Government of South Australia

Department of Treasury and Finance

2025 METHODOLOGY REVIEW

DRAFT REPORT – TRANSPORT

Submission from the South Australian Department of Treasury and Finance

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Introduction

COVID-19 has impacted the use and provision of public transport services. While public transport usage is increasing, passenger numbers are still below pre-COVID levels and may take a number of years to return. The shift in work, educational and social commuter patterns following COVID could mean that public transport usage patterns have permanently changed. COVID-19 also impacted key data used in the urban transport assessment. These factors have complicated the review of the transport assessment in the 2025 Review.

Noting these difficulties, South Australia appreciates the way that the Commission has approached the review of the transport assessment. Given the circumstances, we believe that the Commission's position in the draft report is balanced and appropriate. The mix of updates to the regression model to address identified issues with density, an increase in blending to account for data reliability issues caused by COVID-19, combined with a commitment to a more detailed review of the assessment once reliable data becomes available, is a sensible way forward.

A summary of South Australia's views on the Commission's draft positions on the transport assessment for the 2025 Review are outlined below. The next section provides further detail on South Australia's views.

Replace the current Statistical Area Level 1 based measure of population-weighted density with a measure based on the square kilometre grid
• South Australia supports updating the measure of density in the regression model. This should be undertaken regardless of any other decisions related to the model. • As outlined in South Australia's submissions on the transport assessment for the 2025 Review and 2024 Update, there are a number of concerns with the use of a population weighted density measure at the SA1 level and whether it appropriately reflects the demand for public transport, the cost of transport provision and decisions made by governments when planning transport services. SA1 geographical areas and changes to SA1 boundaries between censuses have been shown to be inconsistent and highly volatile. • While a switch to a measure of density measured at the SA2 level would be an improvement, a change to a density based on a per square kilometre grid better addresses the identified issues and should provide a more stable measure of density. • The impact of urban density on the cost of and demand for transport provision can be explored further as part of the proposed future review of the assessment.
Use 2022-23 net expense data in the regression model for the 2025 Review and 2022-23 and 2023-24 net expense data from the 2026 Update
• South Australia supports the Commission's position. • South Australia has concerns about using a single year of net expense data in the regression but notes that there are limitations associated with alternative net expense data. Net expense data from prior to 2019-20 does not reflect the current

transport landscape post COVID, and data from 2019-20 to 2021-22 is significantly impacted by temporary COVID impacts. This warrants the use of data from 2022-23 if the regression model is updated. The increased blending ratio helps to address concerns around the use of a more limited range of net expense data in the regression model.

- The impact of using 2023-24 net expense data should be critically analysed before it is introduced in the 2026 Update to make sure it is fit for purpose. Some jurisdictions have introduced time-limited transport changes, for example 50c fares, that may temporarily impact data suitability, especially with limited years net expense data captured in the regression model.

Adjust 2016 Census passenger numbers using Bureau of Infrastructure, Transport and Research Economics data on passenger kilometres

- South Australia supports the proposal.
- Passenger numbers based on 2016 Census data are already 8 years out of date and will be around 12 years out of date before revised 2026 Census data is available for use in the assessment. Given the significant changes in passenger numbers, the model needs to reflect more contemporary passenger usage data.
- While there are limitations with the indexing approach, it appears to be the most appropriate approach when it is combined with an increase in blending to account for data concerns.

Use a regression to model passenger numbers

- South Australia notes the Commission's position but would prefer to retain the existing data ranges approach for modelling passenger numbers, with appropriate indexation applied to the thresholds.

Increase blending ratio by 10 percentage points to 65% urban centre characteristics and 35% urban population (recurrent assessment only)

- South Australia supports an increase in the blending ratio for the recurrent assessment to reflect increased uncertainty associated with the impact of COVID-19 on transport spending, passenger numbers and other data used in the assessment. The appropriate ongoing blending ratio can be considered further as part of the broader review of the model.
- South Australia supports the retention of the current blending ratio in the urban transport investment assessment.

