



COMMONWEALTH GRANTS COMMISSION

DRAFT ASSESSMENT PAPER CGC 2003/46

ROADS

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NOTE

Included in this paper are the results of preliminary calculations based on the methods proposed throughout the paper and using the data currently available. Those results are indicative only and should be seen as work in progress. Ongoing changes are being made to standards and factor calculations as new data come to hand. Moreover, the calculations have been done using a prototype assessment system and are subject to ongoing revision as checking processes proceed.

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SUMMARY OF PROPOSED APPROACH

1. Because of the large number of components in this category, and the technical nature of some of the analysis, it may be helpful to identify the major issues for this category and the broad approach proposed by the Commission.

2. Broadly, the assessment structure and factors proposed for the 2004 Review are similar to those used in the 1999 Review. Differences are outlined in Table 40 of Commission decisions at the end of this paper.

3. With respect to the scope of the assessment, we draw your attention to the inclusion of expenses associated with national highways. Grants for national highways will be treated by inclusion and expenses will be assessed on an APC basis. Depreciation expenses (as defined by the ABS) will also be brought into the scope of the assessment and will be allocated to several components.

4. We note in particular the decision to change the data on which the road use and length factor is based. This was a difficult issue because we consider the approach used in the 1999 Review to be conceptually sound. However, we are concerned that the data used are not broadly based enough to provide a comprehensive picture of all States' needs. We have also proposed increasing the heavy vehicle weights used in that factor to provide a more accurate assessment of expenses associated with such traffic.

5. We have changed the weights used in the calculation of the physical environment factors for arterial roads and bridges. These are derived from a credible source and are more conservative than those derived from the analysis used in the 1999 Review.

6. Costs associated with urban influences are more fully reflected in the proposed approach. The arterial roads component will have needs assessed for maintenance and infrastructure cost differences, and the road safety component will have needs assessed for the costs of road safety measures in large cities. Urban traffic management costs will also be assessed.

INTRODUCTION

7. This paper presents a draft assessment for the Roads category for the 2004 Review. It builds on the staff proposals set out in *Discussion Paper 2002/34, The Roads Assessment* and State comments provided at the 2002 Conferences and in the 2003 Rejoinder Submissions. There is a separate Roads user charges assessment which is discussed at the end of this paper.

1999 REVIEW APPROACH

8. In the 1999 Review, the Roads category included expenses on the maintenance and rehabilitation of roads and bridges that were the responsibility of the States, road safety, and other transport activities such as driver licensing, motor vehicle registration and transport planning. Road rehabilitation expenditure was included in this category partly to overcome classification problems (some States treat some tasks as maintenance while others treat them as rehabilitation) and partly because it was thought to reflect depreciation costs. The category excluded expenditure on national highways (a responsibility of the Australian Government) and roads that were the responsibility of local authorities.

9. More specifically, the category included expenses on:

- (i) road safety;
- (ii) collection of vehicle registration and driver licensing fees;
- (iii) vehicle safety inspection;
- (iv) size and load specifications;
- (v) granting of franchises and frequency of operations;
- (vi) maintenance of roads undertaken by the State; and
- (vii) planning and design of roads and bridges, including engineering advice to State authorities, and the cost of administering contracts associated with the upkeep of roads, highways and bridges, where the State had primary financial responsibility.

10. The category also included costs associated with asset preservation, such as:

- (i) line marking, pot-hole repair and resealing of roads;
- (ii) maintenance as a result of flooding or other natural disasters;
- (iii) recurrent maintenance of roads and bridges where the purpose was to preserve, not upgrade, the initial condition of the road;
- (iv) maintenance of plant, equipment, traffic lanes and traffic signs;
- (v) maintenance of road surrounds (including noxious weed and plant control, replacement and protection of planted trees); and
- (vi) reimbursements to local authorities of expenditures undertaken by them on roads which were a State responsibility.

11. Reimbursement of State expenses by the Australian Government and local authorities on roads that were their responsibility was netted off.

12. Table 1 shows the gross standard expenses for six financial years. In 2001-02, this category represented 2.97 per cent of total gross standard expenses.

Table 1 ROADS CATEGORY — GROSS STANDARD EXPENSES

	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02
\$pc	124.16	130.39	135.24	137.95	149.82	148.96
% of total gross standard expenses	3.37	3.38	2.97	2.98	3.08	2.97

13. *Assessment structure.* The 1999 Review assessment structure is summarised in Table 2. The major components of the assessment related to the maintenance of arterial roads, other transport (which included policy, planning and management of the road networks), road safety (mainly road safety campaigns) and bridges. Disability factors were assessed using the general method for administrative scale, input costs, dispersion and land rights. Category specific disability factors were assessed for road use, road length, physical environment, urban influences, bridge maintenance, local road maintenance and socio-demographic composition.

14. Compared to an equal per capita assessment, the 2003 Update Roads assessment redistributed \$153 million away from Victoria, Queensland, South Australia and the ACT to the other States.

Table 2 ROADS — ASSESSMENT STRUCTURE, 2003 UPDATE

Expenditure component	Component weight	Factors	Basis of calculation
	%		
Fixed costs	2.95	Input costs	General method with weights of 80% for wages, 2% for accommodation and 1% for electricity.
Arterial roads	62.82	Administrative scale	General method.
		Dispersion	General method.
		Input costs	General method with weights of 60% for wages, 2% for accommodation and 1% for electricity.
		Road use, length and environment	Based on the effects of road use and the environment on maintenance costs per kilometre.
Bridges	6.50	Urban influences	Based on effects of urban influences in adding to the cost of maintaining very heavily trafficked roads.
		Dispersion	General method.
		Input costs	General method with weights of 60% for wages, 2% for accommodation and 1% for electricity.
		Bridge maintenance	Based on deck area of bridges and standard cost per square metre.
Local roads	1.50	Physical environment	General method.
		Dispersion	General method.
		Input costs	General method with weights of 60% for wages, 2% for accommodation and 1% for electricity.
Other transport	19.00	Local road maintenance	Based on the standardised length of non-arterial roads.
		Dispersion	General method.
		Input costs	General method with weights of 60% for wages, 2% for accommodation and 1% for electricity.
Road safety	7.00	Urban traffic control	By judgement, 2 per cent disability for NSW and Victoria.
		Dispersion	General method.
		Input costs	General method with weights of 60% for wages, 2% for accommodation and 1% for electricity.
Land rights	0.02	Socio-demographic composition	Based on State adult population with a weight of three applied to Indigenous Australians.
		Land rights	General method.
Native title administration	0.02	Native title	General method.
Isolation	0.19	Isolation	General method.

15. ***Specific Purpose Payments.*** In the 2003 Update there were three SPPs relating to the Roads category. The first, 'Roads to Recovery — Unincorporated Areas' was treated by exclusion. The two others, 'Road Program-National Highways' and 'Road Safety Blackspots — States' were treated as out of scope.

PROPOSED CATEGORY DEFINITION AND ASSESSMENT STRUCTURE

Category definition — Addition of road depreciation expenses and expenditure on national highways

16. ***1999 Review.*** The Commission used roads rehabilitation expenditure as a proxy for roads depreciation expenses. Road pavement depreciation expenses were not included in the equalisation budget.

17. The Commission viewed the decision as a 'phasing-in' of the depreciation assessment and said that it would be reconsidered in the next review with the aim of obtaining a more accurate estimate of roads depreciation.

18. ***State views.*** Western Australia asked the Commission to consider a depreciation assessment for roads. It said that the assessment of road rehabilitation expenses did not replace a depreciation assessment because rehabilitation expenses fell well short of depreciation expenses.

19. ***Staff proposal.*** In *Agenda Paper 2003/151 Roads*, staff proposed excluding national highways depreciation expenses from the Roads standard. Staff also proposed including depreciation expenses on roads in the equalisation budget and classifying the expense to the Roads category as a separate expenditure component. Disability assessments specifically developed for this component would be applied.

20. To avoid double-counting, it was proposed that road rehabilitation expenditure (National Road Transport Commission's 'Category D') be removed from the equalisation budget.

21. ***Further State views. Depreciation expenses.*** In rejoinder submissions, New South Wales, Queensland, Western Australia, South Australia, and the Northern Territory supported the replacement of 'Category D' costs with States' depreciation expenditures. Although supportive, some States were concerned with the data and noted that there were significant differences in the methods States used to derive the depreciation figures included in the GFS data on roads.

22. New South Wales said that the 'Category D' expenditure should be replaced with road depreciation expenses only after issues relating to the consistency of data, different depreciation methods and different valuation and re-valuation methods were adequately addressed. It argued for the need to have a consistent definition of depreciation and a consistent coverage of roads included in the calculation.

23. *National highways.* South Australia said that GFS Road Depreciation expenses included depreciation expenses on national highways located within State boundaries.

24. South Australia said:

- (i) in the 1960s responsibilities for road funding were split between the Australian Government, State and local governments. The States did not, however, transfer the national highways within their boundaries to the Australian Government;
- (ii) it constructs and maintains national highways within its boundaries and its expenses are reimbursed by the Australian Government; and
- (iii) those national highway assets are held on its balance sheet. Both national highway expenses and the depreciation relating to them are included in the State's operating statements. South Australia said this implied the State owns those national highways assets.

25. South Australia said if the Commission were to treat the Roads SPP by exclusion, the depreciation expenses on national highways should be removed from the depreciation standard. South Australia said it could provide an estimate of depreciation expenses on national highways.

26. Queensland confirmed the same treatment. It said the national highways within its boundaries were considered to be State assets and it included the related depreciation expenses in its operating statements. It could provide an estimate of depreciation expenses on national highways.

27. *Analysis. Depreciation.* The ABS has redefined the GFS data in relation to roads expenses. It now includes both rehabilitation and depreciation in the operating statement. Because GFS is the basic source of our financial data, we propose to follow the ABS approach and include both expenses in the Roads category.

28. *National highways.* Information provided by the States indicates that treating national highways as State assets and including depreciation of them in operating statements is the standard policy. Since national highways are recorded as State assets, and revenues and expenses (including depreciation) have a direct impact on State accounts, the Commission has decided that the SPPs for national highways should be treated by inclusion. This is consistent with the treatment applied to other capital SPPs that create State assets. An equivalent amount of expenses would be left in the Roads category. Because the Australian Government currently funds national highways, the Commission considers that the expenses associated with national highways should be assessed on an actual per capita basis. As long as the Australian Government meets all the expenses of national highways, this assessment would offset the effect of treating the SPP by inclusion on the relativities. However, it will affect the Roads category factor.

29. *Commission decisions.* The Commission accepts that a conceptual case exists for including **depreciation** expenses in the Roads category. It acknowledges that the ABS GFS data now include both rehabilitation and depreciation in the operating statement. Because GFS

is the basic source of our financial data, the Commission proposes to follow the ABS approach and include both types of expense in the Roads category. Depreciation expenses will be allocated to all category-specific components.

30. The Commission also considers that a strong conceptual case exists for treating SPPs for **national highways** by inclusion. The standard policy is to treat national highways as State assets and the expenses relating to them, including depreciation, are in their accounts. Because national highway transactions affect State budgets, and consistent with the treatment of other capital SPPs used to fund State assets used in the provision of State-type services, the Commission has decided to treat the SPPs for national highways by inclusion. It has also decided to use the actual per capita method to assess a separate component of Roads expenses.

31. The definition of the Roads category for the 2004 Review will be expenses on the maintenance and depreciation of roads and bridges that are the responsibility of the States, road safety, and other transport activities such as driver licensing, motor vehicle registration and transport planning. The category will include expenditure on national highways and exclude roads that are the responsibility of local authorities.

Assessment structure

32. The structure proposed for the 2004 Review is the same as that used in the 2003 Update except for the addition of a national highways component. Table 3, below, outlines the Commission decisions for the proposed category structure and presents the proposed component weights, which were derived according to each component's share of total expenses.

Table 3 COMMISSION DECISIONS – CATEGORY DEFINITION, ASSESSMENT STRUCTURE AND COMPONENT WEIGHTS

Decision	Reason
<p>Definition: Unchanged from 2003 Update, except that:</p> <ul style="list-style-type: none"> • road depreciation expenses will be included; and • expenses for national highways will be included. 	<p>We propose to allocate road depreciation expenses to the Roads category as ABS GFS data now includes both rehabilitation and depreciation expenses in the operating statement and ABS GFS expenses are the basic source of our financial data.</p> <p>We propose to include expenses for national highways in a separate component. This is because national highway transactions affect State budgets, and it is consistent with the treatment of other capital SPPs used to fund State assets used in the provision of State-type services.</p>
<p>Assessment structure and component weights</p> <p>Fixed costs expenditure — 0.89%</p> <p>National highways — 28.26%</p> <p>Arterial roads — 32.39%</p> <p>Bridges — 3.58%</p> <p>Local roads — 0.98%</p> <p>Other transport 26.81%</p> <p>Road safety — 6.99%</p> <p>Land rights — 0.00%¹</p> <p>Native title — 0.03%</p> <p>Isolation — 0.06%</p>	<p>These weights reflect each component’s share of total expenditure.</p>

33. ***Specific Purpose Payments.*** In the 2004 Review there will be three SPPs relating to the Roads category, the same as for the 2003 Update. However, the treatment of two of the SPPs will change for the 2004 Review. The 2004 Review SPPs and their treatments are presented below.

- (i) The ‘Roads to Recovery — Unincorporated Areas’ will be treated by exclusion.
- (ii) The ‘Road Program — National Highways’ will be treated by inclusion.
- (iii) ‘Road Safety Blackspots — States’: the State roads portion of the SPP will be treated by inclusion and the local roads portion will be treated as out of scope.

34. Table 4 summarises the proposed assessment for the 2004 Review.

¹ Please note that this component weight may vary between updates.

Table 4 2004 REVIEW PROPOSED ROADS ASSESSMENT STRUCTURE

Expenditure Component	Component weight	Factors	Basis of calculation
	%		
Scale-affected expenditure	0.90	Input costs	General method with weights of 80% for wages, 2% for accommodation and 1% for electricity.
		Administrative scale	General method.
National highways	28.26	National highways	Actual Per Capita (APC) assessment
Arterial roads	32.39	Dispersion	General method.
		Input costs	General method with weights of 60% for wages, 2% for accommodation and 1% for electricity.
		Road use and length	Based on average vehicle kilometres travelled with weights for heavy vehicles.
		Physical environment	Based on the effects of climate and soil type.
		Urban influences	Based on the proportion of urban arterial road length in each State.
		Urban complexity	Based on higher infrastructure and depreciation costs in Sydney.
Local roads	0.99	Dispersion	General method.
		Input costs	General method with weights of 60% for wages, 2% for accommodation and 1% for electricity.
		Local road maintenance	Based on the standardised length of non-arterial roads.
Bridges	3.58	Dispersion	General method.
		Input costs	General method with weights of 60% for wages, 2% for accommodation and 1% for electricity.
		Bridge operations	Based on deck area of bridges, culverts and tunnels and standard cost per square metre.
		Physical environment	Based on the effects of climate and soil type.
Road safety	6.99	Dispersion	General method.
		Urban influences	Based on the proportion of urban arterial road length in each State.
		Input costs	General method with weights of 60% for wages, 2% for accommodation and 1% for electricity.
Other transport	26.81	Dispersion	General method.
		Input costs	General method with weights of 60% for wages, 2% for accommodation and 1% for electricity.
		Urban influences	Judgement to allow for traffic management measures.
Native title	0.03	Native title	General method.
Land rights	0.00	Land rights	General method.
Isolation	0.06	Isolation	General method.

