



# **COMMONWEALTH GRANTS COMMISSION**

**DISCUSSION PAPER CGC 2002/25**

## **DEPRECIATION**

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## INTRODUCTION

### THE PURPOSE OF THIS PAPER

1. This paper is intended to provide the basis for future discussions on the Depreciation assessment and States are invited to respond to its contents, either in writing or at the November staff conference. The proposed assessment structure in Table 2 and the reasons for changes outlined in Table 3 summarise our tentative conclusions.

2. In determining how to revise this assessment, we will take into account the views expressed by the States. The proposed assessment and other arguments outlined in this paper should be taken as a guide to our current thinking.

### THE CURRENT DEPRECIATION ASSESSMENT

3. Depreciation allocates the cost of purchasing an asset over its useful life. It enables the cost of service provision to be measured more fully by including the cost of using assets. The role of the Depreciation assessment is to allow States to fund annual depreciation of a standardised capital stock in the assessment period at a standardised cost of provision, taking account of factors leading to differential rates of depreciation. It was introduced in the 1999 Review because the separation between recurrent and capital transactions had become blurred, and other mechanisms for addressing the differential capital needs of the States had ceased. The Commission concluded that fiscal equalisation was not being achieved while it did not consider these needs.

4. As Table 1 shows, in the current assessment, assets are divided into several classes — buildings, other construction, plant and equipment, housing, urban transit construction and urban transit plant and equipment. Each of these classes has a different mix of disabilities applied to it. There is also a small component for isolation. The scope of the existing assessment is the same as the scope of the standard budget minus concessions and other payments and roads<sup>1</sup>. To match depreciation as far as possible with the standard budget, the functional framework for capital expenditures was based on the mapping of the ABS government purpose codes and sectors that produces the standard budget. This required a simplified approach because a number of the ABS classifications used in compiling the standard budget are not available for capital transactions. Depreciation expenses were calculated separately for housing, urban transit and other functions. A comparison of the initial results with published depreciation figures suggested that most

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<sup>1</sup> While retaining the same general approach, the assessment proposed in this paper would apply a slightly different mix of disabilities to the classes of capital and would be limited to buildings, other construction and plant and equipment. Roads and concessions and other payments would continue to be excluded.

were in line with the limited data published. However, the urban transit figures required weighting by 60 per cent to bring them into line. The three separate estimates were combined and included in the standard budget in a single depreciation category.

5. The asset life disability takes account of factors that might affect the *rate* of depreciation. The other disabilities reflect the States' different needs for capital (and consequently depreciation expenses). For example, if a State has a very low number of students, its depreciation needs for schools will be also be low because its capital needs for schools will be low.

**Table 1** CURRENT DEPRECIATION ASSESSMENT STRUCTURE

Expenditure component	Component weight	Disability factors
Buildings	34.10	Asset life Construction cost Population concentration Socio-demographic composition
Other construction	22.79	Asset life Construction cost Population concentration Socio-demographic composition — Equal per capita (EPC)
Plant and equipment	18.09	Asset life Dispersion Population concentration Socio-demographic composition
Housing	9.43	Construction costs Physical environment factor for public housing Socio-demographic factor for housing depreciation
Urban transit construction	7.43	Asset life Construction costs Capital requirement factors for urban transit
Urban transit plant and equipment	7.77	Asset life Capital requirement factors for urban transit
Isolation	0.38	Isolation

## **PURPOSE OF REVIEWING THE ASSESSMENT**

6. The Commission is reviewing the Depreciation assessment to ensure that it appropriately captures the influences on each State's capital-related service delivery costs. Submissions to the 2001–02 Depreciation and Debt Charges Working Party of Commission and State Treasury staff which reported in July 2002 made it clear that States are happy with the conceptual approach to the assessment but see a need to refine the assessment and to ground it more securely in the available evidence.

7. In considering this assessment, the Working Party focused on improving its structure and disabilities so that the assessment would more accurately reflect the different capital costs facing the States. Although the Depreciation assessment is less controversial than the Debt Charges assessment, strong feelings were expressed about some disabilities, such as asset life and population concentration. Other issues were whether recurrent disabilities should be used (and if so whether they should be discounted) and how assessments could be more robustly supported by evidence. We have attempted to address these concerns in the proposed assessment outlined in this paper.

## **DEPRECIATION AND DEBT CHARGES WORKING PARTY**

8. The Commission has applied a Debt Charges assessment for many years. During the 1993 Review, several States argued that the Commission's analysis should be expanded to include capital transactions. The Commission considered the matter, but concluded that conceptual and practical obstacles precluded the introduction of an assessment at that time. The Government's instructions to the Commission confirmed this approach.

9. During the 1999 Review, a working party of State Treasury and Commission officers was formed to report on the operating impacts of capital and how they might be assessed. The Working Party reported in November 1998. It noted a wide range of views among its members with respect to depreciation disabilities, and made a number of findings, including that:

- (i) assessment should be made of States' standardised needs for depreciation expenses;
- (ii) transitional depreciation measurement arrangements would be necessary because reported depreciation data were of poor quality;
- (iii) general government depreciation should be assessed in one category, with separate assessments for PTE categories; and
- (iv) the general government depreciation category would not include depreciation of roads.

10. After the 1999 Review, the States agreed to continue with the working party process to give further consideration to the assessment of depreciation and debt charges expenses. This reflected widespread dissatisfaction with the assessments. The Working Party met three times and States' views were also presented in written form. The Depreciation assessment was less controversial than the Debt Charges assessment although there was strong criticism of aspects of the assessment — such as how securely it was based on evidence and whether and how recurrent disabilities should be applied. The Working Party presented its report in July 2002.

## ISSUES

11. This section discusses issues that are relevant to the improvement of this assessment, but do not relate directly to a particular disability. They are:

- (i) needs arising from shrinking populations and intrastate migration;
- (ii) calculation of the depreciation standard; and
- (iii) methodological issues.

### NEEDS ARISING FROM DECLINING POPULATIONS AND INTRASTATE MIGRATION

12. Different rates and directions of population change can present difficulties for those States with a declining population and/or significant internal migration. They may face capital-related disadvantages through having to maintain and depreciate immobile assets that are used below capacity due to population changes. This is not currently recognised as a disability.

13. *State Views.* This issue was raised by Queensland and South Australia. At its 2001 Workplace Discussions, Queensland discussed the difficulties of shifting populations. South Australia argued that low growth States may incur higher costs as they have to operate with outdated technology or design (such as prisons).

14. *Comment.* We agree that these circumstances can raise difficulties for States, but there are practical and conceptual difficulties with developing an assessment.

15. In practical terms, how would we measure a disability? We would need to:

- (i) identify regions based on area rather than population;
- (ii) identify which regions had undergone population decline for the period under consideration; and
- (iii) develop and apply a measure of disadvantage, including a sunset clause.

16. There might also be conceptual problems with an assessment. We would not wish to introduce a grant design inefficiency by inadvertently:

- (i) encouraging States to continue to use under-utilised facilities unnecessarily; or
- (ii) discouraging States from selling or leasing out the assets where this option is available.

17. Given these potential difficulties, we are not inclined to propose an assessment for this issue.

## MEASUREMENT OF THE DEPRECIATION FINANCIAL STANDARD

18. The Commission currently estimates the States' depreciation expenses. This is because not all States were sufficiently advanced in the implementation of accrual accounting to show accurate and comparable figures for depreciation in the GFS collection. In 2002, there was agreement among Working Party members that ABS data should be used when it was sufficiently reliable.

### *State Views*

19. **Victoria.** Victoria supported the use of State data, provided there was consistency between States.

20. **Queensland.** Queensland agreed that the government finance statistics (GFS) data had been inadequate for the 1999 Review but argued that once comparative data were available, GFS data would be preferable.

21. **South Australia.** South Australia supported the use of GFS actuals, while accepting the continued use of estimates. It also noted that some modification would still be necessary to deal with excluded capital grants.

22. **Tasmania.** Tasmania argued that it would support the use of actual data, but noted the issue of data incomparability and the need for five years of useable data.

### *Comment*

23. The Working Party concluded that the GFS data are adequate to support a standard for the Depreciation assessment. We are satisfied that the GFS data can now be used.

## ISSUES IN DEVELOPING CAPITAL-RELATED DISABILITIES

24. Two issues make this area particularly difficult to analyse and quantify. They are:

- (i) the indivisibility of capital — making it difficult to determine the impact of growing demand on capital needs (and therefore depreciation needs); and

- (ii) whether recurrent disabilities are an appropriate mechanism for the equalisation of depreciation needs.

### ***Indivisibility of Capital***

25. Some capital purchases are relatively small, meaning that they can be directly matched to the amount required. Examples include school desks and hospital beds, which may cost the same per capita for a small town as for a large city. However, other capital expenditure (including most buildings) is likely to require a minimum level of investment that means that it will cost more per capita in a small town than a large city (where the cost can be spread across more people). Examples include schools and hospitals.<sup>2</sup>

26. This disadvantage is picked up in the service delivery scale component of the population concentration disability. However, the problem remains of how to calculate the capital impact of extra demand for services. An extra student in a small town is unlikely to be the one to trigger the need for a new class room, but if growth continues, then at some point this must happen. This analysis works on the premise that every student brings a level of capital use although we cannot be aware of exactly which communities will need to build a new class room, and when.

### ***The Use of Recurrent Disabilities***

27. The current Depreciation assessment has been criticised both for discounting or changing recurrent disabilities, and for applying them. For example, Western Australia argued that there should be a more reliable quantification of depreciation disabilities, noting that there are many instances where the depreciation and recurrent disabilities are different, without strong reasons being evident for the differences. Victoria made a different point, arguing that recurrent disabilities would not necessarily be applicable to depreciation.

28. We believe that recurrent disabilities make the best starting point for developing depreciation disabilities because they measure the factors that influence demand for services and thus the need for capital and the resultant depreciation expense. For example, the education disabilities tell us about demand for schools, and the law and order disabilities tell us about demand for police, courts and prisons. They also measure factors that influence costs. For example, the dispersion disability tells us about freight costs which influence construction costs. By using recurrent disabilities, we facilitate consistency with recurrent assessments, ensure that data changes flow through to the Depreciation assessment, and reduce the data demands we make of the States. However, these disabilities cannot always be applied directly to the Depreciation assessment. They may be inappropriate or require adjustment so that they accurately reflect the impact on capital consumption. This paper discusses their relevance and how they can be tailored to suit this assessment.

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<sup>2</sup> Some recurrent costs are also indivisible, such as the employment of a teacher, resulting in the current assessment of service delivery scale disability factors applied to functional recurrent costs.

29. This paper uses the term ‘recurrent disabilities’ to refer to disabilities that are applied in categories such as Hospitals, Police, Corrective Services etc. We realise that recurrent costs are a cash concept, but need a way of distinguishing the disabilities applied to the depreciation standard from the disabilities applied to other category standards. This is the term that has been used by members of the Working Party.

30. The link between recurrent disabilities and those applied to the depreciation standard has yet to be fully explored. For example, we believe that an economic environment factor for hospitals will probably need to be applied to the depreciation standard so that we take account of the effect of private hospital services on the need for public hospitals.

