



# **COMMONWEALTH GRANTS COMMISSION**

**DISCUSSION PAPER CGC 2002/27**

**URBAN TRANSIT**

**A PROPOSED APPROACH FOR THE 2004 REVIEW**

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## Table of Contents

INTRODUCTION .....	1
BACKGROUND .....	1
<i>The Current Assessment</i> .....	1
<i>Concerns with the 1999 Review Assessment</i> .....	2
<i>Changes in the Way States are Providing Services</i> .....	3
<i>What Has Been Done since the 1999 Review</i> .....	4
PROPOSED APPROACH .....	6
<i>Assessment Approach</i> .....	8
CONCESSIONAL SUBSIDIES .....	9
<i>Concession Passenger Groups</i> .....	10
<i>Use Propensities</i> .....	11
<i>Concession Rate</i> .....	12
<i>Factor Calculation</i> .....	12
NON-CONCESSIONAL SUBSIDIES .....	14
<i>Pricing Subsidy Factor</i> .....	15
<i>Capital Subsidy Calculation</i> .....	19
NATIONAL CAPITAL INFLUENCES .....	23
COMPONENT WEIGHTS .....	23
WHAT THE ASSESSMENT MIGHT LOOK LIKE .....	24
ALTERNATIVE APPROACHES .....	26
<i>Modified Actual Per Capita (APC) Approach</i> .....	26
<i>Broad Indicators Assessment</i> .....	27
REALITY CHECKING .....	28
CONCLUSIONS .....	29
ATTACHMENTS	
A - 1999 REVIEW ASSESSMENT METHOD .....	31
<i>Assessment Method</i> .....	31
B - STATE SUBMISSIONS .....	34
<i>New South Wales</i> .....	34
<i>Victoria</i> .....	35
<i>Queensland</i> .....	36
<i>Western Australia</i> .....	36
<i>South Australia</i> .....	38
<i>Tasmania</i> .....	38
<i>Australian Capital Territory</i> .....	38
<i>Northern Territory</i> .....	39
C - MAPS OF UCLS INCLUDED IN URBAN TRANSIT CATEGORY .....	40
D - DATA ADJUSTMENTS .....	50
E - BROAD INDICATORS ASSESSMENT – REGRESSION ANALYSIS .....	52

## **INTRODUCTION**

1. This paper presents the Commission's proposed urban transit assessment for the 2004 Review. It confirms the preliminary decision that the Urban Transit category should be assessed on the basis of net subsidy payments from the general government sector to service providers. This will make the urban transit assessment consistent with the approach in the other categories that assess needs for subsidies to service providers (the 1999 Review Concessions and Other Payments categories).

2. The Commission acknowledges that the working party process involving Commission staff and State Treasury officers has helped the development of the proposed assessment.

3. A full factor assessment has been developed, which takes into account States' comments provided as part of the working party process. For the purpose of this paper, some calculations use 1999 Review data. The paper also discusses two alternative approaches to the assessment and undertakes some reality checks.

## **BACKGROUND**

4. Urban Transit was excluded from the Concessions and Other Payment group in the 1999 Review because, while Urban Transit services were subject to micro-economic reform, they were not subject to the NCP and State governments tended to be the main service providers.

### ***The Current Assessment***

5. In the 1999 Review, the Commission undertook separate assessments of Urban Transit gross expenditure and revenue. As best it could, it looked at the total operations of urban transit bodies. The category included transactions relating to the provision of urban transit services for capital cities and urban centres of 50 000 people or more. The transactions included:

- (i) the operating expenditure of most urban transit bodies, excluding depreciation, debt charges and superannuation;
- (ii) the subsidies paid to some urban transit authorities, such as the Brisbane City Council and private operators in Melbourne and Sydney; and
- (iii) fares and other revenue.

The Urban Transit category covered about 40 per cent of the total cost to the States of urban transit services. Other expenditures were in the Depreciation, Debt Charges and Superannuation categories.

6. Standardised expenditure and revenue were assessed separately and the result presented as a net figure. A standardised level of service for each State was calculated. This took into account the characteristics of the urban population and urban form of cities in each State. Standardised expenditures were calculated by multiplying the standardised level of service by standardised costs. Standardised revenues were calculated by applying an Australian average revenue effort to the standardised level of service.

7. The model used to derive the standardised level of service assumed that demand for urban transit services depended on characteristics of the city to be served — population density, size of city, urban form and the level of car ownership. It was measured in terms of standardised passenger kilometres. Standardised cost depended on economies of scale, congestion, wage levels, fuel and power prices, and vandalism and security requirements. Attachment A provides a summary of the assessment method and an analysis of the effects of the Urban Transit assessments on State grants.

### ***Concerns with the 1999 Review Assessment***

8. States were critical of the 1999 Review assessment because they considered:
- (i) the data to be inadequate;
  - (ii) the approach too complex; and
  - (iii) the model to be wrongly specified.

States also criticised the Commission for developing the assessment very late in the 1999 Review process. They did not think they were given enough time to provide comment on the method.

9. We are therefore aiming to develop an assessment for the 2004 Review that:
- (i) is strongly based on the way States are providing services;
  - (ii) is supported by adequate data; and
  - (iii) is easy to understand.

10. This is a considerable challenge as the way States provide urban transit services and the way they fund them are extremely complex. Data available to measure differential needs are less readily available than in the past for reasons of commercial-in-confidence. In any case, even if the data were available, the amount of data needed to measure needs fully would mean that assessment would not be simple. We have therefore developed a conceptual framework for the assessment based on a number of simplifying assumptions and approximations.

## *Changes in the Way States are Providing Services*

11. The level of private provision of urban transit services has grown substantially since the 1999 Review. There has been increased privatisation and corporatisation of service providers and State PTEs have an increased commercial focus. States have established separate bodies to oversee prices. Several States have tendered out the use of their urban transit infrastructure. State budget papers indicate that this trend will continue. The more populous (larger) States now purchase most services, particularly bus services. The three smaller States still directly provide their major urban transit (bus) services. Victoria is alone in privatising the provision of rail services. Table 1 summarises the way States provide urban transit services.

**Table 1** URBAN TRANSIT SERVICES NATURE OF PROVISION

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Rail	State	Private	State	State	State	NA	NA	NA
Light Rail	Private	Private	NA	NA	State	NA	NA	NA
Bus	State & Private	Private	Local Gov't & Private	Private	Private	State & Private	State	State
Ferry	State	NA	Local Gov't	State	NA	NA	NA	Private

NA - not applicable.

12. All States provide subsidies to enable providers to offer concessional fares to students, the unemployed, the aged and other Commonwealth pension beneficiaries. Most States also provide grants for operating purposes (general payments to providers that are State enterprises). In some States, the subsidies include an allowance for depreciation and a rate of return (eg payments to Queensland Rail); in others, the State has maintained ownership of the assets and covers the depreciation and debt charges expenses from within the budget. Private operators generally receive payments for concessions, to provide minimum levels of service and to fund capital works.

13. Most States specify the need for subsidies to guarantee a minimum level of service. States want to ensure minimum standards of service in terms of route coverage and frequency of services in less densely populated urban areas. Victoria has contracted agreed standards and applies penalties to providers that do not meet the standard. It also offers incentives for improved services.

14. It is difficult to obtain information on how the size of subsidies is determined. Many are subject to contractual arrangements and information is commercial-in-confidence. Some States, for example Victoria and Western Australia, use the number of patrons or service kilometres when determining the size of the subsidy.

15. Nonetheless, States generally seem to provide subsidies both to public and private providers to achieve a number of objectives.

- (i) Subsidies are provided to compensate service providers for the concessional fare rates available to some population groups.
- (ii) Pricing subsidies are provided to keep fares lower than a commercial level to ensure a certain level of patronage and to achieve governments' social and environmental objectives.
- (iii) Service level subsidies are provided to ensure the financial viability of uneconomic services (to provide a minimum level of service) and to encourage service improvement.
- (iv) General subsidies and other payments are provided to cover operating subsidies, capital contributions and deficits. They have the effect of keeping fares lower than the commercial rate and encouraging efficient and effective service provision where the private sector may not be willing or able to undertake the investment needed.

16. Subsidy is the main mechanism used by States to fund urban transit services, through both public and private providers. Private providers tend to operate the less infrastructure-intensive types of services (such as buses). Public providers tend to operate rail services. It is not clear that public and private operators are eligible for different types of subsidy, although the levels may differ. The types of subsidies provided seem to be more influenced by the needs of the transport mode and by government policy.

17. The standard policy seems to be to provide subsidies for a range of purposes including concessional fares, price reductions to reduce externalities such as pollution and congestion, and minimum level and other service level payments. These might best be grouped into concessional and non-concessional subsidies. Implicitly, States recognised the economic and social benefits of urban transit provision by funding transport PTEs' operating deficits. More recently, however, and associated with the movement to privatisation or corporatisation, States have increasingly been making explicit community service obligation payments (CSOs) to fund PTEs.

18. To reflect the changes in the provision of urban transit services, the Commission has decided to apply a Concession and Other Payments (COP) or net subsidy approach for the assessment of Urban Transit needs for the 2004 Review.

### ***What Has Been Done since the 1999 Review***

19. In July 2000, the Commission released Discussion Paper 2000/2: *Urban Transit – A Concessions and Other Payments Approach*. In that paper, it outlined a proposal to develop an assessment method for urban transit by assessing relative needs for the level of subsidies State pay for the provision of urban transit services. In November 2000, Commission staff convened a conference with State Treasury officers to discuss the issues related to development of a possible net subsidy assessment for Urban Transit for the 2004 Review.

20. States, while supporting a net subsidy assessment, raised concerns on data availability and the identification of disabilities.

21. In September 2001, the Commission released Discussion Paper 2001/10: *Urban Transit – A proposed Assessment for the 2004 Review* and Commission staff met with State Treasury officers to discuss the issues raised in the discussion paper. The discussion paper:

- (i) proposed a conceptual framework for the assessment of Urban Transit;
- (ii) presented an assessment with calculations based on the data currently held by the Commission;
- (iii) outlined the data required to implement the assessment more appropriately; and
- (iv) discussed expected difficulties.

22. The new approach focused on the budget impact of subsidies for urban transit providers. It attempted to reflect disabilities that influence the size of subsidies rather than disabilities that influence gross expenditure and gross revenue.

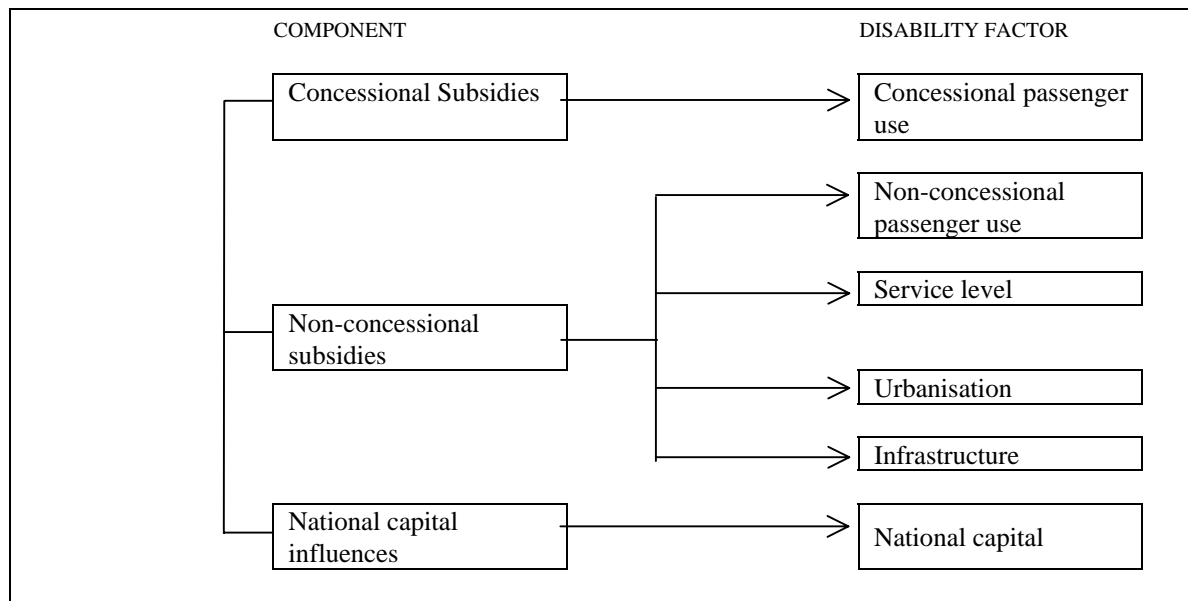
23. The analysis of the provision of urban transit services and funding arrangements suggested that breaking the subsidies into several components would help recognise State needs. The discussion paper therefore proposed components for:

- (i) concessional subsidies;
- (ii) non-concessional subsidies; and
- (iii) national capital influences.

The structure of the category and the disability factors to be applied to each component are outlined in Figure 1.