FIXED COST EXPENSES COMPONENT

35. In the 1999 Review, administrative scale and input costs factors were applied to this component. We propose to continue this approach.

Administrative scale

36. **1999 Review.** The administrative scale factor accounted for differences in per capita costs of providing central office functions and whole of State services. Scale-affected expenses for this category were assessed as \$8 million, of which \$4 million was considered as fixed cost and \$4 million as variable cost. The scale-affected expenses component represented 2.95 per cent of expenses in this category.

37. **2004 Review.** *Draft Assessment Paper 2003/60 Administrative Scale* discusses the issues raised by the States regarding the assessment of this factor. The States did not raise issues specific to this category. The paper sets out the Commission's decisions on the general method of assessment adopted for the 2004 Review and the size of the fixed cost component in each category. The Commission has decided that administrative scale will be assessed for this category.

38. The administrative scale factors for this category, shown in Table 5, have been calculated according to the general method outlined in *Draft Assessment Paper 2003/60 Administrative Scale*. Minimum fixed cost for this category has been estimated to be \$5 million for each State, which represents 1.49 per cent of the category standard.

Table 5 ADMINISTRATIVE SCALE FACTORS — FIXED COST COMPONENT

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
1997-98	0.36858	0.50382	0.68027	1.28668	1.56812	4.92560	7.52310	12.32319
1998-1999	0.36853	0.50445	0.67767	1.28097	1.57795	4.99478	7.55742	12.25346
1999-2000	0.36854	0.50478	0.67478	1.27836	1.58830	5.05782	7.57230	12.19839
2000-01	0.36846	0.50489	0.67161	1.27768	1.60144	5.12202	7.57722	12.18130
2001-02	0.36891	0.50461	0.66745	1.27717	1.61320	5.17750	7.59249	12.25311

Input costs

39. **1999 Review.** The input costs factor was assessed to account for differences between States in per capita costs of labour, office accommodation and electricity. A separate

factor was calculated for each type of input and the following standard expense proportions were applied to each of the factors assessed for the fixed cost component:

- (i) wages and salaries 80 per cent;
- (ii) accommodation 2 per cent; and
- (iii) electricity 1 per cent.

40. **2004 Review.** *Discussion Paper CGC 2003/04 Input Costs* sets out the issues raised by the States regarding the assessment of wages and salaries costs. The paper sets out the Commission's proposals for the general method of assessment to be adopted for the 2004 Review. *Draft Assessment Paper CGC 2003/79 Input Costs - Electricity and Accommodation* sets out the Commission's decisions on the general method of assessment to be adopted for the 2004 Review and on the size of the standard expense proportions in each category for accommodation costs and electricity costs. The States did not raise issues specific to this category.

41. The Commission considered that the prices of labour, accommodation and electricity used in providing services differ across States for reasons beyond the control of individual States. It has therefore decided that input costs will be assessed for this component.

42. The input costs factors for the fixed cost component of this category, shown in Table 6 have been calculated according to the 2004 Review general methods. The standard expense proportions applied were 80 per cent for wages and salaries, 2 per cent for accommodation and 1 per cent for electricity.

Table 6 INPUT COSTS FACTORS — FIXED COST COMPONENT

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
1997-98	1.03086	0.98776	0.98243	0.98229	0.97405	0.93225	1.00817	1.11439
1998-99	1.03267	0.98876	0.98050	0.97883	0.97213	0.92981	1.01243	1.10979
1999-2000	1.03546	0.98791	0.97763	0.98082	0.96857	0.92317	1.01680	1.10513
2000-01	1.03603	0.98930	0.97573	0.98076	0.96738	0.92031	1.01603	1.10244
2001-02	1.03498	0.99044	0.97446	0.98186	0.97135	0.92001	1.01306	1.09897

NATIONAL HIGHWAYS COMPONENT

1999 Review method

43. As noted above, expenditure on national highways was not included in the scope of the category.

Commission decision

44. As noted above, the Commission has decided to include expenditure on national highways in a separate component, and assess needs on an APC basis.

Proposed method and results

45. The following table shows the factors to be applied to this component. Because they were calculated on an actual per capita basis, they can be volatile.

Table 7 NATIONAL HIGHWAYS FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
1996-97	1.06823	0.58060	1.33502	0.93063	0.98984	1.28665	0.83083	3.28483
1997-98	1.15920	0.46765	1.18307	0.91288	1.39186	1.32894	0.18145	3.65473
1998-99	1.06123	0.49542	1.21304	1.02057	1.45037	1.42998	0.86909	2.83178
1999-2000	1.09892	0.43119	1.32823	0.89505	0.92002	1.65269	2.02096	3.93485
2000-01	1.10169	0.43630	1.62772	0.86125	0.69571	1.61020	0.25702	3.23367
2001-02	0.95657	0.96448	1.24899	0.91413	0.66643	0.82918	0.88736	2.67739

46. **Reality check.** The factors reflect the Australian Government's assessment of States' needs.

47. **Updateability.** The factors will be updated annually.

ARTERIAL ROADS

48. This component covers expenses incurred in maintaining and depreciating major State roads. In the 1999 Review, four factors were applied to the arterial roads component:

- (i) dispersion;
- (ii) input costs;
- (iii) road use, length and environment; and
- (iv) urban influences.

49. We propose to continue to apply dispersion and input costs, along with a road use and length factor, a physical environment factor, an urban influences factor and an urban complexity factor. Each is discussed below.

Dispersion

50. **1999 Review.** The dispersion factor was assessed to account for differences in per capita costs of service provision associated with the spread of population. The dispersion factor thus reflected the combined differences in State expenses associated with telecommunication, freight, travel and other costs relating to providing services to dispersed localities.

51. There were seven indexes in the dispersion factor, each reflecting interstate differences in a separate type of dispersion related cost. The dispersion factor for the component was derived by weighting each index by the proportion of standard expenses accounted for by the relevant dispersion-affected cost and combining the results. The proportions of standard expenses estimated for this component are shown in Table 8.

Table 8 COST WEIGHTS FOR DISPERSION, 2003 UPDATE

Telephone	Freight	Air Travel	Road Travel		Remote Removals	Locality Allowances
			Inter Regional	Local		
0.01489	0.00721	0.00448	0.02405	0.02014	0	0.00465

Source: 2003 Update Working Papers, Volume 5, p.117.

52. **2004 Review.** *Draft Assessment Paper 2003/63 Dispersion* discusses the issues raised by the States regarding the assessment of this factor. The States did not raise issues specific to this category. The paper sets out the Commission’s decisions on the general method of assessment adopted for the 2004 Review and the size the of the standard expense proportions estimated for each of the nine elements of dispersion-affected expenses in each category. Since arterial roads are provided throughout each State, the Commission has decided that dispersion will be assessed for this component.

53. The dispersion factors for this component have been calculated according to the general method outlined in *Draft Assessment Paper 2003/63 Dispersion*. There were nine indexes within the dispersion factor for the 2004 Review. Table 9 shows the proportions of standard expenses estimated for each of the nine elements of dispersion-affected expenses for this component.

Table 9 COST WEIGHTS FOR DISPERSION, ARTERIAL ROADS COMPONENT

Telecommunication		Freight, General	Air Travel	Road Travel		Repairs and Maintenance	Remote Staff Turnover	Locality Allowances
Voice	Non-voice			Inter Regional	Local			
0.34	0.33	0.08	0.24	0.25	0.84	0.24	0.07	0.14

54. Table 10 shows the dispersion factors assessed for this component for the 2004 Review.

Table 10 DISPERSION FACTORS — ARTERIAL ROADS COMPONENT

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
1997-98	0.99765	0.99352	1.00616	1.01084	0.99583	0.99553	0.98281	1.09379
1998-99	0.99763	0.99350	1.00614	1.01082	0.99580	0.99551	0.98279	1.09377
1999-2000	0.99761	0.99348	1.00612	1.01080	0.99579	0.99549	0.98277	1.09375
2000-01	0.99760	0.99347	1.00611	1.01079	0.99578	0.99548	0.98276	1.09374
2001-02	0.99760	0.99346	1.00610	1.01078	0.99577	0.99547	0.98275	1.09373

Input costs

55. **1999 Review.** The following standard expense proportions were applied to each of the factors assessed for this component:

- (i) wages and salaries 60 per cent;
- (ii) accommodation 2 per cent; and
- (iii) electricity 1 per cent.

56. **2004 Review.** The input costs factors for the arterial roads component of this category, shown in the following table have been calculated according to the general method outlined in *Discussion Paper CGC 2003/04 Input Costs* and in *Draft Assessment Paper CGC 2003/79 Input Costs – Electricity and Accommodation*. The standard expense proportions applied were 60 per cent for wages and salaries, 2 per cent for accommodation and 1 per cent for electricity.

Table 11 INPUT COSTS FACTORS — ARTERIAL ROADS COMPONENT

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
1997-98	1.02347	0.99051	0.98643	0.98734	0.98043	0.94629	1.00588	1.09164
1998-99	1.02483	0.99126	0.98499	0.98475	0.97899	0.94446	1.00907	1.08820
1999-2000	1.02692	0.99063	0.98283	0.98624	0.97632	0.93948	1.01235	1.08470
2000-01	1.02735	0.99167	0.98141	0.98620	0.97543	0.93734	1.01177	1.08268
2001-02	1.02656	0.99252	0.98046	0.98702	0.97840	0.93711	1.00954	1.08008

Road use and road length

57. **1999 Review.** The Australian Roads Research Board (ARRB) supplied data on road use from a sample of about 80 arterial road sections. These were used to estimate the standard cost for each unit of road use (measured in terms of Average Annual Daily Traffic

(AADT)). The data were provided for three types of traffic — light, heavy and super heavy vehicles. Each traffic type was weighted according to its relative impact on road maintenance costs.

58. **State views.** Several States argued that the road use data provided an inconsistent and inaccurate measure. Western Australia also questioned the weights applied to heavy and super-heavy vehicles.

59. **Staff proposals.** In *Discussion Paper 2002/34, Roads*, staff agreed that the AADT data used in the 1999 Review assessment were deficient in that they were not representative of the entire State road network. Staff suggested two options:

- (i) continue with AADT in the hope that new data might prove more satisfactory and in light of other measures being inadequate; or
- (ii) find a new measure of road use.

60. The following measures were suggested by Victoria:

- (i) average vehicle kilometres of travel (AVKT), which the Commission used prior to the 1999 Review (its use was discontinued in the 1999 Review because road use and road length were assessed separately, and AVKT incorporates both);
- (ii) tonne kilometres (TK), reflecting mass of freight moved; and
- (iii) equivalent standard axle-kilometres (ESA).

61. **Further State views.** South Australia, Tasmania, the ACT, and the Northern Territory supported the continued use of AADT data. New South Wales, Victoria, Queensland and Western Australia supported the use of alternative methods.

62. New South Wales argued that road use was better measured by volume, distance and load. New South Wales said that tonne-kilometres were the best measure for road use, but noted that ABS data for tonne-kilometres were not available for arterial roads only. It suggested that the Commission investigate whether tonne-kilometre data could be obtained specifically for State arterial roads. New South Wales said that the best alternative to tonne kilometres was equivalent standard axle kilometres.

63. New South Wales said that many roads, sometimes with low AADTs, still undertook an arterial function (for example they provide a network availability function for regional communications and trade).

64. New South Wales supported arterial road maintenance being disaggregated into urban and rural roads in the Roads assessment.

65. Victoria suggested incorporating up to date information on aggregate distance travelled by vehicles and the extent of road use, not just road length. It noted that the National Road Transport Commission (NRTC) had developed and applied a more credible methodology

for attributing road agency costs. The data used by the NRTC were collected by the ABS reflecting:

- (i) vehicle kilometres of travel;
- (ii) tonnes kilometres (reflecting mass of freight moved); and
- (iii) equivalent standard axle-kilometres (ESA-KM).

66. Victoria asked that an adjustment be introduced for costs associated with maintaining different types of road surface. It noted that road surface was not a policy matter but was dictated by traffic density, travel time and road safety considerations. The choice of road surface adopted by road agencies and the standard to which these surfaces are maintained, are reflections of different service and safety requirements associated with the functions of different roads. Road surface type and condition affect overall safety, vehicle operating speed and the vehicle operating costs incurred by users.

67. Victoria said that the average maintenance and asset renewal costs for gravel roads were about six times greater than for a natural surface. The costs for sealed roads in rural shires were twice as great as gravel roads. The costs for sealed roads in Melbourne were four times greater again. It noted that the Princes Highway between Melbourne and Geelong is one of the busiest rural arterial roads in Australia, and that it is economically impractical to provide anything other than a multi-lane sealed road.

68. Queensland said that although the use of AADT data was problematic, ESA or tonne-kilometres involved greater complexity in obtaining accurate data. Queensland preferred using average vehicle kilometres travelled (AVKT) because it was a better indicator of road use and maintenance needs.

69. Queensland said that if AADT or AVKT were used for the measures of road use, then vehicles weights would continue to be required. Queensland said data to indicate the impact of heavy vehicles was not available in the State. At the November Conference Queensland supported a weight of 70 for super heavy vehicles.

70. Western Australia suggested the Commission consider the use of the ABS survey of Motor Vehicle Use (SMVU), although it acknowledged that some problems were evident with that data.

71. Western Australia argued in its rejoinder submission that if AADT were retained, a weighting of at least 70 needed to be applied for super heavy vehicles. This would reflect the damage caused by heavy vehicle types. The State noted that the NRTC used ESA to estimate heavy vehicle road damage and suggested that this may be used as a guide to heavy vehicle road weights.

72. South Australia suggested that it may be appropriate to take greater account of the vehicle stream compositions and urged the consistent reporting of data between the States.

73. Tasmania argued that tonne-kilometre and ESA were not viable options, largely due to potential for bias. It argued that the method of the heavy vehicle assessment was too broad and that it did not differentiate between vehicles with widely varying capacity. It said

that grouping together all vehicles from Class 3 to 9 was not logical. It argued that its log trucks, typically large articulated vehicles, tended to be older trucks with less road-friendly suspension. This resulted in more damage than some larger trucks.

