are not aligned with the Commission's HFE principles and would actively undermine equalisation outcomes. Instead, Queensland <u>recommends</u> the Commission adopt the following changes to the justice assessment:

- Change 1: The consolidation of the policing component with 100 per cent of costs assessed using sociodemographic characteristics and having regional costs applied.
- Change 2: The introduction of a juvenile detention cost weight as soon as practical.

#### **Policing component**

#### Proposal raised by other jurisdiction: **Carve out central policing costs from other policing costs and** *redistribute on an EPC basis without a remoteness weighting.*

New South Wales and Victoria both submitted that central policing costs are separated from other policing costs and redistributed on an EPC basis.

Victoria's submission argued that allocating central police costs<sup>52</sup> to police districts is inappropriate and results in an overweighting of both the remoteness cost factor and the sociodemographic usage factors.

<sup>&</sup>lt;sup>52</sup> Central policing costs have been defined in Victoria's tranche 1 submission as corporate costs related to human resources, corporate finance, IT, and legal services.

New South Wales's submission argued that the model does not appropriately allocate centrally provided police spending across police districts.<sup>53</sup> NSW further argue that remote policing costs are driven by the presence of police stations in small communities to maintain the perception of safety and connectedness to government services rather than being driven by actual occurrence of crime.

Queensland <u>does not support</u> the proposed change as it is in direct breach of the CGC principles of what states do, policy neutrality and practicality, and the change would lead to the redistribution of GST inconsistent with equalisation outcomes. There are several key issues and limitations with this proposal which will be discussed below:

- Issue 1 Splitting out central policing costs is impractical.
- Issue 2 The application of central police services is policy dependent.
- Issue 3 Regional and remote police districts rely more heavily on central policing services as they lack the capability of metropolitan police stations.
- Issue 4 Central policing need and cost are driven by actual policing need.

#### Key issues

#### *Issue 1 – Splitting out central policing costs is impractical.*

The proposed change is not aligned to the CGC's principle of practicality. Splitting out central policing costs from other policing costs is extremely difficult and costs are not specifically allocated in that way at the state level, with any allocation likely to be undertaken differently across states, resulting in distorted measurements of assessed expenses.

Furthermore, there is disparity between the New South Wales and Victorian submissions in defining central policing costs. Currently, not all states provide police data, and further complicating the reporting requirements may result in less states contributing comprehensive data in the future.

#### *Issue 2 – The application of central police services is policy dependent.*

Splitting out central policing costs is also in breach of the policy neutrality principle. Police services operating in different states have different operating models and structures. For example, some states assign certain tasks to police districts and other jurisdictions deem them the responsibility of a central police services unit. The splitting out of central policing costs, and then weighting them differently to other police costs, may either penalise or reward a particular state based on their respective police force operating model (which is clearly a policy decision of the individual jurisdiction). Therefore, the proposed change is in direct breach of the policy neutrality principle.

# *Issue 3 - Regional and remote police districts rely more heavily on central policing services as they lack the capability of metropolitan police stations.*

The argument that regional and remote police districts should be apportioned less central costs than metropolitan districts is flawed and in direct contradiction to how the police force operates in reality. Indeed, regional and remote police districts rely more heavily on central policing services as they lack the capability of metropolitan police stations.

For example, the Queensland Police Service has centralised command services specifically to support regional operations such as road policing, forensic services, domestic and family violence, and vulnerable person services<sup>54</sup>. Furthermore, the governance and use of central policing services in more centralised states such as New South Wales and Victoria is, by their nature, likely to be less focussed on supporting

<sup>&</sup>lt;sup>53</sup> Central police costs have been defined in New South Wales's tranche 1 submission as selected police force commands including Counter Terrorism and Special Tactics, State Intelligence, State Crime, Forensic Evidence and Technical Services, Marine Area, and Aviation.

<sup>&</sup>lt;sup>54</sup> Queensland Audit office. (2023). Deploying Police Resources. <u>Deploying police resources | Queensland Audit Office (qao.qld.gov.au)</u>

regional and remote service delivery. As such, it is not comparable to central policing services in much more regionally dispersed states such as Queensland and the Northern Territory.

#### *Issue 4 - Central policing need and cost are driven by actual policing need.*

**Central policing costs are not detached from other police spending.** Central policing need and cost are driven by actual policing need, which in turn is driven by offence rates, sociodemographic factors, and remoteness. Therefore, central policing costs are directly influenced by the size and complexity of the policing task experienced by each state.

In addition, there is significant variability in crime rates across police districts. The higher rate and greater complexity of crimes in regional and remote districts is well documented, resulting from differences in local demographic, socio-economic and other factors.<sup>55</sup>

**Regional police stations are not provided simply for the perception of safety and community connectedness,** with regional access to local police infrastructure directly impacting crime outcomes.<sup>56</sup> Therefore, splitting out central policing costs and weighting them differently to other police costs is not reflective of what states do, and the removal of the regional cost weighting would be in direct contradiction of the drivers of central police costs.

# Proposal raised by other jurisdiction: Carve out preventative policing costs and remove sociodemographic drivers.

Victoria submitted that preventative policing costs should be carved out, and suggested the drivers of preventative policing are different to that of reactive policing, and that offender numbers and sociodemographic factors do not correlate with preventative policing expenditure.

Queensland <u>does not support</u> the proposed change as it is in direct breach of the Commission's principles of what states do and practicality and the change would be detrimental to equalisation outcomes. This is because of three primary issues:

- Issue 1 Preventative and reactive policing are inherently interlinked.
- Issue 2 Expenses relating to preventative policing are driven by crime and crime propensity.
- Issue 3 The current model is not reflective of the proportion of time attributed to reactive policing.

Overall, because of these issues, Queensland <u>recommends</u> that all policing be assessed as a single component, with sociodemographic characteristics determined by offender rates as the key volume driver of need and regional costs applied to all policing costs.

#### *Issue 1 - Preventative and reactive policing are inherently interlinked.*

The argument put forward by Victoria is flawed and in breach of the 'what states do' principle as preventative and reactive policing are inherently interlinked. Reactive policing and offence rates drive the need for preventative policing.<sup>57</sup> Frontline police spend their time responding to calls for service based on prioritisation of demand, rather than a notional allocation of discrete blocks of time on criminal or community policing.

<sup>&</sup>lt;sup>55</sup> Exploring regional variability in the short-term impact of COVID-19 on property crime in Queensland, Australia, (2021). Exploring regional variability in the short-term impact of COVID-19 on property crime in Queensland, Australia | Crime Science | Full Text (biomedcentral.com).

<sup>&</sup>lt;sup>56</sup> Blesse, S & Diegmann, A. (2022). The place-based effects of police stations on crime: Evidence from station closures. <u>The place-based effects of police</u> <u>stations on crime: Evidence from station closures - ScienceDirect</u>; Independent Review of Policing in Remote Indigenous Communities in the Northern Territory. (2010). <u>Microsoft Word - Draft Report 310310 11.doc (dss.gov.au).</u>

<sup>&</sup>lt;sup>57</sup> Sherman, L & Weisburd, D. (1995). General deterrent effects of police patrol in crime "HOT SPOTS": A randomized, controlled trial (PDF) General deterrent effects of police patrol in crime "HOT SPOTS": A randomized, controlled trial (researchgate.net).

#### *Issue 2 - Expenses relating to preventative policing are driven by crime and crime propensity.*

Expenses relating to preventative policing – including community policing, providing a visible police presence and community safety and support – are driven by the explicitly sociodemographic factors of crime and crime propensity, rather than population. If the level of spending on community and preventative policing is not driven by the propensity for crime, then this is a clear policy choice, as opposed to spending required to meet policing need.

Preventative police programs are generally targeted at high-risk settings or directed at the early identification and subsequent intervention in the lives of people or groups at risk of engaging in criminal activity or becoming victims of crime (secondary prevention). It can also be targeted at the prevention of recidivism among those people who have already engaged in offending behaviour.<sup>58</sup> Additionally, provision of police services to the general community includes protection from those population groups that are more likely to commit crime.<sup>59</sup> **Overall, the level and amount of community policing needed in a state is directly determined by the same sociodemographic drivers as the need for criminal policing.** 

#### *Issue 3 – The current model is not reflective of the proportion of time attributed to reactive policing.*

The Commission's model already has a population weighted cost, that is *not* driven by offender numbers, responsible for 69% of the estimated police cost. Contrastingly, Queensland police service analysis suggests around 73% of FTE time *can* be attributed to crime-related and reactive policing activity.<sup>60</sup>

Therefore, the current model is not fit for purpose, but carving out preventative policing and removing sociodemographic drivers would move the model significantly further away from a model based on how policing services are actually delivered by states.

# Overall, Queensland <u>recommends</u> that all policing is assessed under a single component, using offender rates by sociodemographic composition to assess relative state need, and applying regional costs to the component.

Sociodemographic composition of those most at risk of offending drives police services need for both community and criminal policing. Meanwhile, increasing the remoteness of an offence increases the need for police spending to address that offence, as well as increasing costs in providing associated community and preventative policing programs.

#### **Prisons assessment**

### Proposal raised by other jurisdiction: **Delay or remove the introduction a juvenile detention cost** weight.

South Australia's submission proposed a delay to the introduction of juvenile detention cost weightings within the prison's methodology. South Australia suggests 2022-23 data should be observed when available to identify if juvenile detention costs are still rising at the same trajectory as they were in prior years.

Victoria does not support the introduction of a juvenile detention cost weight. Victoria's submission suggests the Report on Government services (ROGS) data used to assess the cost of juvenile detention is aggregated and not reflective of the actual juvenile detention costs across jurisdictions.

<sup>&</sup>lt;sup>58</sup> Australian Institute of Criminology. National Crime Prevention Framework. <u>NCP Framework.pdf (police.qld.gov.au)</u>; (Bartels, L. (2011). Crime prevention programs for culturally and linguistically diverse communities in Australia. <u>Crime prevention programs for culturally and linguistically diverse communities in Australia</u> <u>Australia</u> <u>Australia</u> <u>Institute of Criminology (aic.gov.au)</u>.

<sup>&</sup>lt;sup>59</sup> Richardson, K. (2018). " "The Effects of Community Policing Practices and Related Social Demogra" by Keighan Richardson (bryant.edu).

<sup>&</sup>lt;sup>60</sup> Queensland Police Service Cost Attribution Modelling conducted by Queensland Treasury Corporation.

Queensland strongly <u>supports</u> the introduction of a juvenile detention cost weight as soon as **practicable**, given that the relevant data already exists and given the cost of youth detention is almost 12 times greater than the cost of prison.

#### Key issues

#### *Issue 1 - The cost of youth detention is almost 12 times greater than the cost of prison.*

The current methodology does not include a separate cost to represent the greater expense to states of placing a person in youth detention, as opposed to a prison. Including youth detention services, but not correctly assigning a separate cost per age cohort, will result in underestimating the expense need. The ROGS data seen in Figure 4.1 indicates the cost of youth detention is almost 12 times greater than the cost of prison.<sup>61</sup>



#### Figure 4.1: Cost of detainment per night for prison and youth detention (\$)

Source: Productivity Commission; Queensland Treasury Corporation analysis

The ROGS data used to estimate the national average cost of juvenile detention encompasses data from all jurisdictions and, therefore, is reflective of any differing costs across jurisdictions.

The proposed implementation of a differential cost weight for youth detainees will more accurately capture a major cost driver borne by all states in the detention of underage persons.

#### Proposal raised by other jurisdiction: Change the cost-weights applied in the prisons model

New South Wales and Victoria suggested that the remoteness cost weighting within the prisons assessment is inappropriate and should be removed.

Western Australia proposes updating the regression with new independent variables to derive a number of new cost weights beyond remoteness.

Queensland <u>does not support</u> any change to the regression and the cost weights applied in the prisons model. The key issues with changing the regression and the cost weightings are:

- Issue 1 Remoteness is a key cost driver within the prisons model.
- Issue 2 Inclusion of new independent variables in the regression violates the principle of policy neutrality, while decreasing simplicity, increasing reporting requirements, and leading to less meaningful regression results.

<sup>&</sup>lt;sup>61</sup> Productivity commission. (2022). Report on Government Services: Youth Justice Services. <u>17 Youth justice services - Report on Government Services 2022 -</u> <u>Productivity Commission (pc.gov.au)</u>.

#### Key issues

#### *Issue 1 – Remoteness is a key cost driver within the prisons model.*

Removal of the remoteness cost weighting within the prisons model is inappropriate, as it has considerable explanatory power as a key cost driver for prisons. Given Queensland's disperse population and vast area, there is a need to provide appropriate criminal justice facilities in regional areas.

For example, more than 1 million Queenslanders live more than 400 kilometres away from the Brisbane GCCSA or any other major city. Moving prisoners from these areas to major cities would separate them from their communities, which would be impractical, costly, and would likely negatively impact on rehabilitation and recidivism prevention initiatives.<sup>62</sup>

Overall, the need for regional and remote cost weights is directly determined by the population dispersion and remoteness characteristics of a state.

*Issue 2 – Inclusion of new independent variables in the regression violates the principle of policy neutrality, while decreasing simplicity, increasing reporting requirements, and leading to less meaningful regression results.* 

Queensland is opposed to the inclusion of new independent variables in the regression to inform cost weights in the prisons model. Only limited information was provided as to what the new independent variables would be and how they would be implemented as cost weights within the model. The incorrect inclusion of several new independent variables may lead to a less meaningful regression that could have issues including multicollinearity or problems with the scale of variables used.

Additionally, the inclusion of variables such as the age of prison infrastructure or prison funding models clearly reflect state policy decisions and thus violate the Commission's principle of policy neutrality.

Furthermore, increasing the number of variables will increase the complexity of the regression along with the reporting responsibilities of states all without making material difference to redistribution.

# Proposal raised by other jurisdiction: Assess non-custodial corrective services separately from full-time prisoners.

New South Wales proposes to carve out the non-custodial corrective services from full-time prisoners within the prisons model. Non-custodial corrective services include the cost of managing individuals on community service orders. New South Wales suggested the share of people in community-based corrections has grown since the last review, which has largely been driven by New South Wales itself. Queensland <u>does not support</u> this proposed method change as it is impractical and policy contaminated.

#### **Key issues**

#### *Issue 1 – Assessment of non-custodial corrective services is policy contaminated.*

Queensland is opposed to assessing non-custodial corrective services separately to full-time prisoners. The number of non-custodial sentences is driven by legislation and, therefore, policy contaminated and not appropriate for inclusion as a driver in a Commission assessment. Changes since the 2020 Methodology Review have been driven by changes in New South Wales, illustrating that this proposal is driven by state-specific policy decisions.

#### Proposals raised by other jurisdictions for changes across all justice components

#### Recognise costs associated with providing justice services in major cities.

New South Wales proposes recognising the costs related to major city effects in a joint driver across the four components of the justice assessment: police, legal services, criminal courts, and prisons. New South

<sup>&</sup>lt;sup>62</sup> S. McNeeley & G. Duwe 2019. "Keep Your Friends Close and Your Enemies Closer: Prison Visitation, Spatial Distance, and Concentrated Disadvantage of Visitor Neighbourhoods, and Offender Recidivism." *Justice Quarterly*. 37(4): 571-589.

Wales suggests major cities face issues such as terrorism, complex crime (organised crime, cybercrime, financial crime), federal prisoners, and culturally diverse prisoners, that may drive extra expense.

Queensland <u>does not support</u> the inclusion of a major city cost weighting. There is no evidence to suggest major cities incur significantly greater expenses across the components of the justice assessment. There are two key issues with this proposal:

- Issue 1 Complex crime threatens all jurisdictions and is often managed by Australian Government agencies.
- Issue 2 Lack of evidence to suggest greater costs are borne by major cities to deliver criminal courts, other legal services, or prison services.

#### Key issues

*Issue 1 – Complex crime threatens all jurisdictions and is often managed by Australian Government agencies.* 

All jurisdictions are responsible for policing the types of crimes suggested by New South Wales to be unique to major cities including organised crime, cybercrime, and financial crime.

Furthermore, a number of these crimes may be the responsibility of government agencies that are funded by the Australian Government. Crime related to terrorism, cybercrime, and financial crime may be the responsibility of organisations such as the Australian Federal Police, Australian Security Intelligence Organisation, the Australian Signals Directorate, and the Australian Securities and Investments Commission.

## *Issue 2 – Lack of evidence to suggest greater costs are borne by major cities to deliver criminal courts, other legal services, or prison services.*

There is no evidence provide by New South Wales or that is readily available to suggest that the operation of criminal courts, other legal services, or prisons within major cities comes at a greater expense than anywhere else.

Furthermore, there is no evidence provided to suggest cultural diversity in the prison population drives significantly greater expenditure. Instead, Queensland contends that cost increases significantly with increasing remoteness.

As such, Queensland <u>recommends</u> a broader coverage of regional costs should be considered across the whole policing component to account for the increasing costs associated with increasing remoteness.

### **Priority assessments**

### 5. Investment

#### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states support smoothing user population growth to reduce volatility, with an associated reduction in contemporaneity?
- If user population growth were to be smoothed, do states support a 3-year moving average of growth rates?
- Do states support freezing the component shares of the value of assets for the life of the 2025 Review?

Additionally, Queensland has <u>significant concerns</u> with the transport investment assessment more broadly in its current form. These are detailed in the case for change below along with recommendations for improvement to ensure the assessment is fit for purpose and delivering a more meaningful assessment in the context of HFE.

#### Queensland position

## Do states support smoothing user population growth to reduce volatility, with an associated reduction in contemporaneity?

#### Queensland <u>does not support</u> smoothing user population growth.

Making this change would unacceptably reduce the contemporaneity of the assessment, further increasing the time between when population growth is identified and occurs (i.e. when a state needs to increase investment to meet the needs of that growing population) and when a states GST needs are met. This would result in an increased and extended fiscal capacity gap for states with above average population growth, which would place substantial additional strain on state budgets.

Queensland also contends that the issues related to the volatility of the current assessment are already sufficiently addressed through the three-year averaging of relativities. This smooths all assessments and lessens the impact of volatile assessments such as investment on GST relativities.

### *If user population growth were to be smoothed, do states support a 3-year moving average of growth rates?*

As outlined above, Queensland <u>does not support</u> smoothing user population growth, therefore any method of smoothing, such as using 3 year moving averages, is also not supported.

#### Do states support freezing the component shares of the value of assets for the life of the 2025 Review?

Queensland <u>does not support</u> freezing the component shares of the value of assets for the life of the 2025 Review.

Making this change would reduce the contemporaneity of the assessment and result in the assessment being unable to respond to changes in what states do. Furthermore, Queensland has concerns that freezing component shares over the life of a Review would result in the need for some components being over-assessed whilst the need for other components would be under-assessed. This means that the assessment would no longer be accurately assessing states' investment need.

# More broadly, in addition to the three specific questions proposed by the Commission, Queensland <u>does not support</u> the urban transport investment assessment in its current form and believes the urban transport assessment need should be assessed according to urban population shares.

Queensland <u>does not support</u> the continued use of the current urban transport investment assessment and, as outlined in Queensland's Tranche 1 submission, contends that this assessment has never been appropriate for assessing urban transport investment need. The assessment is not fit for purpose, not policy neutral, and is redistributing GST against equalisation.

As was discussed in the Tranche 1 submission, Queensland <u>strongly recommends</u> the complete removal of the urban transport regression model. Queensland also <u>strongly recommends</u> the removal of the population squared variable in the investment assessment.

Instead, Queensland <u>recommends</u> that the urban transport need be assessed using state shares of urban population, number of urban and non-urban school students, and number of concession card holders.

Queensland has identified four fundamental issues with the urban transport investment assessment:

- Issue 1 The urban transport regression model is not fit for purpose.
- Issue 2 Use of the population-squared variable lacks economic validity and has substantial design limitations.
- Issue 3 Population-squared variable lacks a conceptual foundation and is not policy neutral.
- *Issue 4 Population-squared variable is incentivising high levels of urban transport investment.*

*Issue 1* was discussed in detail in Queensland's *Tranche 1 submission: Urban transport expenses* and will not be discussed further here. This issue is multi-faceted and clearly demonstrates how the urban transport regression model is producing outcomes inconsistent with HFE.

*Issues 2, 3 and 4* will be discussed in detail in the case for change section below. These issues individually and combined demonstrate that the population squared variable is not fit for purpose and is producing outcomes that are inconsistent with HFE.

#### Case for change – urban transport investment.

#### Context

The urban transport assessment model was developed during the 2020 Methodology Review on the recommendations of the Jacob's Stage One and Stage Two consultancy reports. The regression was applied to both expenses and investment for urban transport, with both assessments redistributing a substantial amount of GST. As was previously discussed in Queensland's *Tranche 1 submission: Urban transport expenses*, there are multiple inconsistencies and shortcomings in this model.

Overall, the issues identified by Queensland with this model were broad and fundamental, clearly demonstrating that this regression was not fit for purpose and is producing outcomes inconsistent with the principle of HFE.

It is the view of Queensland that the drivers of need for urban transport investment are largely identical to the drivers of need for urban transport expenses. As such, this regression model should not be used to assess urban transport need in either the expenses or investment assessments.

The population squared variable for urban transport investment was introduced in the 2015 Methodology Review, informed by consultant research undertaken as part of the 2010 Methodology Review. This variable redistributes a significant amount of GST. However, the data used to justify this variable was highly policy contaminated while the assumptions of diseconomies of scale and density ingrained within the use of the population squared variable are explicitly refuted by substantial volumes of academic literature.

This variable **does not account for differences in state policies** and, therefore, is inherently biased towards the dominant SUAs of Sydney and Melbourne. Overall, the population-squared variable further contributes towards the assessment correlating urban transport investment policy decisions in these SUAs with need.

Overall, this variable is not fit for purpose and is redistributing GST in a way that is inconsistent with HFE. Any policy neutral and fit for purpose urban transport investment assessment <u>should not</u> include a population squared variable.

Issue	Queensland position
Issue 1: Urban transport regression model is not fit for purpose.	As discussed in the Tranche 1 submission, the urban transport regression model is not fit for purpose and is redistributing GST inconsistently with HFE outcomes. See case for change discussion in Urban Transport Expenses section of Queensland's Tranche 1 submission.
Issue 2: The population- squared variable lacks economic validity – and has substantial design limitations.	When the population-squared variable was introduced in the 2015 Review, the Commission assumed a linear relationship between asset values and urban population. Queensland asserts that this assumption does not reflect reality or evidence, and as such the variable has never been fit for purpose, is based on policy contaminated data, and the justifications for its inclusion are not consistent with the Commission's commitment to quality assurance. <b>Overall,</b> <b>by its nature, the population-squared variable represents an even more</b> <b>significant and inappropriate form of the incorrect approach adopted in the</b> <b>urban transport expense regression, and its inclusion in the urban transport</b> <b>investment assessment is resulting in significant redistributions that are</b> <b>inconsistent with fiscal equalisation outcomes.</b>
Issue 3: The population- squared variable lacks a conceptual foundation and is not policy neutral.	Issue 3a – Economies of density and scale. The population squared variable incorrectly assumes that, in the absence of policy decisions, significant diseconomies of scale and density are present in Australian urban transport capital. Economic literature consistently refutes this assumption, demonstrating that economies of density and scale are expected. Instead, the Commission has incorrectly associated policy decisions by jurisdictions, in particular in Sydney and Melbourne, as reflecting increased need. <b>Overall, the</b> <b>population-squared variable lacks a conceptual framework, is not</b> <b>policy neutral, and is not fit for purpose.</b>

Summary

	Issue 3b – Use of policy contaminated asset data in development of the model.
	The population-squared variable was developed using policy
	contaminated data which reflected the impact of previous and ongoing
	policy decisions on the relative cost and nature of public transport
	services being provided. Consequently, the urban transport investment
	assessment has been skewed by the Commission assuming that policy
	choices in Sydney and Melbourne represented need. A such, the
	conceptual foundation on which the assessment is based is <b>not policy</b>
	neutral, and further demonstrates that the population-squared
	variable is not fit for purpose.
	Issue 3c – State policy impacting the assessment.
	The population-squared variable is heavily influenced by the
	dominant SUAs of Sydney and Melbourne. As such, Sydney and
	Melbourne's previous and ongoing policy decisions will have a
	dominant effect on the assessment. Queensland's Tranche 1 submission
	(section: Transport – Issue 1b) discussed at length how state policies
	could impact the operating expenses of an urban transport network. In
	particular, Sydney has made policy decisions to provide more services
	relative to need compared to other SUAs. These urban transport
	policies in Sydney are also likely occurring in capital and investment
	expenditure. Overall, it is clear that urban transport capital policies in
	the Sydney SUA are being incorrectly and inappropriately
	compensated through use of the population-squared variable, which
	is redistributing GST in a way that is not aligned with actual need.
	Issue 4a – Urban transport investment has increased exponentially since 2015,
	and the model is inappropriately incentivising high levels of investment in New
	South Wales and Victoria that is not necessarily aligned with need.
	Total urban transport investment has increased exponentially since
	the population-squared variable was introduced. This increased
	expenditure has been driven by megaprojects in Sydney and
	Melbourne, whose investment is then being inappropriately reimbursed
Issue 4: The	through the urban transport investment assessment on the basis that
population	this investment is being driven by need. As such, the current
squared	assessment is inappropriately incentivising high levels of investment in
variable is	urban transport in New South Wales and Victoria, whilst disincentivising
incentivising	investment in other states. This clearly violates the policy neutrality
high levels of	principle and, again, demonstrates that the assessment is not fit for
urban transport	purpose.
investment	Issue 4b – Evidence suggests NSW and Victoria overinvest in other investment
	categories.
	Commission assessments indicate that New South Wales and Victoria
	broadly invest in services at a higher level than needed when
	considered in the context of sociodemographic compositions.
	Therefore, Queensland has significant and justifiable concerns that they
	also overinvest in urban transport capital, and that the current
	assessment approach is incentivising this outcome.
Principlos	Practicality – fit for purpose.
affected	Violated by Issues 1, 2, 3 and 4.
anelled	Practicality – simplicity.

	Violated by Issue 1.		
	Practicality – quality assurance.		
	• Violated by Issues 1 and 2.		
	Policy neutrality.		
	<ul> <li>Violated by Issues 1, 2, 3 and 4.</li> </ul>		
	Contemporaneity.		
	<ul> <li>Violated by Issues 1 and 2.</li> </ul>		
Effect on horizontal fiscal equalisation	The current urban transport investment assessment is highly detrimental to the fiscal equalisation outcomes being sought by the Commission and states. Multiple shortcomings in the regression model result in it being not fit for purpose and it breaches numerous HFE principles.		
Changes sought	Change 1 – Discontinue the use of the urban transport regression model and use of the population-squared variable in the urban transport expenses and urban transport investment assessments.		
	Change 2 – Differentially assess states' urban school transport task.		
	Change 3 – Differentially assess states' non-urban school transport task.		
	Change 4 – Assess remaining urban transport expenses and investments based on 50 per cent urban population and 50 per cent number of concession card holders.		

#### Detailed discussion of key Issues

*Issue 1 – The urban transport regression model is not fit for purpose.* 

See case for change in the Urban Transport Expenses section of Queensland's Tranche 1 submission.

As discussed in the Tranche 1 submission, the urban transport regression model is not fit for purpose. Its continued usage in the urban transport investment assessment is redistributing GST inconsistently with fiscal equalisation outcomes.

*Issue 2 – The population-squared variable lacks economic validity and has substantial design limitations.* 

#### Summary of Issue 2

Principles violated:

- Practicality fit for purpose
- Practicality quality assurance
- Policy neutrality
- Contemporaneity

The population-squared variable was introduced at the 2015 Review. In this Review, the Commission assumed a linear relationship between asset values and urban population. Queensland asserts that this variable has never been fit for purpose, is based on policy contaminated data, and the justifications for its inclusion are not consistent with the Commission's commitment to quality assurance. **Overall, the population-squared variable amounts to an even more severe form of the urban transport regression and its inclusion in the urban transport investment assessment is resulting in outcomes inconsistent with HFE.** 

#### Discussion of Issue 2

When the population-squared variable was first proposed, states disputed the analysis conducted by the Commission. Despite these concerns, the Commission claimed that its conclusion that assets were linearly related to urban population size was valid, stating:

"Data are sufficiently accurate to show there is an upward sloping relationship between city size and assets per capita. It would remain upward sloping even if the asset values of a number of cities were substantially overstated or understated."<sup>63</sup>

However, using actual urban transport cost data is highly problematic given the substantial policy contamination underpinning that historical data.

The relationship observed by the Commission in 2015 was almost certainly impacted by the extreme outliers of Sydney and Melbourne SUAs. The high level of capital stock in both SUAs is not necessarily a result of increased need, but rather reflects policy decisions related to transport service provision, expenditure, and investment.<sup>64</sup> As such, any relationship derived and skewed by their influence is highly questionable and does not meet the Commission's criteria in terms of policy neutrality.

Furthermore, the assumptions used in the 2015 Review to support introduction of the population-squared variable are essentially the same as those underlying the urban transport regression model. Indeed, it produces an even more inappropriate and 'severe' form of the regression, in that it suggests a linear relationship with urban population, rather than being driven by need. As was discussed in Queensland's *Tranche 1 submission*, these assumptions are highly flawed.

Meanwhile, when the Commission tested the fitness for purpose of the population-squared variable, the results were not shared with states to allow for appropriate review, despite substantial concerns with the approach being raised. As such, Queensland considers states have never been afforded the opportunity to adequately scrutinise and test the data and conclusions supporting the use of the population-squared variable. This is at odds with the Commission's commitment to quality assurance.

Furthermore, the CGC has previously acknowledged that:

"There are concerns about the shape of the relationship between city size and infrastructure requirements and whether other drivers, which we have not been able to measure, affect infrastructure requirements."<sup>65</sup>

On this basis, the Commission blended the population-squared model 50:50 with urban population. This clearly demonstrates that the Commission itself had clear concerns with the use of the population-squared variable and consider its use to be sufficiently questionable to, in practice, warrant applying a 50 per cent discount.

This issue has been exacerbated by the Commission not fully reassessing the validity of the populationsquared variable over the last decade, resulting in both a flawed and non-contemporaneous assessment.

