

## CHAPTER 21

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# INFRASTRUCTURE — INVESTMENT AND DEPRECIATION

- 1 As explained in Chapters 3 and 5 of Volume 1, the Commission has decided to undertake assessments of depreciation and investment to recognise State infrastructure needs in the year they occur. Depreciation and investment are transactions relating to the use, ownership and acquisition of infrastructure. This chapter provides more background in relation to the assessments, including State arguments and how the assessments have been undertaken.

### WHAT IS INCLUDED IN THE INFRASTRUCTURE ASSESSMENTS?

- 2 Infrastructure refers to the stock of physical assets owned by the State general government sector. It includes buildings, plant and equipment and other constructed assets (such as roads). In a year, States use the infrastructure they own in providing services and acquire new infrastructure. Depreciation is a measure of the value of infrastructure ‘used’ in a year which must be replaced. Investment refers to the acquisition of new infrastructure. Depreciation and investment in a year sum approximately to total capital expenditure or ‘gross fixed capital formation’<sup>1</sup>.
- 3 State depreciation expenses and investment for 2008-09 are shown in Table 21-1 and Table 21-2 respectively. Depreciation expenses varied between 6.8 per cent of total State operating expenses in Queensland and 3.9 per cent in Victoria. Investment expenditure varied between 10.7 per cent of total State outlays in Queensland and 0.4 per cent in Tasmania.

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<sup>1</sup> Investment is equivalent to ‘net acquisition of non-financial assets’ that appears in the Government Finance Statistics (GFS) operating statement. It is defined as gross fixed capital formation (GFCF) less depreciation plus changes in inventories plus other transactions in non-financial assets. GFCF covers expenditure on non-financial produced assets including assets donated and assets acquired under finance lease.

**Table 21-1 Depreciation category expenses, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Category expense (\$m)	2 614.5	1 515.8	2 496.2	763.7	547.0	229.4	213.1	192.4	8 571.9
Category (\$pc)	371.30	282.54	573.91	346.50	339.33	458.46	612.52	867.79	396.09
Proportion of State operating expense (%)	5.2	3.9	6.8	4.0	4.0	5.3	6.1	4.8	5.0

Source: Commission calculation.

**Table 21-2 Investment category expenses, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Category expense (\$m)	2 379.0	1 435.6	4 433.0	1 305.0	707.0	16.0	86.0	209.0	10 570.6
Total (\$pc)	337.86	267.60	1 019.19	592.09	438.59	31.98	247.24	942.79	488.44
Proportion of total State expenditure (%)	4.5	3.5	10.7	6.4	5.0	0.4	2.4	5.0	5.8

Note: Investment is expressed as a proportion of total State outlays which is equal to total State operating expenses plus investment.

Source: Commission calculation.

- 4 Depreciation expenses as a proportion of total State operating expenses and investment as a proportion of total State outlays are shown in Table 21-3 and Table 21-4 respectively. Table 21-3 shows that on average depreciation expenses grew slightly from 4.9 per cent of total State expenses in 2005-06 to 5.0 per cent in 2008-09. Table 21-4 shows that on average investment expenditure grew significantly from 3.3 per cent of total outlays in 2005-06 to 5.8 per cent in 2008-09.

**Table 21-3 Depreciation, as a proportion of total State expenses, 2005-06 to 2008-09**

	2005-06	2006-07	2007-08	2008-09
Total for category (\$m)	6 619.0	7 229.0	7 563.0	8 571.9
Total operating expenses (\$m)	134 969.0	146 359.0	157 538.0	171 074.5
Proportion of total operating expenses (%)	4.9	4.9	4.8	5.0

Source: Commission calculation.

**Table 21-4 Investment, as a proportion of total State expenditure, 2005-06 to 2008-09**

	2005-06	2006-07	2007-08	2008-09
Total for category (\$m)	4 566.0	6 535.0	8 306.0	10 570.6
Total expenditure (\$m)	139 535.0	152 894.0	165 844.0	181 645.1
Proportion of total State expenditure (%)	3.3	4.3	5.0	5.8

Note: Investment is expressed as a proportion of total State expenditure. Total State expenditure is equal to total State operating expenses plus investment.

Source: Commission calculation.

- 5 Table 21-5 shows the stock of State infrastructure in 2008-09. It suggests that depreciation represented about 3 per cent of total stock in 2008-09 and investment represented about 4 per cent.

**Table 21-5 Stock of State infrastructure, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Dollars million	85 005	46 771	78 296	29 760	15 094	8 437	9 079	4 360	276 802
Dollars per capita	12 072.19	8 718.15	18 001.08	13 502.48	9 363.51	16 864.62	26 100.86	19 666.53	12 790.30

Source: Commission calculation.

### The average service delivery policy

- 6 All States own infrastructure to allow them to deliver services. States also lease or rent infrastructure and these costs are incorporated and assessed within State expense categories.
- 7 One of the key challenges facing governments today is meeting the needs of rapidly growing populations for government services, including the provision of social and economic infrastructure to support service delivery. State budget papers and infrastructure strategies have clearly identified population growth and changes in State circumstances as a major driver of new infrastructure.
- 8 During the review States demonstrated that population growth has placed pressure on road networks, transport systems and water and power infrastructure and created the need for new schools, hospitals, police stations and prisons. Queensland noted its population grew by 22.5 per cent between 1996 and 2006 compared with 10.0 per cent in New South Wales and 12.6 per cent in Victoria. It experienced some 35 per cent of the national growth between 2001 and 2005. As a result, its need for new infrastructure is substantial.
- 9 States can finance the acquisition of new infrastructure in several ways. They can use their revenue in excess of what they need to deliver services, sell existing assets or they can borrow. Over the period on which this review is based, the average State policy has been to use revenue from all sources, including the GST, to deliver services, replace infrastructure used up in service delivery and invest in new infrastructure. In the three years to 2008-09, of the \$25.4 billion States spent on investment, \$11.4 billion was financed through their recurrent revenue including GST revenue. In 2006-07, States financed all their investment this way and, in 2007-08, nearly half. In 2008-09, when the global financial crisis impacted on State revenue, States financed all their investment through borrowing. However, it is average State policy to fund new investment from surpluses on recurrent budgets in the long run. As economic circumstances change, States are expected to return to the situation observed throughout most of the last 10 to 15 years in which States used surpluses on their recurrent budgets to invest in infrastructure.

### Role of the Commonwealth in assisting States in providing infrastructure

- 10 The Commonwealth makes payments to the States for infrastructure purposes. The main payments are for infrastructure associated with schools, post-secondary education, health,

roads, public transport and housing. These payments and their treatment are shown in Table 21-6.

- 11 Most of the payments listed in Table 21-6 are available to States to undertake infrastructure spending associated with services for which States are responsible. We have decided that they should impact on our recommended relativities.
- 12 We have identified a number of payments that do not affect State fiscal capacities.
  - Payments made to New South Wales and the ACT for the Kings Highway upgrade.
  - Payments made to Western Australia for environmental health measures, teacher training facilities and aged care facilities that are part of the East Kimberley development package.
  - Payments made to States to fund major improvements to National network roads have been assessed so that 50 per cent of them are distributed in a way consistent with the Department of Infrastructure, Transport, Regional Development and Local Government assessment of State requirements. These payments are made through the Nation building program NPP and the Nation building plan for the future NPP.
- 13 Details of the treatment accorded Commonwealth payments and the reasons for them are in the Adjusted budget chapter.

**Table 21-6 Treatment of Commonwealth payments — investment in infrastructure**

Payments affecting relativities	Payments not affecting relativities (a)
National Partnership payments:	National Partnership payments to States:
Digital education revolution (Government)	Kings Highway upgrade
Building the education revolution (Government)	East Kimberley development package (part)
National solar schools plan	Nation building program (formerly Auslink) - 50 per cent of the payment for National Network road construction will not affect relativities.
Trade training centres in schools (Government)	Nation building plan for the future (Building Australia Fund). 50 per cent of the payments for National network road construction will not affect relativities.
Health and hospital fund	Terminated payment:
Health infrastructure	Relocation of Amberley State school
East Kimberley development package (excluding payments for environmental health measures, teacher training facilities and aged care facilities)	
Nation building program (formerly Auslink) for rail, road maintenance and non-national network road construction. 50 per cent of the payment for National Network road construction will affect relativities.	
Nation building plan for the future (Building Australia Fund). 50 per cent of the payments for National network road construction will affect relativities.	
Nation building and jobs plan — Social housing (invest in)	

- (a) There are a number of payments to third parties for infrastructure projects that are made through the States, these payments are shown in the relevant expense categories. Programs that have been replaced by other programs included in this table are treated in the same way. There are a number of payments that are for recurrent and infrastructure purposes. In most instances, these payments are listed in the relevant expense categories.

Source: Commonwealth of Australia *Budget Paper No. 3, 2009-10*.

## **BROAD ASSESSMENT APPROACH**

### **Overview**

- 14 The Commission has sought to develop infrastructure assessments that reflect average State policy for acquiring, using and funding investment in infrastructure, appropriately recognise the disabilities that influence the quantity and unit cost of infrastructure, and are simple to implement.
- 15 In the 2004 Review, the Commission used a debt charges assessment to recognise the financial implications of State requirements for new infrastructure and a depreciation assessment to recognise the financial consequences of existing infrastructure. States were assessed to need to borrow different amounts and at different rates to finance their assessed infrastructure and hence had different per capita debt charges. When average State policy changed and States became net lenders, the assessment method was not able to assess relevant debt charges expenses, and on the advice of Heads of Treasuries in the 2005 Update, an equal per capita (EPC) assessment was introduced. In three further updates since then, differential needs for new infrastructure have not affected the GST distribution.
- 16 The Commission considers that the infrastructure assessments should be simpler than the 2004 Review debt charges assessment. The Heads of Treasuries supported this view at a meeting in November 2007. A clear majority agreed that:
  - it was not desirable to pursue the redevelopment of the debt charges assessment because of its complexity and problems with obtaining a meaningful category average;
  - a more direct assessment of capital needs was desirable; and
  - an assessment of State infrastructure needs relating to service provision was required (although the method to be used or the disabilities to be assessed were not agreed).
- 17 The assessment approach, as in the 2004 Review, involves two steps:
  - assessing the stock of infrastructure a State needs to deliver the average per capita services in its circumstances; and
  - assessing fiscal capacity in a way that recognises the financial consequences of giving each State the capacity to have its assessed level of infrastructure. We aim to provide States with the capacity to fund the annual depreciation of their infrastructure holdings and the investment in new infrastructure they require to maintain their assessed level of infrastructure.