## PROPOSED ASSESSMENT

31. The Depreciation assessment currently includes estimated depreciation expenses associated with the provision of all State services included in the standard budget except those involved with the restoration of road pavements, and concessions and other payments. The proposed assessment would continue to exclude roads and concessions and other payments, and would also exclude depreciation of housing and urban transit stock. Because of cost recovery arrangements, the depreciation of such stock will be covered in the relevant category assessments. Consideration was given to the further categorisation of depreciation, but insufficient data are available.

32. The current assessment applies a mix of demand and cost disabilities. However, the proposed assessment is based on cost disabilities because we believe that these drive capital expenditure. In contrast, recurrent expenses are more likely to be driven by both cost and demand disabilities. For example, the need for space in schools is driven by the number of students, regardless of their characteristics. However, recurrent education costs (for example, breakfast programs) are driven by both the number of students and characteristics such as socio-economic status.

33. Table 2 shows the proposed assessment structure. It assumes the continuation of the expenditure assessment framework used in the 1999 Review, but with Housing and Urban Transit removed. Each disability factor is discussed in more detail later in this section. Numbers in brackets refer to the paragraph numbers in this paper where the proposed assessment is outlined. Component weights have not yet been calculated.

**Table 2** PROPOSED ASSESSMENT STRUCTURE

Expenditure component	Component weight	Factors	Basis of calculation
	%		
Buildings	XX	Physical environment (61–72)	Assessment based on impact of climate, termites and natural hazards
		Service delivery scale (Table 11, 173–174)	Composite of factors applied to Education, Health, and Law and Order
		Administrative scale (Table 11, 171–172)	Composite of factors applied to Education, Health, and Law and Order
		Urbanisation (Table 11, 167–170)	Based on possible disabilities for Health, and Law and Order
		Socio-demographic composition (Table 15, 202–205)	Composite of factors applied to Education, Health, and Law and Order
		Dispersion (Table 8, 117–118)	Dispersion components relating to freight and locality allowances New assessment for plant hire (subject to materiality test)
		Input costs (Table 7, 97–102)	Construction-related wages

**Table 2 PROPOSED ASSESSMENT STRUCTURE (continued)**

Expenditure component	Component weight	Factors	Basis of calculation
Other construction	XX	Physical environment (61–72)	Assessment based on impact of climate, termites and natural hazards
		Service delivery scale (Table 11, 173–174)	Combined service delivery scale and urbanisation factor from other expenditure categories
		Urbanisation (Table 11, 167–170)	Combined service delivery scale and urbanisation factor from other expenditure categories
		Socio-demographic composition (Table 15, 202–205)	EPC
		Dispersion (Table 8, 117–118)	Dispersion components relating to freight and locality allowances New assessment for plant hire (subject to materiality test)
		Input costs (Table 7, 97–102)	Construction-related wages
Plant and equipment	XX	Physical environment (61–72)	Assessment based on impact of climate, termites and natural hazards
		Dispersion (Table 8, 117–118)	Based on the general method with needs assessed for freight New assessment telecommunications equipment (subject to materiality test)
		Socio-demographic composition (Table 10, 209–212)	Composite of factors applied to Education, Health and Law and Order
		Administrative scale (Table 11, 171–172)	Composite of factors applied to Education, Health and Law and Order
		Urbanisation (Table 11, 167–170)	Based on possible disabilities for health and law and order
		Socio-demographic composition (Table 15, 202–205)	Composite of factors applied to Education, Health and Law and Order

34. Table 3 outlines the changes and the reasoning behind them in summary form.

**Table 3** PROPOSED 2004 REVIEW ASSESSMENT —  
SUMMARY OF CHANGES FROM 1999

Old Assessment	Change	Reason for change
<b>Disabilities</b>		
Asset life	Incorporated into new physical environment assessment and different evidence used to construct disability	Evidence that current assessment is too narrowly focused
Construction Cost	Replaced by assessments for dispersion and input costs	Widespread dissatisfaction with Rawlinsons Index, particularly possible policy contamination and double-counting
Dispersion	Application extended to buildings and other construction	Widespread dissatisfaction with Rawlinsons Index
Input costs	Application introduced to buildings and other construction	Widespread dissatisfaction with Rawlinsons Index
Population concentration	Replaced by disabilities for service delivery scale, administrative scale and possibly urbanisation, with greater similarity to recurrent disabilities	Recurrent disabilities believed to be more accurate than the current 'population bands' approach
Socio-demographic composition	Less discounting and some adjustment of the assessment to make the disabilities more relevant to depreciation	50 per cent discounting not supported by evidence
Isolation	Assessment removed	Belief that the usual assumption that materials and equipment are sourced from the south eastern States does not apply in the case of construction
<b>Other</b>		
Scope of the assessment	Depreciation needs for housing and urban transit removed (dealt with in relevant categories)	Functionalisation believed to be more viable under cost recovery arrangements
Measurement of the depreciation standard	Use government finance statistics rather than Commission estimates	Quality of data available has improved

## PHYSICAL ENVIRONMENT (ASSET LIFE)

### *Background*

35. In the 1999 Review, the asset life assessment was intended to take account of States' different per capita depreciation costs due to aspects of the physical environment that affect the life of assets. It was applied to depreciation on:

- (i) buildings;
- (ii) other construction; and
- (iii) plant and equipment.

36. Assets located above the Tropic of Capricorn were judged to have a shorter life than those located elsewhere due to the effects of the tropical climate. The weighting for asset life in northern Australia varied between components. Buildings and other construction had a weighting of 120 per cent, and plant and equipment had a weighting of 115 per cent. This means that they were believed to deteriorate 20 per cent and 15 per cent more quickly than similar assets in southern areas. This disability has been criticised for ignoring physical environment issues that affect southern States and for being only loosely supported by evidence.

### *State Views*

37. Several States provided comments on this factor. Queensland, Western Australia and the Northern Territory broadly supported the current approach. Victoria, South Australia and Tasmania viewed it as flawed. A data request we distributed to the States in March 2002 resulted in some useful data.

38. *New South Wales.* New South Wales supported the asset life assessment. On the matter of how New South Wales is affected by this issue, its response to the data request included information on extra costs incurred by the Education Department. These included the provision of cooling services, the corrosive effect of the marine environment, anti-pollution measures, and allowances for floods, high winds, bushfires and storms.

39. *Victoria.* Victoria argued that this assessment is based on inadequate evidence and that the need to build physical assets to withstand specific conditions does not necessarily involve additional costs. It also identified a possible double-counting between this factor and the construction costs factor if the latter included an allowance for a higher standard of building to withstand a harsh physical environment. In May 2002, Victoria argued that an equal per capita assessment should be applied because so many variables could influence asset life and it would be impossible to include and quantify them all. It gave the examples of corrosion, intensity of asset use, appropriateness of construction materials, exposure to natural disasters and whether assets are used in accordance with the design intent.

40. In addition, Victoria argued that while some conditions are more prevalent in northern Australia, others (such as bushfires, flooding and hailstorms) are more common in southern Australia and these are more likely to affect population centres. It stated that if more expensive construction is required in the tropics, this would be captured by the construction cost disability.

41. In its response to the data request, Victoria noted that its Building Code sets out additional requirements for Alpine areas and that Commonwealth Scientific and Industrial Research Organisation (CSIRO) research found that corrosion is highest in the south-east, Tasmania and East Arnhem in the Northern Territory.

42. *Queensland.* Queensland argued that harsh and prolonged weather conditions (such as droughts, cyclones, ultra-violet light and high rainfall) diminish asset life. It also argued that adverse conditions in non-tropical Australia are likely to be infrequent and that there is no double counting with the Rawlinsons index because it does not consider the use of more robust materials. To illustrate its point, Queensland cited several measures that need to be taken in cyclone-affected areas such as coastal northern Queensland.

43. Queensland also noted the need in tropical areas for more substantial drainage facilities due to heavy rainfall, and increased wear and tear due to sunlight and ultraviolet light. In its response to the 2002 data request, it presented the following examples of the climatic impact on assets in Queensland.

- (i) Hard water from the Artesian Basin shortens the life of plumbing components, leading to a life expectancy for some components of one-third of that in other areas.
- (ii) The high salt content in winds necessitates the use of expensive corrosion-resistant materials, such as roofs which cost more than twice those used in the south-east.
- (iii) The wet, humid climate compounded by salty winds accelerates the deterioration of paint, metal and wood (average programmed time for external re-painting is five years compared with ten years in the south-east of the State).
- (iv) In the second half of 2001, the average recharge cost for a returned two-wheel drive was \$704, whereas for a two-wheel drive from north of Townsville or Mount Isa, the average cost was \$841.
- (v) The hot climate in the north of the State fuels community expectations that air-conditioning will be provided in government buildings (including an electrical upgrade, this can cost up to \$220 000 for a standard teaching block).

44. Queensland also argued that, at a minimum, cyclone-proofing adds three per cent to the cost of building a General Learning Block (containing four classrooms) where

standard forms of design and construction apply. This would be substantially higher where unique design situations are applied for other types of public building infrastructure.

45. **Western Australia.** Western Australia described the current approach as *ad hoc* and suggested that the Tropic of Capricorn cut-off be changed to reflect the fact that it excludes some cyclone-prone areas. In its response to the 2002 data request, it described its three broad climate zones and the impacts on the life of assets as:

- (i) temperate climate of the southwest (wind load, corrosion, termites);
- (ii) tropical climate of the far north (storms, corrosion, termites); and
- (iii) arid climate of the inland part of the State (heat, dust).

46. With respect to education-related assets, it argued that buildings designed to withstand cyclones cost 10 to 15 per cent more than otherwise and that mechanical plant in the northwest could be expected to last no more than 75 per cent of that in the southwest. Data provided emphasised the increased cost (15 per cent) of building police facilities for cyclonic conditions, and the effect of moist salty air, water quality, solar radiation and temperature variation. Information from the Department for Planning and Infrastructure outlined the design implications of high tidal ranges, and cyclonic storm surges, waves, winds and rainfall. It estimated that approximately 30 per cent of the cost of Exmouth Boat Harbour was due to design for cyclone exposure and tidal range.

47. **South Australia.** South Australia requested further justification of the 20 per cent loading for buildings in tropical climates as well as investigation of the effects of other extreme climates such as desert areas prone to extreme temperatures. In its response to the 2002 data request, it provided life factors for fencing, walls, roofs, downpipes and gutters, depending on whether the region was coastal, arid, high rainfall or Port Pirie.<sup>3</sup> For all the items discussed, durability was highest in arid areas, usually followed by high rainfall areas, and then coastal areas (equal with Port Pirie).

48. **Tasmania.** Tasmania argued that there are several climatic conditions that could reduce the life of assets, citing constant high temperatures, extreme variations in temperature, and regular snowfall. It put forward the view that it would be very complex to incorporate all of these conditions and that it would therefore be more equitable to exclude the effect of climatic factors. Tasmania developed this argument in its February 2002 submission and its response to the 2002 data request. It argued that:

- (i) there is such a variety of climatic influences across Australia that it would not be possible to develop an accurate assessment;
- (ii) the ability to compare climatic effects on assets is undermined by assets having different life spans and utilisation rates;
- (iii) the useful life of assets can be extended through upgrading; and

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<sup>3</sup> Port Pirie was separately identified because of the incidence of pollution.