Re-classify pipeline transport to the non-urban transport category

- South Australia supports the Commission's position.

Ferry dummy variable

- South Australia notes the Commission's proposal to continue using the ferry dummy variable in the regression model.

Retain the 2020 Review approach for the assessment of non-urban transport

- South Australia supports the Commission's position to retain the 2020 Review approach, which recognises that non-urban transport services vary based on state populations. The use of actual passengers has a high degree of policy influence making this an unsuitable base for any alternative assessment approach.

Assessment of urban transport investment

- The Commission proposes to continue blending estimates for the urban transport investment assessment based on population-squared with estimates based on the recurrent transport model. South Australia notes the Commission position, and consideration of whether population squared or population is more appropriate for blending in the investment assessment can be deferred for consideration as part of the proposed future review of the transport model.

Seek external advice on the urban transport assessment prior to the next methodology review

- South Australia supports the Commission's proposal to seek external advice on the transport assessment when 2026 Census data is available. This will allow for key assumptions underpinning the regression model to be retested, including whether post COVID-19 other influences such as non-commuter patterns should be reflected in the model.

Volatility

- South Australia has some concerns that ongoing changes to the transport assessment between reviews (updating for new net expense, census data etc) have the potential to introduce a high level of volatility in the distribution of GST revenue, particularly given the overall scale of redistribution from the transport and associated investment assessment. However, given current data limitations and the preference to use the most accurate and up to date information where possible, there may not be any alternatives. The increase in the blending ratio should also help to address potential volatility in the assessment.
- South Australia suggests the impact on volatility in the distribution of GST should be a factor considered when making future updates to the transport assessment between the 2025 and 2030 Reviews.

Further detail

Calculation of population weighted density

Under the 2020 Review methodology, population weighted density (PWD) is calculated at the ABS Statistical Area Level 1 (SA1). As outlined in South Australia's submission to the 2025 Review assessment papers and the 2024 Update New Issues paper, there are significant concerns with measuring PWD at the SA1 level in the transport model. These concerns include:

- Inconsistencies in the treatment of geographical areas.
- Volatility caused by changes to SA1 boundaries between censuses.[1]

These factors mean that measuring PWD at the SA1 level under the 2020 Review methodology may not adequately capture what is intended by the PWD variable within the regression model.[2]

South Australia suggested an alternative approach based on the ABS per square kilometre grid that addressed the identified issues with measuring PWD at the SA1 area level.

Concerns around measuring PWD at the SA1 level in the model were recognised by the Commission. The Draft Report provides a detailed examination of the potential concerns with measuring PWD at the SA1 level and considered two alternative measures based on a per square kilometre grid basis or ABS Statistical Area Level 2 (SA2). These findings are not repeated in this submission.

South Australia agrees with the detailed analysis undertaken by the Commission in the Draft Report and supports its overall findings. That is, both a per square kilometre grid and SA2 based measure of PWD represent a significant improvement over the use of SA1, but measuring PWD on per square kilometre grid basis best addresses the identified issues.

As part of the considerations ahead of any switch to a per square kilometre grid measure of PWD, South Australia has previously noted that issues around boundary intersections between the per square kilometre grid and significant urban areas would need to be considered, particularly for smaller significant urban areas. The Commission's proposed methodology addresses this by allocating residents to each area based on the proportion of land in each urban centre boundary.

South Australia therefore supports the Commission's proposal to calculate PWD using a per square kilometre grid.

South Australia considers that the change to measuring PWD on a per square kilometre grid basis should be undertaken regardless of any other decisions regarding the transport model (net expense, passenger numbers etc).

[1] Refer to South Australia's submission to the 2024 Update New Issues Paper and 2025 Review assessment paper for further detail.

[2] This does not consider broader issues around the appropriateness of PWD as a driver in the transport assessment. This can be considered further as part of the proposed future review of the assessment.