74. Tasmania said that levels of road use are significant in adding costs for works in built-up areas, while climatic and topographic factors, and geographic isolation, were more significant in rural areas.

75. The ACT was conceptually attracted to using ESA because the data were more robust. It argued that a larger component weight should be given to the urban arterial component relative to rural arterials, due to the additional costs of maintaining urban roads.

76. Subject to the removal of the national highway use, the Northern Territory supported SMVU as an alternative measure. It supported, in principle, the recognition of the additional costs associated with super heavy vehicles. However, it did not think the current weight accurately reflected the additional cost associated with super heavy vehicles. The Northern Territory suggested increasing the weight for super heavy vehicles to 25.

77. The Northern Territory said that double and triple road trains had a greater impact on road surfaces than other heavy vehicles and their use was higher in the Territory.

78. *Analysis. Maintaining roads.* There is no disagreement that a conceptual case exists for assessing needs for the impact of road length, light vehicle road use and heavy vehicle road use on the cost of maintaining roads. All evidence available supports this and that the impact on States' budgets is material. The issue for this assessment is what data should be used to assess needs.

79. We have derived factors using the different measures available. The table below shows the following factors:

- (i) 1999 Review road length factor based on lane-kilometres;
- (ii) 1999 Review road use factor based on AADT;
- (iii) two above factors combined;
- (iv) combined road use and length with heavy vehicle weights;
- (v) road length factor based on updated lane-kilometre data;
- (vi) road use factor based on updated AADT data;
- (vii) two above factors combined;
- (viii) factor based on AVKT, which combines road length and use using 2000 data;
- (ix) factor based on AVKT, which combines road length and use using 2000 data, and also includes heavy vehicle weights; and

- (x) factor based on ESA, which combines road length and use using 1996 data.

Table 12 ROAD USE AND ROAD LENGTH FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust	
1999 Review										
i	Road length factor	0.92576	0.83068	0.92117	1.55871	1.13665	1.05499	0.45610	3.37470	1.00000
ii	Road use factor	1.36151	1.12097	0.39010	0.59161	0.60005	0.55125	4.10036	0.26613	1.00000
iii	Combined road use and length	1.12628	0.83240	0.48044	1.02505	0.60706	0.48885	1.90791	0.73209	1.00000
iv	Combined road use and length with heavy vehicle weights	1.08348	0.86302	0.84472	1.27256	1.04717	0.89199	0.69713	2.17587	1.00000
Possible 2004 Review factors										
v	Updated road length using 1999 Review method	0.82723	0.74257	1.23159	1.73266	1.01169	0.88680	0.46530	2.75086	1.00000
vi	Updated road use using 1999 Review method	1.57852	0.96768	0.43260	0.50157	0.48202	0.45203	2.73657	0.19645	1.00000
vii	Updated combined road use and length	1.30580	0.71857	0.53279	0.86904	0.48765	0.40086	1.27334	0.54041	1.00000
viii	AVKT	1.01536	1.16373	0.81457	0.99849	0.88267	1.27468	0.74759	0.58122	1.00000
ix	AVKT including heavy vehicle weights	1.10028	1.00071	0.95413	0.87068	0.83618	1.38679	0.43409	0.97714	1.00000
x	ESA	0.95725	1.04771	1.03902	1.11388	0.84927	0.89492	0.22006	2.10501	1.00000

80. The differences in the proposed range of measures are surprising. However, we have considered the quality of the data on which each is based. We propose to use average vehicle kilometre travelled including weights for heavy vehicles (ix, based on AVKT) as a measure of road use and road length because:

- (i) AADT data currently available are not necessarily representative of the use of States' entire arterial road networks (particularly Tasmania and the ACT);
- (ii) AVKT data are more up-to-date;
- (iii) AVKT is a good measure of road use and road length; and
- (iv) it has the support of most States.

81. AVKT data for State arterial roads are available from the AustRoads' publication *RoadFacts 2000*.

82. To measure the impact of heavy vehicles, we propose to retain the 1999 Review approach. We have reviewed the weights applied to heavy and super heavy vehicles using the work done by the National Road Transport Commission for determining heavy vehicle charges. The vehicle charging regime is intended to reflect the relative levels of damage to roads by vehicles of various classes. It indicates that super heavy vehicles make a much higher contribution to road maintenance costs than that indicated by the 1999 Review weights. The data suggest a super heavy weight of 70, which we propose to adopt. The proposed weights are shown in Table 13.

Table 13 CURRENT AND PROPOSED VEHICLE WEIGHTS BY TYPE OF VEHICLE

Vehicle type	Current weights	Proposed weights
Car	1	1
Heavy	10	10
Super heavy	20	70

83. **Analysis. Pavement types.** In regard to Victoria's view about the inclusion of an adjustment for different types of road surfaces, Table 14 shows road surface data from the NRTC 1996 Mass Limit Review. The data indicate that maintenance cost differentials exist by types of road pavement, and lead to two conclusions:

- (i) the major cost difference is between granular unsealed roads and other types of roads; and
- (ii) the cost differences for other types of roads (concrete, cement stabilised, asphalt, granular sealed) are relatively small.

84. We consider that a conceptual basis exists for cost differentials of different pavement types. This is supported by data. However, we are not convinced that the choice of road pavement is policy free. There is considerable disparity between States in the proportion of types of road pavement in each State, as shown in Table 15. These differences cannot be easily attributed to needs.

85. That said, we consider that road use and the urban/rural location are the most important influences on pavement type choice. Road use is already taken into account in the assessment. Using an urban/rural location split is a good policy neutral way of capturing pavement type differences. This issue is discussed below under the urban influences assessment.

Table 14 PAVEMENT AREA AND MAINTENANCE COSTS BY ROAD SURFACE

	Concrete	Cement stabilised	Asphalt	Granular sealed	Granular not sealed	Unpaved & unformed	Total
Pavement area ('000m ²)	8100	8500	50870	498140	47930	22320	635860
Proportion of total (%)	1.3	1.3	8.0	78.3	7.5	3.5	100.0
Estimated unit rates for pavement restoration (\$/m ²)	27.0	19.3	29.6	24.8	7.4	0	
As a ratio of granular sealed cost	1.1	0.8	1.2	1.0	0.3	0	

Source: National Road Transport Commission, Technical Supplement No2, Road and Bridge Impact, May 1996.

Table 15 PAVEMENT TYPE BY STATE

Pavement type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
	'000m ²	'000m ²	'000m ²	'000m ²	'000m ²	'000m ²	'000m ²	'000m ²	'000m ²
Concrete	7800	0	300	0	0	0	0	0	8100
Cement stabilised	7400	0	1100	0	0	0	0	0	8500
Asphalt	15600	20100	0	0	13300	0	1870	0	50870
Granular sealed	61600	135300	116600	100600	53200	19000	1140	10700	498140
Granular not sealed	22500	3400	10400	5430	0	600	0	5600	47930
Unpaved & unformed	0	0	0	20300	0	0	0	2020	22320
Total	114900	158800	128400	126330	66500	19600	3010	18320	635860

Source: National Road Transport Commission, Technical Supplement No2, Road and Bridge Impact, May 1996.

86. **Commission decisions. Maintaining Roads.** The Commission accepts that a conceptual case exists to assess needs for the impact of road length and light vehicle road use on the cost of maintaining roads. The conceptual case is supported by data which the Commission is satisfied are comparable and representative and provides a strong basis for assessing the impact of road length and light vehicle road use on the cost of maintaining roads. While the data used in the 1999 Review may be conceptually stronger, they have the practical weakness that they do not cover the entire network. This, along with the fact that most States support the use of AVKT data, leads the Commission to propose assessing needs for the impact of road length, light vehicle road use and heavy vehicle road use on the cost of maintaining roads using AVKT data.

87. In addition, the Commission accepts that a conceptual case exists to assess needs for the impact of heavy vehicles on the cost of maintaining roads. It considers that the conceptual case is supported by data from the National Road Transport Commission (weight of 70) which provides an adequate basis for updating the weight. Therefore, the Commission proposes to assess needs for the impact of heavy vehicles on the cost of maintaining roads using the NRTC data.

88. *Pavement types.* The Commission accepts that a conceptual basis exists for assessing needs for cost differentials of different pavement types. This is supported by data. However, it also accepts that pavement choice may be policy influenced. The Commission considers that road use and the urban/rural locations are the most important influences on pavement choice and that these influences are already taken into account in the category assessment. Therefore, the Commission proposes not to assess needs separately for pavement choice.

89. *Proposed method and results.* The road use and length factor was derived in the following way.

- (i) AVKT data were obtained for the year 2000 and for each State from the AustRoads report *Roadfacts*.
- (ii) Proportions of AVKT by type of vehicle for each State were obtained from the 1996 National Road Transport Commission's report *Mass Limits Review, Technical Supplement No. 2*.
- (iii) The heavy vehicle weights were applied to heavy vehicle AVKT.
- (iv) The weighted AVKTs were summed and divided by States population.
- (v) The State ratios were divided by the Australian ratio to obtain the factors shown in Table 16.

Table 16 ROAD USE AND LENGTH FACTOR

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Proposed Factors based on AVKT	1.10028	1.00291	1.01592	0.99459	1.00651	1.03282	0.87982	1.01716	1.00000
1999 Review factors	1.08348	0.86302	0.84472	1.27256	1.04717	0.89199	0.69713	2.17587	1.00000

90. *Reality check.* Like the 1999 Review assessment, the 2004 Review proposed assessment is based on road use and length. The difference in the factors is due to:

- (i) the use of AVKT as a measure of road use; and
- (ii) the increase of the super heavy vehicle weight from 20 to 70.

91. The AVKT data recognised:

- (i) half the road use that the AADT did for the Northern Territory; and
- (ii) fifty per cent more road use in Tasmania than the AADT data did.

92. The AADT data used in the 1999 Review were not necessarily representative of the road use of States' entire arterial road network (particularly for Tasmania and the ACT). AVKT will better capture road use.

93. The increase in the cost weight for super heavy vehicles reflects the NRTC heavy vehicle charges.

94. **Updateability.** This factor will be updated when new AVKT data become available.

Physical environment

95. **1999 Review.** The current assessment made adjustments to unit maintenance costs to reflect cost differences due to the impact of the physical environment. The assessment involved:

- (i) dividing Australia into regions according to the expected effect of the physical environment on maintenance costs. This was based on research from the Australian Road Research Board Transport Research (ARRB TR) unit;
- (ii) estimating the average maintenance costs attributable to the environment in each region. This was derived from Commission staff analysis;
- (iii) estimating the length of roads in each region in each State; and
- (iv) applying the estimated average cost for each region to the length of roads in that region for each State.

96. **State views.** Victoria said that recent research suggested that the impact of the physical environment on road maintenance costs was overestimated and noted that AustRoads had funded substantial work undertaken by ARRB TR to better estimate the effect of climate on road maintenance costs in Australia. This has found that the environment influence was substantially less than that estimated in the 1999 Review assessment. Victoria concluded that the physical environment factor should be halved.

97. Western Australia said that the physical environment factor should be recalculated to recognise specific disabilities, such as the emerging problem of rising water tables and salinity in low-lying areas.

98. **Staff proposals.** The starting position for the 2004 Review was that it would not be necessary to make major changes to the 1999 Review assessment because the environment and road lengths would not have changed much.

99. Nevertheless, *Discussion Paper 2002/34* presented two options.

- (i) Option 1 was almost the same as the 1999 Review assessment framework. The component weights would be reassessed but the components would remain the same. New data from the States would be used to reassess the factors.
- (ii) Option 2 relied on the assumption that the major factors affecting arterial road maintenance costs differed for urban roads and rural roads. This

model would remove dispersion from the urban road assessment and, assuming that road length and the physical environment were more relevant to rural roads, adopt a simple assessment of road use. A factor for urban influences, possibly based on a measure of congestion, would be applied to the urban arterial component.

100. States were asked to provide information on whether an allowance should be made for the environmental impact of rising water tables and salinity in low-lying areas.

101. **Further State views.** New South Wales supported the reduction of the physical environment factor in principle. It said that the Commission's model did not recognise that the effects of the physical environment were only important at low traffic levels on rural arterials. At high traffic levels on urban arterials, the impact of road usage outweighs the effects of the physical environment.

102. Victoria argued that the physical environment factor was overstated. Victoria said the factor should be based upon the research undertaken by ARRB TR for AustRoads, which showed a reduced impact of the environment on road maintenance costs.

103. Western Australia saw no justification for reducing the currently assessed impact of the environment on road maintenance costs, and did not support any reduction of the environment/use split. Western Australia said that the ARRB report was unsuitable for use in terms of the current assessment. It noted a number of concerns with this report.

- (i) The work was a preliminary version of a report sponsored by AustRoads. However the final report was not distributed through the AustRoads vetting process. The report therefore remained a record of work only and had not been signed off by State Road Authority CEOs.
- (ii) AustRoads made a decision not to circulate the report due to the theoretical nature of the study. The study was a purely desktop examination of existing roughness progression algorithms.
- (iii) The maintenance activities examined by the study were limited to pavement treatments such as pot hole repairs and rehabilitation treatments. Other major components of maintenance activities such as reseals, off road maintenance and routine maintenance of signs and lines did not form part of the study.

104. South Australia supported the inclusion of a salinity adjustment. However, it did not support New South Wales' view that physical environment factors were only important on low traffic roads. South Australia argued that physical environment factors could impose high maintenance costs in urban areas, particularly areas where roads were constructed on highly reactive soils.

105. Tasmania argued that discounting the physical environment factor was highly questionable, noting that:

- (i) the ARRB TR study was only based on climatic variations;

- (ii) the roughness of a road was not the only trigger for maintenance, and that road maintenance extended further than in the study; and
- (iii) non-road maintenance requirements were also influenced by physical environment (for example in areas of high rainfall and/or steep terrain, drainage works tended to be more costly and frequently required; some areas required higher maintenance to control vegetation).

106. The Northern Territory supported the Commission's current assessment and strongly opposed a decrease in the assessment of the physical environment factor. It considered that the current assessment took into account the unique weather conditions it faced and which added to road maintenance costs.

107. *Analysis.* The Commission considers that a conceptual case exists to assess costs attributable to physical environment. The ARRB TR report cited by Victoria shows lower maintenance costs attributable to physical environment than those recognised in the 1999 Review Roads assessment. The percentage differences between the highest and lowest cost areas are 530 per cent in the Commission's 1999 Review assessment and 50 per cent in the ARRB TR report.

108. The question is whether the current weights should be retained or modified in light of the ARRB TR report. In comparing the two studies, we note that:

- (i) the regional classification and the physical elements (such as temperature, soil type) used in the two analyses are similar;
- (ii) the ARRB TR analysis is more sophisticated than that carried out by the Commission in the 1999 Review; and
- (iii) the ARRB TR report is more recent than the 1999 Review Commission research.