- (iv) there is potential for policy contamination as governments determine the engineering standards required for particular areas.

49. **Northern Territory.** The Northern Territory argued that the current approach is justified because the harsh northern climate necessitates measures such as stronger foundations, reinforced walls, the elevation of houses and the treatment of metal against biological agents. It also argued that it is legitimate to apply concurrently construction cost, asset life, and repairs and maintenance disabilities. In March 2002, the Northern Territory provided further examples of the impact of its physical environment, such as:

- (i) roofing tiles having a life of 15 to 20 years, compared with a probable life of 30 years in South Australia;
- (ii) the impact of fruit bat droppings on the life of paint; and
- (iii) the impact on building life of termites, humidity, tropical rain, ants and flooding.

50. The Northern Territory also noted the extra expense associated with its vulnerability to cyclones. It stated that in cyclone areas, a cyclone code adds 15 per cent to the cost of dwellings. Buildings built to code are designed to meet a category four cyclone rating. To build above this standard involves prohibitive costs. The Commonwealth's Natural Disaster Relief Arrangements assist States to replace assets to their pre-existing standard. Consequently, the Northern Territory has needed to spend extra funds in order to upgrade assets so as to withstand the physical environment. This amounted to \$4.8m in 1998–99, \$5m in 1999–2000, and \$7.9m in 2000–01.

51. The Northern Territory disagreed with some of CSIRO's findings on the impact of the physical environment (discussed below). It argued that CSIRO underestimated the impact in the Northern Territory of biological agents, the monsoonal pattern of Top End rainfall, high temperature, saline soils, other soils, the interaction of factors and the need for air-conditioning.

### ***Comment***

52. This is a complex and difficult area in which to construct an accurate assessment. However, evidence presented by the States leads us to believe that it should be done. The following discussion outlines our preliminary findings and our proposed method of assessment.

### ***Research Findings***

53. **Climate.** This issue needs to be considered in detail and any assessment should be based on clear evidence. Because this is such a technical area, the Commission contracted CSIRO to provide an outline of the issues involved. Their resulting report suggests that the influence of geographical variation on asset life is much greater than the current assessment assumes. For example, in broad terms, the climate data indicate that:

- (i) ultraviolet light and sunlight are most severe in inland Australia, followed by coastal Northern Territory and Queensland;
- (ii) wetness and moisture are severe in Victoria, southwest Western Australia, near coastal New South Wales and near coastal north Queensland;
- (iii) the impact of maximum temperature is most severe in inland regions and northwest coastal Western Australia;
- (iv) cyclic temperature is most severe in inland areas and Victoria;
- (v) relative humidity is most severe in coastal north Queensland, coastal northwest Northern Territory, southwest Western Australia, Victoria, Tasmania and southeast South Australia;
- (vi) marine salts have the most effect in coastal southwest Western Australia, coastal southeast South Australia, coastal Victoria and Tasmania;
- (vii) industrial pollutants are strongest in Sydney, Melbourne, Kalgoorlie, Brisbane, Mt Isa, Port Pirie and Gladstone; and
- (viii) termites are most commonly found in northern Australia.

54. **Natural hazards.** The risk of natural hazards is presented in two maps available on the internet.<sup>4</sup> One shows potential for natural hazards. The other combines history (30 per cent) with potential (70 per cent). The most hazardous location is Sydney, followed by Brisbane. Vulnerability is largely found in coastal areas, although much of both the southern coast of the mainland and the Tasmanian coast have a low level of vulnerability. The Natural Hazards Research Centre has calculated the contribution of nine natural perils to total building damage from 1900 to 1999. In order of damage caused, there were: tropical cyclones, floods, bushfires, gusts, hail, earthquakes, tornados, landslides and tsunami.

55. According to the Bureau of Transport Economics (BTE)'s *Economic Costs of Natural Disasters in Australia*<sup>5</sup>, total natural disaster costs between 1967 and 1999 were mostly incurred in New South Wales (44 per cent) and Queensland (22 per cent), followed by the Northern Territory (13 per cent), Victoria (9 per cent), Western Australia (6 per cent), South Australia (4 per cent), Tasmania (2 per cent) and the ACT (0.02 per cent). It should be noted that these figures refer to total damage rather than damage to assets owned by State governments. Also, these costs were affected by three extreme events — Cyclone Tracy, the Sydney hailstorm and the Newcastle earthquake.

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<sup>4</sup> The maps are the work of the Natural Hazards Research Centre at Macquarie University. They are available at [http://www.es.mq.edu.au/NHRC/web/nhq/nhq6\\_2/nhq6\\_2tables.htm](http://www.es.mq.edu.au/NHRC/web/nhq/nhq6_2/nhq6_2tables.htm) and [http://www.es.mq.edu.au/NHRC/web/nhq/nhq6\\_2/perilmaptables.htm](http://www.es.mq.edu.au/NHRC/web/nhq/nhq6_2/perilmaptables.htm).

<sup>5</sup> This can be found at <http://www.bte.gov.au/docs/r103/contents.htm>.

56. An alternative basis to view States' relative needs could be to use the Damage Index developed by the Natural Hazards research Centre. It shows the percentage of building damage suffered by each State from 1900 to 1999. These figures, shown in Table 4, have not been adjusted for population.

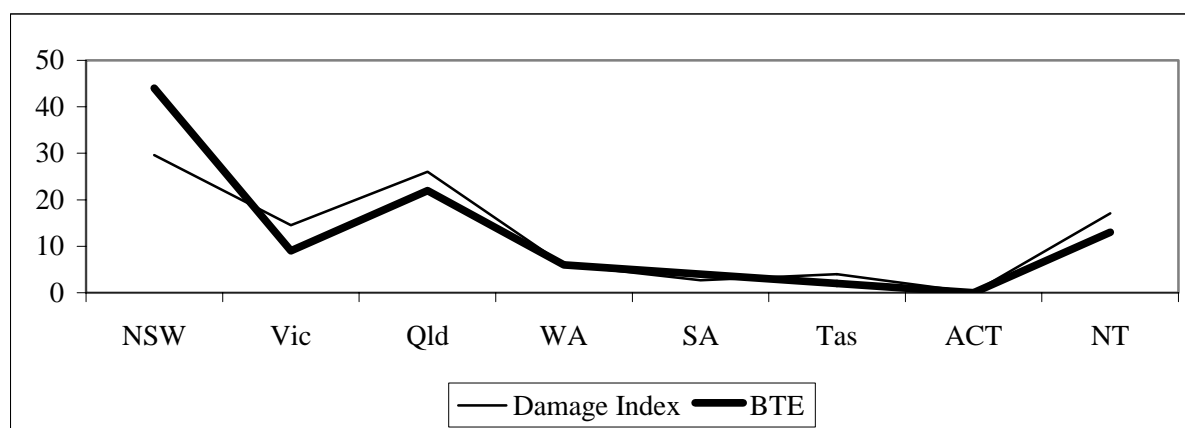
**Table 4** PERCENTAGE OF BUILDING DAMAGE SUFFERED BY EACH STATE, 1900-99

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Percentage	29.6	14.5	26.0	6.0	2.7	4.0	0.1	17.1

Source: Russell Blong, *Damage Index, 1999 (Natural Hazards Quarterly, December 1999, available at www.es.mq.edu.au).*

57. Figure 1 shows the strong similarities between Russell Blong's index and the BTE's index. This indicates that a historically accurate factor could be derived for natural disasters. Two possible shortcomings would be that it would not include the potential for disasters (which could be relevant to the building policies of State governments) and it would not consider the impact of Commonwealth disaster relief. These could compound each other because a State that prepared for disasters that did not occur would be ineligible for consideration for either equalisation or disaster relief. However, historically-derived evidence is consistent with the Commission's general approach and the long period considered by the Damage Index lessens the risk of the factor being inaccurate. The issue of Commonwealth disaster relief will be explored further.

**Figure 1** COMPARISON OF DAMAGE INDEX AND BTE'S NATURAL DISASTER COSTS



### *Other Possible Influences*

58. States have provided information about other possible influences on the life of assets. These included lightning strikes, hard water, snowfall, fruit bat droppings and ants. Given that one of the major criticisms of the current assessment concerns its

subjectivity, the Commission believes that the new assessment should be confined to the factors identified and explored by independent agencies such as CSIRO, the Bureau of Transport Economics and the Natural Hazards Research Centre.

59. Another question is whether we should consider the greater need of some States for heating and air-conditioning facilities. For example, the Queensland Government is undertaking the Cooler Schools program where it assists schools in a particular zone to purchase air-conditioning facilities. In principle such costs should be considered if they are required in order to provide students with an equivalent learning environment to other regions. However, we are inclined to believe that such an assessment would be ill-advised because:

- (i) it would be onerous to identify the proportion of each State's school-age population that required heating and/or cooling; and
- (ii) we believe that, once the costs of both heating and cooling across the country were taken into account, the differential expenses would not be worth pursuing.

### ***Other Issues***

60. Victoria expressed its concern that the assessment may not consider the possibility of assets being used in a manner contrary to their design intent, or being constructed inappropriately. Stakeholders can be assured that these situations would not distort the proposed assessment because it is based on a scientific analysis of the effect of conditions on materials, rather than States' actual costs. The Victorian argument about the intensity of asset use in highly populated areas is considered in the discussion of urbanisation in the population concentration factor.

### ***Proposed Assessment***

61. A harsh physical environment can affect assets through a combination of higher construction costs, greater repairs and maintenance, and lower asset life. Clearly, construction standards and the level of repairs and maintenance will affect asset life. Construction standards can also affect the level of repairs and maintenance required. We propose to construct an assessment that determines the life of an asset in a particular location, assuming EPC expenses on construction costs and repairs and maintenance as far as physical environment issues are concerned.

62. We propose to construct an assessment by:
- (i) developing an index showing each State's vulnerability to climatic conditions that are likely to increase the deterioration of assets based on the information provided by the CSIRO;
  - (ii) developing an index showing each State's vulnerability to natural hazards;

- (iii) developing an index showing each State's vulnerability to termites;
- (iv) weighting and combining these indexes and deriving a disability factor for each State;
- (v) applying a 'reality check' to the factors by considering them in the context of evidence provided by the States; and
- (vi) using judgment to accept or adjust the factors (or to apply an EPC assessment if this is believed to be more appropriate).

63. This approach would assume that States spent EPC amounts on repairs and maintenance and would adjust the expected asset life accordingly. Compared with the current assessment, it would:

- (i) achieve a greater degree of accuracy, consistency, transparency and objectivity;
- (ii) account for the effect of physical environment on repairs and maintenance costs without requiring detailed data which is not available; and
- (iii) avoid double-counting between repairs and maintenance, construction cost and asset life.