### **Assessing State infrastructure requirements**

- 18 In this review, the assessments of the stock of infrastructure required to provide the average level of service and of the depreciation on that infrastructure are largely the same as those in the 2004 Review and relatively uncontroversial. Most States agreed that infrastructure holdings are influenced by the same factors as other recurrent expenses, although not necessarily to the same extent.

- 19 Some States said other stock specific disabilities should be recognised, such as the impact of the physical environment, historical factors and urban development on infrastructure. However, other than for roads stock, no infrastructure specific disabilities have been assessed because there was either no conceptual case for recognising them, no reliable method of measuring them or they were not material. There is a more detailed discussion of the disabilities that have been applied to the stock of infrastructure later in this chapter.

#### **Recognising the financial consequences of existing infrastructure (depreciation)**

- 20 Depreciation is assessed as a proportion of a States' assessed stock of infrastructure. Most States agreed that the same disabilities should be applied to depreciation as to the stock of infrastructure because depreciation relates to the assessed level of infrastructure States require for service provision. Initially, we intended to allocate depreciation expenses to categories and assess them as part of the costs of delivering a service. However, applying the infrastructure stock disabilities to depreciation was more easily done by undertaking a separate assessment of depreciation expenses.

#### **Recognising the financial consequences of new infrastructure**

- 21 Extensive debate has occurred over when State needs relating to new infrastructure should be recognised — when the investment takes place or spread over time as the infrastructure is used.
- 22 The Commission considered alternative approaches in the light of the views of all parties. The two options considered were:
- the direct approach — recognising the financial consequences in the year new assessed infrastructure needs arise. This approach recognises the effects of differential population growth and differences between the States in the quantity of infrastructure required to provide services (called stock disabilities) and its cost.
  - the holding cost approach — recognising the financial consequences over the life of infrastructure. This approach is based on the implicit opportunity cost of the assessed level of infrastructure. It recognises differences between the States in the quantity of infrastructure required to provide services (called stock disabilities) and its cost. Appendix 21A provides more information on the main holding cost models proposed by the States during the review.

The Commission prefers the direct approach.

#### **State views**

- 23 Queensland, Western Australia and the Northern Territory supported the direct approach. They argued it was conceptually sound, better recognised the pressures States face in providing infrastructure to their growing populations, was more contemporaneous and transparent and the simplest way of assessing new infrastructure needs. Victoria provided qualified support, preferring the direct approach to others under consideration, but retaining concerns over its conceptual basis.

- 24 New South Wales, South Australia, Tasmania and the ACT disagreed. They raised a number of concerns about the conceptual basis of the direct approach, as well as problems with its implementation.
- 25 *Achieving equalisation.* New South Wales, South Australia, Tasmania and the ACT said that the Commission had not demonstrated that a better equalisation outcome is achieved by adopting an approach to equalisation that focuses on the acquisition of capital rather than the use or consumption of capital. New South Wales and South Australia argued that the Commission's objective should continue to be the equalisation of State net operating balances, including a measure of holding costs, and that if the net operating balance (NOB) is equalised, no further assessments are required. In their final submissions, Tasmania and the ACT did not explicitly endorse a holding cost approach but they supported an approach to the assessment of State infrastructure that focuses on when capital is used and not when it is acquired. They argued that this is consistent with what States do and accrual accounting practices.
- 26 We consider it appropriate for all States to have the same per capita capacity to hold the infrastructure they require to provide the average level of services. The Commission also considers it appropriate to assess State infrastructure needs upfront when State circumstances change and new assets are acquired. The direct approach achieves these objectives and, in our view, better reflects what States do. A holding cost approach, excluding an assessment of population dilution of net worth, does not.
- 27 *Requirements of terms of reference.* New South Wales said that the Commission has extended the definition of equalisation and in doing so had gone well beyond its terms of reference. It also said that the position the Commission adopted in relation to the equalisation of substantial proportion of net worth moved away from views expressed earlier in the review when the Commission explicitly stated that equalising net worth was not an appropriate objective for equalisation.
- 28 We do not accept that the direct approach extends the definition of equalisation. It is assessing the same needs recognised in the 2004 Review debt charges assessment using a simpler method and more reliable data. The 2004 Review debt charges assessment sought to recognise stock disabilities and population dilution needs. These are the same needs recognised in the 2010 Review infrastructure assessments. As such, the direct approach does not represent a change in the intent of equalisation.
- 29 The Commission acknowledges that the proposed assessments extend the scope of transactions that are assessed. Previous infrastructure assessments did not directly assess new capital expenditure. We consider that it is reasonable to extend the scope of transactions that are assessed because it simplifies the achievement of equalisation and ensures a uniform approach to the differential assessment of needs for services and the infrastructure required to provide them.
- 30 *Population growth as a driver.* Some States said that there is no need to recognise the impact of population growth because there is no evidence that population is a key driver of State

investment in infrastructure. In addition, they said the investment assessment does not reflect what States do; they do not adjust holdings of infrastructure on an annual basis in response to changes in population and other State circumstances.

- 31 We believe there is strong evidence that population growth is a major driver of State infrastructure spending, and States with rapid population growth must spend more to provide the average per capita stock of infrastructure required to deliver the average level of service.
- 32 While we acknowledge that investment is lumpy and does not necessarily respond annually to changes in State circumstances, we favour an assessment approach that will give States the capacity to fund investment in the year population growth occurs and other circumstances change. When and how States use this capacity to adjust their stock of infrastructure is a matter of their policy choice.
- 33 *Average stock of assets.* New South Wales said the investment assessment is built on the assumption that the average State needs the average stock of assets per capita to deliver services. It argued that this assumption is ‘questionable’ and the Commission had not provided evidence to demonstrate its validity. New South Wales presented the following arguments.
- The value of the depreciated stock of infrastructure is not necessarily related to the services provided from it. For example, a school that is 10 years old may deliver the same level of service as a new school. However, the depreciated value of the two schools will be different.
  - The public good characteristics of some assets, for example rural roads, means that an extra person does not require a proportionate increase in the road stock to provide the same level of service.
  - States can provide the same level of service using different mixes of labour, capital and other inputs.
- 34 We consider that a basic equalisation starting point is that States need comparable levels of infrastructure per capita to deliver comparable levels of service. We use the national average level of infrastructure to capture the average of what States do. That average stock of infrastructure is then adjusted to reflect States disabilities. We make the following observations in response to the issues raised by New South Wales.
- The investment assessment assumes that States need the national average stock of infrastructure with the national average asset life to deliver comparable services.
  - The Commission acknowledges that some State assets have public good characteristics, for example rural roads, which mean that an extra person does not require a proportionate increase in the road stock to provide the same level of service. As populations grow, the ratio of rural road stock to population falls and this is reflected in our assessment.

- States can provide the same level of service using different mixes of labour, capital and other inputs. By using national averages, our assessments are based on the assumption that States use the average mix of capital and other inputs in service delivery.
- 35 *Starting point.* New South Wales said that it cannot be assumed that starting the investment assessment at a particular point in time and ignoring history will equalise States' positions over the next few years.
- 36 The Commission has assessed State infrastructure needs through a debt charges assessment since 1993. This means that past Commissions have recognised that States have differential needs for infrastructure and developed assessments to reflect this. Therefore, policy differences aside, States' current stock of infrastructure has been equalised.
- 37 *Revaluations.* Some States said that revaluations have a major influence on State balance sheets and these non-transaction changes in the value of infrastructure should not influence the assessment results. However, our approach is considered appropriate because the stock data used in the assessment reflects the current costs States face in providing average per capita assets.
- 38 *Zero investment.* Some States noted that in the investment assessment, needs are assessed even when average investment in a year is zero or negative. We acknowledge that the direct approach assesses needs even when average investment in a year is zero or negative. The assessment does not try to model State investment in infrastructure but rather to provide States with the capacity to hold the average per capita stock of infrastructure adjusted for stock disabilities. Even if overall investment was zero, changes in disabilities and populations would require different levels of State investment.
- 39 *Volatility.* Some States were concerned that the investment assessment would be volatile and that this would result in budget uncertainty. They said that small changes in disabilities translate into significant GST redistributions.
- 40 We accept that the direct approach to assessing State investment needs results in some volatility. Volatility arises in part because service use disabilities are used as a proxy for stock disabilities. The volatility of stock disabilities is likely to be less than the volatility of the service use disabilities we have used to estimate them. For this reason, we decided to smooth the stock disabilities used in the assessment of investment. We have used a three year moving average. Smoothing significantly reduces the volatility.

#### *Commission view*

- 41 At our meeting with Heads of Treasuries in August 2009, we explicitly asked States if they considered that one or other of these approaches would not achieve equalisation. No State argued convincingly that one or other would not deliver equalisation. We consider that either, if properly implemented, could be used.
- 42 However, we think it more appropriate to assess State infrastructure needs upfront when State circumstances change and new assets are acquired than to provide States with the capacity to

fund their infrastructure requirements over time as the holding cost or debt charges approaches do. In reaching our decision, we considered the following points.

