

Addendum – transport assessment

Context

- 1 On 5 July 2024, the Commission issued a Draft Report chapter on the transport assessment. The Commission considered changes since the 2020 Review and their implications for the assessment method. It proposed 5 changes to the recurrent assessment. For the investment assessment, it proposed one change and flagged the possibility of another, subject to data analysis.
- 2 In the Draft Report, the Commission noted that the draft positions relating to urban transport could change subject to the results of re-estimating the urban transport regression model with 2022–23 and 2023–24 state data. Results could not be presented in the Draft Report as additional time was needed to collect and validate state expense data. Analysis of 2022-23 state expense data has been completed and new coefficients have been produced¹.
- 3 The results of re-estimating the model, including the GST impacts of proposed changes, are outlined in this addendum to the Draft Report. The changes proposed in the Draft Report still stand, with one exception relating to investment. The Commission has also corrected an error from the Draft Report.
- 4 The Draft Report proposed that non-urban transport would continue to use the same method as in the 2020 Review. There has been no change to this position and, as such, it is not discussed in this addendum.

Recurrent transport assessment

- 5 Re-estimating the urban transport regression model with 2022–23 net expense data produced coefficients that are consistent with the expected drivers of public transport need. These drivers, identified in the 2020 Review, include the demand and supply of public transport (proxied by population weighted density and passenger numbers), network complexity, topography and public transport modes. All variables have the same sign as in the 2020 Review regression and most coefficients are of similar magnitude. While several variables remain insignificant (see Table 1), this is not surprising given the small number of data points used.

¹ The Commission proposes to collect 2023-24 net expense data and incorporate into the model in the 2026 Update. This will result in further changes to the coefficients.