109. In respect of the various criticisms of that report, we note that:

- (i) some of the criticism of that report could also be applied to the current assessment;
- (ii) while the ARRB TR study may be limited to pavement treatment, the cost differences between regions estimated by the ARRB TR might also apply to costs other than pavement treatment;
- (iii) the ARRB TR study includes climatic variations and soil types; and
- (iv) the ARRB TR cited a study that concluded that road roughness was found to best represent the functional performance of a pavement.

110. From the above observations, we conclude that both the ARRB TR and 1999 Commission work have deficiencies but that the ARRB TR weights have greater conceptual rigor. While the 50 per cent difference in relative costs implied by the ARRB TR study is

smaller than expected, we propose to derive weights from the ARRB TR report. Table 17 shows the current and proposed weights.

Table 17 CURRENT AND PROPOSED PHYSICAL ENVIRONMENT WEIGHTS

Region	Current weights	Proposed weights
Low cost area	1.0	1.0
Medium cost area	1.8	1.1
Medium high area	2.9	1.3
High cost area	5.3	1.5

111. In response to New South Wales’s argument about the relative importance of road use and environment on the cost of maintenance, the ARRB TR report shows, based on the results of their best statistical model, that the proportion of road maintenance costs due to the environment varies between 100 per cent (where the road use is zero) and 33 per cent on busier roads.

112. This information supports the judgment-based 1999 Review weight, which attributed, on average, 62 per cent of road wear to the physical environment. In the absence of better information, the Commission proposes to retain the 1999 Review weight of 62 per cent for road wear attributable to physical environment.

113. In respect of the impact of salinity, research from Environment Australia shows that it increases road maintenance costs. There is thus a conceptual case to allow for it in the assessment. However, Table 18 shows that the number of roads that are at high risk from salinity is relatively small, representing about three per cent. An adjustment is therefore unlikely to be material. In addition, it is likely that salinity is at least partly reflected in the environmental effects covered by the physical environment factor and that some double-counting would arise if another adjustment were made. Therefore, we do not propose to introduce a salinity assessment in this review.

Table 18 ROADS AT HIGH RISK OF SALINITY

	NSW ^(a)	Vic ^(b)	Qld ^(c)	WA ^(d)	SA ^(e)	Tas	ACT	NT
	km	km	km	km	km	km	km	km
Roads at high risk of salinity	110	808	na	680	910	nil	nil	nil

(a) Arterial roads.

(b) Freeways and arterial roads.

(c) No assessment made yet.

(d) Primary roads.

(e) All roads.

Source: Environment Australia, National Land & Water Resources Audit, Salinity Assessment, 2000.

114. **Commission decisions.** The Commission considers that a conceptual case exists for assessing costs attributable to physical environment. This is supported by data. The Commission accepts that the ARRB TR weights have greater conceptual rigor, and therefore proposes to derive the weights for assessing costs attributable to the physical environment from that report.

115. In addition, the Commission considers that a conceptual case exists to assess road wear attributable to physical environment. In the absence of better information, the Commission proposes to retain the 1999 Review weight (62 per cent) for road wear attributable to the physical environment.

116. The Commission considers that a conceptual case exists for assessing the impact of salinity. However, due to the relatively small number of roads at risk of salinity it considers that an adjustment is not likely to be material. Also, it considers that effects due to salinity are likely to be partly reflected in the physical environmental factor. Therefore, the Commission does not propose to introduce a salinity adjustment in the 2004 Review.

117. **Proposed method and results.** The method used in the 1999 Review has been adopted, except that the ARRB TR weights replace those from the 1999 Commission work. Table 19 shows the proportion of sealed and unsealed roads in each of the four environmental cost groups. The proposed cost weights in Table 17 have been applied to the length of roads in each State to derive the factor.

Table 19 PROPORTIONS OF STATE ARTERIAL ROADS IN EACH ENVIRONMENTAL REGION

Cost region	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
	%	%	%	%	%	%	%	%	%
Low cost	23.84	9.96	6.39	17.54	3.65	0.10	38.90	18.53	13.78
Medium cost	71.08	86.96	79.06	80.66	95.78	76.03	61.20	54.66	79.17
Medium high cost	4.77	2.92	14.33	1.80	0.58	21.62	0.00	24.38	6.76
High cost	0.31	0.16	0.21	0.00	0.00	2.25	0.00	2.44	0.30

118. Table 20 shows the proposed physical environment factors.

Table 20 CURRENT AND PROPOSED PHYSICAL ENVIRONMENT FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
1999 Review	0.95043	1.00028	1.08788	0.95521	1.01184	1.20141	0.84665	1.13697	1.00000
Proposed factors	0.98890	0.99964	1.01261	0.99135	1.00323	1.02946	0.87695	1.01385	1.00000

119. **Reality check.** The factors continue to reflect the needs identified above, however with more conservative weights. States with larger proportions of roads in the higher cost regions have factors above one. Those with lower proportions have factors below one. We consider the differences to have been over-stated in the previous approach.

120. **Updateability.** This factor will not be updated between reviews.

Urban influences — road maintenance costs

121. **1999 Review.** The assessment aimed at capturing the effects of urban influences (other than the volume of traffic) on annual maintenance costs. The factors were intended to recognise costs not fully captured by the road use factor. For example, in large cities, maintenance work was often done at night to avoid traffic disruption, and road repair materials were more expensive.

122. To calculate the factor, the estimated extra maintenance costs of about \$700 per lane-kilometre were applied to the length of urban arterial roads with traffic levels in excess of 40 000 AADT. The ratios of State notional road maintenance costs to the Australian average, inclusive of the urban influences influenced costs, were then compared with the corresponding ratios excluding that influence.

123. **State views.** Victoria stated that substantial additional costs were incurred in the maintenance and operation of roads in urban areas compared with rural areas. These additional costs were related to traffic use and were evident at even relatively low urban volumes. They were not restricted to high freeway volumes over 40 000 AADT. Victoria suggested that the urban influences factor should be increased by at least 60 per cent to take account of extra costs of maintaining roads in urban areas, regardless of traffic flow.

124. New South Wales said that urban influences could be measured using the number of traffic control devices per lane kilometre.

125. **Staff proposals.** Staff agreed that urban influences effects, other than the volume of traffic, could increase the annual maintenance costs. However, the examples supporting urban influences related disabilities were limited and suggested that the overall urban influences disability (after traffic volume effects were taken into account) would be small.

126. Staff did not consider that there was enough evidence to support the retention of the urban influences factor, or that its measurement would be robust. Staff proposed that the factor be discontinued for the 2004 Review unless evidence could be presented to justify continuing to assess the factor.

127. **Further State views.** New South Wales strongly opposed the removal of the urban influences factor and argued for a greater disability on the basis that:

- (i) there was substantial evidence that a highly urbanised State incurred more costs, directly and indirectly, in maintaining arterial roads;
- (ii) larger output volumes give rise to diseconomies of large scale;
- (iii) the variable maintenance cost tends to exhibit diminishing marginal returns; and

- (iv) the current \$700 per lane km applied to the length of urban arterial roads with traffic levels in excess of 40 000 AADT understated the effects of urban influences.

128. New South Wales argued that there were other costs in addition to volume of traffic. For example, detours often could not be arranged on to municipal roads and there were costs associated with the establishment of physical barriers to stop arterial traffic using local streets. In addition, a significant amount of work was done at night, resulting in higher costs. Tunnels cost more to maintain than surface arterial roads.

129. New South Wales suggested using congestion as an additional indicator of the costs attributable to urban influences.

130. Victoria argued that the urban influences disability should be maintained and increased. Victoria said that most of Melbourne's urban road network traffic flow was less than 40 000 AADT and yet it was exposed to the higher costs that are intended to be captured in the assessment.

131. Victoria said that the cost of maintaining urban local roads exceeded the costs of maintaining rural arterial roads. It provided the data in Table 21 to demonstrate the additional costs. It argued that the main driver of these cost differences was the need to undertake work much more quickly in an urban area to limit the amount of disruption to traffic. As a result of that, there were different material types used, such as asphalt pavement rather than the chipped seal pavement that might be used on rural roads. There was also the need to pay greater attention to factors such as underground utility services. Often with an overlay treatment within an urban area, the works were far more complex because of the need to remove previous materials on the road itself to give access to some of the manhole covers and fire hydrants and a range of different services. These were all additional costs that were appropriately assessed as an urban influences disability.

Table 21 AVERAGE EXPENDITURE RATES, SEALED LOCAL ROADS, VICTORIA, 2000–01

	Melbourne statistical division	Provincial urban centres	Other cities	Other shires
	\$/km/year	\$/km/year	\$/km/year	\$/km/year
Road Pavements				
Maintenance (Routine & Periodic) Existing Asset	5 370	3 680	1 830	1 420
Existing Asset Renewal (Rehabilitation)	3 240	1 850	2 290	990
<i>Subtotal</i>	8 610	5 530	4 120	2 410
Ancillary Traffic & Street Management				
Traffic Control Maintenance	3 040	860	390	170
Kerb & Channel Maintenance	1 030	1 160	240	120
Street Lighting Charges	2 280	1 070	300	240
Parking Administration	2 530	1 530	230	40
Street/Road Cleaning	2 270	750	170	170
Footpath Maintenance	2 270	1 010	330	210
Beautification	1 210	1 150	290	170
<i>Subtotal</i>	14 630	7 530	1 940	1 120
Total	23 240	13 070	6 070	3 530

Source: VICROADS 2002

132. Queensland said that the additional costs said to be due to urban influences should already be captured in the factor for road use. Queensland noted that although published data provided State congestion costs, these did not impact directly on State governments.

133. Western Australia, Tasmania and the Northern Territory said that a lack of evidence and doubts about materiality supported the removal of the urban influences factor. However, Western Australia accepted that undertaking works within urban areas at night may have some cost implications.

134. South Australia said AADT over 40 000 was not an appropriate indicator of the need for night time maintenance, suggesting that a factor describing vehicles per hour per lane between 9am and 5pm be developed instead. It said that its night operations were constrained in Adelaide by noise restrictions. It suggested other factors such as the availability of alternative routes be considered. The State also argued that the nature of Adelaide's urban sprawl resulted in cost penalties associated with pavement reinstatement works based on distance.

135. The ACT argued that it faced greater per capita urban influences costs than most, if not all other States. The ACT noted that AustRoad figures showed that it has the highest number of persons per kilometre of road and the highest road density. If the urban influences factor were continued, the ACT asked that the updated ACT roads data be used. It said that it

had costs associated with working outside normal hours due to constraints in terms of lack of available contractors and extreme weather conditions.

136. *Analysis.* The evidence available from Victoria and Western Australia showed higher maintenance costs in Melbourne and Perth. The Perth data for 1999-2000 showed that road maintenance expenditure per lane-kilometre in the Perth metropolitan area was five times greater than expenditure outside the Perth metropolitan area.

137. It is likely that metropolitan areas, in general, are more expensive to service than non-metropolitan areas. Much of the higher maintenance costs may be due to influences already taken into account in the assessment such as general road use and heavy vehicle use. Other influences may be those mentioned by New South Wales and Victoria.

138. The data and arguments put forward by the States indicate that there is a conceptual case that maintenance costs in urban areas are affected by influences that are not fully reflected in road use and physical environment indicators. However, it is not evident that those effects are restricted to the large urban areas of Sydney and Melbourne. Nor is it evident that the costs in those cities are markedly higher than costs in other metropolitan areas.

139. The cost differences from the Victorian and Western Australian data indicate that the impact on State budgets would be material.

140. It seems reasonable to assess different road maintenance costs for urban and rural arterial roads. Cost data from Victoria have been used to derive cost weights for urban and rural arterial roads, which are shown in Table 22. The Western Australian data were not used because they were split between the Perth metropolitan area and non-metropolitan areas, which is not the same as the required urban and rural split. Staff will seek similar data from other States to strengthen the assessment.

Table 22 URBAN AND RURAL ARTERIAL ROAD COST WEIGHTS

	Victorian expenditure data	Proposed weight
	\$ per lane/km	
Urban arterial roads	4 900	1.5
Total arterial roads	3 200	1

Source: Commonwealth Grants Commission, 2004 Review roads special data collection.

141. *Commission decisions.* The Commission considers that there is a conceptual case that maintenance costs in urban areas are affected by influences that are not fully reflected in road use and physical environment indicators. This is based on data from States. Therefore, the Commission proposes to assess different road maintenance costs for urban and rural arterial roads.

142. *Proposed method and results.* The urban roads maintenance factors were calculated as follows.

- (i) Based on the data from Table 22, weighted road length was calculated by applying a cost weight of 1.5 to urban arterial road lane-kilometres and a weight of 1 to rural arterial road lane-kilometres.

- (ii) States and Australian weighted road length were divided by States and Australian unweighted road length.
- (iii) State ratios of weighted to unweighted road lengths were divided by the Australian ratio.

143. Table 23 shows the resulting urban roads maintenance factors. The factor has not been discounted to remove the likely overlap with the road use and physical environment factors because we have no data to enable us to do so. We suspect that the factor should apply to less than 20 per cent of expenses in this component because it is intended to relate to expenses on night repairs, the need for more expensive surfaces, and so on. State views would be appreciated.

Table 23 PROPOSED URBAN AND RURAL ARTERIAL ROAD FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Proposed factors	1.00164	1.03777	0.94625	0.96047	0.97508	0.96193	1.47028	0.91486	1.00000
U2003 factors	1.00117	1.00389	0.99757	0.99596	0.99600	0.99463	0.99976	0.99363	1.00000

144. **Reality check.** These factors reflect the cost differences provided by Victoria and State splits of urban and rural roads.

145. **Updateability.** The factors would not be updated annually.

Urban complexity —infrastructure costs

146. **1999 Review method.** No differential needs were assessed for these costs.

147. **State views.** In its workplace discussions, New South Wales made a case for recognising higher costs associated with retrofitting of infrastructure in the construction and extension of roads. It presented evidence that the constraints of existing development and business patterns, congestion of alternative routes and the environmental considerations meant that constructing new and expanded road infrastructure in a large city such as Sydney required costly techniques, such as underground or split levels routes. Other supplementary facilities to reduce pollution or minimise other environmental concerns were also often required. The costs of those processes were considerably higher than conventional construction and expansion options that are feasible in smaller or less densely settled cities.

148. Queensland suggested that a good measure of needs would be population growth because increased infrastructure and re-fitting occurred largely due to population growth.

149. **Analysis.** There is a conceptual case for assessing an allowance for the higher per capita retrofitting costs associated with road network extensions in the largest Australian cities — costs that would be reflected in the roads depreciation costs. The conceptual case was supported by limited data on comparative construction costs for the major new projects in Sydney compared with more conventional construction techniques. New South Wales gave some examples of its costs:

- (i) \$450 million for a 2km cross-city tunnel (\$200m per km); compared with
- (ii) \$850 million for 10kms of the M5 extension (\$85m per km).