- Recent average State practice has been to finance, at least in part, new infrastructure from State revenue, including the GST. Therefore to mirror what States do, we favour an approach which give States GST revenue to reflect both their service needs and their needs to acquire new infrastructure.
- Both approaches to infrastructure assessments assume States require the average quantity of infrastructure, adjusted for their disabilities, to deliver average services. This is similar to the expense assessments which assume equal per capita expenses, adjusted for disabilities, are required to provide average services. The same assumption was made in the debt charges assessment. The major difference between the approaches to infrastructure is the timing with which they recognise the effects of disabilities on infrastructure requirements. We prefer a more contemporaneous one.
- States do not report holding costs in their annual financial accounts. We accept that for internal State purposes opportunity cost measures might be employed, but for us to adopt such an approach would require us to impute a holding cost, and the resulting GST distribution would be sensitive to our decision on an appropriate rate.
- We accept that States actual infrastructure stocks and their actual investment in new infrastructure will differ from our assessed amounts. We seek to give States the fiscal capacity to have the average per capita stock of infrastructure adjusted for their unique circumstances. How they use that capacity is their policy choice, the same as is true for our assessments for all service delivery expenses.
- We accept the direct approach provides States only with the capacity to keep their infrastructure at the assessed level over time. Rather than to close a gap between actual and assessed infrastructure, we consider that gap to be heavily influenced by State policy, noting that in reviews since 1993 States have been given the capacity to hold assessed levels of infrastructure.
- We recognise this approach to the infrastructure assessment involves extending the equalisation framework beyond the NOB measure used in the 2004. As discussed in Chapter 3 of Volume 1, we consider this is appropriate if it delivers fiscal equalisation in a way which is simple and reflects average State practice.

43 In summary, we favour an approach that recognises infrastructure needs as they arise for the following reasons:

- States use their revenue, including that from GST revenue, to fund investment in new infrastructure.
- It is more contemporaneous because it provides States with the capacity to fund investment in new infrastructure when the need arises and assets are acquired.
- It is responsive to changes in State populations and other key drivers of the need for investment in new infrastructure.

- It applies the same assessment principles to investment as we apply to service delivery costs. It gives each State the capacity to fund the average per capita investment in new infrastructure adjusted for their circumstances, just as they are given the capacity to fund their assessed service delivery expenses.
- It is policy neutral because the assessments recognise that States, on average, fund infrastructure investment in a number of ways and give States the capacity to achieve this. It will not influence State decisions on whether to own, rent or fund infrastructure through public private partnerships (PPPs).
- It is simple to implement and uses reliable data. It uses data on investment, depreciation, stocks of infrastructure and total State estimated resident population from the ABS and expense disabilities that satisfy Commission assessment guidelines.

### Assessment issues

#### *Factors affecting the quantity of infrastructure*

- 44 *Service use - socio-demographic composition (SDC) disabilities.* The Commission considers that there is a strong case for applying most SDC disabilities, including cross-border disabilities to infrastructure. Most SDC disabilities influence the quantity of infrastructure required to deliver services.
- 45 As an exception, the Commission considers that the schools education SDC cost weights (Indigeneity and low Socio Economic Status (SES)), the post-secondary education SDC cost weight (Indigeneity only) and some cost influences in the Admitted patients category do not necessarily result in a need for more classrooms, hospital beds or equipment. For example, on State visits, we observed higher staff to student ratios where Indigenous students were present. However, there was limited evidence that this translated into higher capital to student ratios.
- 46 There are also a number of expense service use disabilities which have a minimal effect on State infrastructure needs; for example, the disabilities in the Services to communities and Transport services categories recognising needs for operating or price subsidies. States, in general, do not own the physical assets used in delivering these services. The majority are owned by public trading enterprises (PTEs).
- 47 While most States agreed that these disabilities are not relevant on conceptual grounds, they have an inconsequential effect on the assessment due to their small weighting and, on simplicity grounds, have not been removed from the calculation.
- 48 Most States agreed that the stock of infrastructure is influenced by the same disabilities that influence service use, and the expense category disabilities that capture these disabilities are generally appropriate for assessing the quantity of infrastructure States required to deliver services. However, some said there was a stronger link between the SDC cost weights and State infrastructure requirements than the Commission believed.

- 49 *Roads use and length.* Because roads account for just over 30 per cent of State depreciation expenses and investment<sup>2</sup>, the Commission undertook additional analysis to determine whether recurrent roads disabilities and the weighting patterns for combining them were appropriate for roads investment and depreciation. We decided that the road use and length disabilities used in the recurrent roads assessment captured the main influences on roads investment and depreciation. We concluded, however, that there were grounds for applying different weights to them for the infrastructure assessments drawing on data from the National Transport Commission (NTC).
- 50 We have observed a close concordance between the roads investment data reported to the NTC and the ABS giving us confidence that we can use NTC data to calculate weights in this assessment. The way these weights are calculated mirrors the way the NTC data are used to calculate recurrent weights as set out in the Roads chapter. For the Roads category, NTC recurrent expenditures (NTC categories A to E, H and G) were used to derive weights for combining roads disabilities. For the infrastructure assessments, NTC capital expenditures (categories F1, F2 and F3) were used to derive weights. The final weights used in the infrastructure assessments are a six year moving average of annual NTC capital weights.
- 51 The Commission also decided to undertake separate assessments of rural and urban roads infrastructure because the pattern of State spending in these areas changes to favour urban investment. Without separate assessments, the material impacts of these changes could not be captured. Using data provided by the States, we estimated that on a national average basis rural and urban roads accounted for 60 per cent and 40 per cent respectively of total State roads infrastructure. Rural roads disabilities were applied to rural roads stock and urban roads disabilities were applied to urban roads stock. The Commission's expenditure weights for combining rural and urban roads disabilities are shown in Table 21-7. Appendix 21C shows the derivation of these expenditure weights.

**Table 21-7 Weights for combining rural and urban roads disabilities for roads infrastructure, 2008-09**

Disability	Rural roads	Urban roads
	%	%
Road length	67.6	69.5
Traffic volume	5.8	5.9
Heavy vehicle use	12.5	13.7
Bridges	14.1	10.9
<b>Total</b>	<b>100.0</b>	<b>100.0</b>

Source: Commission calculation using State road expense data reported to the NTC for 2003-04 to 2008-09.

<sup>2</sup> Commission calculation based on ABS GFS data on depreciation and net investment by expense category. For depreciation expenses, the proportion is not variable over time. Over the six years to 2008-09, roads investment accounted for between 21.8 per cent and 49.1 per cent of total net investment. On average, over the six years, roads investment accounted for 31.7 per cent total net investment.

- 52 Some States did not support the use of separate weights for road infrastructure and recurrent roads expenses. Their main concern was that the NTC data could not be reliably used to calculate weights for combining roads disabilities. Tasmania also said that State allocations of roads expenses to roads recurrent and capital expenditure are not sufficiently reliable to warrant separate recurrent and capital weights. No State disagreed with the inclusion of all three NTC category F expenditures (F1, F2 and F3).
- 53 *Disabilities for national network roads.* The Commission decided that Commonwealth payments for the construction of national network roads (NNR) should affect State fiscal capacities because it is a function for which we assess needs. However, we were concerned that the roads disabilities may not capture all non-policy influences on State expenditure on the construction of NNR. We believe that part of the Commonwealth support for these roads and the consequent investment is influenced by Commonwealth considerations which are not captured in our State based disability measures. These include the need to develop an efficient national transport network to facilitate national economic growth and productivity gains in the long-term. We have decided that 50 per cent of these Commonwealth payments and the related expenditure should not impact on the GST distribution.
- 54 Victoria, Western Australia, Tasmania and the ACT did not support an APC assessment of Commonwealth payments for the construction of national network roads in the investment assessment because:
- States influence how the funding is allocated;
  - an APC treatment is not policy neutral;
  - the funding is mostly consistent with State priorities;
  - the States receiving the funding directly benefit from the investment and can use the roads in an unrestricted manner;
  - the funding reduces the States own infrastructure funding requirements; and
  - the roads disabilities capture needs for these roads.
- 55 Queensland and South Australia argued that NNR should have no impact on the relativities. New South Wales and the Northern Territory did not comment.
- 56 *Administrative scale.* The Commission considers that States which experience an administrative scale disability will require more infrastructure per capita, reflecting the need for additional office space and equipment (see the Administrative scale chapter).
- 57 Most States agreed that administrative scale disabilities should be applied to infrastructure related expenses including depreciation.
- 58 *Public private partnerships.* The Commission accepts that there is some evidence to indicate that using PPPs to fund general government infrastructure projects may produce savings. Some of the smaller States with limited access to PPPs as a source of funding argued for this disability. However, the Commission notes that there are no reliable data available on the size

of the savings. The Commission will not assess any needs for States that have limited or no access to PPPs as a source of funding due to a lack of reliable data.

- 59 *Urbanisation.* New South Wales argued that changing patterns of urban development are likely to increase the quantity of infrastructure required and that the per unit cost of providing such infrastructure in highly urbanised areas would be much higher. Queensland illustrated its increasing urban transport infrastructure requirements during the Commission visit to that State and discussed the high costs of providing it. However, no data were available on differences between State urban and rural infrastructure requirements except for roads.
- 60 Apart from the road infrastructure assessment, urban related needs are only recognised in the stock of infrastructure assessment when they are captured in the expense assessments. Urban influences are captured in the Admitted patients and Transport services (urban size) assessments, and these factors impact on State infrastructure needs.
- 61 *Calculating the stock disabilities.* Stock disabilities are based on the expense use disabilities included in the expense assessments. If a State is assessed as having a higher demand for services, then it is also assessed as needing a higher than average stock of infrastructure. The Commission decided to weight the expense use disabilities from the expense categories using the proportion of total depreciation related to the category. Data on the stock of infrastructure by category would be a better basis for combining expense use disabilities but these data are not available from ABS Government Finance Statistics (GFS) and States were unable to provide the data at an appropriate level of detail. In the absence of infrastructure data by category, depreciation expenses by category are the most appropriate weights for combining expense disabilities.
- 62 The Commission did not consider that all service use disabilities are relevant to State infrastructure requirements, hence our decision to apply a small general discount (12.5 per cent) to the stock disability. We considered it simpler to apply a small general discount rather than eliminate irrelevant disabilities. The same discount has been applied to the road stock disabilities. The size of the discount is considered appropriate because it recognises that not all SDC disabilities impact on State infrastructure requirements but does not significantly affect the capacity of States to maintain their capital to output ratio for each expense category. The same discounted stock factors have been applied to depreciation expenses and infrastructure in the investment assessment. Before being used in the assessments, a three year moving average is applied to the discounted stock factors. The three-year moving average reduces the volatility in the changes in these disabilities from year to year. Details of how expense use disabilities are combined to derive stock disability factors are in Appendix 21B.

*Factors affecting the cost of infrastructure*

- 63 States suggested that the cost per unit of service could also be affected by:
- natural hazard mitigation costs; and
  - physical environment.