Furthermore, as will be discussed below in *Issue 4*, extremely high levels of policy driven transport investment that are not related to urban transport need has occurred over the past 10 years in Sydney and Melbourne. Therefore, it would be highly inappropriate to reassess the population-squared assumption using current data related to actual expenditure, as any regression developed using current data will continue to reflect the impact of previous policy decisions in Sydney and Melbourne.

In summary, the population-squared variable represents an even more inappropriate version of the same key inappropriate variable driving assessment outcomes in the urban transport model, thereby producing even more material perverse redistribution outcomes.

 <sup>&</sup>lt;sup>63</sup> Commonwealth Grants Commission 2015. *Report on GST Revenue Sharing Relativities 2015 Review, Volume 2.* Australian Government: Canberra.
 <sup>64</sup> These will be further discussed in Issue 3 and Issue 4.

<sup>&</sup>lt;sup>65</sup> Commonwealth Grants Commission 2015. *Report on GST Revenue Sharing Relativities 2015 Review, Volume 2.* Australian Government: Canberra.

Given these substantial issues related to use of the variable, Queensland is of the view that an urban transport investment assessment that effectively redistributes GST according to equalisation principles cannot include the population squared variable.

#### *Issue 3 – The population-squared variable lacks a conceptual foundation and is not policy neutral.*

When the population-squared variable was developed, the Commission used data from Australian capitals to establish a relationship between asset value and population size. This policy contaminated data resulted in the Commission incorrectly concluding diseconomies of scale were present in Australian urban transport investment. Given the strong correlation between Australian capitals population and urban density, the Commission's method also asserts diseconomies of density.

Furthermore, because of the ownership structure of urban transport assets, most assets assessed were for rail transit (including both heavy & light rail). Therefore, using population squared explicitly implies that diseconomies of density and scale exist in relation to urban rail capital investment and, therefore by extension, urban transport provision more broadly.

The Commission's claims of diseconomies of scale and density in urban transport investment are explicitly refuted by international literature. As outlined above, the population-squared variable lacks a conceptual foundation, with the correlation between urban population size and asset value that the Commission has observed reflecting policy decisions in the dominant SUAs of Sydney and Melbourne.

The issues and evidence underpinning Queensland's position are discussed in detail below under three key topics:

- Issue 3a Economies of density and scale.
- Issue 3b The use of policy contaminated data.
- *Issue 3c State policy impacting the population-squared variable.*

*Issue 3a – Economies of density and scale.* 

#### Summary of Issue 3a

Principles violated:

- Practicality fit for purpose
- Policy neutrality

The population squared variable incorrectly assumes that there are diseconomies of scale and density related to Australian urban transport capital. Economic literature consistently refutes this assumption, instead demonstrating economies of density and scale are likely present.

The Commission has incorrectly associated policy decisions as increased need. **Overall, this means that the population-squared variable lacks any conceptual framework.** 

#### Detailed discussion of Issue 3a

As was discussed in the *Tranche 1 submission*, economic theory and international experience consistently confirm economies of density exist in urban rail networks.

Several studies have explicitly found economies of density and economies of scale in capital and investments costs in urban rail transit.<sup>66</sup> For example, Savage (1997) concluded that:

<sup>&</sup>lt;sup>66</sup> Literature regarding economies of scale or density for capital in North American urban rail includes: **(1)** T. Keeler 1974. "Railroad costs, returns to scale, and excess capacity." *The Review of Economics and Statistics*. 56(2): 201-208; **(2)** R. Pozdena & L. Merewitz 1978. "Estimating cost functions for rail rapid transit properties." *Transportation Research*. 12(2): 73-78; **(3)** T. Keeler 1983. Railroads, Freight, and Public Policy. Washington, D.C.: The Brookings Institution; **(4)** M. Ivaldi & G. McCullough 2007. "Railroad pricing and revenue-to-cost margins in the post-Staggers era." *Research in Transportation Economics*. 20: 153-178; **(5)** J. Bitzan & F. Karanki 2022. "Cots, density economics, and differential pricing in the US railroad industry." *Transport Policy*. 119:

"Economies [of scale and density] became even more substantial when...capital costs are incorporated."<sup>67</sup>

Across this substantial volume of literature, research has consistently suggested that the cost of investment in railways decreases in relation to return on investment as traffic density increases. This means that efficiently priced urban rail transport systems should become less expensive per capita to invest in as population size and density increase. This is summarised by Bitzan (2003) as:

"Capital per mile of track...[suggest] that the transport costs associated with operating over a rail line are lower when the...capacity of the [track] is higher."<sup>68</sup>

As such, an SUA with lower density (such as Brisbane) will require substantially more investment in track to service the same need compared to an SUA with higher density (such as Sydney). Furthermore, Hensher et al's (1995) research found that capital produced increasing returns to scale, **suggesting economies of density for capital are also present in Australian rail networks once policy differences are considered**.<sup>69</sup>

Academic literature also indicates that less dense cities are required to invest more in railroad plant as they must move trains further distances to reach the same service population. This means that to meet the equivalent urban transport task in a less dense SUA (such as Brisbane) compared to a denser SUA (such as Sydney), Brisbane would have to invest in a larger quantity of railroad plant (such as trackage) per user. As was discussed in Keeler (1974):

"On the routes where indivisibilities or regulatory policies require maintaining substantial amounts of...capacity, marginal cost pricing will fail to recover costs."<sup>70</sup>

This indicates that capital in higher density SUAs (such as Sydney) would be more able to take advantage of economies of density compared to lower density SUAs (such as Brisbane). **Overall, the less dense an SUA, the higher the need to invest in capital, if all other factors are equal.** 

This contradicts the Commission's assumptions and further demonstrates that the population squared variable is not fit for purpose.

What the Commission has observed in relation to state ownership of urban public transport assets is not a correlation between urban centre size and need. Rather, it is an observation of many decades (and in some cases over a century) of policy decisions related to the establishment and investment in the public transport (in particular rail) network in the dominant SUAs of Sydney and Melbourne.

Consequently, the population-squared variable lacks any conceptual foundation. This renders the variable not fit for purpose, not policy neutral, and suggests that it is redistributing significant volumes of GST against equalisation.

<sup>67-77; (6)</sup> J. Bitzan & T. Keeler 2007. "Economies of density and regulatory change in the U.S. Railroad freight industry." *Journal of Law and Economics*. 50: 156-179; (7) G. Weisbrod & A. Reno 2009. Economic Impact of Public Transportation Investment. Washington. D.C.: American Public Transportation Association; (8) F. Friedlaender, E. Berndt, J. Shaw-Er Wang Chiang, M. Showalter, & C. Vellturo 1993. "Rail costs and capital adjustments in a quasi-regulated environment." *Journal of Transport Economics and Policy*. 27(2): 131-152.

Literature regarding economies of scale or density for capital in global urban rail includes: (9) P. Gagnepain & M. Ivaldi 2002. "Incentive regulator policies: the case of public transit systems in France." *The RAND Journal of Economics*. 33(4): 605-629; (10) M. Farsi, A. Fetz, & M. Filippini 2007. "Economies of Scale and Scope in Local Public Transportation." *Journal of Transport Economics and Policy*. 41(3): 345-360; (11) C. Growitsh & H. Wetzel 2009. "Testing for economies of scope in European railways." *Journal of Transport Economics and Policy*. 43(1): 1-24; (12) P. Cantos, J. Pastor, & L. Serrano 2002. "Cost and revenue inefficiencies in European railways." *International Journal of Transport Economics*. 29(3): 279-308. Countries analysed included France, Switzerland, Belgium, Bulgaria, Estonia, Germany, Latvia, Lithuania, Luxembourg, Romania, Greece, Ireland, Spain, Slovakia, Czechia, Austria, Poland, Sweden, Finland, Norway, Denmark, Portugal, Sweden, the UK, & Hungary.

This volume of literature includes analysis of investment in ways and structure (tracks, stations, trainyards, signals) as well as rollingstock and suggested that both contribute economies of scale.

<sup>&</sup>lt;sup>67</sup> I. Savage 1997. "Scale economies in United States rail transit systems." Transportation Research Part A: Policy and Practice. 31(6): 459-473.

<sup>&</sup>lt;sup>68</sup> J. Bitzan 2003 "Railroad costs and competition: The implications of introducing competition to railroad networks." *Journal of Transport Economics Policy*. 37(2): 201-225.

<sup>&</sup>lt;sup>69</sup> D. Hensher, R. Daniels, & I. Demellow 1995. "A comparative assessment of the productivity of Australia's public rail systems 1971/72-1991-92." Journal of Productivity Analysis. 6(3): 201-223.

<sup>&</sup>lt;sup>70</sup> T. Keeler 1974. "Railroad costs, returns to scale, and excess capacity." *The Review of Economics and Statistics*. 56(2): 201-208.

#### *Issue 3b – Use of policy contaminated asset data in development of the model.*

#### Summary of Issue 3b

Principles violated:

• Policy neutrality

The population-squared variable was developed using policy contaminated data. Consequently, the urban transport investment assessment has been skewed by the Commission assuming that policy choices in Sydney and Melbourne represented need. Therefore, the primary assumptions and data informing those assumptions that underpin the model are not policy neutral, and further demonstrates that the population-squared variable is not fit for purpose.

#### Detailed discussion of Issue 3b

As was discussed in *Tranche 1: Transport – Issue 1a*, using policy contaminated data can be highly misleading when trying to ascertain the presence and magnitude of economies of scale or density. This is an even more pertinent issue in the urban transport investment assessment given urban transport capital ownership varies significantly with policy decisions, particularly in relation to the privatisation of urban transport assets. **These policy decisions do not impact actual urban transport need.** 

An example of how diseconomies of scale can be incorrectly identified is presented in Figure 5.1. As shown,  $SUA_1$  and  $SUA_2$  are initially on the same long-run average cost curve for capital. Given  $SUA_2$  has a larger population, it can exploit economies of scale in urban transport capital, and therefore has lower capital costs per capita when the two SUAs have identical policy settings.

However, if SUA<sub>2</sub> makes a policy decision to invest in more capital, its long-run average cost of capital curve will shift to the left. Overall, there will be a significant increase in cost per capita because of this policy decision to invest more.<sup>71</sup> Using raw data without accounting for policy differences would incorrectly suggest that the cost of capital reflecting need is now higher in SUA<sub>2</sub> compared to SUA<sub>1</sub>.



#### Figure 5.1: Economies of scale and policy decisions.

Source: Queensland Treasury based on Jacobs Urban Consultancy Stage 2.

<sup>&</sup>lt;sup>71</sup> All else being equal, SUA2 will also experience an increase in demand, partially offsetting the leftward average cost-curve shift.

However, if SUA<sub>1</sub> also decided to increase their investment level to be policy identical with SUA<sub>2</sub>, their costs of capital per capita would be significantly higher than in SUA<sub>2</sub>, consistent with the concept of economies of scale. This clearly demonstrates that using actual historical asset value data can significantly skew the observance of economies of scale if policy differences are not accounted for. This illustrates that the Commission's assertion of population squared being a reliable variable lacks an appropriate conceptual grounding.

Furthermore, different SUAs invest in different modes of travel and have different levels of use of privateowned capital. Indeed, states with less urban rail have invested in other forms of public transport, most notably bus rapid transport.

However, a large proportion of the capital associated with bus rapid transport (and non-urban rail transport more generally), including extensive busway infrastructure and most buses, were not included when the Commission first made the urban transport investment assessment. This is because buses are commonly owned by private companies and local governments and are not with in scope of the investment assessment, while busways are classified as part of the urban road infrastructure assessment. Even though these capital expenses are not captured in the transport investment assessment, it does not in reality reduce the state governments needs to ensure the provision of that infrastructure. Instead, capital-related expenditure will be passed on to states through operating expenses, substantially increasing the operating cost of urban transport.

Furthermore, the initial regression was significantly impacted by historical policy decisions from as early as the 19<sup>th</sup> Century to build urban rail in Sydney and Melbourne. The presence of these rail lines, many of which are not necessarily required as the most efficient form of transport in modern cities, effectively skewed the regression to show higher per capita asset ownership in Sydney and Melbourne. However, this **does not reflect increased need.** 

The continued use and operation of these heavy rail networks will increase capital costs when less capitalintensive urban transport methods, such as bus rapid transit, could have been, or could be, developed in these SUAs is not for the substantial historical investment in the rail network as the primary form of public transport infrastructure in those SUAs.

*Issue 3c – State policy impacting the population-squared variable.* 

#### <u>Summary of Issue 3c</u>

Principles violated:

- *Practicality fit for purpose*
- Policy neutrality

Queensland's *Tranche 1 submission (Transport – Issue 1b)* discussed at length how state policy could impact the operating expenses in urban transport.

This policy contamination of the assessment is particularly prevalent in Sydney and Melbourne compared to other SUAs. Urban transport capital policy decisions in Sydney and Melbourne are also likely impacting on the urban transport investment assessment. **Overall, capital policy decisions in Sydney and Melbourne are being compensated through the population-squared variable, which is redistributing GST in a way that is not appropriately aligned with, or reflecting, relative need.** 

#### Detailed discussion of Issue 3c

There is a significant volume of academic literature that concludes that high levels of capital in urban transport networks can increase net expenses. For example, Friedlaender et al (1993), found that in a network with high levels of capital:

"Railroads suffered from...low profitability and a consequent inability to generate adequate internal or external funds to maintain their...capital."<sup>72</sup>

Overall, capital expenditure is directly related to both short-run and long-run cost, and that having an above optimal level of capital will make a network unproductive from both an operating and capital perspective.<sup>73</sup> Furthermore, networks maintaining high levels of capital will be forced to continue investing in above optimal levels of capital.<sup>74</sup> Conversely, investing in an optimal level of capital enables operations to take advantage of significant economies of both scale and density.<sup>75</sup>

Urban transport networks maintaining high levels of urban transport capital stock are subsidised by state governments in Australia. This is important, as operating a public transport system that can deliver the required level of services for equity of mobility will likely result in negative returns. However, it is important for fiscal equalisation that the Commission does not recommend redistributing GST to compensate states for subsidising any above average capital investment and ownership when services are provided above the required quantity or quality to meet actual service need.

Furthermore, as stated by Keeler (1974):

"Investment in rail trackage [and rollingstock] is not easily varied with traffic levels."76

As such, if there is an above optimal level of capital in an urban rail network, these assets cannot be readily discarded or repurposed. This implies that high levels of investment can increase both capital and ongoing operating expenses.

However, the urban transport assessment, in effect, assesses the maintenance and operation of unproductive assets as representing increased need in the high population and density SUAs of Sydney and Melbourne. Again, this illustrates that the population-squared variable will incorrectly assess policy choices as increased need, further illustrating that it is not fit for purpose.

Another policy issue that has been identified as distorting the presence of economies of scale and density in railroad capital is ticket subsidisation levels. For example, Coulombel and Monchambert (2023) found that ticket subsidisation policies could produce diseconomies of density in the most traffic heavy lines.<sup>77</sup> These diseconomies could be corrected through differential pricing and allow for networks to take advantage of the existing economies of density.<sup>78</sup>

Overall, given the findings of academic literature and the presence of economies of scale and density in urban rail capital, the most dense and largest SUAs should have the lowest asset values per capita if they were optimally investing in capital. This is contrary to the assumptions of the population-squared variable and the realised experience in Australia.

Research from Hensher et al (1995) found evidence that there were differential capital policies present in Australian rail networks stating:

"Capital still produces discernible differences in the relative productivity of different railways."<sup>79</sup>

<sup>&</sup>lt;sup>72</sup> F. Friedlaender, E. Berndt, J. Shaw-Er Wang Chiang, M. Showalter, & C. Vellturo 1993. "Rail costs and capital adjustments in a quasi-regulated environment." *Journal of Transport Economics and Policy*. 27(2): 131-152.

<sup>&</sup>lt;sup>73</sup> F. Friedlaender, E. Berndt, J. Shaw-Er Wang Chiang, M. Showalter, & C. Vellturo 1993. "Rail costs and capital adjustments in a quasi-regulated environment." *Journal of Transport Economics and Policy*. 27(2): 131-152.

<sup>&</sup>lt;sup>74</sup> F. Friedlaender, E. Berndt, J. Shaw-Er Wang Chiang, M. Showalter, & C. Vellturo 1993. "Rail costs and capital adjustments in a quasi-regulated environment." *Journal of Transport Economics and Policy*. 27(2): 131-152.

<sup>&</sup>lt;sup>75</sup> F. Friedlaender, E. Berndt, J. Shaw-Er Wang Chiang, M. Showalter, & C. Vellturo 1993. "Rail costs and capital adjustments in a quasi-regulated environment." *Journal of Transport Economics and Policy*. 27(2): 131-152.

<sup>&</sup>lt;sup>76</sup> T. Keeler 1974. "Railroad costs, returns to scale, and excess capacity." The Review of Economics and Statistics. 56(2): 201-208.

<sup>&</sup>lt;sup>77</sup> N. Coulombel & G. Monchambert 2023. "Diseconomies of scale and subsidies in urban public transportation." Journal of Public Economics. 223.

<sup>&</sup>lt;sup>78</sup> N. Coulombel & G. Monchambert 2023. "Diseconomies of scale and subsidies in urban public transportation." Journal of Public Economics. 223.

<sup>&</sup>lt;sup>79</sup> D. Hensher, R. Daniels, & I. Demellow 1995. "A comparative assessment of the productivity of Australia's public rail systems 1971/72-1991-92." Journal of *Productivity Analysis*. 6(3): 201-223.

The substantial evidence suggesting that the urban transport model and population-squared variable are inappropriately compensating policy decisions in Sydney and Melbourne is clearly inconsistent with the Commission's principles, which state:

#### "If a State is less efficient than average, it must finance this above average inefficiency itself."80

Further evidence of more capital investment relative to need in Sydney and Melbourne compared to other SUAs can be observed in bus fleet data related to bus travel.

For example, using pre-COVID data, bus trips made up 5.2 per cent of all trips in Sydney, with a fleet of 5,224 public transport buses,<sup>81</sup> compared to 6.7 per cent of all trips in Brisbane, with a fleet of 2,065 public transport buses.<sup>82</sup> **Deriving the bus service population by these relative proportions and assuming a standardised capital cost of buses, Sydney has 67 per cent higher level of bus vehicle capital.<sup>83</sup> This higher level of bus vehicle capital would also be expected to result in a higher level of investment in other infrastructure, such as bus depots and non-passenger vehicles.** 

Using a more simplistic approach, where just the proportion of commuters using buses is analysed, this data suggests that Sydney's bus services are still over capitalised compared to Brisbane (by 11%), Adelaide (by 10%), Hobart (by 7%), and Darwin (by 59%).<sup>84</sup>

This high level of bus capital is even more pronounced in the other dominant SUA, Melbourne, where the level of bus capitalisation compared to the proportion of commuters using buses is more than double that of Hobart, Darwin, Perth, Brisbane, or Adelaide.<sup>85</sup>

This demonstrates substantial differences in the relative levels of urban transport capitalisation across SUAs and jurisdictions. It is likely that the most significant driver of asset values is ways and structures of heavy and light rail systems. This is because literature suggests the cost of replacement for 1 kilometre of rail <sup>86</sup> is likely to be substantially less than the cost of construction for 1 kilometre of rail tunnel.<sup>87</sup> As such, capital policies concerning urban railways and structures will significantly skew the urban transport investment assessment.

Another key factor highlighted in literature is that the cost of public transport provision, and therefore the implied efficiency of the provision of those services to meet need, can be influenced substantially by the design of the network.

Academic literature, including Gschwender et al (2016)<sup>88</sup> and Gkiotsalitis (2022), <sup>89</sup> has consistently found that using direct lines increases costs compared to feeder-trunk urban transport networks in the presence of economies of density. As such, denser cities including Sydney and Melbourne have significantly higher

<sup>&</sup>lt;sup>80</sup> Commonwealth Grants Commission 2020. Report on GST Revenue Sharing Relativities, 2020 Review, Volume 2 – Methodology for measuring State fiscal capacities.

<sup>&</sup>lt;sup>81</sup> Based on: Transport for NSW 2023. *Household Travel Survey: Data by Region*. Available at https://www.transport.nsw.gov.au/data-by-region. 2015-16 year was used; Australian Bus Fleet Lists 2023. Available at https://fleetlists.busaustralia.com/qld.php?search=BBL.

<sup>&</sup>lt;sup>82</sup> Based on: Department of Infrastructure, Local Government and Planning 2017. *Connecting Brisbane*. Brisbane: Queensland Government; Department of Transport and Main Roads 2017. *How Queensland Travels Report*. Brisbane: Queensland Government; Australian Bus Fleet Lists 2023. Available at https://fleetlists.busaustralia.com/qld.php?search=BBL.

<sup>&</sup>lt;sup>83</sup> It is worth noting that most urban transport public buses in Australia are privately owned and will therefore not be captured in the urban transport investment assessment. However, this comparison is still relevant as it demonstrates the overall overinvestment in asset ownership because of Sydney's policy decisions. This will be discussed further in *Issue 4*.

<sup>&</sup>lt;sup>84</sup> Queensland Treasury calculations based on Australian Bus Fleet Lists 2023. Available at https://fleetlists.busaustralia.com/qld.php?search=BBL.

<sup>&</sup>lt;sup>85</sup> Queensland Treasury calculations based on Australian Bus Fleet Lists 2023. Available at https://fleetlists.busaustralia.com/qld.php?search=BBL.

<sup>&</sup>lt;sup>86</sup> Based on Australian Rail Track Corporation Ltd 2007. ARTC Standard Gauge Rail Network DORC. Sydney: Australian Rail Track Corporation Ltd. Indexed using PPI.

<sup>&</sup>lt;sup>87</sup> Based on CPCS 2015. NCRRP Report 1: Alternative Funding and Finance Mechanisms for Passenger and Freight Rail Projects. Washington D.C.: Transportation Research Board.

<sup>&</sup>lt;sup>88</sup> A. Gschwender, S. Jara-Diaz, & C. Bravo 2016. "Feeder-trunk or direct lines? Economies of density, transfer costs and transit structure in an urban context." Transport Research Part A: Policy and Practice. 88: 209-222.

<sup>&</sup>lt;sup>89</sup> K. Gkiotsalitis 2022. "Coordinating feeder and collector public transit lines for efficient MaaS services." *EURO Journal on Transportation and Logistics*. 11: 100057.

capacity to take advantage of economies of density through strategies such as feeder-trunk lines compared to all other Australian SUAs.<sup>90</sup>

The impact of network integration and capital intensity of railways were summarised by Evers (1994) as follow:

"All else equal, consolidated terminals hold a competitive advantage over decentralized terminals in that the former are able to provide the same level of service as the latter with less capital investment."<sup>91</sup>

Despite the advantages of achieving economies of scale in their capital investment through consolidating their public transit networks, both Sydney and Melbourne's networks consist of multiple individual direct lines. These networks connect destinations directly as opposed to through a central hub. This has been observed in Sydney by research conducted by Tsai et al (2015)<sup>92</sup> and Imperial College London (2020)<sup>93</sup>, both of which concluded that the urban transport network delivered more services relative to need compared to Australian and international networks. This further indicates that the increased level of investment in Sydney and Melbourne is not a result of increased need, but rather policy decisions. Again, this clearly points to the current assessment approach, given its reliance on the population-squared variable, inadvertently and inappropriately redistributing GST on the basis of policy-contaminated investment and expense outcomes.

Meanwhile, other networks in Australia operate relatively more efficiently despite their relative urban densities. For example, Imperial College London (2020) noted that both Adelaide and Brisbane had cost-recovery at a similar level as Sydney despite international evidence suggesting that Sydney (being denser) should be able to operate substantially more competitively.<sup>94</sup>

Indeed, there is evidence of the use of feeder-trunk strategies in other public transit networks in Australia. For example, the South East Queensland public transit network operates multiple hubs throughout Brisbane, the Sunshine Coast, the Gold Coast.<sup>95</sup>

These hubs are the terminus for multiple routes (primarily bus) and the departure location for high frequency and express services (across multiple modes) which act as a trunk for the SEQ public transport system and decrease the usage of capital intensive heavy rail structures. These hubs include Broadbeach South, Robina, Helensvale, Southport, Coomera, Nambour, Caloundra, Maroochydore, Noosa Junction, Ipswich, Springfield Central, Upper Mount Gravatt, Springwood, Browns Plains, Loganholme, Beenleigh, Caboolture, Morayfield, Strathpine, North Lakes, Westfield Carindale, Buranda, Capalaba, Wynnum Central, Victoria Point, Cleveland, Eight Mile Plains, Moorooka, and Indooroopilly.<sup>96</sup>

This strategy is used despite the South East Queensland network being significantly more dispersed and, therefore, less able to exploit underlying economies of density compared to Sydney or Melbourne.

Another policy contamination issue with the urban transport investment assessment and the populationsquared variable is the significant disparity between the capital requirements of different modes of public transport.<sup>97</sup> It is a policy choice to invest in one form of public transport over another and does not affect urban transport need.

<sup>&</sup>lt;sup>90</sup> R. Del Mistro & E. Bruun 2015. Appropriate operating environments for Feeder-Trunk-Distributor or Direct road based public transport services in cities of developing countries. Cooperation for Urban Mobility in the Developing World XVI Conference. 2-5 February, Istanbul.

<sup>&</sup>lt;sup>91</sup> P. Evers 1994. "The occurrence of statistical economies of scale in intermodal transportation." Transportation Journal. 33(4). 51-63.

<sup>92</sup> C. Tsai, C. Mulley, & R. Merkert 2015. "Measuring the cost efficiency of urban rail systems." Journal of Transport Economics and Policy. 49(1): 17-34.

<sup>&</sup>lt;sup>93</sup> Imperial College London Transport Strategy Centre 2020. Sydney Trains Update 2020: Comparison with International Benchmarking Groups.

<sup>&</sup>lt;sup>94</sup> Imperial College London Transport Strategy Centre 2020. Sydney Trains Update 2020: Comparison with International Benchmarking Groups.

<sup>&</sup>lt;sup>95</sup> Transport and Main Roads 2010. Connecting SEQ 2031 – An Integrated Regional Transport Plan for South East Queensland. Queensland Government: Brisbane.

<sup>&</sup>lt;sup>96</sup> Transport and Main Roads 2010. Connecting SEQ 2031 – An Integrated Regional Transport Plan for South East Queensland. Queensland Government: Brisbane.

<sup>&</sup>lt;sup>97</sup> M. Zhang 2009. "Bus versus rail: Meta-analysis of cost characteristics, carrying capacities, and land use impacts." *Journal of the Transportation Research Board*. 2110: 87-95.

Indeed, if a state chooses investment in urban rail that results in higher levels of capital investment compared to investment in buses, those states making that policy choice should not be compensated through the redistribution of GST. States choosing to invest in more capital-intensive modes of urban transport is not a reflection of relatively higher need and assessing it as such delivers outcomes inconsistent with HFE.

Concerningly, New South Wales and Victoria appear to be continuing to make policy decisions which will further redistribute GST inconsistent with equalisation. Contemporary major projects that are investing in high levels of capital include the Sydney Metro project and the Melbourne Suburban Loop project.<sup>98</sup> These megaprojects continue to inaccurately imply under the current assessment methodology that these dominant SUAs have higher urban transport capital need, when indeed, the level of investment in these specific projects is policy driven.<sup>99</sup> *This will be further discussed in Issue 4.* 

#### *Issue 4 – The population squared variable is incentivising urban transport investment unrelated to need.*

Since the Commission first indicated its preliminary position to adopt the population-squared variable in the urban transport investment assessment, there has been an exponential increase in the amount of urban transport investment driven by these infrastructure megaprojects in Sydney and Melbourne.

Projects that began construction after the 2015 Final Report was released include the Sydney Metro City & Southwest, Sydney Metro West, Sydney Metro Western Sydney Airport, the Suburban Rail Loop, and the Metro Tunnel. Many of these projects have experienced large cost increases and delays.

However, because of the reliance on the population-squared variable, NSW and Victoria can indirectly recoup a substantial proportion of their additional costs related to these urban transport investment projects through the redistribution of GST. This demonstrates that the population-squared variable is incentivising increased capital expenditure in these states that is not correlated with urban transport need.

This issue will be discussed in detail below under two key topics:

- Issue 4a Urban transport investment has increased exponentially since 2015, and the current assessment model is inappropriately incentivising high levels of investment in New South Wales and Victoria that is not necessarily aligned with need.
- Issue 4b NSW and Victoria invest above need in other investment categories.

*Issue 4a – Urban transport investment has increased exponentially since 2015 and the current assessment model is inappropriately incentivising high levels of investment in New South Wales and Victoria that is not necessarily aligned with need.* 

#### Summary of Issue 4a

Principles violated:

- Practicality fit for purpose
- Policy neutrality

Based on Commission publications, the policy neutrality principle should seek:

"To ensure state policy choices have minimal effect on its assessments and, in turn, the assessments have minimal impact on state policy choices."<sup>100</sup>

<sup>&</sup>lt;sup>98</sup> Portfolio Committee No. 6 – Transport and Customer Service 2020. *Report No. 11: Sydenham-Bankstown line conversion*. Legislative Council of NSW: Sydney; M. Terrill, O. Emslie, & G. Moran 2020. *The rise of megaprojects: Counting the costs*. Grattan Institute: Melbourne.

<sup>&</sup>lt;sup>99</sup> Portfolio Committee No. 6 – Transport and Customer Service 2020. *Report No. 11: Sydenham-Bankstown line conversion*. Legislative Council of NSW: Sydney.

<sup>&</sup>lt;sup>100</sup> Commonwealth Grants Commission 2021. Occasional Paper No. 2: GST distribution and state tax reform.
Urban transport investment has increased exponentially since the population-squared variable was introduced. This increased expenditure has been primarily driven by megaprojects in Sydney and Melbourne, whose investment is then largely reimbursed through the urban transport investment assessment.

As such, the current assessment is incentivising investment in urban transport in New South Wales and Victoria, whilst disincentivising investment in other states. This clearly violated the policy neutrality principle and demonstrates that the assessment is not fit for purpose.

### Discussion of Issue 4a

The assessed urban transport investment has increased from \$3.6 billion in 2015-16 to \$19.0 billion in 2021-22. This represents a 422 per cent increase in urban transport investment over the span of 6 years.