150. The figures demonstrated that costs in Sydney were high but they did not provide a comparative basis for assessing a disability factor. The evidence provided by New South Wales suggests it costs 2 to 3 times more to construct a tunnel than a road.

151. The Commission considers that New South Wales would have the highest per capita retrofitting costs. Victoria and Queensland would also have above average retrofitting costs but lower than New South Wales.

152. **Commission decisions.** The Commission considers that a conceptual case exists for assessing an allowance for the higher per capita retrofitting costs associated with road network extensions in the largest Australian cities. It notes that the conceptual case is supported by limited data, but it is satisfied with the strength of the case. In view of this, the Commission considers that equalisation would be improved by an assessment of urban complexity for Australia’s largest cities. The Commission considers that the cost impact would be material.

153. Therefore, on the basis of judgement, the Commission, has decided to assess needs for urban complexity in the 2004 Review.

154. **Proposed method.** The Commission proposes to use the factors in Table 24. The relativities assessed by judgment were rescaled and discounted to reflect the proportion of expenses in this component which related to retrofitting. This was estimated using judgment based on the length of roads assumed to have been retrofitted and cost information from New South Wales.

Table 24 PROPOSED URBAN COMPLEXITY FACTORS (INFRASTRUCTURE AND DEPRECIATION)

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Factors	2.50000	1.50000	1.50000	1.00000	1.00000	1.00000	1.00000	1.00000
Rescaled and discounted factors	1.03302	0.99458	0.99458	0.96095	0.96095	0.96095	0.96095	0.96095

155. **Reality check.** The proposed factors reflect the higher costs resulting from Sydney’s (and, to a lesser extent, Melbourne’s and Brisbane’s) higher population and more complex urban environment.

156. **Updateability.** The urban complexity factor will not be updated as it is based on judgment.

LOCAL ROADS

157. In the 1999 Review, three factors were applied to the local roads component:

- (i) dispersion;
- (ii) input costs; and
- (iii) local roads maintenance.

158. The dispersion and input costs factors proposed for the 2004 Review are the same as those proposed for the arterial roads component. This discussion outlines the Commission's proposal for the local roads maintenance factor.

Local roads maintenance

159. ***1999 Review.*** The assessment recognised that most State governments meet the maintenance costs of some local roads, mostly in areas with very low population density and where local councils, if they exist, cannot raise sufficient revenue for their upkeep. It was estimated that about 1.5 per cent of State road maintenance expenditure related to the maintenance of local roads. It was considered that roads in sparsely populated areas had low traffic levels. Therefore, the assessment was based on road length in areas with a population density of less than 10 persons per 1000 square kilometres.

160. ***State views.*** Queensland said that the arterial roads component should be renamed 'roads' and include both arterial roads and local roads serving the purpose of arterial roads. Alternatively, 18 266 lane-kilometres of Queensland's local roads should be reclassified as arterial roads. Queensland also said that, as it assists Brisbane City Council to maintain urban arterial roads, these should be included.

161. Western Australia noted that it provided a minimum 25 per cent of State road funds for expenditure on local government roads. In recent years, it had provided total grants averaging \$150 million to local authorities for road maintenance and improvement. It said that, while this funding was not solely for local government arterial road expenditures, it had provided local government with the capacity to fund arterial road maintenances.

162. ***Staff proposals.*** Commission staff asked States for information to establish whether funding for the maintenance of local roads, or some subset of local roads, was common State policy.

163. ***Further State views.*** New South Wales, Victoria, Tasmania and ACT argued that local roads should not be included in the assessment. New South Wales noted that although some States provided recurrent funding for local roads, it was not standard policy. New South Wales said that it was not its policy to provide funds for the maintenance of local roads.

164. Victoria and the ACT said the decision to fund local roads was a policy choice. Victoria said that there was no standard policy of funding local roads and although some States funded local roads, significant amounts of the funding were for capital improvement rather than maintenance.

165. The ACT argued that local government road costs were out of scope.

166. Queensland wrote that a clearer definition of local roads was required. It said that it provided road funding to local councils, however this was largely of a capital nature. Queensland argued that the inclusion of local roads within the roads assessment would resolve problems with the different interpretations of arterial, different State/local responsibilities, and the different needs for States to fund local roads. In its main submission it drew attention to the unusually large size of the Brisbane City Council and the resulting need for the State government to provide funding for arterial roads under the council's control.

167. Western Australia said that it provided significant funding to local governments for roads because:

- (i) it transferred responsibility for many arterial roads to local government authorities, and committed to provide a minimum 25 per cent of State road funding to local government;
- (ii) different levels of local road needs existed in each State — especially since the local government equalisation arrangements did not achieve much equalisation, as funds were insufficient and not allocated between States on equalisation principles; and
- (iii) there was a need to provide support for some local roads that were critical to the establishment of major projects.

168. South Australia supported the inclusion of local roads in the assessment. It said that it provided funding for local roads under the Regional Roads Program and provided funding for all local roads in unincorporated areas.

169. Tasmania said that it provided some assistance with the maintenance of several local government owned roads, largely due to historical precedents. It also provided assistance in relation to specific major council roads and bridges. Tasmania said it was apparent that States adopt a variety of different policies in terms of providing funding towards the maintenance of council owned roads. Because of this, it said that there was a fundamental difficulty in establishing whether a standard policy existed.

170. Tasmania said the Commission should not include the funding of local roads in the assessment. It said the 1991 Intergovernmental Agreement (IGA) on road funding set the boundaries for each level of government in terms of what was mandatory. Tasmania argued that deviation from this should be considered as policy choice.

171. The Northern Territory said that it was standard policy for States to fund local roads and therefore this should be included in the assessment. At a minimum, the Territory argued that the assessment should include local roads in unincorporated areas.

172. **Commission decision.** Five of the eight States told the Commission that they partly funded local roads. We consider that States are mainly funding local roads in response to a need to meet maintenance and construction costs in areas with very low population density and where local councils, if they exist, cannot raise sufficient revenue for their upkeep.

173. To the extent that an expenditure need is recognised by a majority of the States (albeit the smaller States), the Commission accepts that there is a conceptual case for assessing needs in regard to local road maintenance. It considers that there is adequate evidence that it is standard policy for States to fund local roads. Therefore, the Commission proposes to continue to assess needs for local roads maintenance as outlined in the table below.

174. Noting that no State has proposed changes to the assessment method and that the evidence indicates that it is standard policy for States to fund local roads, the Commission proposes to continue the 1999 Review assessment. This was based on each State's road length in sparsely populated areas.

175. The Commission is concerned that not all State expenses on local roads are being included in operating statements. A number of States have noted that expenditure on local roads was mainly for capital purposes. If this expenditure is asset-forming, the depreciation relating to these assets should be included. If it is not asset-forming, then expenses should be included in operating statements. In relation to definitions of arterial and local roads, the Commission is proposing to continue to use the broadly accepted definition used for the 1999 Review. Queensland may have a case for the inclusion of some portion of Brisbane urban arterial roads in its urban road length. Information would be required on the proportion of total expenses the State funds in relation to these roads.

Table 25 LOCAL ROADS COMPONENT — LOCAL ROAD MAINTENANCE FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Road Length (Km)	7 359	100	11 566	15 540	8 345	0	0	7 632	50 542
Per capita (Km)	0.00111	0.00002	0.00315	0.00810	0.00550	0.00000	0.00000	0.03817	0.00258
Local Road factor	0.42971	0.00799	1.22192	3.14151	2.13085	0.00000	0.00000	14.80207	1.00000

Source: CDATE96

176. **Proposed method.** The length of local roads in sparsely populated areas is the basis of the assessment. The local roads factors, using 1996 CDATE, are presented in the Table 25 above. These are to be updated using 2001 CDATE.

177. **Reality check.** The factors reflect each State's population distribution, with higher needs assessed for those States with a large amount of roads in sparsely populated areas.

178. **Updateability.** This factor will not be updated between reviews as the length of local roads would only change marginally over the course of the 2004 Review.

BRIDGES

179. In the 1999 Review, four factors were applied to the bridges component:

- (i) dispersion;
- (ii) input costs;
- (iii) physical environment; and
- (iv) bridge maintenance.

180. The dispersion and input costs factors proposed for the 2004 Review are the same as those proposed for the arterial roads component. This discussion outlines the Commission's proposals for the physical environment and bridge maintenance factors (which we have renamed 'bridge operations' because it will include depreciation expenses).

Physical environment

181. ***1999 Review.*** The physical environment factor applied to the arterial roads component was applied to this expenditure component.

182. ***State views.*** In its main submission, the ACT requested the removal of the physical environment factor from the assessment of the bridge and major culvert component. It considered that the effects of the physical environment should be accounted for in the design and construction of bridges.

183. ***Staff proposal.*** Commission staff did not propose to modify the assessment.

184. ***Further State views.*** In its rejoinder submission, the ACT argued for the discounting of the physical environment factor applied to the bridges component. It said that since 1992, the AustRoads Bridge Design Code ameliorated the effect of the physical environment on overall bridge maintenance costs.

185. ***Analysis.*** There is evidence that physical environment affects the operating expenses associated with bridges through maintenance and repair costs and/or depreciation costs (which reflect the impact on construction costs of measures taken to account for the environment). As the physical environment differs between regions, it is logical to expect there to be different effects on State costs. This implies there is a logical case for assessing a physical environment factor to capture the effects on both those costs.

186. While we do not have information that specifically links environmental effects to bridge maintenance or construction costs, the ARRB TR study mentioned earlier indicates that the environment can have large effects on road costs. It is reasonable to think that the effects on bridges will be broadly similar. We consider that assessing a physical environment factor will improve the equalisation outcome. We propose to make an assessment by applying the physical environment factor adopted for the arterial roads component.

187. ***Commission decision.*** The Commission considers there is a conceptual case for assessing a physical environment factor to capture the effects of operating expenses associated with bridges. It also considers that the region will affect these costs. The Commission also considers that assessing a physical environment factor will improve the equalisation outcome.

Therefore, it proposes to assess physical environment by applying the physical environment factor adopted for the arterial roads component.

188. **Proposed method.** The factors to be applied are outlined in the following table.

Table 26 PROPOSED PHYSICAL ENVIRONMENT FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Proposed factors	0.98890	0.99964	1.01261	0.99135	1.00323	1.02946	0.87695	1.01385	1.00000

Bridge operations

189. **1999 Review.** The assessment was based on the per capita area of bridges and major culverts. Ferry crossings on arterial roads were deemed notional bridges.

190. **State views.** No views were received from States in the main submissions.

191. **Staff proposal.** Commission staff proposed to retain the assessment for the 2004 Review. To capture the higher maintenance cost of tunnels, an adjustment for tunnel maintenance costs was proposed.

192. **Further State views.** No views were received from States in the rejoinder submissions.

193. **Commission decisions.** The Commission considers that a conceptual case exists for retaining the 1999 Review assessment method for the bridges maintenance factor. In the absence of any comments, we propose to retain the 1999 Review assessment method for the bridges maintenance factor. We will update the data on bridge, floodway and culvert areas and the maintenance costs per square metre. We also propose to include tunnels in this component. Because maintenance costs are a good proxy for depreciation costs, we will not apply a separate assessment of depreciation expenses.

194. **Proposed method and results.** Table 27 shows the updated data and compares them with the data used in the 1999 Review.

Table 27 TOTAL DECK AREAS OF BRIDGES, CULVERTS AND TUNNELS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
	(m ² ,000)	(m ² ,000)	(m ² ,000)	(m ² ,000)	(m ² ,000)	(m ² ,000)	(m ² ,000)	(m ² ,000)	(m ² ,000)
1999 Review									
Concrete bridges	1236.0	728.6	833.5	180.3	83.4	189.6	81.0	57.7	3390.1
Steel bridges	468.3	337.4	115.2	9.3	79.5	85.5	2.1	12.5	1109.8
Other bridges	164.5	156.8	118.7	101.0	7.3	6.6	0.8	0	555.7
Ferries ^(a)	7.8	7.8	0	0	16.4	13.6	0	0	45.6
Culverts	258.6	167.6	253.3	164.7	43.4	23.8	18.2	166.8	1096.4
2004 Review									
Concrete bridges	1449.0	966.9	796.9	239.0	95.8	189.6	152.2	33.5	3922.9
Steel bridges	485.0	336.2	77.7	26.5	88.9	85.5	2.1	6.8	1109.8
Other bridges	133.0	24.6	92.9	75.3	4.2	6.6	0.8	0	337.4
Ferries	37.0		1.2	0	1.1	13.6	0	0	52.9
Culverts	323.0	256.0	404.2	420.7	184.5	23.8	18.2	285.8	1916.2
Tunnel (lane-kilometre)	32.0	0.0	1.7	6.4	0.0	0.0	1.2	0.0	41.3

(a) Ferries are used as notional bridges.

Source: Commonwealth Grants Commission, roads special data collection, 2004 Review.

195. Table 28 shows the maintenance cost data provided by States as part of the special data collection.

Table 28 BRIDGE, CULVERT AND TUNNEL MAINTENANCE COSTS,

	NSW	Vic	Qld	WA	SA	Tas ^(a)	ACT	NT
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Bridges on arterial roads (per sq metre) -								
1. Concrete Structure	21.0		39.0	25.0	35.0	863.0	7.0	9.0
2. Steel Structure	105.0		39.0	17.0	40.0	927.0	7.0	762.0
3. Timber Structure	342.0		39.0	35.0		125.0	7.0	
Culverts on arterial roads (per sq metre)								
	24.0		n/a	22.0	37.0	112.0		
Tunnels on arterial roads (per lane km)								
	10.3		n/a	702.9	0	n/a	66.2	n/a

(a) Tasmania provided total expenditure.

Source: Commonwealth Grants Commission, Roads special data collection

196. Table 29 shows the 1999 Review and updated maintenance cost weights. The cost weights were updated using the data provided by States in the roads special data request for the 2004 Review.

Table 29 CURRENT AND UPDATED MAINTENANCE COST WEIGHTS

	Current weights	Proposed weights
Concrete bridges	2	1
Steel bridges	2	2
Other bridges	3	3
Culverts	1	1.5
Tunnels	na	1

Note: na: Tunnel maintenance costs were not separately assessed in the 1999 Review.

Source: Commonwealth Grants Commission, Roads special data collection, 2004 Review.

197. Table 30 shows the calculation of the bridge operations factors.

Table 30 CALCULATION OF BRIDGE OPERATIONS FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Proposed Factors	1.01710	0.85969	1.03856	0.99928	0.59386	1.86116	1.44337	3.46958	1.00000
1999 Review factors	1.03767	0.94761	1.12481	0.72715	0.47750	2.20882	0.95346	2.53050	1.00000

198. **Reality check.** The factors are based on States' actual deck areas of bridges, culverts and tunnels. States with the greater surfaces have higher needs.