- 64 *Natural hazard mitigation costs.* The Commission accepts the conceptual case that it costs more to construct buildings in cyclone regions. State provided data indicate that it costs about 15 per cent more to construct dwellings in cyclone regions. The Commission also recognises that States incur other natural disaster mitigation expenses such as bushfire and flood mitigation costs. No data were available on other State natural hazard mitigation expenses such as bushfire and flood mitigation. In the absence of a comparable and reliable data source to develop a comprehensive assessment of natural hazard mitigation costs, the Commission has decided it cannot support an assessment of the impact of cyclone mitigation costs.
- 65 *Physical environment.* The Commission accepts the conceptual case that climate impacts on State construction costs and asset lives.
- 66 For the 2004 Review, the Commission put considerable effort into developing an assessment to measure the vulnerability of each State's assets to climatic influences. The assessment:
- involved a significant level of judgment;
  - only assessed needs for some of the conditions that could impact on asset life; and
  - produced results that were contrary to the Commission's observations.
- 67 For these reasons, the then Commission concluded that it was unable to assess needs for the effect of climate. Despite State arguments supporting a physical environment disability, we could not find, and the States have not presented, any new data or a reliable method to assess the disability. We have not made an assessment.

*Other factors affecting the cost of infrastructure*

- 68 *Location.* There are a number of location influences that affect the cost of providing infrastructure. We have recognised interstate and regional differences in wage and other costs by applying the interstate wage, interstate non-wage and regional location factors to investment expenditure. The Location chapter discusses how the location factors are derived.
- 69 The Commission has applied the same location disabilities to depreciation expenses and investment. We consider a substantial part of infrastructure costs, and hence depreciation expenses and investment expenditure, are affected directly or indirectly by wage differentials. In the interest of simplicity, we assumed the average wages proportion for recurrent expenses applied to depreciation expenses and investment.
- 70 A number of States expressed concerns about the applicability of location disabilities to investment. Queensland was particularly concerned that the expense disabilities may not accurately reflect the costs faced by States in delivering new infrastructure, particularly new assets being constructed in regional areas. Similarly, Western Australia said that as the location disabilities are developed, there should be a reality check on their application to investment, by comparing them to actual construction costs. South Australia and Tasmania said that the location wage disabilities should be adjusted for the investment assessment to reflect the fact that these factors do not influence a significant proportion of total capital expenditure.

- 71 We consider that the measurement of the location factors are supported by the available data and that they are appropriate to apply in the investment assessment.
- 72 *Calculating the cost disabilities.* We decided to use investment by category to weight cost disabilities in the investment assessment, and to apply them directly to investment because they relate to investment in the current year. The Commission decided depreciation expenses by category were the most appropriate weights for combining cost disabilities for the depreciation assessment. No discount has been applied to the cost disabilities and the disabilities have not been smoothed.

## THE ASSESSMENT METHOD

### Data reliability

- 73 The main data used in the infrastructure assessments are sourced from the ABS. They are:
- ERP data by State;
  - investment and depreciation expenses by Government Purpose Classification (GPC);
  - net acquisition of non-financial assets which we call investment; and
  - non-financial produced assets which we call the stock of infrastructure.
- 74 With the exception of the ERP data, the ABS data used in the assessments are sourced from annual ABS GFS. GFS estimates are based on annual audited data reported by State Treasuries. Where reported data do not conform to GFS standards, adjustments are made by the ABS if sufficient information is available. In the case of stock estimates, the ABS has little or no information available to make adjustments and the State Treasuries are relied upon to provide data of an appropriate quality. From January 2009, States need to comply with Australian Accounting Standard (AAS) 1049 Whole of Government and General Government Sector Financial Reporting. Greater comparability may result.
- 75 The ABS advised that estimates of the stock of infrastructure are subject to differences across States in the frequency of revaluation and the revaluation method. Nevertheless the data are based on audited State balance sheets that must comply with Australian accounting standards.
- 76 In addition, the infrastructure assessments use expense category disabilities that are calculated by the Commission under its assessment guidelines.

### Depreciation assessment

- 77 Depreciation is an infrastructure cost and is part of the cost of delivering services. We measured the depreciation expenses required by States by assessing disabilities relating to the stock of infrastructure required to provide the average level of services and the per unit cost of infrastructure.
- 78 Table 21-8 sets out the category structure and the disabilities to be assessed for 2008-09. There is one component in this category.

**Table 21-8 Category structure, Depreciation, 2008-09**

Component	Component		Influence measured by disability
	weight	Disability	
Service expenses	100.00	Capital stock	This disability recognises the impact of the demand for services on the need for infrastructure. It is calculated using a composite of all expense use disabilities, weighted using depreciation estimates by category.
		Cost	This disability recognises differences in the cost of providing infrastructure between States and to different areas within a State. It is calculated using a composite of location disabilities, weighted using depreciation estimates by category.

Source: Commission calculation.

- 79 The stock disabilities are derived from service use disabilities used in each expense category combined using the proportion of depreciation expenses by category, and the cost disabilities are derived from location disabilities for each expense category combined using the proportion of depreciation expenses by category. The method for calculating the stock disabilities is described in Appendix 21B. A general 12.5 per cent discount has been applied to the stock disabilities which are a three year moving average of annual disabilities. The cost disability factors have not been discounted or smoothed.
- 80 There is no explicit administrative scale assessment in this category. The influence of administrative scale on depreciation expenses is captured through the stock disability factors.
- 81 Table 21-9 shows how the equal per capita (EPC) allocation of those depreciation expenses across the States is adjusted for stock and cost disabilities. Factors below one indicate a State needs to spend less than average. Factors above one indicate States need to spend more than average.

**Table 21-9 Assessed expenses and factors, Depreciation, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Service expenses (\$m)	2 789.0	2 124.9	1 722.8	873.0	638.5	198.2	137.8	87.8	8 571.9
Capital stock factor	0.95207	0.92518	1.03436	1.10749	1.04852	1.07536	0.91121	2.20677	
Cost factor	1.01017	0.98814	0.99390	1.02102	0.98825	0.97303	0.94870	1.10138	
Assessed expenses (\$m)	2 678.4	1 939.7	1 768.5	985.7	660.6	207.0	118.9	213.1	8 571.9

Source: Commission calculation.

- 82 Table 21-10 shows the assessed expenses for the Depreciation category and the cost of service provision ratio.

**Table 21-10 Assessed expenses, Depreciation, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Service expenses (\$m)	2 678.4	1 939.7	1 768.5	985.7	660.6	207.0	118.9	213.1	8 571.9
Assessed expenses (\$pc)	380.37	361.57	406.60	447.22	409.81	413.83	341.89	961.26	396.09
Cost of service provision ratio (a)	0.9603	0.9128	1.0265	1.1291	1.0347	1.0448	0.8632	2.4269	1.0000

(a) The cost of service provision ratio is the ratio of each State's assessed expenses per capita to the average assessed expenses per capita.

Source: Commission calculation.

### Investment assessment

- 83 A State's assessed investment is what a State needs to spend to acquire the additional assets needed to hold the average per capita stock of infrastructure at the end of the year, adjusted for its stock and cost disabilities.
- 84 How much a State needs to invest is determined by:
- changes in the national average stock of infrastructure per capita;
  - changes in the stock disabilities that recognise State differences in the quantity of infrastructure States required;
  - the cost of the additional infrastructure in each State; and
  - its population growth.
- 85 We assessed these disabilities for two components in this category — roads investment and non-roads investment.
- 86 The category includes a third component that assesses land and other investment EPC because we decided that land transactions and stocks should not impact on the relativities.
- 87 Table 21-11 sets out the category structure, the assessed disabilities and the relative size of each component for 2008-09.

**Table 21-11 Category structure, Investment, 2008-09**

Component	Component weight	Disability	Influence measured by disability
	%		
Non-roads investment	63.15	Capital stock disability	This disability recognises the impact of the demand for services on the need for non-road infrastructure. It is calculated using a composite of all non-road expense use disabilities, weighted using depreciation estimates by category.
		Cost disability	This disability recognises differences in the cost of providing infrastructure between States and to different areas within a State. It is calculated using a composite of location disabilities, weighted using investment by category.
		Differential population growth	This disability recognises the impact of population growth on a State's capacity to hold the same per capita level of non-road infrastructure.
Roads investment	33.87	Road stock disability	This disability recognises the impact of road use and length on the need for roads. It is calculated using a composite of road use and length disabilities, weighted using NTC capital expenditure data.
		Cost disability	This disability recognises differences in the cost of providing infrastructure between States and to different areas within a State. It is estimated using the Roads category location factor.
		Differential population growth	This disability recognises the impact of population growth on a State's capacity to hold the same per capita level of road assets.
		Investment in National Network roads	This disability recognises differences between States in the per capita capital grants they actually received from the Australian Government for the major upgrade of National Network roads. 50 per cent of the Commonwealth payments are assessed APC.
Land and other investment	2.98	Equal per capita	This is an equal per capita assessment of expenditures included in the GFS item 'net acquisition of non-financial assets' not included in the roads and non-roads investment components. It includes expenditure on non-produced assets including land.

Source: Commission calculation.

### *Non-roads investment*

- 88 The non-roads investment component made up 63.15 per cent of the average expenditure for the category in 2008-09. The influences on State investment in non-road infrastructure considered by the Commission are stock disabilities, population growth and cost disabilities.
- 89 Unlike other categories where factors are separately calculated and combined to derive a component or category factor which is then applied to the average expense, the method derives assessed investment directly. Box 21-3 provides the formula.
- 90 Assessed investment for a State is calculated as the difference between:
- its assessed closing stock of infrastructure (derived by applying the current year's stock disabilities and State population to the national average closing stock of infrastructure per capita); and
  - its assessed opening stock of infrastructure (derived by applying the previous year's stock disabilities and State populations to the national average revalued opening stock of infrastructure per capita).

The average revalued opening stock of infrastructure is calculated by subtracting the average investment in the year from the average closing stock. This ensures that the two stock levels are in the same price levels.