24. In response to the proposed assessment method, States provided comments as either special submissions in response to the Urban Transit Discussion Papers and/or as part of their main submissions for the 2004 Review. Attachment B provides a summary of those submissions.

**Figure 1** PROPOSED URBAN TRANSIT ASSESSMENT STRUCTURE



### PROPOSED APPROACH

25. States' submissions in response to Discussion Papers CGC 2000/02, CGC 2001/10, and further Commission staff work, have led to the following conclusions.

- (i) It may not be possible to adequately measure complex concepts and account for specific State circumstances in a simple way, especially in net terms.
- (ii) Because of the complexity of the urban transit function and the lack of agreement on what the assessment results should look like, some reality checks are needed to ensure the reasonableness of the assessment.

26. For example, the work done so far shows the difficulty in defining and measuring the impact of concepts such as urbanisation on subsidies, and in measuring propensity to use services and infrastructure needs, especially in net terms.

27. These conclusions have direct bearings on two of the main objectives for the 2004 Review Urban Transit assessment, which are that:

- (i) the assessment should be as simple and transparent as practical; and
- (ii) the needs assessed should satisfy a reality check.

28. To help the conceptual development of assessment approaches, we think that answering the following questions is essential.

- (i) Why are governments involved in the provision of urban transit services?
- (ii) Why do per capita subsidies vary between States?

29. To understand the reasons for governments involvement in providing urban transit services and the motivations behind government interventions in the provision and fare structure of services, it is useful to revisit some basic concepts.

30. Urban transit is only a component of the total transport task in urban areas. Governments aim to achieve a balance between public and private transport, and related infrastructures.

31. Within a market-dictated environment, any public transport route or service that is not financially viable would not be served and any person who could not afford the commercial rates would have limited mobility. In such circumstances, governments are involved in urban transit services to:

- (i) provide an acceptable level of mobility for socio-economically and demographically disadvantaged groups who cannot afford non-subsidised fare levels (**concessional subsidies**);
- (ii) provide services on commercially unviable routes and at commercially unviable frequencies (**Minimum Service Level contracts**);
- (iii) provide an acceptable level of mobility for all residents (**pricing subsidies**);
- (iv) achieve environmental objectives by increasing patronage, governments keep fares at certain levels and if necessary introduce modal choices (eg rail) to reduce greenhouse gas emissions, congestion and noise pollution (**pricing subsidies**); and
- (v) provide acceptable quality of service and customer satisfaction through capital improvements and capital related expenses (**capital contributions**).

32. The urban transit services are currently delivered and funded in varied ways, both in terms of sectoral and modal provisions. Some States have bus-only systems while others have a mixture of bus, train, tram and ferry services, provided by a mixture of private and PTE operators. These variations make the development of an assessment methodology difficult. However, the standard policy for urban transit services, for the period covered by the 2004 Review, seems to be for services to be provided either by private or by PTE operators and for urban transit related assets not to be owned directly by governments.

33. Although the States supported the general approach presented in Discussion Paper CGC 2001/10, various improvements were proposed in their submissions. Based on further research and State submissions, the proposed assessment was refined in the following way.

34. ***Category definition (financial standard).*** The Urban Transit category financial standard will comprise all subsidies from the State general government sector to urban transit service providers, any direct payments made for depreciation and debt charges relating to assets used in the provision of services, and any other costs met directly by governments. Therefore, regardless of any standard policy adopted in this assessment that urban transit services are only provided to urban centres over 50 000 population, expenditure on urban transit subsidies to all services providers will be included in the category financial standard.

35. ***The relevant urban population.*** Both the 1993 and 1999 Review assessments were based on a standard policy of providing urban transit to population centres greater than 50 000 persons. Although the current provision of urban transit services largely matches this definition, some States provide services in urban centres below 50 000 people. To allow for this some adjustments were made to include some urban centres that were contiguous to centres over 50 000 population where urban transit services were provided, such as the Sunshine Coast.

36. At the last staff level conference, States, overall, showed little enthusiasm for changing the standard threshold, but cited the current difficulty in adequately comparing the provision of the service in Maitland (population 50 108) and Sydney.

37. For the 2004 Review, we propose to maintain the 50 000 threshold. However, urban centres with less than 50 000 population which are adjacent to metropolitan areas and served by metropolitan urban transit services will be included.

38. In the 1999 Review, the Commission included Urban Centres and Localities (UCLs) as defined by the ABS with populations above 50 000 persons. It also included the Sunshine Coast Statistical Subdivision. Although none of the fifteen UCLs in the Sunshine Coast Statistical Subdivision is larger than the 50 000 population threshold, the total 1996 population was over 150 000.

39. In the 1999 review, in subsequent updates, and again recently, Tasmania sought the inclusion of the Burnie-Devonport corridor, Queensland and Western Australia submitted several other UCLs that should be considered in scope.

40. To better capture the urban areas served by metropolitan services as an extension to metropolitan areas, we propose to include Nerang, Helensvale and Cairns Northern Beaches in Queensland and Kwinana, Rockingham and Mandurah in Western Australia, but not the Burnie-Devonport corridor. The total population in the Burnie-Devonport corridor is insufficient to justify its inclusion.

41. Maps of Urban Centres/Localities (UCLs) are provided at Attachment C.

### ***Assessment Approach***

42. As a result of States' concerns regarding double-counting, complexity, difficulties in measuring disabilities and interaction between disabilities in the assessment

proposed in Discussion Paper 2001/10, we now propose a new structure for the assessment as shown in Table 2.

**Table 2** COMPARISON OF ASSESSMENT STRUCTURES

Discussion Paper 2001/10 Proposed Assessment		Refined Proposed Assessment	
Expenditure Component	Factors	Expenditure Component	Factors
Concessional Subsidies	Concession passenger use	Concessional Subsidies	Concession passenger use
Non-concessional subsidies	Passenger use	Non-concessional subsidies	Pricing subsidy
	Service level		Capital subsidy
	Urbanisation		
	Infrastructure		
National capital	National capital	National capital	National capital

### ***Data Issues***

43. The 1999 Review assessment was criticised because it relied on inadequate data. The proposed assessment has fewer data requirements, and the main source of the data is the ABS.

44. The passenger use and the pricing subsidy factors are based on ABS data.

45. The measurement of the capital subsidy factor relies on urban transit asset value data provided by States. We have tried to make the data as comparable as possible. The adjustments to the States' data are explained in Attachment D.

### **CONCESSIONAL SUBSIDIES**

46. This component of the assessment captures subsidies paid by States to provide concessional fares for different concession passenger groups. The size of the payment for a State reflects:

- (i) how many people have access to concessional fares;
- (ii) the propensity of the groups to use public transport; and
- (iii) the difference between the standard fare and different concession groups' fares.

### *Concession Passenger Groups*

47. The population groups that are eligible for concessional fares vary considerably between States. There are two possible approaches to determine the standard groups who are eligible for concessions.

- (i) Work through States' information on eligibility for concession, determining the standard for each group. While for groups such as children or aged pensioners this is relatively easy, calculating a standard proportion of veterans' wives appears to be pursuing a spurious level of accuracy.
- (ii) Look for broad population groups that cover the concession groups. This approach is simpler and more transparent, and there is no reason to believe it would bias the measure of States' relative needs.

48. The second option was proposed to the States as part of the working party discussions. The population groups proposed were:

- (i) children and students; and
- (ii) other concession passengers, defined as the aged and the unemployed.

49. *State views.* Only New South Wales commented on this proposal. It believed that it did not take into account that:

- (i) permanent Australian residents aged 60 and over can obtain a Seniors Card, which enables them to access concession fares; and
- (ii) there are concession-qualifying persons on pensions under 65 years who can also access concession fares (i.e. invalid, war veterans, war widows, ex-members of the Defence Forces and vision impaired persons).

50. *Proposal.* For reasons of simplicity, we do not propose to amend our definition of concession groups. We acknowledge that it will not specifically capture all the groups identified by New South Wales but that was not the intention, it is to be used only as a measure of relative need.

51. We propose to divide the eligible population into two groups.

- (i) **Concession passengers**, which include persons aged 65 and over and not in the labour force, and unemployed persons aged 15 and over.
- (ii) **Students**, which include all persons aged 5 to 14, and persons aged 15 to 24 and not in the labour force (unemployed persons are not in the labour force).

## *Use Propensities*

52. The propensity to use urban transit services depends on the concessional group and the city where the service is located. These two elements were included in the 1999 Review methodology. The city-specific propensities were heavily criticised by the States for being based on a complex methodology and unreliable data.

53. Group-specific propensities for public transport use estimated in the 1999 Review were not controversial. They were calculated by dividing the total number of journeys undertaken by public transport by each group (Australia-wide) by the Australian size of the group.

54. *State views.* Victoria reserved its comment on the use of city-specific propensities depending on the Commission's proposal. It recommended the use of actual data in all calculations.

55. Queensland suggested that both group and city-specific propensities be deleted from the model, arguing that relative group size is sufficient to measure differential needs.

56. Western Australia argued that city-specific propensities for concession and student groups should not vary significantly, as most trips involve students attending local schools and concession people travelling to local facilities. It also argued for the use of single city-specific propensities for all passenger groups.

57. South Australia suggested that the Commission use judgement based on the experience of State Urban Transit providers, rather than continuing to use the much criticised 1999 Review model for propensities.

58. Victoria, Queensland and South Australia also argued that city-specific propensities double counted the pricing subsidy assessment.

59. *Comments.* We continue to believe that concession groups have different propensities to use public transport in different cities because of the characteristics of those cities.

60. Data recently collected from the States show that city-specific use propensities vary widely between cities. This suggests that city-specific characteristics influence the use of urban transit services by concession groups.

61. We are reluctant to use actual city-specific concession passenger use rates because of policy influences, but we doubt that policy free measure can be achieved successfully. In the likely event that we will not be able to remove policy influences, we will make no adjustment for city-specific use propensities.

62. *Proposal.* We propose that:

- (i) group-specific use propensities be calculated using the 1999 Review method and the new data; and

- (ii) no city-specific use propensities be used in the calculation of concession passenger use factors, unless policy influences can be removed from actual city-specific use propensities.

### ***Concession Rate***

63. There seems to be general agreement among the States, that a concession rate of 50 per cent should be used for both students and other concessional groups.

64. ***Proposal.*** We propose to apply concession rates of 50 per cent for both students and other concessional groups.

### ***Factor Calculation***

65. The factors shown below are based largely on data used in the 1999 Review. Commission staff are in the process of gathering more recent data, which will be used to update the factors.

66. The factor will be calculated as described below.

- (i) The population of each concession group in cities over 50 000 population including Nerang, Helensvale and Cairns Northern Beaches in Queensland and Kwinana, Rockingham and Mandurah in Western Australia, will be enumerated from the Census. Table 3 provides data from the 1996 Census as the 2001 Census data are not yet available at the required level of detail.

**Table 3** CONCESSION GROUPS IN URBAN CENTRES BY STATE, 1996

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Non-student Concessions ('000)	617.6	501.5	349.5	177.0	183.9	36.2	31.3	6.1	1 903.0
(%)	15.3	16.1	16.6	14.7	18.8	18.7	10.5	8.6	15.8
Students ('000)	742.7	575.4	380.3	236.1	175.3	37.0	62.3	12.7	2 221.8
(%)	18.4	18.5	18.1	19.6	17.9	19.1	21.0	18.1	18.5
Total concession groups ('000)	1 360.3	1 076.9	729.8	413.1	359.2	73.2	93.6	18.8	4 124.9
(%)	33.6	34.6	34.6	34.4	36.7	37.8	31.5	26.7	34.4
Urban centres passenger base	3 646.2	2 833.0	1 890.2	1 092.9	899.0	178.0	269.6	60.5	10 869.4

Source: ABS, Census 96.

- (ii) An Australian standard concession group-specific use propensity will be calculated by dividing the total number of journeys undertaken by

public transport by each group (Australia-wide) by the Australian size of the group. Table 4 shows the Australian standard group-propensity to use public transport.

**Table 4** STANDARD GROUP PROPENSITY TO USE PUBLIC TRANSPORT

Item	Non-concession	Non-student concession	Student	Total urban population
Total group journeys	1 168 919	795 358	591 462	2 555 738
Total passenger groups	6 614 761	1 853 838	2 172 360	10 640 959
Group average propensity	0.18	0.43	0.27	0.24
Relative propensity	0.7358	1.7863	1.1336	1.0000

Source: ABS, Census 96 and Special data collection 2002

(iii) The number in each concession group will be multiplied by the corresponding use propensity. Then, for each State, the weighted number in each concession group will be added.

(iv) For each State and for Australia, the weighted number of concession holders will be divided by the total State /Australian population. Each State ratio will be divided by the Australian ratio to obtain factors, as shown in Table 5.