64. Using this approach, there would be no separate assessment for repairs and maintenance. The impact of physical environment on repairs and maintenance would be fully reflected in the Depreciation assessment. The following example illustrates the proposed approach to repairs and maintenance in a simplified form.

Two States — A and B — each purchase a school that will, if appropriately designed, built and maintained, last for 35 years and service the same number of students.

A spends \$1 million to build the school, and \$10 000 each year to maintain the school. Over 35 years, this totals \$350 000.

B spends extra on the construction of the school because it will be placed in a region subject to natural disasters. It costs \$1.2 million. B needs to spend \$13 000 each year to achieve the same level of maintenance as A. Over 35 years, this totals \$455 000.

Let us now assume that, in total, A and B both spend the same amount on construction and maintenance — that is, the amount sufficient for A's needs (\$1.35 million). This is 82 per cent of what B should have spent if it wanted the school to last the full thirty-five years. So we could assume that the school will last only 28.5 years and build this into the physical environment factor in the Depreciation assessment.

65. The assessment framework proposed in this section would be inexact because it would be informed by assumptions about the composition of buildings, and plant and equipment, and about the degree of difference between particular situations. The question will be whether it takes us closer to equalisation or further away from it (in which case an EPC assessment is likely to be preferable). In making this determination, it should be noted that:

- (i) we have assumed that the same mix of materials is used across the country (discounting could be used to account for likely substitution);
- (ii) where no information has been provided for a condition in a particular region, we have imputed 'none'; and
- (iii) we have imputed a value difference for the different effects of various conditions — strong = 1.8, moderate = 1.5, low = 1.1 and none = 1.

66. The value differences were estimated using evidence provided by the States. Where States quantified the effect of physical environment, it varied widely:

- (i) life factors for chain mesh fencing in South Australia were 1.7, 1.3 and 1 (typical of many life factor ranges provided by South Australia);
- (ii) life factors for downpipes in South Australia were 2 and 1;
- (iii) hard water from the Artesian Basin induced a factor of 3 for some plumbing components;
- (iv) New South Wales provided factors such as 1.015, 1.013 and 1.045.
- (v) cyclone-proofing induced a factor of approximately 1.1; and
- (vi) roofing tiles in the Northern Territory were said to have a factor of up to 2.

67. The weightings selected are more conservative than the highest differentials reported by States, and higher than the smallest. They are broadly in line with the South Australian data, which was unique in its level of detail.

68. The three indexes would be developed as follows.

69. **Climate.** We propose to:

- (i) assign a weight to each climatic condition according to its impact on materials;
- (ii) use climatic regions to determine the proportion of residents in each State that is highly affected by this condition, and repeat for medium, low and none (equals 100 per cent);

- (iii) for each State, award a weighting of 1.8, 1.5, 1.1 and 1 to the differently affected groups, and sum them;
  - (iv) for each State, multiply the weight calculated in (i) by the sum reached in (iii); and
  - (v) repeat this process for each climatic condition.
70. The climatic regions identified by CSIRO are:
- (i) Inland;
  - (ii) Coastal (50 kilometres from the coast);
  - (iii) Near coastal (between 50 and 150 kilometres from the coast);
  - (iv) Southern coastal New South Wales;
  - (v) Near coastal north Queensland;
  - (vi) Near coastal south Queensland;
  - (vii) Coastal south Queensland;
  - (viii) Coastal north Queensland;
  - (ix) Southern Western Australia;
  - (x) North west coastal Western Australia;
  - (xi) South west coastal Western Australia;
  - (xii) South east South Australia;
  - (xiii) Coastal south east South Australia;
  - (xiv) Coastal north west Northern Territory; and
  - (xv) Regions in neighbourhood of Sydney, Melbourne, Brisbane, Kalgoorlie, Mt Isa, Port Pirie and Gladstone.
71. **Termites.** We propose to:
- (i) determine what proportion of residents in each State is highly affected by termites, and repeat for medium, low and very low (equals 100 per cent); and
  - (ii) for each State, award a weighting of 1.8, 1.5, 1.1 and 1 to the differently affected groups, and sum them.

72. *Natural hazards.* We propose to implement the following historically-derived assessment.

**Table 5** PROPOSED ASSESSMENT — NATURAL HAZARDS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Percentage of building damage	29.6	14.5	26.0	6.0	2.7	4.0	0.1	17.1
Percentage of Australia's population	33.74	24.88	18.62	9.83	7.82	2.46	1.62	1.02
Natural hazards factors	0.877	0.58	1.4	0.61	0.35	1.63	0.06	16.76

### CONSTRUCTION COST

73. The construction cost factor is applied to the building and other construction expenditure components. It considers differences in building costs across Australia — both within and between States. These occur because of variations in the availability of materials and labour, and construction time as affected by the weather.

74. For the 1999 Review and subsequent updates, Construction Costs have been measured using data from Rawlinsons *Australian Construction Handbook* which is published annually. Rawlinsons provides a series of indexes relating the construction costs in major regional towns to the costs in the capital city in each State (with each capital equal to 1.00). They also provide a spatial series relating the costs of the capitals to each other. We currently use Census populations to derive a regional weighted cost index for each State, with the result expressed relative to the Australian average. A construction cost index was used because the Commission considered it to be a more accurate reflection of the variation in capital costs than the recurrent measure of dispersion. The factors were discounted by 50 per cent due to ambivalence about the appropriateness of the Index for equalisation purposes.

75. A small national capital adjustment was also made to the factors applied to the buildings and other construction components to acknowledge the ACT's lack of policy influence over assets. Its capital city index was increased by 0.005.

76. This assessment is controversial for several reasons, particularly the possibility of double-counting with other disabilities and policy contamination in the Rawlinsons Index. Working Party discussions indicated a broad agreement among the States that the current measure of construction cost differences is flawed.

#### *State Views*

77. *New South Wales.* New South Wales asked for a re-examination of the construction cost, dispersion and isolation assessments because of possible double counting between them.

78. **Victoria.** Victoria argued that the Rawlinsons Index has policy contamination. It also noted that construction costs vary with the building cycle and suggested that the index be averaged over a reasonably long period. It was sympathetic to a construction cost assessment if it did not lead to double-counting with the asset life, dispersion and isolation assessments. In May 2002, Victoria recommended that the Rawlinsons Index be adjusted annually to factor in State-based variations in the building cycle that affect construction costs.

79. **Queensland.** Queensland argued the Rawlinsons Index has policy contamination and other deficiencies, including:

- (i) comparisons of the price indices for capital cities are complicated by compositional and building cycle timing issues;
- (ii) Rawlinsons' publication of the capital building price indices includes the qualification that the indices do not reflect the relative cost differential of the various cities;
- (iii) the use of Rawlinsons is a contributing factor to the high volatility in the capital assessments;
- (iv) Rawlinsons includes the effect of Workers Compensation, fuel taxes, industrial relations and industry policy; and
- (v) Rawlinsons understates costs in regional areas and Queensland's islands.

80. Queensland argued that if Rawlinsons continues to be used, it should be substantially discounted, by say 75 per cent or in such a way that the impact of current change in the indices is not backcast forty years

81. **Western Australia.** Western Australia argued that the Rawlinsons Index has policy contamination and measures only a relatively narrow range of costs. It suggested that the current approach be evaluated and possibly replaced with a combination of recurrent factors for input costs, dispersion and isolation. Western Australia noted that isolation and input costs factors show a different pattern of disabilities to that of the construction costs factor.

82. **South Australia.** South Australia questioned the usefulness of the Rawlinsons Index because of the volatility of the capital city index and the unavailability of full five years of regional data. It also noted that the construction cost factors may overlap with the asset life cost disabilities.

83. **Tasmania.** Tasmania supported the consideration of other indexes.

84. **Northern Territory.** The Northern Territory supported a construction cost assessment and supported the consideration of other indexes.

### Comments

85. The construction cost factor has been heavily criticised by the States. The three main areas of concern are:

- (i) policy contamination;
- (ii) volatility of the assessment and whether the factors accurately reflect the building cycle; and
- (iii) double counting with other factors.

86. **Policy contamination.** Policy contamination refers to the States' taxes and fees that are paid as part of building construction. The 1999 Review attempted to recognise the policy contamination of the Rawlinsons index by discounting it to 50 per cent. This is appropriate as long as each State's policy influence is equal, which is unlikely to be the case. Therefore the discounting is a rather blunt instrument which reflects the Commission's unease with the appropriateness of Rawlinsons for its purposes. There is no doubt that the Rawlinsons index contains the effects of States' taxes on construction costs, and information gathered from Rawlinsons suggests that it would be impossible to remove these. They include payroll tax, the cost of development and planning permits, onsite fees, fuel taxes, labour costs (such as workers compensation and industrial relations) and industry policy (danger loadings, long service leave and superannuation).

87. **Volatility.** Table 6 indicates the volatility of the index over six years. It highlights the dominance of the Sydney area over this time — every other city has fallen in cost relative to Sydney (although Darwin was still higher in 2000). This volatility is a reflection of the nature of the building industry and the building cycle. At present the index is averaged over five years but a longer period may be used if the States agree that it is appropriate. On the matter of whether the Index reflects the building cycle, we believe that this must be the case for the Index to have any commercial value.

**Table 6** BUILDINGS COMPONENT —  
CONSTRUCTION COSTS INDEXES

Calendar years	Sydney	Melbourne	Brisbane	Perth	Adelaide	Hobart	Canberra	Darwin
1995	1.00	0.99	0.93	0.93	0.98	1.05	1.13	1.20
1996	1.00	0.97	0.87	0.90	0.92	1.04	1.09	1.19
1997	1.00	0.94	0.85	0.87	0.88	1.01	1.04	1.14
1998	1.00	0.91	0.80	0.81	0.83	0.95	0.98	1.07
1999	1.00	0.90	0.76	0.79	0.80	0.89	0.93	1.02
2000	1.00	0.96	0.78	0.83	0.89	0.91	0.99	1.09

Source: Rawlinsons Australian Construction Handbook.

88. **Double-counting.** Isolation measures the disadvantage of being far from the major eastern markets, whereas construction cost recognises that other elements cause

variations in building costs as well as isolation. This is clearly so when variations in regional areas close to Sydney, for example are observed. Nevertheless, there may be some double counting of construction costs with isolation. Even though the current isolation component is small (0.38 per cent) and the double counting would also be small, the Commission is considering eliminating the isolation disability.

89. Because the construction cost factor does not include an allowance for higher standards of building needed to prolong the life of an asset in a harsh environment, there is no potential for double-counting between the construction cost and asset life assessments.

### **Options**

90. The following options were identified:

- (i) adjusting the Rawlinsons Index to remove policy influences and/or further discounting the factor to 75 per cent and/or averaging it over a longer period to reduce volatility and/or removing the isolation factor;
- (ii) using other construction costs indexes; or
- (iii) applying separate input costs and dispersion assessments.