Broader conceptual issues around the impact of density on the demand for and cost of urban public transport can be considered further as part of the proposed review of the assessment when updated Census data becomes available.

Net expense data in the regression model

The regression model for the 2020 Review was based on net expense data over the three years from 2013-14 to 2015-16.

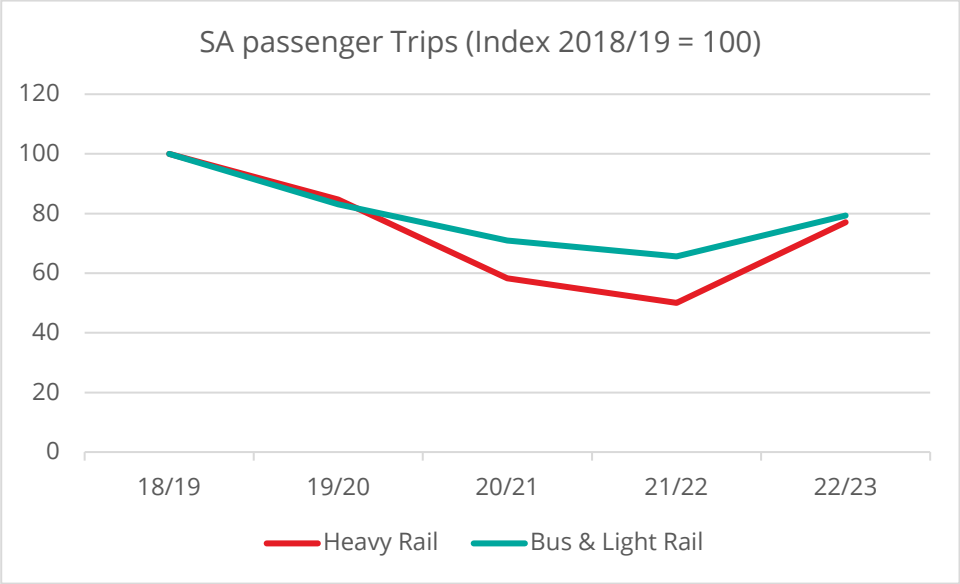
The Commission has proposed using 2022-23 net expense data to update the model for the 2025 Reivew. The model would be updated to include both 2022-23 and 2023-24 net expense data as part of the 2026 Update.

South Australia has previously raised concerns about using a single year net expense data in the regression due to data reliability issues, especially where the post-COVID 'new normal' is still emerging. However, there are significant limitations associated with alternative net expense data options:

- Net expense data prior to 2019-20 does not reflect the urban public transport landscape which has changed since COVID due to shifting work, educational and social commuting patterns.
- Net expense data over the period from 2019-20 to 2021-22 was significantly impacted by temporary COVID-19 impacts that do not reflect future state net expenses.
- Net expense data in the 2020 model, if retained in the 2025 Review, would be up to 17 years old.

The alternative is therefore net expense data from 2022-23 as proposed by the Commission.

As shown below, public transport usage in South Australia is increasing, but remains below levels pre-COVID. For example, boardings across 2022-23 were up 54% for heavy rail and 21% for bus and light rail compared to 2021-22, but still 25% and 21% below pre-COVID levels respectively. While transport boardings are increasing, it is not known when they will return to pre-COVID levels. Given the change in commuting, educational and social patterns, any growth in passenger numbers above pre-COVID levels may be driven by other factors such as increasing population or other transport shifts, rather than a return to a “pre-COVID normal position.”



As part of the response to the 2025 Review transport assessment paper South Australia noted that, given the significant distortions in the public transport usage patterns, any updates to net expenses data should only be contemplated after significant interrogation of the data. In the Addendum to the Draft Report, the Commission notes that:

"Re-estimating the urban transport regression model with 2022-23 net expense data produced coefficients that are consistent with expected drivers of public transport need."

