

COMMONWEALTH GRANTS COMMISSION

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THE ASSESSMENT OF URBANISATION DISABILITIES IN THE 2004 REVIEW

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INTRODUCTION

1. A major theme of both the New South Wales and Victorian workplace discussions was the impact of urbanisation on the cost of providing government services. Both States argued that the Commission's assessments considerably underestimated its impact.

2. This paper, however, does not specifically respond to State arguments for the assessment of urbanisation factors in particular categories. Individual discussion papers have already done that. Instead, the paper provides a review of what the Commission accepted as urbanisation disabilities in the 1999 Review, a summary of general State arguments and some analysis of those arguments. It proposes a framework that Commission staff consider might be helpful in differentiating urbanisation impacts on costs from those of other factors. It suggests that more evidence is needed to identify the cost-urbanisation relationship and that the task of reliably measuring urbanisation impacts will not be an easy one. It suggests that some judgement is likely to be required.

3. The views expressed are those of Commission staff.

1999 REVIEW METHODS

4. In the 1999 Review, the Commission accepted that, for a range of reasons, 'urbanisation' could have an influence on the demand for some State services. It explicitly assessed urbanisation disabilities which were not captured in other factors in:

- (i) National Parks and Wildlife Services, where a factor was assessed to allow for the higher conservation related expenditures incurred in parks where the boundaries are contiguous with urban areas;
- (ii) Roads, where allowances were made for the higher costs incurred in maintaining highly trafficked roads in densely populated areas and for the extra traffic control costs incurred in Sydney and Melbourne;
- (iii) Urban Transit, where the demand factor took account of the greater transport task in large urban areas, as well as the effects on costs of congestion, security and activities associated with preventing and repairing damage by vandals; and
- (iv) Depreciation, where the population concentration factor reflected the requirements for specialised or more extensive capital stock in larger urban areas, the greater capital requirements of urban transit services in the larger urban centres and diseconomies of scale associated with some capital stock in the smaller States.

5. The extra costs associated with vandalism and security in large urban areas were assessed in the Schools Education categories.

6. The urbanisation and vandalism factors redistributed \$155.6 million. Figure 1 shows their impact on the redistribution for each State.

Figure 1 REDISTRIBUTIVE EFFECTS OF URBANISATION AND VANDALISM FACTORS, 1999 REVIEW



Source: CGC, *Report on General Revenue grant Relativities, 1999, Volume II*.

7. Some additional effects which could be attributed to urbanisation were included in other disabilities, especially in socio-demographic composition factors. In particular:

- (i) the socio-demographic composition factors for the Vocational Education and Training, Hospitals and Mental Health categories included an element that allowed for the effects of the regions in which people live on demand for services;
- (ii) the socio-demographic composition factor for Hospitals also included an allowance for the higher incidence of HIV/AIDS and drug related treatments in Sydney;
- (iii) the calculation of notional student numbers for secondary education included an adjustment that allowed for the effects of socio-economic status and urbanisation on retention rates in the non-compulsory years;
- (iv) the socio-demographic composition factor for Police contained a weight that allowed for the higher crime rates and the size of the policing tasks in Sydney and Melbourne; and
- (v) the depreciation category factor used in the Debt Charges assessment reflected population concentration.

8. In addition, costs impacts were recognised in other categories which could be said to partly capture urbanisation effects. For example, the Administration of Justice assessment allowed for the extra costs per civil case in higher courts which generally reflected issues arising in metropolitan areas. The Public Safety and Emergency Services category recognised the need for expenditure in all locations, including urban areas, by using actual expenditure on natural disasters in the physical environment factor for the Natural Disaster Prevention component and fire insurance claims and land valuation data in the economic environment factor in the Fire Brigade component.

9. It could be argued that implicit urbanisation effects were also captured in the Land Revenue and Housing User Charges assessments where the tax bases were increased because of the higher values of property in major urban areas and the higher market rents available.

STATE VIEWS

10. Both New South Wales and Victoria argued that a high level of urbanisation increased the demand for and the cost of providing many services. Other States suggested that they experienced similar demand and cost pressures, not always in urban areas.

Workplace Discussions

11. *New South Wales.* In its workplace discussions, New South Wales demonstrated the demand and cost impacts of urbanisation and congestion through briefings on population pressures and the need for infrastructure by planning authorities and at Central Station, the traffic control centre and other locations. It said that the Commission had underestimated its expenditure needs in regard to these costs. This was because the Commission had not taken into account, or had underestimated, the effects of a critically congested environment, a growing population, increasing economic activity levels, a difficult topography and high land prices on the costs of:

- (i) providing services, especially transport services, including an adequate rail and road network, public transport services, traffic control, traffic signals and freight movement services; and
- (ii) providing infrastructure, mainly for transport, which required 'retrofitting' over existing urban development and undergrounding of transport networks;

12. New South Wales also illustrated the convergence in the Sydney urban area of the service provision needs arising from drug related problems and from concentrations of people from diverse ethnic backgrounds, of people living in poverty, of people with poor employment levels and of people with high levels of social dysfunction. These were said to have an impact on the cost of providing education, health, welfare, law and order, and housing services.

13. *Victoria* demonstrated the demand and cost impacts of urbanisation at the Traffic Control Centre, Holmesglen TAFE, State Emergency Control Centre, Mildura Police and Dandenong Ranges National Park. It contended that an urbanisation disability should be introduced to several additional categories and that existing urbanisation factors were too small. For example:

- (i) the assessment for roads should recognise that:
 - highly urbanised and populated centres incurred additional costs associated with complex and costly solutions in managing road use and congestion;
 - arterial road maintenance was influenced by high volumes of traffic and costs about 3 times per kilometre that of rural arterial road maintenance; and
 - the choice of road type and standard was primarily determined by traffic volumes, not policy choice;
- (ii) the Vocational Education and Training assessment should recognise the high urban vandalism costs and the need for extra security because campuses could not be enclosed and high crime and damage rates were experienced;
- (iii) the urbanisation factor for Police should recognise:
 - the demand and cost impacts associated with a large non-English speaking and ethnically diverse population; and
 - the wider range and scale of police resources required due to major fraud and criminal investigations, anti-terrorism, personal assaults, drug-related crime and gang violence; and
- (iv) the assessment for urbanisation in Public Safety should recognise that large urban areas were complex, difficult and expensive to service due to population density, diverse NESB communities, close proximity of major hazards to residential areas and the increasing risks associated with major events (eg Melbourne Grand Prix, 2006 Commonwealth Games) where large numbers of people congregated.

14. *Other States*, such as Queensland and Western Australia, also demonstrated the high costs they incurred in providing traffic control systems in their capital cities and in planning, constructing and operating their transport infrastructure networks to deliver services which adequately served their rapidly growing populations. Western Australia also made a case at Mandurah that crime and service provision needs were becoming more of a problem in regional areas of high growth than in more stable, well provided inner areas of capital cities.

15. Some States made a case that vandalism was not a feature of highly urbanised areas, but was due more to social dysfunction and alienation. This accounted for

the large expenditure needs in Aboriginal and smaller rural communities where unemployment was high and incomes low.

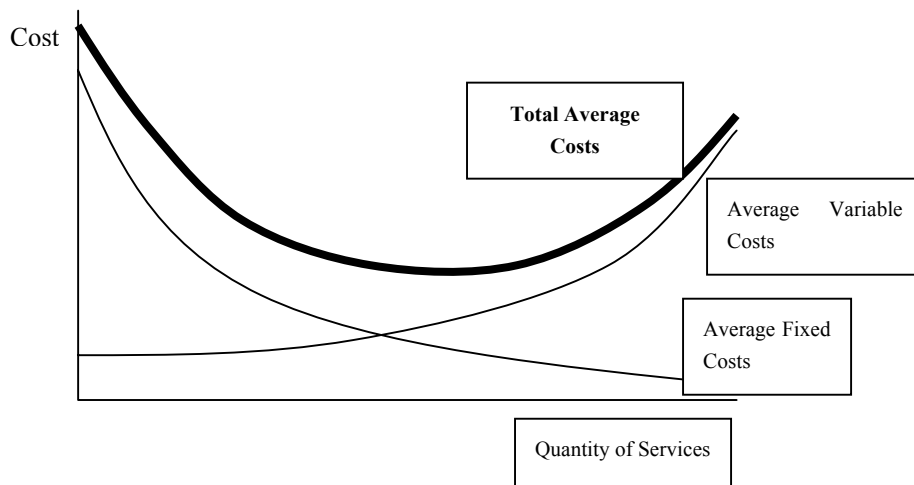
16. Western Australia and the Northern Territory also challenged Victoria's view that crime and road accidents were more prevalent and costly to deal with in large urban areas. They provided details of the costs of dealing with major crimes and traffic accidents in remote areas — the staffing requirements, the travelling times and distances and the equipment that must be transported.

Submissions

17. In their submissions, New South Wales and Victoria agreed that more people meant more demand for government services and that the average cost of providing services increased once a city reached a certain size.

18. **New South Wales.** New South Wales defined 'urbanisation' effects as relating mainly to Sydney and as being due to its large size, rapid population growth and its role as a global city and international gateway. It submitted that, in line with accepted economic principles, variable costs tended to exhibit diminishing marginal returns, that is, increasing variable costs per unit of service. At larger output volumes, this gave rise to diseconomies of scale, as shown in Figure 2:

Figure 2 DISECONOMIES OF SCALE



Source: New South Wales Submission, May 2002, p.41.

19. **Victoria** defined urbanisation effects more broadly as the shift of State populations to capital cities resulting in:

- (i) increased population of urban centres, particularly major cities;
- (ii) increased physical size of such cities, and/or increasing population density; and

(iii) changes in the composition of the population in urban areas.