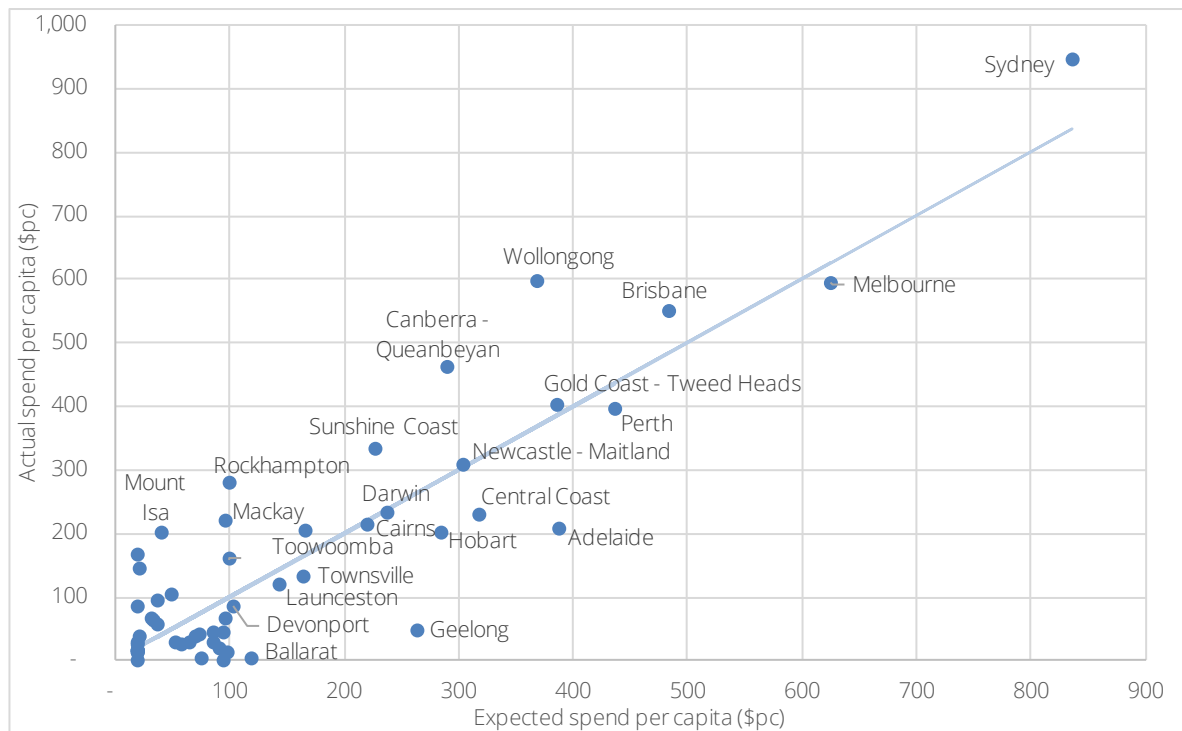
Table 1 Updated regression coefficients

	Coefficient	Standard error	Significance
(Intercept)	-195.61	40.99	< 0.001
Ferry dummy variable	28.38	46.12	
Heavy rail passengers	21.39	10.53	< 0.01
Bus & light rail passengers	30.17	17.50	
Population-weighted density	0.15	0.03	< 0.001
Average slope	13.03	5.81	< 0.05
Median distance to work	0.68	2.05	

Source: Assessment System

- 6 The dots in Figure 1 show the actual spending on urban transport in Significant Urban Areas, relative to the predicted spending using the regression model. The line shows where the actual and predicted spending is the same. Most points are close to the line, indicating that the model does a good job of predicting actual spending. However, there are Significant Urban Areas in some states where predicted expenses are significantly different to reported expenses. This may reflect that:
- some cities may have an above- or below-average standard of service
 - state estimates of spending for individual cities may not be comparable
 - the Commission’s regression may not accurately capture all drivers of state spending.

Figure 1 Actual vs expected expenses per capita, Significant Urban Areas



Note: All Significant Urban Areas with reported state expenditure are used in the regression and are shown in this graph.
Source: Commission calculation

- 7 The ferry variable in the regression identifies all cities with a public intra-urban ferry service. In the 2024 Update, Darwin and Townsville were identified as having such ferries. However, the Darwin-Mandorah, Darwin-Tiwi islands, Townsville-Magnetic Island and Townsville-Palm Island ferries only provide transport to outside the Significant Urban Areas. As such, the Commission proposes that Darwin and Townsville will no longer be classified as having urban transport ferries. This proposed change was identified through analysis since the Draft Report and was not incorporated in the Draft Report.
- 8 The Commission recognises some issues remain regarding the reliability and comparability of state-provided data on expenses in each Significant Urban Area. For example, total reported expenses in 2022-23 are only around 55% of the Government Finance Statistics estimate of urban transport expenses. However, these remain the best available data, and the Commission considers that the proposed assessment captures the differences in state needs for urban transport spending more appropriately than any identified alternative.
- 9 As indicated in the Draft Report, the Commission intends to collect 2023-24 net expenditure data during 2025 for incorporation into the regression for the 2026 Update. This may require the Commission to reconsider which variables are used in the model consistent with the theoretical drivers of transport identified in the [Draft Report](#).
- 10 Based on the Australian Bureau of Statistics (ABS) schedule of data releases for the 2016 and 2021 censuses, the Commission will consider incorporating 2026 Census journey to work data into its model for the 2028 Update. In consultation with states, it intends to update the model with data from states and the ABS. As part of this work, it will consider the precise specification of the model and whether the temporary proposed increase in blending should be removed.
- 11 As noted in the proposed forward work program, given the assessment's complexity and degree of unease amongst some states, the Commission will seek external advice on the transport assessment prior to the next review.

Commission draft position

- 12 The analysis undertaken on the latest state net expense data for 2022-23 supports the proposals in the Draft Report. The Commission has made no changes to its proposals for the recurrent urban transport assessment except for the ferry error correction.
- 13 The proposed changes are:
 - replace the current Statistical Area Level 1 based measure of population-weighted density with a measure based on the square kilometre grid
 - adjust 2016 passenger numbers using Bureau of Infrastructure, Transport and Research Economics data on passenger kilometres
 - use a regression to model passenger numbers

- change blending ratio by 10 percentage points to 65% urban centre characteristic and 35% urban population (recurrent assessment only)
- re-classify pipeline transport to the non-urban transport category