**Table 5** CONCESSIONAL SUBSIDY FACTOR CALCULATION

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Weighted Passenger Base									
Concessions	265.0	215.2	150.0	75.9	78.9	15.5	13.4	2.6	816.5
Students	202.2	156.6	103.5	64.3	47.7	10.1	17.0	3.5	604.9
Total Concession	467.2	371.8	253.5	140.2	126.6	25.6	30.4	6.1	1,421.4
Total Population (State)	5 996.1	4 406.0	3 238.9	1 701.8	1 434.7	464.1	298.2	177.0	17 716.8
Ratio (Weighted/Total)	0.07791	0.08439	0.07827	0.08240	0.08826	0.05515	0.10189	0.03427	0.08023
Concession Factors	0.97114	1.05186	0.97555	1.02703	1.10012	0.68746	1.27001	0.42713	1.00000

Source: ABS, Census 96 and Special data collection 2002.

67. The formulae below shows an algebraic representation of the factor calculation.

$$CPU_j = \frac{\sum_k P_{Wk}}{Pop_j} \bigg/ \frac{\sum_j \sum_k P_{Wjk}}{\sum_j Pop_j} \quad (1)$$

Where:

CPU = Concession passenger use factor

Pop = Population (State)

Pw = Weighted passenger base

$$P_{Wk} = \sum_i PT_i * Pr_i \quad (2)$$

PT = Size of concession passenger group

Pr = Public transport use propensity (group specific)

i = concession group (ie. student, concession card holders)

j = State

k = urban settlement

## NON-CONCESSIONAL SUBSIDIES

68. In addition to funding concessional rates for some population groups, State governments provide payments to cover urban transit services providers' operating deficits. In recent time, States have increasingly been making explicit the nature of that funding.

69. States usually makes these payments for the following reasons.

- (i) **Passenger Use.** The sizes of subsidies differ because of the relative size of the different passenger groups (non-concession, concession and student passengers), and their propensity to use public transport as a result of group and urban characteristics.
- (ii) **Service level.** The amount of subsidy differs if States have more large urban centres, or more parts of them where a minimum level of service cannot be provided in a financially viable way.
- (iii) **Urbanisation costs.** State governments need to provide larger subsidies to overcome the costs of urbanisation, such as congestion and pollution, where urban populations are large and densely

concentrated. This is usually achieved through subsidies designed to reduce standard fares.

- (iv) **Infrastructure costs.** Governments also subsidise capital expenditures and/or other operating costs. Where populations are large and more densely settled, governments need to provide larger subsidies for the dedicated use of railway tracks and high investment/maintenance costs of rail services.

70. Discussion Paper CGC 2001/10 proposed to measure non-concessional subsidy needs by using four different factors: passenger use; service level; urbanisation; and infrastructure. States broadly supported that approach, but provided the following comments.

- (i) Because the payments were based on inter-related influences, double-counting needed to be avoided in the way the factors were calculated.
- (ii) Using density as one of the disability measures did not provide insight into the relative impact of demand, minimum levels of service and urbanisation. However it was noted that the disability measure was expected to be consistent with the general consensus that the need for subsidy decreased with increased density.
- (iii) Travel behaviour characteristics and congestion costs did not measure urbanisation costs accurately. Congestion costs were too policy influenced. A simpler assessment, such as density, may be better.
- (iv) An infrastructure cost factor was not appropriate when combined with urbanisation and minimum service levels.

71. After considering the States' views, the four disabilities previously identified have been merged into two. They are:

- (i) needs for a pricing subsidy; and
- (ii) needs for a capital subsidy.

### ***Pricing Subsidy Factor***

72. The pricing subsidy factor would measure the influences on subsidy levels that are not determined by concessions and the use of capital assets. The factor would capture the effects on subsidy levels of differences in:

- (i) passenger use;
- (ii) urbanisation; and
- (iii) uneconomic services.

73. While there is clear conceptual evidence of the existence of these disabilities, data to measure them precisely are not readily available. Measuring the disabilities will be difficult because:

- (i) their separate effects cannot be easily defined; and
- (ii) their measurement would require a large amount of data and complex methods.

74. With simplicity being an important aim, and in the context of a net assessment, we are seeking broad and simple measures. We tried a number of indicators in Discussion Paper 2001/10. We think that the criteria for using an indicator should be:

- (i) measurability – accurate and reliable data are available for the indicators;
- (ii) avoidance of double-counting – the indicator does not double-count with another; and
- (iii) acceptability and robustness of the method.

75. To avoid double-counting, less indicators than identified in Discussion Paper 2001/10 would be better. In addition, the impact of indicators such as congestion costs, urban form and topography on the need for subsidy would be difficult to measure, both in terms of data availability, policy contamination and robustness of method.

76. We are proposing to use urban density to capture the effects of:

- (i) passenger use;
- (ii) urbanisation; and
- (iii) uneconomic services.

77. We believe there is inverse correlation between the need for subsidy and population density, because:

- (i) as density increases, demand for services increases, which generates more revenue and a reduced need for subsidy;
- (ii) in highly urbanised areas, density is high, which generates congestion in overall transport and provides an incentive for a modal shift to public transport, increasing the revenue raising capacity of service providers and, decreasing the need for subsidy; and
- (iii) as density decreases, public transport operations become less financially viable due to reduced patronage and, therefore, the need for subsidy increases.

78. While this measure does not fully capture the subtleties of urban transit funding, it is thought to capture the States' relative positions well.

79. The pricing subsidy factor will be calculated according to the following formulae.

$$D = \text{Density Factor} \quad D_j = \frac{\sum_i (Dw_i * P_i)}{P_j} \quad (3)$$

Where:

$$Dw = \text{Density weight} \quad Dw_i = 1 / \frac{D_i}{D_a} \quad (4)$$

$P$  = Population

$D$  = Density (P/ha)

$ha$  = Area of urban settlement in hectares

$a$  = Australian average (of urban settlements)

$I$  = Urban settlement

$j$  = State

80. The pricing subsidy factors will be calculated for each settlement as follows.

- (i) Population density for each settlement and for Australia is calculated by dividing urban population by urban areas.
- (ii) Density weights for each settlement are calculated as the inverse of each settlement density.
- (iii) The density weights are then multiplied by the population of each settlement, and the weighted populations are added to obtain State totals.
- (iv) Density factors are calculated by dividing State weighted population by State unweighted population, and then by dividing by the equivalent Australian ratio (see Table 6).

**Table 6** PRICING SUBSIDY FACTORS CALCULATION

City	Population	Area (ha)	Density (p/ha)	Density weight	Weighted population	Density factors
Sydney	3 503 864	182 641	19.18	0.71	2 477 152	
Newcastle	320 432	33 444	9.58	1.42	453 597	
Wollongong	219 761	18 324	11.99	1.13	248 526	
NSW Total	6 307 140	234 409			3 179 274	0.78226
Melbourne	2 865 329	179 144	15.99	0.85	2 429 716	
Geelong	125 382	8 339	15.04	0.90	113 099	
Ballarat	64 831	6 747	9.61	1.41	91 514	
Bendigo	59 936	7 624	7.86	1.73	103 404	
Vic Total	4 633 264	201 854			2 737 732	0.91698
Brisbane	1 291 117	127 100	10.16	1.34	1 723 853	
Gold Cost	302 447	24 727	12.23	1.11	335 364	
Sunshine Coast	155 240	19 434	7.99	1.70	263 584	
Townsville-Thuringowa	109 914	15 158	7.25	1.87	205 587	
Cairns	107 041	11 801	9.07	1.50	160 054	
Toowoomba	83 350	8 892	9.37	1.45	120 601	
Rockhampton	57 770	7 996	7.22	1.88	108 454	
Qld Total	3 427 345	215 108			2 917 498	1.32101
Perth	1 202 036	105 351	11.41	1.19	1 428 864	
WA Total	1 814 292				1 428 864	1.22219
Adelaide	978 100	72 379	13.51	1.00	981 676	
SA Total	1 483 418				981 676	1.02697
Hobart	126 118	12 649	9.97	1.36	171 556	
Launceston	67 701	8 851	7.65	1.77	120 050	
Tas Total	193 819	21 500			291 606	0.95726
Canberra	297 034	27 416	10.83	1.25	371 838	
ACT Total	307 748				371 838	1.87505
Darwin	70 251	7 312	9.61	1.41	99 166	
NT Total	188 343				99 166	0.81709
Australia	18 634 289	885 328	13.56	1.00	12 007 654	1.00000

Source: ABS, Census 96, CDATA'96.

81. Table 7 shows the resulting factors.

**Table 7** PRICING SUBSIDY FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Density Factors	0.78226	0.91698	1.32101	1.22219	1.02697	0.95726	1.87505	0.81709	1.00000

***Capital Subsidy Calculation***

82. In relation to capital subsidies, governments make payments to urban transit service providers:

- (i) for the construction of new public transport networks and for extensions to existing networks;
- (ii) for the major maintenance of the existing system; and
- (iii) to make a system more competitive against other modes of transport by introducing better service and better customer facilities.

83. The size of capital related subsidies differ between States mainly because of the scale of the urban transit operations and the infrastructure required. Furthermore, the characteristics of urban environment, such as topography (eg bridge crossings), size and density (eg. need for intermodal urban transit services) would also contribute to differing capital subsidy levels. For example, urban areas with more water features require higher capital subsidies for the maintenance of more costly urban transit infrastructure, and areas with large population bases and monocentric employment distribution require different modes of urban transit infrastructure.

84. In the case of bus transport, all the capital expenses (such as bridges and tunnels) related to roads and shared bus lanes are included in the Roads category.

85. As capital subsidies are allocated mainly for major maintenance and extensions, current network characteristics such as track/road length, number of depots and stations can probably be used to measure relative need among the States. Although this would be a gross approach, we still believe that there is a direct positive correlation between the amount of infrastructure and the operating expenditures related to capital - the larger or more complex the network, the higher the requirement for funds to maintain and extend. Therefore, we propose to use asset value as a proxy for capital subsidies.

86. Of the States that provided submissions as part of the working party process, only Western Australia disagreed with the proposed measurement of infrastructure disabilities. It argued that the assessment double counted with other non-concessional subsidy factors. With the proposed changes to those factors, we believe any potential double counting is eliminated.

87. To calculate capital subsidy needs through urban transit asset values, we need network characteristics data for all relevant urban areas and for all modes of urban transit, as well as standard unit cost data.

88. **Assessment proposal.** We believe the information provided by States, regarding the physical characteristics of the infrastructure elements are essentially policy neutral. Therefore, other than for bus stops and bus depots, for which we have made some adjustments, we propose to use actual number of track length, rail depots, rail stations, and vehicles and rolling stock as provided by the States.

89. In summary the urban transit capital subsidy factors will be calculated as follows.

- (i) Value of tracks is calculated by multiplying the actual length by standard unit cost.
- (ii) Other than bus mode, values of stations and depots are calculated by multiplying the actual numbers by standard unit costs.
- (iii) Bus stops and depots are adjusted to fill in the gaps and to standardise (see Attachment D for adjustment method), and the value is calculated by multiplying the standardised numbers by standard unit costs.
- (iv) Values of vehicles and rolling stock are calculated by multiplying the actual numbers of vehicles/rolling stock by the standard (Australian average) unit cost.
- (v) Standardised asset values are calculated by summing the resulting standardised values.
- (vi) For each State and for Australia, standardised per capita asset values are calculated by dividing total asset values by the relevant population.
- (vii) Capital subsidy factors are calculated by dividing each State's standardised per capita asset values by the Australian standard per capita asset value.

90. The algebraic expression of these are as follows:

$$CS_i = \frac{AV_i}{SAV} \quad (5)$$

Where:

CS = capital subsidy factor

$$AV_i = \frac{\sum_j C_j * I_j}{Pop_i} \quad (6)$$

AV = standardised per capita asset value

SAV = Australian standard per capita asset value

- C = standard unit cost
- I = actual/standardised number or length of urban transit infrastructure element
- i = State
- j = infrastructure element j (eg. depot, station).

91. The asset values calculation uses standard unit costs for each urban transit infrastructure component (see Table 8). Data similar to those used in the 1999 Review have been requested, along with data on vehicles, rolling stock and buildings, to enable us to assess total asset values relating to urban transit services.

**Table 8** UNIT COSTS OF URBAN TRANSIT INFRASTRUCTURE COMPONENTS

	Track/road cost per km	Cost per station	Cost per depot	Per Vehicle/Rolling Stock Value
	\$m	\$m	\$m	\$m
Underground heavy rail	40.00	40.00	na	2.82
Above ground heavy rail	8.00	1.50	2.00	2.82
Light rail	5.00	0.10	2.00	0.86
Bus	4.00	0.01	1.00	0.10
Ferry	na	1.00	na	0.96

Note: na means not applicable.

Source: Data provided for the 2004 Review.

92. Table 9 shows urban transit infrastructure component data provided by the States. Bus transport related data are adjusted to include all urban settlements included in the category (see Attachment D for adjustments).

93. Standardised asset values are calculated by multiplying the standard unit costs (Table 8) and required/actual length or number of urban transit infrastructure components as explained above (see Table 9).