20. It argued that a city exceeded its optimal size when the average cost of providing a particular service began increasing. A city would therefore experience diseconomies of scale with further service provision. Victoria reported that:

- (i) the concept of optimal city size in the provision of public services was first identified by Hirsch (1956) through his estimation of the U-shaped scale of per capita local public expenditures¹;
- (ii) Hayashi's study of Japanese cities suggested an optimal city population in Japan of 200 000 to 300 000 people. As cities became more populous, diseconomies of scale in public service provision were shown to increase²;
- (iii) a similar study by Capello found that advantages experienced living in cities in terms of employment, school provision, energy use, waste creation and the supply of public services, begin to decrease after a city reached a population of approximately 360 000. After this optimal city size, congestion effects and diseconomies of scale prevailed at an ever-increasing rate, all with significant consequences for public expenditure³; and
- (iv) research by The World Bank Group (<http://econ.worldbank.org>) reinforced these empirical studies by noting there are best degrees of urban concentration at the national and regional level.

21. Victoria noted that studies in an Australian context were not available, but applying Hayashi's and Capello's findings to Australian capital cities suggested the outcome illustrated in Figure 3. With a population of approximately 300 000 people, Canberra fell in the range of optimal city size according to both studies. The million-plus cities thus experience diseconomies of scale as population increases – in order, Adelaide, Perth, Brisbane, Melbourne and Sydney climb further up the right-hand slope of Hirsch's 'U-shaped' curve.

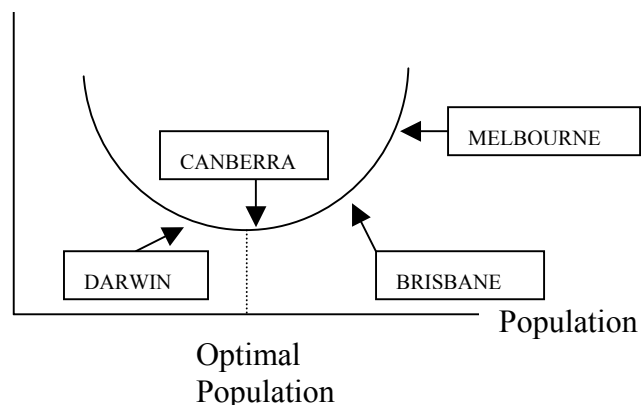
¹ Victorian Submission, April 2002, p. 88.

² Masayoshi Hayashi, 'Congestion, Technical Returns and the Efficiency Scales of Local Public Expenditures: An Empirical Analysis for Japanese Cities (Preliminary)', December 2000, Kinetica.

³ Roberta Capello, 'Urban Growth in Italy: Economic Determinants and Socio-Environmental Consequences', International Symposium in Urban Design on Urban Systems and Public Place, CERUM, Sweden, June 2001.

Figure 3 HIRCH'S U-CURVE APPLIED IN AN AUSTRALIAN CONTEXT

Cost per unit of
public services



Source: Victorian Submission, April 2002, p 89.

22. Both States attributed this diseconomies of scale effect to increasing complexity — the increasing complexity of the planning and management task for land development, transport infrastructure and operations, fire suppression and emergency services, environmental pressures, crime and vandalism. Attachment A contains a summary of the urbanisation effects New South Wales and Victoria would like the Commission to recognise.

23. Queensland, Western Australia, South Australia, Tasmania, the ACT and the Northern Territory all expressed concerns over the Commission's urbanisation-based assessments. Their view was that the relationship between population density, city size, or other measures used as proxies for urbanisation were not reflective of the actual costs faced by States. Queensland proposed that an explicit cost model, such as that used for dispersion, be developed.

24. Category specific discussion papers provide staff preliminary responses to category-specific arguments. These are summarised in Attachment B.

ANALYSIS

25. Past reviews have not clearly defined urbanisation related disabilities. Commission staff believe that we need to be much clearer about exactly what 'urbanisation' is and how it has a separate and distinct impact from other disabilities. We need to more clearly understand the direction and size of its impact on costs of government services and take a consistent approach to its measurement.

What Past Commissions Have Done

26. ***Urbanisation disabilities that have been recognised.*** Past Commissions have assessed urbanisation needs as arising from:

- (i) maintaining highly trafficked roads in densely populated areas;
- (ii) controlling traffic in large cities;
- (iii) the public transport task in large urban areas;
- (iv) congestion in large urban areas;
- (v) providing infrastructure in larger cities;
- (vi) conservation in parks contiguous with large urban populations; and
- (vii) vandalism and security in larger cities.

27. They have also recognised that demand for some services and/or the cost of providing them in urban locations is higher. The effects were assumed to be due to the greater accessibility of services in urban areas and to the socio-demographic characteristics of people living in there. As actual use or cost data by region were used to derive weights or standard proportions, these effects were not specifically attributed to ‘urbanisation’ influences.

28. ***Measurement.*** Past Commissions have measured State relative needs in a number of ways, mainly assigning cost or demand weights to urban populations in centres of different sizes. As well, they have used a range of methods, including assigning a cost weight to urban road lengths, assigning cost weights to urban populations contiguous with national park boundaries or cost weighting the populations of Sydney and Melbourne.

29. Queensland’s criticism that the Commission does not have a model which explicitly defines the relationship between cost and measures of ‘urbanisation’ like we do for dispersion is well founded.

What Past Commissions Have Not Done

30. ***Urbanisation disabilities that have not been recognised.*** Past Commissions did not recognise urbanisation disabilities relating to:

- (i) water and sewerage, and electricity infrastructure because it was assumed that any costs would be covered by user charges in major urban areas and no subsidy would be needed;
- (ii) the greater risk of damage and need for public safety expenses in urban areas — although an attempt was made to recognise this in an economic environment factor which included insurance claims and land values;

- (iii) the impact of the high costs of housing in large urban areas on the demand for public housing because a method of doing this could not be devised; and
- (iv) higher land costs and their influence on debt charges⁴ as it was too complex to derive a satisfactory factor.

31. Nor did past Commissions recognise urbanisation disabilities in relation to a number of influences that States have drawn our attention for the first time in this review, such as:

- (i) the greater complexity of the planning task for a range of functions in urban areas (public transport, roads, urban development);
- (ii) the need for greater environmental protection expenses in urban areas; and
- (iii) other areas where urbanisation causes greater complexity in service provision, such as in retrofitting infrastructure, the provision of public safety and emergency services, the provision of services to large concentrations of people from particular ethnic backgrounds, the duplication of regional offices to minimise travel times in congested environments.

At this stage, we are not sure how material these influences are on costs, or whether they are, in part, recognised in other disability assessments.

32. ***Interaction of disabilities.*** Past Commissions have not explicitly dealt with issues relating to the confluence of disabilities in large urban areas. They have not explicitly stated whether:

- (i) these disabilities can be taken into account on the basis of already recognised disabilities — socio-demographic composition, economic environment, physical environment;
- (ii) there is a unique and separate urbanisation disability; or
- (iii) there is an extra disability caused by the interaction of disabilities in one area.

33. The arguments of New South Wales suggest that urbanisation is a distinct disability but that interactions are also important. It noted that urban population pressures and congestion, together with Sydney's topography, stage of development and lack of suitable land for further urban development, result in higher planning costs, higher costs of dealing with air and other environmental impacts, higher land costs and higher costs for the retrofitting of transport, electricity, water and sewerage infrastructure. It also argued that its urbanisation needs (drug problems, crime and high land prices) related to Sydney's role as a

⁴ Capital expenditure on land has no impact on the depreciation assessment as land does not depreciate.

global city and international gateway. The concentration of migrants was also cited as a relevant influence.

34. Victoria made a similar case, arguing that population size and concentrations lead to higher costs in some functions and the interaction of various influences in large urban areas increased the complexity of service provision.

35. There are some characteristics which would seem to have a similar impact on costs regardless of location. For example, it could be assumed that people aged 70 would have the same demand for hospital services regardless of where they live. People without fluency in English would need an interpreter to assist with a police interview regardless of where they were suspected of having committed a crime. However, the interaction of population density and large numbers of people who were not fluent in English may make policing task more complex and more costly.

36. This example suggests that there may be socio-demographic composition disabilities to be recognised regardless of location but there may be additional cost imposts due to the interaction of the characteristics of a large urban area (such as density and a large number of people) and socio-demographic characteristics.

Increasing Unit Costs

37. Increasing complexity in service provision is one possible explanation for the increasing unit costs with increasing population size, postulated by New South Wales and Victoria in their submissions.

38. The optimum city size, however, is likely to vary according to the service being provided — the optimum size for an efficient urban transport system is likely to be greater than for garbage collection services.

39. Also, it is difficult to know where each of Australia's cities would be located on the curve for different services. One of the authors quoted by Victoria concluded:

Optimal city size does not exist but differs one city to another depending on the structural characteristics — the functions and spatial organisation of activities.⁵

40. The Report of the House of Representatives Standing Committee for Long Term Strategies, *Patterns of Urban Settlement: Consolidating the Future?* (1992, xiv) concluded 'Cities have no optimal size.' It noted that it is difficult to define optimal city size or to define an upper limit. It reported various estimates of optimal size ranging from a population of 75 000 up to three million. It concluded that what could be defined as an optimal size depended very much on a range of social and environmental factors at work in the city in question. It also concluded that these factors would change over time to give a variety of optimal sizes.

⁵ Capello, *ibid.*, p.24.

41. Brothie's Australian study in 1992 derived a mathematical formulation of optimal city size for various objectives and for given economies of scale of income and diseconomies of scale of costs in housing, transport and infrastructure. He concluded:

It shows that for current variations in these parameters with city size — including subsidies to public transport and to fringe development — optimum urban population for maximum net income per resident is now larger than the largest existing cities. For maximum national productivity, the optimal sized city for the channelling of further growth is now of the order of 3 million, eg Sydney and Melbourne.

However, it also shows that the region of the optimum is relatively flat and that the variation of net income per capita is not large over Australia's major cities...⁶

42. The steepness of the curve illustrated in the figures provided by New South Wales and Victoria is uncertain — is it steep, or is it almost flat? Brothie's work suggested that, in the Australian context, it is relatively flat around the optimum. The analysis undertaken by Hayashi, and referred to by Victoria, certainly suggested that, for Japanese cities, unit costs increased at a faster rate as the intensity of use of government services increases⁷. If data were available for Australian cities, it may be worthwhile considering using methods similar to Hayashi's to measure, in the Australian context, the expected change in the unit cost of providing public services in cities of given sizes if their populations increased.