**Box 21-3 Calculation of assessed investment**

Assessed investment is calculated as:

$$= \{ [(K_1 / P_1) p_{i1} \delta^u_{i1}] - [(K_0 / P_0) p_{i0} \delta^u_{i0}] \} * \delta^c_{i1}$$

Where  $\delta^u_{i1}$  and  $\delta^u_{i0}$  are the depreciation weighted expense *use* disability factors for State i in time 1 and 0;

$\delta^c_{i1}$  is the expense *cost* disability factors for State i in time 1 weighted by investment;

$p_{i1}$  and  $p_{i0}$  are the populations of State i in time 1 and 0;

K is the Australian total stock of infrastructure; and

P is the Australian population.

$K_0$  is calculated as  $K_1$  minus investment so that  $K_0$  and  $K_1$  are in the same price levels.

- 91 In practice, the method captures the influence of the level of service use as well as annual changes in the level of service use. This results in stock disabilities having a double effect through their annual change and through their actual level. For example, it is possible for a State with a below average level of service use to increase its GST share if it experiences a sufficiently high growth in service use during the year.
- 92 Cost disabilities are applied to the resulting estimate of assessed investment to obtain a final measure of a State’s assessed investment. The component factor is calculated residually.
- 93 These calculations are summarised in Table 21-12.
- 94 The stock disabilities applied to the opening and closing stocks of non-road infrastructure are the expense use disabilities for each expense category, excluding roads, combined using the proportion of depreciation expenses by category. A 12.5 per cent discount has been applied to the stock disabilities which are a three year moving average of annual disabilities. The stock disabilities applied to the opening and closing stocks of non-road infrastructure are shown in Table 21-12.
- 95 Table 21-12 also shows the cost disabilities that have been applied to assessed investment which are the cost disabilities for the expense categories combined using the proportion of investment by category. No discount has been applied to the cost disabilities and the disabilities have not been smoothed.

**Table 21-12 Calculation of assessed investment for the non-road investment component, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
<b>Closing stock of State non-road infrastructure (a)</b>									
Average State infrastructure (\$pc)									8 545.61
Population (million)	7.0	5.4	4.3	2.2	1.6	0.5	0.3	0.2	21.6
Stock factor	0.97946	0.95669	1.01297	1.03324	1.02106	1.10115	1.00586	1.72512	1.00000
Assessed State infrastructure (\$m)	58 937	43 860	37 651	19 461	14 066	4 708	2 990	3 268	184 940
<b>Opening stock of State non-road infrastructure (b)</b>									
Average State infrastructure (\$pc)									8 394.65
Population (million)	6.9	5.3	4.2	2.1	1.6	0.5	0.3	0.2	21.2
Stock factor	0.97823	0.95792	1.01330	1.03444	1.02053	1.10110	1.01209	1.71564	1.00000
Assessed State infrastructure (\$m)	57 022	42 317	36 090	18 566	13 651	4 579	2 906	3 132	178 265
<b>Investment (c)</b>									
Difference in assessed stocks (\$m)	1 914.5	1 542.6	1 561.0	894.5	414.2	128.7	83.6	136.5	6 675.7
Cost factor	1.00703	0.99079	0.99248	1.01476	0.98544	0.98353	1.01556	1.11914	1.00000
Assessed investment (\$m)	1 925.1	1 526.1	1 546.9	906.4	407.6	126.4	84.8	152.6	6 675.7
Population (million)	7.0	5.4	4.3	2.2	1.6	0.5	0.3	0.2	21.6
Assessed investment (\$pc)	273.40	284.46	355.65	411.23	252.84	252.57	243.79	688.21	308.47
Component factor	0.88630	0.92216	1.15296	1.33315	0.81967	0.81878	0.79031	2.23107	1.00000

(a) Infrastructure estimate used in the calculation excludes investment in non-produced non-financial assets (mainly land). In GFS, it is equal to ETF 816.

(b) Opening stock of infrastructure is calculated as closing stock of infrastructure minus investment in non-financial produced assets as defined in Note (a).

(c) Investment is defined as gross fixed capital formation (GFCF) plus changes in inventories minus depreciation. GFCF includes assets acquired under finance lease and assets donated.

Source: Commission calculation.

96 Additional information on the derivation of the non-roads investment stock and cost disabilities is provided in Appendix 21A.

### Roads investment

97 Roads investment made up 33.87 per cent of the average expenditure for the category in 2008-09. The influences on State roads investment considered by the Commission are road use and length disabilities and population growth. The roads component also includes the national network roads disability factor in which 50 per cent of the expenditure of Commonwealth payments for the construction of National network roads under the Nation building program (formerly Auslink) and Nation building plan for the future (Building Australia Fund) is treated actual per capita.

98 The method used to calculate assessed non-roads investment is also used to calculate assessed road investment. For road investment, this method is used to separately calculate assessed rural road investment and urban road investment. (See Box 21-3.) Table 21-13 and Table 21-14 show the calculations of the assessed rural and urban road investment. Table 21-15 shows the total assessed road investment, which is the sum of the assessed rural and urban road investment and the assessed NNR investment.

**Table 21-13 Calculation of assessed rural road investment for the road investment component, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
<b>Closing stock of State rural road infrastructure</b>									
Average State rural road infrastructure (\$pc)									2 546.81
Population (million)	7.0	5.4	4.3	2.2	1.6	0.5	0.3	0.2	21.6
Stock factor	0.80453	0.71205	1.13930	1.50444	1.27305	1.04526	0.31614	5.41414	1.00000
Assessed State rural road infrastructure (\$m)	14 428	9 729	12 621	8 445	5 226	1 332	280	3 057	55 117
<b>Opening stock of State rural road infrastructure</b>									
Average State rural road infrastructure (\$pc)									2 601.50
Population (million)	6.9	5.3	4.2	2.1	1.6	0.5	0.3	0.2	21.2
Stock factor	0.80190	0.71214	1.14422	1.51422	1.26760	1.03985	0.32172	5.43803	1.00000
Assessed State rural road infrastructure (\$m)	14 486	9 749	12 629	8 422	5 255	1 340	286	3 076	55 244
<b>Rural road investment</b>									
Difference in assessed stocks (\$m)	-58.1	-20.4	-9.0	22.5	-28.4	-8.3	-6.2	-19.3	-127.2
Population (million)	7.0	5.4	4.3	2.2	1.6	0.5	0.3	0.2	21.6
Assessed rural road investment (\$pc)	-8.25	-3.80	-2.06	10.22	-17.60	-16.57	-17.94	-87.22	-5.88
Rural road investment factor	1.40486	0.64651	0.35064	-1.74022	2.99462	2.82028	3.05383	14.84527	1.00000

Source: Commission calculation.

**Table 21-14 Calculation of assessed urban road investment for the road investment component, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
<b>Closing stock of State urban road infrastructure</b>									
Average State urban road infrastructure (\$pc)									1 697.88
Population (million)	7.0	5.4	4.3	2.2	1.6	0.5	0.3	0.2	21.6
Stock factor	0.99198	1.02311	1.01568	1.00012	0.90917	0.99738	1.17400	0.78011	1.00000
Assessed State urban road infrastructure (\$m)	11 860	9 319	7 501	3 743	2 488	847	693	294	36 745
<b>Opening stock of State urban road infrastructure</b>									
Average State urban road infrastructure (\$pc)									1 649.36
Population (million)	6.9	5.3	4.2	2.1	1.6	0.5	0.3	0.2	21.2
Stock factor	0.99045	1.02331	1.01700	1.00209	0.90826	0.99642	1.17907	0.78734	1.00000
Assessed State urban road infrastructure (\$m)	11 344	8 882	7 117	3 534	2 387	814	665	282	35 025
<b>Urban road investment</b>									
Difference in assessed stocks (\$m)	516.0	437.4	383.9	208.8	101.2	33.1	28.1	11.3	1 719.8
Population (million)	7.0	5.4	4.3	2.2	1.6	0.5	0.3	0.2	21.6
Assessed urban road investment (\$pc)	73.28	81.53	88.26	94.75	62.81	66.06	80.84	50.80	79.47
Urban road investment factor	0.92213	1.02596	1.11067	1.19234	0.79034	0.83135	1.01730	0.63928	1.00000

Source: Commission calculation.

**Table 21-15 Calculation of assessed expenses, roads investment component, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Difference in assessed rural road stock (\$m)	-58.1	-20.4	-9.0	22.5	-28.4	-8.3	-6.2	-19.3	-127.2
Difference in assessed urban road stock (\$m)	516.0	437.4	383.9	208.8	101.2	33.1	28.1	11.3	1 719.8
Combined assessed rural and urban road investment (\$m)	457.9	417.0	374.9	231.4	72.9	24.8	21.9	-8.1	1 592.6
Cost factor	1.01310	0.98175	0.99928	1.03302	0.99380	0.96978	0.83435	1.08458	1.00000
Assessed rural and urban road investment (\$m)	463.8	409.3	374.6	239.0	72.4	24.0	18.3	-8.8	1 592.6
Assessed NNR (\$m)	757.1	142.6	772.0	163.9	113.0	18.5	0.0	20.1	1 987.3
Total assessed road investment (\$m)	1 220.9	552.0	1 146.6	402.9	185.4	42.5	18.3	11.3	3 579.9
Total assessed road investment (\$pc)	173.39	102.89	263.61	182.80	115.04	85.01	52.47	51.13	165.42
Component factor	1.04818	0.62199	1.59361	1.10508	0.69544	0.51388	0.31720	0.30910	1.00000

Source: Commission calculation.

### *Land and other investment*

99 Land and other investment makes up 2.98 per cent of the average expenditure for the category in 2008-09. It includes transactions for land and other non-produced assets. These transactions are assessed on an EPC basis because we decided that land transactions and stocks should not impact on the relativities. This component also includes a balancing item used to ensure the coverage of the assessment is the same as that of the ABS Government Finance Statistics. The balancing item mainly includes balancing amounts for Commonwealth payments that we decided should not impact on State fiscal capacities.

100 Table 21-16 shows the land and other investment amounts included in the component for 2008-09.

**Table 21-16 Assessed expenses, land and other investment component, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Assessed expenditure (\$m)	102.5	78.1	63.3	32.1	23.5	7.3	5.1	3.2	314.9
Assessed expenditure (\$pc)	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55

Source: Commission calculation.