94. Table 10 shows total standardised value of capital assets including tracks, stations, depots, vehicles, rolling stock and buildings. However, data on buildings are not available for the calculations yet and the intention is to include them in the final calculations when the States provide the comparable data on urban transit services related buildings.

**Table 9** SIZE OF URBAN TRANSIT INFRASTRUCTURE COMPONENT

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
LENGTH OF TRACK (kms)									
Underground heavy rail	80	20	2	1					103
Above ground heavy rail	1 780	366	402	97	120				2 765
Light rail		240			11				251
NUMBER OF STATIONS									
Underground heavy rail	11	3	4						14
Above ground heavy rail	291	208	143	57	86				785
Light rail		1 761			20				1 781
Bus (adjusted)	12 132	12 462	10 534	8 137	6 847	1 744	2 673	632	55 162
Ferry	34		25	2				2	38
NUMBER OF DEPOTS									
Underground heavy rail									
Above ground heavy rail	3	5	5	2	4				19
Light rail		8			1				9
Bus (adjusted)	27	25	24	12	10	4	4	1	106
Ferry									
NUMBER OF VEHICLES/ROLLING STOCK									
Train	1 458	152	429	48	100				2 187
Tram		507			21				528
Bus	1 906	1 725	1 463	933	788	202	347	43	7 407
Ferry	30		20	2				2	34

Source: Data provided for the 2004 Review.

**Table 10** STANDARDISED VALUE OF ASSETS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Tracks/Stations/Depots	18 505	5 712	3 844	1 108	1 302	23	97	9	30 600
Vehicles/Rolling Stocks	4 320	1 031	1 366	228	377	21	34	5	7 382
Buildings <sup>(a)</sup>									
Total	22 825	6 743	5 210	1 336	1 680	44	131	14	37 982

Note: (a): Value of buildings will be included when the data is available.

Source: Data provided for the 2004 Review.

**Table 11** CAPITAL SUBSIDY FACTOR CALCULATION

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Stz Asset Value (\$m)	22 825	6 743	5 210	1 336	1 680	44	131	14	37 982
State Population (million)	6.430	4.737	3.536	1.872	1.496	0.471	0.310	0.194	19.046
Per capita asset value (\$)	3 550	1 423	1 473	714	1 123	93	422	73	1 994
Capital subsidy factor	1.78001	0.71367	0.73885	0.35788	0.56310	0.04673	0.21173	0.03676	1.00000

Source: Data provided for the 2004 Review.

### NATIONAL CAPITAL INFLUENCES

95. The 1999 Review provided a national capital allowance for the ACT of \$1.5 million because of reduced bus patronage due to Commonwealth policies which prohibit parking fees being charged on Commonwealth land.

96. *State views.* The ACT, in its main submission, argued that the national capital allowance should be increased to \$2.8 million based on an estimate from Action Bus Services. It calculated that the number of full fare paying passengers could be increased by 20 per cent if pay parking was introduced on Commonwealth land.

97. Victoria considered that the national capital factor should be removed from the assessment on the basis that many local governments have the authority to make decisions about parking charges without consulting State governments.

98. *Comments.* The ACT has no scope to charge for parking on Commonwealth land, and this would have some negative impact on its bus patronage. However, there are now moves to introduce pay parking in these areas.

99. *Proposal.* Commission staff intend to recommend the continuation of a National Capital Allowance unless the Commonwealth allows the introduction of pay parking in the Parliamentary triangle. We will need further information from the ACT to help us determine the size of the allowance.

### COMPONENT WEIGHTS

100. The data available on government funding of urban transit services are limited and vary between States. Table 12 presents the analysis of data provided by the States on subsidies provided to urban transit service producer for all modes.

**Table 12** URBAN TRANSIT GOVERNMENT FUNDING SUMMARY

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
	%	%	%	%	%	%	%	%	%
Concessional Subsidies	25	5	9	15	13	50	34	27	17
Non-concessional-Pricing and other subsidies.	43	83	65	67	87	50	66	73	60
Non-concessional-Capital related subsidies	33	12	26	18	-	-	-	-	23
Total subsidies	100	100	100	100	100	100	100	100	100

Source: Data provided for the 2004 Review.

### WHAT THE ASSESSMENT MIGHT LOOK LIKE

101. We used the available data to calculate factors for the proposed approach. The proposed components weights are:

- (i) Concessional subsidies weight = 17.00;
- (ii) Non-concessional subsidies weight = 82.95, being:
  - pricing subsidies factor weight = 59.95;
  - capital subsidies factor weight = 23.00; and
- (iii) national capital influences weight = 0.05.

102. Table 13 summarises the assessment and shows the derivation of the category factors.

**Table 13** DERIVATION OF CATEGORY FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
<b>Concessional Subsidies (component weight = 17.00%)</b>								
Concession Passenger Use (CPU)	0.97114	1.05186	0.97555	1.02703	1.10012	0.68746	1.27001	0.42713
Component factor	0.97114	1.05186	0.97555	1.02703	1.10012	0.68746	1.27001	0.42713
Cont. to category factor	0.16509	0.17882	0.16584	0.17459	0.18702	0.11687	0.21590	0.07261
<b>Non-Concessional Subsidies (component weight = 82.95)</b>								
<b>Pricing Subsidy (component weight = 59.95%)</b>								
Pricing subsidies (PS)	0.78226	0.91698	1.32101	1.22219	1.02697	0.95726	1.87505	0.81709
Component factor	0.78226	0.91698	1.32101	1.22219	1.02697	0.95726	1.87505	0.81709
Cont. to category factor	0.46896	0.54973	0.79195	0.73270	0.61567	0.57388	1.12409	0.48984
<b>Capital Subsidy (component weight = 23.00%)</b>								
Capital subsidies (CS)	1.78001	0.71367	0.73885	0.35788	0.56310	0.04673	0.21173	0.03676
Component factor	1.78001	0.71367	0.73885	0.35788	0.56310	0.04673	0.21173	0.03676
Cont. to category factor	0.40940	0.16414	0.16994	0.08231	0.12951	0.01075	0.04870	0.00846
<b>National capital (NCAP) (component weight = 0.05%)</b>								
National capital (n)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	61.66046	0.00000
Component factor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	61.66046	0.00000
Cont. to category factor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03083	0.00000
<b>CATEGORY FACTOR</b>	<b>1.04346</b>	<b>0.89269</b>	<b>1.12773</b>	<b>0.98961</b>	<b>0.93220</b>	<b>0.70149</b>	<b>1.41952</b>	<b>0.57091</b>

## ALTERNATIVE APPROACHES

103. In addition to refining the approach proposed in Discussion Paper CGC 2001/10, we explored two other assessment approaches. They will serve as further reality checks on the approach outlined in the first part of this paper.

- (i) Modified Actual Per Capita (APC) approach, where differences in actual expenditure are largely due to non-policy influences. Actual expenditure is modified where we detect policy differences.
- (ii) An assessment based on the relationship between subsidies and broad indicators, such as population density, population size, route kilometres, asset value and size of urban area.

### *Modified Actual Per Capita (APC) Approach*

104. To adopt an actual per capita (APC) approach, it would be necessary to assume:

- (i) there are no policy influences in fare levels or the efficiency with which they are policed;
- (ii) there are no policy influences on subsidy levels - all are needs based; and
- (iii) there are no policy influences on operations, and urban transit services operate on a profit basis to achieve maximum efficiency and productivity.

105. While we accept there are policy differences in all three areas, if States are behaving as rational economic entities, it is possible to accept that policy influences on levels of subsidy or expenses are minimal (immaterial). However we know that fare levels are heavily influenced by State government policies and propose to modify actual expenses to account for that.

106. An adjusted factor has been calculated on the basis of standardised minimum adult fares.

107. Table 14 shows the derivation of the Urban Transit category factor for the modified APC approach.

**Table 14** DERIVATION OF URBAN TRANSIT FACTORS - MODIFIED APC METHOD

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Subsidy (\$m)	1 232.6	535.9	472.6	252.5	177.8	18.6	44.5	7.4	2 742.0
State Population (million)	6.500	4.799	3.597	1.897	1.500	0.470	0.313	0.196	19.273
Average subsidy (pc)	189.64	111.66	131.37	133.08	118.56	39.66	142.43	37.84	142.27
Factors (APC)	1.33293	0.78485	0.92337	0.93539	0.83329	0.27873	1.00109	0.26595	1.00000
Minimum adult fare	1.40	1.90	1.80	1.10	1.60	1.30	2.30	1.40	1.60
Adjustment Factors	0.87500	1.18750	1.12500	0.68750	1.00000	0.81250	1.43750	0.87500	1.00000
Modified Factors (APC)	1.16631	0.93200	1.03879	0.64308	0.83329	0.22646	1.43906	0.23270	1.00000

### ***Broad Indicators Assessment***

108. This approach attempts to find some broad indicators of subsidy levels. Possible indicators can be found by looking at the conceptual framework behind the government subsidies for urban transit services explained earlier.

109. We consider that the factors influencing level of subsidies are:

- (i) population size, including the size of the disadvantaged groups;
- (ii) density of urban settlements, including residential and employment densities;
- (iii) urban form, topographical features;
- (iv) per capita vehicle kilometres (all modes); and
- (v) urban transit infrastructure base (all modes).

110. We could use these indicators independently or in a regression analysis to determine their relative influence. Although we do not have a complete and up to date data set to demonstrate the approach, a regression analysis has been performed using the available data. Attachment E provides a detailed description of the data and the regression analysis. The factor calculation, based on modelled government subsidy levels, is presented in Table 15.

**Table 15** DERIVATION OF CATEGORY FACTORS BASED REGRESSION ANALYSIS RESULTS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Actual Subsidy (\$m)	1 232.59	535.91	472.59	252.52	177.83	18.65	44.52	7.43
Modelled Subsidy (\$m)	1 281.28	593.27	513.96	218.80	179.28	35.99	61.50	15.19
Per Capita Modelled Subsidy (\$)	213.69	134.65	158.68	128.57	124.96	77.54	206.27	85.82
Factors	1.30578	0.82282	0.96968	0.78568	0.76361	0.47384	1.26047	0.52440

### REALITY CHECKING

111. Information against which the credibility of the proposed assessment can be judged is difficult to come by. Table 16 compares the proposed assessment against factors derived from:

- (i) alternative approaches set out in this paper;
- (ii) actual government subsidy per capita;
- (iii) actual government subsidy per capita of population living in areas covered by the scope of the urban transit assessment;
- (iv) the 1999 Review net assessment of urban transit (2002 Update);
- (v) the 1999 Review net assessment of urban transit and the urban transit components of the depreciation assessment (2002 Update); and
- (vi) the 1993 Review assessment (1998 Update).

112. It should be noted that:

- (i) urban transit related debt charges disabilities are included in none of the update factors;
- (ii) the 2002 Update and the discussion paper category factors are based on similar data and methods of calculation; and
- (iii) the factors based on per capita subsidies would be expected to be similar – they will vary with the proportion of population that is urban.

**Table 16** CATEGORY FACTOR COMPARISONS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Proposed Assessment	1.04346	0.89269	1.12773	0.98961	0.93220	0.70149	1.41952	0.57091
Modified APC factors	1.16631	0.93200	1.03879	0.64308	0.83329	0.22646	1.43906	0.23270
Regression analysis	1.30578	0.82282	0.96968	0.78568	0.76361	0.47384	1.26047	0.52440
Per capita subsidy (State population)	1.33471	0.75328	0.98226	0.91994	0.79617	0.42126	0.65632	0.46334
Per capita subsidy (Urban population)	1.32820	0.78588	0.94275	0.95874	0.80084	0.25956	0.96474	0.27138
2002 Update factors <sup>(a)</sup>	0.93695	1.01608	1.04456	1.03711	1.22718	0.60774	1.21762	0.37678
2002 Update factors including UT depreciation disabilities	1.09790	1.03583	0.90362	0.92269	1.08578	0.48850	1.04674	0.31814
1998 Update factors (1993 Review)	1.17309	1.16951	0.64680	0.80712	1.00594	0.49582	1.05615	0.40768

(a) 2002 Update factors does not include debt and depreciation charges related to urban transit capital expenditures.

113. The most obvious observation from Table 16 is that the 2002 Update factors, whether adjusted for urban transit depreciation disabilities or not, show a lower level of correlation with State populations than the other factors. Other observations include:

- all factors show Tasmania and the Northern Territory having low disabilities;
- all factors show the ACT having greater disabilities than Tasmania;
- for South Australia, only 2002 Update factors are above 1.00000; and
- for New South Wales, only the 2002 Update factors unadjusted for depreciation are below 1.00000. That is, its net operating costs without the costs of capital are below standard.

## CONCLUSIONS

114. The States are in broad agreement with the proposed net subsidy approach to the assessment of Urban Transit in the 2004 Review.

115. The refined proposed assessment further improves the assessment approach presented in Discussion Paper CGC 2001/10 by addressing issues raised by the States in their submissions.

116. The alternative methods, modified APC and broad indicators approach, provide some bases for comparison. However the data used in these approaches requires further refinement.