91. **Adjusting Rawlinsons Index.** The Rawlinsons *Australian Construction Handbook* was re-examined with a view to removing the policy influenced items. Rawlinsons extensively lists unit costs of building hardware (such as hardboard, sinks and electrical cable) for each capital city and separately lists wage rates for various trades for each capital city. However it not possible to tell how each is combined to form the index. It might be possible to choose a 'standard basket' of building materials to form a policy free index. However there is no way of deciding which materials and in what quantities would constitute a 'standard' building. Moreover there would be capital city price variations only recorded and the intrastate variations would not be captured.

92. Further discounting would dilute both the strengths and the weaknesses of the Index. This is not an optimal solution.

93. Averaging the Index over a longer period would reduce volatility but not address the potentially more significant issues of policy contamination and double-counting.

94. Consideration is being given to eliminating the isolation assessment.

95. **Other construction costs indexes — Cordell's index.** We investigated building cost indicators and regional cost factors compiled by Cordell Building Information Services. Initially, Cordell's indexes were promising because they include a larger number of regional centres in each State and they also have separate indexes for houses and other buildings. However, without data on how the model combines this information it is not possible to devise a policy free index and staff at Cordell considered that it would be impossible to remove the influence of State taxes on their index. A further difficulty with Cordell is that they do not currently have an index comparing costs across the States (although they may be able to devise such an index on a consultancy basis).

96. **Other construction costs indexes — ABS building costs series.** The ABS publishes a comparison of the cost of building materials across the States. However, the list of materials costed is limited and there are no data for Canberra or Darwin. There are no regional costings.

97. **Input costs and dispersion assessments.** The following elements of construction costs would be accounted for:

- (i) wages input cost measured by wages related to the private construction industry; and
- (ii) the impact of dispersion on freight and locality allowances.

98. From the common input costs assessment, we propose to retain wages and salaries for tradespersons, plant/machinery operators, labourers and related workers and managers/administrators. We also propose to measure the impact of freight and the need to pay locality allowances using the common dispersion factor assessment. This assumes that most of the difference in the cost of construction is due to labour costs and freight costs. It also assumes that high regional costs caused by the physical environment will be accurately reflected in those factors.

99. This approach also has the advantage that all the data are available and the common factors need only to be modified. It measures differences in construction-related wages costs through the input costs factor and differences in intrastate costs through the dispersion factor. This method would also avoid the inherent volatility in the Rawlinsons index due to the building cycle.

100. On the other hand, construction costs indices comprise the elements of cost of materials, labour, and plant and machinery hire. The current factors for dispersion do not include a measure of the cost of plant hire. This may not be a difficulty if the differences in the cost of plant are mainly due to freight. If this is not the case, a new measure of cost of plant could be sought for the Review. It could also be argued that the differences in construction costs are not mainly attributable to freight, as we assume, but to availability of supply of materials and plant. Some further measure of economic environment may then be required.

101. We considered incorporating an isolation disability to account for costs necessarily incurred because of the distance of States from other State capitals and sources of supply. However, because building materials and equipment can be sourced from many locations, it would be inappropriate to continue to apply the current isolation assessment.

### ***Proposed Assessment***

102. We are inclined to believe that the fourth option — the use of input costs and dispersion assessments — would be the most robust and would address the States' concerns about double-counting, policy contamination and volatility. It is outlined in the following table.

**Table 7** CONSTRUCTION COST ASSESSMENT

Component	Factor	Basis for calculation
Buildings	Dispersion	Dispersion components relating to freight and locality allowances New assessment for plant hire if data are available
	Input costs	Construction-related wages
Plant and equipment	EPC	
Other construction	Dispersion	Dispersion components relating to freight and locality allowances New assessment for plant hire if data are available
	Input costs	Construction-related wages

### DISPERSION

103. Dispersion disabilities relate to intrastate costs necessarily incurred in providing services to dispersed populations. The common disability factor applied to operating expenses measures the effect of dispersion within the State on telecommunications, freight, travel, remote removals and locality allowances.

104. The only element of the dispersion factor included in the current depreciation assessment is freight. It is only applied to the plant and equipment component. The factor was discounted to apply to one per cent of expenses in the component.

#### *State Views*

105. *New South Wales.* New South Wales asked for a re-examination of the construction cost, dispersion and isolation assessments because of possible double counting between them.

106. *Victoria.* Victoria referred the Commission to the discussion of dispersion in its Main Submission. This focused on the savings being derived from advances in telecommunications.

107. *Queensland.* Queensland argued that there are demand-driven capital costs resulting from dispersion that are not being picked up in the current assessment. It noted that 64 per cent of its capital works program in 2000–01 and 58 per cent of the program in 2001–02 was spent outside the Brisbane statistical division, and that many communities are located far from Brisbane.

108. **Western Australia.** Western Australia argued that the weight applied to this factor should be reviewed and possibly increased. The following examples were provided in its response to the 2002 data request:

- (i) 39 satellite teleplan systems for remote community schools at \$3000 each;
- (ii) capital infrastructure costs for Schools of the Air of \$700 000 to \$1 000 000;
- (iii) remote country police stations typically 30 per cent larger in relative terms due to need for self-reliance;
- (iv) fewer opportunities to lease assets;<sup>6</sup>
- (v) diseconomies of scale for policing, higher construction costs and larger custodial facilities in country areas;
- (vi) scattered harbour facilities; and
- (vii) diseconomies of scale and travel costs for the management of remote infrastructure facilities.

109. **Tasmania.** Tasmania argued that there are demand (as well as cost) implications of the distance of communities from large urban centres. It noted that isolated communities have difficulty accessing services from larger urban centres. It is often necessary to establish services, including the provision of capital to support these services, in isolated communities. Residents of similar sized communities, which are not isolated, would be expected to access services from the nearest large urban centre. It also noted the significant driving times between some small population centres due to the nature of the roads.

110. **Northern Territory.** The Northern Territory argued that dispersion should be expanded to include travel costs as well as freight, providing an example involving the supply, installation and maintenance of air-conditioners in Maningrida.

### **Comment**

111. Some States argued that the dispersion assessment should be expanded to reflect the need for:

- (i) additional or more expensive capital equipment when services are provided in remote areas. Examples given were:
  - telecommunication facilities;

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<sup>6</sup> The issue of owning versus leasing capital relates to more than just the dispersion assessment, and is dealt with in a separate discussion paper. The Commission is not inclined to introduce a disability for differences in the opportunity to access privately-owned capital.

- motor vehicles, planes and helicopters;
  - larger police stations because of the need for self-reliance; and
  - harbour facilities.
- (ii) travel costs related to the management, maintenance and installation of assets.

112. There seems to be a prima facie case for assessing needs associated with the necessity to spend more on capital equipment to provide services in remote areas. However it is not clear what areas of States should be covered by this disability (for example, all non-metropolitan areas, only remote areas or just very remote areas).

113. We agree that travel costs should be picked up in the dispersion factor applied to operating expenses (such as repairs and maintenance and asset management). Motor vehicles are considered to be non-capital items so they are not included in this assessment. These issues will be followed up with the recurrent assessment. If appropriate data are available and the costs are material, planes and helicopters could be considered.

114. Issues relating to diseconomies of small scale will be discussed in the service delivery scale factor.

115. While we recognise that telecommunications can reduce the unit cost of service delivery, we do not see how this would affect the cost of assets. We may need to establish whether, and in what direction, they impact on the capital costs of telecommunications.

116. In principle, the dispersion assessment should cover the need for additional or more expensive capital equipment when services are provided in remote areas, including the additional costs associated with telecommunications. Similar to this, it is likely that hiring of capital equipment will be more expensive in non-metropolitan areas. However, the data received so far does not justify the inclusion of a disability factor in the Depreciation assessment because it does not pass the materiality test. Unless further data are received from the States, the Commission is not inclined to pursue this issue.

### ***Proposed Assessment***

117. The freight component of the Depreciation assessment would continue to be applied to plant and equipment. To account for the impact of dispersion on construction costs, the dispersion components relating to freight and locality allowances would be applied to buildings and other construction, as would a new dispersion assessment accounting for plant hire and telecommunications equipment if the evidence satisfies the materiality test.

118. The following table sets out the proposed depreciation assessment, including its role in the replacement of the construction cost assessment.

**Table 8**      **DISPERSION ASSESSMENT**

Component	Basis for calculation
Buildings	Dispersion components relating to freight and locality allowances New assessment for plant hire (subject to materiality test)
Plant and equipment	Freight component New assessment for plant hire and for telecommunications equipment (subject to materiality test)
Other construction	Dispersion components relating to freight and locality allowances New assessment for plant hire (subject to materiality test)

## ISOLATION

119. Isolation was designed as a disability factor applied to recurrent expenses where it is intended to recognise the costs of moving goods and staff from sources of supply in the south-eastern States to other States. The Depreciation assessment recognises the extra cost of freighting capital goods. To avoid double counting with other disabilities, the isolation factor is applied to a separate component of the depreciation category (0.38 per cent of the category). Isolation is different from dispersion, which takes account of the spread of the population within each State. For example, higher freight costs to Perth from the east coast are covered by isolation, while subsequent freight costs to Kalgoorlie are covered by dispersion.

### *State Views*

120. *New South Wales.* New South Wales asked for a re-examination of the construction cost, dispersion and isolation assessments because of possible double counting between them.

121. *Victoria.* As noted above, Victoria saw potential double-counting between this factor and the construction cost factor.

122. *Queensland.* Queensland disputed the likelihood of double-counting between isolation and construction costs factors, noting Rawlinsons regional price indices are not intended as, and are flawed as, a measure of isolation. The tender prices for building contracts that underpin Rawlinsons are influenced by a range of market factors, and it cannot be assumed all these factors correlate with isolation. Moreover, many isolated communities are not assigned their own Rawlinsons value. Assigning them the value of the nearest centre would likely understate their freight costs.

123. *Western Australia.* Western Australia supported the current approach, noting that the Rawlinsons factor is suspect in terms of accuracy and policy neutrality, and

that plant and equipment are not included in the construction cost assessment. However, it argued that the weight of isolation in the depreciation assessment (0.36 per cent) is too low given that the assessment of operating expenses recognises isolation freight allowances of \$64 million per year.

124. **South Australia.** South Australia argued that this factor should be deleted due to likely double-counting with the construction cost factor.

125. **Tasmania.** Tasmania argued that isolation affects demand for capital as well as its cost because isolated communities may need services to be provided locally.

### ***Comment***

126. Tasmania's argument about the demand for capital is relevant to the service delivery scale assessment.

127. Western Australia argued that this expense is under-estimated, while some other States argue that it constitutes double-counting. We believe the current assessment to be inappropriate because the interstate sources of supply for material and equipment may not always be the south-eastern States. To calculate a depreciation specific isolation factor related to construction costs, we would require information about the main sources of supply of material and equipment. Practically, it would be difficult to determine these main sources of supply.

### ***Proposed Assessment***

128. We do not propose to apply an isolation factor unless sources of supply can be determined accurately and simply.

### ***Summary of the interaction between construction cost, dispersion, input costs and isolation, as proposed.***

**Construction cost.** This assessment would be replaced by the application to buildings and other construction of three factors — the dispersion components relating to freight and locality allowances; a new dispersion assessment accounting for plant hire if there is evidence of a disability and if the evidence satisfies the materiality test; and the wage component of the input cost factor, redesigned to apply to construction-related wages.