43. Available research does not confirm or deny that the unit cost of providing government services in Australian cities increases with increasing population size. It does suggest that it is hard to know the shape of the curve and where each of the cities are on that curve. It is also hard to untangle all the influences⁸.

44. What is needed is a systematic way of evaluating State arguments and of calculating factors. Conceptually, there seems to be a case that urbanisation can impact on both the demand for services and the unit costs of providing them. Empirically, we are not quite there. We need to identify the impacts of urbanisation on the demand for and unit cost of providing services and to measure them to ensure they taken into account in the 2004 Review. To do this, Commission staff propose developing:

- (i) a framework which can be used to identify urbanisation influences which are distinct from other influences observable in urban areas (and perhaps how the urbanisation influences might interact with other influences);

⁶ John Brothie, 'The Changing Structure of Cities', *Urban Futures*, Special Issue 5, February 1992, p13.

⁷ For example, Hayashi estimated that unit costs in Osaka, a city of 2.6 million people, would increase by 40 per cent for a 1 per cent increase in population. This was based on the estimation of an optimum sized city of some 300 000.

⁸ The Parliament of Australia, House of Representatives Standing Committee for Long term Strategies, *Patterns of Urban Settlement: Consolidating the Future?* AGPS, Canberra, 1992, p3.

- (ii) a method of relating the characteristics of urbanisation to their impact on costs.

CONCEPTUAL FRAMEWORK

45. The views put by New South Wales and Victoria suggest that urbanisation disabilities arise in urban centres which are usually large and which experience rapid population growth, increasing density and changing population composition. These urban population pressures are said to result in both higher demand and increasing average costs.

46. So how do urbanisation disabilities occur? Is it the size of the centre, the rate of population growth, the population density, when the centre reaches a certain size, or the population characteristics which increase demand and unit costs?

47. Australia has close to 65 per cent of its population living in centres of more than 50 000. Some States — Victoria, South Australia, Western Australia and the ACT — have more than 70 per cent of their population resident in their capital cities. Sydney has over 4 million people, Melbourne 3.5 million, Brisbane and Perth about 1.5 million and Adelaide also more than 1 million. However, by international standards, Australia's urban population density is quite low.

48. Understanding the nature of urbanisation disabilities is of some importance to the Commission. It is desirable to develop an approach that will:

- enable urbanisation disabilities to be distinguished from other disabilities;
- ensure that there is no double counting between the urbanisation and other disabilities;
- ensure that any interaction of urbanisation with other disabilities is properly recognised; and
- enable the degree of disability to be estimated.

49. There is a wide variety of human settlements in Australia. They vary from the one family farmstead, to the small urban centre of 1000 people, to metropolitan Sydney of over 4 million people. The costs of providing services in each will differ, depending on their characteristics. What characteristics cause an urban centre to experience urbanisation disabilities?

50. ABS defines an urban centre to be collection of contiguous collector's districts for which the place of enumeration population at Census time is greater than 1000 people. From this to Sydney, urban centres can be characterised by groups of people and activities in one location and differentiated by:

- (i) the physical environment — location, area, topography, climate and soil type, vegetation — these can influence the urban form and the costs of providing transport and other infrastructure networks, the spatial distribution and density of the population, the costs of building and asset maintenance;
- (ii) the number of people — this will drive the basic demand for government services and, possibly, when the number of people are less than or greater than an optimum size, result in higher per capita demand and higher unit costs;
- (iii) the characteristics of the people — their age, sex, income levels, education, employment status, ethnic background, Indigeneity — these can change the per capita demand for and costs of delivering government services;
- (iv) the economic environment and the nature of that environment — the number and different types of activities carried out (industry, residential, gateway), the networks (the transport, communications and essential services) the costs of land, the cost of building, the costs of wages — can influence the unit costs of providing services.

51. The interaction of these characteristics will lead to different types of urban centres and different costs. We need to decide which characteristics lead to an urbanisation disability and how we can ensure that what we quantify as an urbanisation disability is only that, and has not been taken into account in other factors.

52. One way of doing that might be to assess all other disabilities first, then consider whether there might be innate impacts on costs other than those already taken into account in other factors. The alternative would be to decide which characteristics lead to uniquely urbanisation disabilities and which are more appropriately measured as other disabilities. The characteristics that could give rise to urbanisation disabilities rather than other disabilities are:

- (i) a large number of people — the absolute size of the urban centre;
- (ii) changes to that number of people – for example, through growth;
- (iii) the interaction of the number of people with area (density);
- (iv) a large number of different activities; and
- (v) the interaction of those activities and people requiring complex transport and other networks, including maybe complex service delivery arrangements.

53. Other characteristics, such as physical environment and socio-demographic composition of the population, will influence the nature of the urban centre but the same

characteristics could exist elsewhere. The interaction of large numbers of activities, people and limited available areas for development, causing higher input prices (wages⁹, land, building costs) could exist elsewhere. For example, Newman in Western Australia is an example of much economic activity, a relatively large number of people and limited housing where wages and house prices are high. Thus, it is proposed that this combination of characteristics be classified as input cost disabilities. Figure 4 proposes a schema of characteristics and disabilities.

54. The next question is then: How do urbanisation disabilities defined as the result of number of people and activities (the urban size) and the interaction of these with area (density) and networks (complexity) influence the costs of government service provision?

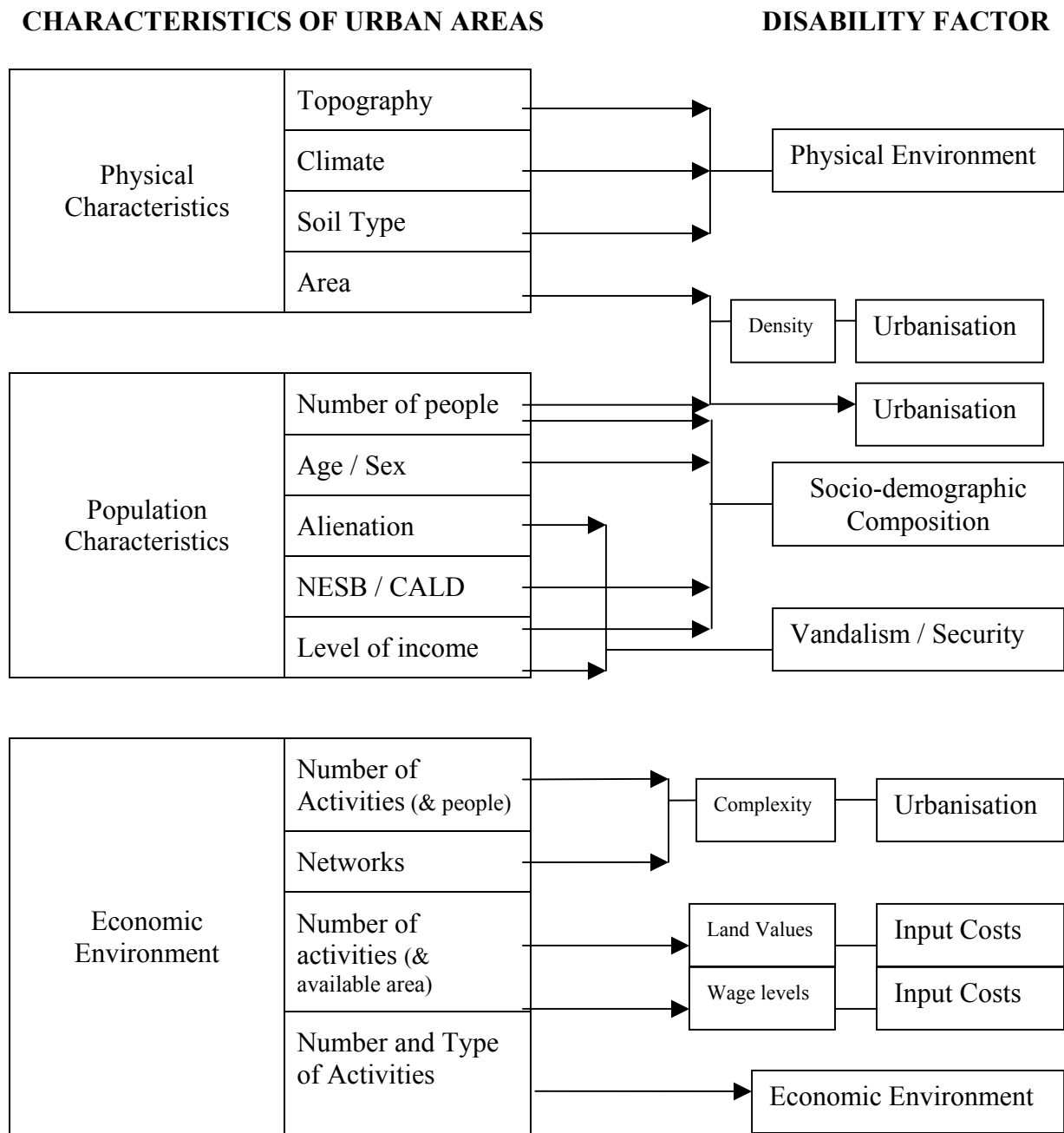
55. As suggested by New South Wales and Victoria, urban size and density may impact on both the number of units of service required, and the unit cost of providing the service.

56. The number of units of service required could be influenced by urban size and density because the proximity of large numbers of other people can change the behavioural pattern of residents.

- (i) Residents in large urban areas may use more (or less) government services because they are available more (or less) easily.
- (ii) Residents may need more of some services per capita to cope with problems generated by urban size and density (such as more planning of service delivery, more traffic control, more subsidised public transport infrastructure, more environmental effort).
- (iii) Residents may need less of some services per capita because of the advantages provided by a large urban area (such as lower needs for electricity, water subsidies).
- (iv) Residents may commit more crimes and detection may be more difficult because of the anonymity given by a large and densely populated urban environment.
- (v) Greater numbers of people with certain characteristics may mean governments must provide services that are not provided in smaller centres (such as VET), or the community provides them for itself (for example, welfare services).

⁹ Already recognised as an input cost factor, not related to urbanisation but to the characteristics of labour markets.