117. Although the reality checks, to some degree, produce divergent outcomes, they give an indication about what factors might look like. It appears that the proposed assessment approach would move the relativities in the expected direction. However, further work is required to refine the measurement of disabilities by updating the Census and other State data.

118. The Commission prefers the refined proposed approach because:

- it is based on a stronger conceptual framework than the alternative approaches;
- the methodology reflects what States actually do; and
- it is relatively simple, without complex adjustments and refinements which are not robust.

## 1999 REVIEW ASSESSMENT METHOD

### *Assessment Method*

A.1 In the 1999 Review, the Urban Transit category covered the operating expenditure — excluding depreciation, debt charges and superannuation — and the user charges and other revenue associated with urban transit services for capital cities and major urban centres with a population of 50 000 or more. The Urban Transit category thus covered about 40 per cent of the total cost of urban transit services to the States.

A.2 Table A-1 shows the category standard for the six years ending 2000-01. In 2000-01, this category represented 1.8 per cent of total standard expenses.

**Table A-1** EXPENDITURE AND REVENUE STANDARDS, URBAN TRANSIT, 2002 UPDATE

	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01
Net standard expenses (\$pc)	74.63	60.25	82.27	72.02	79.74	85.88
% of total gross standardised expenses	2.10	1.64	2.13	1.58	1.72	1.80

Note: Numbers may not add due to rounding.

A.3 Conceptually, the assessment is relatively simple. The Commission calculated a standardised level of service for each State, taking into account the characteristics of the urban population and urban form. This standardised level of service was multiplied by the standardised unit cost to generate standardised expenditure. Standardised revenue was calculated by applying an Australian average revenue effort to the standardised level of service.

A.4 ***Expenditure assessment structure.*** The Commission allocated Urban Transit expenditure to two components and assessed the following disabilities:

- (i) public transport operating expenditure — a joint demand and cost factor; and
- (ii) national capital — a national capital factor.

A.5 The joint demand and cost factor was derived using estimates of the standardised expenditures associated with providing urban transit services. Standardised expenditures were calculated by:

- (i) estimating a standardised number of journeys for each of the three main groups of passengers (regular passengers [mainly commuters], concessional passengers and students) in the capital city;

- (ii) converting the estimates of passenger journeys to passenger kilometres by applying average journey lengths for each city;
- (iii) applying a notional cost per passenger kilometre to the estimated passenger kilometres (the notional cost per passenger kilometres was derived from data for all States to reflect the economies of scale associated with increases in the size of the task, together with adjustments for the effects on expenditures of differences between the States in congestion, wage levels, fuel and power prices, vandalism and security requirements); and
- (iv) adding estimated expenditure for services provided in the State's other urban centres with populations of more than 50 000, imputed using details for the State capital cities of comparable size.

A.6 The most difficult part of this calculation was the estimation of the standardised number of passenger journeys for each city. The Commission based these on a policy-neutral travel propensity for each group of passengers in each capital city — that is, estimates of the likelihood of people in each city using public transport, assuming that States provide the average level of service and charge the Australian average fares. The propensities were derived by:

- (i) calculating a *city-wide propensity* of residents in each city to travel by public transport; and
- (ii) applying a *basic access adjustment factor* that reflected the effects of differential access to private vehicles.

A.7 ***Revenue assessment structure.*** The Commission allocated revenues to:

- (i) a fare revenue component (with revenue raising capacity based on the Australian standard fare multiplied by standardised passenger kilometres for each State); and
- (ii) an other revenue component assessed as equal per capita.

A.8 ***Urban transit depreciation assessment.*** The need for different amounts of depreciation on urban transit stock in each State was recognised in the 'urban transit construction' and 'urban transit plant and equipment' components of the Depreciation category. These capital requirement factors were based on the standardised service levels (passenger kilometres) calculated in the Urban Transit assessment. The service levels were adjusted to recognise differences in the efficiency with which States could use capital because of the size and form of their urban areas. The capital adjustment factors were based on the relationship between seat kilometres and passenger kilometres for transport tasks of various sizes, using data from all States.

A.9 The asset life factor used in both urban transit components reflected the effect on depreciation costs of the shorter useful lives of assets in northern Australia.

A.10 A construction cost factor was applied in the urban transit construction component. It measured the differences between States in the construction costs incurred to provide a standard level of infrastructure at a standard cost. The Commission based the standard infrastructure requirements on judgement and the standard construction costs on data provided by the States.

A.11 *Urban transit debt charges assessment.* The depreciation disability factors for the urban transport components (weighted by 75 per cent) and the Urban Transport category factors (weighted by 25 per cent) were used to calculate standardised capital expenditure on urban transit in the Debt Charges assessment.

A.12 *Urban transit superannuation assessment.* The Urban Transit category factor was used to assess superannuation needs for urban transit services.

A.13 Table A-2 shows the effect on grants of the Urban Transit assessment and of the assessment of superannuation, depreciation and debt charges relating to urban transit.

**Table A-2** EFFECT OF URBAN TRANSIT ASSESSMENTS ON GRANTS,  
1999 REVIEW

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Urban Transit Category	-32.7	6.5	14.7	7.1	23.4	-15.9	6.4	-9.4	58.0
Superannuation	14.5	2.6	-7.0	-3.9	-1.6	-2.9	-0.2	-1.5	17.1
Depreciation	96.0	11.0	-49.6	-21.8	-10.6	-14.0	-4.6	-6.3	107.0
Debt Charges	154.2	19.7	-81.4	-34.4	-16.6	-23.0	-8.4	-10.2	174.0
Combined redistribution	232.0	39.8	-123.3	-53.0	-5.4	-55.8	-6.8	-27.4	271.8

Source: Commonwealth Grants Commission, *Report on General Revenue Grant Relativities 1999*, Vol II, p166.

## STATE SUBMISSIONS

B.1 While all States supported the Commission's new Concessions and Other Payments (COP) approach to the urban transit assessment, they raised a number of issues related to the proposed assessment structure and the measurement of factors.

### *New South Wales*

B.2 New South Wales considered that the proposed COP assessment could achieve greater consistency. However, it expressed the view that costs associated with depreciation and debt charges should be included in the proposed assessment.

B.3 **Concession rates.** In New South Wales, students receive 100 per cent discount on study related travel and 50 per cent discount at other times. The non-student concession fare is a flat rate, \$1.10 per day, for all government transport services and a 50 per cent subsidy for all non-government services.

B.4 **Passenger Use - Concessional.** New South Wales suggested a revision to the concession group definition. It proposed that permanent Australian residents aged 60 and over who have Seniors Card and persons having access to concession rates (invalid, war widows, etc) should be included in the concession group.

B.5 **Passenger Use – Non-Concessional.** It also suggested that persons aged 15 to 24 who are in the workforce should be included in the non-concession passenger group and that both the number and the average length of the trips should be taken into account in determining the intensity of passenger use.

B.6 **Service Level.** The service level definition should consider service quality as well.

B.7 **Urbanisation.** New South Wales suggested that the Commission should investigate taking into account the cost of relieving congestion on the rail network in the urbanisation cost disability factor. It suggested that the Commission should also consider taking into account the cost of providing passenger information, additional information for special events, and integrating public transport in the urbanisation cost disability.

B.8 **Infrastructure.** New South Wales proposed that the Commission should ensure that future infrastructure cost measures focus only on the cost of new service provision. It also argued that redevelopment or upgrading is costlier than providing new urban transit infrastructure. The retro-fitting of new infrastructure to existing corridors is a costly exercise.

B.9 **Sydney Ferries.** New South Wales argued that cost of providing infrastructure for ferry services should be included in the assessment.

B.10 **National Icon.** New South Wales suggested that a “national icon” disability cost factor be introduced into the proposed assessment.

### *Victoria*

B.11 Victoria agreed that to adopt a new approach (COP) in the urban transit assessment was appropriate. It believes that the derivation of an Australian standard is extremely difficult, given that States’ practices varies greatly. Victoria suggested that the use of a sub-global method would remove complexity and, with carefully chosen indicators, policy differences from the calculations.

B.12 Victoria argued that the assessment method needed to be thoroughly questioned in relation to:

- the urbanisation factor;
- the propensity to use public transport; and
- the large absolute differences between the States.

B.13 **Passenger use.** Victoria recommended the use of actual data in all calculations. It suggested student fare levels of 50 per cent and all urban centres (50 000 and more population) should be taken into account.

B.14 **Service Level.** It argued that the factor calculations should be extended to all modes and that different modes should be assessed separately, as they all have different service level agreements. In Victoria, minimum service level (MSL) payments work on an incentive basis and failure to meet agreed targets results in operators having to provide free tickets to regular passengers. Victoria believes that without clear indication that States have common frequency requirements, this factor should be omitted.

B.15 **Urbanisation.** Victoria questioned the use of Bureau of Transport and Communications Economics’ (BTCE) congestion cost estimates and suggested the use of Austroads’ travel time performance indicators.

B.16 **Infrastructure.** Victoria supported the way the infrastructure factor was calculated, but suggested that the 75 per cent weighting should be omitted.

B.17 Victoria argued that Sydney and Brisbane rail-air links should not be included in the infrastructure assessment, as they were not part of the standard policy for rail service provision. It also argued that tram stop costs were undervalued and security and safety costs were not included.

B.18 **National Capital Influences.** Victoria believed that this should be removed from the assessment.

B.19 **Component weights.** Victoria argued that component weights should be established on the basis of funding data from all States.

## *Queensland*

B.20 In general, Queensland supported the proposed COP approach and suggested some improvements to the assessment.

B.21 **Non-State capital Cities.** Queensland argued that the characteristics of capital cities could be used as a proxy for characteristics of non-capital cities over 50 000 population.

B.22 **Category Standard.** Queensland believed that contributions to superannuation entitlements of government-owned service providers should be included in the standard. It also argued that the Fuel Subsidy Scheme was a kind of subsidy provided by the Queensland Government and it should also be included in the category standard.

B.23 **Population measurement.** Queensland suggested that annual population data should supplement the census data for annual updates.

B.24 **Urban Centre.** Queensland argued that the assessment should include significant populations in adjacent urban centres such as Nerang and Helensvale in the Gold Coast and Cairns Northern Beaches in Cairns, which are served as part of metropolitan urban transit services.

B.25 **Propensities.** Queensland suggested that both group and city-specific propensities be removed from the model, arguing that relative group size is sufficient to measure differential needs.

B.26 **Service Level.** Queensland supported the way the factor was calculated, but suggested that all settlements with over 50 000 population should be included in the calculations. It also argued that the number of urban centres be reflected in the calculations.

B.27 **Urbanisation.** Queensland supported the use of BTCE congestion costs for measuring urbanisation.

B.28 **Infrastructure.** Queensland argued that dedicated bus lane costs should be reflected in the infrastructure costs.

## *Western Australia*

B.29 Western Australia broadly agreed with the COP proposal but noted that the new approach would need to:

- reflect a consistent definition of subsidies (economic subsidies)
- reflect the scope for cost recovery;
- recognise that urban transit subsidies are not an efficient tool for dealing with congestion costs;
- recognise that name tags of subsidies are not an objective indicator;

- avoid using policy affected indicators of disability (e.g. congestion costs); and
- resolve the problems of interdependency of disability factors.

**B.30 Capital Costs.** To avoid the problem of assessing historical disabilities, Western Australia suggested that the urban transit assessment should focus on economic subsidy rather than budget subsidy.

**B.31 Scope.** Western Australia argued that Kwinana, Rockingham and Mandurah should be included in the assessment as the part of Perth's urban public transport network.

**B.32 Passenger Use – Concessional.** Western Australia argued that city-specific propensities for concession and student groups should not vary significantly, as most trips involve students attending local schools and concession people travelling to local facilities. They also argued the use of single city-specific propensities for all passenger groups.

**B.33 Passenger Use – Non-concessional.** Western Australia argued the policy neutrality of city-specific propensities and the exponential relationship between density and demand.

**B.34 Minimum Service Level.** Western Australia argued that the assessment method proposed in CGC 2001/10 did not provide insight into the relative impact of demand, minimum level of service and urbanisation. However, it noted that the net outcome was expected to be consistent with the general consensus as increased density reduced net costs.

**B.35 Urbanisation.** Western Australia argued that neither travel behaviour characteristics nor congestion cost approaches measure urbanisation cost and suggested the Commission seek a simpler assessment such as density.

**B.36 Infrastructure.** Western Australia believed that the infrastructure cost factor was not needed in addition to urbanisation and minimum service levels.

**B.37 Other disabilities.** Western Australia suggested the revenue raising capacities depend upon subsidy levels and that:

- urban form;
- employment concentration; and
- temporal concentration of demand (peak demand),

should also be included in the assessment.

*South Australia*

B.38 In general, South Australia supported the COP assessment as it had the advantage of reflecting what most States were doing, while offering a simpler and more transparent assessment.