199. **Updateability.** This factor will not be updated between reviews as the bridge, culvert and tunnel data would only change marginally over the course of the 2004 Review.

ROAD SAFETY

200. In the 1999 Review, three factors were applied to the road safety component:

- (i) dispersion;
- (ii) input costs; and
- (iii) socio-demographic composition.

201. The dispersion and input costs factors proposed for the 2004 Review are the same as those proposed for the arterial roads component. This discussion outlines the proposed treatment of urban influences, and addresses the merits of an assessment of socio-demographic composition.

Urban influences

202. **1999 Review.** No urban influences factor was assessed in this component.

203. **State views.** At its workplace discussions, Victoria argued for the introduction of an urban influences assessment in the Road Safety component. It suggested the factor be based on either accident data by locality or on annually published estimates of road-based travel in each State. Victoria said that the road safety component assessment should be revised to reflect the 50 per cent higher exposure to, and costs of, fatal and other casualty road accidents on urban roads.

204. **Staff proposal.** Staff did not see a direct link between accident rates or amount of travel and the amounts spent of road safety. They therefore did not support an assessment for urban influences on road safety. However, State views were sought.

205. **Further State views.** New South Wales supported the inclusion of an urban influences factor in the road safety assessment. New South Wales noted that approximately 70% of all accidents in New South Wales occurred in metropolitan areas over the period of 1994 to 2000.

206. **Commission decisions.** The Commission considers that the types of road safety expenditure covered by the component (road markings, signals, pedestrian crossings, safety areas) are likely to be more prevalent in urban areas. This suggests there is a link between urban influences (although not necessarily accident rates) and road safety expenses. Thus there is a conceptual case for introducing an urban influences assessment.

207. The data indicate that such an assessment would have an impact on State budgets, which the Commission considers to be material. In Australia, road safety expenditures were about \$300 million in 2001-02. We have good data on road length in urban and rural areas for this assessment, and are confident that, in using it to calculate a factor, the margin of error would be acceptable. Therefore, the Commission proposes to introduce an urban influences factor in the road safety component based on the proportion of urban arterial roads in each State, (the same as that used in the arterial roads assessment). See Table 31.

Table 31 PROPOSED URBAN AND RURAL ARTERIAL ROAD FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Factors	1.00164	1.03777	0.94625	0.96047	0.97508	0.96193	1.47028	0.91486	1.00000

Socio-demographic composition

208. **1999 Review.** The socio-demographic composition factor was intended to recognise that governments make efforts to target particular 'at risk' groups of road users. In particular, road accident statistics showed that the Indigenous population suffered three times the fatality rate of non-Indigenous road users. States demonstrated the special efforts they made to educate Indigenous road users. Census data were used to calculate a socio-demographic composition factor with a use weight of 3 applied to the Indigenous population.

209. **State views.** New South Wales considered that the socio-demographic composition factor should be expanded to include the numbers of male drivers aged 17-25. It said it directed several programs towards that group, including Youth Road Safety Programs, the New Graduated Licensing Scheme, the Hazard Perception Test and the Driver Qualification Test.

210. **Staff proposal.** Staff proposed not to assess a socio-demographic composition factor covering the impact of Indigeneity or any other specific group for road safety in the 2004 Review. This was because it was not clear that States spent materially large amounts on road education campaigns for Indigenous people or other groups. In addition, it was not clear that the amount spent would vary with the size of the relevant group.

211. **Further State views.** The ACT supported the removal of the socio-demographic composition factor from the road safety component. It said that evidence indicated that State populations as a whole were targeted in terms of changing driving behaviour, not specific target groups. The ACT also noted that the importance of the demand for, and cost of, providing road safety services to specific socio-demographic groups was difficult to measure, and the relative importance of these groups in determining resource allocation had not been supported by empirical evidence.

212. Conversely, the Northern Territory argued that the factor should be retained because it accounted for the additional costs associated with Indigenous road safety. It said Indigenous road safety was a major concern as Indigenous people were significantly over represented in road statistics. It had implemented a number of programs in an attempt to improve the road safety of its Indigenous population, including its 'Kick a Goal for Road Safety Strategy' road safety workshops conducted in remote Indigenous communities, and its Indigenous road safety messages and community service announcements.

213. **Analysis.** In respect of road safety campaigns, the conceptual case that needs to be established is whether the relative proportions of socio-demographic groups in each State influence States' spending on road safety.

214. Observation of past practices suggests that road safety campaigns target both whole of State populations and particular population groups. There are many current programs aimed at general safety practices, wearing seat belts and raising awareness of fatigue — issues which are relevant to all road users. The Northern Territory cited expenditure on Indigenous road safety campaigns. New South Wales mentioned programs aimed at younger males. It appears that each State will have its own road safety issues and priorities. In addition, those issues may vary over the course of a year. This all implies that expenditure patterns could differ markedly from State to State depending on policies. Thus it is difficult to determine a standard policy.

215. Moreover, road safety campaigns are mainly media based, which implies that they target groups of people not individuals. Therefore, much of the expenditure on road safety campaigns will not vary according to the size of the groups targeted. However, our socio-demographic composition factors are generally based on the premise that the use of a service is affected by the size of the target group in a State. That implies that interstate differences in per capita costs are driven by differences in the relative size of the targeted groups.

216. A more broadly based factor based on the driving age group (say 17 to 75 years) would be more conceptually sound. However, it would not have a material impact on the relativities because of the relatively small amount of expenditure on road safety and the comparatively small differences between States in the proportion of their population in that age group.

217. **Commission decisions.** The Commission considers that, on balance, a conceptual case has not been established that socio-demographic composition drives the need for expenditure on road safety. It cannot be confident that equalisation will be improved by assessing needs for road safety campaigns aimed at one or two groups in the community. Therefore, the Commission proposes to remove the socio-demographic composition factor from the assessment.

OTHER TRANSPORT

218. In the 1999 Review, three factors were applied to the other transport component, which comprises transport planning, traffic management, and other regulatory and administrative functions:

- (i) dispersion;
- (ii) input costs; and
- (iii) urban traffic management.

219. The dispersion and input costs factors proposed for the 2004 Review are the same as those proposed for the arterial roads component. This discussion outlines the Commission's proposed approach for urban traffic management.

Urban traffic management

220. **1999 Review.** An urban traffic control factor was assessed to allow for the extra costs incurred in Sydney and Melbourne because of the need to provide and maintain complex traffic control systems. Based on the information available at the time, a two per cent allowance was made for New South Wales and Victoria.

221. **State views.** New South Wales and Victoria argued that traffic control systems were increasingly complex and expensive to operate. Queensland and Western Australia argued that their traffic management expenses should be recognised in the assessment.

222. **Staff Proposal.** Staff sought information on how much States spent on Traffic Control Centres.

223. **Further State views.** New South Wales provided expenditure data on traffic control, shown in Table 32. The Transport Management Centre's major tasks include transport and network operations, incident management, traveller information service, liaison with transit authority, police and state emergency services. Management of cycleways, pedestrian facilities, network efficiency and other traffic control facilities are all part of the highly complex urban traffic control task.

Table 32 SYDNEY TRAFFIC CONTROL EXPENDITURES

	2001-02	2002-03
	\$'000	\$'000
Transport management centres	39 328	37 278
Traffic control devices	26 679	24 313
Pedestrian facilities	6 477	10 119
Cycleways	6 248	11 215
Network efficiency	17 686	22 186
Road-based public transport priority	26 251	31 492
Maintenance of other traffic control facilities	21 604	22 987
Program support	10 026	12 289
Total	154 299	171 879

Source: New South Wales Treasury.

224. Queensland's total expenditure for 2001-02 for traffic management was expected to total \$5.7 million. Queensland argued the urban influences disability of 2 per cent provided to New South Wales and Victoria should also apply to Queensland.

225. The ACT argued that it was conceivable that population size and density could lead to higher costs in managing traffic flows. However, it would also follow that the costs would be spread out over a larger population. Hence the per capita costs may not be different from the standard. In fact, in areas with large populations that have a tendency towards congestion, many people opt to use alternative modes of transport, such as trains, keeping traffic flow management costs down. It also said that, while congestion may lead to more complex road management requirements, it was questionable whether it led to higher per capita costs. Data needed to be provided to support such a proposition.

226. **Analysis.** The amount and concentration of traffic in larger cities, which leads to congestion, requires that States operate traffic management systems. This was witnessed by the Commission during workplace discussion visits. The five largest capital cities operate traffic control systems in transport management centres. Therefore, there is, in principle, a conceptual case that larger cities have greater needs for urban traffic control systems.

227. However, before a disability could be assessed, it needs to be demonstrated that the urban traffic control task and the associated costs are directly linked to the size of the cities served. Table 33 shows the data provided by States on their traffic management centre expenses.

228. Overall, there are strong doubts about the reliability and interstate comparability of the data in the table. In the 1999 Review, the assessment assumed that only New South Wales and Victoria required complex traffic management systems. State submissions and workplace discussions revealed that Queensland, Western Australia and South Australia also operate traffic management centres. While the three smaller States report expenditure on traffic control systems, it is not clear that these expenses are comparable with those of the other States or that the systems are similar in size and sophistication to those of the other States. Nevertheless, the data do show a broad trend of higher expenditure in the bigger cities. In addition, these expense figures are material.

229. We therefore conclude that an urban traffic management disability should be assessed.

Table 33 EXPENSES ON TRAFFIC MANAGEMENT CENTRES

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Cost of traffic control systems (\$m)	37.3	na	5.68	7.3	5.5	0.1	1.4	0.3
Cost of traffic control systems (% of total maintenance expenditure)	22.0	na	2.4	4.2	3.2	12.6	4.5	1.9
Per capita amount (\$)	5.6 ^(a)	na	1.5	3.8	3.6	0.2	4.3	1.5

(a) The figure of \$37 million was used for New South Wales. Table 32 indicates it is only part of what might be called traffic control expenses.

na Data not available.

Source: State data returns, 2004 Review.

230. Based on evidence from workplace discussions and State submissions, we have proposed, on the basis of judgement, to assess the urban traffic management factors shown in Table 33. The table suggests a three tier grouping. New South Wales has the highest per capita expense. While Victoria did not provide data, we consider that it would have similar per capita expenditure. Queensland, Western Australia and South Australia are another group. They have lower per capita expenditure on urban traffic management centres. The three smaller States can be grouped together because they do not have urban traffic management centres.

231. **Commission decisions.** The Commission considers that a conceptual case exists to assess an urban traffic management disability. There are also data that show a broad trend of higher expenditure in the bigger cities and these expenditure figures are material. Therefore, the Commission has decided, on the basis of judgement, to assess an urban traffic control disability. It has used judgement, informed by the data provided by States, to derive the factors.

Table 34 URBAN TRAFFIC MANAGEMENT FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Urban traffic control factors	1.10000	1.10000	1.03000	1.03000	1.03000	1.00000	1.00000	1.00000
Rescaled urban traffic control factors	1.02848	1.02848	0.96304	0.96304	0.96304	0.93499	0.93499	0.93499

232. **Proposed method and results.** The table above shows the urban traffic control factors.

233. **Reality check.** These factors broadly reflect the size and traffic management complexity of the capital city of each State.

234. **Updateability.** The factor will not be updated annually because it is derived by judgment.

NATIVE TITLE

235. **1999 Review.** Native title factors were assessed to account for the additional costs incurred by the States attributable to the operation of the Australian Government *Native Title Act 1993*.

236. **2004 Review.** *Draft Assessment Paper 2003/70 Native Title Assessment* concluded that because there had been no changes in legislation or State policies that could potentially affect the native title assessment, the disability and the method of assessing it should be retained for the 2004 Review.

237. **Proposed method and results.** The native title factors will be calculated according to the method outlined in *Draft Assessment Paper 2003/70, Native Title Assessment*. Native title-affected expenses for this category have been estimated to represent 0.04 per cent of the category standard in 2001-02. The factors are shown in the table below.

Table 35 NATIVE TITLE EXPENSES, 2004 REVIEW

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
1997-98	0.42165	0.42619	1.56652	2.91310	0.51622	0.04919	0.09846	13.44409	1.00000
1998-99	0.14991	0.21264	2.00743	2.65354	1.09573	0.06876	0.10404	17.35096	1.00000
1999-2000	0.08245	0.24111	2.45173	2.17071	1.19182	0.00896	0.01342	14.80043	1.00000
2000-01	0.02799	0.47561	2.14751	2.65026	1.41883	0.14621	0.21630	9.34459	1.00000
2001-02	0.06730	0.18047	1.94495	2.74309	1.56301	0.15232	0.22312	16.79242	1.00000

238. **Updateability.** The factor is based on expenses incurred in each year. Since they can vary from year to year and the data are available for each year, the factor and the component weight will be updated yearly.

LAND RIGHTS

239. **1999 Review.** The land rights factor was assessed to take account of the additional costs incurred by the Northern Territory which are attributable to the operation of the Australian Government *Aboriginal Land Rights (Northern Territory) Act 1976* (ALRA).

240. **2004 Review.** *Draft Assessment Paper 2003/69 Land Rights* concluded that a land rights factor should be assessed for this category using the 2004 Review method.

241. **Proposed method and results.** The land rights factors for this category, shown in Table 36, have been calculated according to the general method outlined in *Draft Assessment Paper 2003/69 Land Rights*. In brief, factors were calculated by dividing the Australian population by the Northern Territory population. Land rights-affected expenses for this category have been estimated to be 0.002 per cent of the category standard in 2001-02.

Table 36 LAND RIGHTS FACTORS — LAND RIGHTS COMPONENT

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
1997-98	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	98.58552
1998-1999	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	98.02771
1999-2000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	97.58712
2000-01	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	97.45037
2001-02	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	98.02489

242. **Updateability.** The factor is based on expenses incurred in each year. Since they can vary from year to year and the data are available for each year, the factor and the component weight will be updated yearly.

ISOLATION

243. **1999 Review.** The isolation factor was assessed to account for differences in per capita costs of service provision for some States because of their economic and geographical isolation from the main interstate sources of supply in South Eastern Australia. It reflected the combined effect of isolation on labour-related costs, interstate freight costs, professional infrastructure costs, commercial goods costs, airfares, travel allowances and other travel-related subsidies. The isolation-affected expenses component represented 0.18 per cent of expenses in this category.

244. **2004 Review.** *Draft Assessment Paper 2003/65 Isolation* decided that an isolation factor will be assessed for the isolation-affected expenses component using the 2004 Review method.

245. **Proposed method and results.** The isolation factors for this category, shown in Table 37, have been calculated according to the general method outlined in *Draft Assessment Paper 2003/65 Isolation*. Isolation-affected expenses for this category have been estimated to be 0.06 per cent of the category standard.

Table 37 ISOLATION FACTORS — ISOLATION-AFFECTED EXPENSES COMPONENT

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Isolation	0.05107	0.10737	0.17783	0.74776	0.56469	3.49490	1.51842	68.27218

246. **Updateability.** The factor will be updated annually.