Indeed, the proportion of the investment assessment category comprised of the urban transport component has increased even more rapidly in recent years. In 2015-16, the urban transport component represented 17 per cent of the total investment assessment. This increased to 21 per cent in the 2018-19 assessment year, and then 37 per cent of the investment assessment in 2021-22.

Overall, 77 per cent of the increase in expenditure on investment from 2018-19 to 2021-22 was attributable to the urban transport category. Importantly, 91 per cent of the increase in urban transport investment was attributable to New South Wales and Victoria.

Such large increases in urban transport investment concentrated in Sydney and Melbourne would suggest that these two states, which are largely compensated for any urban transport expenditure through GST redistribution, have been increasing their expenditure in the context of the perverse incentives established by the urban transport regression model and the population-squared variable.

The significant increase in urban transport investment expenditure since the introduction of the population squared variable has resulted in a significant volume of GST being redistributed. Given issues discussed elsewhere in this submission, this redistribution is not consistent with equalisation outcomes and is inequitable.

In recent years, Victoria and New South Wales have committed to multiple major urban transport infrastructure projects. This indicates that their elevated level of urban transport investment expenditure will remain for a significant period.<sup>101</sup> Given the increase in the expenditure on Sydney and Melbourne urban transport investment megaprojects, even following the decrease in need from COVID-19,<sup>102</sup> it would suggest that perverse incentives are contributing towards state government public transport investment policy. These perverse incentives are a result of both the urban transport regression model and the population-squared variable driving the investment assessment.

Multiple urban transport megaprojects are currently under construction, mostly in Melbourne and Sydney. Table 5.1 summarises these projects. This table shows the initial cost estimate of these infrastructure projects (as quoted from their respective business cases) and the business case assessed benefits, the current cost estimate for these projects and the per cent increase in costs, and the implied benefit-cost ratio for both the initial cost estimate and the current cost estimate.

<sup>&</sup>lt;sup>101</sup> Whilst there have also been increases in urban transport investment expenditure in other states, namely Queensland and Western Australia, are likely to be temporary. The increases in costs in Queensland and Western Australia have been driven by the Metronet project in Perth and Cross River Rail in Brisbane. Both projects are major infrastructure projects with long capital lifespans and represent once-off capital expenditure in these jurisdictions. This is typical of normal investment expenditure, which is naturally lumpy over time. Additionally, other states have much lower levels of urban transport investment compared to New South Wales and Victoria. This is not a reflection of decreased need, but rather policy decisions which should not be penalised through Commission assessments as they currently are with the population-squared variable.

<sup>&</sup>lt;sup>102</sup> This is discussed in detail in Queensland's Tranche 1 submission: Urban transport expenses – Issue 4.

Project	Initial cost estimate (\$m)	Current cost estimate (\$m)	Cost increase	Assessed benefits (\$m)	BCR (initial)	BCR (current)
Sydney Metro West <sup>104</sup>	12,320	25,320	106%	17,348	1.41	0.69
Sydney Metro CSW <sup>105</sup>	11,500	20,500	78%	12,988	1.13	0.63
Western Sydney Airport <sup>106</sup>	7,384	11,000	49%	6,091	0.82	0.55
Melbourne Metro Tunnel <sup>107</sup>	7,300	12,584	72%	11,000	1.51	0.87
Suburban Rail Loop	50,500	125,045	148%	58,700	1.16	0.47
(Melbourne) <sup>108</sup>						
Cross River Rail (Brisbane) <sup>109</sup>	5,370	6,330	18%	7,687	1.43	1.21

Table 5.1: Comparisons of urban transport megaprojects.<sup>103</sup>

Source: Queensland Treasury

As can be seen, the only project that has a current benefit-cost ratio above 1 is Cross River Rail, in Queensland. This indicates that Cross River Rail is the only analysed urban transport megaproject where the investment represents expenditure relative to need.

All five projects in Sydney and Melbourne have a current benefit-cost ratio of below 1. This indicates that none of the analysed projects in NSW or Victoria are representative of urban transport need.

Figure 5.2 illustrates the aggregated initial and current benefit-cost ratios of projects in Sydney and Melbourne compared to Brisbane, as well as the percent increase in cost since respective businesses case were conducted.

<sup>109</sup>Building Queensland 2017. Cross River Rail Business Case. Queensland Government: Brisbane.

<sup>&</sup>lt;sup>103</sup> Metronet in Perth and the Melbourne Airport Link megaprojects are excluded given a lack of available data for analysis.

<sup>&</sup>lt;sup>104</sup>Infrastructure NSW 2020. *Sydney Metro West: Final Business Case Evaluation Summary*. NSW Government: Sydney; C. Minns & J. Haylen 2023 *Ministerial media release: Sydney Metro Review*. 13 April. Accessed 17 October 2023. Available at https://www.nsw.gov.au/media-releases/sydney-metro-review.

<sup>&</sup>lt;sup>105</sup>Transport for NSW 2016. *Sydney Metro City & Southwest: Final Business Case*. NSW Government: Sydney; C. Minns & J. Haylen 2023 *Ministerial media release: Sydney Metro Review*. 13 April. Accessed 17 October 2023. Available at https://www.nsw.gov.au/media-releases/sydney-metro-review.

<sup>&</sup>lt;sup>106</sup>Infrastructure Australia 2021. *Sydney Metro – Western Sydney Airport: Project business case evaluation summary*. Australian Government: Canberra; DITRDCA 2020. *Sydney Metro – Western Sydney Airport*. Accessed 17 October 2023. Available at https://investment.infrastructure.gov.au/key-projects/sydney-metro-western-sydney-airport.

<sup>&</sup>lt;sup>107</sup>Melbourne Metro Rail 2016. *Melbourne Metro Business Case*. Victorian Government: Melbourne; Victorian Auditor-General's Office 2022. *Melbourne Metro Tunnel Phase 2: Main Works*. Victorian Government: Melbourne.

<sup>&</sup>lt;sup>108</sup>Suburban Rail Loop Authority 2021. Business and Investment Case. Victorian Government: Melbourne; Parliamentary Budget Office 2022. Suburban Rail Loop East and North – Building and operating costs. Parliament of Victoria: Melbourne.





Source: Queensland Treasury with Reference to Sources listed in Table 5.1.

As shown in Figure 5.2, aggregate costs have increased by 82 per cent in Sydney and 138 per cent in Melbourne. This is drastically higher than the 18 per cent increase in Brisbane. This is particularly concerning given the significant volumes of GST that would be redistributed towards Sydney and Melbourne because of the population squared variable. In effect, this variable, coupled with the urban transport regression model, allows New South Wales and Victoria to inequitably recoup from other states through GST much of the costs they incur from any cost increases on urban transport projects.

Given the perverse incentives created by the population squared variable and the evidence that New South Wales and Victoria are able to inequitably recoup urban transport investment costs, the Commission must remove the urban transport regression model and population-squared variable from the assessment to ensure that this redistribution against HFE does not continue.

*Issue 4b – NSW and Victoria invest above need in other investment categories.* 

### Summary of Issue 4b

Principles violated:

- Practicality fit for purpose
- Policy neutrality.

According to the Commission's own assessments, New South Wales and Victoria consistently invest above their need according to sociodemographic compositions. Given this, it is probable that this investment above need also occurs for urban transport capital.

### Discussion of Issue 4b

As different states have different demographic, geographic, and economic compositions, they will have differentially investment needs. As such, states such as Queensland and the Northern Territory which have higher proportions of Indigenous Australians, more individuals of a low socio-economic status, and a geographically dispersed population will be required to invest more per capita in services such as schools, healthcare, and justice.

Conversely, states such as New South Wales and Victoria which are relatively less dispersed, have lower Indigenous populations and less socio-economic disadvantage should not have to invest as much per capita in the infrastructure related to these essential services.

Indeed, the Commission's own investment assessment demonstrates that New South Wales and Victoria are the only states with a below average investment need in all categories excluding urban transport.

However, actual data suggests that these states have a propensity to invest above their assessed need. This is illustrated in Table 5.2, which show actual compared to assessed expenditure for expenses categories (excluding urban transport and land) across different states.

Table 5.2: Difference between actual and assessed investment in different states (excluding land andurban transport, \$ per capita)

	NSW	Vic	Qld	WA	SA	Tas
Per capita actual	1,471	1,278	1,278	1,130	1,276	1,143
Per capita assessed	1,149	1,110	1,459	1,483	1,265	1,357
Difference per capita	322	168	(181)	(353)	12	(214)

Source: Commonwealth Grants Commission, 2023 Update Report.

Table 5.2 highlights that New South Wales' and Victoria's assessed investment need is significantly lower than in other states whilst their actual investment expenditure is similar or higher. This suggests that both states are investing significantly above their need (28 per cent and 15 per cent higher respectively).

However, once investment expenditures are adjusted to account for the distortionary effect NSW and Victoria have on assessed need, Queensland Treasury analysis based on Commission data indicates that New South Wales and Victoria are investing 40 per cent more and 26 per cent more respectively than implied by their assessed need.<sup>110</sup>

If it was assumed that New South Wales and Victoria invest above their need at a similar level for urban transport as they do for other components (i.e. 40 per cent and 26 per cent respectively as per the adjusted estimate), the implied actual need for urban transport investment in New South Wales and Victoria can be estimated. The effect of this adjustment is shown in Table 5.3.

## Table 5.3: Decrease in indicative actual urban transport expenditure based on assessed overspendacross other categories in NSW and Victoria (\$ per capita)

	NSW	Vic
Per capita urban transport actual	636	693
Per capita urban transport adjusted need	455	551
Difference	181	142

Source: Queensland Treasury based on Commonwealth Grants Commission data.

As can be observed in Table 5.3, based on their investment compared to need for other components, both states could have significantly less urban transport investment based on this indicative analysis. Given the extremely high levels of investment in NSW and Victoria discussed in *Issue 4a* and *4b*, it is highly probable that the actual level of investment above need for these states is significantly higher than the figure in Table 5.3.

This again highlights that, because of the reliance of the current method on the population-squared variable and the urban transport regression model, all urban transport investment in NSW and Victoria

<sup>&</sup>lt;sup>110</sup> The adjustment is necessary as the level of overinvestment in these two states is understated using the data directly stated in Table 5.3. This is as the overspend from New South Wales and Victoria is increasing their assessed need. Given that the four other states have actual spends of a population-weighted average of 13 per cent lower than their assessed spends, this suggests that to more accurately calculate what the assessed need in New South Wales and Victoria would be if they spent according to need to require a 13 per cent reduction of their actual expenditure amounts. All other states had their actual expenditure kept constant. This adjustment would still see three of the four other states' actual expenditure below their re-assessed need, with NSW and Victoria above their re-assessed need. ACT and NT were excluded because of their small size and volatile investment expenditures.

results in both states being assessed as having increased need, regardless of whether that level of investment is actually aligned with the need. This further demonstrates the inadequacy of both the model and the population-squared variable.

### Principles affected

For the Commission to justify an assessment it should be aligned with its guiding principles. As was discussed in Queensland's *Tranche 1 submissions*, the current urban transport regression model used in the investment assessment violates the principles of practicality, policy neutrality and contemporaneity. The issues discussed above in relation to the population-squared variable further significantly violated the practicality and policy neutrality principles.

### Practicality – fit for purpose

• Violated by Issues 1, 2, 3 and 4.

As noted in discussion of *Issue 2*, the population-squared variable represents a simplified and even more extreme version of the urban transport regression model. As such, it faces the same shortcomings as this model and is not fit for purpose. Like the regression model, the population-squared variable lacks a conceptual framework, largely due to the methodology having incorrectly assumed that SUA public transport investment is policy neutral. This incorrect assumption makes the population-squared variable economically invalid and not an accurate representation of urban transport capital need. **Overall, the population-squared variable is not based on sound or reliable methods and, therefore, is not fit for purpose.** 

### Practicality – quality assurance

• Violated by Issue 1 and Issue 2.

The terms of reference for the 2025 methodology review requested that the Commission *"ensure robust quality assurance processes."*<sup>111</sup> States have not been adequately consulted over the population-squared variable and the Commission has not allowed for sufficient scrutiny of the policy contaminated supporting data. Therefore, this model should not be used to determine state capacities and relativities.

### **Policy neutrality**

• Violated by Issues 1, 2, 3 and 4.

When the policy neutrality principle is violated, states are rewarded or penalised for policy decisions, establishing perverse incentives where investment expenditure can be unfairly compensated through GST. This perversion is present in the urban transport investment assessment because of the severe policy contamination related to historical and ongoing policy decisions made in relation to public transport provision in Sydney and Melbourne.

Overall, the increased level of capital asset ownership in NSW and Victoria is not a reflection of increased urban transport investment need, but rather policy decisions.

The analysis outlined above clearly demonstrates that policy decisions in Sydney and Melbourne will impact GST relativities and increase the assessed need for Sydney and Melbourne, showing that the assessment cannot be policy neutral.

### Effect of assessment on horizontal fiscal equalisation

The urban transport investment assessment redistributes billions of dollars in GST annually.

<sup>&</sup>lt;sup>111</sup> J. Chalmers 2023. Terms of Reference for the 2025 Methodology Review.

However, of the 101 SUAs, only Sydney and Melbourne are assessed as having greater than average need. This means that billions of dollars in GST is redistributed away annually from the other 99 SUAs to compensate New South Wales and Sydney for the largely policy-driven cost of providing and maintaining Sydney and Melbourne's public transport systems.

In contrast to the assertions made by New South Wales in their supplementary submission, the above case for change, combined with the issues raised in Queensland's *Tranche 1* submission, provide extensive and substantial evidence demonstrating that the current redistribution is unfair and not accurately assessing urban transport need.

Furthermore, this model is not even assessing most of the urban transport task, given it considers need only on the basis of public transport commuters and ignores the important role states play in providing public transport as a social service for equity of mobility and transporting students.

Given the multiple substantial issues with the model and population-squared variable, the current urban transport investment assessment is extremely detrimental to fiscal equalisation outcomes.

To ensure that HFE is not further negatively impacted, the Commission should discard the urban transport regression model and population-squared variable, and utilise different approaches in making these assessments, including appropriately accounting for the substantial public transport task related to other cohorts in addition to commuters.

### Changes sought

Queensland considers it imperative to change the urban transport investment assessment to prevent any further damage to HFE. Fundamentally, this assessment would need to measure the underlying need for urban transport investment in each SUA in a policy neutral manner.

Given the policy contamination of the public transport expenses data, it is the view of Queensland that it would be impractical and inappropriate to attempt developing any alternative model for the urban transport assessment using this data.

Overall, Queensland believes the drivers of urban transport investment and expenses are essentially identical, apart from an additional population growth driver for investment. As such, Queensland recommends the Commission adopt the same methodology for each assessment. This would require the following changes:

- Change 1 Discontinue the use of the urban transport regression model and population-squared variable in the urban transport investment assessments.
- Change 2 Differentially assess states' urban school transport task.
- Change 3 Differentially assess states' non-urban school transport task.
- Change 4 Assess remaining urban transport investments as 50 per cent urban population and 50 per cent number of concession card holders.

These changes and their justification are discussed in depth in section 2 on *Transport*, of this submission. Implementing these changes would recognise equity of mobility as a fundamental driver of urban transport need, both for capital and operating expenses.

Meanwhile, they would also recognise the inherent differences in providing urban transport for urban and non-urban school students compared to other passengers.

It is vitally important that these changes are adopted for both the urban transport expenses and investment assessment for two fundamental reasons:

- The drivers of need for urban transport operating expenditure and urban transport investment are largely identical. An increased need to provide services for concession card holders will result in both increased operating expenditure from an increased task and increased capital expenditure to provide the necessary infrastructure to enable a state to provide these essential services. Likewise, an increased number of non-urban or urban school students will both increase operating expenditure for the respective components as well as increase the amount of capital required to provide these services.
- As discussed above, there are significant disparities between the level of investment of capital
  assets between urban transport modes. For example, whilst urban rail assets (including
  rollingstock and ways and structure assets) are mostly state-owned, bus, ferry, and taxi assets
  are regularly owned by local government or private companies and rarely owned by state
  governments.

However, the **level of investment in urban transport assets does not decrease the overall need for urban transport capital.** Instead, where investment is not undertaken directly by state governments, capital costs are indirectly incurred through contracts with providers. This will decrease urban transport investment expenditure whilst increasing urban transport operating expenditure. This complexity means that capital costs cannot be adequately separated from operating expenses for urban transport in most SUAs.

The only differential determinant of need between operating expenses and capital expenses for urban transport is population growth, with states experiencing above average population growth having an increased need to invest in urban transport capital to provide for their increasing population.

Overall, the urban transport expenses and urban transport investment are very closely interlinked, with each category interacting and impacting the other. This presents a situation where accurately differentiating between operating expenses and capital expenditures is often highly impractical.

Overall, this means that it is inappropriate to have differential assessment methods for investment and expenses. Adopting a common core assessment method across investment and expenses, while allowing for a population growth variable in the investment assessment, will produce a consistent assessment of urban transport need which would more accurately reflect the task facing states.

### 6. Regional costs and remoteness

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states support continuing the current methodology for estimating regional costs and service delivery scale effects?
- Can states identify any data to measure differences in non-wage costs between major cities?

### Queensland position

## Do states support continuing the current methodology for estimating regional costs and service delivery scale effects?

Queensland <u>strongly supports</u> assessing regional costs, service delivery scale (SDS) costs, and sociodemographic characteristics related to remoteness. Assessing these is essential for delivering HFE outcomes that assess genuine fiscal capacity.

Service delivery scale adjustments capture the additional cost per person of delivering services in small, isolated centres compared with larger urban areas due to fixed costs. Currently, component specific SDS adjustments occur in the health, justice, and school assessments, while a general SDS gradient is applied to the child protection and family services component.

Queensland <u>recommends</u> that SDS adjustments are extended to also apply to all other components that have regional costs associated with them. The drivers for increased operating costs are strongly correlated and multiplicative to the drivers for increased fixed costs. Recognising and assessing these increased costs will improve equalisation outcomes.

Each of these components also face significant additional costs per person for delivering services in small or isolated centres compared with larger urban areas due to the impact of fixed costs needing to be spread across a smaller, more diverse population requiring the services. As such, applying the general gradient for SDS costs would improve equalisation outcomes for these components.

Furthermore, the Commission also applies a medium (25 per cent) discount to the general SDS & regional costs gradient. Queensland does not agree that a discount should be applied across the regional cost assessment in any assessment on conceptual grounds, given the clear nexus between regional disparity and costs of service provision. In particular, there are several components of this assessment where there are very strong cases to not justify any discount.

A list of proposed changes and the rationale for these changes is discussed in detail below.

Whilst there is often not appropriate data to produce a component specific gradient, it is noted that the general gradient, based on the schools' and admitted patients' gradients, is used. However, it would be expected that the regional and SDS costs associated with many services to which the general gradient is applied would actually be significantly higher than SDS or regional costs for schools or admitted patients. This likely higher cost gradient would reflect the more bespoke, place-based and 'one-on-one' service delivery aspects of a range of other essential government services (e.g. child safety) that need to be provided across regional, remote and very remote areas.

Given the limited time remaining in the current review and reflecting the overall importance of accurately assessing regional cost, if it is not possible to undertake a full review of this element of the assessment in the 2025 Review, Queensland strongly urges that the Commission consider this as a priority in the 2030 Methodology Review.

In addition to the specific changes requested below as priorities, there are a number of other areas of this assessment that Queensland would be interested in further exploring in detail with the Commission and

we would appreciate the opportunity to work with the Commission on these as part of a detailed review to inform.

## • *Requested Change 1 - Remove the discount on the general gradient for Indigenous community development.*

Indigenous community development focuses on providing services to discrete Indigenous communities. These communities are heavily concentrated in remote and very remote areas.

However, based on Queensland Productivity Commission analysis, the cost of providing local government and development assistance to discrete Indigenous communities increases markedly with remoteness. Overall, the cost per capita of providing Indigenous community development services increased by 40 per cent between remote and very remote localities, which is double the 20 per cent increase in regional & SDS costs predicted by the combined undiscounted general gradient.<sup>112</sup>

This suggests that the combined general gradient underestimates regional & SDS costs and any discount applied to this gradient is producing outcomes inconsistent with equalisation. As such, Queensland **recommends** that the undiscounted regional & SDS general gradient is used for the Indigenous community development component.

• Requested Change 2 – Remove the discount on the general gradient for other community development and amenities.

The Commission currently does not apply any socio-demographic factors for other community development and amenities. As such, the only weighting is for regional costs.

However, given the nature of state expenditure on non-Indigenous community development, it is highly concentrated in rural and remote areas.<sup>113</sup> Indeed, the Queensland Department of Infrastructure, Local Government and Planning's service delivery description states:

"The department delivers statewide information programs on legislation and policy, targeted governance training **especially for small rural, remote and Indigenous Councils**."<sup>114</sup>

Given that the task is concentrated in these rural and remote areas, a SDC adjustment would be appropriate for this component. This would recognise the need for states with more dispersed populations to provide these services.

In the absence of the Commission developing an SDC adjustment, applying any discount to this adjustment would produce outcomes inconsistent with equalisation. As such, Queensland <u>recommends</u> that the undiscounted regional & SDS general gradient is used for the other community development and amenities component.

### • Requested Change 3 – Remove the discount on the general gradient for social housing.

The drivers of expenses for social housing are split between maintenance expenses and other social housing expenses. Both sub-components are impacted by regional & SDS costs. Overall, the use of the general gradient is underestimating the actual pressures faced in regional and remote areas and producing outcomes inconsistent with equalisation.

The maintenance of social housing faces additional pressures in regional, remote, and very remote localities for a range of factors, including higher labour costs and increased maintenance needs. This generates both regional & SDS costs.

<sup>&</sup>lt;sup>112</sup> Queensland Productivity Commission 2017. Service delivery in remote and discrete Aboriginal and Torres Strait Islander communities. Queensland Government: Brisbane.

<sup>&</sup>lt;sup>113</sup> Indigenous community development is already assessed by using discrete Indigenous communities, which acts as a quasi-proxy for remote and very remote localities.

<sup>&</sup>lt;sup>114</sup> Queensland Department of Infrastructure, Local Government and Planning 2015. *Queensland Budget 2015-16: Service Delivery Statements*. Queensland Government: Brisbane.

Research conducted by AHURI indicated maintenance services were three times higher in remote and very remote areas compared to major cities.<sup>115</sup> A significant driver of these increased costs was a higher need for repairs and inspections because of increase climatic risks, such as mould. This was particularly an issue in tropical climates.<sup>116</sup>

As tropical regions are predominantly located in Queensland, Northern Territory and Western Australia, these jurisdictions will face significantly higher maintenance expenses for social housing, not just in remote and very remote areas but also in outer regional areas such as Townsville, and Darwin, and Inner Regional areas such as Mackay and Rockhampton.

Other drivers of state expenditure for social housing include tenancy management expenses. These services require direct service delivery in the communities where individuals live, resulting in higher per capita regional & SDS costs for both variable and fixed costs associated with higher labour costs and higher fixed cost requirements per capita.<sup>117</sup>

Overall, Queensland Treasury analysis shows that the weighted regional cost factor for all social housing would be 1.0396, which is higher than the undiscounted general gradient of 1.0269.<sup>118</sup> This analysis is shown in Table 6.1. This demonstrates that continuing to apply a discounted regional cost gradient would produce outcomes not consistent with HFE. As such, Queensland <u>recommends</u> that the undiscounted and combined regional & SDS general gradient is used for the homelessness services component.

Component expense drivers	Weight	Cost weighting
Maintenance expenses (general)	0.125	1.09
Other expenses	0.75	1.02
Weighted regional & SDS cost factor		1.0396
General regional & SDS cost factor		1.0269

### Table 6.1: Developing a regional & SDS cost factor for social housing.

Source: Australian Housing and Urban Research Institute.

• Requested Change 4 – Remove the discount on the general gradient for all other relevant assessments.

The other assessments which use the general regional costs gradient are:

- services to communities: environmental protection (protection of biodiversity and landscapes sub-component).
- roads: rural roads and bridges and tunnels components.
- services to industry: agriculture regulation, mining regulation, and other industries regulation components.
- transport: urban (as proposed by Queensland) and non-urban.
- other expenses: service expenses.

Overall, there is limited availability of data to estimate the true regional & SDS costs for any of these assessments. However, given that economies of scale have been shown to be more pronounced for smaller expenditure categories, it is reasonable to assume that each of these components also face increased regional & SDS costs compared to the admitted patients and the schools assessment.

<sup>&</sup>lt;sup>115</sup> T. Lea, L. Grealy, M. Moskos, A. Brambilla, S. King, D. Habibis, R. Benedict, P. Phibbs, C. Sun, & P. Torzillo 2021. *Sustainable Indigenous housing in regional and remote Australia*. Australian Housing and Urban Research Institute: Melbourne.

<sup>&</sup>lt;sup>116</sup> T. Lea, L. Grealy, M. Moskos, A. Brambilla, S. King, D. Habibis, R. Benedict, P. Phibbs, C. Sun, & P. Torzillo 2021. *Sustainable Indigenous housing in regional and remote Australia.* Australian Housing and Urban Research Institute: Melbourne.

<sup>&</sup>lt;sup>117</sup> AIHW 2023. *Housing assistance in Australia*. Australian Government: Canberra.

<sup>&</sup>lt;sup>118</sup> The 12.5 per cent weighting given to construction costs which use the Rawlinson's Construction Cost Index are excluded.

Furthermore, all components, apart from roads, require significant service delivery components. These services require direct service delivery in the communities where individuals live, resulting in higher regional & SDS costs for both variable and fixed costs associated with higher labour costs and higher fixed cost requirements per capita. As such, not applying SDS factors and maintaining a discount on regional & SDS costs for these components is producing outcomes inconsistent with equalisation.

For the roads component, labour costs are significantly increased across regional and remote localities to account for increased travelling distances and accommodation fees for specialist workers. Fixed costs are increased by the need to have staff and equipment located in regional and remote areas to enable rapid repairs and emergency response times. Staff and equipment in these areas are likely to have lower utilisation rates per capita, increasing costs.

Overall, Queensland <u>recommends</u> that the Commission apply SDS factors and remove the discount for regional costs across all these components.

• *Requested change 5 – Introducing regional costs for the urban transport assessment, using the general gradient.* 

The non-urban transport assessment recognises the increased cost of public transport service delivery with increasing remoteness. However, despite the clear conceptual case that costs increase with remoteness, there is no regional costs adjustment for the urban transport assessment. This is despite many significant urban areas being located in regional and remote areas.

The same pressures that result in substantially higher costs associated with running transport services in these areas for non-urban transport occur with urban transport. However, there is no allowance for this in the current urban transport assessment. Consequently, Queensland <u>recommends</u> that regional costs are incorporated into the urban transport assessment using the general gradient.

### Can states identify any data to measure differences in non-wage costs between major cities?

Queensland <u>did not identify</u> any specific data considered appropriate to measure differences in nonwage costs between major cities.

### **Revenue assessments**

### 7. Payroll tax

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states support assessing revenue from payroll tax surcharges on the same basis as payroll tax?
- Do states support retaining the 2020 Review assessment method and data sources, noting that the Commission will continue to explore the feasibility of an assessment based on data from BLADE and/or PLIDA?
- Do states support the assessment method including scope for the Commission to move to BLADE and/or PLIDA data in a future update, in consultation with states, if those data would improve the assessment?

### **Queensland position**

### Do states support assessing revenue from payroll tax surcharges on the same basis as payroll tax?

Queensland <u>supports</u> assessing revenue from payroll tax surcharges on the same basis as payroll tax. There is a relevant nexus between payroll tax surcharges and payroll tax for the purpose of HFE, given these surcharges are levied on taxable wages paid by an employer, like payroll tax.

Any alternate treatment of payroll tax surcharges would introduce more complexity to the assessment, requiring the identification of the proportion of payroll tax revenue relating to these surcharges.

Furthermore, there is currently no data available to estimate the value distribution of payrolls and it would place additional reporting burdens on states to report the distribution of payroll values. As such, to enable a simple assessment, Queensland believes it is reasonable to assess revenue from payroll tax surcharges on the same basis as payroll tax without adjustments to the current assessment method.

# Do states support retaining the 2020 Review assessment method and data sources, noting that the Commission will continue to explore the feasibility of an assessment based on data from BLADE and/or PLIDA?

Queensland <u>supports</u> retaining the 2020 Review assessment method and data sources. Queensland also <u>supports</u> the continued exploration of the feasibility of using data from BLADE and/or PLIDA for the payroll tax assessment.

BLADE and PLIDA microdata have the potential to provide a more reliable assessment of state payroll tax revenue raising capacities. However, Queensland's view is that using this data should not significantly impact on the contemporaneity of the assessment.

Additionally, Queensland would like to highlight that there continues to be significant and likely incomplete data with the PLIDA database which would impact its fitness for purpose.<sup>119</sup> The Commission's consideration of the use of this data must ensure that it would not result in a decrease in reliability or ability to quality assure the data.

<sup>&</sup>lt;sup>119</sup> N. Biddle, R. Breunig, F Markham, & C Wokker 2019. Introducing the longitudinal MADIP and its role in understanding income dynamics in Australia. Australian National University Centre for Social Research & Methods: Canberra.

# Do states support the assessment method including scope for the Commission to move to BLADE and/or PLIDA data in a future update, in consultation with states, if those data would improve the assessment?

Queensland <u>does not support</u> the assessment method including scope for the Commission to move to BLADE and/or PLIDA data in a future update.

Changing the assessment to utilise BLADE and/or PLIDA data would represent a significant change in the payroll tax assessment.

It is Queensland's view that a thorough consultation process, more fulsome than the current annual new issues process would be required for states to analyse and scrutinise this potentially significant assessment change.

### 8. Gambling tax

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states agree there is no reliable method of differentially assessing gambling taxes? If not, what do states consider to be a reliable method of assessing state gambling taxes?
- Do states agree that state gambling taxes should be assessed equal per capita in the other revenue category?

### **Queensland position**

## Do states agree there is no reliable method of differentially assessing gambling taxes? If not, what do states consider to be a reliable method of assessing state gambling taxes?

Queensland <u>supports</u> the Commission's conclusion that there is no reliable method of differentially assessing gambling taxes. As the Commission has been unable to identify suitable drivers to assess state gambling taxation capacity and there is significant policy contamination in the assessment, there is no conceptual or principled foundation to introduce or design a method for assessing gambling taxes.