Figure 4 FRAMEWORK FOR THE ASSESSMENT OF DISABILITIES



57. The unit cost of providing service can also change because urban size, density and complexity can influence:

- (i) when things are done, such as the maintenance on roads needing to be done at night and on weekends;
- (ii) how things are done:

- more complex services can be required to ensure adequate service levels (more retrofitting of infrastructure, more sophisticated traffic control systems, more planning, duplication of regional offices to minimise travel times in congested environments); and
- large and densely settled populations and high levels of economic activities can generate more waste and have a large impact on air and water quality.

58. In using the proposed framework, the Commission would recognise urbanisation disabilities as those which result from only those cost impacts which can be attributed to urban size and density and the interaction of these to cause a need for complex networks and service provision arrangements. Other cost impacts would be taken into account in other disability factors. Where there is interaction with other disabilities and data measured costs concurrently, care would need to be exercised to avoid double counting of disabilities.

APPLYING THE FRAMEWORK

59. Some practical examples of how the framework might work may be helpful.

Urbanisation

60. Subject to the availability of empirical data, other reasonable evidence and materiality, staff would be prepared to recommend to the Commission that it consider assessing urbanisation disabilities in relation to the following:

- (i) the greater complexity of the traffic management task and the impact of this on the costs in the Roads category;
- (ii) the greater need for environmental protection expenses in large urban areas and the impact on costs in Other General Public Services;
- (iii) the greater risk of damage and need for public safety expenses in densely settled urban areas, particularly those adjacent to hazardous activities;
- (iv) the greater complexity of the planning task for a range of functions in urban areas (public transport, roads, urban development);
- (v) other areas where urbanisation causes greater complexity in service provision, such as in retrofitting infrastructure, the duplication of regional offices to minimise travel times in congested environments.

61. For example, it seems appropriate to consider the need for a complex traffic management system as an urbanisation disability. At workplace discussions, in

submissions and in the literature, considerable evidence has been provided that the tasks relating to traffic management and environmental protection are substantial and more complex in large urban areas. This is largely because of the impact of population size and density on the way people behave. The numbers of people going to work (interacting with the available transport networks) generate a larger per capita management task. In fact, it is likely that a certain minimum urban centre size would need to be achieved before investment in such a system could be justified. That size would not necessarily be the same for all cities, because the physical and economic environment of each would be different.

62. Similarly, it seems appropriate for the need for greater environmental protection expenses to be considered as an urbanisation disability. Large concentrations of people living and working together are likely to generate a more concentrated environmental protection task.

Input Costs — High Land Costs

63. We would propose to recommend that input cost-type disabilities rather than urbanisation disabilities be recognised in relation to:

- (i) the impact of the high costs of housing in large urban areas on the cost of providing public housing; and
- (ii) the impact of higher land costs on debt charges.

64. The effects of high land costs in large urban areas on service delivery costs (housing, welfare) or debt charges are undoubtedly real. However, because higher land costs are the market's way of rationing available land for development in both large urban and other areas, we think it better that it be treated as an input cost disability.

Socio-demographic Composition — Concentrations of CALD people

65. We would propose recognising any higher costs arising from concentrations in large urban areas, particularly Sydney and Melbourne, of people from culturally and linguistically diverse (CALD) backgrounds as a socio-demographic composition disability. New South Wales and Victoria have argued that large concentrations of people from particular CALD groups, particularly in Sydney and Melbourne, generate a higher demand for services and higher unit costs. This is because the government must provide appropriate services for them. Where should these costs be recognised? While it is the size of the group that is causing the higher costs, such groups could be located anywhere. Thus, under the framework, such costs would be considered under the socio-demographic composition disability factor.

Other Costs

66. We are less certain about how we should treat other cost impacts observable in urban areas. For example, are the impacts of high drug use or vandalism the result of urbanisation — urban centre size, density or complexity — or something else?

67. **Drugs.** New South Wales, in particular, argued that it faces a serious drug problem which affects policing, corrective services education and health and costs in both metropolitan Sydney and in regional Lismore. Data available from the Institute of Health and Welfare supports the view that drugs are not a uniquely urban problem, although some drugs are more commonly used in urban areas. Table 1 illustrates this.

Table 1 PERCENTAGE OF AUSTRALIAN POPULATION AGED 14 YEARS AND OVER WHO USE DRUGS — LOCATION

Drug type	Urban	Rural/Remote
	%	%
Alcohol (Regular Use)	49.4	46.7
Prescription Drugs Use for Non-medical Purposes	13.7	15.6
Marijuana/Cannabis	39.0	39.4
Tranquillisers/Sleeping Pills	6.4	5.5
Heroin	2.3	1.9
Pain-killers/Analgesics Use for Non-medical purposes	10.7	13.6
Cocaine	5.0	2.6
Inhalants	4.2	3.1
Ecstasy/Designer Drugs	5.4	3.2
Injecting Behaviour	2.2	1.9

Source: Australian Institute of Health and Welfare, *National Drug Strategy Household Survey, 1998*, October 2000.

68. What is not clear is what is causing drug use to impact on government service provision costs. Do residents of urban areas have greater access to drugs (is it a market driven phenomenon?) Are high or low income people the main users; is it the employed or the unemployed? The type of drug use seems to be the key, but for most types of drugs, use appears heavier by those in the most affluent areas. Table 2 illustrates the relationships between socio-economic status and drug use. Employment and educational status also seems to be more correlated with drug use than to urban/rural location for most drugs. It is possible that most drug related costs could be best captured under a socio-demographic composition factor. The high proportion of people with HIV/Aids in Sydney may be the exception. This could be due to the need for those with HIV/Aids to be close to appropriate health care. In this case a separate factor may be required.

Table 2 PERCENTAGE OF AUSTRALIAN POPULATION AGED 14 YEARS AND OVER WHO USE DRUGS — SOCIO-ECONOMIC STATUS AREA

Drug type	Quintile				
	1st	2nd	3rd	4th	5th
Alcohol (Regular Use)	46.7	44.2	47.0	47.8	56.1
Prescription Drugs Use for Non-medical Purposes	13.6	13.2	14.8	16.7	13.7
Marijuana/Cannabis	35.5	35.7	42.3	40.2	42.7
Tranquillisers/Sleeping Pills	6.0	5.6	5.6	6.9	6.9
Heroin	2.3	2.5	1.8	1.7	2.5
Pain-killers/Analgesics Use for Non-medical purposes	11.9	1.09	12.3	12.9	10.6
Cocaine	3.1	3.1	4.1	4.6	6.2
Inhalants	3.6	3.0	4.4	4.4	4.5
Ecstasy/Designer Drugs	3.2	4.2	5.4	4.7	6.1
Injecting Behaviour	2.2	2.6	1.4	2.1	2.0

Source: Australian Institute of Health and Welfare, *National Drug Strategy Household Survey, 1998*, October 2000.

69. **Vandalism.** Evidence has been presented that vandalism and security is not just an urbanisation problem. It is a serious problem in large urban areas and in rural centres, and in particular in remote Aboriginal communities.

70. Queensland provided Institute of Criminology data on the level of malicious damage per 100 000 population, reproduced as Table 3. These show that the incidence of damage is marginally below average for New South Wales and is significantly below average for Victoria. As such, we suspect that other factors are at work. Queensland reported that schools in socially stressed communities, regardless of size, are subject to higher levels of vandalism. It said that these schools can be located in pockets of disadvantage within a large urban area or small individual communities.

Table 3 PROPERTY CRIMES REPORTED TO POLICE — MALICIOUS DAMAGE PER 100 000 POPULATION

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
	Number per 100 000 population								
1991-92	869	755	994	1598	1607	673	2369	2022	1021
1992-93	975	710	1183	1838	1711	752	2970	1842	1116
1993-94	990	306	1247	1859	1832	1020	2965	2033	1054
1994-95	1167	314	1406	1987	1879	1112	3612	1685	1165
1995-96	1234	373	1431	2245	1867	1247	3522	2139	1242

Source: Australian Institute of Criminology, *A Statistical Profile of Crime in Australia*, March 1997.

71. This suggests that we need to look beyond urbanisation as the driver of vandalism and security for measures which relate the actual costs incurred to measures of social stress or of alienation from the rest of the community. Maybe even socio-economic status, or employment status, may hold the key. Thus, this disability should not be classified as an urbanisation disability and it will be necessary to devise a way of calculating it which more closely reflects its impact on cost.

Other Costs — Data Availability

72. ***Higher hospital costs.*** The effect of location is taken into account in joint socio-demographic and hospital costs factors in the hospitals assessment. These capture use and costs differences across the States by age, sex, income levels, Indigeniety and low fluency status, as well as location. No attempt is made to explicitly attribute the differences actually observed to particular causes. The use and cost weights are derived from Australian average data and applied to the relevant population groups by age-sex, location, and so on in each State. We would not propose to disaggregate these factors so that the framework proposed in this paper can be applied.

HOW SHOULD URBANISATION DISABILITIES BE MEASURED?

73. A further consideration is how urbanisation disabilities should be measured. The 1999 Review methods concentrated on developing cost weights, mainly for application to the number of people in centres of particular sizes. However, most of these factors were based on very little empirical evidence.

74. Information Paper CGC 2002/1, *Guidelines for Implementing Horizontal Fiscal Equalisation*, said that determining any disability factor requires the application of evidence and judgement. It noted that it was best to have data which showed how costs changed in relation to a change in a population characteristic or other variable but that this was not always available and we had to rely on less explicit information and use judgement.

75. The paper went on to say that it was the quality and quantity of information relating to a possible disability that would make a case more or less convincing. The level of confidence required to justify the inclusion of a disability depended on the likely size of the disability, the importance of its underlying cause in the policy standard and the strength of the logic used to support it.

76. If we can obtain evidence on how costs change in relation to different levels of urbanisation, measured by urban centre size, density or some other indicator, then it would be possible to construct robust factors based on the type of cost model sought by Queensland. We would need data:

- (i) which showed whether costs increased or decreased with increasing centre size or density; and
- (ii) on the proportion of expenses in the category so affected.