**Dispersion.** The freight element would continue to be applied to plant and equipment. The dispersion assessment would be expanded to account for the effect of dispersion on construction costs. Also, recognition could be given to the cost of telecommunications equipment if there is evidence of a disability and it satisfies the materiality test.

**Input costs.** Construction-related wages would be considered in the assessment if relevant data are available. Together with the expanded dispersion assessment, this would replace the construction cost assessment.

**Isolation.** We believe the current assessment to be inappropriate because the interstate sources of supply for material and equipment may not be the south-eastern States. To calculate a depreciation specific isolation factor related to construction costs, we would require information about the main sources of supply. We do not propose to apply an isolation factor unless sources of supply can be determined accurately and simply.

## POPULATION CONCENTRATION

129. The population concentration disability is applied to three components of the depreciation category. They are:

- (i) buildings;
- (ii) other construction; and
- (iii) plant and equipment.

130. The Working Party vigorously debated the merits of this disability. It is intended to recognise the different quantities of capital required due to urbanisation, administrative scale and service delivery scale. This disability is complex because urbanisation addresses the extra costs faced by large cities, administrative scale addresses the needs of States with small populations, and service delivery scale addresses the diseconomies of scale faced by States with scattered populations.

131. Urbanisation refers to the greater need for capital in large cities for reasons such as specialisation and social dysfunction. The current assessment appears to place a high value on the capital costs associated with urbanisation. The Working Papers state that this is because of the specialist or more extensive services provided from facilities in those areas.<sup>7</sup>

132. Service delivery scale takes account of the extra capital costs involved in providing services to small communities. This issue is particularly important for the depreciation category because some types of capital are less divisible than most operating expenses. Facilities such as police stations, clinics and schools may need to be provided in towns even when they will operate below capacity.

133. Administrative scale refers to a State's need for a minimum expenditure for buildings for the additional staff required as a result of scale disabilities. Any State, no

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<sup>7</sup> Commonwealth Grants Commission, 2001 Update Working Papers, Vol. 5, p. 195.

matter how few residents it has, will need to have an administrative structure. Therefore an EPC assessment would disadvantage States with small populations because they have fewer people over which to spread these costs. Administrative scale considerations are not currently applied to other construction or plant and equipment.

134. The combined urbanisation and service delivery scale disability is applied according to the size of communities. Disabilities in the areas of education, health, law and order, and other functions are applied to communities using the five population bands shown in Table 9.

**Table 9** POPULATION BANDS FOR POPULATION CONCENTRATION ASSESSMENT

Population Band	Education	Health	Law and Order	Other
0–9999	1.40	1.00	1.25	1.00
10 000–99 000	1.00	1.00	1.00	1.00
100 000–749 999	1.05	1.50	1.10	1.00
750 000–1 999 999	1.10	1.75	1.20	1.00
2 million and above	1.10	2.00	1.20	1.00

135. For example, a large city is judged to face some extra (per capita) capital costs in the areas of education and law and order, and significant extra capital costs in the provision of health services. In contrast, a small town is judged to face higher capital costs in education, and law and order, but not in health. The Commission is not satisfied that there is a clear and robust basis for such judgements.

136. These factors are applied to buildings, other construction, and plant and equipment. For the buildings component, administrative scale effects are also considered, with the recurrent disability discounted by 50 per cent as capital costs were considered to be less affected by this than operating costs.

### *State Views*

137. Several criticisms were made of this assessment, mostly of what was perceived to be a generous treatment of larger cities and larger States.

138. *New South Wales.* The evidence presented by New South Wales related to the high price of land and the implications of congestion and diseconomies of scale on capital-intensive areas of service delivery such as public and private transport and housing.<sup>8</sup>

<sup>8</sup> The Commission acknowledges the high price of land in some urban centres and its impact on States' decision-making. However, because land does not depreciate, it is inappropriate to consider it in this assessment. The

139. **Victoria.** Initially, Victoria gave in principle support to urbanisation, service delivery scale and administrative scale (for head office capital expenditure only) factors. In May 2002, Victoria argued that:

- (i) diseconomies of scale associated with the depreciation of assets in small population centres are exaggerated, and inappropriately considered in this category;
- (ii) the cost weights applied are arbitrary, based largely on judgment and not supported by any defensible quantitative data;
- (iii) the administrative scale assessment should only be made in respect of the need for a minimum level of buildings and plant and equipment to provide head office and whole of state services (and not applied to the greater per capita expenditure by smaller States on minimum fixed head office type services);
- (iv) the urbanisation weights do not acknowledge that a highly urbanised population requires more specialised and extensive services provided from facilities that are more costly and incur higher depreciation costs; and
- (v) there is no evidence that service delivery scale is relevant to the Depreciation category or that the delivery of capital stock in smaller units affects the extent or rate of depreciation.

140. **Queensland.** Queensland criticised the current approach, arguing that:

- (i) the extra costs faced by large cities are outweighed by economies of scale — no evidence has been presented to show that any city in Australia has reached a population concentration level where serious diseconomies of scale would be applicable;
- (ii) capital goods are less divisible than recurrent goods, meaning that a scattered population has a greater effect on capital costs than on recurrent costs;
- (iii) any extra responsibilities shouldered by Sydney and Melbourne hospitals need to be identified;
- (iv) towns of fewer than 2000 people should be eligible for medical capital (such as health centres and staff accommodation);
- (v) service delivery scale is not adequately assessed for a State that has a high proportion of people living outside the capital city, particularly if it is also a large State in area; and

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impact of congestion and diseconomies of large scale on transport or road costs is not relevant to this assessment because depreciation costs have been functionalised to these categories.

- (vi) administrative scale should be discounted by more than 50 per cent to reflect the sharing and leasing of accommodation (the latter coming out of recurrent expenditure).

141. Queensland argued that it is likely that there is an additional demand disability related to the growth and the number of population centres outside a capital city that is not currently being identified by the assessment. Centres such as Cairns, Townsville and Rockhampton fall in the bottom of the U shaped curve used in the current assessment, meaning that their size makes their weightings low despite their distance from Brisbane.

142. **Western Australia.** Western Australia expressed concern with several aspects of this assessment. They were:

- (i) the arbitrary choice of weights for the population bands;
- (ii) assignment of weights to urban centres based on the number of residents rather than the population served;
- (iii) the lack of consistency with the corresponding disability factors for the recurrent assessments;
- (iv) the implication that a higher standard of service is appropriate for Sydney and Melbourne; and
- (v) the discounting of the administrative scale factor by 50 per cent.

143. Western Australia concluded that the current approach should be replaced with an assessment based on the recurrent factors for service delivery scale, administrative scale and urbanisation, although it did not consider that urbanisation would generally result in any capital cost disabilities between States.

144. **South Australia.** South Australia suggested that administrative scale be extended to plant and equipment as staff would require equipment as well as buildings. South Australia also argued that quantitative data should be presented to support the population concentration weights, noting the high health-related capital allocation for Sydney and Melbourne.

145. **Tasmania.** Tasmania identified several problems with the current approach, arguing that:

- (i) there should be more recognition of the economies of scale enjoyed by large States;
- (ii) the weighting should take account of capital city status — although smaller capital cities are required to provide some services to the whole State, their capital requirements are deemed to be equivalent to those of similarly sized regional centres (through the use of population bands); and

- (iii) the hospital cross border adjustment results in the service-providing State receiving a double benefit — this is because the cost of capital is reflected in both the interstate payment arrangements and the relativity calculations.

146. In its response to the 2002 data request, Tasmania provided the example of a neonatal unit. It argued that such a unit would be needed by each State, but the capital costs involved would not be in proportion to the State's population. Consequently, a much higher capital cost per capita would be incurred by States with small populations. Also raised by Tasmania was the issue of the need for local services due to such factors as poor roads, capital indivisibility and community expectations. The latter two factors mean that when a local population falls, it may not be practical to cease the service. Tasmania noted that the police service has a helicopter on standby for emergencies at an annual cost of \$1.5 million.

147. Tasmania suggested that the assessment consider:

- (i) the capital needs associated with administration and state-wide services which do not vary with population size;
- (ii) the relative needs of capital due to the population distribution in smaller rural communities; and
- (iii) the indivisibility of stock in smaller centres.

148. **Northern Territory.** The Northern Territory argued that:

- (i) administrative scale considerations should be extended to plant and equipment;
- (ii) recurrent factors would be preferable to the current approach because, unlike the population bands used in the population concentration assessment, they take account of the population serviced by an urban centre;
- (iii) the current assessment underestimates the costs associated with a dispersed population but generously assesses the needs of larger cities. The Northern Territory has 90 remote communities with health centres valued at \$94 million, and some are not identified as urban centre localities and thus excluded from this assessment; and
- (iv) the current approach implies that larger cities should be able to provide a higher level of service than smaller urban centres.

149. In its response to the 2002 data request, the Northern Territory raised further issues. It argued that:

- (i) crime can result from isolation and boredom (as opposed to urbanisation);

- (ii) highly populated States have more access to private funding of infrastructure;
- (iii) stocks of publicly held land that have appreciated in value should have mitigated any extra costs faced in large cities;
- (iv) recurrent medical research (and associated capital costs) per capita are higher in the Northern Territory than in New South Wales or Victoria, due partly to its unique requirements; and
- (v) the Northern Territory has fewer opportunities to share capital costs in areas such as forensics (new laboratory cost \$6 million).

***Comment***

150. ***Need for evidence.*** Among the many issues raised by States, a strong theme emerged of the need for the assessment to be supported by firm evidence. We agree that this is critical and propose that it be achieved through the greater use of recurrent disabilities. Other advantages would be a more accurate reflection of the population served by a centre and greater consistency between the capital and recurrent assessments (which should facilitate the efficient development of more robust disabilities).

151. Table 10 compares the grant share effects of the disabilities currently assessed for depreciation and recurrent costs. While the direction is generally the same, the size of the effect of relativities varies between depreciation and other expenses. In particular:

- (i) administrative scale disabilities are relatively small for depreciation;
- (ii) Western Australia receives funds for the effect of service delivery scale in recurrent assessments, but loses them for service delivery scale in the Depreciation assessment; and
- (iii) it is difficult to explain why urbanisation disabilities influence depreciation so much more than they influence recurrent expenses.

**Table 10** GRANT SHARE EFFECT OF EACH DISABILITY

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Recurrent disabilities									
Administrative scale	-302.8	-179.7	-90.1	49.3	70.5	133.0	139.9	179.9	572.6
Service delivery scale	-51.4	-58.5	17.9	26.8	13.4	15.0	-11.0	47.8	120.8
Urbanisation	175.5	33.1	-114.5	-42.2	-15.5	-22.8	-3.3	-10.4	208.6
Total	-178.7	-205.0	-186.8	34.0	68.4	125.2	125.7	217.2	570.5
Depreciation disabilities									
Administrative scale	-3.9	-2.2	-1.2	0.5	0.7	1.5	1.6	3.1	7.3
Service delivery scale	-8.5	-11.0	6.4	-0.3	3.6	8.3	-3.9	5.3	23.6
Urbanisation	33.9	52.3	-45.8	-7.9	-4.7	-15.7	0.0	-12.1	86.2
Total	21.7	40.1	-42.1	-8.4	0.3	-5.0	-3.4	-3.2	62.1

Note: The sum of the grant share effect of each disability may not add to the total because of interaction.

