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An investigation of regional public transport spend in Australia

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1 Introduction

Public transport plays a vital role in delivering both social and environmental benefits across urban and rural areas. In cities, it alleviates congestion and enhances economic productivity, while in rural regions, it serves as a critical support for individuals lacking alternative transport options (Nelson and Caulfield, 2022). Despite its significance, rural public transport is often constrained by challenges such as low population density and limited funding. Addressing mobility equity, particularly in rural areas, remains a pressing concern. While equality ensures an identical distribution of benefits, equity emphasises a fairer allocation based on need (Brick, 2015). Public transport subsidies aim to enhance social equity, especially for vulnerable groups such as the elderly and low-income individuals. However, balancing equity in low-density regions while simultaneously increasing patronage presents significant challenges (Mulley and Nelson, 2021).

Several studies recommend integrating flexible transport systems and improving connections to rail services to enhance regional mobility (Meng et al., 2017, Velaga et al., 2013). Despite these recommendations, there is a significant gap in research comparing regional and metropolitan transport operational expenditures in Australia. Addressing this gap is crucial for understanding the implications of sustainable transport modes and ensuring equitable access for all residents, especially in rural areas (Stanley and Stanley, 2021). This paper investigates how Australian states and territories allocate public transport expenditure and its impact on patronage in metropolitan versus regional areas. It focuses particularly on bus services due to their flexibility and dominance as the primary mode of public transport in regional areas. The findings suggest best practices for future spending strategies to ensure equitable public transport provision in rural and regional environments.

2 Methodology

Preliminary desk-top studies for this research primarily utilised publicly accessible online resources, focusing exclusively on public transport operational expenditure incurred by the state. Hence, for the purpose of this analysis, public transport spend is defined as the total expenditure incurred by a particular jurisdiction in operating and managing the delivery of public transport. It includes both state and local subsidies, operator contract payments and other administration expenses incurred to govern the public transport system. It is important to note that this figure excludes the expenditure allocated for planning, designing and constructing the required infrastructure.

The categorisation from the Australian Bureau of Statistics (ABS, 2021), which updated the Australian Statistical Geography Standard (ASGS) Remoteness Structure, classifies Australia into five remoteness categories. For analysis, major cities and inner regional areas are classified as metro, while outer regional, remote, and very remote areas are categorised as regional. However, deviations among the states in defining urban and rural areas necessitated prioritising the advice of state authorities to derive an assessment of public transport spending.

The analysis was based on publicly available data for the 2019-20 fiscal year. Information gaps were identified through meetings with key staff from state bus associations and government agencies. Participants were selected using purposive and snowball sampling techniques, with initial contact via email followed by interviews for clarifications. Follow-up meetings were conducted to validate figures related to metro-regional classifications, budget allocations, and expenditures. The completed data was shared with stakeholders for further validation. Subsequently, the spend per head figures were calculated for state, metro and regional areas (excluding the Australian Capital Territory which is too urban and too geographically small to constitute a regional area). School transport expenditure was also considered in arriving at the latter figures. Subsequently, these were further segregated into public transport modes available in each state (i.e. bus – with and without school bus expenditure, rail, ferry etc.). These metrics were used to compare the differences among the states mainly focusing on the regional rail/bus transport spend in relation to patronage and population density. Due to the limited dataset, statistical testing was not feasible; instead, visual representations such as charts and graphs were employed to highlight trends and differences among states. The findings reflect the availability of supporting documentation and insights from interviews with relevant decision-makers regarding definitions and allocation of public transport resources.