Noting that there are concerns with all net expense data options, **South Australia supports the Commission's proposal to base the regression model on 2022-23 net expense data in the 2025 Review.** The Commission's proposal to increase the blending ratio for urban population shares will address increased data reliability concerns. Using net expenses data from 2022-23 will also better align with the contemporaneity of other data proposed to be used in the model.

Updating the regression model to include both 2022-23 and 2023-24 net expense data from the 2026 Update will address concerns about the model being based on a single year's net expense data. This proposal is therefore supported, but only on the basis that jurisdictions are given the opportunity to critically examine the net expense data and model outputs prior to implementation. Some jurisdictions are introducing a range of temporary public transport policies, for example flat 50c fares for all users, which could result in temporary distortions in net expense data. These temporary impacts could produce significant bias in the results where limited data is used within the regression model.

Adjust 2016 Census passenger numbers using Bureau of Infrastructure, Transport and Research Economics data on passenger kilometres

The Commission is proposing to index 2016 Census passenger data using Bureau of Infrastructure, Transport and Research Economics (BITRE) data when modelling passenger numbers and re-estimating the regression. This would continue in each Update until 2026 Census data becomes available.

2016 Census passenger data is not reflective of current public transport usage levels. Passenger numbers based on 2016 Census data are already 8 years out of date and will be around 12 years out of date before revised 2026 Census data is available for use in the assessment. Given the significant changes in passenger numbers, the model needs to reflect more contemporary passenger usage data.

As 2021 Census data was impacted by lock-downs, an alternative measure is therefore required to update the regression model.

It is recognised that indexing 2016 Census data using BITRE's measure of passenger kilometre by mode has limitations. This includes:

- BITRE data is based on distance travelled, not passenger numbers.
- BITRE data is only available by mode for capital cities. The indexation factors derived from capital cities would need to be applied to all regions within a state and may not pick up regional variations in usage levels, or changes in transport supply between regions.

Internal testing of 2011 Census data indexed by BITRE data against actual 2016 Census results showed variability in the modelled (indexed) result to the actual outcome, with variations between modes and regions. Comparisons of 2016 Census data indexed by BITRE against internal South Australian public transport passenger data also showed variability in the modelled (indexed) result to the actual outcome across years. However, South Australia has not been able to identify any alternative approach that would produce a more accurate result.

While there are concerns about the ability of the BITRE indexing approach to accurately reflect current passenger numbers, it is important that contemporary data is used in the assessment. Concerns around the accuracy of the data can be managed through changes to the blending ratio proposed by the Commission.

On this basis**, South Australia supports the Commission proposal to index 2016 Census passenger data using BITRE data**. Any residual concerns around data reliability could be addressed by further increases to the blending ratio.

Use a regression model to model passenger numbers

South Australia notes the Commission's position, but would prefer to retain the existing data ranges approach for modelling passenger numbers with appropriate indexation to account for growth of urban centres.

Ferry dummy variable

In South Australia's submission on the Tranche 1 Transport consultation paper, we suggested that the Commission could remove the ferry dummy variable from the regression model. This reflected the very large standard errors associated with the variable in the regression model and to address the concerns and issues associated with using a dummy variable.

We appreciate the Commission's efforts in testing this suggested approach and providing the results of the regression model excluding the ferry variable. The results confirm that the inclusion of the ferry variable in the model reduces the overall explanatory power of the model. The standard error for the ferry dummy variable is also almost double its coefficient. This would support its removal from the model. However, we note the Commission considers that the ferry variable should be retained to capture all relevant forms of transport and be consistent with what states do.

On the basis that the ferry variable continues, **South Australia notes the Commission proposal to continue using the ferry dummy variable in the regression model**.

South Australia agrees with the Commission that alternative measures, including ferry passengers as a proportion of public transport users and ferry passengers as a proportion of commuters, raise concerns about the potential for policy influence.