77. If city size were the main influence, the additional costs attributable to ‘urbanisation’, say the above standard cost of providing a complex traffic control system, in cities above a certain size could be multiplied by the number of such cities in each State and the impact of the total on the standard calculated. For density relationships, a factor could be calculated by weighting the proportion of the population living in regions with particular population density by the relevant cost weight.

78. However, relationships may not be that simple. It may be that:

- (i) urban size and density do not have a one way impact on costs;
- (ii) there is not a continuous relationship between cost and size, cost and density: the relationship may be stepped and a certain size might need to be reached before any disabilities are experienced; and
- (iii) both city size and density combine to influence demand and unit costs.

79. It is very likely that urban size and density do not have a one way impact on costs. In many cases, costs may be increased, in others they may decrease. Empirical evidence will be needed to build cost relationship models for affected categories. For example, in Urban Transit, evidence suggests that increasing urban density reduces the need for subsidies of uneconomic services (because of higher revenue raising capacity) but increases the need for infrastructure subsidies.

80. It is also likely that a certain critical city size and/or density must be reached before an urban centre requires a complex traffic management system. Again empirical evidence would be helpful in establishing the relationship.

81. Where good data are not available or where city size and density (or other influences) are combining to influence demand and unit costs, judgement may need to be used to derive a factor to take account of both effects. It may be necessary to adopt a broad indicator, such as proposed by Western Australia at the October Conference 2002. For example, if population density were considered to be the main driver of higher costs, then it may be appropriate to use the relative density of relevant cities in each State as an indicator of need. This could be used unadjusted, based on the assumption that as relative density increased there was a one-to-one increase in costs. If anecdotal evidence existed that an increase in population density of one person per square kilometre increased costs by 50 per cent, then the factor could be halved. If costs doubled for every increase in density, then the factor could be doubled. In developing a factor in this way, it would be very important to be aware of the underlying assumptions and to consider whether they are reasonable.

82. Double counting in factors is always a concern. As the Commission noted in Discussion Paper CGC 2002/21, *Socio-demographic Composition*:

The Commission will continue to ensure in the 2004 Review that there is no double-counting between dispersion, urbanisation and socio-demographic composition assessments. The geographic location (spatial distribution) of the population within each State will continue to cause variations between States in their costs of providing services. The Commission assesses the

impacts of population location through three disability factors — dispersion, urbanisation and socio-demographic composition.

83. To be sure there is no double counting, a way of taking all location specific costs into account may be to obtain location specific demand and cost weights that can be built into socio-demographic composition joint factors, such as those used in the Hospitals assessment. There may be two problems with this approach — it could make it more difficult to separately identify all ‘urbanisation’ effects in a transparent way and there may be some cost influences that cannot be incorporated in the socio-demographic factors.

84. Assistance from the States on these issues, on a category by category basis, would be appreciated.

CONCLUSION

85. The purpose of this paper has been to set out a conceptual framework which staff can use to evaluate arguments relating to urbanisation effects. Assistance with developing explicit cost models using empirical data would be very helpful. At the very least, the framework is intended to ensure that urbanisation disabilities are adequately identified and recognised in the full range of assessments to which they apply. It should also help to minimise any double counting with other disabilities.

86. We encourage States to frame their arguments and provide evidence around the effects of urban size and density on the costs (and related measures) of providing government services as suggested above. Arguments relating to other influences observable in urban areas should be made in relation to other disability factors.

ATTACHMENT A

URBANISATION DISABILITIES SOUGHT BY NEW SOUTH WALES AND VICTORIA

87. The Table A1 provides a summary of the submissions by New South Wales and Victoria that an urbanisation disability factor should be introduced or changed in some way. Views expressed by the other States have also been included where relevant.

Table A1 URBANISATION DISABILITIES SOUGHT BY NEW SOUTH WALES AND VICTORIA, AND THE VIEWS OF OTHER STATES

Category	Factor assessed in 1999 Review	New South Wales	Victoria	Other States
Education	Vandalism and Security in Government Schools categories	Urbanisation disability only partly addressed. Urbanisation should cover truancy, student mobility, teacher mobility, violence in schools, migration costs	The costs of vandalism and security should be introduced into the VET category.	Queensland, Western Australia, South Australia, the ACT and the Northern Territory opposed using population size as a proxy for urbanisation costs. Suggested relationship with socio-economic indicators, social stress. Said factor should reflect actual costs.
Health Services	Indirectly in Inpatient Services (in SDC) Population and Preventive Health (HIV Aids and Drugs)		The assessment for Urbanisation in the various health categories should reflect the greater demand for and cost of providing health services in urban areas.	
Police	Indirectly in SDC factor	Assessment does not properly recognise the impact of the more opportunities for crime available in urban areas, impact of anonymity.	The cost weighting associated with the Sydney or Melbourne factor for policing services should be increased.	Western Australia submitted that crime was greater in areas with high population growth and poor service provision.
Administration of Justice	Partly in the economic environment factor for civil courts	Assessment does not properly recognise the impact of the more opportunities for crime available in urban areas, impact of anonymity.	The assessment for Urbanisation in Administration of Justice should reflect the additional demand generated for civil court services in urban areas.	
Corrective Services	A weight applied to high risk prisoners in New South Wales	Assessment does not properly recognise the impact of the more opportunities for crime available in urban areas, impact of anonymity, drugs.	An additional cost weighting should be applied to prisoner populations with illicit drug dependency. The additional cost weight applied to New South Wales for high-risk (secure) prisoners should also be applied to high-risk (secure) prisoners in Victoria.	

Category	Factor assessed in 1999 Review	New South Wales	Victoria	Other States
Public Safety	Indirectly (expenses on natural disasters, insurance claims and land valuation data)	Assessment should recognise the higher cost of natural disasters in Sydney because of the amount of damage that can be done in densely populated areas.	The assessment for Urbanisation in Emergency Services should be expanded to include expenditure on all forms of emergency response in urban areas and to recognise the increased risk	
Welfare	No	Factor should recognise impact of social segregation in Sydney on demand for welfare services because of increasing concentrations of people in need.		
Housing	Indirectly in User Charges assessment (market rent)	An urbanisation factor should recognise the higher costs incurred by State housing authorities in buying or renting houses for their tenants in congested cities. Higher demand also because Commonwealth rent assistance has far less purchasing power (higher property values).	Factor should recognise differences in rental payments in different regions and in different metropolitan regions	
Electricity and Gas	No	Diseconomies of large scale may influence the subsidies paid.		
Culture and Recreation	No		The economic environment factor should recognise that a larger capital city population results in greater attendance at cultural events and use of cultural facilities. This higher use should be recognised by discounting the economic environment factor or by incorporating an Urbanisation disability that recognises higher use by urban populations.	

Category	Factor assessed in 1999 Review	New South Wales	Victoria	Other States
National Parks and Wildlife	Yes		Urbanisation disability should be altered to recognise the size of the national park when deciding the radius within which the urban population has an impact on the conservation costs of national parks.	Queensland said that States should provide evidence of the additional per capita costs attributed to conservation resulting from populations contiguous to national parks. It suggested that an empirical model be used to calculate urbanisation factors and that the model should be consistent with the method for assessing dispersion factors, and weighted to reflect that proportion of costs identified by States for conservation where populations are adjacent to national parks. Tasmania said the factor should not be assessed because policy has a major impact on the location of national parks. The ACT wanted the factor retained and expanded.
Protection of the Environment (OGPS)	No		The assessment should reflect the cost disadvantage faced in managing and regulating environmental externalities such as pollution in urbanised areas.	
Urban Transit	Yes	The assessment should recognise the need for subsidies to encourage patronage to reduce pollution and the need to expand the road network, the high cost of expanding the network, the high cost of planning.	The BTCE paper approach to assessing congestion costs should be replaced with an alternative, and more recent, measure of relative congestion costs (e.g. the Australian and New Zealand Road System and Road Authorities' [Austroads] National Performance Indicators 2000 compares travel-time performance indicators).	

Category	Factor assessed in 1999 Review	New South Wales	Victoria	Other States
Roads	Yes	<p>The urbanisation factor should recognise the higher maintenance costs in congested urban areas because of work being undertaken outside weekday daylight hours.</p> <p>The allowance for the high cost of providing and operating traffic monitoring and response systems is inadequate.</p> <p>The factor should recognise the high cost of building new roads and expanding the network in populated areas, the high costs of tunnels and overpasses, the need for spare capacity to deal with breakdowns and other interruptions.</p>	<p>The Urbanisation disability in the arterial roads component should be extended to include extra maintenance costs associated with all arterial urban roads and not just those with traffic volumes in excess of 40 000 Average Annual Daily Traffic (AADT).</p> <p>The road safety component should be redeveloped to measure exposure to road accidents, taking the increased risk of incidents in urban areas into account.</p>	<p>Queensland and Western Australia argued that they experienced the same complexity in traffic control as New South Wales and Victoria.</p>
Depreciation and Debt Charges	Yes	<p>Higher cost of purchasing infrastructure and land not recognised adequately.</p>	<p>The cost weights should be adjusted to reflect initial increased costs, and subsequent higher depreciation costs, of providing specialised and extensive services from physical facilities</p>	<p>Queensland, Western Australia, South Australia, Tasmania and the Northern Territory argued that the weights were too high and not supported by empirical evidence. Tasmania argued that capital city status (rather than size) was often a factor in determining the services required.</p>
All categories	No		<p>A vandalism factor should be applied across all public service spending categories, in the same way as currently applied in the Government Primary and Secondary Education categories.</p>	

ATTACHMENT B

SUMMARY OF URBANISATION ARGUMENTS AND STAFF VIEWS BY CATEGORY

GOVERNMENT PRIMARY (Discussion Paper CGC 2002/28, *Schools Education*)

1999 Review Method

1. This category did not have an urbanisation factor in the 1999 Review, but it had a vandalism and security factor. While it was not called an urbanisation factor, it was directly related to urban population size. The factor was calculated by applying weights to centres of populations as shown below.