**Bringing the category assessment together**

101 Table 21-17 brings the assessed expenses for each component together to derive the total assessed expenses for each State for the Investment category.

**Table 21-17 Assessed expenses, Investment, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Non-roads investment	1 925.1	1 526.1	1 546.9	906.4	407.6	126.4	84.8	152.6	6 675.7
Roads investment	1 220.9	552.0	1 146.6	402.9	185.4	42.5	18.3	11.3	3 579.9
Land and other investment	102.5	78.1	63.3	32.1	23.5	7.3	5.1	3.2	314.9
Total	3 248.5	2 156.1	2 756.8	1 341.3	616.5	176.2	108.1	167.1	10 570.6
Assessed expenses (\$pc)	461.34	401.90	633.82	608.59	382.43	352.12	310.81	753.90	488.44
Capital requirements ratio	0.9445	0.8228	1.2976	1.2460	0.7830	0.7209	0.6363	1.5435	1.0000

Note: The ratio of each State's assessed expenses per capita to the total assessed expenses per capita.

Source: Commission calculation.

102 Table 21-18 summarises the calculation of category disability factors which indicate how much more or less than average a State needs to spend on investment in infrastructure. It shows for each disability how the investment per capita in each component, and in total, is affected by differences in State characteristics and population. Disability factors below one indicate a State needs to spend less than average. Disability factors above one indicate a State needs to spend more than average.

**Table 21-18 Category factor, Investment, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
<b>Non-road investment (component weight = 63.15 %)</b>									
Non-road investment factor	0.88630	0.92216	1.15296	1.33315	0.81967	0.81878	0.79031	2.23107	1.00000
Component factor	0.88630	0.92216	1.15296	1.33315	0.81967	0.81878	0.79031	2.23107	1.00000
A. Wgtd comp factor	0.55973	0.58238	0.72813	0.84193	0.51765	0.51709	0.49911	1.40900	0.63154
<b>Road investment (component weight = 33.87 %)</b>									
Road investment factor	0.89502	1.03683	1.17032	1.47336	0.61045	0.65213	0.71301	-0.53672	1.00000
Investment in National Network Roads factor	1.17093	0.28954	1.93282	0.80994	0.76355	0.40308	0.00000	0.98694	1.00000
Component factor	1.04818	0.62199	1.59361	1.10508	0.69544	0.51388	0.31720	0.30910	1.00000
B. Wgtd comp factor	0.35499	0.21065	0.53971	0.37426	0.23552	0.17403	0.10743	0.10468	0.33867
<b>Land and Other Investment (component weight = 2.98 %)</b>									
EPC factor	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Component factor	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
C. Wgtd comp factor	0.02979	0.02979	0.02979	0.02979	0.02979	0.02979	0.02979	0.02979	0.02979
<b>Category factor</b>									
[A+B+C]	0.94451	0.82282	1.29764	1.24598	0.78297	0.72091	0.63633	1.54348	1.00000

Source: Commission calculation.

## WHAT IS THE IMPACT ON THE GST DISTRIBUTION?

### Depreciation distribution

103 Table 21-19 shows the extent to which the assessment for the Depreciation category moves the recommended distribution of the GST for the 2010 Review away from an EPC distribution.

**Table 21-19 Impact on the GST redistribution of the Depreciation assessment**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Dollars million	-102.3	-175.8	45.7	103.5	20.3	8.3	-17.4	117.6	295.5
Dollars per capita	-14.35	-32.20	10.27	45.75	12.48	16.40	-49.18	519.49	13.42

Note: The difference from an equal per capita assessment, derived using 2006-07, 2007-08 and 2008-09 assessed expenses and 2009-10 GST.

Source: Commission calculation.

104 Table 21-20 show the main reasons for the redistribution from an EPC share for each State.

**Table 21-20 Reasons for difference from EPC, Depreciation, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Capital stock disability	-128.6	-147.8	56.9	89.5	28.0	13.7	-10.9	99.2	287.3
Cost disability	31.5	-27.4	-8.4	13.8	-6.5	-4.8	-6.9	8.5	53.8
Interactions	-5.2	-0.6	-2.7	0.1	-1.2	-0.6	0.4	9.9	10.5
Category	-102.3	-175.8	45.7	103.5	20.3	8.3	-17.4	117.6	295.5

Source: Commission calculation.

105 The tables shows that New South Wales, Victoria and the ACT are assessed as needing to spend less than average on depreciation. Queensland, Western Australia, South Australia, Tasmania and the Northern Territory are assessed as needing to spend more. The underlying cause of the difference in assessed per capita depreciation expenses varies from State to State. For example:

- New South Wales is assessed as needing less infrastructure per capita to deliver the average level of service and as a result has below average assessed depreciation expenses per capita. New South Wales faces high per unit costs in providing infrastructure. This partially offsets its below average need for infrastructure.
- Victoria and the ACT are assessed as needing less infrastructure per capita to deliver the average level of service and as a result have below average assessed depreciation expenses per capita. Victoria and the ACT also face lower than average per unit costs of infrastructure. This augments their below average need for infrastructure.
- South Australia and Tasmania are assessed as needing more infrastructure per capita to deliver the average level of service and as a result have above average assessed depreciation expenses per capita. They face lower than average per unit costs in

providing infrastructure. This partially offsets their above average need for infrastructure.

- Queensland, Western Australia and the Northern Territory are assessed as needing more infrastructure per capita to deliver the average level of service and as a result have above average assessed depreciation expenses per capita. They also face high per unit costs in providing infrastructure. This augments their above average need for infrastructure.

106 Table 21-21 shows assessed stock of infrastructure for each State in each of the review years and the previous year. They support the above analysis.

**Table 21-21 Assessed infrastructure, 2006-07 to 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2005-06	63 960.9	46 797.8	42 001.7	22 833.6	16 366.7	5 237.7	3 018.9	4 749.8	204 967.0
2006-07	68 653.3	50 423.5	45 565.6	24 769.2	17 560.8	5 600.8	3 240.4	5 154.5	220 968.0
2007-08	84 944.9	62 584.5	56 766.9	30 788.2	21 611.5	6 887.6	4 010.5	6 365.9	273 960.0
2008-09	85 224.3	62 907.8	57 772.6	31 648.4	21 780.5	6 886.6	3 963.4	6 618.4	276 802.0
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc
2005-06	9 424.81	9 202.19	10 386.64	11 207.91	10 495.68	10 722.21	9 082.75	22 791.10	9 978.10
2006-07	10 009.87	9 751.92	11 007.02	11 881.24	11 139.16	11 388.74	9 613.11	24 275.40	10 587.18
2007-08	12 233.05	11 892.79	13 379.63	14 400.03	13 562.36	13 903.74	11 724.18	29 277.33	12 901.04
2008-09	12 103.33	11 726.04	13 282.48	14 359.26	13 511.49	13 765.52	11 394.11	29 855.51	12 790.30

Source: Commission calculation.

107 Table 21-22 compares the total redistribution for the depreciation assessment in the 2009 Update and 2010 Review. In the 2009 Update, a significant proportion of depreciation expenses were not assessed in the depreciation category. The standard analysis attributing the source of changes since the 2009 Update to method changes and State circumstances is not available. Most of the change in the redistribution between updates is due to changes to the method for calculating the stock and cost disability factors for the category.

**Table 21-22 Changes since the 2009 Update, Depreciation**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2010 Review	-102.3	-175.8	45.7	103.5	20.3	8.3	-17.4	117.6	295.5
2009 Update	-50.3	-228.5	16.3	119.3	-6.0	16.3	-21.3	154.1	306.1
Difference	-52.0	52.7	29.4	-15.8	26.3	-8.0	3.9	-36.5	-10.6

Note: The 2009 Update redistribution is an estimate. In the 2009 Update about 35 per cent of depreciation expenses (including roads depreciation) were not assessed in the depreciation category.

Source: Commission calculation.

## Investment

108 Table 21-23 shows the extent to which the assessment for the Investment category moves the distribution of the GST for the 2010 Review away from an equal per capita distribution.

**Table 21-23 Impact on the GST redistribution of the Investment assessment**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
Dollars million	-294.9	-298.9	503.6	254.3	-146.3	-60.6	-48.4	91.2	849.1
Dollars per capita	-41.36	-54.75	113.08	112.43	-89.74	-120.02	-136.92	402.65	38.56

Note: The difference from an equal per capita assessment derived using 2006-07, 2007-08 and 2008-09 assessed expenses and 2009-10 GST.

Source: Commission calculation.

109 Table 21-24 provides a summary of how the different components of the assessment move State GST shares away from an EPC distribution.

**Table 21-24 Reasons for difference from EPC, Investment, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Non-road investment	-264.2	-125.6	242.5	183.5	-80.3	-32.8	-21.3	98.1	524.2
Road investment	-30.8	-173.4	261.2	70.8	-66.0	-27.8	-27.0	-7.0	332.1
Land and other investment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interactions	0.0	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.2
Category	-294.9	-298.9	503.6	254.3	-146.3	-60.6	-48.4	91.2	849.1

Source: Commission calculation.

110 Table 21-25 shows the main reasons for the redistribution from an EPC share for each State on a disability basis.

**Table 21-25 Reasons for difference from EPC, factor analysis, Investment, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
<b>Non-road investment</b>									
Population growth	-294.0	15.8	242.4	159.6	-84.4	-38.6	-6.5	5.8	423.6
Capital stock disability	17.9	-125.6	7.3	15.5	8.2	7.2	-15.7	85.2	141.3
Cost disability	9.2	-16.6	-10.0	7.1	-4.8	-1.6	0.6	16.1	33.0
<b>Road investment</b>									
Population growth	-136.1	7.4	111.4	74.8	-39.2	-17.8	-3.0	2.5	196.1
Rural road stock disability	51.9	-9.8	-43.8	-10.4	12.5	5.6	-1.5	-4.4	70.0
Urban road stock disability	0.4	7.9	5.3	0.6	-10.9	-0.1	2.6	-5.9	16.8
Cost disability	6.8	-9.0	0.5	7.6	-0.5	-1.0	-5.4	1.1	15.9
NNR	47.1	-169.7	188.1	-2.0	-27.9	-14.7	-19.9	-1.0	235.2
Interactions	1.9	0.6	2.5	1.4	0.8	0.5	0.5	-8.2	8.2
Category	-294.9	-298.9	503.6	254.3	-146.3	-60.6	-48.4	91.2	849.1

Source: Commission calculation.