B.39 **Revenue Raising Capacity.** South Australia suggested that cities with larger populations benefit from economies of scale and the gap between the costs and revenues was reduced. Therefore revenue raising capacity should be included in the proposed model.

B.40 **Propensity to use public transport.** South Australia suggested that the Commission use judgement based on the experience of State Urban Transit providers, rather than continuing to use the 1999 Review model for propensities.

B.41 **Concessional subsidies.** South Australia suggested that student cost weight should be decreased to 50 per cent.

B.42 **Non-concessional Passenger use.** South Australia was concerned about the application of non-concession city specific propensities to concession groups.

B.43 **Service Level.** South Australia suggested that data used in calculating service level needed to be updated annually and that revenue kilometres should be used instead of vehicle kilometres.

B.44 **Urbanisation.** South Australia suggested the removal of this factor from the assessment on the basis that it was heavily policy influenced and represented double counting with passenger use factor.

B.45 **Infrastructure costs.** South Australia supported assessing capital costs. However, it suggested that the current calculation overemphasised the impact of demand on infrastructure. It also suggested that interest rate disabilities faced by small States should be included in the assessment.

*Tasmania*

B.46 Tasmania's submission commented only on data availability. No comments were received in relation to the proposed assessment approach.

*Australian Capital Territory*

B.47 The ACT supported, in principle, the proposed change from gross expenditure and gross revenue assessment to one based on a net concessions and other payments (COP) approach, as this approach offered reduced complexity and increased transparency.

B.48 However, the ACT did not support the introduction of an urbanisation factor or the assessment of infrastructure costs.

**B.49 Passenger Use.** The ACT suggested that the current passenger use propensities derived for the 1999 Review should not be used as the propensities for New South Wales looked too high.

**B.50 Service Level.** The ACT supported the inclusion of such a factor, but argued that population rather than passenger numbers should be used in measuring the needs for the minimum service level.

**B.51 Urbanisation.** The ACT did not support the inclusion of an urbanisation factor in the assessment as it considered that the proposed urbanisation factor would double-count the impact of larger cities on urban transit operations. On the inclusion of an urbanisation factor, the ACT suggested that instead of the BTCE's congestion cost estimates, the Commission should use the key transport indicators.

**B.52 Infrastructure Costs.** The ACT did not support the inclusion of infrastructure costs. It argued that concessions per passenger declined as systems became larger and the benefits of large systems were reflected in the lower net cost per passenger.

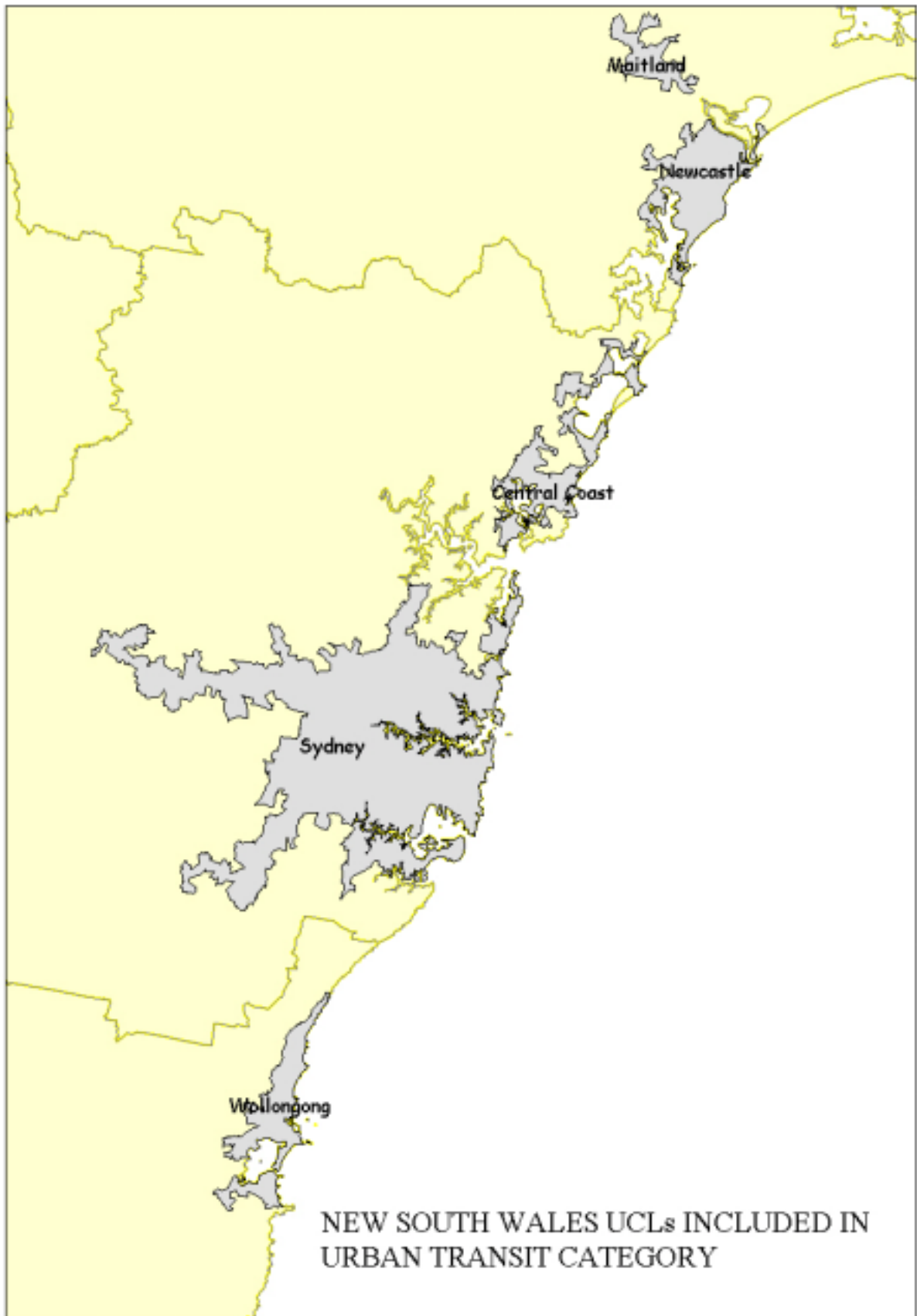
**B.53 National Capital influences.** The ACT supported the inclusion of the National Capital Influences factor. However, it believes that the annual allowance of \$1.5 million underestimates the full cost impact of Commonwealth policies. As a result, it requested an increase to \$2.8 million per annum.

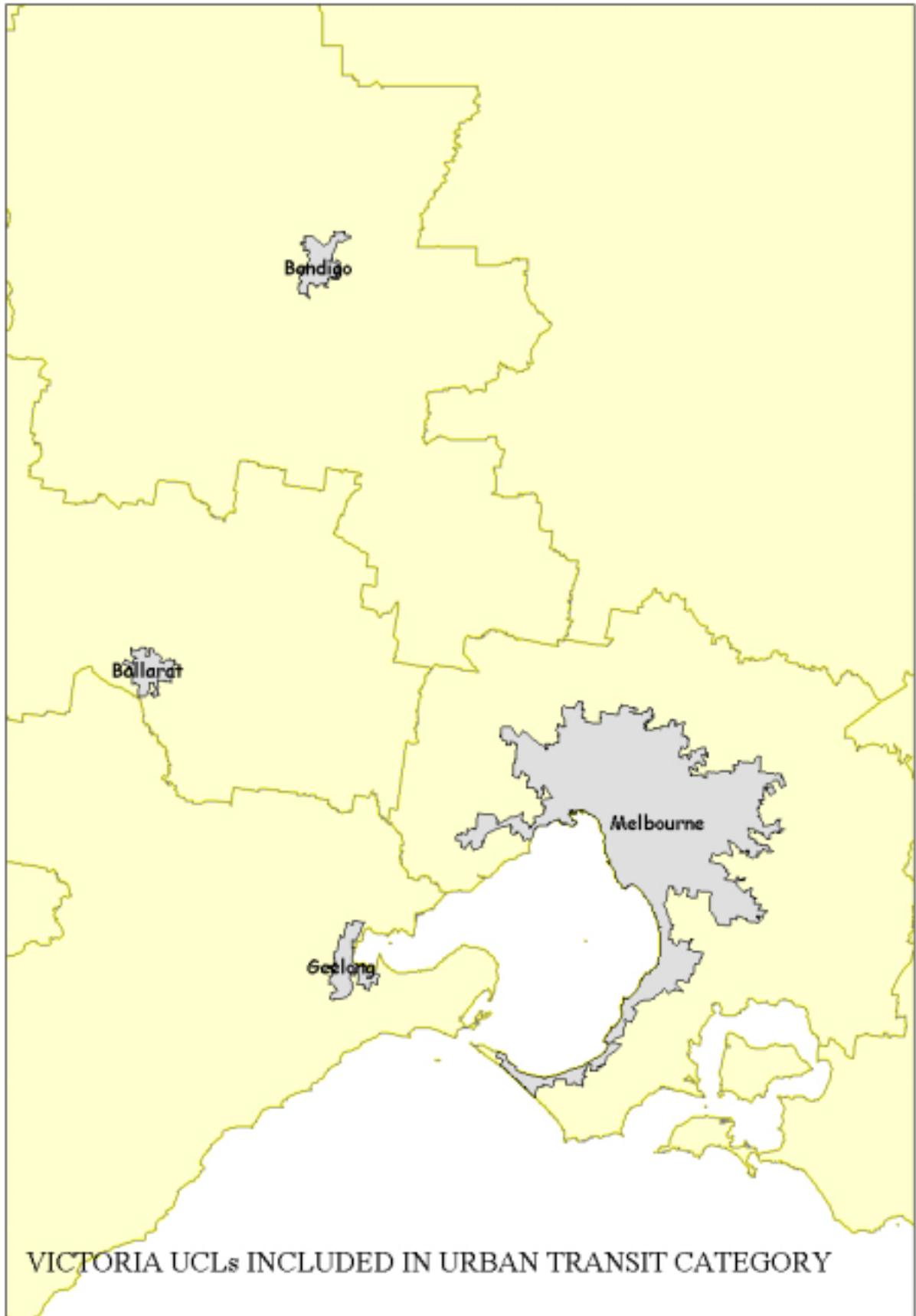
**B.54 Component weights.** The ACT argued that the weights presented in the discussion paper were biased towards States with larger urban transit systems.