Transport investment

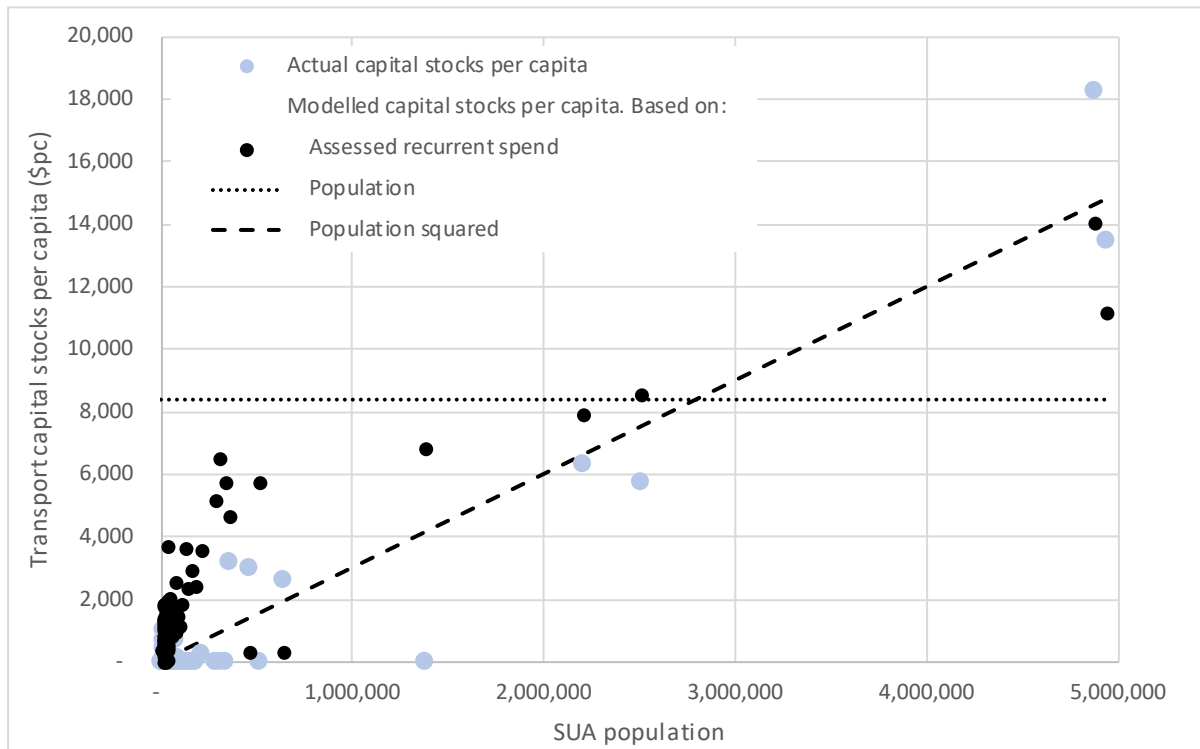
Driver for blending

- 14 In the Draft Report, the Commission proposed to blend urban centre characteristics with urban populations squared if the updated state data supported the relationship.
- 15 The Commission has considered 3 approaches to estimating each state's assessed capital stocks per capita, based on state submissions to the transport assessment consultation paper (Figure 2). It could assume that capital stocks are proportional to recurrent expenses, where recurrent expenses are calculated using the urban transport regression. Alternatively, it could assume that capital stocks are proportional to a city's population, or the square of a city's population.
- 16 There is evidence that capital stocks per capita increase with population size and do so at a faster rate than recurrent transport expenses (Figure 2). This is consistent with larger cities relying more on more capital-intensive forms of public transport. Using population squared better reflects this relationship.

Blending proportions

- 17 In the 2020 Review, the blending proportions in the urban transport recurrent and investment assessments were 25% population-squared and 75% urban centre characteristics. In the Draft Report, the Commission proposed temporarily changing these proportions to 35% and 65% for the recurrent urban transport assessment to reflect uncertainty associated with the effect of COVID-19 on transport spending and passenger number data. It also proposed that this increase would be applied to the urban transport investment assessment.
- 18 COVID-19 has caused changes in the transport task facing states, with a decline in commuters and fare revenue. However, this largely affects recurrent spending. As investment decisions are determined over a longer timeframe, the effects of COVID-19 have not exerted as significant an impact. On balance, the Commission considers it preferable to retain the existing 25% and 75% blending proportions for the urban transport investment assessment.