OTHER ISSUES

247. Other issues raised by States were national capital influences, congestion, insurance and freight.

National capital influences

248. **1999 Review.** No adjustment for national capital influences was made in the 1999 Review.

249. **Initial State views.** The ACT requested a National Capital allowance of \$4.7 million per annum comprising:

- (i) \$3.8 million for the shorter lifespan, hence earlier rehabilitation and maintenance of a significant portion of the road network, resulting from the Australian Government's:
 - sub-standard design and poor supervision of road construction; and
 - poor heavy vehicle controls with respect to dimensions and mass, resulting in the overloading of heavy commercial vehicles; and
- (ii) \$0.9 million for excessively wide roads built by the Australian Government.

250. **Staff proposal.** In *Discussion Paper 2002/34, The Roads Assessment*, staff proposed an allowance of \$0.9 million to assist the ACT to maintain roads of more than average width inherited from the Australian Government. Staff did not accept that ACT roads had a shorter life span because of Australian Government actions.

251. **Further State views.** In its rejoinder submission, the ACT supported the proposed national capital allowance. However on the basis of information provided by a consultancy report from Ernst & Young, it asked that the allowance be increased to \$2.6 million. This would reflect the correction in the calculation of the additional road width on arterial roads built by the Australian Government.

252. The ACT also requested a national capital allowance of \$3.8 million for the shorter lifespan, hence earlier rehabilitation and maintenance of a significant portion of the road network. It said that this arose because, prior to self-government, the Australian Government had adopted:

- (i) sub-standard design and poor supervision of road construction; and
- (ii) poor heavy vehicle controls with respect to dimensions and mass, resulting in the overloading of heavy commercial vehicles.

253. The ACT sought a reassessment of the national capital arguments because it said that:

- (i) the ACT had a significantly higher than average volume and usage of roads which exacerbated the maintenance costs associated with those roads with below average construction and surface quality left by the Australian Government to the Territory; and
- (ii) AustRoads road surface quality data used by the Commission staff to refute the ACT's quality arguments were inconclusive.

254. The ACT said that the information provided in its submissions, and the further quantification of arguments for the workplace discussions should be used to determine the argument regarding the quality of the road construction (including the beneath surface construction) for the arterial roads constructed by the Australian Government prior to self-government.

255. **Commission decisions.** The Commission does not consider that a conceptual case has been made for the assessment of a national capital allowance for wider roads in the ACT, or for an allowance for early road deterioration. Extra costs associated with a legacy from the Australian Government would need to be considered under special fiscal needs. Any needs that might have been assessed for this item would have been phased out by this point. Therefore, the Commission does not propose to include a national capital adjustment in the assessment.

Congestion

256. **1999 Review.** The 1999 Review approach did not assess needs for the additional costs of congestion.

257. **State views.** New South Wales argued that a factor for congestion should be developed because there were diseconomies of large scale in providing services for larger populations. It said that congestion imposes costs over and above costs directly associated with

road length and use, such as the ‘stop-start’ status of vehicles on the road network. It suggested that congestion could be measured in many different ways, such as per person trip rate, effect of traffic volume on travel time/speed, and level and distribution of delay on the urban road network.

258. **Staff proposal.** Commission staff did not propose to pursue this issue further.

259. **Further State views.** New South Wales argued that congestion measures can be policy influenced. The more a State spends on roads and road maintenance the lower its apparent congestion. New South Wales however suggested using congestion as an additional indicator to urban influences. New South Wales submitted that congestion factors derived using 3-year data from AustRoads National Performance Indicators All Day Congestion, weighted by vehicle kilometres travelled, could be used. See Table 38.

Table 38 URBAN CONGESTION FACTORS, 1997-98 TO 1999-2000

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
1997-98	0.540	0.530	0.340	0.340	0.430	0.340	0.340	0.340	
1998-99	0.580	0.490	0.330	0.440	0.430	0.340	0.340	0.340	
1999-2000	0.560	0.500	0.450	0.330	0.440	0.340	0.340	0.340	
3 year average	0.560	0.507	0.373	0.370	0.433	0.340	0.340	0.340	0.4695
VKT	54 966	50 165	34 678	18 270	13 424	4 475	3 200	1 603	180 781
Congestion Factor	1.19277	1.07917	0.79518	0.78808	0.92298	0.72418	0.72418	0.72418	1.0000

Source: Austroads National Performance Indicators, ABS Survey of Motor Vehicle Use.

260. Western Australia said traffic congestion was not a relevant measure of need.

261. Although the ACT accepted that congestion could lead to more complex road management requirements, it questioned whether this led to higher per capita costs. The ACT required data to support such a proposition.

262. **Analysis.** New South Wales has provided no evidence that congestion increases State costs over and above those assessed through the road length and road use factor. It is reasonable to conclude that the urban influences and complexity factors and the urban traffic control factor capture the higher maintenance costs associated with busy road networks.

263. **Commission decisions.** The Commission does not consider that a conceptual case exists for assessing the impact of congestion on roads maintenance expenses. Therefore, it does not propose to assess a separate disability for congestion.

Insurance costs

264. **State views.** New South Wales asked the Commission to consider including an administrative component for insurance payments (workers compensation, motor vehicle, property and liability).

265. **Staff proposal.** Commission staff did not see why New South Wales would have higher insurance costs per capita than other States and were not inclined to assess needs. Staff invited New South Wales to provide evidence that it needed to spend more per capita than other States for reasons outside its control.

266. **Further State views.** In its rejoinder submission, New South Wales noted that insurance costs of the Roads and Traffic Authority (RTA)² constituted around 11 per cent of corporate overhead expenditure. New South Wales said that national discussions regarding the Review of Tort Law had recognised that New South Wales is the second most litigious society in the world.

267. New South Wales argued that defences to litigation and administrative management of claims required extensive investment in record keeping, management systems and procedures, information systems, complaints recording systems, as well as direct costs of litigation and settlement of claims. The State said that each RTA region employed one full-time equivalent claims officer.

268. **Commission decisions.** The Commission does not consider, on balance, that a conceptual case exists to assess disabilities for insurance costs. This is because we are concerned by the possible influence of policy in such an assessment. Also, we are not inclined to assess needs for a population attribute such as litigiousness. Therefore, it does not propose to introduce such an adjustment in the 2004 Review.

Road use by freight carriers

269. **State views.** New South Wales argued that, because of its location, it experienced high levels of freight traffic travelling from one State to another. It thought a freight disability factor should be assessed based on ‘origin and destination’ of freight loads. It said that AADT counts did not accurately allocate the proportions of the different types of vehicles and it would prefer a measure based on net tonne kilometres (NTKM).

270. **Staff proposal.** Staff concluded that an appropriate and accurate measure of road use, as discussed above, should include the effects of through traffic.

271. **Further State views.** New South Wales agreed with the statement that ‘if the AADT and vehicle type data provided by the States are accurate, they should be a good proxy for freight weights’. However, the AADT and vehicle type data provided by States tended to be inaccurate and therefore were not a good proxy for the freight task in New South Wales. New South Wales suggested a separate disability factor to address the disproportionate burden of the national freight tasks that fell on its road network.

272. It suggested that a freight disability be adopted in the Roads assessment. It proposed two possible measures (see Table 39) that could be used to calculate a tonne productivity factor:

² The RTA is the New South Wales agency responsible for promoting road safety and traffic management, driver licensing, vehicle registration, and maintenance and development of the National Highway and State Road network.

- (i) the first would be based on the freight task's contribution to economic activity, measured in terms of freight tonne/Gross Domestic Product per capita; and
- (ii) the second would be calculated as tonne/Gross Domestic Product per full time equivalent in employment.

Table 39 SUGGESTED FREIGHT TASK DISABILITY FACTOR (TONNE PRODUCTIVITY FACTOR)

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Tonnes	188 213	122 387	127 197	44 521	104 971	21 384	9,188	2 616	620,477
GDP/Capita	36 492	36 731	31 151	30 064	40 168	25 285	45 281	43 042	35 30
Tonne/GDP per capita	5 158	3 332	4 083	1 481	2 613	846	203	61	17 577
Ratio	0.2934	0.1896	0.2323	0.0842	0.1487	0.0481	0.0115	0.0035	1.000
GDP/FTE (\$/FTE)	149 496	146 030	125 481	126 598	152 850	115 376	187 598	167 404	142 571
Tonne/GDP per FTE	1 259	838	1 014	352	687	185	49	16	4 352
Ratio	0.2893	0.1926	0.2329	0.0808	0.1578	0.0426	0.0113	0.0036	1.0000

Source of basic data: ABS Survey Freight Movements

273. **Commission decisions.** The Commission does not consider that a conceptual case exists for introducing an additional freight carrying disability factor. We propose to use AVKT to assess the impact of road use with specific weights for heavy vehicles. We consider that this will capture the impact of the freight task. Therefore there is no need to introduce an additional adjustment to recognise the impact of freight carrying on road maintenance expenditure.

ROAD USER CHARGES

274. **1999 Review.** Roads user charges were assessed using a road transport charges component of 40 per cent and a road toll component of 60 per cent. The road transport charges component was assessed equal per capita.

275. The imposition of road tolls was considered to be standard policy and New South Wales and Victoria were considered to have twice the revenue raising capacity of Queensland, Western Australia and South Australia. Tasmania, the ACT and the Northern Territory were considered to have none.

276. **State views.** New South Wales did not consider that the current factor was justified and argued that the assessment should be equal per capita. New South Wales also said

that the Road Revenue model should use a 60 per cent charge — 40 per cent toll split (as opposed to the current 40/60 split).

277. Western Australia said its capacity to raise tolls was about one third that of New South Wales and half that of Victoria and Queensland. It considered the Commission's current assessment about right for the Victoria/Western Australia comparison, but too low for New South Wales and Queensland.

278. South Australia supported the factors used in the 1999 Review.

279. **Staff proposals.** Staff proposed to review the split between toll and other revenue with the aid of budget data. Staff were inclined to use judgement to review toll raising capacity and thought a measure based on congestion may be beneficial. Staff thought that there was likely to be a threshold number of vehicles or licensed drivers before a toll could be cost effective. Staff considered that Tasmania, the ACT and the Northern Territory continued to have little capacity to raise tolls.

280. **Further State views.** New South Wales argued that there was no intuitive, conceptual, economic or other reason for revenue from road tolls to be assessed differentially. New South Wales stated that road tolls were fundamentally a policy choice and considered that the imposition of road tolls should be not treated as standard policy. The State argued that road tolls should be assessed equal per capita.

281. New South Wales also argued that the current assessment was arbitrary and acted as a disincentive for Tasmania the ACT and the Northern Territory to introduce road tolls. New South Wales said that, in the current assessment, the Commission was relying exclusively on judgement and on the basis of the complete lack of evidence, and in line with the Commission's guidelines, road user chargers should be subject to EPC.

282. South Australia and Northern Territory supported the differential assessment of revenue from road tolls. South Australia argued that more populated areas have a revenue raising advantage in relation to tolls. The Northern Territory said it would be unreasonable to assume that it was able to raise the same amount of revenue through road tolls as the larger States.

283. **Commission decisions.** The Commission does not consider that a conceptual case exists to assess capacity to raise revenue from public road tolls. It is not State standard policy to have tolls on public roads as only three public road tolls exists in Australia (one in New South Wales and two in Brisbane). The Commission proposes that revenue raising capacity should be assessed on an equal per capita basis.

SUMMARY OF RESULTS

Summary of Commission decisions

284. The following table outlines the decisions taken by the Commission for this category.

Table 40 COMMISSION DECISIONS — ROADS CATEGORY

Decision	Reason
Add a national highways component, with needs assessed on an APC basis	National highways are considered to be State assets. Needs will be assessed on an APC basis because SPPs reflect States' needs.
Include depreciation expenses as defined by the ABS to the scope of the assessment	GFS is the principal source of the Commission's financial data.
Continue to assess fixed costs, dispersion, input costs, native title, land rights and isolation needs	The Commission is satisfied that these disabilities affect States' needs.
Change data on which road use and length factor (arterial roads component) is based to AKVT	The AKVT data provide a more representative picture of States' needs because of their more comprehensive coverage, and are supported by the majority of States.
Change weights used for heavy vehicles in the road use and length factor (arterial roads component)	This is consistent with data from the NRTC.
Change data on which weights for the physical environment factor (arterial roads and bridges components) are based to those of the ARRB TR report	The weights are credible and more conservative than those derived from Commission analysis.
Change calculation method for urban and rural arterial road factors	The new method reflects actual expenditure data.
Introduce an assessment for higher infrastructure costs in urban areas (arterial roads component)	The proposed factors reflect the higher costs resulting from Sydney's (and, to a lesser extent, Melbourne's and Brisbane's) higher population and more complex urban environment.
Maintain the calculation method for local roads factors	The factors reflect the States' patterns of population density.
Maintain the calculation method used for the bridge operations factor (bridges component) and update the data on which it is based	The Commission is satisfied with the approach and no comments were received from States.
Introduce an assessment for higher infrastructure costs in urban areas	Evidence presented to the Commission supports this.
Assess needs for urban influences in the road safety component	The Commission is satisfied that this would influence State needs and suitable data are available.
Not to assess SDC needs for road safety	The Commission is not convinced that the need for road safety programs is driven by specific SDC groups.
Assess needs for urban traffic management	The Commission is satisfied that urban complexity necessitates greater expenditure on traffic management.
Not to assess needs for national capital influences	This issue does not fit the criteria for a national capital allowance disability because it is not mandated. Were it to have been identified as a special fiscal needs issue, any allowance would have been phased out by this point.

Change the road user charges assessment to EPC	It is not standard policy to raise toll revenue from publicly owned roads.
Not to assess needs for insurance, freight or congestion.	No conceptual case was established.

Derivation of category factor

285. Table 41 summarises the components, component weights and disability factors assessed for this category for 2001-02. It shows the calculation of the category factor.