<u>Urban Areas of</u>	<u>Weight</u>
More than 2 000 000 persons	5
750 000 to 2 000 000 persons	3
100 000 to 749 999 persons	2
less than 100 000 persons and rural areas	1

State Arguments

2. New South Wales argued that urbanisation disability was only partially addressed through the recognition of vandalism and security costs. It referred to other issues that it believed should be included, such as truancy, student mobility, teacher mobility, violence in schools and migration. New South Wales provided data showing that costs associated with theft, fire and vandalism were higher in the west and south western parts of Sydney compared with other parts of the State. New South Wales did not propose an alternative method or suggest what the weights should be.

3. Victoria did not comment on this factor in relation to schools education, but implicitly appeared to support its continuation by proposing that the application of the schools factor be widened to cover Vocational Education and Training.

4. Queensland, Western Australia, South Australia, the ACT and the Northern Territory were opposed to using population size as a proxy for urbanisation costs. They argued that population size or density were not reflective of the costs faced by the States.

5. Queensland said that there has been little evidence provided to support the theory that the level of school vandalism was directly correlated to the size of urban centre. It presented Australian Institute of Criminology data to support this claim.

6. Queensland also said that, should the vandalism and security assessment remain unchanged in the 2004 Review, urban centres should be grouped by conurbations as was done in the Urban Transit expenditure assessment for the Gold Coast and Sunshine coasts.

7. Western Australia asserted that the vandalism and security factor was the most arbitrary in the school assessments and did not reflect reality, as vandalism was not closely related to urban centre size. Western Australia also said that it was not aware of any data which supported this assumption.

8. South Australia said that it believed that vandalism was not purely a function of density and size. It considered that more appropriate indicators of graffiti, vandalism and property attacks are socio-economic indicators of the surrounding population, such as youth unemployment.

9. Tasmania proposed that the vandalism factor be reviewed to take account of socio-economic factors that influence the level of vandalism and security costs, and also recognise that urban centre size was not an influence.

10. The ACT proposed that the current method be replaced by one that reflected the costs incurred by States. Alternatively, it said that if data are not available, the factor should either be abandoned or, if the present method is to be continued, the ACT's weighting should be increased to the highest weight of 5 in recognition of its high vandalism costs.

11. The Northern Territory also proposed that the urbanisation factor be based on actual expenditure. It said that the key driver of expenditure is social dislocation, not urbanisation. In the Territory, social dislocation and vandalism was higher in remote centres.

Preliminary Views

12. As indicated in the Schools Education discussion paper, work will be undertaken by Commission staff to test the feasibility of developing a factor that measures both the effects of population size and socio-economic characteristics. If socio-economic effects are found to be important, one assessment option would be to fold this element into the calculation of the socio-demographic composition factor. Irrespective of whether vandalism is treated as a separate factor or as part of a socio-demographic composition factor, it will be necessary to review the cost weights by location. To assist with this, States are requested to provide recurrent cost data on:

- (i) the proportion of schools expenditure associated with vandalism and security;
- (ii) a break down of the vandalism and security expenses; and
- (iii) a comparison, in cost per student terms, of metropolitan and non-metropolitan vandalism and security costs.

GOVERNMENT SECONDARY
(Discussion Paper CGC 2002/28, *Schools Education*)

13. Identical to Government Primary, except for the additional comment below.

14. The current socio-demographic composition factor for secondary education includes a weight to reflect the higher participation rates of post compulsory schooling in the larger urban areas. This issue is dealt with in the discussion on post compulsory enrolment section of the Schools Education discussion paper.

NON-GOVERNMENT PRIMARY AND SECONDARY
(Discussion Paper CGC 2002/28, *Schools Education*)

1999 Review Method

15. No urbanisation factor was assessed for these categories in the 1999 Review .

State Arguments

16. No States raised any issues relating to urbanisation in their submissions.

Preliminary Views

17. No urbanisation factor is proposed for these categories.

VOCATIONAL EDUCATION AND TRAINING
(Discussion Paper CGC 2002/40, *Vocational Education and Training*)

1999 Review Method

18. This category did not have an urbanisation factor in the 1999 review but did contain an element in the socio-demographic composition joint factor that recognised the difference in standard participation rates between urban centres of more than 5000 persons and those with 5000 or less, after taking account of differences in age participation.

State Arguments

19. No State made any comment on this aspect of the socio-demographic composition factor, but Victoria argued that a vandalism and security factor should be introduced for Vocational Education and Training (VET) as it claimed the costs to TAFE

institutions were not dissimilar to those of schools. Although the present vandalism and security factor for the government school categories is not called an urbanisation factor, it is directly related to urban population size.

Preliminary Views

20. In the 1999 Review, the difference in participation rates attributed to urban centre size was small. Unless updated data show a greater disparity, the view of staff is that this element be abandoned.

21. As to whether a vandalism and security factor should be introduced, this was discussed in the VET discussion paper in the following terms.

If a vandalism and security factor is to be introduced for VET, it would be necessary for States to show that both the proportion of expenditure and the higher unit costs¹⁰ in major urban areas are significant. It would be helpful if comparisons could be made between VET and government schools on the proportions of budgets spent on vandalism and security.

22. Unless convincing data are forthcoming, the preliminary view of staff is not to recommend the introduction of a vandalism and security factor. This is because schools are unattended for much longer periods than TAFE colleges and therefore appear to be more vulnerable.

INPATIENT SERVICES **(Discussion Paper CGC 2002/29, *Inpatient Services*)**

1999 Review Method

23. In the 1999 Review, the Hospitals assessment included a regional adjustment in the socio-demographic composition and hospitals costs factors. This adjustment was based on the Remote, Rural and Metropolitan Areas (RRMA) classifications. The introduction of a regional classification allowed for the differential cost and demand for inpatient services to be assessed for different State regions.

24. ***Socio-demographic composition factor.*** The costs and demand for inpatient services are affected by socio-demographic composition influences, including the location of the population.

25. The socio-demographic composition factor calculated the demand and cost influences of these socio-demographic groups for each State region. The data used in the calculation were derived from the National Hospital Morbidity dataset and the Census of

¹⁰ For example, cost per student hour.

Population and Housing. The national average DRG cost weights were derived from the Department of Health and Ageing.

26. Only actual data were used in the factor calculation, no weights determined by judgement were applied.

27. ***Hospital costs factor.*** In addition to socio-demographic composition, the costs of providing inpatient services are also affected by influences such as:

- (i) the location of hospitals away from capital cities,
- (ii) cost differences related to the small size of hospitals; and
- (iii) cost differences related to training, research and case complexity, mainly associated with tertiary hospitals in major urban areas.

28. The hospital costs factor assessed cost disabilities relating to these influences. The factor calculated the differential costs of providing inpatient services in each of the RRMA regions, other than those captured by the socio-demographic composition factor. National public hospital establishment data and national hospital morbidity data were used in the factor calculation.

29. Again, only actual data were used in the factor calculation, no weights determined by judgement were applied.

State Arguments

30. There were no issues raised which specifically related to how we assess costs or demand in different State regions.

Preliminary Views

31. Commission staff propose to continue the current socio-demographic composition and hospital costs factor assessments. It should be noted that the Commission proposes to introduce the ARIA+ classifications for defining region in the 2004 Review.

NURSING HOMES, MENTAL HEALTH AND COMMUNITY HEALTH SERVICES

**(Discussion Papers CGC 2002/29, *Inpatient Services*
CGC 2002/30, *Non-Inpatient and Community Health Services*)**

1999 Review Method

32. No urbanisation factor was assessed for these categories in the 1999 Review.

State Arguments

33. No States raised any issues relating to urbanisation in their submissions.

Preliminary Views

34. The Nursing Homes category no longer exists – nursing homes expenditure will be included in the Aged and Disabled Welfare category. The Mental Health category no longer exists – mental expenditure will be divided between the Inpatient Services, and Non-Inpatient and Community Health Services, categories. No urbanisation factor is proposed for the latter category.

**POPULATION AND PREVENTIVE HEALTH (PUBLIC HEALTH)
(Discussion Paper CGC 2002/31, *Population and Preventive Health*)**

1999 Review Method

35. In the 1999 Review assessment, no urbanisation factor was assessed.

State Arguments

36. Victoria noted that parasitic diseases and diseases such as Hepatitis B and Tuberculosis affect the migrant population more frequently than others. It also claimed that the risks of and costs associated with highly contagious diseases are significantly greater in urban areas in terms of identifying problems and managing solutions. As Sydney and Melbourne are the major ports of entry for migrant populations, these urban areas are at greatest public health risks and have additional demand for preventive expenditure on potential public health risks. As such, Victoria argued that an urbanisation factor should be included to account for the significantly greater public health risks.

Preliminary Views

37. In the Population and Preventive Health category, we are trying to develop a socio-demographic composition factor based on a broad measure of health status. It would take into account all population characteristics targeted by public health programs.

38. We have asked for more information on how recently arrived migrants impact on the cost of providing public health services, beside those already accounted for in the low English fluency assessment. It may be that the use of a health status measure will account for these disabilities.

39. If there are material urbanisation effects over and above those already accounted for in the assessment, we will try to develop a measure that will capture the effects of urban threats to public health.

POLICE **(Discussion Paper CGC 2002/36, *Law and Order*)**

1999 Review Method

40. The socio-demographic composition factor is the main driver of this assessment. An econometric model based on data at police district level was estimated to measure potential influences on crime and/or police expenditure. The model was specified:

- (i) to link expenditure and crime rates to socio-demographic composition variables; and
- (ii) to estimate implicit weights for different socio-demographic composition influences. The model suggested a weight of 3.5 for Indigenous persons and a weight of 2.5 for young males aged 17 to 25 (reflecting a propensity to commit crimes), and a weight of 1.1 due to the cost impact of urbanisation in Melbourne and Sydney.

State Arguments

41. New South Wales argued for an 'urbanisation' cost weight of 5 for residents of CBDs and 1.2 for those in urban areas with a population greater than 100 000.

42. New South Wales and Victoria submitted that investigation of crime in urban areas is more resource intensive because less information is generally available from witnesses. Instead, investigations rely more on the costly gathering, analysis and identification of physical evidence.

43. Victoria argued that the urbanisation weight applied to Sydney's and Melbourne's population be raised from 1.1 to at least 1.5. In support, it referred to the

potential impact of terrorism and the need to have ‘Asian’ Squads’ in Sydney and Melbourne.