Blending ratio – recurrent assessment

In the 2020 Review, the Commission noted that the decision to blend the urban transport assessment (recurrent) with urban population shares (75% / 25% respectively) was based on concerns about the reliability of net urban transport expense data and the use of proxy variables in the model to capture supply and demand.

Noting the proposed impacts of COVID-19 on data availability for updates to the transport model in the 2025 Review, concerns around the reliability of net expense data and proxy variables have significantly increased. This warrants an increase in the blending ratio.

The size of the increase in the ratio is a judgement call. **South Australia would support a larger increase in the blending ratio for the recurrent assessment on the basis of data reliability concerns as outlined in this submission, with the increase in the blending ratio to 65% regression model and 35% urban population shares being a minimum level**.

The Draft Report states that the Commission considers it is appropriate to return to the 75:25 blending ratio when fit for purpose data becomes available. While South Australia recognises that the proposed change in the calculation of density will improve the modelled outcome (relative to no change), it is appropriate to continue ongoing blending. The issues associated with measuring density at the SA1 level were not known at the time of the 2020 Review when the 75:25 blending ratio was introduced. This implies that this should be the minimum blending amount applied to the assessment after data issues are resolved, despite the change in density calculation. The appropriate ongoing blending level can be considered further as part of the future review of the model.

Re-classification of pipeline transport to the non-urban transport category

South Australia notes the Commission's position to reclassify pipeline and other transport COFOG-A (1171) from the urban to the non-urban transport component.

Non-Urban transport assessment

South Australia agrees with the Commission's acknowledgment that actual passenger numbers are not sufficiently policy neutral to directly include in the assessment.

Actual passenger transport usage levels are significantly impacted by policy choices. This can include things such as fares, concessions and service availability. In the case of rail services, the availability of fit for purpose and cost-effective alternative options are also a factor.

South Australia also agrees with the Commission that the drivers of urban and non-urban spending are significantly different to warrant separate assessments.

South Australia supports the Commission's position to continue with an equal per capita assessment of non-urban transport in the absence of any suitable alternative.

Assessment of urban transport investment

The transport addendum notes the Commission's position to continue blending estimates for the urban transport investment assessment based on urban population-squared with estimates based on the regression model used in the recurrent expenses assessment.

It is proposed that the blending ratio continues to be weighted 25% urban population squared and 75% based on the regression model. This varies to the recurrent expenses assessment, where the blending ratio has been increased. The difference reflects that transport investment decisions are determined over a longer timeframe and are less likely to be impacted by COVID.

South Australia supports the position to retain the current blending ratio in the urban transport investment assessment.

Consideration of whether population squared or population is more appropriate for blending in the investment assessment can be considered as part of future reviews of the transport model.

Volatility

South Australia has concern that ongoing changes to the transport assessment between reviews (updating for new net expense data, census data etc) have the potential to introduce a high level of volatility in the distribution of GST revenue, particularly given the overall scale of redistribution under the transport and associated investment assessment. The increase in the blending ratio should help to address potential volatility in the assessment.

South Australia suggests the impact on volatility in the distribution of GST is considered when making future updates to the transport assessment between the 2025 and 2030 Review.

Review of the transport model

The proposed forward work program between Reviews notes that, given concerns raised by some states, it would be appropriate to seek external advice on the transport assessment prior to the next methodology review.

This would be undertaken after fit for purpose data is available following the 2026 Census to retest the urban centre characteristics regression model.

South Australia appreciates the Commission's analysis in the Draft Report on the impact of including different variables into the model to recognise non-commuter usage such as socio-economic status, concessions and student numbers. We note the findings of the analysis based on 2016 Census data using the 2020 Review model produced some counterintuitive results. Given the ongoing shifts in the public transport usage post-COVID reflecting changing work, education and commuting patterns, it will be important to test the impact of non-commuters in the model when fit for purpose data becomes available. The proposed review will be an appropriate place to consider this further, along with broader conceptual issues regarding the model that have been raised as part of the 2025 Review process.