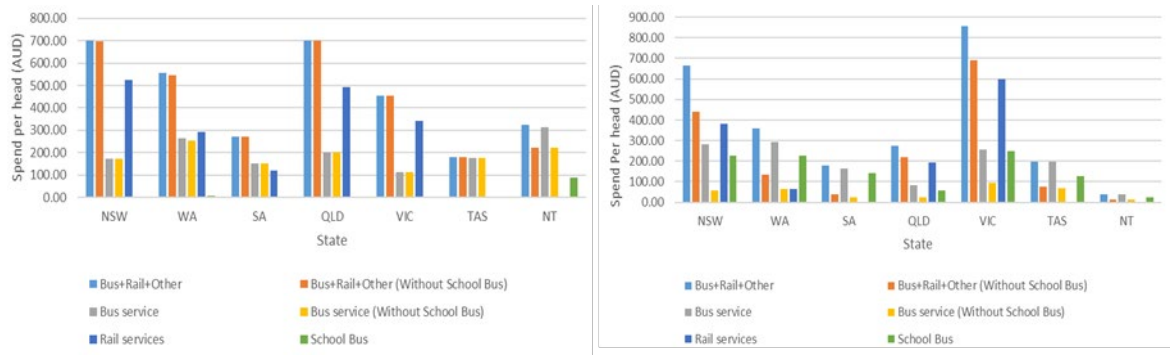
3 Main Findings

Gaining an overview of the demographics and public transport context in each Australian state is crucial for understanding the significance of the findings. Table 1 presents a summary of key demographics for each state, while Figure 1 illustrates the spend per head in metro and regional areas in each state. In metropolitan areas (refer to Figure 1), NSW and QLD have the highest public transport expenditure, around $700 per head, largely due to substantial investments in both bus and rail services. NSW and QLD spend $525 and $491 per head on rail, respectively, while the NT leads in bus expenditure at $312 per head, followed by WA at $264. States like TAS and NT, which do not use rail for passenger transport, have notably lower total transport spend per head. Additionally, most states do not dedicate specific funding for school transport in metropolitan areas due to the extensive availability of public transport services. Regarding regional areas, VIC leads with the highest public transport spend per head at $856, driven by a robust regional rail network accounting for $599 of this figure. NSW follows with $664, while SA and NT have the lowest spend at $181 and $37, respectively. NT, TAS, and regional SA lack passenger rail services, leading to lower overall expenditure. However, regional bus spending remains significant, particularly in WA ($293) and NSW ($281), driven by the need to connect communities across vast areas. Importantly, a large portion of this expenditure is allocated to school transport services. Without school transport costs, VIC still spends the most on regional bus services ($93), highlighting the strength of its public transport network, which likely contributes to higher patronage levels.

Table 1. Demographic details of each state, 2019-20

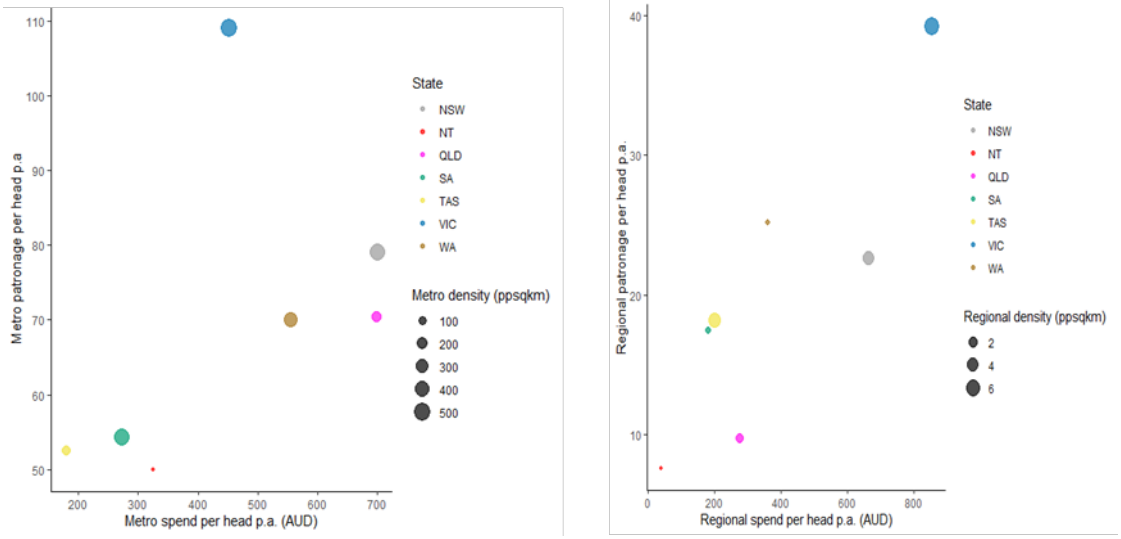
Demographic	NSW	WA	SA	QLD	VIC	TAS	NT
Population (millions)							
State	8.2	2.7	1.8	5.2	6.7	0.5	0.2
Metro	6.3	2.1	1.4	2.6	5.2	0.2	0.1
Regional	1.8	0.5	0.4	2.6	1.5	0.3	0.1
Population Density (Persons per sqkm)							
State	10.2	1.0	1.8	2.8	29.4	7.9	0.2
Regional	3.6	0.2	0.4	1.5	7.1	4.6	0.1
Coverage (sqkm)	801,150	2,646,000	983,482	1,850,000	227,444	68,401	1,420,000