Coupled with this, gambling revenue is influenced by interstate and international populations, as well as the presence of online gambling. An assessment would need to account for other factors such as tourism and other policy factors that have impacted states gambling industries for it to fairly capture underlying differences between states. Using HILDA data alone would not adequately account for these drivers, as HILDA data looks at a state's own population, it does not account for visitors to the state.

## Do states agree that state gambling taxes should be assessed equal per capita in the other revenue category?

Queensland <u>supports</u> the Commission's proposal to continue to assess gambling taxes equal per capita in the other revenue category.

As there is no reliable method for differentially assessing gambling taxes the most appropriate assessment is equal per capita. As this assessment will not impact relativities it is reasonable to include it in the other revenue category.

### 9. Other Revenue

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states agree with the revenues classified to the other revenue category?
- Do states agree that other revenue should be assessed equal per capita?

### Queensland position

### Do states agree with the revenues classified to the other revenue category?

Queensland <u>supports</u> the classification of the revenues in the other revenue category.

The revenues classified in the other revenue category are either policy contaminated or have no identifiable drivers. Classifying these revenues together in the other revenue category is consistent with the Commission's practicality principle as it is a simple approach for assessing need.

### Do states agree that other revenue should be assessed equal per capita?

Queensland <u>supports</u> assessing other revenue as equal per capita. As these revenues are either policy contaminated or have no identifiable drivers and therefore cannot be differentially assessed.

Given these factors, the most appropriate assessment is to assume all states have equal capacity and assess other revenue equal per capita.

### **Expense assessments**

### 10. Housing

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states agree that the housing assessment remains fit for purpose notwithstanding recent developments in the housing market?
- Do states agree that there should be separate assessments for public and community housing if it results in a material change in GST distribution?
- Is the ABS census data on households with members that have long-term health conditions a suitable proxy for households that have high service needs?
- Do states have data on the cost of servicing different household types that would enable the calculation of a cost gradient?

### **Queensland position**

## Do states agree that the housing assessment remains fit for purpose notwithstanding recent developments in the housing market?

Queensland <u>supports</u> the current assessment as fit for purpose notwithstanding recent developments in the housing market.

However, the assessment is already overly complex and has the second lowest overall distribution of expense assessments, adding further disaggregation to this assessment is not recommended as it is unlikely to be material and would result in additional unnecessary complexity.

## Do states agree that there should be separate assessments for public and community housing if it results in a material change in GST distribution?

Queensland <u>does not support</u> a separate assessment for public and community housing regardless of its materiality.

Although there is a clear indication that some states have a higher concentration of community housing compared to public housing, this is most likely a result of the community housing market responding to service delivery decisions made by states rather than a measure of different fiscal needs of states.

Although the community housing sector may have a lower cost, it is doubtful that it would be material from a GST distribution point of view, would add further complexity to the housing assessment and would be inappropriate as it would assume different fiscal needs because of service delivery choices by states.

## Is the ABS census data on households with members that have long-term health conditions a suitable proxy for households that have high service needs?

Queensland <u>does not support</u> the inclusion of high service need within the housing assessment.

In Queensland's experience, including long term health conditions data (the proposed proxy) will not result in significant changes to the housing data currently provided. This is because the vast majority of persons within the Queensland social housing system are noted to already have long term health conditions and hence will already be included within the current assessment methods.

To add this new layer of granularity to the assessment would therefore result in added complexity with limited additional benefit.

This is supported by the Queensland Department of Housing who note that determining the additional costs of high-cost clients is difficult and unlikely to be material.

Additionally, there are limitations with Census data on long term health conditions which would affect its suitability as a proxy. The list of conditions is not comprehensive, does not reflect the severity of conditions and does not include any information on how these conditions affect service access and usage. Some conditions are also found to be under reported (arthritis, mental health, asthma) when compared to National Health Survey data.

## Do states have data on the cost of servicing different household types that would enable the calculation of a cost gradient?

As part of the data request process in the five year review, Queensland will work with the Department of Housing to acquire the data and consult with Commission staff where required.

### 11. Welfare

### Proposed changes

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states agree that the state NDIS contributions can be collected from the Commonwealth Budget papers rather than from the states?
- Do states agree that the current NDIS assessment is fit for purpose?
- Do states support the development of a homelessness services assessment?
- Will states be able to identify spending on homelessness services and identify where that spending is reported in the Government Finance Statistics classifications?
- Do states support the proposed drivers to assess homelessness spending, noting further work is to be undertaken on mental health conditions as a potential driver?
- Do states support combining the other welfare, non-NDIS aged care and National Redress Scheme components and assessing spending using the 2020 Review method for other welfare (equal per capita assessment method with regional and wage cost factors)?
- Do states support the Commission ceasing to collect state spending on the National Redress Scheme?

### Queensland position

## *Do states agree that the state NDIS contributions can be collected from the Commonwealth Budget papers rather than from the states?*

Queensland <u>supports</u> the Commission collecting the NDIS contributions from Commonwealth budget papers rather than from the states. This would ensure that the data is on a consistent basis and could be provided to the Commission in a timelier manner.

### Do states agree that the current NDIS assessment is fit for purpose?

Queensland <u>supports</u> the current assessment of NDIS state expenses as being fit for purpose.

However as is standard Commission practice, should the NDIS be renegotiated in the near term, the Commission, through its usual annual consultation process, should review and ensure the assessment method is still fit for purpose.

### Do states support the development of a homelessness services assessment?

Queensland does not support introducing a separate homelessness services assessment.

State's homelessness spending will already be captured or reflected across a number of the Commission's assessments including housing, welfare, and health. The drivers proposed for the homelessness assessment are also very similar to the drivers in other assessments in which homelessness spending is already captured.

Therefore, it's questionable that an assessment for homelessness would be material and could reduce the materiality of other assessments in the process.

## Will states be able to identify spending on homelessness services and identify where that spending is reported in the Government Finance Statistics classifications?

Within the Government Finance Statistics (GFS) framework, housing spending is categorised broadly to include the administration of housing programs and development activities; construction of new housing stock and grants; loans and subsidies to support the maintenance and expansion of housing stock; as well

as the provision of social protection benefits to help households meet the costs of housing (rental subsidies and allowances, low cost mortgage financing). Spending related to homeless services will be encapsulated with other forms of housing spending.

Based on Queensland Treasury's detailed consideration of this issue, there is no specific GFS code which would satisfy the collection of spending for homelessness for GST distribution.

### Do states support the proposed drivers to assess homelessness spending, noting further work is to be undertaken on mental health conditions as a potential driver?

If the Commission decided to introduce a homelessness assessment, Queensland <u>does not oppose</u> using the Commission's proposed drivers (Indigenous status, age, socio-economic status, and remoteness) noting the correlation with increased usage rates of homelessness services.

Queensland <u>does not support</u> the inclusion of mental health services as a driver for homelessness spending using the ABS Census as a data source.

The ABS does not consider that mental health data is comparable with specialist collections on this topic and the collection methodology, where an individual responds on behalf of other household members, is likely to underreport the prevalence of mental health conditions. While the suggestion to utilise survey data to augment the Census data may have merit, substantial further research is required to investigate this prior to any consideration of utilising this data.

# Do states support combining the other welfare, non-NDIS aged care and National Redress Scheme components and assessing spending using the 2020 Review method for other welfare (equal per capita assessment method with regional and wage cost factors)?

Queensland <u>does not oppose</u> the Commission combining the other welfare, non-NDIS aged care and National Redress Scheme components and assessing the spending on the same basis as the 2020 review method.

### Do states support the Commission ceasing to collect state spending on the National Redress Scheme?

Queensland <u>supports</u> the Commission ceasing to collect state spending on the National Redress Scheme. Given the proposed change to data collection directly from the Australian Government, this renders this state data request unnecessary. This change in approach should also ensure more consistency in the data.

### 12. Roads

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states support retaining the 2020 Review method of assessing urban road length, using population as the driver for large towns?
- Do states agree that the 2020 Review synthetic rural road network should not be updated?
- Do states agree that traffic volume should continue to be assessed using data from the Bureau of Infrastructure and Transport Research Economics and the National Transport Commission?

Queensland would also like to raise an important issue pertinent to the roads assessment:

• Queensland <u>supports</u> continuing to apply the 50 per cent discount of National Road Network Commonwealth payments.

### **Queensland position**

## Do states support retaining the 2020 Review method of assessing urban road length, using population as the driver for large towns?

Queensland <u>supports</u> retaining the 2020 Review method of assessing urban road length, using population as a driver for large towns. As the Commission notes, there have not been any significant changes that would require a change in assessment methods.

### Do states agree that the 2020 Review synthetic rural road network should not be updated?

Queensland <u>supports</u> retaining the 2020 Review synthetic rural road network. As the Commission notes, any changes since the 2020 Review are unlikely to have any material effect on the assessment.

## Do states agree that traffic volume should continue to be assessed using data from the Bureau of Infrastructure and Transport Research Economics and the National Transport Commission?

Queensland <u>supports</u> using data from the Bureau of Infrastructure and Transport Research Economics and the National Transport Commission to assess traffic volume. With the discontinuation of the ABS Survey of Motor Vehicle use, this data remains the most reliable and comprehensive source for traffic volume.

### Key Issue – maintenance of 50 per cent discount of National Road Network (NRN) payments

While the Commission has not asked for specific views on this component of the assessment, Queensland is of the strong view that the longstanding treatment of Commonwealth payments to states for the National Road Network (NRN) continues to be appropriate, and it is critical that this approach is retained in any review of the methodology related to this assessment.

Selection of NRN projects is largely dictated by the Commonwealth. While they support states that receive payments, these states have limited control over NRN projects and payments. This funding allocation is consistent with the continuing operation and improvement of the national network, under which ongoing maintenance is necessary to ensure NRNs are fully operable and meet their intended purpose.

There may be elements of the national network that benefit the state where the funding is provided to a greater extent than the national network as a whole. However, there are significant difficulties in attributing the proportion of these payments to specific functions.

Queensland's long running position is that a 50 per cent exclusion of NRN Commonwealth payments should continue to be applied.

### 13. Services to communities - Natural disaster relief

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

• Do states support the continuation of the natural disaster relief assessment in its current form?

### **Queensland position**

### Do states support the continuation of the natural disaster relief assessment in its current form?

Queensland <u>supports</u> the continuation of the natural disaster relief assessment in its current form.

State spending on natural disasters is not policy influenced and as such an actual per capita assessment is the most appropriate assessment method.

Natural disaster relief expenses have been subject to considerable scrutiny and investigations as part of previous Commonwealth Grants Commission (CGC) Reviews and Updates.

These reviews have confirmed that an actual per capita (APC) assessment is the most appropriate approach to assessing state needs for natural disaster relief and recovery.

### 14. Services to industry

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states support replacing total factor income as measure of industry size with the chain volume measure of industry value-add to assess the need for spending on industry regulation?
- Do states support the development of an average or representative base year to index changes in the chain volume of production?
- Do states support the reintroduction of the number of businesses as a driver of need for regulatory spending if it is material?

### **Queensland position**

Do states support replacing total factor income as measure of industry size with the chain volume measure of industry value-add to assess the need for spending on industry regulation?

## Do states support the development of an average or representative base year to index changes in the chain volume of production?

Queensland supports the Commission's efforts to address the volatility in this assessment caused by price fluctuations in key commodities. However, Queensland considers the approach proposed by the Commission to achieve this outcome has some significant limitations, and Queensland proposes that an alternative approach should be considered.

Changes in nominal values of production resulting purely from changes in prices for goods, should not necessarily affect state spending need on industry regulation. However, changes in nominal values over time, and from year to year, ultimately reflect the combination of changes in volumes of production, including the number of producers, and price impacts.

The Commission's proposal to replace the current total factor income measure with a chain volume measure as a means of addressing volatility appears to have merit on face value. However, this will not fully resolve the problem as the ABS rebasing of the base year itself is a source of volatility.

Further, the proposed solution by the Commission to index any changes to either a 'representative' or average base year, could also be highly subjective, and the choice of any base year can have a significant impact on results.

Queensland instead <u>recommends</u> that the Commission should continue to use the current total factor income measure, while also utilising a long-term moving average for the value of factor income. The benefit of this approach is that this would remove the potential issues in selecting a base year while also addressing the impacts of any short-term price volatility without the need for a substantial change in the current underlying and longstanding assessment method.

Queensland proposes that a five-year moving average based on the most recent available data should be used. This reflects that commodity price cycles typically last several years. It is also considered to provide an appropriate balance between a longer, less contemporaneous average and a shorter, more volatile average.

Should the Commission, however, decide to proceed with its proposal to adopt a chain volume measure of industry value, Queensland <u>supports</u> the use of an average base year rather than using any single representative year. This will help prevent the base from being affected by significant short-term changes or extreme events.

However, the choice of average base year should be tested with states to ensure there are no perverse impacts on the assessment.

While the use of an average base year over several years still may reflect impacts of changing market dynamics impacting over that period, the potential for the base year to be an 'outlier' and skew the results, should be lessened.

## Do states support the reintroduction of the number of businesses as a driver of need for regulatory spending if it is material?

Queensland <u>does not oppose</u> the Commission including additional measures as drivers of need that reflect regulatory spending, should these prove to be material.

This could include the number of businesses by industry in certain industries, in particular those industries dominated by a large number of small businesses, which theoretically should have some correlation to the extent of spending needed to regulate an industry.

However, Queensland notes that there are some material data limitations with this measure, in particular how the location of the business is defined, including where the location of the business activities and head office may be in different jurisdictions.

If the number of businesses is to be included as a driver, it is important the Commission takes measures to ensure that any data limitations are addressed and do not bias the assessment results.

For mining regulation, Queensland <u>recommends</u> that the Commission should use *number of mining tenements* rather than the number of businesses as a driver of regulatory spending. This is a more valid measure that is based on access rights to explore and mine and better reflects the need for regulation. In particular, given the capital-intensive nature of mining, mining activity may be dominated by a small number of large businesses in some states, but this small number of businesses does not reflect the complexity of the regulatory framework that needs to be administered in relation to the broad range of activities undertaken across mining tenements and different regions.

For example, in Queensland's coal industry, while production is largely focussed on a small number of medium to large mining companies, each of these companies' projects is made up of multiple mining tenures and each tenure needs to be considered within the regulatory framework, with specific actions triggered by regulatory requirements (application, renewal, environmental protections) related to each tenement. In this instance, a driver based around number of businesses will not reflect the true scale of regulation spending need by the state.

In terms of agricultural regulation, Queensland has concerns that the number of businesses in the sector as a measure of a states' regulatory need is overly simplistic and could be misleading. Aggregate agricultural regulatory costs for state governments are increasing each year at a time when the agriculture sector is experiencing structural adjustment which continues to increase the average farm size.

Biosecurity risks, an increasing incidence of natural disasters, growing consumer demands for environmental, social and corporate governance, food security concerns and a need to transition to net zero are all driving a need for services to industry in this industry. Therefore, a driver based on number of businesses would not account for these other considerations and would likely produce an inaccurate, incomplete and misleading picture on the need for regulation, thereby resulting in perverse impacts in terms of HFE.

Given these limitations and risks across key sectors, any inclusion of number of businesses as a variable is a reasonable assumption. However, this would need to be carefully considered on an industry by industry basis, with other relevant measures considered and applied for key industries such as mining and agriculture.

The number of businesses would therefore be seen as only one potential measure among several that could affect the need for regulatory spending, with other measures having an equal or greater influence. Additionally, in some cases the number of businesses may not be considered appropriate to use. This may

be the case in particularly large, complex, highly technical, or high risk industries. Where this is relevant, the use of, or prioritisation of, alternative measures should be considered.

The Commission would also need to be satisfied that the re-inclusion of another variable to the assessment doesn't have similar unintended redistribution consequences as those potentially resulting from the use of production values. Given the complexity of any potential change in this regard, as outlined above, potentially this should be considered in the context of the 2030 review given the current condensed timeframes of this review.

## Key issue – the proportions of state spending for regulation and businesses development purposes has recently not been static and has led to the regulatory assessment no longer being assessed correctly.

State spending on regulation and development is aggregated in the Government Finance Statistics data and the Commission uses additional state provided data to calculate the average share of regulation and business development spending to apportion spending to either regulation or development activities.

These proportion are fixed within the Service to Industry assessment from 2020 till 2025. However, various states expenditure on business development increased significantly in response to the COVID-19 pandemic. Because of the fixed proportions in the assessment this additional business development spending has artificially increased the Commission's assessed expenses for states regulatory needs, leading to some states being assessed as having substantially increased regulatory need where no real increased need existed.

In future updates, the Commission should consider updating the ratios where it is appropriate to do so to better reflect states assessed need for business regulatory spending and to minimise the inappropriate 'leakage' of business development expenditure into the regulatory expense assessment.

### Net zero transition – grants to industry

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Will states be able to identify spending on the net-zero transition and provide it to the Commission to develop an assessment?
- Can states identify and provide data on potential drivers of state spending on the net-zero transition?
- Do states expect there to be a sufficient increase in state net-zero transition spending to warrant a separate assessment, within or outside of the business development assessment?

### **Queensland position**

## Will states be able to identify spending on the net-zero transition and provide it to the Commission to develop an assessment?

Although spending on the transition to net zero emissions will be included broadly within the GFS framework and possibly already captured to an extent through existing assessments, identifying specific spending at a detailed level would likely not be a simple task.

This is because the spending to support business in their transition will occur across multiple projects and programs and may be included in broader programs and funding provided to support and facilitate other forms of business development. Therefore, a full review of all government programs across all states would be needed to ensure that any net zero transition spending is appropriately identified and included.

While not an exhaustive list, for Queensland this would be likely to include a range of major investments and initiatives being implemented by the Queensland Government, or important elements of those programs, including:

- \$62 Billion Queensland Energy and Jobs Plan<sup>120</sup>, including key elements such as:
  - \$4.5 billion Queensland and Renewable Energy and Hydrogen Jobs Fund to increase ownership of renewable energy projects and supporting infrastructure, in partnership with the private sector.
  - \$200 million Regional Economic Futures Fund to support economic and community development initiatives, which include priority actions required to support the energy transformation in regional Queensland.
- \$520 million Low Emissions Investment Partnerships Program<sup>121</sup> to accelerate least cost emissions reductions at the state's largest emitting facilities, through partnerships and co-investment.
- \$500 million Land Restoration Fund<sup>122</sup>, to facilitate a pipeline of qualifying Queensland-based carbon offset projects, including through private sector investment.
- Queensland Zero Emissions Vehicle Strategy<sup>123</sup>, which includes electric vehicle rebates (\$45 million) and electric vehicle charging infrastructure (\$10 million).
- \$9.8 million Vegetation Management Compliance Program to implement an enhanced compliance model to reduce emissions from unexplained land clearing.
- Low Emissions Agriculture Roadmap<sup>124</sup> to assist Queensland agribusiness and the broader supply chain to lower greenhouse gas emissions without impacting the supply of food and fibre.

In addition to these, a range of other smaller programs and initiatives would also likely be fully or partially within scope and would need to be carefully considered.

Given these complexities, a clear agreed framework for identifying net zero transition spending is needed before any assessment could practically and effectively be considered.

In order to respond to this question more definitively, Queensland recommends that a detailed data request is developed, specifying the scope and definitions of the data required which could be used to investigate this further as part of this Review.

Queensland would welcome the opportunity to work with the Commission to develop such a data request to identify spending across agencies and GFS codes.

### Can states identify and provide data on potential drivers of state spending on the net-zero transition?

Queensland considers that the drivers for state spending to support transition to net zero will likely include the volume of carbon dioxide emissions to be abated, cost per tonne of abatement (in turn affected by the source of emissions and timing and complexity of abatement). The Queensland Government has an existing target of achieving 30 per cent reduction on 2005 levels by 2030, and net zero emissions by 2050. The Queensland Government has also recently committed to a new interim target of 75 per cent reduction by 2035.

The Australian Government's Department of Climate Change, Energy, the Environment and Water publishes Australia's National Greenhouse Accounts annually. Results are reported by jurisdiction and by sectors. However, Queensland has not yet investigated whether there is other comparable data available

<sup>&</sup>lt;sup>120</sup> <u>Queensland Energy and Jobs Plan | Department of Energy and Climate (epw.qld.gov.au)</u>

<sup>121</sup> Low Emissions Investment Partnerships - Queensland Treasury

<sup>122</sup> Land Restoration Fund to create jobs and environmental benefits - Ministerial Media Statements

<sup>&</sup>lt;sup>123</sup> <u>Queensland's Zero Emission Vehicle Strategy</u> | <u>Transport and motoring</u> | <u>Queensland Government (www.qld.gov.au</u>)

<sup>&</sup>lt;sup>124</sup> <u>Queensland Low Emissions Agriculture Roadmap 2022–2032 (daf.qld.gov.au)</u>

for drivers of spending by jurisdictions, as this would need to be determined as part of the data request process in the five year review.

It will also be important to consider the extent to which that cost is borne by the general government sector, or that government support or facilitation is required to enable industry to abate emissions but remain competitive and viable given the specific characteristics of their abatement challenge.

Queensland's industry structure and dispersed population means that, on a tonnes of emissions per GSP basis, the state's emissions intensity is nearly two times higher than the rest of Australia. This means its more costly to abate emissions in some of the key industries in the absence of Commonwealth investment. Given the structure of the Queensland economy and emission intensive nature of Queensland industries, this is likely to result in a substantially greater transition task for Queensland compared to several other states.

Queensland has also reduced its emissions more than other states over the 2005 to 2021 period. To date, Queensland has led the way in emissions reduction, reducing more tonnes of emissions than any other state or territory in Australia and achieving a 29% reduction on 2005 levels. The task will become increasingly difficult as hard to abate sectors are considered.

## Do states expect there to be a sufficient increase in state net-zero transition spending to warrant a separate assessment, within or outside of the business development assessment?

Queensland considers that spending on the transition to net zero is likely to increase over time and may increase materially enough to warrant a separate assessment.

However, as outlined above, this task is also likely to be a complicated issue, particularly if broadened to include other relevant spending by states that is broader in scope than business development.

As outlined above, a clear agreed framework for identifying net zero transition spending is needed before any assessment could practically and effectively be considered.

Given the structure of the Queensland economy and emission intensive nature of Queensland industries, Queensland clearly faces a substantially greater transition task then several other states. Therefore, Queensland would welcome the opportunity to work with the commission in relation to any further consideration of this matter.

### 15. Other expenses

### Proposed changes

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states agree with the expenses classified to the other expenses category?
- Do states agree that other expenses should be assessed equal per capita?

### Queensland position

### Do states agree with the expenses classified to the other expenses category?

Queensland <u>supports</u> the classification of the expenses in the other expenses category.

Expenses classified in the other expenses category are either policy contaminated or have no identifiable drivers.

Classifying these expenses together in the other expenses category is consistent with the Commission's practicality principle as it is a simple approach for assessing need.

### Do states agree that other expenses should be assessed equal per capita?

Queensland <u>supports</u> assessing other expenses as equal per capita.

As these expenses are either policy contaminated or have no identifiable drivers they cannot be differentially assessed.

Given these factors, the most appropriate assessment is to assume all states have equal need and assess other expenses equal per capita.

### 16. Net borrowing

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states agree that the conceptual basis for the net borrowing assessment remains unchanged?
- Do states support smoothing population growth to reduce volatility in the net borrowing category if a change is made to smooth population growth in the investment assessment?

### Queensland position

### Do states agree that the conceptual basis for the net borrowing assessment remains unchanged?

Queensland <u>does not support</u> the conceptual case, rationale and the methodology underpinning the assessment of net borrowing.

Net borrowing represents the amount by which the total outlays of the general government sector (including both service delivery expenses and investment in infrastructure) exceed its total revenue.

As the Commission's other assessments already currently equalise separately all of the individual elements that contribute to the overall fiscal balance (i.e. expenses, revenues and investment), Queensland's position is that the need, fiscal capacity and GST distribution that results from the net borrowing assessment is already being equalised through all other expense, revenue and capital assessments. Therefore, a net borrowing assessment has no strong conceptual case and should be discontinued.

### States net borrowing position has fundamentally changed:

Since the 2019-20 fiscal year, there has been a fundamental shift in the level of borrowings undertaken by states. The CGC's own data shows net annual borrowing increasing at an aggregate national level for States and Territories from \$21 billion in 2018-19 to \$56 billion in 2019-20 and has remained around that level from 2019-20 to 2021-22.

This has been largely driven by additional spending and changes in revenue by states during, and in the recovery phase from, the COVID pandemic. The Commission has already assessed these impacts and appropriately captured the impacts through its assessments and resulting GST redistribution outcomes.

The changes in levels of spending by states was also clearly driven by policy choices of states in how they responded to the COVID-19 crisis and policy choices they made in terms of the actions they took in the context of the recovery from the crisis.

As such, the assessment of states' net borrowing position is not only clearly policy contaminated (with many major spending decisions by individual states in recent years being driven by clear policy decisions resulting in major fiscal impacts) but also results in the assessment of, and equalisation outcomes due to, these revenue and expenditure outcomes being duplicated.

### Fundamental issues with only narrowly using population growth for the assessment:

The net borrowing assessment does not appropriately take into account each state's socio-demographic composition and fiscal capacity.

Under the current assessment methods, population growth is determined to be the driver of state need, with states that have above average growth assumed to need less GST to maintain the same net liabilities per capita. Net borrowing reflects the extent to which a state or territory (states') total outlays on service delivery and investment in infrastructure exceed their total revenue from all sources including GST. If total revenue exceeds total expenditure, states are net lenders.

However, population growth is too narrow a measure, and consideration should be given to the underlying characteristics of the population and population growth.

It is reasonable to expect, for example, that a working age, income generating person would have a greater capacity to service debt than someone who is not of working age and without a source of income.

In addition, states with strong population growth are much more likely to have to borrow substantially to fund the essential capital required to cater for future population growth and the provision of additional services, coupled with the geographical impacts in a dispersed population such as exists in Queensland, all of which would flow into borrowing considerations for states.

Queensland suggests that the Commission should discontinue the net borrowing assessment. Alternatively, if the Commission determines that the assessment will be retained, detailed consideration should be given to expanding the assessment's drivers to include the same drivers of expenses needs used in the investment assessment.

### Queensland's position:

Queensland proposes, given the fundamental change in the underlying drivers of the assessment in recent years and the lack of a strong conceptual case for the assessment, is that the net borrowing assessment be discontinued or heavily discounted by 50%. In addition, as the Commission already assess expenses, capital and revenue, there should be no impacts from either discontinuing or heavily discounting this assessment on any other assessment.

Should the Commission continue to consider there is a sound conceptual case for this assessment, Queensland recommends incorporating population characteristics similar to the revenue raising capacity of states and expenses needs in the net borrowing assessment.

## Do states support smoothing population growth to reduce volatility in the net borrowing category if a change is made to smooth population growth in the investment assessment?

Queensland <u>does not support</u> smoothing user population growth.

Making this change would reduce the contemporaneity of the assessment, further increasing the time between population growth (when a state needs to increase investment) and when a states' GST needs are met.

Furthermore, issues with volatility are already addressed through the three-year averaging of relativities. This indirectly smooth's all assessments and lessens the impact of volatile assessments such as investment.

### Other

### 17. Adjusted budget

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

- Do states agree with the Commission's preliminary view to use:
  - ABS preliminary Government Finance Statistics data for year 3
  - A state's year 3 data if the ABS preliminary data are not available
  - The final ABS Government Finance Statistics data for the first 4 assessment years (year minus 1 to year 2).
- Do states consider the proposed process for implementing adjustments in the 2025 Review adjusted budget is appropriate?

### Queensland position

Do states agree with the Commission's preliminary view to use:

- ABS preliminary Government Finance Statistics data for year 3
- A state's year 3 data if the ABS preliminary data are not available
- The final ABS Government Finance Statistics data for the first 4 assessment years (year minus 1 to year 2).

## *Do states consider the proposed process for implementing adjustments in the 2025 Review adjusted budget is appropriate?*

Queensland <u>supports</u> the Commission using preliminary ABS Government Finance Statistics (GFS) data for the final year in an annual update in place of State GFS data to then be replaced by finalised data in the next update. ABS final data would be used in all other years of the annual update. This is Option 1 in the consultation paper.

This should result in improved data quality by drawing all data from a single source providing greater reliability and consistency when used. Furthermore, as noted in a comparison provided by the Commission the differences between state and ABS data across most categories of revenue, expense and investment are either negligible or explained by known adjustments.

The Commission notes that the number of adjustments has increased from 10 to 20 since the 2020 review This change should also result in fewer data adjustments, specifically those that were needed to align state GFS data with ABS GFS data. This relates to the adoption of new accounting standards by states which are now inconsistent with ABS GFS historical standards.

In instances where the timing of the ABS preliminary data does not align with update timelines, Queensland <u>supports</u> the Commission working with states to use state GFS data in its place. However, as the Commission notes, these instances should be lessened due to the earlier availability of ABS data.

If Option 1 were not supported, Queensland would recommend continuing with current assessment methods (Option 3 in the consultation paper). That is using ABS GFS data for first two years of the assessment and state GFS data for the final year.

Queensland <u>does not support</u> using state GFS data for all assessment years (Option 2) as there are likely to be differences in how states code their GFS data which could adversely affect any assessments using this data.

The consultation paper notes that in some cases state GFS data is currently used to inform detailed component splits on ABS data where the ABS does not provide data to this level e.g. investment and services to industry. The Commission has suggested that it may in these cases apply its discretion when compiling the adjusted budget.

Consistent with the approach taken for any proposed changes, Queensland <u>recommends</u> that the Commission consult with states before implementing any new adjustments.

To restrict the number of adjustments applied, Queensland <u>supports</u> applying a materiality threshold when considering the implementation of adjustments and re-testing these in each review.

### 18. Administrative scale

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

• Do states support the continuation of the administrative scale expense assessment in its current form?

### **Queensland position**

### Do states support the continuation of the administrative scale expense assessment in its current form?

Queensland does not support the level and reliability of the current administrative scale adjustment.

However, Queensland does support retaining an administrative scale assessment to recognise the minimum costs incurred by states to deliver services. This recognises the fact that smaller state populations have higher per capita costs as the services of government are distributed across fewer residents.