44. Western Australia argued that it incurs extra traffic control costs in Perth (approximately \$1.7 million per annum) as a result of its new Traffic Operations Centre, set up to co-ordinate and control increasing urban traffic volumes and congestion in Perth.

Issues and Options for Assessment

45. The model clearly established the higher propensity of young males aged 17 to 25 to commit crimes, and the influence of urbanisation on costs.

46. The New South Wales’ proposal for an additional urbanisation weight to be applied to urban areas of size greater than 100 000 is somewhat problematic. The composition of the populations of urban centres across Australia which would be captured by this proposal, are not similar to those of Melbourne and Sydney. As a result, the suggested weight of 1.2 would not be aimed at the same concept of disability as the current weight of 1.1 applied to Sydney and Melbourne. In fact, many Australian studies have found no evidence of urbanisation effects on crime rates. For example, in Bell Planning Associates, *Crime, Safety and Urban Form*¹¹, no urbanisation influence was found when the narrowest interpretation of urban form as ‘built form’ was adopted; and in C Devery, *Disadvantage and Crime in NSW*, crime rates were linked to socio-economic status in urban areas, and not to urbanisation *per se*.

47. On Victoria’s proposal to raise the urbanisation weight to 1.5 for Sydney and Melbourne’s residents to account for the potential threat of terrorism and the need for special police squads dedicated to policing people of Asian background, we note that the risks and measures of ‘standard’ levels of State response to potential terrorism are currently unknown. The response to Asian gangs is at least indirectly included in the current weight for urbanisation. On balance, we are not inclined to pursue this argument.

Some additional information

48. The Australian Institute of Criminology paper, *Regional Development and Crime*, July 2000, reported that official crime statistics show that violent and property offences have increased at faster rates in major urban centres. In addition, high concentrations of young males are associated with higher crime rates. The report found that densely populated areas usually have higher crime rates than sparsely populated areas — increased social transactions derived from wider community networks guard against the incidence of crime. However, residential mobility may reduce communities’ ability to develop informal and formal social control mechanisms, which may lead to an increase in crime.

49. Similarly, while CBDs are possibly more prone to crime because of the floating population and large number of retail establishments, the New South Wales’

¹¹ Urban Futures Journal No. 21, 1996.

suggested weight of 5 for the residents of CBDs would have a minor effect because of the relatively small number of residents in CBDs.

50. On the argument that investigation of crime is more resource intensive in urban areas, because less information is generally available from witnesses in such areas, we need more information. The current urbanisation weight of 1.1 for Sydney and Melbourne residents is a cost-side affect and arguably captures such influences. Without evidence, we propose not to investigate this issue further.

ADMINISTRATION OF JUSTICE **(Discussion Paper CGC 2002/36, *Law and Order*)**

1999 Review Method

51. In the 1999 Review, no urbanisation factor was assessed. However, the assessment allowed for the higher costs per case of civil court cases brought in higher courts by different types of entities, including individuals, and small and large businesses. At least in part, this allowance captures the effects of urbanisation.

State Arguments

52. Victoria argued that the assessment for Urbanisation should reflect the additional demand generated for civil court services in urban areas because there is greater demand for and complexity involved in conducting criminal and civil court proceedings in urban areas.

Preliminary Views

53. No urbanisation factor per se is proposed.

CORRECTIVE SERVICES **(Discussion Paper CGC 2002/36, *Law and Order*)**

1999 Review Method

54. In the 1999 Review, no urbanisation factor was assessed. However, an additional cost weight was applied to New South Wales for high-risk (secure) prisoners.

State Arguments

55. Victoria argued that, due to their size and position as ports of entry, Melbourne and Sydney experience significant problems with illicit drug use, as is evident in these cities' prison populations. Prisoners with an illicit drug problem are increasing as a proportion of the total prison population in Victoria, primarily due to the high levels of recidivism amongst dependent offenders.

56. Similar to Sydney, Melbourne incurs higher demand for and costs of providing corrective services for high-risk (secure) prisoners. The additional cost weight applied to New South Wales for high-risk (secure) prisoners should also be applied to high-risk (secure) prisoners in Victoria.

Preliminary Views

57. No urbanisation factor per se is proposed.

PUBLIC SAFETY **(Discussion Paper CGC 2002/41, *Public safety and emergency Services*)**

1999 Review Method

58. Disabilities related to urbanisation were not considered in 1999 Review. However, the greater need for expenditure in urban areas was captured in the fire insurance claims and land values data used in the economic environment factor in the Fire Brigade component and in the actual expenditure data on natural disasters used in the physical environment factor in the Natural Disaster Prevention component.

State Arguments

59. In the context of the Fire Brigade component, Victoria argued that the assessment of fire brigades spending should be expanded to include the range of hazard and accident rescue responses that are provided. In addition, it argued that an urbanisation factor should be included in the assessment of fire brigade spending to reflect the additional need for fire and other hazard responses in large urban centres.

60. Victoria argued that the need for hazardous material incident prevention and suppression has been particularly great in urban area. Of the total turnouts attended by the Metropolitan Fire Brigade in 1997-98, only 30 per cent related to genuine fire incidents. The remainder were associated with traffic accident rescue, hazardous materials incidents and other non-fire emergency functions.

61. In the context of Natural Disaster Relief component, New South Wales argued that States with most densely populated urban areas would incur the most damage

and require the most assistance from Public Safety and Emergency Services agencies, and Welfare agencies. It referred to the Sydney hailstorms of 1999 as an example.

Preliminary Views

62. A component called 'Other Emergency Prevention and Response' instead of the 'Fire Brigade' component has been proposed to better account for States' functions in this category. A risk factor has been proposed to account for:

- (i) costs of property loss from structure fires;
- (ii) costs of road accidents; and
- (iii) costs of industrial or other incidents.

63. A capacity factor has been proposed to account for the differences in cost of providing other (not natural disaster) emergency prevention and responses between locations (urban, rural and remote). If the required cost data are not available, the capacity factor may be assessed by dispersion, urbanisation and input costs disabilities using general methods.

64. Staff have proposed not to pursue the New South Wales argument because any disabilities due to population concentration should be reflected in the natural disaster relief expenditure used in the assessment.

WELFARE CATEGORIES

**(Discussion Papers CGC 2002/32, *Welfare Part 1 Aged and Disabled Welfare*;
CGC 2002/45, *Welfare Part 2 Family and Child Services*;
CGC 2002/46, *Welfare Part 3 Homeless and General Welfare*)**

1999 Review Method.

65. No urbanisation factor was assessed for these categories in the 1999 Review.

State Arguments

66. New South Wales argued that the impact of high land prices and social segregation in Sydney had an impact on the demand for welfare services because of the concentrations of people in need.

Preliminary Views

67. No urbanisation factor has been proposed but a better understanding of the argument New South Wales is making and of how demand is affected is sought.

HOUSING (Discussion Paper CGC 2002/33, *Housing*)

1999 Review Method

68. The impact of urbanisation was implicitly taken into account by including market rents in the Tenant Income factor calculation in the User Charges element.

State Arguments

69. New South Wales said that the Commission's current assessments did not take account of the higher costs faced by government housing authorities in congested cities. It argued that congested cities typically have higher property prices than elsewhere. This made it more expensive for State housing authorities to buy or rent housing for their tenants. New South Wales also said that another impact of higher property prices was that Commonwealth rent assistance had less purchasing power. This resulted in people having to spend more of their income on housing, making them more vulnerable to other social problems.

70. Victoria proposed that the Commission consider applying a disability weight for differences in housing costs (that is rental payments) in metropolitan areas. It provided the following comparison of rental costs.

Table B4 COMPARISON OF WEEKLY RENTAL COSTS

	Sydney	Melb	Bris	Perth	Adel	Hob	Canb	Darwin	Aust
	\$	\$	\$	\$	\$	\$	\$	\$	\$
Rents	140	134	117	118	129	120	129	123	133
Ranking	1	2	7	8	3	6	4	5	

Source: ABS CPI report Dec. Qtr. 2001

71. Victoria said that housing costs were typically higher in capital cities due to higher dwelling values. It also claimed that living in a highly urbanised environment imposed higher costs, as the higher levels of vandalism, crime, congestion and pollution resulted in higher levels of maintenance for public housing.

Preliminary Views

72. The impacts of urbanisation, including its impact on property prices and household incomes, will be considered when developing a new method of assessment for housing.

ELECTRICITY AND GAS
(Discussion Paper CGC 2002/35, *Concessions and Community Service Obligations*)

1999 Review Method.

73. No urbanisation factor was assessed in the 1999 Review.

State Arguments

74. New South Wales argued that diseconomies of large scale may influence the subsidies paid.

Preliminary Views

75. No subsidies paid in large urban areas — no factor.

WATER, SANITATION AND PROTECTION OF THE ENVIRONMENT
(Discussion Paper CGC 2002/35, *Concessions and Community Service Obligations*)

1999 Review Method

76. No urbanisation factor was assessed in the 1999 Review.

State Arguments

77. While urbanisation was not specifically raised, South Australia indicated that where urban areas encroached on water supply catchment areas, sewerage disposal costs increased.

Preliminary Views

78. No urbanisation factor is proposed.

FREIGHT
(Discussion Paper CGC 2002/35, *Concessions and Community Service Obligations*)

1999 Review Method

79. No urbanisation factor was assessed in the 1999 Review .

State Arguments

80. No States raised any issues relating to urbanisation in their submissions. However, New South Wales noted during its workplace discussions that it subsidised rail infrastructure and provided roads which were important in transporting freight through metropolitan Sydney to the Port.