Figure 1. Comparison of spend per head in metro (right) and regional (left) areas



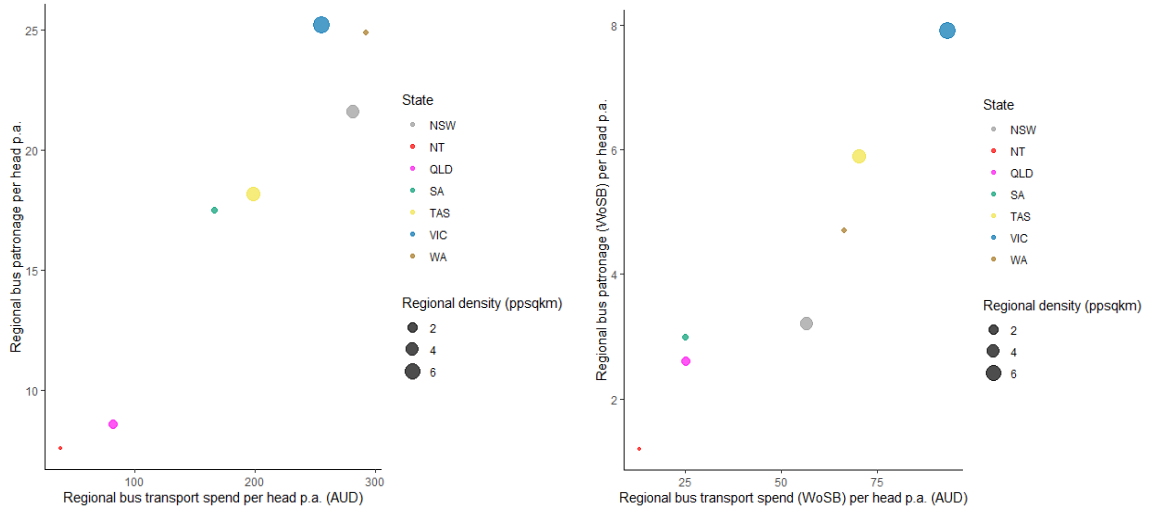
The relationship between public transport spending and patronage is further explored in Figure 2. VIC emerged as an outlier, achieving the highest patronage despite being fourth in terms of metro spending, likely due to its well-developed and reliable public transport network. In contrast, NT has the lowest patronage, despite ranking fifth in metro spending per head, potentially due to low population density and less integrated transport services. Regional areas show a clearer link between spending and patronage, with VIC again leading due to its comprehensive rail and bus networks. WA records the third-highest spend, resulting in relatively high patronage, despite being the second-lowest in population density. However, QLD and NSW, despite their high regional spending and density, show comparatively lower patronage, suggesting further investigation is needed.

Figure 2. Public transport spend with patronage and density in metro and regional areas



Similar insights can be observed in Figure 3 (left-hand side graph), which illustrates the regional bus transport spend per head (with school transport). WA has the highest spend, which has resulted in the second-highest patronage, despite being the second-lowest in population density. The increase in patronage appears to be exponential after a particular point (in WA, VIC, and WA). This may be due to the perception of reliability that the certainty of the public transport system instils in the public after achieving a certain benchmark, leading to greater reliance on the existing public transport system and increased patronage. The improved connectivity provided by the robust rail and bus transport networks is partly due to the spending allocated towards operationalising these networks. This aligns with the findings of network theory, which indicate an increase in patronage (Rye and Wretstrand, 2019).

Figure 3. Bus transport spend with patronage and density in regional areas (with and without school bus (WOSB)

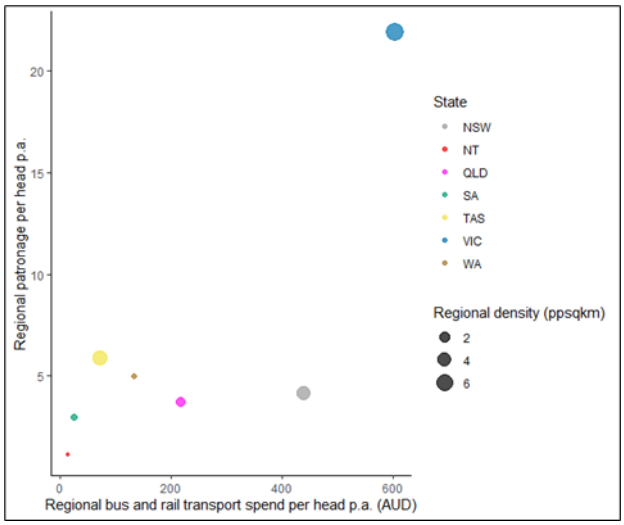


It is important to consider the role that buses play in regional areas, given their importance in connecting communities due to their flexibility (Hansson et al., 2021). In Figure 3 (right-hand side graph), a similar comparison is illustrated by removing the school transport expenditure from the regional bus spend per head figures. This adjustment has moved VIC to the highest position in both spending and patronage. A significant drop can be observed in NSW in both spending and patronage, highlighting the need to focus on the wider public. NT, SA, and QLD are at the bottom.