In its estimation approach applied in the 2020 review, one of the methods the Commission utilised to determine administrative scale costs was a bottom-up approach that derived a basic structure and staffing by Department or function and the costs associated with this. This approach, however, was heavily reliant on subjective judgements, particularly around minimum staffing.

Attempting to establish average government structures and minimum staffing profiles at a functional level is fraught given the significant differences that exist between states.

To use Education as an example the Commission assesses that the average structure is to provide one Department and one teacher registration board. In several states however education services (VET, TAFE) are provided through separate agencies rather than a central Department. Also, in smaller states some of the board positions are unpaid.

This is also the case for Health where the average structure is determined to be one Department. In practice however, crucial functions such as ambulance services are handled vastly differently between states, either through Health departments, separate service agencies or contractual arrangements with other providers.

Building on this approach to then determine staff numbers and levels is even more unreliable. For example, in 2020, the Commission determined that an education function required an estimated 133 staff. However, this number is not consistent with staff counts taken from the Productivity Commission's Report of Government Services for either Tasmania (275) or ACT (288), smaller jurisdictions that would be expected to most closely reflect an actual administrative scale number. In fact, the only justification for this estimate appears to be that it was similar to the 120 staff estimated in the 2004 review.

The Commission established that most Departments have common functions such as corporate services, however there is no accounting in the assessment of the role of shared services at a whole-of-government level. This typically involves pooling corporate service activities between Departments to remove duplicate functions and generate efficiencies.

This is the case in Queensland, with Queensland Shared Services providing finance, procurement, human resources management and communication services to Queensland Government agencies. Similar bodies are known to exist in other jurisdictions.

Shared service models, where implemented correctly, have the potential to offer cost savings. The Queensland Audit Office<sup>125</sup> noted a high level of satisfaction from customers that shared service providers had made their work easier or costs cheaper.

Overseas examples<sup>126</sup> also show the benefits, such as the US Department of Treasury where it defined standards for financial management and engaged third parties (Oracle, SAP and CGI) as shared service providers. Furthermore, the Commission in its draft assessment paper on administrative scale in the 2020 review agreed that 'total costs would be reduced through shared services or outsourcing'.

These examples show the unreliability of attempting to create stylised structures at a functional level which ultimately are unlikely to reflect 'what states do'. These issues would be somewhat lessened if the Commission were to consider administrative scale costs at a whole of government level and this would reduce the impact of duplicate functions.

There is a high degree of subjectivity across other areas of the assessment too, in particular the assumption that state wage costs equate to 60% of expenses (reflecting estimated labour cost proportions).

According to the Commission's final report as part of the 2020 Review, this has been derived using ABS GFS data on employee and non-employee expenses. While these proportions remain consistent in latest iterations of ABS data, they are significantly different when compared to the previous Commission method of using state annual reports.

According to 2022-23 financial statements, wage costs vary significantly in Queensland between government agencies. Likewise, wages costs vary significantly between States as the Commission itself notes in its 2020 final report.

Therefore, applying a consistent rule of thumb approach across functions does not make sense and is not reflective of 'what states do'.

Queensland considers that, in light of these fundamental issues, the administrative scale assessment should be redesigned at a whole of government level. Further, in recognition of the significant level of judgement and uncertainty attached to this assessment and an inability to properly quality assure the estimates, Queensland recommends that a low level discount should also be applied (12.5%).

<sup>&</sup>lt;sup>125</sup> Queensland Audit Office, <u>Delivering shared corporate services in Queensland | Queensland Audit Office (qao.qld.gov.au)</u>, accessed 4 December 2023 <sup>126</sup> BCG, <u>Transformation in Government | BCG</u>, accessed 4 December 2023

### 19. National capital

### **Proposed changes**

Based on information provided in the consultation report, the Commission's proposed questions are:

• Do states support discontinuing the national capital assessment if the assessment is immaterial?

### **Queensland position**

#### Do states support discontinuing the national capital assessment if the assessment is immaterial?

Queensland <u>supports</u> the discontinuation of the national capital assessment if the assessment is immaterial.

# Appendix A: Supplementary evidence related to Queensland's transport expenses and investment submissions.

### Appendix A.1: Estimating PWD distortion.

### Context

Queensland has argued in both the *Tranche 1* and *Trance 2* submissions that the use of ABS geographies, both at a SA1 or an SA2 levels, will result in significant distortions of the PWD of SUAs (referred to as dilution in the *Tranche 1 submission*). These distortions will materially affect the urban transport expenses and investment assessment through the not fit for purpose regression model.

In the *Tranche 1 submission* a substantial list of impacted SA1s impacted was included. Despite this, New South Wales' supplementary submission on urban transport suggests that "no evidence was provided to support the materiality of this claim."<sup>127</sup> This appendix will provide a detailed discussion of Queensland's methodologies and present further evidence of the materiality of PWD distortions to the assessment.

### PWD distortion from geographic and planning factors

This issue is discussed in relevant sections of the urban transport expenses submission.

A range of geographic and planning factors contribute towards PWD distortions. The factors which most substantially contribute towards these distortions are:

- Geographic factors
  - Urban green space
  - Urban areas that cannot be used for residential properties (including floodplains and areas of high natural disaster risk). These factors will also be referred to below as "other geographic factors".
- Planning factors
  - Non-residential land use industrial and commercial areas.

### Estimating PWD distortion from geographic and planning factors using SA1 geographies

### Non-residential land use

Note: This section outlines the approach taken in calculating PWD distortion from non-residential land use caused by industrial and commercial land uses as well as urban green space when greater than 50 per cent of an SA1's area is used for non-residential purposes.

For the purpose of estimating the volume of PWD distortion in different SUAs, Queensland Treasury only incorporated distortions in SA1s where more than half of the area is reserved for non-residential land use. This is as SA1s where the ERP is 0 will not have any distortion and were therefore excluded from all analysis.

Estimating the PWD distortion generated by non-residential land use areas being included within SA1s with residential areas requires two variables:

- 1. Estimating the proportion of SA1s in an SUA with non-residential land use distortion.
- 2. Estimating the average PWD distortion per impacted SA1.

The proportion of SA1s in an SUA with non-residential land use distortion was estimated using a sample of SA3s within the SUA. Queensland Treasury estimated the proportion of SA1s experiencing PWD distortion in Sydney SUA and Brisbane SUA, with the analysis shown in Table A.1:

<sup>&</sup>lt;sup>127</sup> NSW Treasury 2023. NSW Treasury supplemental Transport submission. NSW Government: Sydney.

SA3	PWD distortion present	Total SA1s	Per cent with PWD distortion	
Nundah	18	96	18.75%	
Strathpine	14	97	14.43%	
Forest Lake-Oxley	34	178	19.10%	
Brisbane Inner	21	138	15.22%	
Indooroopilly-Sherwood	20	121	16.53%	
Brisbane sample	107	630	16.98%	
Brisbane estimated	847	4,986	16.98%	
Eastern Suburbs-North	13	300	4.33%	
Blacktown	15	311	4.82%	
Parramatta	23	331	6.95%	
Cronulla-Miranda-Caringbah	3	274	1.09%	
Sydney sample	54	1,216	4.44%	
Sydney estimated	445	10,022	4.44%	

## Table A.1: Estimating the proportion and number of SA1s in Sydney SUA and Brisbane SUAexperiencing PWD distortion.

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

Analysis was completed using 2021 ABS defined SA1s and SA3s, with the number of SA1s with an ERP of 0 estimated using Commission provided data.

Given that zero-population SA1s are excluded, the total number of SA1s shown in Table A.1 is lower than the actual number of SA1s defined by the ABS. Included in the calculations for PWD distortion from non-residential land use at an SA1 level is some large urban green spaces.

The sampled SA3s were chosen to provide a reflective sample of the SUA. In Brisbane SUA, this sample represented inner city, inner suburb, and outer suburb areas. In Sydney SUA this sample represented inner city & inner suburbs, Western Sydney, and outer Sydney areas.

Estimating the average distortion per distorted SA1 requires a sample of distorted SA1s from the SUA. By way of example, Tables A.2 and A.3 display the calculations for Brisbane SUA and Sydney SUA respectively:

### Table A.2: Estimating average PWD distortion by distorted SA1 in the Brisbane SUA.

SA1 Maincode	Population	Area	Primary cause of distortion	Residential	Distortion
(2016)	(2021)			area	(2021)
31001127607	1,352	4.98	Brisbane Youth Detention Centre	0.10	1.36
30304107116	425	0.45	Weller Road Park	0.15	0.94
30403109416	285	0.15	Indooroopilly Shopping Centre	0.25	0.67
30504113715	393	0.26	Brisbane Boys' College	0.30	0.57
30504113505	340	0.38	Suncorp Stadium	0.10	1.13
30503112614	625	0.44	Royal Brisbane and Women's Hospital	0.25	1.09
30504113309	564	0.17	The Wesley Hospital	0.30	1.81
31401138601	332	0.32	Arana Hills Plaza	0.25	0.43
30504113707	593	0.40	Anzac Park	0.30	0.84
30504113704	307	0.68	Toowong Cemetery	0.20	0.23
30402109104	356	5.89	UQ Moggill Farm	0.30	0.02
30403109306	622	0.56	Corinda State High School	0.25	0.86
30403109311	448	0.31	Corinda State School	0.30	0.62
30302105803	690	0.31	The Gabba	0.30	1.46
30502111501	278	0.08	Mowbray Park	0.20	1.55
30502111503	411	0.43	Anglican Church Grammar School	0.15	0.92
30501110930	419	0.24	New Farm Park	0.15	1.70
30501111109	523	0.35	Victoria Park	0.25	0.97
30203103923	489	0.42	Nudgee Cemetery	0.30	0.55
30204104404	377	0.49	Sandgate Lagoon Reserve	0.25	0.36
30204104111	529	0.37	TAFE Bracken Ridge	0.30	0.72
31403139419	311	1.26	Westfield Shopping Centre Strathpine	0.10	0.28
31403139429	354	0.28	Westfield Shopping Centre Strathpine	0.35	0.35
31403139420	882	1.20	Grahams Road Environmental Reserve	0.20	1.07
31403139425	583	0.66	Rob Akers Reserve	0.25	0.64
31403139422	450	0.38	Pine Rivers State High School	0.30	0.51
31403139129	541	0.46	Les Hughes Sporting Complex	0.30	0.61
30501111018	2,228	0.23	Musgrave Park	0.50	8.89
		Brisbane SU/	A average distortion		1.27
-------------	-----	--------------	------------------------------	------	-------
30504113214	371	0.37	Enoggera Creek Reserve	0.30	0.36
30504113414	377	0.35	Bushland Park		0.39
30202102708	465	0.60	Aspley State High School	0.30	0.35
30204104615	413	0.37	O'Callaghan Park	0.25	0.57
30202103005	483	0.41	7th Brigade Park	0.30	0.54
30202103006	473	0.31	Marchant Park	0.30	0.70
30202103417	363	0.20	Wavell State High School	0.30	0.65
30202103106	859	0.33	Bradbury Park	0.35	1.71
30202103206	329	0.14	Gibson Park	0.40	0.48
30503112301	618	0.41	Grange Forest Park	0.25	1.15
30501110527	758	0.18	Roma Street Parkland	0.10	11.86
30302105517	643	0.38	Greenslopes Private Hospital	0.30	1.05
30403109512	489	0.29	Tennyson Rail Yards	0.35	0.63
30403109505	283	0.27	Sherwood Arboretum	0.25	0.36
30503113004	691	0.56	Northey Street Park	0.30	0.82
30404110303	663	0.94	D'Aguilar National Park	0.30	0.45
30404110302	381	0.72	D'Aguilar National Park	0.25	0.25
30404110334	574	1.30	D'Aguilar National Park	0.10	0.94
30404110301	232	0.36	The Gap State High School	0.25	0.19
30404110311	563	0.48	Ashgrove Golf Course	0.40	0.41
30504113719	506	0.18	Toowong Memorial Park	0.40	0.89
30403109703	379	0.18	Perrin Park	0.30	0.77
30501111013	840	0.11	TAFE South Bank	0.25	8.09
30501111014	443	0.12	Brisbane Convention Centre	0.35	1.22