Source: Commonwealth Grants Commission, 2002 Update.

152. These outcomes, along with several of the criticisms outlined above, incline us to believe that the current Depreciation assessment is flawed.

153. *Urbanisation.* Is an urbanisation assessment appropriate for the Depreciation category? Such an assessment would measure any capital-related disabilities associated specifically with large cities. The urbanisation component of the population concentration assessment has been criticised for not being well supported by evidence. For example, it is based partly on an assumption that a disproportionate share of the capital costs of health research is undertaken in Sydney and Melbourne and that high cost buildings and equipment are required. However, the pattern of recurrent expenditure on health research for 1998–99 indicated that the ACT and the Northern Territory spent significantly more per capita on health research than the other States.

154. As noted above, if there is to be an urbanisation factor in the Depreciation assessment, it may be useful to base it on urbanisation measures used in recurrent assessments. We have identified several ways in which urbanisation is judged to affect recurrent expenses in order to determine whether they are likely to be relevant to depreciation. We have also identified several further possibilities for inclusion in an urbanisation factor for the Depreciation assessment.

155. Aspects of urbanisation that are judged to affect recurrent costs include:

- (i) greater use of roads and complexity of the road system;
- (ii) higher crime rates and complexity of police services;
- (iii) greater responsibilities and complexity of services provided in urban hospitals;

- (iv) complexity of delivery of emergency services; and
- (v) higher vandalism rates at educational facilities.

156. Other possible grounds for an urbanisation factor include the capital implications of:

- (i) greater wear and tear in more heavily used facilities in large urban centres;
- (ii) non crime-related police activity more common in large cities, such as crowd control, traffic management and accident response; and
- (iii) crime-related law and order activity more common in large cities, such as investigation of international crime.

157. The depreciation of roads is dealt with in that category and vandalism is dealt with in the education assessments. We do not propose to develop an assessment for higher wear and tear because it is reasonable to assume that facilities in cities are used up to, but not beyond, their intended capacity, meaning that the level of wear and tear should not shorten asset life.

158. New South Wales' point about the high price of land in Sydney would most likely affect the cost of road and public housing construction and the cost of providing of urban transit services and the related infrastructure. The impact of the price of land and related issues will be discussed in the relevant category assessments.

159. This leaves hospitals and law and order as areas in which an urbanisation assessment for depreciation is likely to be warranted. Higher law and order costs would result from the need to provide extra space and equipment in police stations, courts and prisons. We hope to access data that will enable us to measure this accurately. Higher hospital depreciation costs would result from the need for more space and more expensive equipment. We hope to derive this factor from that applied in the Hospital Costs assessment.

160. ***Service delivery scale.*** Several States argued that the current weights underestimate the capital-related economies of scale available to large cities (particularly given the relatively low divisibility of capital goods). The most obvious examples of extra capital expenses potentially incurred by States due to service delivery scale disabilities are the need to provide police stations, schools and clinics in small communities.

161. ***Administrative scale.*** Western Australia questioned why administrative scale is discounted by 50 per cent, and Queensland suggested that it be discounted by more (citing the sharing of accommodation and leasing). Accommodation sharing and leasing could be expected to ameliorate the impact of small size on depreciation costs. However, it is unlikely to halve it. We propose that it be discounted by 20 per cent for buildings.

162. South Australia and the Northern Territory argued that administrative scale should be applied to plant and equipment. If a minimum number of staff is required to administer programs, it is reasonable to suppose that they will require office equipment and

air conditioning capacity. However, we believe that it is relevant to a smaller proportion of plant and equipment than buildings. We support the proposal but suggest that the assessment be discounted by 60 per cent.

163. The administrative scale assessment for depreciation expenses asserts that two per cent of standard expenditure is required to provide a base level of administrative support. We propose that two per cent of the depreciation standard should be deemed to be the base level of depreciation incurred in providing such support.

164. **General comment.** Each State is required to provide services to its population irrespective of the size of its capital city. The current approach, whereby weights are assigned to bands of urban centres, is flawed because:

- (i) it takes no account of the responsibilities of capital cities to provide services to the general population (instead, assuming that a larger city has greater responsibilities than a smaller urban centre even if the latter is a capital city); and
- (ii) it takes no account of the responsibility of an urban centre to service outlying populations.

165. The application of service delivery scale, administrative scale and urbanisation should achieve what this assessment has attempted, and without the problems listed above.

166. **Cross-border adjustment for hospitals.** If hospital interstate payment arrangements reflect the full operating costs of services provided, there is no reason to apply a cross-border adjustment for hospitals.

**Proposed Assessment****Table 11** REPLACEMENT OF POPULATION CONCENTRATION ASSESSMENT

Component	Factor	Basis for calculation
Buildings	Service delivery scale	Composite of recurrent factors for: Education Health Law and order Aboriginal Community Services Other
	Administrative scale	General method discounted by 20%
	Urbanisation	May relate to capital needs for law and order and hospitals
Plant and equipment	Service delivery scale	Composite of recurrent factors for: Education Health Law and order Other
	Administrative scale	General method discounted by 60%
	Urbanisation	May relate to capital needs for law and order and hospitals
Other construction	Service delivery scale	Combined service delivery scale and urbanisation factor from other expenditure categories
	Urbanisation	Combined service delivery scale and urbanisation factor from other expenditure categories

167. **Urbanisation.** It may be appropriate to consider greater per capita needs of cities in the areas of hospitals and law and order. The issues are how the disabilities would be measured and the thresholds for inclusion. The recurrent assessment could be used for hospitals. For law and order, we would ask States for asset values by region of the State and by function. If this is not available, we would need to ask the States to provide:

- (i) for each city of more than 90 000 people, the per capita depreciation cost of (or alternatively the total value of assets used for):
  - policing; and
  - the administration of justice; and
- (ii) the average per capita cost of these services for the remainder of the State.

168. The threshold of 90 000 people was selected to ensure that Darwin would be included so that any capital city influences would be recognised. If the data supported it, we would differentiate between cities according to their size because the impact of urbanisation could be expected to be compounded in larger cities.

169. This information would be used to determine:

- (i) whether per capita costs are higher in urban areas;
- (ii) whether urbanisation costs (if they exist) are compounded depending on the size of the city; and
- (iii) the extent of any such costs.

170. If evidence supports the application of an urbanisation factor, discounting may be appropriate as its impact on depreciation may not be as high as its impact on recurrent costs. This is more likely to be true of accommodation (which can be leased or shared) than equipment. Urbanisation has a relatively small effect on grant shares for recurrent expenses and we believe that it should have a similarly small effect on depreciation grant shares. The evidence we now have does not support the current assessment's strong urbanisation effect.

171. **Administrative scale.** Administrative scale disabilities would be applied to the relevant portion of assets in buildings and plant and equipment. We would continue with the 1999 Review approach of using the same factors as those used on the recurrent side. Alternatively, we could attempt to calculate specific scale affected capital expenditure. Considering the difficulties associated with the latter option, we would prefer to use the proportion of scale affected expenditure on the recurrent side.

172. We support Queensland's argument that discounting is appropriate for the building component because of opportunities for leasing and sharing accommodation. However, we are not convinced that the impact on depreciation would be halved. In the absence of better information, a discount of 20 per cent should be applied.

173. **Service delivery scale.** For consistency and robustness, we are inclined to favour using the service delivery scale factors applied to recurrent expenses. It is reasonable to assume that where there is indivisibility with respect to staffing, there is also indivisibility with respect to buildings, plant and equipment and other construction. Service delivery scale disabilities could be applied to depreciation expenses relating to functions where a service delivery scale factor will be assessed for recurrent expenses for the 2004 Review. In the 1999 review, service delivery scale factors were assessed for:

- (i) education;
- (ii) hospitals;
- (iii) law and order (police services and administration of justice); and
- (iv) Aboriginal Community Services.

174. The factor for hospitals covers dispersion, service delivery scale and urbanisation. Because it cannot be separated into its different parts, it has been left out of the table.

**Table 12** SERVICE DELIVERY SCALE FACTORS  
APPLIED IN THE 1999 REVIEW

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Pre-school education	0.99892	0.99256	0.99923	1.00127	1.01106	1.03771	0.97281	1.04574
Government Primary	0.99271	0.98495	1.00570	1.01223	1.01311	1.03777	0.96522	1.13680
Government Secondary	0.99406	0.99245	1.00300	1.00622	1.00799	1.04011	0.96058	1.10444
Vocational Education and Training	0.99406	0.99245	1.00300	1.00622	1.00799	1.04011	0.96058	1.10444
Police	0.99776	0.99726	1.00314	1.00193	1.00253	1.00047	0.99703	1.04437
Aboriginal Community Services	0.13527	0.00000	1.02536	2.76394	0.62626	0.16623	0.00000	42.97913

### SOCIO-DEMOGRAPHIC COMPOSITION

175. The socio-demographic composition (SDC) factor is intended to recognise the impact of the demand for services by different population groups on the need for buildings, and plant and equipment. It considers the number of people likely to require a particular service (such as school students) as well as other characteristics that are likely to influence the demand for those services.

176. Socio-demographic composition for the other construction expenditure component is assessed on an EPC basis. For both buildings and plant and equipment, the SDC assessment is currently applied as per Table 13. Education, health and law and order were selected because they account for significant proportions of States' assets.

**Table 13** COMPONENTS OF THE SOCIO-DEMOGRAPHIC  
COMPOSITION FACTORS

Component Factor applied	Component Weight	Factor applied
Education	25 per cent	SDC factor for Education
Health	15 per cent	Composite of SDC factors for Hospitals and Community Health
Law and order	10 per cent	Composite of SDC factors for Police, Administration of Justice and Corrective Services
Other	50 per cent	EPC

177. Members of the Working Party had different views on the impact of SDC on the need for capital. This prompted us to consider ways in which this disability could be adjusted to reflect the impact more accurately.

### *State Views*

178. Several States criticised the application of this disability in the Depreciation assessment. Underlying the States' comments was a desire for greater transparency and evidence with respect to the Commission's application of disabilities to depreciation.

179. *New South Wales.* In its 2002 Main Submission, New South Wales provided evidence that high capital costs cause socio-economic disadvantage, rather than the socio-demographic disadvantage creating higher capital needs. Data from the Australian Institute of Health and Welfare demonstrates the much higher housing costs in Sydney than in other cities. The cost of housing thus amplifies the relative socio-economic disadvantages of people in Sydney, increasing demand for housing and welfare services.<sup>9</sup>

180. *Victoria.* Victoria questioned the relevance of ethnic composition to depreciation costs and emphasised that recurrent disabilities should be applied cautiously. In May 2002, Victoria added that it supported the discounting of recurrent factors and urged the Commission to undertake further discounting in recognition of the extremely limited cost impact of socio-demographic composition on depreciation. It argued that socio-demographic composition is not relevant to the major components of capital costs (feasibility studies, approvals, design, management, land acquisition and preparations, and site building costs). It concluded that it should be removed from the assessment.