111 The table shows that New South Wales, Victoria, South Australia, Tasmania and the ACT are assessed as needing to spend less than average on investment. Queensland, Western Australia and the Northern Territory are assessed as needing to spend more. The underlying cause of the difference in assessed per capita investment expenses varies from State to State. For example:

- The redistribution for New South Wales arises primarily because it has below average population growth. This is partly offset by increasing levels of service use. For New South Wales, the average annual increase in service use is sufficient to more than offset the influence of its below average service use. New South Wales also has below average road use and length but as with other service use, road use and length have been increasing and this has partially offset the impact of below average population growth. New South Wales also receives an above average share of Commonwealth payments for the construction of NNR.
- The redistribution for Victoria arises primarily because it has below average service use, and the level of service use is declining over time. In most years, Victoria's population growth is just above the national average. Therefore population growth has only a small positive influence on the redistribution for Victoria.
- The redistributions for Queensland, Western Australia and the Northern Territory arise because they have above average service use and population growth. All three States have declining road use and this partially offsets the redistributions to these States. The decline in road use and length has had a more pronounced effect on the redistribution for the Northern Territory.
- The redistributions for South Australia and Tasmania arise primarily because they have below average population growth. They have above average service use and this has partially offset the impact of below average population growth.
- The redistribution for the ACT arises primarily because it has below average population growth. The ACT also has below average service use and it has been falling over time.

112 Table 21-26 shows population growth and Table 21-27 shows assessed stock of infrastructure by type of infrastructure for each State in each of the review years and the previous year. They support the above analysis.

**Table 21-26 Population growth, 2005-06 to 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	%	%	%	%	%	%	%	%	%
2005-06	0.86	1.43	2.48	1.93	0.90	0.80	1.29	2.27	1.44
2006-07	1.06	1.67	2.37	2.33	1.10	0.67	1.41	1.88	1.60
2007-08	1.24	1.77	2.49	2.56	1.08	0.73	1.48	2.40	1.75
2008-09	1.40	1.95	2.52	3.09	1.16	0.99	1.69	1.95	1.91

Source: Estimated resident population, ABS.

113 There was no assessment of State infrastructure needs in the three updates prior to the 2010 Review. Therefore, for the investment assessment, there is no practical comparison between the 2009 Update redistribution and the 2010 Review redistribution.

**Table 21-27 Assessed infrastructure, 2005-06 to 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Stock of rural road infrastructure									
2005-06	10 252.2	6 869.2	8 860.4	5 892.3	3 721.0	953.0	204.2	2 172.6	38 924.8
2006-07	10 979.6	7 374.6	9 527.4	6 348.0	3 986.9	1 018.1	218.4	2 325.7	41 778.8
2007-08	12 817.2	8 626.2	11 174.6	7 452.1	4 649.5	1 185.7	253.3	2 721.7	48 880.3
2008-09	14 427.8	9 728.9	12 620.5	8 444.9	5 226.5	1 331.8	280.1	3 056.7	55 117.1
Stock of urban road infrastructure									
2005-06	8 494.4	6 578.9	5 190.9	2 572.2	1 793.0	615.5	496.4	208.5	25 949.9
2006-07	9 067.6	7 062.9	5 616.2	2 783.9	1 912.6	654.1	531.6	223.8	27 852.5
2007-08	10 553.9	8 263.6	6 621.5	3 287.8	2 221.0	757.5	618.9	262.7	32 586.9
2008-09	11 859.5	9 319.3	7 500.7	3 742.6	2 488.4	847.2	693.4	293.6	36 744.7
Stock of non-road infrastructure									
2005-06	45 214.2	33 349.7	27 950.4	14 369.1	10 852.6	3 669.2	2 318.3	2 368.7	140 092.3
2006-07	48 606.1	35 985.9	30 422.0	15 637.3	11 661.3	3 928.6	2 490.3	2 605.0	151 336.6
2007-08	61 573.7	45 694.7	38 970.9	20 048.2	14 741.1	4 944.4	3 138.3	3 381.5	192 492.9
2008-09	58 937.0	43 859.7	37 651.3	19 460.9	14 065.7	4 707.6	2 989.9	3 268.1	184 940.3

Source: Commission calculation.

## UPDATE PROCESS

114 We recommend that data used in these assessments be updated when new data become available to ensure the relativities remain contemporary and consistent with the circumstances of the States. On this basis we expect the following data would be updated annually:

- ABS aggregate population data;
- GFS investment and depreciation data that support the category structures;
- GFS stock of infrastructure data;
- GFS investment and depreciation expenses data by GPC;
- NTC State expense data that are used to weight roads infrastructure disabilities; and
- stock and cost disability factors that come from the expense categories will be updated annually. Any revisions or updates to data underlying these disabilities will be reflected in the depreciation and investment assessments in the year when the underlying data are updated.

115 The following data would be updated at longer intervals when new data become available or material changes occur:

- the rural and urban roads infrastructure spilt.

### **SIMPLIFICATION**

- 116 While the depreciation assessment is much the same as in the 2004 Review (disabilities are assessed a little differently), the infrastructure assessment uses much less data, including accumulated transactions data extending back to 1960-61, and complex calculations, than the 2004 Review Debt charges assessment.
- 117 The 2010 Review approach is simpler and more transparent than the previous approaches.

### **FURTHER INFORMATION**

- 118 Background material in support of this assessment is published on the Commission's website. That material includes the following documents, released for comment in the development of this assessment, together with State submissions responding to those documents:
- Staff discussion paper *2007/22-S Building blocks for the assessment of capital related expenses in the 2010 Review*;
  - Staff discussion paper *2007/26-S Assessing new capital expenditure*;
  - Staff discussion paper *2007/33-S Assessing capital needs — an alternative approach*;
  - Commission position paper *2008/29 Capital*; and
  - *2010 Review Draft Report*.

## APPENDIX 21A: HOLDING COST APPROACHES

- 1 During the review, States advocated a range of different holding costs approaches. This appendix documents the two most important versions.

### EQUALISING NET OPERATING BALANCE — THE SIMPLE HOLDING COST APPROACH

- 2 New South Wales, Victoria, South Australia, Tasmania and the ACT proposed a simple holding cost approach that did not recognise the impact of differential population growth<sup>1</sup>. They proposed the following assessments:
  - an assessment of the holding cost of physical assets;
  - an assessment of depreciation expenses; and
  - EPC assessments of net interest and dividend income.
- 3 These States preferred a holding cost approach because infrastructure is assessed in the year of consumption and not the year of acquisition. They believe this is consistent with what States do — they spread capital costs over time as capital is utilised. As a result, they consider that capital needs should be assessed in the context of service delivery and the GFS net operating balance. South Australia came to support this approach by the end of the review.

### EQUALISING NET WORTH — SOUTH AUSTRALIA'S HOLDING COST APPROACH

- 4 Earlier in the Review, South Australia proposed a holding cost approach that recognised the impact of differential population growth on accumulated surpluses. Its approach included the following assessments:
  - an assessment of the holding cost of non-financial assets;
  - an assessment of depreciation expenses; and
  - an assessment of population dilution of a modified net worth balance to give States the capacity to have equal net worth per capita. The modified net worth balance was proposed as a proxy for accumulated surpluses.

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<sup>1</sup> States supporting the holding cost approach proposed alternative methods for calculating the holding cost of capital. Victoria proposed the use of net holding costs calculated as the difference between holding cost and holding revenue where holding revenue is a measure of the growth in the price of assets during the period. The remaining States proposed the application of an appropriate holding cost rate to the total stock of physical assets.

- An EPC assessment of net interest and dividend income because net interest and dividend earning needs are addressed through the upfront assessment of the differential impact of population growth on net worth.
- 5 The net worth concept proposed by South Australia was not GFS net worth because South Australia did not consider it appropriate to include revaluations in the net worth measure used in the calculation of population dilution needs. South Australia outlined the scope of the net worth balance that should be used in the population dilution calculation. South Australia said land and contributed capital and retained earnings of non-financial PTEs only should be included, and net assets of public financial corporations and assets acquired through excluded capital grants should be excluded. Furthermore, after making these adjustments South Australia said that a substantial general discount should be applied to the remaining net worth to take account of valuation uncertainties. South Australia said that these adjustments would substantially and appropriately reduce the size of the dilution needs.
- 6 Subsequent to its November 2008 capital submission, South Australia proposed a modification to its basic holding cost model to allow it to meet needs upfront for the non-debt funded proportion of capital expenditure. South Australia said upfront funding needs could be recognised by capitalising a proportion of depreciation and estimated holding costs and assessing this amount in the context of service delivery expenses. The proportion to be capitalised would be based on the average ratio of non-debt funded to debt funded capital expenditure. Under this approach capital costs would be wholly functionalised. The following assessments and calculations would be required:
- an assessment of depreciation and holding costs;
  - the calculation of a relevant capitalisation factor to apply to a proportion of functionalised depreciation and holding cost needs;
  - an assessment of population dilution of a modified net worth balance to give States the capacity to have equal net worth per capita; and
  - the annual needs amount is then the difference between the capitalised amount for a year less the capitalised amount for the preceding year.
- 7 South Australia said that it preferred this approach to the direct approach if an upfront assessment of needs were required. It argued it was more internally consistent than the direct approach, recognised needs upfront only in respect of the non debt funded proportion of physical assets and occurred within the context of the net operating balance.
- 8 No other State specifically supported the approaches outlined by South Australia, and in its final submission, South Australia supported a simple holding cost approach as outlined in paragraph 2 of this appendix.

## APPENDIX 21B: COMBINING DISABILITIES

- 1 In the depreciation and investment assessments, expense use disabilities are used as a proxy for stock disabilities and location disabilities are used as a proxy for the cost influences on State depreciation and investment. Expense use disabilities are those that influence the quantity of a service States must provide. They include socio-demographic composition (SDC) factors, service delivery scale factors and cross-border factors. The location factors and the natural disaster relief expenses factor are the only cost factors included in the calculation of the cost disabilities. All other expense disability factors are classified as expense use factors.