Figure 4 illustrates aggregate bus and rail expenditure in regional areas, confirming the general trend of increased patronage with higher spend per head. Different states in Australia exhibit varied configurations of rail and bus transport networks, with the NT, TAS, and regional SA relying exclusively on bus services. VIC leads in regional patronage, primarily due to the effective integration of rail and bus systems and well-planned bus services that offer high frequency and extended hours. In contrast, NT and SA have opportunities for increased investment in bus network design, especially given the absence of passenger rail services. This variation in transport configurations is not unique to Australia; countries with extensive rail systems like Japan, China, and Germany show higher public transport patronage due to well-integrated rail and bus services (Yin et al., 2021). Conversely, regions lacking rail infrastructure, such as parts of Africa and Southeast Asia, heavily rely on buses to meet mobility needs, with enhancements in bus design and service frequency shown to improve accessibility (Noussan et al., 2020).

All states in this study operate dedicated school bus networks to cater to students in regional areas, but these services are largely not accessible to the general public. Research in VIC and SA indicates that expanding the use of school buses could enhance rural accessibility (Stanley and Stanley, 2021). This is consistent with global trends, where school bus networks often exist primarily for students. Analysing factors influencing public transport expenditure reveals a stronger correlation between patronage and spending than with population density, suggesting that actual public transport usage is more critical in determining expenditure.

Figure 4. Bus and Rail Transport spend (without school bus) with patronage and density in regional areas



4 Discussion

This study highlights the varying focus on regional public transport expenditure across Australian states, resulting in differing levels of accessibility and patronage. VIC stands out, outperforming other states in both spending and patronage. WA is notable for its high bus transport expenditure, including school bus services, which likely contributes to its increased patronage despite low population density. TAS serves as a good example for regions reliant solely on bus transport, demonstrating a commendable balance between patronage and density. All three “benchmark” states namely, TAS, VIC, and WA, exhibit equitable resource allocation towards both metropolitan and regional areas, unlike states with significant disparities in spending between these areas.

WA's PTA provides comprehensive information through annual reports, aiding in data accessibility and transparency. This centralised management of public transport services has positively influenced spending trends and patronage levels. QLD also has a similar authority, although its responsibilities extend beyond public transport planning and operations. The study indicates a lack of clear segregation between public transport spending for regional and metropolitan areas, suggesting that authorities should develop methodologies for identifying and collecting regional expenditure data. This would help illuminate resource allocation gaps and enhance strategic public transport planning. Further, findings indicate that low patronage in regional areas is linked to low spending per capita, exacerbated by poor public transport connectivity, which favours car-based transport. Expanding access to school buses for the general public in regional areas is one potential avenue that could further enhance mobility in these regions.

Key contributions of this research include the introduction of a basic metric to compare public transport operational expenditure between metropolitan and regional areas within jurisdictions, emphasizing the correlation between spending and patronage, particularly in regional contexts (Abenoza et al., 2017). This metric can complement public transport accessibility indicators such as proposed by Verduzco Torres and McArthur (2024). The findings also suggest that funding allocations should prioritise patronage trends linked to spending rather than relying solely on population metrics, potentially reshaping funding strategies to enhance public transport services effectively.

The study faced challenges in collecting accurate and appropriate data, particularly due to the limited availability of segregated regional and metro public transport expenditure. While WA

provides comprehensive data through its PTA, most other states lack such clear distinctions, requiring the use of assumptions and external sources to estimate certain figures. This limitation highlights the need for a more standardised approach to data reporting across states. Another limitation is the study's exclusive focus on patronage as the primary performance indicator. While it effectively demonstrates the link between spending and increased patronage, it does not account for other critical factors such as user satisfaction, service coverage, or broader impacts on travel behaviour. Future research could incorporate these additional metrics to provide a more comprehensive evaluation of public transport performance.

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