Figure 2 Options for modelling capital stocks per capita



Source: Commission calculation

Commission draft position

- 19 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, weighting these elements 25% and 75% respectively.

Indicative distribution impacts

Recurrent transport assessment

- 20 The impact on the GST distribution in 2024-25 from the proposed method changes to the recurrent transport assessment is shown in Table 2.

Table 2 Indicative impact on GST distribution (difference from an equal per capita distribution) – recurrent assessment, 2024–25

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total Effect
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
U2024 using R2020 methods	1,280	630	-830	-321	-364	-243	-57	-96	1,910
U2024 using draft R2025 methods	687	422	-538	-48	-192	-201	-43	-88	1,109
Effect of draft method change	-593	-208	292	274	173	42	13	8	801
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
U2024 using R2020 methods	150	90	-148	-109	-193	-418	-118	-373	70
U2024 using draft R2025 methods	80	60	-96	-16	-101	-345	-91	-343	41
Effect of draft method change	-69	-30	52	93	91	72	27	31	29

Note: Based on no change to the wage costs assessment. The effect of these changes is shown in the wage costs chapter. The GST pool and population estimates are equivalent to those used in the 2024 Update. The data included in the table have not been subject to full quality assurance processes and as such, should be treated as indicative only. Indicative GST impacts are provided for illustrative purposes only and should not be used to predict impacts on GST distribution for 2025-26.

Source: Commission calculation

21 There are 5 changes proposed to the recurrent and investment transport assessments. All except the ferry error correction were flagged in the Draft Report. A breakdown of the impact of changes on the GST distribution for recurrent transport is shown in Table 3.

- The population-weighted density variable would change from being calculated on Statistical Area Level 1 geography to being calculated on square kilometre grid. This would reduce the relative differences in density between states. This would result in a reduction in GST in New South Wales, Victoria and the ACT with an increase in GST in the other states.
- A regression model for passenger numbers would be introduced to provide a continuous estimate of the relationship between mode use and an urban areas population.
- The regression was re-estimated based on the new data and proposed methods, producing new coefficients, which would significantly impact the distribution. Within the regression, the importance of the bus and light rail passenger variable increased considerably, while the relative importance of population weighted density fell. New South Wales has a higher share of population-weighted density than assessed bus and light rail passengers, reducing its GST, while Queensland and South Australia have the opposite pattern, thus their GST share would be increased by the new regression. Western Australia has an above average share of assessed bus and light rail passengers and below average share of population weighted density, so both changes would increase its GST share.
- Blending would be increased temporarily from 25% to 35% to account for additional data issues relating to COVID-19, including the continued use of 2016 Census journey to work data as the 2021 Census date were affected by COVID-19 lockdowns.
- An error in the list of cities with intra-urban ferries has been corrected.

Table 3 Indicative impact on GST distribution of proposed method and data changes (disaggregated) - recurrent assessment, 2024-25

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Ferry error correction	1	1	-2	1	0	1	0	-2	5
Square km density (a)	-242	-168	119	166	114	14	-7	3	416
Continuous passenger numbers	1	11	-4	10	-13	-2	-2	-1	21
Revised regression (a)	-258	-2	117	74	52	11	6	0	260
Increase blending	-96	-50	63	23	19	16	16	8	145
Total change	-593	-208	292	274	173	42	13	8	801
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Ferry error correction	0	0	0	0	0	2	0	-9	0
Square km density (a)	-28	-24	21	56	61	25	-15	12	15
Continuous passenger numbers	0	2	-1	3	-7	-3	-4	-3	1
Revised regression (a)	-30	0	21	25	27	20	12	-1	10
Increase blending	-11	-7	11	8	10	28	34	30	5
Total change	-69	-30	52	93	91	72	27	31	29

(a) The change to using a square km measure of density has 2 separate effects. Firstly, states' shares of the new measure differ from their shares of the SA1 based measure. The GST effect of this is shown in the square km density line. The second effect is that the regression coefficients will change. This effect is captured within the revised regression line.