181. *Queensland.* Queensland supported the application of this factor, noting the higher demand for services by Indigenous residents.

182. *Western Australia.* Western Australia questioned why the recurrent factors are discounted by 50 per cent, arguing that, in the absence of evidence to the contrary, it should be assumed that the capital impact of population groups is proportionate to their recurrent impact. It was also argued that, where the impact on capital is considered to be less significant, this should be explained rather than assumed. Western Australia questioned why the factors are not applied to other construction (currently assessed on an EPC basis).

183. *South Australia.* South Australia argued that some recurrent cost factors (such as Indigenous weight in administration of justice) are given too much weight in the Depreciation assessment, and that there should be detailed consideration of these.

184. *Northern Territory.* The Northern Territory commented that:

- (i) the Aboriginal Community Services function should be included in the assessment of this disability;<sup>10</sup>
- (ii) an increase in demand in a remote area may necessitate a greater investment than it would in an urban area;

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<sup>9</sup> The depreciation costs of housing have been functionalised to that category.

<sup>10</sup> The Aboriginal Community Services category covers expenditure on community management; development of community government; and the operation, repair and maintenance of essential services. The Northern Territory has decided not to pursue this matter at this time.

- (iii) remote, Indigenous and low socio-economic groups have a higher demand for services and are associated with shorter asset life — given that the asset life assessment does not include Indigeneity or low income groups, it is imperative that this category covers them adequately; and
- (iv) over-crowding of housing impacts on sewerage systems.<sup>11</sup>

185. The Northern Territory also expressed its support for the current practice of applying the factors to plant and equipment.

### **Comment**

186. This factor considers the impact of population characteristics on the need for assets. This means the demand volume. Where a population group increases the unit costs of a service, it is unlikely to affect the level of capital stock required.

187. Several of the arguments listed above point to the need to develop a more accurate ‘fit’ between depreciation and recurrent disability factors. This involves a reassessment of whether and how much the latter disabilities are discounted, and whether some components of these factors should be removed before the application of recurrent disabilities. The two issues are closely related because a better selection of recurrent disabilities could be expected to reduce the need for discounting.

188. **Recurrent disabilities.** The main reason for discounting the SDC factors was that they were designed to apply to recurrent costs, meaning that they were unlikely to be totally applicable to depreciation. For example, allowance for the costs of translation is not appropriate for depreciation. If the 2004 Review factors were more relevant to depreciation, the need for discounting would be reduced or even removed. The following paragraphs set out influences that are likely to increase the consumption of capital and suggest how the relevant recurrent factors might be modified. We considered adding welfare to the current components of education, health and law and order. However, as this table demonstrates, the proportion of assets held for welfare purposes is too small.

**Table 14** PERCENTAGE OF DEPRECIATION  
BY FUNCTION, 1999–2000

Function	State government average
	%
Health	22.6
Education	20.8
Law and order	5.7
Welfare	1.4

<sup>11</sup> Because housing issues are not relevant to the depreciation category, this issue has not been pursued.

189. **Education.** Recurrent education costs are said to be influenced by age, socio-economic status, Indigeneity and low English fluency. Age would be the biggest driver of capital consumption because the number of students would translate directly to demand for class room space and equipment. The other factors may affect teaching and other recurrent costs, but they are likely to have little impact on assets. We propose that only the age component of this disability be applied (without discounting).

190. **Health.** Recurrent health spending is said to be influenced by age, sex, socio-economic status, Indigeneity, low English fluency and place of residence. With the exception of English fluency (which is most relevant to translation services), these influences could be expected to increase demand for hospital beds and equipment. We propose the application of a composite of health disabilities, with the removal of English fluency. If the 2004 Review SDC factors for health assessments include allowances for the different demands for services by culturally and linguistically diverse groups, the SDC factor applied to depreciation would reflect this.

191. **Law and Order.** Recurrent spending on law and order is said to be influenced by age, sex, Indigeneity and remote Indigeneity, and low English fluency. With the exception of English fluency (most relevant to translation services), these influences could be expected to increase demand for space and equipment in police stations, courts and correctional facilities. We propose the application of a composite of law and order disabilities with the removal of English fluency. We also propose that cost weights be removed as we believe that demand, rather than cost disabilities are relevant to depreciation.

192. **Possible double-counting.** There remains the issue of how to avoid giving a double benefit to States that have a service delivery scale disability and a socio-demographic composition disability. For example, assume that the viability threshold for a clinic is a population of 1000 people. If a community has fewer people, a service delivery scale disability applies. If a town has 700 people, mostly Indigenous, its demand for the clinic's services may effectively be the same as the demand of 1000 'average' people. The Commission will apply a SDC disability to account for the population mix as well as a service delivery scale disability to account for the small number of people. In principle, one disability should partially offset the other.

193. To put the same argument another way, if remote Indigenous clients make greater than average use of a clinic, the clinic itself will not necessarily need to be larger because it may have been built with excess capacity due to service delivery scale. Indeed, one of the principles underlying the service delivery scale assessment is that a scattered population necessitates the provision of excess capacity.<sup>12</sup> If a capital item needs to be purchased anyway (such as a clinic for a remote community), then socio-demographic factors are only relevant to the extent that they *add* to the cost of providing that capital. Of

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<sup>12</sup> Service delivery scale is not the only possible cause of excess capacity. It could also be caused by population movement away from a community. However, because the Commission does not assess this phenomenon, there is no potential for double-counting.

course, some capital items will constitute a variable cost, thus reducing the potential for double-counting.

194. Where there is excess capacity, extra demand is likely to be irrelevant. We could expect excess capacity to exist in many facilities where service delivery scale disabilities apply. Examples might include police stations, schools and clinics in small communities, and base hospitals. However, plant and equipment, being more divisible, may be less likely to have excess capacity, meaning that SDC factors may impact more directly on their consumption. While urban hospitals and schools may be less likely to have excess capacity, metropolitan police stations may have some capacity to handle extra demand.

195. The potential for double-counting is highest where service delivery scale applies. How should we respond? Discounting the SDC factor would be inappropriate because it would affect all States with a SDC disability regardless of whether they receive the benefit of a service delivery scale disability. We could discount the service delivery scale disability in recognition of the overall capacity of small, scattered communities to absorb a higher SDC disability without requiring more capital. This might be preferable but it could be unfair to those States with a high service delivery scale disability and a low SDC disability because they would make little use of this capacity.

196. There is no practical way to address this problem. We cannot be aware of the extent to which each community's service delivery scale disability is offset by the composition of its population. While we recognise that there is a conceptual possibility of providing a double benefit to some States with a service delivery scale disability, we do not believe that it is possible to address this issue in the assessment.

197. **Discounting.** The current Depreciation assessment discounts recurrent disabilities by 50 per cent. We support the use of discounting in those cases where there are clear reasons for doing so.

198. **Remote versus urban areas.** It has been suggested that an increase in demand in a remote area may necessitate a greater investment than it would in an urban area. In fact, the opposite is likely to be true because remote areas are more likely to have excess capacity. This in turn may trigger the need for the service delivery scale assessment.

199. **Impact of Indigeneity, remote Indigeneity and socio-economic status on asset life.** This argument appears to concern housing primarily, which is no longer relevant to the Depreciation assessment. However, the Northern Territory also provided the example of security for health centres in remote locations. The line between recurrent and capital expenses can be unclear in such cases. If it is considered to be a capital expense, security would only constitute a small component of the total cost. In the circumstances, we are inclined to believe that such an expense is more usefully considered as a recurrent cost, with recurrent disabilities to be applied to it.

200. **Application of disabilities to other construction.** Other construction includes shafts, tunnels and other structures associated with roads; railways; bridges; tunnels and subways; waterways and harbours; long distance pipelines, communication and power lines; local pipelines and cables; and sporting and recreational constructions. It also includes historic monuments which cannot be identified as buildings. It excludes major

improvements to land such as dams and dykes for flood control. It is difficult to see how socio-demographic characteristics would influence the consumption of this capital.

201. **Relevance of SDC to depreciation unit costs.** Victoria is correct in noting that SDC does not influence the unit cost of buildings or their depreciation rate. However, the population mix does influence the demand for various types of buildings. For example, Victoria might be expected to have a high per capita need to provide health facilities for newly arrived migrants. The SDC assessment attempts to capture the impact of different demographic mixes on the need for capital (measured through its depreciation).

### ***Proposed Assessment***

202. The following assessment is proposed as the mechanism for applying socio-demographic composition considerations to depreciation.

**Table 15** SOCIO-DEMOGRAPHIC COMPOSITION ASSESSMENT

Component	Factor	Weight	Basis for calculation
Buildings	Health	23	New assessment reflecting the demand impact of SDC groups on hospitals and community health services
	Education	21	Age component of recurrent education disability only
	Law and order	6	Police and administration of justice and corrective services demand factors (excluding English fluency component)
	Other	50	EPC
Plant and equipment	Health	23	New assessment reflecting the demand impact of SDC groups on hospitals and community health services
	Education	21	Age component of recurrent education disability only (not discounted)
	Law and order	6	Police and administration of justice and corrective services demand factors (excluding English fluency component)
	Other	50	EPC
Other construction			EPC

203. **Weights of health, education and law and order.** These have been tentatively adjusted to reflect the proportion of depreciation relating to these categories.

204. **Use of age alone for education depreciation.** While social disadvantage places strain on recurrent education costs (for example, security needs and assistance with excursion costs), it is not clear that it has a significant impact on depreciation. However, the number of school-age children has a direct impact on the need for capital. Consequently, standardised student numbers should be used as the socio-demographic determinant of education-related capital spending, without discounting.

205. ***Removal of cost weights from law and order disabilities.*** The need for capital (and therefore depreciation) is driven by demand factors. Cost weights in most categories are appropriate for recurrent costs but do not drive depreciation. Therefore, we suggest that these be removed so as to enhance the accuracy of the factor.

## CONCLUSION

206. We are broadly satisfied with the structure of the Depreciation assessment. We believe that the modifications to its scope and ‘tightening’ of the disabilities as outlined above would give stakeholders greater confidence in the assessment. These modifications are the result of the arguments and evidence presented by members of the Depreciation and Debt Charges Working Party, as well as independent research.

207. In summary, we see the most important proposed changes as being:

- (i) re-developing the asset life disability to reflect the diversity of conditions facing different parts of Australia, grounding this disability more securely in independently generated evidence and incorporating the physical environment impact on repairs and maintenance costs;
- (ii) replacing the construction cost disability with more specific measures of costs;
- (iii) replacing the population concentration disability with more targeted and evidence-based disabilities and dispensing with the use of population bands;
- (iv) tailoring the socio-demographic composition disability to reflect the impact on depreciation more accurately;
- (v) removing the isolation disability;
- (vi) removing depreciation needs associated with housing and urban transit; and
- (vii) using GFS data to calculate the depreciation standard.

208. We invite the States to provide their views on the proposed assessment.