Table 41 ROADS — DERIVATION OF CATEGORY FACTOR — 2001-02

Factors	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
	0.3818127							
Fixed Costs	0.009							
Administrative Scale Factor	0.36891	0.50461	0.66745	1.27717	1.61320	5.17750	7.59249	12.25311
Fixed Costs Input Costs Factor	1.03498	0.99044	0.97446	0.98186	0.97135	0.92001	1.01306	1.09897
Component factor	0.38252	0.50072	0.65162	1.25634	1.56990	4.77221	7.70596	13.49087
Cont. to category factor	0.00340	0.00446	0.00580	0.01118	0.01397	0.04247	0.06858	0.12007
Local Roads	0.010							
Dispersion Factor	0.99760	0.99346	1.00610	1.01078	0.99577	0.99547	0.98275	1.09373
Input Costs Factor	1.02656	0.99252	0.98046	0.98702	0.97840	0.93711	1.00954	1.08008
Local Roads Factor	0.42971	0.00799	1.22192	3.14151	2.13085	0.00000	0.00000	14.80207
Component factor	0.43073	0.00771	1.17987	3.06797	2.03168	0.00000	0.00000	17.00542
Cont. to category factor	0.00422	0.00008	0.01156	0.03007	0.01991	0.00000	0.00000	0.16665
Arterial Roads	0.324							
Dispersion Factor	0.99760	0.99346	1.00610	1.01078	0.99577	0.99547	0.98275	1.09373
Input Costs Factor	1.02656	0.99252	0.98046	0.98702	0.97840	0.93711	1.00954	1.08008
Urban influences	1.00164	1.03777	0.94625	0.96047	0.97508	0.96193	1.47028	0.91486
Urban complexity	1.03302	0.99458	0.99458	0.96095	0.96095	0.96095	0.96095	0.96095
Physical Environment Factor	0.98890	0.99964	1.01261	0.99135	1.00323	1.02946	0.87695	1.01385
Road Use and Length Factor	1.10028	1.00291	1.01592	0.99459	1.00651	1.03282	0.87982	1.01716
Component factor	1.08148	1.00592	0.92965	0.90274	0.90549	0.87750	1.21569	1.03450
Cont. to category factor	0.35031	0.32584	0.30113	0.29241	0.29330	0.28424	0.39379	0.33510
Bridges	0.036							
Dispersion Factor	0.99760	0.99346	1.00610	1.01078	0.99577	0.99547	0.98275	1.09373
Input Costs Factor	1.02656	0.99252	0.98046	0.98702	0.97840	0.93711	1.00954	1.08008
Bridge Maintenance Factor	1.01710	0.85969	1.03856	0.99928	0.59386	1.86116	1.44337	3.46958
Physical Environment Factor	0.98890	0.99964	1.01261	0.99135	1.00323	1.02946	0.87695	1.01385
Component factor	1.02918	0.84657	1.03659	0.98757	0.57987	1.78521	1.25488	4.12532
Cont. to category factor	0.03689	0.03034	0.03715	0.03539	0.02078	0.06398	0.04498	0.14785
Road Safety	0.070							
Dispersion Factor	0.99760	0.99346	1.00610	1.01078	0.99577	0.99547	0.98275	1.09373

Input Costs Factor	1.02656	0.99252	0.98046	0.98702	0.97840	0.93711	1.00954	1.08008
Urban influences	1.00164	1.03777	0.94625	0.96047	0.97508	0.96193	1.47028	0.91486
Component factor	1.02591	1.02330	0.93360	0.95843	0.94996	0.89714	1.45906	1.07395
Cont. to category factor	0.07174	0.07156	0.06529	0.06702	0.06643	0.06274	0.10203	0.07510
Other Transport	0.268							
Dispersion Factor	0.99760	0.99346	1.00610	1.01078	0.99577	0.99547	0.98275	1.09373
Input Costs Factor	1.02656	0.99252	0.98046	0.98702	0.97840	0.93711	1.00954	1.08008
Urban traffic control	1.02848	1.02848	0.96304	0.96304	0.96304	0.93499	0.93499	0.93499
Component factor	1.05301	1.01376	0.94980	0.96062	0.93787	0.87168	0.92750	1.09716
Cont. to category factor	0.28231	0.27179	0.25464	0.25754	0.25144	0.23370	0.24866	0.29415
Land Rights	0.000							
Land Rights Factor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	98.02489
Component factor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	98.02489
Cont. to category factor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00196
Native Title	0.000							
Native Title Factor	0.06730	0.18047	1.94495	2.74309	1.56301	0.15232	0.22312	16.79242
Component factor	0.06730	0.18047	1.94495	2.74309	1.56301	0.15232	0.22312	16.79242
Cont. to category factor	0.00002	0.00005	0.00058	0.00082	0.00047	0.00005	0.00007	0.00504
Isolation	0.001							
Isolation Factor	0.05107	0.10737	0.17783	0.74776	0.56469	3.49490	1.51842	68.27218
Component factor	0.05107	0.10737	0.17783	0.74776	0.56469	3.49490	1.51842	68.27218
Cont. to category factor	0.00003	0.00006	0.00011	0.00045	0.00034	0.00210	0.00091	0.04096
National Highway	0.283							
National Highway Factor	0.95657	0.96448	1.24899	0.91413	0.66643	0.82918	0.88736	2.67739
Component factor	0.95657	0.96448	1.24899	0.91413	0.66643	0.82918	0.88736	2.67739
Cont. to category factor	0.27031	0.27254	0.35294	0.25832	0.18832	0.23431	0.25075	0.75658
CATEGORY FACTOR	1.01924	0.97672	1.02920	0.95321	0.85497	0.92358	1.10977	1.94346

Calculation formulae

286. The following formulae were used to calculate the contribution of each expenditure component to the overall category factor. In each case, the contributions are calculated as the expenditure component weight multiplied by the component factor (the bracketed terms in the formulas). Each contribution to the category factor was rescaled according to State population proportions to ensure that, for each of them, the sum of standardised equals the sum of actual expenditure.

287. Since input costs and dispersion disabilities are applied to mutually exclusive cost items, they are added within an expenditure component to avoid the creation of unintended interaction effects.

Arterial roads (ART)	=	0.3240 [(rul * 0.4) + (p*0.6) * (ic+d-1) * urb * urb_complex]
Bridge operations (BRI)	=	0.0358 [bm * (ic + d-1) * p]
Local roads (LRD)	=	0.0099 [loc * (ic+d-1)]
National Highways(HWY)	=	0.2826 [nat_hwy]
Road safety (ROS)	=	0.0699 [urb * (ic+d-1)]
Other transport (OTR)	=	0.2681 [utc * (ic+d-1)]
Fixed cost (FC)	=	0.0090 [s*fc_ic]
Isolation (ISO)	=	0.0006 [iso]
Land rights (LR)	=	0.0000 [lr]
Native title (NTA)	=	0.0003 [nt]

Category Factor =

$$\text{ART} + \text{BRI} + \text{ISO} + \text{LRD} + \text{HWY} + \text{LR} + \text{NTA} + \text{OTR} + \text{ROS} + \text{FC}$$

Standardised expenses

288. Table 42 shows the category factors calculated for the Draft Assessment for the 2004 Review compared with the category factors assessed for this category in the 2003 Update

Table 42 COMPARISON OF CATEGORY FACTORS, 2003 UPDATE AND THE DRAFT ASSESSMENT FOR THE 2004 REVIEW

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
2003 Update	1.02269	0.86830	0.92810	1.19361	0.98579	1.14958	0.83950	2.91976
Draft Assessment - 2004 Review	1.01924	0.97672	1.02920	0.95321	0.85497	0.92358	1.10977	1.94346

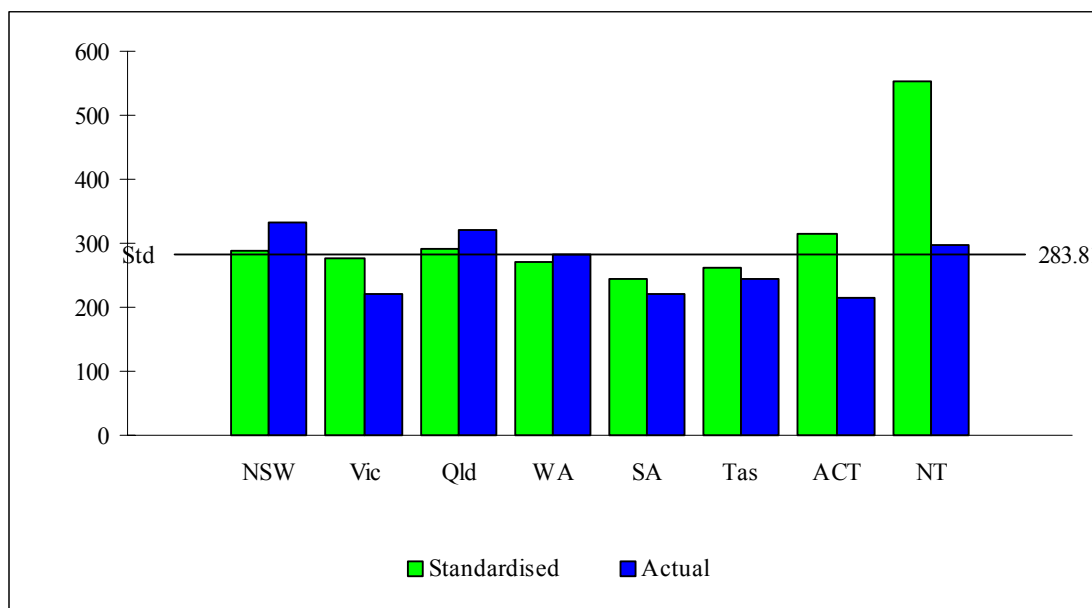
289. Table 43 shows the standardised expenses assessed for this category for 2001-02 in the draft assessment compared with those assessed in the 2003 Update.

Table 43 ROADS - ACTUAL AND STANDARDISED EXPENSES, 2001-02

	Standard	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
2003 Update Actual Expenses									
\$ per capita	149.0	111.6	162.7	174.7	204.7	144.0	183.5	69.8	136.0
2003 Update - Standardised Expenses									
\$ per capita		152.3	129.3	138.3	177.8	146.8	171.2	125.1	434.9
2004 Review Actual Expenses									
\$ per capita	283.8	331.0	221.4	319.2	282.1	219.1	243.0	215.2	297.5
2004 Review Draft Assessment - Standardised Expenses									
\$ per capita		289.3	277.2	292.1	270.5	242.7	262.1	315.0	551.6

290. Figure 1 shows the standardised, actual and standard expenses for Roads for 2001-02.

Figure 1 PER CAPITA ROAD EXPENSES – STANDARDISED, ACTUAL AND STANDARD, 2001-02



Effect of proposed method on grant shares

291. Table 44 shows the redistribution of grants resulting from the assessment in the 2003 Update and in the Draft Assessment for the 2004 Review.

292. Compared to an equal per capita assessment, the Draft Assessment redistributed \$226.8 away from Victoria, Western Australia, and South Australia to the other States, \$68 million more than in the 2003 Update.

Table 44 GRANT SHARE IMPACT OF THE PROPOSED CHANGES TO THE ASSESSMENT

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total ^(a)
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Contribution to 2003 Update relativities ^(b)	21.8	-106.3	-41.4	62.1	-2.9	11.8	-8.2	63.1	158.8
Contribution to 2004 Review Draft Assessments relativities ^(b)	89.1	-180.5	54.2	-23.9	-22.4	10.9	10.6	61.9	226.8
Total change	67.4	-74.2	95.6	-85.9	-19.5	-1.0	18.8	-1.2	181.8

(a) Total redistribution.

(b) Assuming same pool and a constant population.

(c) This figure shows the change in the amount redistributed among the States between the 2003 Update and the 2004 Review Draft Assessment. It does not necessarily equal the difference in the total contributions to the relativities between the two inquiries.

Analysis

293. The main changes in the assessment and their effects are outlined below.

Table 45 IMPACT OF CHANGES

Change	Effect
Inclusion of national highways expenditure and APC assessment of associated needs	Increases grant share of States receiving above average National Highways SPP — Queensland and the Northern Territory in 2001-02
Change data on which road use and length factor (arterial roads component) is based to AKVT and change weights used for heavy vehicles in the road use and length factor (arterial roads component)	Lowers grant share for Western Australia, South Australia and the Northern Territory
Change data on which weights for the physical environment factor (arterial roads and bridges components) are based to those of the ARRB TR report	Increases grant share for New South Wales, Western Australia and the ACT
Change calculation method for urban and rural arterial road factors	Increases grant share for New South Wales, Victoria and the ACT
Introduce an assessment for higher infrastructure costs in urban areas (arterial roads component)	Increases grant share for New South Wales
Assess needs for urban influences in the road safety component	Increases grant share of New South Wales, Victoria and the ACT
Not to assess SDC needs for road safety	Lowers grant share of South Australia, Tasmania, the ACT and the Northern Territory
Assess needs for urban traffic management	Increases grant share of New South Wales and Victoria
Change the road user charges assessment to EPC	Increases grant share of New South Wales and Victoria

USER CHARGES

294. **1999 Review.** The user charges category consisted of user charges raised from publicly owned or controlled toll roads and other miscellaneous charges relating to road use. In the 1999 Review, road transport charges were assessed using an equal per capita method. Toll revenue was assessed on the basis that New South Wales and Victoria had twice the capacity to raise tolls as Queensland, Western Australia and South Australia; while Tasmania, the ACT and the Northern Territory had no road toll raising capacity.

295. Table 46 shows the roads user charges assessed in the 2003 Update. The figures presented are actual amounts.

Table 46 ROADS USER CHARGES, 2001-02

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Per capita (\$)	19.25	36.73	40.04	35.78	56.12	10.95	68.96	11.20	19.25
User charges (\$m)	127.85	178.33	146.98	68.63	85.22	5.18	22.25	2.24	127.85

296. **State views.** New South Wales argued that a revenue capacity factor for this assessment should be based on a measure of relevance to State capacities, such as the number of cars per capita or income per capita. New South Wales said that the current factor was not justified and argued that the assessment should be equal per capita.

297. **Staff proposals.** Staff proposed to review the split between toll and other revenue with the aid of budget data. Staff were inclined to use judgement to review toll raising capacity and thought a measure based on congestion may be beneficial. Staff thought that there was likely to be a threshold number of vehicles or licensed drivers before a toll could be cost effective. Staff considered that Tasmania, the ACT and the Northern Territory continue to have little capacity to raise tolls.

298. **Further State views.** New South Wales said that there was no intuitive, conceptual, economic or other reason for revenue from road tolls to be assessed differentially. New South Wales stated that road tolls were fundamentally policy choice and considered that the imposition of road tolls should be treated as standard policy. The State argued that road tolls should be assessed equal per capita.

299. New South Wales also said that the current assessment is arbitrary and acts as a disincentive for Tasmania, the ACT and the Northern Territory to introduce road tolls. New South Wales said that in the current assessment the Commission is relying exclusively on judgement and on the basis of the complete lack of evidence, and in line with the Commission's guidelines, roads user charges should be subject to equal per capita.

300. South Australia and the Northern Territory supported the differential assessment of revenue from road tolls. South Australia argued that more populated areas have a revenue raising advantage in relation to tolls. The Northern Territory said it would be unreasonable to assume that it was able to raise relatively the same amount of revenue through road tolls as the larger States.

301. **Commission decisions.** The Commission proposes to assess revenue from public road tolls on an equal per capita basis.

302. The Commission did not consider, on balance, that a conceptual case was made that States have different revenue capacity to raise revenue from public road tolls.

303. **Proposed method.** Roads User Charges will be assessed on an EPC basis.