Note: States had no spending on pipeline transport in the years of the 2024 Update. Therefore, this change had no impact on the GST distribution.

Based on no change to the wage costs assessment. The effect of these changes is shown in the wage costs chapters. The GST pool and population estimates are equivalent to those used in the 2024 Update

The data included in the table have not been subject to full quality assurance processes and as such, should be treated as indicative only.

Indicative GST impacts are provided for illustrative purposes only and should not be used to predict impacts on GST distribution for 2025-26.

Source: Commission calculation

Transport investment assessment

22 The Impact on the GST distribution of changes to the urban transport investment assessment are shown in Table 4.

Table 4 Indicative impact on GST distribution (difference from an equal per capita distribution) – investment assessment, 2024-25

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total Effect
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
U2024 using R2020 methods	1,322	723	-733	-287	-510	-304	-78	-132	2,044
U2024 using draft R2025 methods	978	707	-777	-1	-360	-287	-126	-134	1,685
Effect of draft method change	-344	-16	-44	286	151	17	-48	-1	454
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
U2024 using R2020 methods	155	103	-131	-97	-270	-523	-162	-516	75
U2024 using draft R2025 methods	115	100	-139	0	-190	-495	-263	-520	62
Effect of draft method change	-40	-2	-8	97	80	28	-101	-4	17

Note: Based on no change to the wage costs assessment. The effect of these changes is shown in the wage costs chapter.

The GST pool and population estimates are equivalent to those used in the 2024 Update.

The data included in the table have not been subject to full quality assurance processes and as such, should be treated as indicative only.

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Source: Commission calculation

- 23 States build infrastructure to improve the quality of their stocks per capita (capital deepening). The driver of capital deepening is the size of the user population, which is defined similarly to recurrent spending needs. This means that states with increased recurrent needs from the method change also have similarly increased investment needs for capital deepening. For example, the shares of population-weighted density decreased in New South Wales, Victoria and the ACT, reducing GST needs, and increased in Queensland, Western Australia, South Australia, Tasmania and the Northern Territory, resulting in increased GST needs.
- 24 States also build infrastructure for growing (and increasingly dense) cities. This driver is the growth in the user population. For example, the shares of growth in population weighted density increased in New South Wales, Victoria, Western Australia and South Australia relative to the other states, resulting in an increased share of GST needs.
- 25 For most states the total impact was driven more by the impact of changes to the measure of population-weighted density (capital deepening). For others, particularly Queensland and the ACT, the impact is driven by a relative change in the growth rates of population-weighted density (growth in user populations).
- 26 The Commission does not propose to change the blending proportions for the investment assessment (although it had been proposed in the Draft Report). The investment blending proportions will not change from the 2020 Review method.

Table 5 Indicative impact on GST distribution of the proposed method and data changes (disaggregated) - investment assessment, 2024-25

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total Effect
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Capital deepening	-463	-141	211	227	146	25	-4	0	608
Growth in user population	127	125	-257	49	6	-8	-42	-1	308
Cost of construction	-8	0	2	10	-1	0	-3	0	12
Total	-344	-16	-44	286	151	17	-48	-1	454
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
Capital deepening	-54	-20	38	77	77	42	-7	-1	22
Growth in user population	15	18	-46	17	3	-14	-87	-3	11
Cost of construction	-1	0	0	3	0	0	-7	0	0
Total	-40	-2	-8	97	80	28	-101	-4	17

Source: Commission calculation

Note: Based on no change to the wage costs assessment. The effect of these changes is shown in the wage costs chapters.

The GST pool and population estimates are equivalent to those used in the 2024 Update

The data included in the table have not been subject to full quality assurance processes and as such, should be treated as indicative only.

Indicative GST impacts are provided for illustrative purposes only and should not be used to predict impacts on GST distribution for 2025-26.