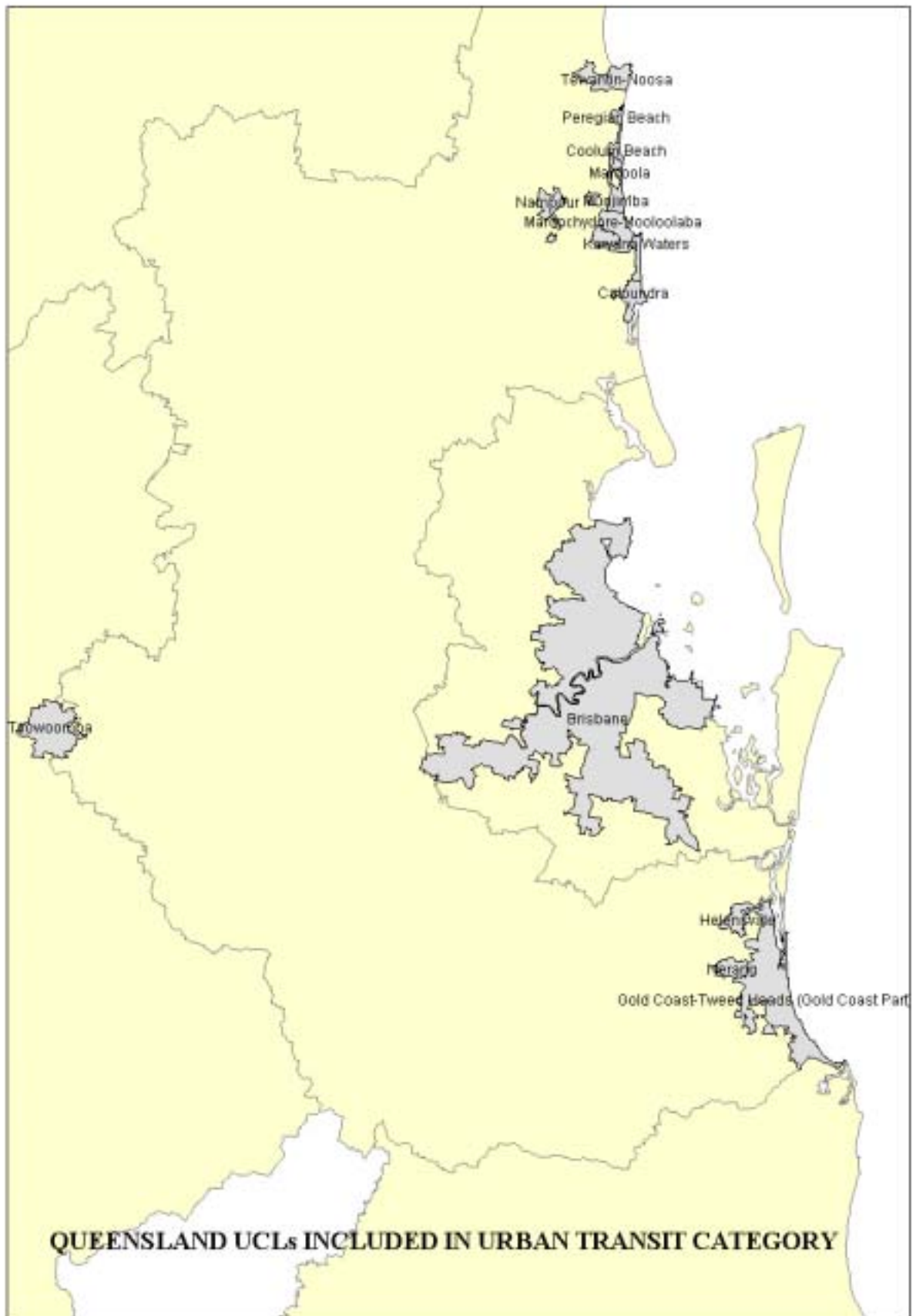
### *Northern Territory*

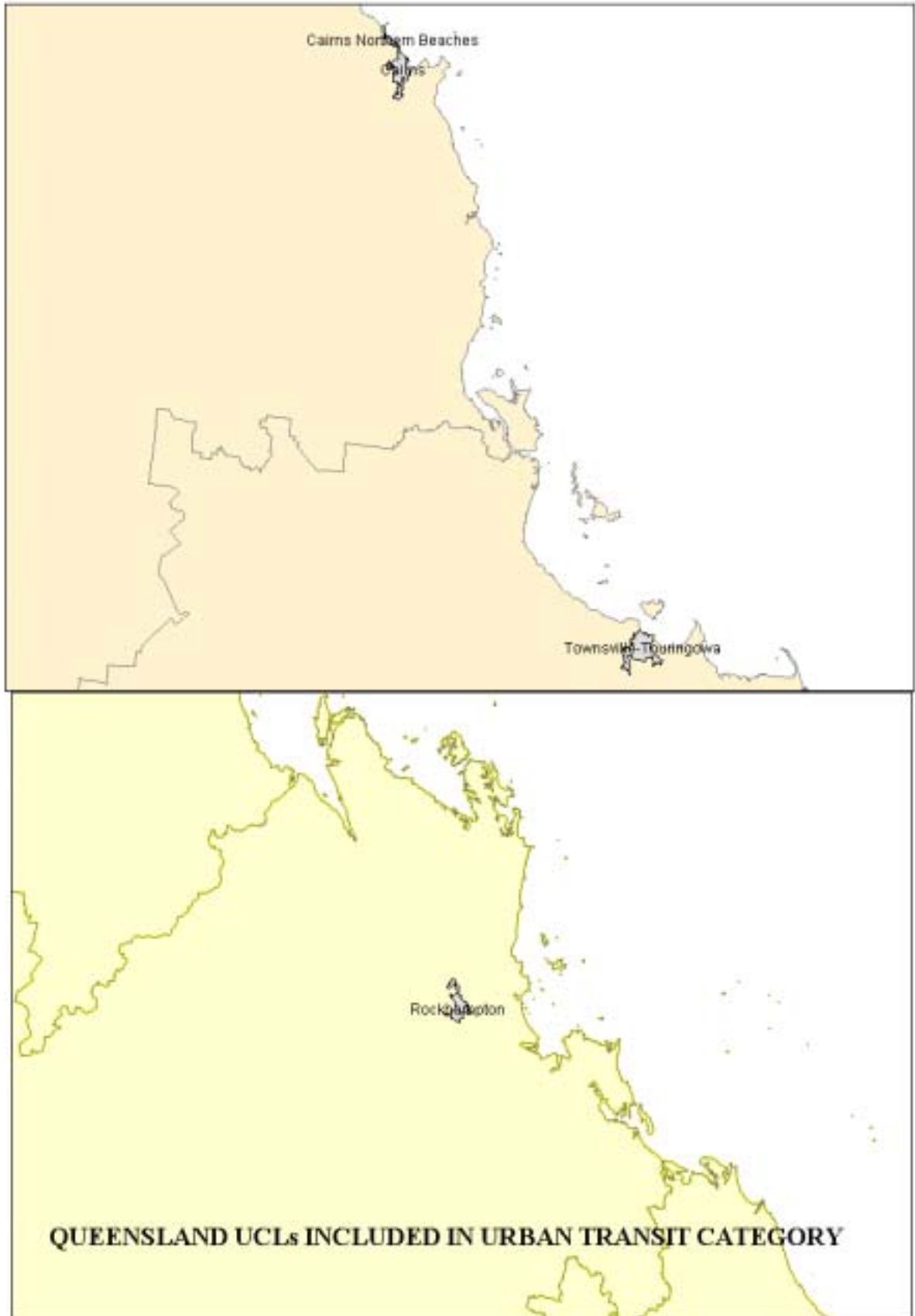
**B.55** The Northern Territory supported the treatment of urban transit in a way consistent with other PTE's operations. No detailed comments were received in relation to the assessment approach.