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

# Table A.3: Estimating average PWD distortion by distorted SA1 in the Sydney SUA.

114712         15750         7.13         Sydney Okympic Park         0.20         29.14           1139154         541         0.09         Burwood Park         0.30         1.54           1139138         415         0.19         Blar Park         0.50         0.76           1138232         483         0.20         Eltabeth Park         0.50         0.24           1138223         483         0.11         Henry Lawson Park         0.50         0.24           1138232         463         0.17         Drummoyne Park         0.40         0.57           1138823         463         0.12         Sydney         0.40         0.57           1148900         387         0.23         Sydney         0.50         0.14           1149901         380         0.14         Sydney         0.50         0.12           1138627         244         0.16         Fire bocks Park         0.50         0.12           1138627         244         0.16         Fire bocks Park         0.50         0.14           1138627         244         0.16         Burbarin         0.50         0.12           1138627         0.42         0.23         Fire hocks Park	SA1 Maincode (2016)	Population (2021)	Area	Primary cause of distortion	Residential area	Distortion (2021)
1139154         541         0.09         Burwood Park         0.30         1.54           1139124         791         0.07         Westfield Burwood         0.50         1.76           1139133         415         0.19         Blair Park         0.50         0.17           113825         283         0.11         Henry Luxson Park         0.50         0.24           1138625         283         0.11         Henry Luxson Park         0.50         0.57           1138624         469         0.12         Sydney         0.60         0.14           1138011         512         0.77         Field of Mars         0.50         0.121           1138012         512         0.77         Field of Mars         0.50         0.121           1138014         0.91         Lanc Cove         0.50         0.121           1138721         492         0.15         Balmain         0.50         0.43           1138721         492         0.15         Balmain         0.50         0.44           1138721         492         0.15         Balmain         0.50         0.17           1138721         492         0.15         Balmain         0.50         0.17	1147312	15,750	7.13	Sydney Olympic Park	0.20	29.14
1139124       791       0.07       Westfiel Burwood       0.50       1.76         1139323       443       0.20       Elizberh Park       0.50       0.24         113823       463       0.11       Henry Lawson Park       0.50       0.15         113824       469       0.12       Sydney       0.40       0.57         1138523       463       0.17       Drumoyne Park       0.50       0.22         1138901       380       0.14       Sydney       0.50       0.22         1149803       374       0.51       Lanc Cove       0.50       0.12         1138620       400       0.24       Thiberli Park       0.50       0.02         1138621       492       0.13       Birchgroe Cool       0.50       0.03         1138621       400       0.24       Thiberli Park       0.50       0.03         1138621       400       0.24       Thiberli Park       0.50       0.03         1138621       402       0.23       Filt Rock Guly       0.50       0.13         1138621       402       0.23       Filt Rock Guly       0.50       0.14         1138721       54       0.24       Balmain	1139154	541	0.09	Burwood Park	0.30	1.54
113933         415         0.13         Biar Park         0.50         0.24           1138625         283         0.11         Henry Lawson Park         0.50         0.32           1138625         283         0.12         Drummoyne Park         0.46         0.32           1138642         469         0.12         Sydney         0.50         0.14           1148901         380         0.14         Sydney         0.50         0.22           1149801         380         0.14         Sydney         0.50         0.21           1149801         380         0.14         Sydney         0.50         0.21           1138017         0.40         0.24         Timbrell Park         0.50         0.31           1138617         244         0.15         Fibe Dorks Park         0.50         0.39           1138731         571         0.16         Bilmsin         0.50         0.31           114323         283         0.23         Fibt Acck Sully         0.50         0.31           1138731         571         0.16         Bilmsin         0.50         0.31           1140257         402         0.23         Fibt Acck Sully         0.50	1139124	791	0.07	Westfield Burwood	0.50	1.76
1138223         443         0.20         Etraberh Park         0.50         0.24           1138252         463         0.17         Drummoyne Park         0.50         0.25           1138252         469         0.12         Sydney         0.60         0.57           1149809         387         0.23         Sydney         0.50         0.22           1149809         387         0.23         Sydney         0.50         0.22           1149800         380         0.14         Sydney         0.50         0.22           114900         300         0.14         Barbania         0.50         0.12           113860         400         0.24         Thorel Park         0.50         0.84           1138721         492         0.13         Barbania         0.50         0.84           1138721         492         0.13         Barbania         0.50         0.15           1138721         492         0.13         Barbania         0.50         0.15           1138721         492         0.23         Fat fack foully         0.50         0.15           1138721         492         0.23         Fat fack foully         0.50         0.12<	1139138	415	0.19	Blair Park	0.50	0.19
1138625       283       0.11       Henry Lawon Park       0.50       0.15         1138542       463       0.12       Sydney       0.50       0.014         1149801       380       0.14       Sydney       0.50       0.021         1149801       380       0.14       Sydney       0.50       0.021         1149801       380       0.14       Sydney       0.50       0.021         1139620       400       0.24       Timbrell Park       0.50       0.031         1138647       244       0.16       Fied Dack Park       0.50       0.039         1138731       571       0.16       Balmain       0.50       0.044         1140257       402       0.23       Fiet Rack Gully       0.50       0.15         1138731       571       0.16       Balmain       0.50       0.17         1140257       402       0.23       Fiet Rack Gully       0.50       0.15         1139353       0.56       0.22       Mowbary Park       0.50       0.12         1140257       402       0.23       Fiet Rack Gully       0.50       0.12         1139353       0.56       0.22       Mowbary Park       <	1138323	483	0.20	Elizabeth Park	0.50	0.24
1138523         463         0.17         Doumsoyne Park         0.45         0.32           1138524         469         0.12         Sydney         0.50         0.14           1149809         387         0.23         Sydney         0.50         0.22           1149001         380         0.14         Sydney         0.50         0.22           1159112         512         0.77         Field of Mars         0.25         0.21           1138620         400         0.24         Timbrell Park         0.50         0.12           1138621         490         0.24         Timbrell Park         0.50         0.39           1138721         492         0.13         Birchgrove Oval         0.50         0.31           1138721         492         0.23         Sydney         0.30         0.17           1143933         369         0.24         Artamon Reserve         0.40         0.18           1139853         369         0.24         Artamon Reserve         0.40         0.18           1140003         714         0.91         Bickman Park         0.50         0.12           1139956         526         0.22         Mogdaln Park         0.5	1138625	283	0.11	Henry Lawson Park	0.50	0.15
1138542         469         0.12         Sydney         0.40         0.57           1149801         380         0.14         Sydney         0.50         0.21           1159112         512         0.77         Field Marc         0.50         0.21           113860         400         0.24         Timbrell Park         0.50         0.12           113867         244         0.16         Fibe Dacks Park         0.50         0.03           1138721         492         0.16         Bahnain         0.50         0.44           1138731         571         0.16         Bahnain         0.50         0.44           114003         744         0.23         Sydney         0.30         0.17           1140237         492         0.23         Fat Rock Guly         0.50         0.18           113003         744         0.91         Backman Park         0.50         0.12           113003         274         0.91         Magdal Park         0.50         0.12           1130010         533         0.31         Greenwood Park         0.50         0.19           1149751         460         0.08         Somerville Park         0.50         <	1138523	463	0.17	Drummovne Park	0.45	0.32
144809         387         0.23         Sydney         0.50         0.14           114901         300         0.14         Sydney         0.50         0.21           114003         714         0.91         Lane Cove         0.50         0.12           1138620         400         0.24         Timbrell Park         0.50         0.03           1138721         492         0.16         Five bocks Park         0.50         0.44           1138721         492         0.13         Birchgrove Cool         0.50         0.44           114131         283         0.23         Sydney         0.30         0.17           1140257         402         0.23         Fjat Kock Guly         0.50         0.18           1139936         526         0.22         Mowbry Park         0.50         0.12           1139936         526         0.22         Mowbry Park         0.50         0.10           115012         243         0.13         Greenwood Park         0.50         0.19           115015         291         0.29         Magdala Park         0.50         0.19           115016         291         0.25         Edm Hunt Sanctuary         0.50 </td <td>1138542</td> <td>469</td> <td>0.12</td> <td>Svdnev</td> <td>0.40</td> <td>0.57</td>	1138542	469	0.12	Svdnev	0.40	0.57
1.49801         380         0.14         Sydney         0.50         0.22           1159112         512         0.77         Field of Mars         0.25         0.21           113860         400         0.24         Timbrell Park         0.50         0.12           1138647         244         0.16         Five Docks Park         0.50         0.08           113871         492         0.15         Balmain         0.50         0.44           1138731         253         0.23         Fist Kock Gully         0.50         0.15           113925         0.62         0.23         Fist Kock Gully         0.50         0.15           1139353         360         0.24         Atamoin Reserve         0.40         0.18           114003         714         0.51         Backman Park         0.50         0.12           1139936         526         0.22         Mowbray Park         0.50         0.19           1150112         243         0.13         Wallmatta Nature Reserve         0.50         0.19           1150112         243         0.13         Wallmatta Nature Reserve         0.50         0.19           1149517         460         0.68 <td< td=""><td>1149809</td><td>387</td><td>0.23</td><td>Sydney</td><td>0.50</td><td>0.14</td></td<>	1149809	387	0.23	Sydney	0.50	0.14
1159112         512         0.77         Field of Mars         0.25         0.21           1140003         714         0.91         Lane Cove         0.50         0.12           1138620         400         0.24         Timbrell Park         0.50         0.03           1138721         244         0.16         Five Docks Park         0.50         0.39           1138731         571         0.16         Balmain         0.50         0.44           1141331         283         0.23         Sydney         0.30         0.17           1140257         402         0.23         Flat Rock Guly         0.50         0.15           11393853         369         0.24         Artamon Reserve         0.40         0.18           1140003         714         0.91         Blackman Park         0.50         0.12           1139395         526         0.22         Mowary Park         0.50         0.10           1150112         243         0.13         Greenwood Park         0.50         0.19           115012         243         0.13         Greenwood Park         0.50         0.57           1149517         460         0.08         Somerville Park	1149801	380	0.14	Svdnev	0.50	0.22
1140003         714         0.91         Lane Cove         0.50         0.12           1138620         400         0.24         Thirel Park         0.50         0.08           1138647         2.44         0.16         Five Docks Park         0.50         0.08           1138721         492         0.13         Birchgrove Oval         0.50         0.44           1141331         283         0.23         Fist Rock Gully         0.50         0.15           1138923         369         0.24         Artamon Reserve         0.40         0.18           1140003         714         0.51         Blackman Park         0.50         0.12           1139936         526         0.22         Mowbray Park         0.50         0.12           1130010         533         0.31         Wallumatta Nature Reserve         0.50         0.19           1140751         460         0.08         Somerville Park         0.50         0.19           1149751         460         0.08         Somerville Park         0.50         0.19           1149751         460         0.08         Somerville Park         0.50         0.19           1149751         450         0.13	1159112	512	0.77	Field of Mars	0.25	0.21
113850         400         0.24         Tmbrell Park         0.50         0.14           1138647         244         0.16         Five Docks Park         0.50         0.39           1138721         492         0.13         Birchgrove Oval         0.50         0.44           1141313         151         0.16         Balmain         0.50         0.44           1141313         283         0.23         Fist Rock Gully         0.50         0.15           1139853         369         0.24         Artamon Reserve         0.40         0.18           1140033         714         0.91         Blackman Park         0.50         0.26           1150126         291         0.29         Magdial Park         0.50         0.12           115012         243         0.31         Walumat Nature Reserve         0.50         0.10           115012         243         0.33         Greenwood Park         0.50         0.19           1149751         460         0.08         Somerville Park         0.50         0.19           1149751         460         0.08         Somerville Park         0.50         0.24           1149751         460         0.08	1140003	714	0.91	Lane Cove	0.50	0.12
133847         244         0.16         Five Dack Park         0.50         0.08           1138711         492         0.13         Birchgrove Oxid         0.50         0.44           1141331         233         0.23         Sythery         0.30         0.17           1140257         402         0.23         Fist Rock Gully         0.50         0.15           1138983         369         0.24         Artamon Reserve         0.40         0.18           1140003         714         0.51         Blackman Park         0.50         0.12           1139936         526         0.22         Mowbray Park         0.50         0.12           115012         243         0.13         Wallumata Nature Reserve         0.50         0.19           115012         243         0.13         Wallumata Nature Reserve         0.50         0.19           1149751         460         0.08         Somerville Park         0.50         0.19           1149751         480         0.33         Eric Mobbs Park         0.50         0.19           1149751         482         0.33         Boronia Park         0.50         0.14           1149751         482         0.33	1138620	400	0.24	Timbrell Park	0.50	0.14
1138721         492         0.13         Birchgrowe Ovari         0.50         0.39           1138731         571         0.16         Balmain         0.50         0.44           114131         283         0.23         Flat Rock Gully         0.50         0.17           1140257         402         0.23         Flat Rock Gully         0.50         0.15           1139853         369         0.24         Artamon Reserve         0.40         0.18           114003         714         0.91         Blackman Park         0.50         0.26           115012         291         0.29         Magdala Park         0.50         0.10           115012         243         0.13         Walumata Nature Reserve         0.50         0.10           115012         243         0.13         Greenwood Park         0.50         0.19           1140751         460         0.83         Sornerville Park         0.50         0.19           1149517         482         0.25         Edna Hunt Sanctuary         0.50         0.14           1149517         482         0.33         Bornoia Park         0.45         0.23           1146237         598         0.31	1138647	244	0.16	Five Docks Park	0.50	0.08
118731         571         0.16         B <sup>main</sup> 0.50         0.44           1141331         283         0.23         Sydney         0.30         0.17           1140257         402         0.23         Flat Rock Gully         0.50         0.15           1139853         369         0.24         Artamon Reserve         0.40         0.18           1140003         714         0.91         Blackman Park         0.50         0.12           1139936         526         0.22         Mowbay Park         0.50         0.12           1150126         291         0.29         Magdala Park         0.50         0.19           1150112         243         0.13         Wallumatta Nature Reserve         0.50         0.19           1149517         482         0.25         Edna Hun Sanctuary         0.50         0.19           1149517         482         0.25         Edna Hun Sanctuary         0.50         0.24           1149517         482         0.25         Edna Hun Sanctuary         0.50         0.24           1149517         482         0.33         Boronia Park         0.45         0.23           1146217         560         0.17 <t< td=""><td>1138721</td><td>492</td><td>0.13</td><td>Birchgrove Oval</td><td>0.50</td><td>0.39</td></t<>	1138721	492	0.13	Birchgrove Oval	0.50	0.39
144331         283         0.23         Sydney         0.30         0.17           1140257         402         0.23         Flat Rock Gully         0.50         0.15           1139353         369         0.24         Artamon Reserve         0.40         0.18           1140003         714         0.91         Blackman Park         0.50         0.22           115012         291         0.29         Magdial Park         0.50         0.10           1150112         243         0.13         Greenwood Park         0.50         0.10           1150010         533         0.31         Greenwood Park         0.50         0.57           1149517         460         0.08         Somerville Park         0.50         0.57           1149517         482         0.25         Edna Hunt Sanctuary         0.50         0.24           1147614         491         0.33         Eric Mobbs Park         0.45         0.23           1147614         491         0.33         Boronia Park         0.46         0.25           1147613         500         0.17         Yegear Reserve         0.50         0.14           1158133         501         0.37         Trege	1138731	571	0.16	Balmain	0.50	0.44
140257         402         0.23         Flat Rock Gully         0.50         0.15           1139853         369         0.24         Artamon Reserve         0.40         0.18           114003         714         0.91         Blackman Park         0.50         0.22           1150126         221         Mowbrany Park         0.50         0.26           1150126         233         0.13         Walumatta Nature Reserve         0.50         0.10           1150112         243         0.13         Greenwood Park         0.50         0.19           1149751         460         0.08         Somerville Park         0.50         0.57           1149751         460         0.08         Somerville Park         0.50         0.57           1149751         460         0.08         Somerville Park         0.50         0.57           1149753         598         0.31         Wildlife Sanctuary         0.50         0.24           115813         501         0.37         Tregear Reserve         0.50         0.14           115813         542         0.33         Boronia Park         0.45         0.23           1146237         526         0.34         Werringto	1141331	283	0.23	Sydney	0.30	0.17
133853         369         0.24         Artamon Reserve         0.40         0.18           1140003         714         0.91         Blackman Park         0.50         0.26           11190126         291         0.29         Magdala Park         0.50         0.26           11150126         291         0.29         Magdala Park         0.50         0.10           115012         243         0.13         Wallumatta Nature Reserve         0.50         0.10           115012         460         0.08         Somerville Park         0.50         0.19           1149517         460         0.08         Somerville Park         0.50         0.19           1147614         491         0.33         Eric Mobbs Park         0.50         0.24           1158133         501         0.37         Tregear Reserve         0.50         0.14           1158133         501         0.37         Tregear Reserve         0.40         0.10           1146217         360         0.17         Sydney         0.40         0.10           1146237         526         0.34         Werrington Lake Reserve         0.40         0.25           1146238         379         0.24	1140257	402	0.23	Elat Bock Gully	0.50	0.15
1140003         714         0.91         Diackman Park         0.50         0.12           1139936         526         0.22         Mowbray Park         0.50         0.26           1150126         291         0.29         Magdala Park         0.25         0.19           1150112         243         0.13         Greenwood Park         0.50         0.19           1150010         533         0.31         Greenwood Park         0.50         0.57           1149517         460         0.08         Somerville Park         0.50         0.19           1147513         598         0.31         Wilding Santuary         0.50         0.14           1158118         542         0.33         Boronia Park         0.45         0.23           1147653         598         0.31         Wilding Santuary         0.50         0.14           1158118         542         0.33         Boronia Park         0.45         0.23           1146217         360         0.17         Sydney         0.50         0.16           1146237         526         0.34         Werrington Lakes Reserve         0.40         0.19           1146707         279         0.17         W	1139853	369	0.24	Artamon Reserve	0.40	0.18
1139936         526         0.22         Mowbray Park         0.50         0.26           1150126         291         0.29         Magdia Park         0.25         0.19           1150126         291         0.29         Magdia Park         0.50         0.10           1150127         243         0.13         Wallumatta Nature Reserve         0.50         0.19           1149751         460         0.08         Somerville Park         0.50         0.19           1149751         482         0.25         Edna Hunt Sanctuary         0.50         0.24           1147614         491         0.33         Eric Mobbs Park         0.25         0.46           1147653         598         0.31         Wildlife Sanctuary         0.50         0.24           1158133         501         0.37         Tregera Reserve         0.50         0.14           1158126         479         0.74         Sydney         0.40         0.25           1146237         526         0.34         Werrington Lakes Reserve         0.40         0.25           1146238         379         0.24         Werrington Lakes Reserve         0.40         0.22           1146238         3.95	1140003	714	0.91	Blackman Park	0.40	0.10
1150126         29         Magdal Park         0.25         0.19           1150112         243         0.13         Wallumatta Nature Reserve         0.50         0.10           1150112         243         0.31         Greenwood Park         0.50         0.19           1149517         460         0.08         Somerville Park         0.50         0.57           1149517         482         0.25         Edna Hunt Sanctuary         0.50         0.19           1147614         491         0.33         Eric MobS Park         0.25         0.46           1147653         598         0.31         Willight Sanctuary         0.50         0.14           1158126         479         0.74         Sydney         0.40         0.10           1146237         526         0.34         Werrington Lakes Reserve         0.40         0.25           1146237         526         0.34         Werrington Lakes Reserve         0.40         0.25           1146238         379         0.24         Werrington Lakes Reserve         0.40         0.25           1146238         399         0.47         Werrington Lakes Reserve         0.50         0.07           1146221         186	1139936	526	0.22	Mowbray Park	0.50	0.26
1150112         243         0.13         Wallumatta Nature Reserve         0.50         0.10           1150010         533         0.31         Greenwood Park         0.50         0.19           1149751         460         0.08         Somerville Park         0.50         0.19           1149517         482         0.25         Edna Hunt Sanctuary         0.50         0.19           1147614         491         0.33         Eric Mobs Park         0.25         0.46           1147653         598         0.31         Wilding Sanctuary         0.50         0.24           1147614         491         0.33         Brin Mobs Park         0.45         0.23           1147613         598         0.31         Wilding Andery         0.50         0.14           115813         501         0.37         Tregear Reserve         0.50         0.16           1146217         360         0.17         Sydney         0.50         0.16           1146237         256         0.34         Werrington Lakes Reserve         0.40         0.25           1146238         379         0.24         Werrington Lakes Reserve         0.20         0.02           1145706         244	1150126	291	0.29	Magdala Park	0.25	0.19
115010         53         0.11         Greenwood Park         0.55         0.19           1149751         460         0.08         Somerville Park         0.50         0.57           1149751         480         0.25         Edna Hunt Sactuary         0.50         0.19           1147614         491         0.33         Eric Mobbs Park         0.25         0.46           1147653         598         0.31         Wildlife Sanctuary         0.50         0.24           115813         501         0.37         Tregear Reserve         0.50         0.14           115813         501         0.37         Tregear Reserve         0.40         0.10           1146217         360         0.17         Sydney         0.40         0.10           1146237         526         0.34         Werrington Lakes Reserve         0.40         0.25           1146238         379         0.24         Werrington Lakes Reserve         0.40         0.22           1145217         526         0.34         Werrington Lakes Reserve         0.20         0.22           1146238         379         0.24         Werrington Lakes Reserve         0.50         0.09           1146248         3.	1150120	231	0.13	Wallumatta Nature Reserve	0.50	0.10
114500         350         0.22         0.000 monoling         0.000 monoling         0.000 monoling           1149751         460         0.08         Somerville Park         0.50         0.17           1149517         482         0.25         Edna Hunt Sanctuary         0.50         0.19           1147653         598         0.31         Wildlife Sanctuary         0.50         0.24           1158133         501         0.37         Tregear Reserve         0.50         0.14           1158136         542         0.33         Boronia Park         0.45         0.23           1158126         479         0.74         Sydney         0.40         0.10           1146217         360         0.17         Sydney         0.40         0.25           1146238         379         0.24         Werrington Lakes Reserve         0.40         0.22           1146238         379         0.24         Werrington Lakes Reserve         0.40         0.22           1145217         249         0.22         Werrington Lakes Reserve         0.50         0.09           1145238         379         0.24         Werrington Lakes Reserve         0.50         0.07           1145624	1150112	533	0.15	Greenwood Park	0.50	0.10
1145517         482         0.25         Edna Hunt Sanctuary         0.50         0.15           1147614         491         0.33         Eric Mobs Park         0.25         0.46           1147613         598         0.31         Wildlife Sanctuary         0.50         0.14           1158133         501         0.37         Tregear Reserve         0.50         0.14           1158138         542         0.33         Boronia Park         0.46         0.10           1146217         360         0.17         Sydney         0.40         0.10           1146237         526         0.34         Werrington Lakes Reserve         0.40         0.25           1146238         379         0.24         Werrington Lakes Reserve         0.40         0.19           1145212         188         0.52         Perrington Lakes Reserve         0.20         0.22           1145238         379         0.24         Werrington Lakes Reserve         0.20         0.06           1145212         188         0.52         Perrington Lakes Reserve         0.20         0.06           1146212         188         0.52         Perrington Lakes Reserve         0.20         0.06           1146422	1149751	460	0.08	Somerville Park	0.50	0.13
1447614         491         0.33         Eric Mobile Park         0.25         0.46           1147614         491         0.33         Eric Mobile Park         0.25         0.46           1147653         598         0.31         Wildlife Sanctuary         0.50         0.24           1158133         501         0.37         Tregear Reserve         0.50         0.14           1158126         479         0.74         Sydney         0.40         0.10           1146217         360         0.17         Sydney         0.40         0.25           1146237         526         0.34         Werrington Lakes Reserve         0.40         0.25           1146238         379         0.24         Werrington Lakes Reserve         0.20         0.02           1145706         244         0.22         Werrington Lakes Reserve         0.20         0.09           1146212         188         0.52         Penrith Cemetery         0.20         0.00           1146422         236         0.21         Kanagra Reserve         0.20         0.27           1146428         3,456         2.51         Nepean Industrial Park         0.30         2.32           1146428         3,456<	1149517	482	0.25	Edna Hunt Sanctuary	0.50	0.19
1447653         598         0.33         Enclusion M         0.12         0.40           1147653         598         0.31         Wildlife Sanctuary         0.50         0.14           1158133         501         0.37         Tregear Reserve         0.50         0.14           1158118         542         0.33         Boronia Park         0.45         0.23           1158126         479         0.74         Sydney         0.40         0.10           1146217         360         0.17         Sydney         0.40         0.25           1146238         379         0.24         Werrington Lakes Reserve         0.40         0.25           1145706         244         0.22         Werrington Lakes Reserve         0.20         0.22           1145707         279         0.17         Werrington Lakes Reserve         0.20         0.06           1146212         188         0.52         Penrith Cemetery         0.20         0.02         0.27           1146421         390         0.47         Nepean Rugby Park         0.30         2.32           1146422         236         0.21         Kanagra Reserve         0.20         0.27           1146423	1147614	402	0.33	Eric Mobbs Park	0.50	0.15
14703         350         0.11         Original banchary         0.35         0.14           1158133         501         0.37         Treger Reserve         0.50         0.14           1158118         542         0.33         Boronia Park         0.45         0.23           1158126         479         0.74         Sydney         0.50         0.16           1146217         360         0.17         Sydney         0.50         0.16           1146237         526         0.34         Werrington Lakes Reserve         0.40         0.19           1145706         244         0.22         Werrington Lakes Reserve         0.40         0.19           1145707         279         0.17         Werrington Lakes Reserve         0.20         0.02           1146422         236         0.21         Kanagra Reserve         0.20         0.06           1146422         236         0.21         Kanagra Reserve         0.20         0.07           1146423         3,456         2.51         Nepean Rugby Park         0.20         0.27           1146424         3,456         2.51         Nepean Rugby Park         0.50         0.07           1146006         220	11/7653	598	0.33	Wildlife Sanctuary	0.50	0.40
1158113         542         0.33         Bronin Park         0.45         0.23           1158118         542         0.33         Boronin Park         0.45         0.23           1158126         479         0.74         Sydney         0.40         0.10           1146217         360         0.17         Sydney         0.50         0.16           1146237         526         0.34         Werrington Lakes Reserve         0.40         0.19           1146238         379         0.24         Werrington Lakes Reserve         0.40         0.19           1145706         244         0.22         Werrington Lakes Reserve         0.20         0.02           1146212         188         0.52         Penrith Cemetery         0.20         0.06           1146421         390         0.47         Nepean Rugby Park         0.20         0.07           1146428         3,456         2.51         Nepean Industrial Park         0.30         2.32           1146006         220         0.14         Rotary Park         0.50         0.07           1146022         440         0.25         Rotary Park         0.50         0.17           1146024         702         0.3	1158133	501	0.31	Tregear Reserve	0.50	0.14
1100100         111         0.00         <	1158118	542	0.33	Boronia Park	0.50	0.23
1130120       47.5       0.74       5 yoney       0.50       0.16         1145217       360       0.17       Sydney       0.50       0.16         1146237       526       0.34       Werrington Lakes Reserve       0.40       0.25         114528       379       0.24       Werrington Lakes Reserve       0.20       0.22         1145706       244       0.22       Werrington Lakes Reserve       0.50       0.09         1145707       279       0.17       Werrington Lakes Reserve       0.50       0.09         1146212       188       0.52       Penrith Cemetery       0.20       0.06         1146411       390       0.47       Nepean Rugby Park       0.20       0.27         1146428       3,456       2.51       Nepean Rugby Park       0.30       2.32         1146006       220       0.14       Rotary Park       0.50       0.07         1146224       944       0.44       Kingswood Park       0.50       0.43         1146244       702       0.30       Nepean Hospital       0.35       0.63         114524       944       0.44       Kingswood Park       0.50       0.31         1151712       <	1158126	/79	0.33	Sydney	0.45	0.25
1140217       300       0.17       500       0.13         1146237       526       0.34       Werrington Lakes Reserve       0.40       0.25         1146238       379       0.24       Werrington Lakes Reserve       0.20       0.22         1145706       244       0.22       Werrington Lakes Reserve       0.50       0.09         1145707       279       0.17       Werrington Lakes Reserve       0.50       0.06         1146212       188       0.52       Penrith Cemetery       0.20       0.06         1146422       236       0.21       Kanagra Reserve       0.25       0.17         1146411       390       0.47       Nepean Rugby Park       0.20       0.07         1146428       3,456       2.51       Nepean Industrial Park       0.30       2.32         1146006       220       0.14       Rotary Park       0.50       0.17         1146022       440       0.44       Kingswood Park       0.50       0.43         1146224       944       0.44       Kingswood Park       0.50       0.31         1146244       702       0.30       Nepean Hospital       0.35       0.63         1151712       1,014<	11/6217	360	0.17	Sydney	0.40	0.10
1146238       379       0.24       Werrington Lakes Reserve       0.40       0.19         1145706       244       0.22       Werrington Lakes Reserve       0.20       0.22         1145707       279       0.17       Werrington Lakes Reserve       0.50       0.09         1146212       188       0.52       Penrith Cemetery       0.20       0.02         1146422       236       0.21       Kanagra Reserve       0.25       0.17         1146421       188       0.52       Penrith Cemetery       0.20       0.06         1146422       236       0.21       Kanagra Reserve       0.25       0.17         1146428       3,456       2.51       Nepean Rugby Park       0.30       2.32         1146006       220       0.14       Rotary Park       0.50       0.07         1146022       440       0.25       Rotary Park       0.50       0.43         1146244       702       0.30       Nepean Hospital       0.35       0.63         114524       944       0.44       Kingswood Park       0.25       0.31         114524       702       0.30       Nepean Hospital       0.35       0.63         1151712	1146237	526	0.3/	Werrington Lakes Reserve	0.50	0.10
11457062440.22Werrington Lakes Reserve0.200.2211457072790.17Werrington Lakes Reserve0.500.0911462121880.52Penrith Cemetery0.200.0611464222360.21Kanagra Reserve0.250.1711464113900.47Nepean Rugby Park0.200.2711464283,4562.51Nepean Industrial Park0.302.3211460062200.14Rotary Park0.500.0711462249440.44Kingswood Park0.500.4311462447020.30Nepean Hospital0.350.6311517121,0140.70Stockland Wetherhill0.500.3111519385990.43Brennan Park0.250.5311482033433.41Brennan Industrial Area0.050.1411567083770.28Arthur Bryne Reserve0.300.2511567094000.11Coral Sea Park0.500.3011348483490.15Park0.500.3711350304490.34Bandwick Golf Course0.430.37	1146238	379	0.24	Werrington Lakes Reserve	0.40	0.25
1145707       279       0.17       Werrington Lakes Reserve       0.50       0.09         1145707       279       0.17       Werrington Lakes Reserve       0.20       0.06         1146212       188       0.52       Penrith Cemetery       0.20       0.06         1146422       236       0.21       Kanagra Reserve       0.25       0.17         1146423       3,456       2.51       Nepean Rugby Park       0.20       0.27         1146006       220       0.14       Rotary Park       0.50       0.07         1146022       440       0.25       Rotary Park       0.50       0.17         1146244       702       0.30       Nepean Hospital       0.35       0.63         114524       944       0.44       Kingswood Park       0.50       0.17         1146244       702       0.30       Nepean Hospital       0.35       0.63         1151712       1,014       0.70       Stockland Wetherhill       0.50       0.14         1151938       599       0.43       Brennan Park       0.25       0.53         1148203       343       3.41       Brennan Industrial Area       0.05       0.14         1156708	1145706	244	0.24	Werrington Lakes Reserve	0.40	0.22
11462121880.52Penrith Cemetery0.200.0611462122360.21Kanagra Reserve0.250.1711464113900.47Nepean Rugby Park0.200.2711464283,4562.51Nepean Industrial Park0.302.3211460062200.14Rotary Park0.500.0711460224400.25Rotary Park0.500.1711462447020.30Nepean Hospital0.350.6311517121,0140.70Stockland Wetherhill0.500.311159385990.43Brennan Park0.250.5311457083770.28Arthur Bryne Reserve0.300.2511567035480.15Broadmeadow Reserve0.400.6211567094000.11Coral Sea Park0.500.3711348483490.15Park0.500.37	1145707	279	0.17	Werrington Lakes Reserve	0.50	0.09
1146422       236       0.21       Kanagra Reserve       0.25       0.17         1146421       390       0.47       Nepean Rugby Park       0.20       0.27         1146428       3,456       2.51       Nepean Industrial Park       0.30       2.32         1146006       220       0.14       Rotary Park       0.50       0.07         1146224       944       0.44       Kingswood Park       0.50       0.17         1146224       944       0.44       Kingswood Park       0.50       0.17         1146244       702       0.30       Nepean Hospital       0.35       0.63         1151712       1,014       0.70       Stockland Wetherhill       0.50       0.31         1151738       599       0.43       Brennan Park       0.25       0.53         1148203       343       3.41       Brennan Industrial Area       0.05       0.14         1156708       377       0.28       Arthur Bryne Reserve       0.30       0.25         1156703       548       0.15       Broadmeadow Reserve       0.40       0.62         1156709       400       0.11       Coral Sea Park       0.50       0.37         1134848	1146212	188	0.52	Penrith Cemetery	0.30	0.05
1146411       390       0.47       Nepean Rugby Park       0.20       0.27         1146412       3,456       2.51       Nepean Rugby Park       0.30       2.32         1146006       220       0.14       Rotary Park       0.50       0.07         1146022       440       0.25       Rotary Park       0.50       0.17         1146224       944       0.44       Kingswood Park       0.50       0.17         1146244       702       0.30       Nepean Hospital       0.35       0.63         1151712       1,014       0.70       Stockland Wetherhill       0.50       0.31         1151938       599       0.43       Brennan Park       0.25       0.53         1148203       343       3.41       Brennan Industrial Area       0.05       0.14         1156708       377       0.28       Arthur Bryne Reserve       0.30       0.25         1156703       548       0.15       Broadmeadow Reserve       0.40       0.62         1156709       400       0.11       Coral Sea Park       0.50       0.37         1134848       349       0.15       Park       0.50       0.17         1135030       449	1146422	236	0.32	Kanagra Beserve	0.25	0.00
1146428       3,456       2.51       Nepean Industrial Park       0.30       2.32         1146006       220       0.14       Rotary Park       0.50       0.07         1146022       440       0.25       Rotary Park       0.50       0.17         1146224       944       0.44       Kingswood Park       0.50       0.43         1146224       944       0.44       Kingswood Park       0.50       0.43         1146244       702       0.30       Nepean Hospital       0.35       0.63         1151712       1,014       0.70       Stockland Wetherhill       0.50       0.31         1151938       599       0.43       Brennan Park       0.25       0.53         1148203       343       3.41       Brennan Park       0.25       0.53         1156708       377       0.28       Arthur Bryne Reserve       0.30       0.25         1156703       548       0.15       Broadmeadow Reserve       0.40       0.62         1156709       400       0.11       Coral Sea Park       0.50       0.30         1134848       349       0.15       Park       0.50       0.37         1135030       449	1146411	390	0.47	Nenean Rughy Park	0.25	0.17
1146006         220         0.14         Repeat Indian Link         0.50         0.07           1146006         220         0.14         Rotary Park         0.50         0.07           1146022         440         0.25         Rotary Park         0.50         0.17           1146224         944         0.44         Kingswood Park         0.50         0.43           1146224         702         0.30         Nepean Hospital         0.35         0.63           1151712         1,014         0.70         Stockland Wetherhill         0.50         0.14           1151938         599         0.43         Brennan Park         0.25         0.53           1148203         343         3.41         Brennan Industrial Area         0.05         0.14           1156708         377         0.28         Arthur Bryne Reserve         0.30         0.25           1156703         548         0.15         Broadmeadow Reserve         0.40         0.62           1156709         400         0.11         Coral Sea Park         0.50         0.30           1134848         349         0.15         Park         0.50         0.37           1135030         449         0.34 </td <td>1146428</td> <td>3 456</td> <td>2 51</td> <td>Nepean Industrial Park</td> <td>0.20</td> <td>2 32</td>	1146428	3 456	2 51	Nepean Industrial Park	0.20	2 32
1140000       120       0.14       11401 (Mith)       0.50       0.51         1146022       440       0.25       Rotary Park       0.50       0.43         1146224       944       0.44       Kingswood Park       0.50       0.43         1146244       702       0.30       Nepean Hospital       0.35       0.63         1151712       1,014       0.70       Stockland Wetherhill       0.50       0.31         1151938       599       0.43       Brennan Park       0.25       0.53         1148203       343       3.41       Brennan Industrial Area       0.05       0.14         1156708       377       0.28       Arthur Bryne Reserve       0.30       0.25         1156703       548       0.15       Broadmeadow Reserve       0.40       0.62         1156709       400       0.11       Coral Sea Park       0.50       0.30         1134848       349       0.15       Park       0.50       0.17         1135030       449       0.34       Bandwick Golf Course       0.25       0.37	1146006	220	0.14	Rotary Park	0.50	0.07
1140214       944       0.43       Kingswood Park       0.50       0.43         1146224       944       0.44       Kingswood Park       0.35       0.63         1146244       702       0.30       Nepean Hospital       0.35       0.63         1151712       1,014       0.70       Stockland Wetherhill       0.50       0.31         1151938       599       0.43       Brennan Park       0.25       0.53         1148203       343       3.41       Brennan Industrial Area       0.05       0.14         1156708       377       0.28       Arthur Bryne Reserve       0.30       0.25         1156703       548       0.15       Broadmeadow Reserve       0.40       0.62         1156709       400       0.11       Coral Sea Park       0.50       0.30         1134848       349       0.15       Park       0.50       0.17         1135030       449       0.34       Bandwick Golf Course       0.25       0.37	1146022	440	0.25	Rotary Park	0.50	0.17
114024     702     0.30     Nepean Hospital     0.50     0.43       1146244     702     0.30     Nepean Hospital     0.35     0.63       1151712     1,014     0.70     Stockland Wetherhill     0.50     0.31       1151938     599     0.43     Brennan Park     0.25     0.53       1148203     343     3.41     Brennan Industrial Area     0.05     0.14       1156708     377     0.28     Arthur Bryne Reserve     0.30     0.25       1156703     548     0.15     Broadmeadow Reserve     0.40     0.62       1156709     400     0.11     Coral Sea Park     0.50     0.37       1135030     449     0.34     Bandwick Golf Course     0.25     0.37	1146224	944	0.25	Kingswood Park	0.50	0.17
1110111         1,014         0.70         Stockland Wetherhill         0.50         0.31           1151712         1,014         0.70         Stockland Wetherhill         0.50         0.31           1151938         599         0.43         Brennan Park         0.25         0.53           1148203         343         3.41         Brennan Industrial Area         0.05         0.14           1156708         377         0.28         Arthur Bryne Reserve         0.30         0.25           1156703         548         0.15         Broadmeadow Reserve         0.40         0.62           1156709         400         0.11         Coral Sea Park         0.50         0.30           1134848         349         0.15         Park         0.50         0.17           1135030         449         0.34         Bandwick Golf Course         0.25         0.37	1146244	702	0.30	Ningswood Faile Nenean Hospital	0.50	0.43
111111         1,014         0,05         Disclosing function         0,05         0,01           1151938         599         0,43         Brennan Park         0,25         0,53           1148203         343         3,41         Brennan Industrial Area         0,05         0,14           1156708         377         0,28         Arthur Bryne Reserve         0,30         0,25           1156703         548         0,15         Broadmeadow Reserve         0,40         0,62           1156709         400         0,11         Coral Sea Park         0,50         0,30           1134848         349         0,15         Park         0,50         0,17           1135030         449         0,34         Bandwick Golf Course         0,25         0,37	1151712	1 01/	0.30	Stockland Wetherhill	0.55	0.31
111100         343         3.41         Brennan Industrial Area         0.05         0.14           1148203         343         3.41         Brennan Industrial Area         0.05         0.14           1156708         377         0.28         Arthur Bryne Reserve         0.30         0.25           1156703         548         0.15         Broadmeadow Reserve         0.40         0.62           1156709         400         0.11         Coral Sea Park         0.50         0.30           1134848         349         0.15         Park         0.50         0.17           1135030         449         0.34         Bandwick Golf Course         0.25         0.37	1151938	599	0.43	Brennan Park	0.50	0.51
1156708         377         0.28         Arthur Bryne Reserve         0.30         0.25           1156703         548         0.15         Broadmeadow Reserve         0.40         0.62           1156709         400         0.11         Coral Sea Park         0.50         0.30           1134848         349         0.15         Park         0.50         0.17           1135030         449         0.34         Bandwick Golf Course         0.25         0.37	1148203	343	3 41	Brennan Industrial Area	0.25	0.14
1156703         548         0.15         Broadmeadow Reserve         0.60         0.62           1156703         548         0.15         Broadmeadow Reserve         0.40         0.62           1156709         400         0.11         Coral Sea Park         0.50         0.30           1134848         349         0.15         Park         0.50         0.17           1135030         449         0.34         Bandwick Golf Course         0.25         0.37	1156708	377	0.28	Arthur Bryne Reserve	0.05	0.14
1156709         400         0.11         Coral Sea Park         0.50         0.30           1134848         349         0.15         Park         0.50         0.17           1135030         449         0.34         Bandwirk Golf Course         0.25         0.37	1156703	548	0.20	Broadmeadow Reserve	0.30	0.62
1134848         349         0.15         Park         0.50         0.17           1135030         449         0.34         Bandwick Golf Course         0.25         0.37	1156709	400	0.13	Coral Sea Park	0.50	0.30
1135030 449 0.34 Randwick Golf Course 0.25 0.37	1134848	349	0.15	Park	0.50	0.17
	1135030	449	0.34	Bandwick Golf Course	0.30	0.37

		Sydney SUA average dis	stortion		0.69
1142203	260	0.25	Angophora Reserve	0.40	0.08
1142635	268	0.07	Dee Why Oval	0.40	0.33
1142630	701	0.34	Dee Why Beach	0.30	0.70
1142932	514	0.14	Manly Beach	0.45	0.50
1151904	556	0.23	Wetherill Park	0.40	0.42
1151922	181	0.18	TAFE	0.30	0.09
1144210	370	0.61	Georges River Nature Reserve	0.20	0.19
1144207	346	0.12	Glenfield Park	0.50	0.21
1144206	381	0.23	Seddon Park	0.35	0.24
1160739	414	0.27	Engadine Bushland	0.35	0.25
1160723	337	0.18	Engadine Tennis Courts	0.50	0.13
1160705	274	0.15	Engadine Park	0.50	0.11
1160218	614	0.21	North Caringbah Oval	0.50	0.38
1160223	549	0.21	Sutherland Hospital	0.50	0.30
1160401	898	6.95	Kurnell Park	0.05	0.46
1153423	447	0.41	Sydney	0.25	0.31
1153609	510	0.22	Bonnet Bay Park	0.40	0.37
1153616	398	0.31	The Glen Bushland Reserve	0.30	0.25
1153629	301	0.58	Burnum Sanctuary	0.10	0.30
1153627	292	0.37	Burnum Sanctuary	0.30	0.11
1153642	547	0.24	Tunbridge Park	0.50	0.26
1153648	386	0.51	Kareela Oval	0.30	0.14
1137431	276	0.19	Sydney	0.40	0.13
1138015	239	0.21	Scarborough Park	0.20	0.23
1138007	427	0.31	Kyeemagh Beach	0.50	0.12
1135025	428	1.50	St Michael's Golf Club	0.10	0.23

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

Using the estimates calculated in Tables A.1-A.3, the total PWD distortion in each SUA can be calculated. This is shown in Table A.4:

#### Table A.4: Estimated PWD distortion from non-residential land use at an SA1 level.

	Average distortion	Estimated distorted SA1s	PWD distortion	Percent distortion
Brisbane	1.27	847	1,074	32%
Sydney	0.69	445	305	4%

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

Comparing the impact of PWD dilution between SUAs shows that Sydney SUA experiences a 4 per cent distortion from non-residential land uses, compared to a 32 per cent distortion in Brisbane SUA.

#### Geographic factors – Urban green space

## Note: This section calculates all urban green space distortion in an SUA.

At an SA1 level, the majority of PWD distortion from geographic factors occurred because of differential levels of urban green space (UGS). This occurs because most urban areas that cannot be used for residential properties (such floodplains and areas of high natural disaster risk) are excluded by the ABS from mostly residential SA1s using ABS boundaries. UGS is not as commonly excluded, and where exclusions occur, they are inconsistent across SUAs. This exacerbates the issue of SUAs having differing proportions of their area covered by UGS.

Estimating the PWD distortion from geographic factors at an SA1 level requires an estimation of the amount of UGS in an SUA excluded from residential areas. This is as their exclusion will largely remove or mitigate its impact on PWD. As was discussed in depth throughout Queensland's submissions, there is significantly higher levels of segregation in Sydney SUA compared to Brisbane SUA.

Based on data from Hsu et al (2022), it was estimated that between 11 and 46 per cent of Brisbane SUA urban green space is excluded from residential SA1s compared to the approximately 69 to 82 per cent of urban green space excluded from residential SU1s in the Sydney SUA. For simplicity, Queensland Treasury excluded 25 per cent of UGS in Brisbane and 75 per cent in Sydney. As such, the UGS cover in PWD calculations accounts for 29 per cent of total area in Brisbane SUA compared to 7 per cent of total area in Sydney SUA. These areas cause a distortion in PWD that is proportional to the proportion of the SUA covered by UGS. Based on this, estimates can be made of PWD distortions in each SUA. These are shown in Table A.5:

	Urban green space cover	Excluded	Adjusted cover	PWD distortion	Total PWD distortion from geographic factors	Percent distortion
Brisbane	38%	25%	29%	869	1,406	41%
Sydney	29%	75%	7%	523	676	9%

## Table A.5: Estimated PWD distortion from urban green space at a SA1 level.

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

To ensure that there is no double counting of PWD distortion from UGS, only the net distortion from UGS was used to give the total PWD from geographic factors. This net figure was calculated based on an analysis of the nature of distortion in the SA3s shown in Table A.1. From this analysis, Queensland Treasury estimates approximately 50 per cent of distortion calculated in Table A.4 is from UGS. This means that an additional PWD distortion from UGS not already accounted for of 332 occurs in the Brisbane SUA and 371 in the Sydney SUA.

Calculations in Table A.5 suggest that Sydney SUA experiences a distortion of 9 per cent from all geographic and planning factors at an SA1 level. This is substantially lower than the 41 per cent distortion experienced in the Brisbane SUA.

Overall, the estimates shown in Tables A.4 and A.5 demonstrate that inconsistencies over SA1 boundaries and the inclusion of non-residential land uses are substantially impacting on the urban transport assessment.

# Estimating PWD distortion from geographic and planning factors using SA2 geographies

Using SA2 geographies will result in almost all non-residential land uses (including industrial areas, land unsuitable for residential living (such as floodplains) and urban green space) having a distortionary impact on PWD.

Only the PWD distortion from urban green space can be directly estimated when SA2 geographies are used. This estimation uses the same method applied at the SA1 level, however there is no exclusion as almost all UGS is included with non-residential areas at an SA2 level using ABS boundaries, with the net impact also being greater given the smaller area of the whole subdivision covered by each UGS. This gives the results shown in Table A.6:

	<b>C</b>				
	Urban green space	<b>PWD distortion</b>	Percent distortion		
Brisbane	38%	589	31%		

972

# Table A.6: Estimated PWD distortion from urban green space at a SA2 level.

Source: Queensland Treasury calculations based on Hsu et al; Bewley; Brisbane City Council; Greater Sydney Commission; DELWP.

29%

The level of PWD distortion from other non-residential land use calculated at an SA1 level geography can be rescaled to give the SA2 level distortion from non-residential land uses. Given the addition of a large proportion of areas segregated at an SA1 level in Sydney SUA, it is also necessary to calculate the level of distortion generated from these inclusions. Given the Brisbane and Sydney SUAs both have large areas zoned for industrial and commercial use, it is reasonable to assume both SUAs have a similar proportion of industrial and commercial land uses. This resulted in the estimates for PWD distortion shown in Table A.7.

Sydney

26%

## Table A.7: Estimated PWD distortion from non-residential land use at an SA2 level.

	SA1 Non-residential land use distortion (rescaled)	Additional distortion at SA2 level	Total	Percent distortion
Brisbane	310	-	310	16%
Sydney	88	512	601	16%

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

There will be additional PWD distortion at an SA2 level for geographic factors related to urban areas that cannot be used for residential properties, most commonly floodplains and areas of high natural disaster risk.