Preliminary Views

81. No urbanisation factor is proposed.

**NON-URBAN PASSENGER TRANSPORT, OTHER TRADING ENTERPRISES
AND OTHER CONCESSIONS**
(Discussion Paper CGC 2002/35, *Concessions and Community Service Obligations*)

1999 Review Method

82. No urbanisation factors were assessed in the 1999 Review.

State Arguments

83. No States raised any issues relating to urbanisation.

Preliminary Views

84. No urbanisation factor is proposed.

NATIONAL PARKS AND WILDLIFE SERVICES
(Discussion Paper CGC 2002/42, *National Parks and Wildlife Services*)

1999 Review Method

85. In the 1999 Review and subsequent updates, the Commission assessed an urbanisation factor in the Conservation component based on the relative size of urban centres contiguous to national parks in each State. The factor was included to measure the relative costs State might experience because of the pressure of population on conservation in their Parks. It was not meant to indicate any measure of absolute use of parks by the people living close to them. Contiguous populations were measured using the total population less than 10 kilometres from a park, and half the population 10-15 kilometres from a National Park.

State Arguments

86. Victoria argued that the urbanisation disability should be abolished. Alternatively, it argued that the size of national parks should be considered when determining the radius of influence, rather than applying a set kilometre radius to all national parks.

87. Queensland supported the Commission's judgement that States should provide evidence of the additional per capita costs attributed to conservation resulting from populations contiguous to national parks.

88. Queensland suggested that an empirical model be used to calculate urbanisation factors and that the model should be consistent with the method for assessing dispersion factors, and weighted to reflect that proportion of costs identified by States for conservation where populations are adjacent to national parks.

89. Tasmania expressed concerns that the urbanisation factor could be significantly influenced by State policy and said it should be removed.

90. The ACT argued that as part of the urbanisation calculations based on populations contiguous to national parks, the assessment should:

- (i) reflect the adoption of the IUCN National Parks definition;
- (ii) include all National Capital Open Space Scheme (NCOSS) land in the basis of the urbanisation factor calculations; and
- (iii) retain the current urbanisation model.

Preliminary Views

91. Commission staff accept that there is a strong conceptual argument that additional unavoidable conservation costs are incurred by States when parks are located in urban areas. Such costs seem to relate to the density of the urban population living close to and around the parks — hence the present approach. At this stage, staff are not inclined to recommend to the Commission that the urbanisation factor be discontinued but would like some clearer evidence of the relationships between conservation costs and proximity of population.

92. If the present method continues to be used, the IUCN definition of National Parks (Category II) will be applied. On South Australia's argument, the use of gazetted / legislated national parks will not necessarily produce a more consistent database than the use of the IUCN framework.

93. There seems no reason to include NCOSS land data in the calculation of contiguous population. The NCOSS lands are not classified as an IUCN II national park and do not have biodiversity conservation as a primary management objective.

SERVICES TO INDIGENOUS COMMUNITIES **(Discussion Paper CGC 2002/37, *Aboriginal Community Services*)**

1999 Review Method.

94. No urbanisation factor was assessed for this category in the 1999 Review.

State Arguments

95. No States raised any issues relating to urbanisation in their submissions.

Preliminary Views

96. No urbanisation factor will be assessed.

SUPERANNUATION
(Discussion Paper CGC 2002/39, *Superannuation*)

1999 Review Method

97. No specific urbanisation factor was assessed in the 1999 Review. However, to the extent urbanisation was considered to increase the need for government employees, such factors were included in the expenditure relativities factors.

State Arguments

98. No States raised any issues relating to urbanisation in their submissions.

Preliminary Views

99. No specific urbanisation factor is proposed.

**OTHER GENERAL PUBLIC SERVICES (INCLUDING PARTS OF
REGULATORY AND OTHER SERVICES)**

1999 Review

100. No urbanisation factor was assessed in the 1999 Review.

State Arguments

101. Victoria argued that an urbanisation disability factor should be included in the assessment of Other General Public Services to reflect the costs associated with the regulation of environmental externalities that arise with large urban population. It argued that urban growth generates more waste and pollution, which in turn reduces the productivity of agriculture and industrial enterprises, causes various health problems and reduces the access to natural sites for recreation — this imposes significant management costs on the States.

Preliminary Views

102. The case for an urbanisation factor will be considered.

SERVICES TO INDUSTRY
(Discussion Paper CGC 2002/38, *Services to Industry*)

1999 Review Method

103. No urbanisation factors were assessed in the 1999 Review .

State Arguments

104. No States raised any issues relating to urbanisation in their submissions.

Preliminary Views

105. No urbanisation factor will be assessed.

ROADS
(Discussion Paper CGC 2002/34, *Roads*)

1999 Review Method

106. In the Roads assessment, the *Arterial Roads* expenditure component had an urbanisation factor. It aimed to measure the disabilities related to the higher cost of maintaining arterial roads in densely populated areas due to high traffic levels and environmental circumstances, the need to work at night and the cost of providing detours and costs associated with specialised materials. The assessment was for an additional annual maintenance costs of \$700 per lane-kilometre on highly trafficked (in excess of 40 000 ADT) urban arterial roads.

107. The Other Transport component of the Roads assessment also provided an allowance for the extra costs incurred in Sydney and Melbourne arising from the need to provide and maintain complex traffic control system. The Commission decided that a factor of 1.02000 would be assessed for New South Wales and Victoria, with all other States equal to 1.00000.

State Arguments

108. Victoria stated that substantial additional costs were incurred in urban areas. It suggested that the urbanisation factor should be increased by at least 60 per cent to take account of extra costs of maintaining roads in urban areas, regardless of traffic flow.

109. New South Wales believed that urbanisation could be measured using the number of traffic control devices per lane kilometre. It also argued that a factor for

congestion should be developed because there are diseconomies of large scale for providing services for larger urban centres.

110. New South Wales, Victoria, Queensland and Western Australia noted that traffic control systems were increasingly more complex and expensive to operate

Preliminary Views

111. The idea that urbanisation effects, other than the volume of traffic, increase annual maintenance costs appears, prima facie, to be reasonable. However, at this stage, the examples supporting urbanisation related disabilities are limited to:

- (i) higher costs associated with doing maintenance work at night or during weekends; and
- (ii) the higher cost of transporting raw materials from sources of supply.

112. These suggest that the overall urbanisation disability may be small.

113. It may be possible to use congestion data as an indicator of urbanisation. For example, there would be a positive correlation between the level of congestion and the need to carry out maintenance at night and on the weekend.

114. At this stage Commission staff do not believe that there is enough evidence to support the retention of the urbanisation factor relating to the maintenance costs of arterial roads, or that its measurement would be robust. Unless more evidence can be presented, Commission staff are inclined to recommend that the factor be discontinued.

115. 'Stop start' traffic movements may add to maintenance costs by accelerating surface deterioration, however, it is not clear how important this factor is in relation to others. Commission staff do not propose to pursue congestion issue further.

116. In relation to traffic control systems, two main issues arise. The first is whether the 2 per cent of roads expenditure allowance made for New South Wales and Victoria reflects the size of the entire task in those States, and the second concerns whether some allowance should also be made for the medium sized capitals.

117. Staff have sought information on how much States are spending on Traffic Control Centres. Once such information is received, the current assessment will be reviewed.

URBAN TRANSIT
(Discussion Paper CGC 2002/27, *Urban Transit*)

1999 Review Method

118. In the 1999 Review, the Urban Transit assessment related to costs in urban centres with a population of 50 000 and more. It used modelled city-specific propensities to use urban transit in calculating the demand factor. City-specific propensities to use public transport, as shown in Table B2, are an estimate of the relative average propensity of residents of each city to use public transport. According to this, higher densities and larger employment bases lead to higher propensities to use public transport. Higher propensities increase demand while decreasing unit cost and increasing revenue.

Table B5 CITY SPECIFIC PROPENSITIES TO USE PUBLIC TRANSPORT

Passenger Type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Regular	6.74	4.13	2.00	1.68	2.29	1.26	1.73	1.00
Concession	2.46	1.95	1.56	1.27	1.34	1.09	1.29	1.00
Student	2.10	1.74	1.5	1.22	1.23	1.06	1.23	1.00

State Arguments

119. Although all States agree that urbanisation has an impact on urban transit operations and government subsidy levels, most of them objected to the way it was measured, including in the city-specific propensities.

Preliminary Views

120. In the proposed assessment, the impact of urbanisation is recognised in two ways. A pricing subsidy factor recognises that increasing density of highly urbanised areas reduces the need for subsidies in those areas because of increasing revenue raising capacity. A capital subsidies factor recognises that governments need to subsidise the complex infrastructure requirements of densely populated urban areas.

DEBT CHARGES
(Discussion Paper CGC 2002/26, *Debt Charges*)

1999 Review Method

121. In the 1999 Review assessment, the urbanisation effects were captured through the use of the capital stock factors derived from the Depreciation assessment to generate quantity of borrowing needs.

State Arguments

122. Some States noted a higher need for borrowing due to more expensive urban infrastructure and land costs.

Preliminary Views

123. It is acknowledged that the higher costs of land and infrastructure in urban areas are relevant to State borrowing needs. It has been proposed that the impact of the need for infrastructure continue to be recognised using relevant factors derived from at least the Depreciation assessment. Relevant disabilities relating to land costs have yet to be devised.

DEPRECIATION
(Discussion Paper CGC 2002/55, *Depreciation*)

1999 Review Method

124. The 1999 Review assessment included an urbanisation factor in each of the components (building, other construction, plant and equipment, urban transit construction, and urban transit plant and equipment). Urbanisation factors (as part of population concentration factors) were aimed at measuring disabilities related to the demand for stock.

125. Other than for the urban transit expenditure components (construction, and plant and equipment), urbanisation factors were estimated based on population band weights for expenditure categories and relative shares of urban and non-urban populations in statistical districts (SD).

State Arguments

126. The urbanisation component of the population concentration assessment has been criticised for not being well supported by evidence.

127. No State explicitly supported the weights used in the present assessment. New South Wales and Victoria argued that they were too low for large urban centres, while Queensland, Western Australia, South Australia, Tasmania and the Northern Territory said that they were too high. Tasmania also argued that capital city status (rather than size) was often a factor in determining the services required. The ACT did not express a view.

Preliminary Views

128. In the Discussion Paper, it is noted that an urbanisation assessment is likely to be warranted for hospitals, and law and order. The view is expressed that data are needed to measure these needs. It is noted that urbanisation depreciation needs relating to roads, urban transit and housing would be assessed where appropriate.