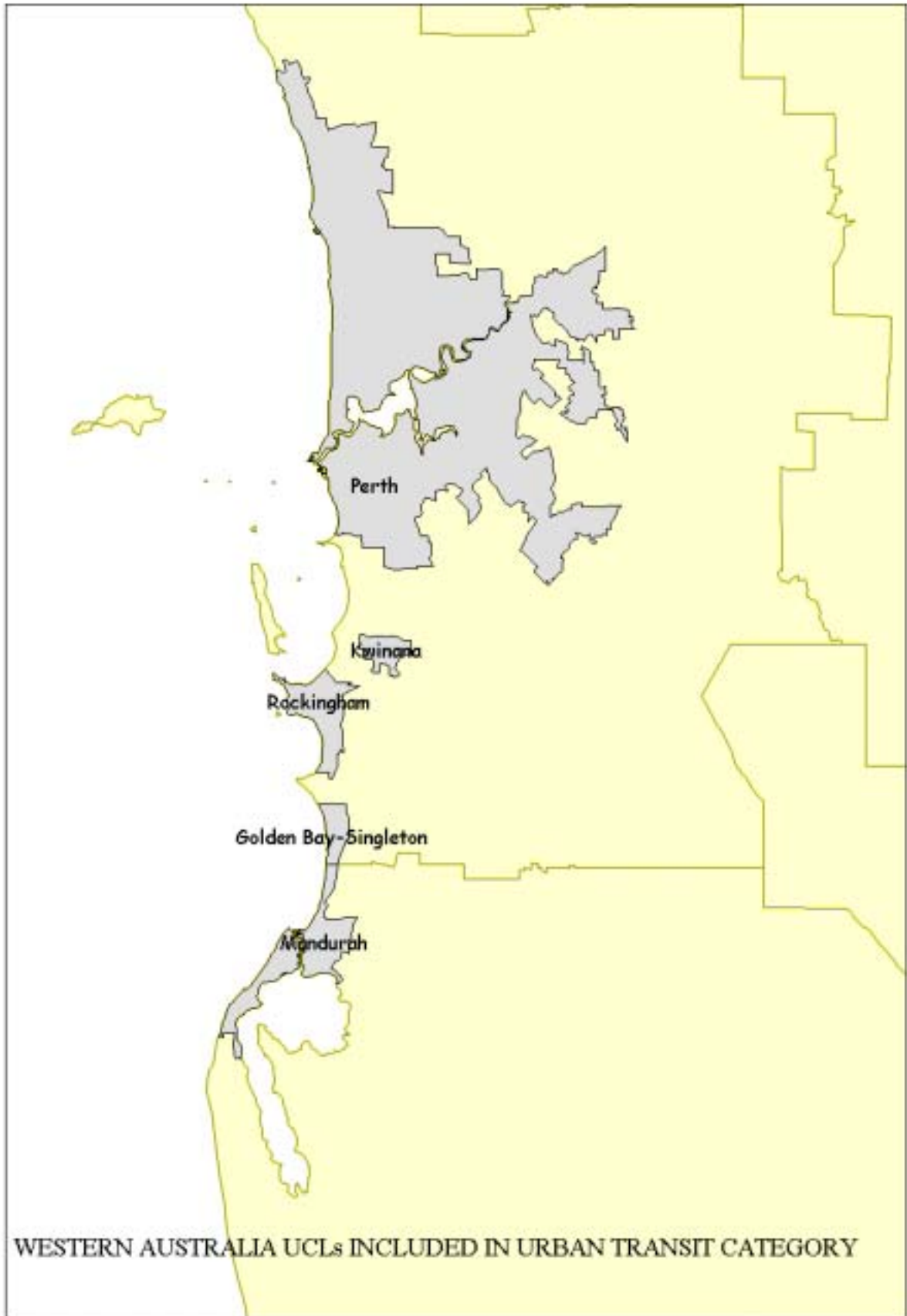
**MAPS OF UCLS INCLUDED IN URBAN TRANSIT CATEGORY**



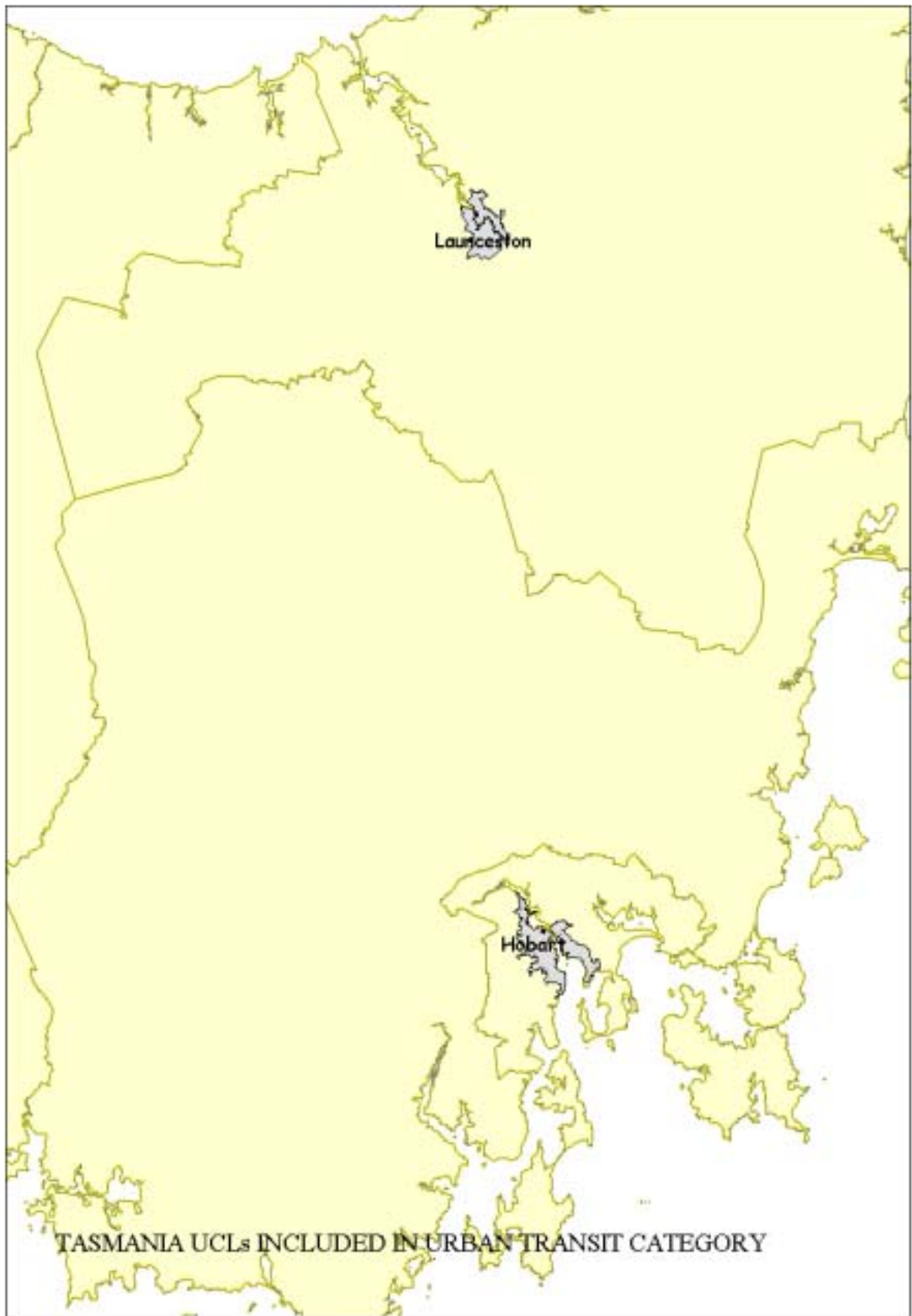


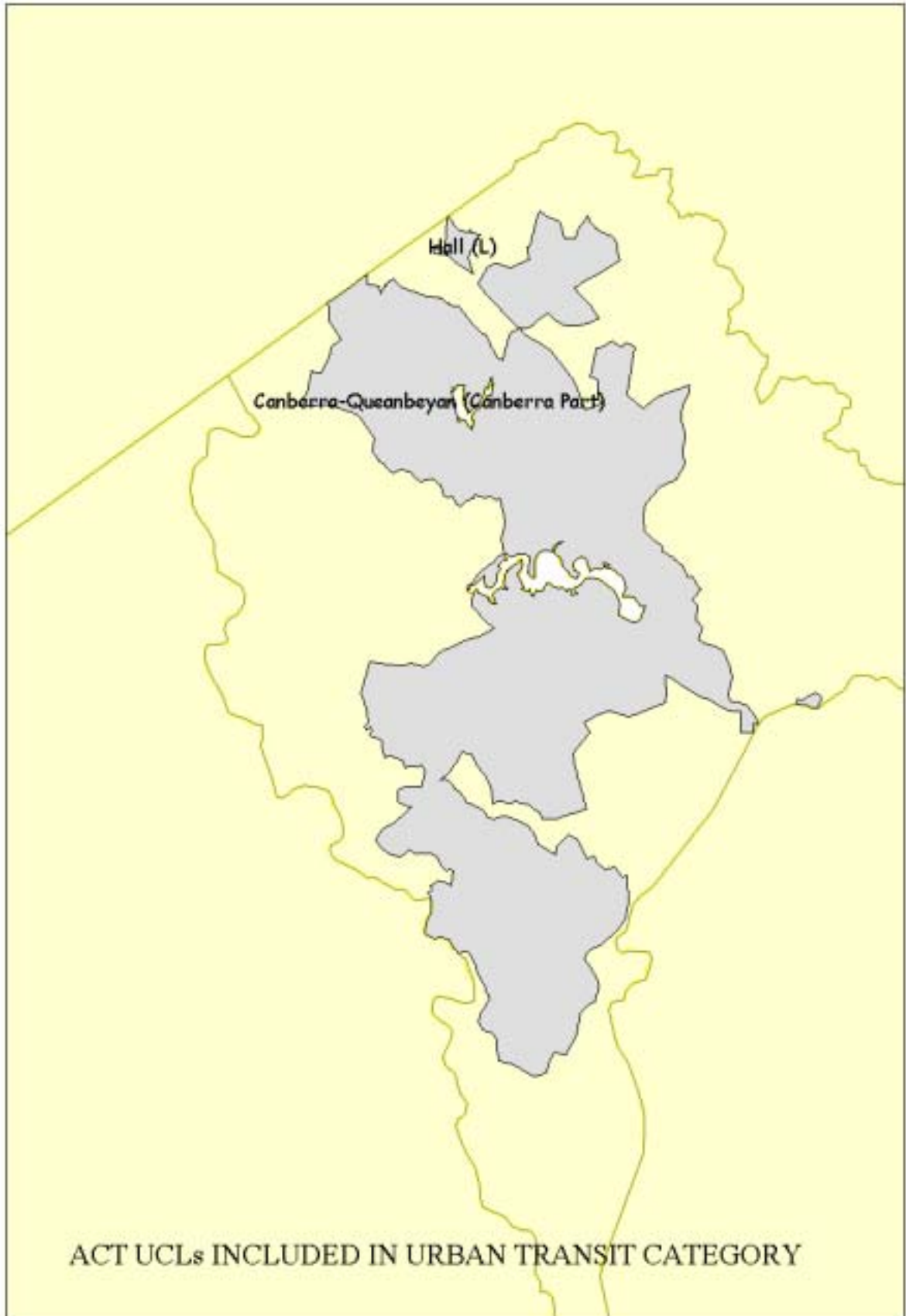


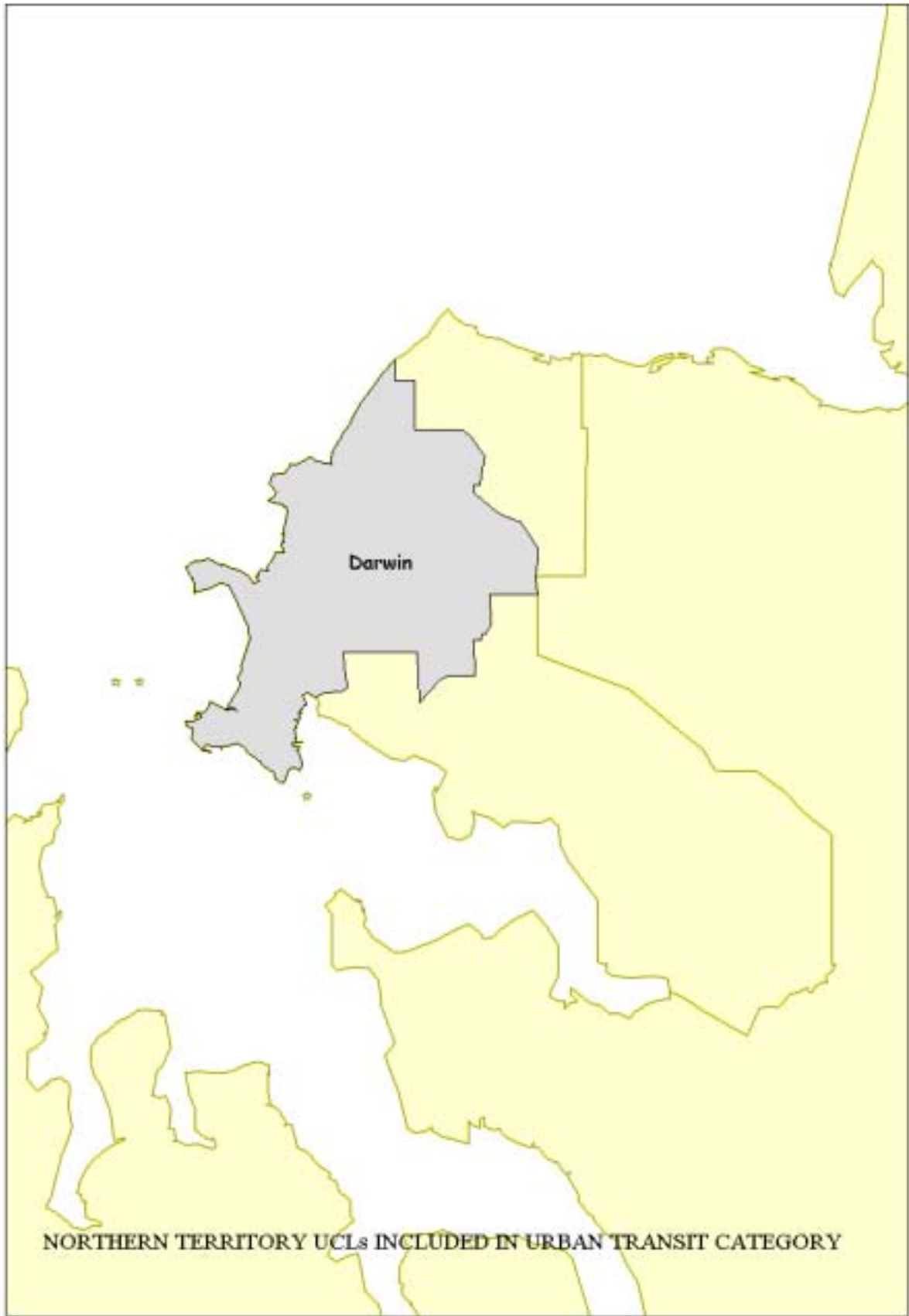












## DATA ADJUSTMENTS

D.1. In response to the Urban Transit special data request, States provided the most recent data on government subsidies, public transport patronage, infrastructure unit costs, infrastructure element quantities and values of urban transit related buildings.

D.2. Table D-1 shows bus transport data provided by the States in response to the urban transit special data request for the Review 2004.

**Table D-1** BUS TRANSPORT

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Bus stations/stops	11 363	11 200	TBA	23	7 400	5	2 846	570	
Bus Depots	14	40	35	16	11	3	2		
Number of Buses	1 906	1 725	1 463	933	788	202	347	43	7 407

Source: State response to 2004 Review urban transit data request

D.3. To standardise the data and to fill in the gaps, we have made the following adjustments to bus stops and depots data

D.4. For bus stops, Queensland did not provide data, and Western Australia and Tasmania did not have credible data. To make State bus stop data more comparable, we adjusted the number of bus stops in each State having regard to urban settlements population, area size, density and the availability of non bus transport modes. The adjusted data is shown in Table D-2.

**Table D-2** BUS STOP ADJUSTMENTS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Bus stops per 1000 urban population (actual)	2.81	3.59	NA	0.02	7.57	0.03	9.58	8.11
Bus stops per 1000 urban population (adjusted)	3.00	3.50	4.00	7.00	7.50	9.00	9.00	9.00
Bus stops (actual)	11 363	11 200	NA	23	7 400	5	2 846	570
Bus Stops (adjusted)	12 132	12 462	10 534	8 137	6 847	1 744	2 673	632

NA Not available

D.5. For depots, we attempted to standardised for the size of depots by assuming that a standard depot would hold 80 buses and each urban centre would require at least one depot. Table D-3 shows the actual and adjusted number of bus depot.

**Table D-3** BUS DEPOT ADJUSTMENTS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Number of Bus Depots (actual)	14	40	35	16	11	3	2	NA
Number of Buses (actual)	1906	1745	1463	933	788	202	347	43
Bus Depots (adjusted)	27	25	24	12	10	4	4	1

NA Not available

## BROAD INDICATORS ASSESSMENT – REGRESSION ANALYSIS

E.1. As an alternative approach, a regression analysis has been performed using the following available data:

- **dependent variable:** average annual subsidy 1995-96 to 2000-01;and
- **independent variables:** route kilometres, vehicle kilometres, urban density, capital asset value, 1996 passenger base, and 1996 State and urban populations.

**Table E-1** INPUT DATA FOR REGRESSION ANALYSIS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Average Annual Subsidy (\$m - 1995-2001)	1 232.59	535.91	472.59	252.52	177.83	18.65	44.52	7.43
Route kilometres (km)	4 867	4 717	1 296	2 048	1 281	567	2 153	600
Vehicle kilometres (million km)	330.62	141.23	75.47	61.96	47.29	14.01	23.22	9.08
Area (thousand hectares)	234 409	201 854	215 108	105 351	72 379	21 500	27 416	7 312
Density (person/ha)	17.25	15.43	9.79	11.41	13.51	9.01	10.83	9.61
Capital Asset Value (\$m)	22 836	6 743	5 013	1 337	1 680	41	131	15
Total passenger base (million-1996)	3.646	2.833	1.890	1.093	0.899	0.178	0.270	0.061
Total Population (million - Urban1996)	4.044	3.115	2.107	1.202	0.978	0.194	0.297	0.070
Total Population (million - State 1996)	5.996	4.406	3.239	1.702	1.435	0.464	0.298	0.177

Source: State budget documents, Departmental annual reports, ABS CDATA1996, State data returns for the 1999 Review and 2004 Review.

E.2. The analysis presented below is an example and only the beginning of the work on this approach. It showed that all variables have high correlations with each other, but most highly with subsidy levels (see Table E-2).

**Table E-2** CORRELATION COEFFICIENTS

	SUBSIDY	DENSITY	ROUTE_KM	AREA_HA	ASSET_VA	PAS_BASE	URB_POP	STATE_PO	VEH_KM
SUBSIDY	1.00000	0.80731	0.81076	0.87425	0.97904	0.95268	0.95428	0.96130	0.98363
DENSITY		1.00000	0.89799	0.65501	0.79873	0.83933	0.83641	0.81724	0.85794
ROUTE_KM			1.00000	0.72866	0.77851	0.87747	0.87548	0.85046	0.84877
AREA_HA				1.00000	0.76390	0.94702	0.94797	0.95120	0.78896
ASSET_VA					1.00000	0.88782	0.88976	0.89960	0.98946
PAS_BASE						1.00000	0.99997	0.99793	0.92209
URB_POP							1.00000	0.99827	0.92308
STATE_PO								1.00000	0.92631
VEH_KM									1.00000

E.3. Subsidy being the dependent variable, route kilometres (ROUTE\_KM), asset value (ASSET\_VA), urban population (URB\_POP) and area (AREA\_HA) are used as variables. The estimated regression coefficients are presented in Table E-3.

**Table E-3** REGRESSION COEFFICIENTS

Coefficients	Unstandardised Coefficients		Standardised Coefficients		t- statistics	Significance
	B	Standard Error	Beta			
(Constant)	-873 522.05	30 353 266.84			-0.029	0.979
ROUTE_KM	8 541.38	25 426.32	0.035		0.336	0.759
AREA_HA	1 414.08	838.69	0.322		1.686	0.19
ASSET_VA	3.98E-02	0.005	0.747		7.448	0.005
URB_POP	-13.09	93.11	-0.047		-0.141	0.897