As discussed under *Issue 3* of this submission, different SUAs have different geographies which impacts the proportion of their urban areas that is unsuitable for residential land use. The additional PWD distortion generated from the inclusion of these areas in calculations at an SA2 level can be simply defined as any distortion that is not accounted for from other distortionary effects. As such, the estimated PWD distortion from these geographic factors is shown in Table A.8:

 Table A.8: Estimated PWD distortion from other geographic factors at an SA2 level.

	Estimated undistorted PWD	SA2 level PWD	Distortion from other factors	Distortion from other geographic factors	Percent distortion
Brisbane	5,506	1,912	2,113	1,481	77%
Sydney	8,182	3,725	2,063	2,395	64%

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

Aggregating Tables A.6-A.8, it is estimated that Brisbane SUA experiences **18 per cent more** PWD distortion from geographic and planning factors compared to Sydney SUA using SA2 geographies.

Overall, this analysis clearly demonstrates that PWD distortion from geographic and planning factors would materially impact the urban transport assessment using either SA1 or SA2 geographies, indicating that neither are a fit for purpose geographic data source.

## PWD distortion from new developments

## Estimating PWD distortion from new developments at an SA1 level

A PWD distortion range from new greenfield developments in Brisbane SUA was developed to estimate the maximum impact of new developments on the urban transport assessment. This analysis was based on two completed developments and one development in-construction. The estimated PWD distortion from each development was then extrapolated to estimate the annual PWD distortion effect on the Brisbane SUA over the next 20 years. Table A.9 summarises this estimation:

Development	SA1 population	New development population	SA1 PWD distortion	SUA PWD distortion	Percent distortion
Strathpine	1,280	1,280	3.72	622	18%
Warren	1,670	1,200	1.51	269	8%
Yarrabilba	11,027	11,027	11.88	230	7%

Table A.9: PWD distortion from new develo	pments in Brisbane SUA at an SA1 level.
---	---

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

To apply the calculations in Table A.9 to other developments further analysis was undertaken, which concluded:

- It is reasonable to assume that new greenfield developments across SEQ will have a similar distortionary impact to one of three analysed SA1s. This is given the consistent inclusion of large non-residential areas in SA1s also containing greenfield development areas across SEQ.<sup>128</sup>
- PWD distortion will affect each new development for 3 to 10 years. This reflects the fact that ABS boundaries are only updated every five years, and even following ABS boundary updates there are often significant non-residential area inclusions within SA1s containing greenfield developments. For example, the Warren development had a population of above 1,000 for each of the five years the 2016 ABS SA1 boundaries were in effect.<sup>129</sup>
- This means that a similar distortionary impact from the new development occurred every year. PWD distortion was occurring from these new developments prior to the 2016 SA1 boundaries being redrawn. Likewise, most developments analysed all had substantial PWD distortion for the full five-year period or did not have their SA1 boundaries adequately updated in the 2021 ABS census.<sup>130</sup> This suggests that PWD distortion from new developments is usually not mitigated for an extended period (at least one census boundary review) and that PWD distortion is therefore present in most new developments for 7 to 10 years. The calculations in Table A.10 use the conservative estimate of PWD distortion occurring for 5 years for each new development.
- Approximately 69 per cent of new residents in SEQ will reside in the Brisbane SUA.<sup>131</sup> This is consistent with current population shares, population projections, and the current distribution of greenfield development projects.
- The highest Brisbane SUA PWD distortion estimate (622 or 18 per cent distortion) is considered the most appropriate proxy for total new development PWD distortion. This is because of two primary factors:
  - The use of the highly conservative of PWD distortion only occurring for 5 years for new developments. As discussed, the distortionary period for most new developments is likely 7 to 10 years instead of 5 years. As such, using an average figure will likely substantially underestimate actual PWD distortion.
  - When testing the volume of PWD distortion using an average PWD distortion value from Table A.9, Queensland Treasury found that the change in the percent distortion difference between Brisbane SUA and Sydney SUA only changed by 5 per cent, and PWD distortion was approximately 4.43 and 4.58 times greater in the Brisbane SUA compared to the Sydney SUA in each respective scenario.

Adjustments also need to be made to calculate PWD distortion from new developments in Sydney for two reasons:

- Given the much higher proportion of population growth in Sydney SUA being based in high density and brownfield development areas which are already situated in residential areas there will be substantially less PWD distortion. This is as the SA1 containing the new development will likely only have limited non-residential areas.
- There is slower population growth in general in Sydney SUA compared to Brisbane SUA.<sup>132</sup>

<sup>&</sup>lt;sup>128</sup> Other examples of new developments include Pelican Waters, South Caloundra, Meridan Plains, Ripley, Jimboomba, Flagstone, Logan Village, and New Beith. This list is not exhaustive.

 $<sup>^{\</sup>rm 129}$  Based on Commission provided data.

<sup>&</sup>lt;sup>130</sup> Based on Commission provided data.

<sup>&</sup>lt;sup>131</sup> Australian Government, Queensland Government, & South East Queensland Council of Mayors 2023. South East Queensland City Deal: Implementation Plan.

<sup>&</sup>lt;sup>132</sup> Environmental Protection Agency 2023. *NSW State of the Environment*. NSW Government: Sydney.

Both of these factors will decrease the PWD distortion from new developments experienced in Sydney SUA relative to Brisbane SUA. Considering these factors, Queensland Treasury estimates for PWD distortion from new developments in each SUA are shown in Table A.10:

## Table A.10: Estimated PWD distortion from new developments at an SA1 level.

	PWD distortion	Percent distortion
Brisbane	622	18%
Sydney	277	4%

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

As shown in Table A.10, the level of PWD distortion from new developments at an SA1 level is 18 per cent in Brisbane SUA compared to 4 per cent in Sydney SUA, demonstrating the clear materiality of this differential PWD distortion on the urban transport assessment.

# Estimating PWD distortion from new developments at an SA2 level

The PWD distortion using SA2 geographies was estimated by calculating the difference in distortion from a major new development area in Caloundra West from SA1 geographies and SA2 geographies. Given the larger area covered by SA2s compared to SA1s, a much higher proportion of an SUAs population is subject to distortion, increasing the magnitude of the PWD distortion. This analysis is shown in Table A.11:

# Table A.11: Estimating factor of increase of PWD distortion for new developments using SA2 geographies compared to SA2 geographies.<sup>133</sup>

	Area	ERP	SA PWD distortion	Percent SUA distortion
SA2 geographies				
Caloundra West -Baringa	47.39	15,707	32.08	3%
Meridan Plains	24.04	14,397	18.16	2%
SA1 geographies				
31,602,142,039	53.40	6,650	33.14	2%
Ratio o	2.69			

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

This ratio can be rescaled to be applied to calculate PWD distortion for new developments at an SA1 level for the respective SUAs.<sup>134</sup> The estimation for PWD distortion from new developments using SA2 geographies is shown in Table A.12:

## Table A.12: Estimated PWD distortion from new developments at an SA2 level.

	Ratio (SA2: SA1)	PWD distortion	Percent distortion
Brisbane	2.69	944	49%
Sydney	2.69	386	10%

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

As shown in Table A.12, the PWD distortion from new developments using SA2 geographies is 49 per cent in Brisbane SUA compared to 10 per cent in Sydney SUA. This clearly demonstrates that PWD distortion remains differential when using SA2 geographies. Overall, this demonstrates that both SA1 and SA2 geographies are not fit for purpose as a data source in the urban transport model.

<sup>&</sup>lt;sup>133</sup> Table 21.11 analyses new developments in the Sunshine Coast SUA. This was for simplicity as it was the only area in SEQ where SA1 and SA2 geographies were directly comparable for new developments. The Caloundra West development shares all characteristics with other developments in SEQ, including most new developments in Brisbane SUA. As such, the proxy developed here is applicable to the Brisbane SUA. It was assumed that the PWD decrease between SA1 and SA2 level geography was equal for the Brisbane SUA and the Sunshine Coast SUA.

<sup>&</sup>lt;sup>134</sup> The rescaling ratio is calculated by the percentage decrease in total PWD for the respective SUA between using SA1 geographies and SA2 geographies.

## PWD distortion from rural residential areas

## Estimating PWD distortion from rural residential areas at an SA1 level

PWD distortion from rural residential areas was calculated by estimating the distortion in each rural residential community in the Brisbane SUA and aggregating the result. This is shown in Table A.13:

Rural localities Brisbane	Population	Area	PWD distortion
Pine Mountain	1,695	38.7	2.06
Mount Crosby	1,860	15.3	2.20
Chuwar	2,178	8.9	2.47
Walloon	2,305	17.9	2.72
Thagoona	1,077	13.2	1.29
Marburg	1,013	18.1	1.23
Rosewood	3,263	31.4	3.89
Willowbank	1,351	20.6	1.63
Deebing Heights	3,960	10.5	4.27
Greenbank	9,587	110.5	11.49
New Beith	5,642	28.8	6.51
Munruben	2,753	12.1	3.14
Logan Village	5,316	39.5	6.27
Cedar Grove	1,992	18.0	2.37
Cedar Vale	2,856	15.7	3.31
Beaudesert	6,752	43.6	7.91
Gleneagle	1,877	31.2	2.27
Mount Cotton	7,302	42.5	8.50
Sheldon	1,762	22.8	2.12
Gumdale	2,298	4.5	2.35
Samford Village	796	1.4	0.80
Mount Nebo	424	14.4	0.52
Samford	3,068	20.5	3.60
Highvale	1,979	24.5	2.38
Burpengary	14,022	22.5	13.72
Upper Caboolture	5,087	12.2	5.41
Wamuran	3,374	68.1	4.10
Moodlu	285	4.7	0.34
Elimbah	4,290	100.1	5.22
Beachmere	3,309	30.2	3.94
Godwin Beach	487	3.8	0.58
Ningi	4,675	30.2	5.47
Sandstone Point	3,959	9.9	4.24
Toorbul	958	25.8	1.17
Bongaree	8,162	8.2	6.73
Woorim	1,843	26.1	2.22
Donnybrook	664	24.4	0.81
Kooralbyn	1,697	87.4	2.08
Brisbane SUA rural localities	125,918	1,058	141.34

Table A.13: Estimating PWD dilution from rural residential areas at an SA1 level.<sup>135</sup>

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

The PWD distortion figure shown in Table A.13 is likely overstated given SA1 boundaries allow for more dense areas of rural localities to partially offset PWD distortion from less dense areas. To counteract this impact, this figure was discounted by 50 per cent to give a final PWD distortion estimate.

The ratio of the proportion of the population living in rural localities in Sydney SUA compared to Brisbane SUA was estimated based on the proportion of the total SUA population not living in the Brisbane or Sydney UCL respectively.<sup>136</sup> Sydney has a much lower number of rural localities included as UCLs within

<sup>&</sup>lt;sup>135</sup> The PWD distortion values in Table x.x have not been rescaled to account for overall SUA PWD increases.

<sup>&</sup>lt;sup>136</sup> Whilst this calculation will not account for all individuals living in rural localities, populations living in these areas are much more likely to be rural residential.

the SUA compared to Brisbane. Overall, the rescaled estimates of PWD distortion from rural localities for Sydney SUA and Brisbane SUA are displayed in Table A.14:

	Ratio of PWD distortion	PWD distortion	Percent distortion
Brisbane	1.00	80	2%
Sydney	0.37	33	0%

## Table A.14: Estimated PWD distortion from rural residential areas at an SA1 level.

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

Estimating PWD distortion from rural residential areas at an SA2 level

PWD distortion from rural residential areas is substantially higher at an SA2 level than at SA1 levels. This is for three primary reasons:

- Using SA1 geographies partially (but not fully) offset the impact of the lowest density areas within the UCL given the greater disaggregation. This complete aggregation of an area means there is no mitigation of large rural, agricultural or wilderness areas within PWD calculations. As such, it is no longer appropriate to discount any PWD distortion estimate.
- 2. Given the larger area covered by SA2s compared to SA1s, more communities, including higher density areas, are impacted by PWD distortion.
- 3. Using SA2 geographies will necessitate significant numbers of low density areas **outside** of UCLs (areas which are not currently included within PWD calculations) being included within the calculation. This will result in SUAs that have a higher proportion of the population living in rural residential and low density areas having their PWD further distorted.

To estimate the increase in PWD distortion from SA1 level geographies to SA2 levels geographies, analysis was undertaken of rural residential localities in the Moreton Bay region. Estimated PWD distortion for the analysed localities in both instances is displayed in Table A.15:

Rural localities Moreton Bay	Population	Area	PWD distortion		
SA	2 level geographies				
Elimbah	4,290	101.2	3.30		
Bribie Island	20,612	145.4	15.02		
Caboolture East	17,736	49.9	11.36		
Burpengary East	6,658	27.2	4.57		
Deception Bay	22,686	31.9	11.21		
Beachmere	16,469	110.1	11.95		
Wamuran	4,228	89.4	3.25		
Upper Caboolture	3,260	55.6	2.49		
Caboolture West	12,165	24.6	7.10		
Samford Valley	12,385	166.1	9.37		
Cashmere	19,643	45.2	11.95		
Narangba	20,914	37.7	11.69		
Morayfield	5,867	24.9	4.05		
Burpengary	16,488	22.3	7.97		
Dayboro	9,213	406.8	7.17		
SA2 level geographies aggregate	192,614	1,338.2	122.45		
SA1 level geographies					
Samford Village	796	1.4	0.46		
Mount Nebo	424	14.4	0.29		
Samford	3,068	20.5	2.05		
Highvale	1,979	24.5	1.35		
Burpengary	14,022	22.5	8.01		

# Table A.15: Estimating PWD distortion from rural residential areas at an SA2 level.<sup>137</sup>

<sup>&</sup>lt;sup>137</sup> SA2 level geographies groups areas by SA2. SA1 level geographies groups areas by locality. PWD distortion for SA1 level geography includes the 50 per cent discount for distortion mitigated through disaggregation.

SA1 level geographies aggregate	59,501	353.2	36.41
Dayboro	2,119	16.2	1.42
Donnybrook	664	24.4	0.46
Woorim	1,843	26.1	1.26
Bongaree	8,162	8.2	4.04
Toorbul	958	25.8	0.66
Sandstone Point	3,959	9.9	2.44
Ningi	4,675	30.2	3.12
Godwin Beach	487	3.8	0.33
Beachmere	3,309	30.2	2.24
Elimbah	4,290	10.1	2.62
Moodlu	285	4.7	0.20
Wamuran	3,374	68.1	2.33
Upper Caboolture	5,087	12.2	3.12

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

Using the data in Table A.15, a ratio of the impact of rural residential areas on PWD distortion from SA1 level geographies to SA2 level geographies can be derived.<sup>138</sup> The increased impact of rural residential areas on PWD distortion at an SA2 level can then be estimated for each SUA. These estimates are given in Table A.16:

## Table A.16: Estimated PWD distortion from rural residential areas at an SA2 level.

	Ratio (SA2: SA1)	PWD distortion	Percent distortion
Brisbane	5.98	269	0.14
Sydney	5.98	103	0.03

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

As can be observed in Table A.16, the PWD distortion from rural residential areas is significantly different between the Sydney SUA and Brisbane SUA at an SA2 level. This would likely drive material changes within the urban transport assessment, demonstrating that SA2 level geographies are not a fit for purpose data source.

# Total PWD distortion using SA1 level and SA2 level geographies

Table A.17 displays the total estimated PWD distortion in the Sydney and Brisbane SUAs:

# Table A.17: Total PWD distortion and distortion by type in the Sydney SUA and Brisbane SUA at anSA1 and SA2 level.

	Other geographic factors	Non- residential land uses	Urban green spaces	New developments	Rural residential	Total PWD distortion	Percent distortion
		SA	1 level geographi	es			
Brisbane	-	537	869	622	80	2,109	62%
Sydney	-	153	523	277	33	986	14%
		SA	2 level geographi	es			
Brisbane	1,481	310	589	944	269	3,594	188%
Sydney	2,395	601	972	386	103	4,457	120%

Source: Queensland Treasury calculations based on Commonwealth Grants Commission data and ABS Maps.

Table A.17 clearly shows that there is significantly more PWD distortion occurring in the Brisbane SUA compared to the Sydney SUA using both geographies. This demonstrates that neither SA1 nor SA2 data is fit for purpose in the urban transport assessment.

Overall, these inconsistencies in ABS geographies are materially impacting on the assessment. Indeed, as indicated in Table A.18 PWD distortion estimates indicate that an undistorted PWD in Brisbane SUA would

<sup>&</sup>lt;sup>138</sup> Deriving this ratio involves calculating percent distortion of the total SUA PWD for each SA level.

be 67 per cent of the undistorted PWD of the Sydney SUA. This is significantly higher than the 47 per cent using SA1 geographies and 51 per cent using SA2 geographies.

As discussed in Queensland's submission, the issue of PWD distortion is also expected to impact other SUAs, most notably Perth, Adelaide, Hobart, and Darwin. It is expected the distortionary effects are similar in magnitude to Brisbane SUA. As such, the estimated undistorted PWD of each SUA is significantly higher than the currently assessed PWD. These changes are shown in Table A.18:

SAZ geographies.						
	Sydney	Brisbane	Perth	Adelaide	Hobart	Darwin
Estimated undistorted PWD	8,182	5,506	4,294	4,081	3,225	4,360
Ratio to Sydney	1.00	0.67	0.52	0.50	0.39	0.53
SA1 (people per km2)	7,196	3,397	2,649	2,518	1,990	2,690
Ratio to Sydney	1.00	0.47	0.37	0.35	0.28	0.37
SA2 (people per km2)	3,725	1,912	1,779	1,812	1,224	1,655
Ratio to Sydney	1.00	0.51	0.48	0.49	0.33	0.44

Table A.18: Estimated undistorted PWD for selected SUAs compared to PWD assessed using SA1 andSA2 geographies.

Source: Queensland Treasury calculations based on Commonwealth Grants Commission; ABS Maps; NSW Submission to Tranche 1 consultation papers.

#### Key data sources

- 1. Commonwealth Grants Commission provided data on SA1s.
- 2. Australian Bureau of Statistics 2023. 2021 Census. Available at https://www.abs.gov.au/census/guide-census-data.
- 3. Australian Bureau of Statistics 2022. *Population projections, Australia*. Available at https://www.abs.gov.au/statistics/people/population/population-projections-australia.
- 4. Australian Bureau of Statistics 2021. Australian Statistical Geography Standard (ASGS) Edition 3: Statistical Area Level 1.
- 5. Australian Bureau of Statistics 2016. *Australian Statistical Geography Standard (ASGS) Edition 2:* Statistical Area Level 1.
- 6. Australian Bureau of Statistics 2021. Australian Statistical Geography Standard (ASGS) Edition 3: Statistical Area Level 2.
- 7. Australian Bureau of Statistics 2016. Australian Statistical Geography Standard (ASGS) Edition 2: Statistical Area Level 2.
- 8. Australian Bureau of Statistics 2021. Australian Statistical Geography Standard (ASGS) Edition 3: Urban Centres and Localities (UCLs).
- 9. Australian Bureau of Statistics 2021. Australian Statistical Geography Standard (ASGS) Edition 3: Significant Urban Areas (SUAs).
- 10. Australian Bureau of Agricultural and Resource Economics and Sciences 2023. National Map.
- 11. Australian Government, Queensland Government, & South East Queensland Council of Mayors 2023. *South East Queensland City Deal: Implementation Plan.*

# Appendix A.2: Calculating urban transport need based on socio-demographic factors.

# Context

In the *Transport* section of this submission, Queensland suggests that the urban transport task is strongly influenced by socio-demographic composition. To support this claim, modelling was provided that compared the relative task, presence of economies of density, and level of servicing for the NSW and SEQ urban transport networks. This appendix outlines the methodologies supporting this modelling.

## Estimating urban transport task by passenger type and purpose of trip

Data from the *How Queensland travels report* and *2018 Queensland household travel survey* were used as a baseline to estimate trips across the SEQ by type of passenger and purpose of travel. This data is shown in Table A.19:

# Table A.19: Public transport resident trips by type of passenger and purpose of travel, SEQ 2018(modelled).

	Greater Brisbane	Sunshine Coast	Gold Coast	SEQ
Concession card holder trips proportion	42%	83%	71%	47%
Commuter trips proportion	49%	14%	22%	45%

Source: How Queensland travels report; Queensland household travel survey.

The proportion of trips by type of passenger in NSW was sourced from the *NSW household travel survey* 2022-23. This data is shown in Table A.20:

Table A.20: Public transport resident trips by type of passenger, NSW 2023.		
Concession card holder trips proportion	26%	
Non-concession card holder trips proportion	74%	

Source: NSW Queensland household travel survey.

To estimate the proportion of trips for work in NSW, an adjustment was made using the Commission's modelled public transport commutes compared to commutes recorded by the *2018 Queensland household travel survey*. This survey reported an average of 262,825 daily public transport commutes compared to 377,563 implied trips using the Commission's modelled passenger numbers. This indicates that on any given day, 70 per cent of SEQ public transport commuters use this mode to get to work. This proxy was applied to NSW commuters (derived from the Commission's modelled passenger numbers) to give an estimated number of daily public transport commutes before the COVID-19 Pandemic.<sup>139</sup> This analysis is shown in Table A.21:

# Table A.21: Modelled daily commutes in NSW and SEQ, 2018.

	Population	Commission modelled commuter trips	Daily commuters (modelled)
SEQ	3,393,161	377,563	262,825
NSW	6,179,292	1,408,245	1,194,268

Source: Queensland Treasury calculations based on How Queensland travels report; Queensland household travel survey; NSW Queensland household travel survey.

These figures give an estimate of the proportion of non-concessional trips in both networks related to commuters or for other purpose travel by apportioning these figures to ticketing data from August 2018 for both networks. There was a significantly higher proportion of non-concessional public transport usage in SEQ compared to NSW. This is shown in Table A.22.

<sup>&</sup>lt;sup>139</sup> The proxy was discounted by 50 per cent when applied to NSW data. This is because there isevidence suggesting individuals in NSW are less likely to change mode of transport to work compared to individuals in Queensland. *See:* C. Munro 2021. *National Walking and Cycling Participation Survey*. Cycling and Walking Australia and New Zealand: Sydney.

## Table A.22: Split of non-concessional trips by purpose in SEQ and NSW, 2018.

	Non-concessional trips for work	Non-concessional trips for all other purposes
SEQ	82.66%	17.34%
NSW	69.93%	30.07%

Source: Queensland Treasury calculations based on How Queensland travels report; Queensland household travel survey; NSW Queensland household travel survey.

Both data sets were then adjusted to account for permanent and differential increases in work from home because of the COVID-19 Pandemic.<sup>140</sup> These changes are shown in Table A.23:

## Table A.23: Non-concessional resident trips for work in NSW and SEQ, 2018 & 2023.

	Work from home increase	Non-concessional resident trips for work (2018)	Non-concessional resident trips for work (2023)
SEQ	7%	83%	77%
NSW	18%	70%	57%

Source: Queensland Treasury calculations based on Hensher et al; DITRDCA.

The number of non-resident fares per day was estimated by comparing 2018 Household travel survey data to TransLink ticketing data. It was assumed that non-resident trips made up an equal proportion of the urban transport task in each SUA and that these non-resident trips could be charged a non-concessional fare. This analysis is shown in Table A.24:

## Table A.24: Estimated non-resident trips.

	Trips
Household travel survey 2018	582,760
TransLink trips August 2018	646,314
Percent difference (Proxy for non-resident trips)	10%

Source: Queensland Treasury calculations based on How Queensland travels report; Queensland household travel survey; Open Data Portal Queensland Government.

To apportion trips between weekdays and weekends, the following statistics were derived from the *How Queensland travels report*:

## Table A.25: Characteristics of weekend travel.

Demand on average weekend day compared to average weekday	23%
Percent of weekend trips for work	14%
Percent of weekly trips taken on weekends	8%

Source: Queensland Treasury calculations based on How Queensland travels report.

Using the data presented in Tables A.23-A.25, the weekly proportion of trips by type of traveller and purpose of travel can be modelled. This is shown in Table A.26:

# Table A.26: Modelled proportion of weekly trips on public transport by type of traveller and purposeof travel, 2023.

	SEQ	NSW
Weekday		
Non-concessional work trips	37.84%	38.15%
Non-concessional other purpose trips	8.54%	25.80%
Concessional work trips	1.15%	0.71%
Concessional other purpose trips	42.64%	25.51%
Non-resident trips	9.83%	9.83%
Weekend		

<sup>&</sup>lt;sup>140</sup> This issues was discussed in *Issue 4* of the urban transport expenses submission.

Non-concessional work trips	13.30%	13.41%
Non-concessional other purpose trips	33.08%	50.54%
Concessional work trips	0.40%	0.29%
Concessional other purpose trips	43.38%	25.93%
Non-resident trips	9.83%	9.83%
Weekly		
Non-concessional work trips	35.76%	36.05%
Non-concessional other purpose trips	10.62%	27.89%
Concessional work trips	1.08%	0.67%
Concessional other purpose trips	42.70%	25.55%
Non-resident trips	9.83%	9.83%

Source: Queensland Treasury calculations based on How Queensland travels report; Queensland household travel survey; Open Data Portal Queensland Government.

The modelling displayed in Table A.26 clearly demonstrates the differential urban task in NSW compared to SEQ, given the significantly higher urban transport need related to concession card holders in SEQ compared to NSW.

## Estimating fare revenue raising capacity

Apportioning the estimates in Table A.26 to ticketing data from August 2023 for both the NSW and SEQ networks, typical weekly trip numbers by type of passenger and purpose of travel can be modelled. This is shown in Table A.27:

## Table A.27: Modelled weekly trips in SEQ and NSW, 2023.

	NSW	SEQ
Adult commuters	4,270,690	1,320,042
Adult all other purposes	3,303,864	391,979
Concession work	79,594	39,946
Concession all other purposes	3,026,134	1,576,354
Non-resident trips	1,164,758	362,976
Weekly trips	11,845,040	3,691,297

Source: Queensland Treasury calculations based on How Queensland travels report; Queensland household travel survey; Open Data Portal Queensland Government; NSW Household Travel Survey; Open Data NSW Government.

#### This is displayed in per capita terms in Table A.28:

# Table A.28: Modelled weekly trips per capita in SEQ and NSW, 2023.

	NSW	SEQ
Adult commuters	0.69	0.39
Adult all other purposes	0.53	0.12
Concession work	0.01	0.01
Concession all other purposes	0.49	0.46
Non-resident trips	0.19	0.11
Weekly trips	1.92	1.09

Source: Queensland Treasury calculations based on How Queensland travels report; Queensland household travel survey; Open Data Portal Queensland Government; NSW Household Travel Survey; Open Data NSW Government.

For simplicity, the non-concessional fare capacity was assumed to be equal in both networks and was set at 1 in a standardised form, based on an assumption that both states have the capacity to raise a full fare for all non-concessional trips. The nominal concession fare (the implied base level concession based on state fare policies) is approximately half the non-concessional fare in both networks. However, significant additional discounts based on need are provided to seniors, school students, person disabilities, and other disadvantaged groups in both networks. This reduces actual concession fare capacity to far below the maximum nominal level. As such, the concession fare capacity was estimated to be approximately 0.25 for both networks in a standardised form. Given that higher concession card holders in SEQ compared to urban NSW, the fare revenue raising capacity in SEQ is lower. The estimated relative ratio for fare revenue capacity per trip for both SEQ and NSW is shown in Table A.29:

## Table A.29: Fare revenue raising capacity per trip in SEQ and NSW, August 2023.

	Relative fare revenue per trip	
SEQ	0.84	
NSW	1.00	

Source: Queensland Treasury calculations based on How Queensland travels report; Queensland household travel survey; Open Data Portal Queensland Government; NSW Household Travel Survey; Open Data NSW Government.

In addition to per capita trips, urban transport need is also determined by the distances public transport users need to travel. Table A.30 shows public transport length of trip data for both networks.

# Table A.30: Length of trip data for SEQ and NSW.

	Brisbane	Sydney
Length of trip (minutes)	54	26
Length of trip (kms)	17	13

Source: How Queensland travels report and NSW Household Travel Survey.

The table shows that the distance users need to travel is significantly higher in SEQ compared to NSW, indicating the urban transport task per user is significantly higher in SEQ compared to NSW.

As is discussed in detail in the submission, the minutes of public transport usage is determined by both distance to destination and the level of servicing in an urban area. To determine the urban transport task in an urban area **the level of servicing needs to be standardised.** 

If both networks had the same level of servicing (operated at an equal level of efficiency) NSW would have a substantially higher fair revenue raising capacity, and thus lower net expense need for urban transport. Table.31 shows the fare revenue raising capacity from differential SDC, economies of density, and network efficiency for compared to:

# Table A.31: Decrease in fare revenue capacity in SEQ compared to NSW, August 2023.

	Decreased fare revenue capacity	Accumulative
Differential SDC	16%	16%
Economies of density	24%	40%
Level servicing differences	20%	60%

Source: Queensland Treasury calculations based on Queensland household travel survey; NSW Household Travel Survey.

Table A.31 demonstrates that the fare revenue raising capacity is significantly higher in NSW compared to SEQ. As presented in *Issue 2* of this submission, this increased but underutilised fare revenue raising capacity has disproportionately inflated the net expense of urban transport in NSW compared to other urban transport.

Table A.32 demonstrates the difference between actual fare revenue in the NSW urban network compared to the modelled fare revenue accounting for all factors shown in Table A.31:

## Table A.32: Actual fare revenue vs Modelled fare revenue in NSW, 2017-18.<sup>141</sup>

Actual fare revenue (\$)	Modelled fare revenue (\$)	Diffe	rence
1,480,	,482,000	3,171,222,971	1,690,740,971

Source: Queensland Treasury calculations based on Queensland IPART 2020.

This modelled fare revenue represents the potential fare revenue that could be raised in NSW if need was serviced at the same level as in SEQ.

<sup>&</sup>lt;sup>141</sup> 2017-18 is the most recent year that NSW urban network fare revenue and operating expenses are available. As fare revenue capacity is based on modelled 2023 passengers, the per capita difference derived in Table A.32 is applicable the current assessment.

As shown in Table A.32, the decrease in net expenses for NSW would have been approximately \$1.7 billion (\$215 per capita) suggesting that urban transport net expenses would decrease from \$719 per capita to \$526 per capita if NSW services public transport need at the same level as Queensland (see Table 2.6).

## Additional data

A range of key data was used to inform the above analysis. This data is presented in Tables A.33-40, showing ticketing data, population data, and weekday/weekend apportionment used for both network for the above calculations.

Mode	Ticket	Number of passengers
Bus	Adult	15,900,861
Bus	Adult Single Bus Trip 1	79,217
Bus	Adult Single Bus Trip 2	40,983
Bus	Adult Single Bus Trip 3	10,600
Bus	СТР	45,975
Bus	Day Pass without SAF	905
Ferry	Adult	724,780
Ferry	СТР	58,355
Ferry	Day Pass without SAF	28
Ferry	Sgl Trip Ferry Adult	31,988
Light rail	Adult	673,022
Light rail	СТР	43,751
Light rail	Day Pass without SAF	15
Light rail	Sgl Trip LR Adult	2,823
Metro	Adult	1,437,608
Metro	СТР	56,587
Metro	Day Pass without SAF	11
Metro	Sgl Trip Rail Adult	8,621
Train	Adult	25,583,771
Train	CTP	1,113,001
Train	Day Pass without SAF	939
Train	Sgl Trip Rail Adult	210,421
Tota	I non-concessional	46,024,263
Bus	Child/Youth	1,260,371
Bus	Child/Youth Single Bus Trip 1	19,594
Bus	Child/Youth Single Bus Trip 2	12,843
Bus	Child/Youth Single Bus Trip 3	3,384
Bus	Concession	1,914,213
Bus	Day Pass Child/Youth w/o SAF	113
Bus	On Demand	23,135
Bus	School Student	3,182,243
Bus	Senior/Pensioner	4,320,530
Ferry	Child/Youth	80,831
Ferry	Concession	22,873
Ferry	Day Pass Cillur Toutil W/O SAF	1 054
Ferry	School Student	1,954
Ferry	School Student	3,407
Eerny	Sal Trip Ferry Child /Vouth	8 804
Light rail	Child/Youth	45 254
Light rail	Concession	41 982
Light rail	School Student	10 457
Light rail	Senior/Pensioner	168,039
Light rail	Sel Trip LR Child/Youth	727
Metro	Child/Youth	85.909
Metro	Concession	251.912
Metro	Day Pass Child/Youth w/o SAF	2
Metro	School Student	93,320
Metro	Senior/Pensioner	135,070
Metro	Sgl Trip Rail Child/Youth	3,949
Train	Child/Youth	948,560
Train	Concession	2,374,111
Train	Day Pass Child/Youth w/o SAF	33
Train	School Student	1,273,508
Train	Senior/Pensioner	2,993,017
Train	Sgl Trip Rail Child/Youth	44,548
То	tal concessional	19,493,827
Ferry	Free Travel	1,954
Bus	Free Travel	42,665
Light rail	Free Travel	1,325
Metro	Free Travel	1,974

## Table A.33: Ticketing data, NSW, August 2019.

Train	Free Travel	35,716
Total free travel (excluded)		83,634
Bus	Employee	94,889
Ferry	Employee	3,847
Light rail	Employee	1,651
Metro	Employee	9,627
Train	Employee	349,886

Source: Open Data NSW Government.

# Table A.34: Ticketing data, NSW, August 2023.

Mode	Ticket	Number of passengers
Bus	Adult	7,488,394
Bus	СТР	6,452,578
Ferry	Adult	350,097
Ferry	СТР	492,569
Ferry	Sgl Trip Ferry Adult	28,060
Light rail	Adult	1,275,747
Light rail	СТР	1,253,138
Light rail	Sgl Trip LR Adult	4,586
Metro	Adult	909,233
Metro	СТР	635,045
Metro	Sgl Trip Rail Adult	4,397
Train	Adult	12,120,198
Train	СТР	9,038,757
Train	Sgl Trip Rail Adult	98,722
Bus	Adult Single Bus Trip 1	119
Bus	Adult Single Bus Trip 2	40
Bus	Adult Single Bus Trip 3	12
Ferry	Day Pass without SAF	6
Light rail	Day Pass without SAF	45
Metro	Day Pass without SAF	11
Bus	Day Pass without SAF	1,072
Irain	Day Pass without SAF	954
Total n	ion-concessional	40,153,780
Bus	Child/Youth	654,775
Bus	Concession	1,009,829
Bus	On Demand	23,305
Bus	School Student	1,659,586
Bus	Senior/Pensioner	3,327,349
Ferry	Child/Youth	58,485
Ferry	Concession School Student	17,980
Ferry	School Student	10,774
Ferry	Sellior/Perisioner	171,227
Ferry	Sgi Thp Ferry Child/Youth	12,082
Light rail	Concession	219 190
Light rail	School Student	218,189 AD A69
Light rail	Senior/Pensioner	381 478
Light rail	Sel Trin LB Child/Youth	2 033
Metro	Child/Youth	83 827
Metro	Concession	215.132
Metro	School Student	177.958
Metro	Senior/Pensioner	146.962
Metro	Sgl Trip Rail Child/Youth	4.478
Train	Child/Youth	601.211
Train	Concession	1.466.217
Train	Sgl Trip Rail Child/Youth	45,109
Train	School Student	1,166,240
Train	Senior/Pensioner	2,435,494
Bus	Child/Youth Single Bus Trip 1	9
Bus	Child/Youth Single Bus Trip 2	1
Bus	Day Pass Child/Youth w/o SAF	24
Light rail	Day Pass Child/Youth w/o SAF	8
Train	Day Pass Child/Youth w/o SAF	53
Tota	l concessional	14,021,849
Bus	Free Travel	30,404
Ferry	Free Travel	1,505
Metro	Free Travel	1,528
Light rail	Free Travel	3,044
Train	Free Travel	24,221
Total free travel (excluded)		60,702
Bus	Employee	61,504
Ferry	Employee	4,023
Light rail	Employee	9,078
Metro	Employee	10,206

Train	Employee	244,741
Total employee (excluded)		329,552

Source: Open Data NSW Government.

#### Table A.35: Ticketing data, SEQ, August 2023.

Week starting	Trips
30/07/2023	3,607,233
6/08/2023	3,608,464
13/08/2023	3,683,396
20/08/2023	3,352,625
Total	14,251,718

Source: Open Data Portal Queensland Government.

#### Table A.36: Apportionment of demand between weekdays and weekends, NSW, August 2019.

	Days	Weekday equivalents
Weekdays	22	22.00
Weekends	9	2.08
Weekend demand		0.09
Weekday demand		0.91

Source: Queensland Treasury (Based on data in Table A.25).

#### Table A.37: Apportionment of demand between weekdays and weekends, NSW, August 2023.

	Days	Weekday equivalents
Weekdays	23	23.00
Weekends	8	1.85
Weekend demand		0.08
Weekday demand		0.92

Source: Queensland Treasury (Based on data in Table A.25).

#### Table A.38: Apportionment of demand between weekdays and weekends, SEQ, August 2023.

	Days	Weekday equivalents
Weekdays	19	19.00
Weekends	9	2.08
Weekend demand		0.11
Weekday demand		0.89

Source: Queensland Treasury (Based on data in Table A.25).

Table A.39: NSW service population.

NSW SUAs	Population
Sydney SUA	4,830,047
Medowie SUA	15,020
Newcastle-Maitland SUA	508,437
Singleton SUA	17,018
Muswellbrook SUA	12,272
Lithgow SUA	12,385
Bathurst SUA	37,396
Nelson Bay SUA	28,418
Central Coast SUA	343,180
Morisset SUA	27,828
Wollongong SUA	305,691
Bowral SUA	41,600
NSW Population	6,179,292

Source: Commonwealth Grants Commission.

## Table A.40: SEQ service population.

SEQ SUAs	Population
Brisbane UCL	2,054,614
Sunshine Coast SUA	307,545
Gold Coast SUA	540,559
SEQ Population	3,393,161

Source: Commonwealth Grants Commission.

#### Key data sources for this analysis

- 1. Commonwealth Grants Commission data.
- 2. Transport for NSW 2023. *Household Travel Survey*. NSW Government: Sydney.
- 3. Department of Transport and Main Roads 2017. *How Queensland Travels report.* Queensland Government: Brisbane.
- 4. Department of Main Roads and Transport 2020. *Queensland Household Travel Survey*. Queensland Government: Brisbane.
- 5. Open Data NSW Government 2023. *Opal Trips All Modes.* 10 November. Accessed 11 December 2023. Available at https://opendata.transport.nsw.gov.au/dataset/opal-trips-all-modes. Primarily data for August 2019 and August 2023.
- 6. Open Data Portal Queensland Government 2023. *Public Transport Patronage.* 20 November. Accessed 11 December 2023. Available at https://www.data.qld.gov.au/dataset/public-transport-patronage-and-go-card-usage. Primarily data for the four weeks starting 4 August 2019 and the four weeks starting 30 July 2023.
- 7. D. Hensher, E. Wei, & M. Beck 2023a. "The impact of COVID-19 and working from home on the workspace retained at the main location office space and the future use of satellite offices." *Transport Policy*. 130: 184-195.
- 8. Department of Infrastructure, Transport, Regional Development, Communications, and the Arts 2022. *South East Queensland: Population, Housing, Jobs, Connectivity and Livebility*. Canberra: Australian Government. Ticket data analysed was from August 2023 for both NSW and SEQ.
- 9. The Independent Pricing and Regulatory Tribunal of NSW 2020. *Final Report: Maximum opal fares 2020-2024.* NSW Government: Sydney.
- 10. TransLink 2018. TransLink Tracker. Department of Transport and Main Roads: Brisbane.

## Appendix A.3: Appropriate allocation of GFS codes given Queensland transport assessment recommendations:

Queensland's proposed changes necessitate adjustments to the current allocation of GFS expense categories. The required adjustments are outlined in Table A.41:

COFOG-A code	Current component	Proposed component
0951 Transportation of non-urban school students	Urban transport	Non-urban school transport
0952 Transportation of other students	Urban transport	Urban school transport
1171 Pipeline and other transport	Urban transport	Non-urban transport

Table A.41: Proposed changes to COFOG-A category allocations by component.

The reallocation of transportation of non-urban school students (COFOG-A 0951) or transportation of other students (COFOG-A 0952) is necessary given the proposed separate assessment of non-urban school transport and urban school transport.

Queensland recommends the reallocation of pipeline and other transport (COFOG-A 117) a from urban to non-urban transport on a conceptual basis. Pipeline and other transport refers to the regulation, administration, and operation of pipelines (used for the transportation of petroleum and natural gas) and miscellaneous transport systems (such as chair lifts). Most transportation of resources through pipelines covers substantial distances and is almost entirely between urban areas or non-urban areas.<sup>142</sup> Meanwhile, it is likely that state government expenditure on other transport systems in minimal.<sup>143</sup> As such, conceptually, this expenditure should be assessed with non-urban transport.

<sup>&</sup>lt;sup>142</sup> Australian Pipelines and Gas Association 2023. Pipeline Facts and Figures. Accessed 16 January 2023. Available at https://www.google.com/search?q=how+long+are+gas+pipelines+australia&safe=active&ssui=on.

<sup>&</sup>lt;sup>143</sup> There is no reference to any of these forms of transportation across government transport websites.

## Appendix A.4: Urban transport expenses and investment literature review.

Queensland has provided substantial evidence and analysis supporting its urban transport investment and expenses submissions. All sources were cited in footnotes throughout the submission. This Appendix provides a consolidated presentation of all academic evidence consulted when developing Queensland's position. This evidence reinforces and legitimises Queensland's presented arguments.

## Studies analysed in the Jacobs Consultancy Report

In the Jacobs Urban Transport Consultancy Stage 2, there was a literature review into the validity of assuming diseconomies of scale (specifically density) in urban transport networks. This literature review concluded that *"one would expect to at least see economies of scale across both key modes in a wider sense"*. Despite this, the adopted model still assumed diseconomies of scale.

The Jacobs' literature review was somewhat ambivalent in terms of its conclusion on the economies of density. This is because their literature review focused on bus networks, which, while only drive a small proportion of the urban transport assessment in the dominant SUAs of Sydney and Melbourne. Therefore, a more appropriate literature review would have been a comprehensive literature review examining research undertaken into heavy rail networks.

Jacobs only analysed a single study on urban rail, despite it being the main mode of public transport in the dominant SUAs of Sydney and Melbourne.

## Studies finding economies of density in heavy rail networks.

A detailed literature review undertaken by Queensland Treasury on economies of density in heavy rail networks identified multiple different researchers have made clear findings of economies of density.

## The following studies found economies of density in heavy rail networks:

- 1) I. Savage 1997. "Scale economies in United States rail transit systems." *Transportation Research Part A: Policy and Practice*. 31(6): 459-473.
- 2) J. Bitzan & F. Karanki 2022. "Costs, density economies, and differential pricing in the U.S. railroad industry." *Transport Policy*. 119: 67-77.
- 3) A. Gschwender, S. Jara-Diaz, & C. Bravo 2016. "Feeder-trunk or direct lines? Economies of density, transfer costs and transit structure in an urban context." *Transport Research Part A: Policy and Practice.* 88: 209-222.
- 4) G. Ahlfeldt, S. Redding, D. Strum, & N. Wolf 2015. "The economics of density: evidence from the Berlin Wall." *Econometrica*. 83(6): 2127-2189.
- 5) F. Mizutani, A. Smith, C. Nash, and S. Uranishi 2015. "Comparing the costs of vertical separation, integration, and intermediate organisational structures in European and East Asian railways." *Journal of Transport Economics and Policy*. 49(3): 496-515. Earlier published in the Kobe University Graduate School of Business Administration Discussion Paper 37 (2014).
- 6) H. Li, K. Yu, K. Wang, & A. Zhang 2019. "Market power and its determinants in the Chinese railway industry." *Transportation Research Part A: Policy and Practice*. 120: 261-276.
- 7) F. Mizutani & S. Uranishi 2013. "Does vertical separation reduce cost? An empirical analysis of the rail industry in European and East Asian OECD countries." *Journal of Regulatory Economics.* 43: 31-59. East Asian nations with urban rail networks analysed were Japan & South Korea.
- 8) D. Graham 2008. "Productivity and efficiency in urban railways: Parametric and non-parametric estimates." *Transportation Research Part E: Logistics and Transportation Review*. 44(1): 84-99.
- 9) Anupriya, D. Graham, J. Carbo, R. Anderson, & P. Bansal 2020. "Understanding the costs of urban rail transport operations." *Transportation Research Part B: Methodological*. 138: 292-316.

- 10) F. Mizutani 2004. "Privately owned railways' cost function, organisation size and ownership." *Journal of Regulatory Economics*. 25(3): 297-322.
- 11) N. Wills-Johnson 2010. "Cost functions for Australia's railways." *Journal of Infrastructure Systems*. 17(1): 1-14.
- 12) D. Hensher, R. Daniels, & I. Demellow 1995. "A comparative assessment of the productivity of Australia's public rail systems 1971/72-1919-92." *Journal of Productivity Analysis*. 6(3): 201-223.
- 13) M. Farsi, A. Fetz, & M. Filippini 2007. "Economies of Scale and Scope in Local Public Transportation." *Journal of Transport Economics and Policy*. 41(3): 345-360.
- 14) J. Bitzan 2003 "Railroad costs and competition: The implications of introducing competition to railroad networks." *Journal of Transport Economics Policy*. 37(2): 201-225.
- 15) H. McGeehan 1993 "Railway costs and productivity growth: The case of the Republic of Ireland, 1973-1983." *Journal of Transport Economic Policy* 19-32.
- 16) M. Filippini & R. Maggi 1992 "The cost structure of the Swiss private railways." *International Journal of Transport Economics.* 19(3): 307-327.
- 17) T. Keeler 1974. "Railroad costs, returns to scale, and excess capacity." *The Review of Economics and Statistics*. 56(2): 201-208.
- 18) D. Graham, A. Fidalgo do Couto, W. Adeney, & S. Glaister 2003. "Economies of scale and density in urban rail transport: effects on productivity." *Transportation Research Part E: Logistics and Transportation Review*. 39(6): 443- 458.
- 19) R. Pozdena & L. Merewitz 1978. "Estimating cost functions for rail rapid transit properties." *Transportation Research*. 12(2): 73-78.

## The following studies made no findings about economies of density, but did find economies of scale:

- 20) M. Ivaldi & G. McCullough 2007. "Railroad pricing and revenue-to-cost margins in the post-Staggers era." *Research in Transportation Economics*. 20: 153-178.
- 21) P. Gagnepain & M. Ivaldi 2002. "Incentive regulator policies: the case of public transit systems in France." *The RAND Journal of Economics.* 33(4): 605-629.

# The following studies made no findings about economies of density, and found constant returns to scale:

- 22) D. Caves, L. Christensen, & J. Swanson 1981. "Productivity growth, scale economies, and capacity utilization in US railroads, 1955-74." *American Economic Review*. 71(5): 994-1002.
- 23) P. Sanchez & J. Villaroyya 2000. "Efficiency, technical change and productivity in the European rail sector: a stochastic frontier approach." *International Journal of Transport Economics*. 27(1): 55-76.

These studies overall analysed hundreds of rail networks across the world, including in: Mexico, Russia, Japan, Turkey, Germany, Taiwan, Malaysia, Thailand, India, the UAE, Great Britain, Denmark, the USA, Canada, France, Australia, Hong Kong SAR, Austria, Belgium, Bulgaria, Czechia, Switzerland, Germany, Spain, Finland, Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, the Netherlands, Norway, Poland, Portugal, Sweden, Slovakia, Turkey, Mexico, Argentina, Brazil, Colombia, Chile, China, & South Korea.

## Studies finding diseconomies of density.

1) N. Coulombel & G. Monchambert 2023. "Diseconomies of scale and subsidies in urban public transportation." *Journal of Public Economics*. 223.

Despite a detailed search, only one piece of research was identified that suggested evidence of diseconomies of density. This very recent study also stated that it was the first research they were aware of that had found diseconomies of density in urban rail.

However, this study focused specifically on one constituent line (Piccadilly) of an integrated network (London Underground), and the study concluded that "our results suggest to enforce fare differentiation in order to shift demand away from the busiest lines toward less crowded time periods/-transit lines. By doing so, diseconomies of [density] on the congested lines would be partly if not fully compensated for by greater economies of [density] on the less busy lines/time periods due to the increase in demand." As such, this study found that diseconomies of density are partially created by fare subsidisation policies, and that these policies could be altered to allow the network to operate more efficiently and take advantage of economies of density.

Overall, no studies found that diseconomies of density existed apart from where fare subsidisation polices were driving them.

## Further literature on economies of density in urban transport

- 1) M. Batarce & P. Galilea 2018. "Cost and fare estimation for the bus transit system of Santiago." *Transportation Policy* 64: 92-101.
- 2) M. Karlaftis & P. McCarthy 2002. "Cost structures of public transit systems: a panel data analysis." *Transportation Research Part E: Logistics and Transportation Review.* 38(1): 1-18.
- 3) M. Karlaftis, P. McCarthy, & K. Sinha 1999. "System size and cost structure of transit industry." *Journal of Transportation Engineering*. 125(3): 208-215.
- 4) P. Viton 1981. "A translog cost function for urban bus transit." *Journal of Independent Economics*. 287-304.

## Literature discussing economies of scale in urban transport capital

- 1) T. Keeler 1974. "Railroad costs, returns to scale, and excess capacity." *The Review of Economics and Statistics*. 56(2): 201-208.
- 2) R. Pozdena & L. Merewitz 1978. "Estimating cost functions for rail rapid transit properties." *Transportation Research*. 12(2): 73-78.
- 3) T. Keeler 1983. *Railroads, Freight, and Public Policy*. Washington, D.C.: The Brookings Institution;
- 4) M. Ivaldi & G. McCullough 2007. "Railroad pricing and revenue-to-cost margins in the post-Staggers era." *Research in Transportation Economics*. 20: 153-178.
- 5) J. Bitzan & F. Karanki 2022. "Cots, density economics, and differential pricing in the US railroad industry." *Transport Policy*. 119: 67-77.
- 6) J. Bitzan & T. Keeler 2007. "Economies of density and regulatory change in the U.S. Railroad freight industry." *Journal of Law and Economics*. 50: 156-179.
- 7) G. Weisbrod & A. Reno 2009. *Economic Impact of Public Transportation Investment*. Washington. D.C.: American Public Transportation Association.
- 8) F. Friedlaender, E. Berndt, J. Shaw-Er Wang Chiang, M. Showalter, & C. Vellturo 1993. "Rail costs and capital adjustments in a quasi-regulated environment." *Journal of Transport Economics and Policy*. 27(2): 131-152.
- 9) P. Gagnepain & M. Ivaldi 2002. "Incentive regulator policies: the case of public transit systems in France." *The RAND Journal of Economics*. 33(4): 605-629.

- 10) M. Farsi, A. Fetz, & M. Filippini 2007. "Economies of Scale and Scope in Local Public Transportation." *Journal of Transport Economics and Policy*. 41(3): 345-360.
- 11) C. Growitsh & H. Wetzel 2009. "Testing for economies of scope in European railways." *Journal of Transport Economics and Policy*. 43(1): 1-24.
- 12) P. Cantos, J. Pastor, & L. Serrano 2002. "Cost and revenue inefficiencies in European railways." *International Journal of Transport Economics*. 29(3): 279-308.
- 13) I. Savage 1997. "Scale economies in United States rail transit systems." *Transportation Research Part A: Policy and Practice.* 31(6): 459-473.
- 14) J. Bitzan 2003 "Railroad costs and competition: The implications of introducing competition to railroad networks." *Journal of Transport Economics Policy*. 37(2): 201-225.
- 15) D. Hensher, R. Daniels, & I. Demellow 1995. "A comparative assessment of the productivity of Australia's public rail systems 1971/72-1991-92." *Journal of Productivity Analysis*. 6(3): 201-223.
- 16) A. Gschwender, S. Jara-Diaz, & C. Bravo 2016. "Feeder-trunk or direct lines? Economies of density, transfer costs and transit structure in an urban context." *Transport Research Part A: Policy and Practice.* 88: 209-222.
- 17) K. Gkiotsalitis 2022. "Coordinating feeder and collector public transit lines for efficient MaaS services." *EURO Journal on Transportation and Logistics*. 11: 100057.
- 18) R. Del Mistro & E. Bruun 2015. "Appropriate operating environments for Feeder-Trunk-Distributor or Direct road based public transport services in cities of developing countries." *Cooperation for Urban Mobility in the Developing World XVI Conference*. 2-5 February, Istanbul.
- 19) P. Evers 1994. "The occurrence of statistical economies of scale in intermodal transportation." *Transportation Journal*. 33(4). 51-63.

This volume of literature includes analysis of investment in ways and structure (tracks, stations, trainyards, signals) as well as rollingstock and suggests that both contribute economies of scale.

Countries analysed included the USA, Australia, France, Switzerland, Belgium, Bulgaria, Estonia, Germany, Latvia, Lithuania, Luxembourg, Romania, Greece, Ireland, Spain, Slovakia, Czechia, Austria, Poland, Sweden, Finland, Norway, Denmark, Portugal, Sweden, the UK, & Hungary.

# Literature discussing Sydney's public transit network

- 1) Imperial College London Transport Strategy Centre 2020. Sydney Trains Update 2020: Comparison with International Benchmarking Groups.
- 2) A. Gschwender, S. Jara-Diaz, & C. Bravo 2016. "Feeder-trunk or direct lines? Economies of density, transfer costs and transit structure in an urban context." *Transport Research Part A: Policy and Practice.* 88: 209-222.
- 3) C. Tsai, C. Mulley, & R. Merkert 2015. "Measuring the cost efficiency of urban rail systems." *Journal of Transport Economics and Policy*. 49(1): 17-34.
- 4) M. Zhang 2009. "Bus versus rail: Meta-analysis of cost characteristics, carrying capacities, and land use impacts." *Journal of the Transportation Research Board*. 2110: 87-95.

The above academic specifically relates to Sydney's public transit system and the efficiency of the type of network strategies Sydney uses. This literature found multiple examples where public transport in Sydney was not delivering services at an optimal level based on need or demand. Overall, this literature consistently found that Sydney was providing more services relative to need compared to other international and Australian transit networks. Government publications and reports also made similar conclusions. These sources were also used in developing Queensland's argument, including:

1) Infrastructure Australia 2018. Outer Urban Public Transport – Improving accessibility in lowerdensity areas.

- 2) The Independent Price and Regulatory Tribunal of NSW 2015. *Efficiency of NSW public transport services*.
- 3) Bureau of Infrastructure and Transport Research Economics 2022. "Australian Infrastructure and Transport Statistics: Yearbook 2022."
- 4) Portfolio Committee No. 6 Transport and Customer Service 2020. *Report No. 11: Sydenham-Bankstown line conversion*. Legislative Council of NSW: Sydney.

## Literature discussing differences in geographic factors between Australian cities

- 1) Y. Hsu, S. Hawken, S. Sepasgozar, & Z. Lin 2022. "Beyond the backyard: GIS analysis of public green space accessibility in Australian metropolitan areas." *Sustainability*. 14(8): 4694.
- 2) L. Plant, A. Rambaldi, & N. Sipe 2017. "Evaluating Revealed Preferences for Street Tree Cover Targets: A Business Case for Collaborative Investment in Leafier Streetscapes in Brisbane, Australia." *Ecological Economics*. 134: 238-249.
- 3) M. Bewley 2021. "Australia's greenest cities and suburbs via Nearmap AI." Available at https://www.nearmap.com/au/en/aerial-view-blog/greenest-cities-and-suburbs-inaustralia?utm\_source=google&utm\_medium=organic.
- 4) Rachel Carson Centre for Environment and Society 2019. Virtual Exhibitions 2019, Number 3: Drought, Mud, Filth, and Flood: Water Crises in Australian Cities, 1880s–2010s.

The above literature discusses the differences in urban green space, tree coverage, and the amount of land left uninhabitable because of flooding or other natural disaster risk. This literature all concludes that Brisbane has a higher proportion of non-residential land within the SUA compared to Sydney. Government sources that also relate to this topic include:

- 1) Australian Government, Queensland Government, & South East Queensland Council of Mayors 2023. *South East Queensland City Deal: Implementation Plan.*
- Brisbane City Council 2021. "Brisbane's urban forest." Available at https://www.brisbane.qld.gov.au/clean-and-green/natural-environment-and-water/plantstrees-and-gardens/brisbanes-trees/brisbanes-urbanforest#:~:text=Brisbane%27s%20tree%20canopy%20cover%20is,is%20growing%20in%20public% 20parks.
- 3) Greater Sydney Commission 2018. "Greater Sydney region plan: a metropolis of three cities connecting people." Greater Sydney Commission: Sydney.
- 4) Department of Environment, Land, Water, and Planning 2018. "Vegetation and heat datasets for Metropolitan Melbourne." Victorian Government: Melbourne.
- 5) Environmental Protection Agency 2023. *NSW State of the Environment.* NSW Government: Sydney.

## Literature discussing the impacts of COVID-19 on public transport patronage

- D. Hensher, E. Wei, & M. Beck 2023. "The impact of COVID-19 and contem home on the workspace retained at the main location office space and the future use of satellite offices." *Transport Policy*. 130: 184-195.
- 2) D. Hensher & M. Beck 2023. "Exploring how worthwhile the things that you do in life are during COVID-19 and links to well-being and working from home." *Transportation Research Part A: Policy and Practice.* 168: 103579.
- 3) D. Hensher, M. Beck, & C. Balbontin 2023b. "Working from home 22 months on from the beginning of COVID-19: What have we learned for the future provision of transport services?" *Research in Transportation Economics.* 98: 101271.

This academic literature focused on the changes to work and commuting habits influenced by the COVID-19 Pandemic. Overall, these papers concluded that the Pandemic produced a permanent increase in work from home, as well as increases in concession card holder shares on public transport, and increases in the use of driving and active transport to get to work. These changes were particularly marked in Sydney. An additional government source was used to allow for accurate comparisons between Sydney and Brisbane:

1) Department of Infrastructure, Transport, Regional Development, Communications, and the Arts 2022. *South East Queensland: Population, Housing, Jobs, Connectivity and Livebility.* Canberra: Australian Government.

## Literature discussing fare policy, concession holder need and levels of servicing

- 2) Y. Liu & P. Charles 2013. "Spreading peak demand for urban rail transit through differential fare policy: a review of empirical evidence." *Australian Transport Research Forum.*
- 3) D. Horcher & A. Tirachini 2021. "A review of public transport economics." *Economics of Transportation*. 25: 100196.
- 4) A. Gschwender, S. Jara-Diaz, & C. Bravo 2016. "Feeder-trunk or direct lines? Economies of density, transfer costs and transit structure in an urban context." *Transport Research Part A: Policy and Practice.* 88: 209-222,
- 5) K. Gkiotsalitis 2022. "Coordinating feeder and collector public transit lines for efficient MaaS services." *EURO Journal on Transportation and Logistics*. 11: 100057.
- 6) Canadian Urban Transit Association 2023. *Re-Attracting Customers Through Fare Policy*. CUTA: Ottawa.
- 7) N. Coulombel & G. Monchambert 2023. "Diseconomies of scale and subsidies in urban public transportation." *Journal of Public Economics*. 223.

The above academic literature discusses fare policy and levels of servicing in relation to optimising the level of servicing and efficiency of a network. In general, this literature found that policy can substantially contribute towards a network operating with high levels of cost recovery in the presence of economies of density. Additional government sources used include:

- 1) Metro Tasmania 2022. Metro Tasmania Annual Report. Tasmanian Government: Hobart.
- 2) Department for Infrastructure and Transport 2022. *Annual Report*. South Australian Government: Adelaide.
- 3) Transport for NSW 2023. Household Travel Survey. NSW Government: Sydney.
- 4) Department of Transport and Main Roads 2017. *How Queensland Travels report*. Queensland Government: Brisbane.
- 5) Department of Main Roads and Transport 2020. *Queensland Household Travel Survey*. Queensland Government: Brisbane.
- 6) The Independent Pricing and Regulatory Tribunal of NSW 2020. *Final Report: Maximum opal fares 2020-2024.* NSW Government: Sydney.
- 7) TransLink 2018. *TransLink Tracker*. Department of Transport and Main Roads: Brisbane.