### Calculating the stock disability factor for the depreciation and investment categories

- 2 Table 21B-1 shows the expense use disabilities for each expense category that contribute to the non-roads investment stock disability factors. The final factors are discounted by 12.5 per cent and are a three year moving average of the stock disabilities.
- 3 Table 21B-2 shows the road use and length disabilities that contribute to the rural and urban roads investment stock disability factors. A 12.5 per cent discount is applied to the rural and urban roads stock factors. The final factors are a three year moving average of the stock disabilities.

### Weighting the category disability factors

- 4 Different weights have been used to combine stock and cost disabilities for the investment and depreciation assessments. For the Investment category, depreciation weights have been used to combine the stock disabilities and investment weights have been used to combine the cost disabilities. The weights are shown in Table 21B-3.
- 5 For the Depreciation category, depreciation weights have been used to combine stock disabilities and cost disabilities. The depreciation weights applied to the stock and cost disabilities are shown in Table 21B-4.

### Stock and cost disabilities factors used in the calculation of assessed non-roads investment, assessed roads investment and depreciation

- 6 Table 21B-5 shows how the depreciation weighted stock disability factors have been calculated for the non-roads investment component of the Investment category for 2008-09.
- 7 Table 21B-6 shows how the depreciation weighted stock disabilities have been calculated for the Depreciation category for 2008-09.
- 8 Table 21B-7 shows the rural and urban roads stock and cost disabilities used in the calculation of assessed roads investment in the Investment category for 2008-09.
- 9 Table 21B-8 shows how the investment weighted cost factors have been calculated for non-roads investment component of the Investment category for 2008-09.

- 10 Table 21B-9 shows how the depreciation weighted cost disabilities have been calculated for the Depreciation category for 2008-09.

**Table 21B-1 Expense use disabilities used to construct the non-road investment stock disability factors**

Expense disability	Treatment in stock disability calculation
<b>Schools education (20.1% depreciation weight) (a)</b>	
Socio-demographic composition	SDC and SDS factors are compounded and the service expenses component weight is applied to the resulting factor.
Service delivery scale	
Transport	The transport component weight is applied to the transport factor.
Administrative scale	The administrative scale expense proportion is applied to the administrative scale factor.
<b>Post-secondary education (4.7% depreciation weight)</b>	
Socio-demographic composition	SDC and cross-border factors are compounded and the service expenses component weight is applied to the resulting factor.
Cross-border	
Administrative scale	The other expenses component weight is applied to the administrative scale factor.
<b>Admitted patients (17.9% depreciation weight)</b>	
Socio-demographic composition	The service expenses component weight is applied to the SDC factor.
Administrative scale	The other expenses component weight is applied to the administrative scale factor.
<b>Community and other health (7.6% depreciation weight)</b>	
Socio-demographic composition	SDC, cross-border and SDS factors are compounded and the service expenses component weight is applied to the resulting factor.
Cross-border	
Service delivery scale	The other expenses component weight is applied to the administrative scale factor.
Administrative scale	
<b>Welfare and housing (5.6% depreciation weight) (b)</b>	
Socio-demographic composition	SDC, cross-border and SDS factors are compounded and the service expenses component weight is applied to the resulting factor.
Cross-border	
Service delivery scale	The actual expense proportions are applied to the native title and land rights factor and administrative scale factor. The resulting factors are summed to obtain the other expenses component factor. The other expenses component weight is applied to component factor.
Native title and land rights	
Administrative scale	
<b>Services to communities (2.4% depreciation weight)</b>	
Protection of the environment	The protection of the environment, water subsidy, electricity subsidy, concessions, community development and community amenities factors are already weighted by the proportion of component expenses to which they relate. Therefore these factors are summed and the service expenses component weight is applied to the resulting factor.
Water subsidy	
Electricity subsidy	
Concessions	
Community development	
Community amenities	The actual expense proportions are applied to the native title and land rights factor and administrative scale factor. The resulting factors are summed. The other expenses component weight is applied to the resulting component factor.
Native title and land rights	
Administrative scale	

**Table 21B-1 Expense use disabilities used to construct the non-road investment stock disability factors (continued)**

Expense disability	Treatment in stock disability calculation
<b>Justice services (13.0% depreciation weight)</b>	
Socio-demographic composition	SDC, Cross-border and SDS factors are compounded and the service expenses component weight is applied to the resulting factor.
Service delivery scale	
Native title and land rights	The actual expense proportions are applied to the native title and land rights factor and administrative scale factor. The resulting factors are summed.
Administrative scale	The other expenses component weight is applied to the resulting component factor.
<b>Transport (2.9% depreciation weight)</b>	
Urban operating subsidy	The urban operating subsidy factor, non-urban subsidy factor and capital subsidy (EPC) are already weighted by the proportion of component expenses to which they relate. Therefore, these factors are summed and the service expenses component weight is applied to the resulting component factor.
Non-urban subsidy	
Capital subsidy	
Administrative scale	The other expenses component weight is applied to the administrative scale factor.
<b>Services to industry (4.3% depreciation weight)</b>	
Economic environment	The service expenses component weight is applied to the economic environment factor.
Native title and land rights	The actual expense proportions are applied to the native title and land rights factor and administrative scale factor. The resulting factors are summed.
Administrative scale	The other expenses component weight is applied to the resulting component factor.
<b>Other expenses (21.4% depreciation weight) (c)</b>	
Cross-border	The service expenses component weight is applied to the cross-border factor.
Culturally and linguistically diverse (CALD) disabilities	The CALD component weight is applied to the disability factor for this component.
National capital	The actual expense proportions are applied to the national capital factor, native title and land rights factor and administrative scale factor. The resulting factors are summed. The other expenses component weight is applied to the resulting component factor.
Native title and land rights	
Administrative scale	
Miscellaneous expenses	The miscellaneous expenses component weight is applied to the EPC factor for this component.

- (a) Non-government school NPP not included in the calculation of the Schools category component for the stock disability factor. These payments are assessed on an actual per capita (APC) basis.
- (b) Remote Indigenous housing NPP is not included in the calculation for the Welfare and housing category component for the stock disability factor. These payments are assessed on an APC basis.
- (c) In Other expenses, the transitional superannuation expenses factor is excluded from the calculation of the capital stock disability factor. Transitional superannuation expenses are excluded because they do not influence the quantity or cost of infrastructure. Natural disaster relief disability is a cost factor. It impacts State investment but has no impact on State stocks of infrastructure.

Source: Commission calculation.

**Table 21B-2 Road length and use disability factors used to construct the road stock disability factors**

<b>Rural roads</b>	
Rural road length	The rural road length, rural traffic volume, rural heavy vehicle use and bridges (EPC) factors are weighted using NTC capital expenditure data. Therefore, these factors are summed and the service expenses component weight is applied to the resulting factor.
Rural traffic volume	
Rural heavy vehicle use	
Bridges	
National capital	The actual expense proportions are applied to the national capital factor, native title and land rights factor and the administrative scale factor. The resulting factors are summed to provide a component factor. The other expenses component weight is applied to the component factor.
Native title and land rights	
Administrative scale	
<b>Urban roads</b>	
Urban road length	The urban road length, urban traffic volume, urban heavy vehicle use and bridges (EPC) factors are weighted using NTC capital expenditure data. Therefore, these factors are summed and the service expenses component weight is applied to the resulting factor.
Urban traffic volume	
Urban heavy vehicle use	
Bridges	
National capital	The actual expense proportions are applied to the national capital factor, native title and land rights factor and the administrative scale factor. The resulting factors are summed to provide a component factor. The other expenses component weight is applied to the component factor.
Native title and land rights	
Administrative scale	

Source: Commission calculation.

**Table 21B-3 Weights for combining non-roads stock and cost disabilities for the non-roads investment assessment, 2008-09**

Category	Depreciation weight (a)	Investment weight (b)
Schools education	20.1	17.7
Post secondary education	4.7	3.3
Admitted patients	17.9	-7.4
Community and other health	7.6	19.0
Welfare and housing services	5.6	8.7
Services to communities	2.4	-3.0
Justice services	13.0	11.9
Transport services	2.9	17.6
Services to industry	4.3	10.0
Other expenses	21.4	22.1
<b>Total</b>	<b>100.0</b>	<b>100.0</b>

(a) Used to combine stock disabilities for the non-roads investment assessment.

(b) Used to combine cost disabilities for the non-roads investment assessment.

Source: ABS GFS data.

**Table 21B-4 Weights for combining stock and cost disabilities for the Depreciation category, 2008-09**

Category	Depreciation weight
Schools education	13.5
Post secondary education	3.1
Admitted patients	12.0
Community and other health	5.1
Welfare and housing services	3.7
Services to communities	1.6
Justice services	8.7
Roads	33.2
Transport services	1.9
Services to industry	2.9
Other expenses	14.3
<b>Total</b>	<b>100.0</b>

Source: ABS GFS data.

**Table 21B-5 Calculation of depreciation weighted non-road stock disability factors for the non-road investment assessment, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
<b>Unweighted stock disability factors by category (a)</b>									
Schools education	0.99079	0.93107	1.05053	1.03243	0.98432	1.14337	0.91747	1.56674	1.00000
Post secondary education	0.98008	0.96590	1.00315	1.03492	0.98250	1.03033	1.28335	1.66325	1.00000
Admitted patients	0.99520	0.96298	0.99647	0.98490	1.10039	1.11587	0.79678	1.59540	1.00000
Community and other health	0.89313	0.96222	1.03078	1.20765	0.97593	1.21065	1.18968	2.04250	1.00000
Welfare and housing services	0.98770	0.90752	1.01350	0.96515	1.13543	1.28246	0.75700	2.46956	1.00000
Services to communities	0.90776	0.83375	1.06491	1.23846	1.08119	0.80644	0.68414	4.65085	1.00000
Justice services	0.97245	0.88759	1.04062	1.05514	0.99284	1.13955	1.02632	2.94601	1.00000
Transport services	1.05914	1.10078	0.93246	0.92892	0.90075	0.61449	0.82488	0.58085	1.00000
Services to industry	0.96072	0.96703	1.00217	1.07397	1.08432	1.16244	0.96597	1.34139	1.00000
Other expenses	0.98526	0.98693	0.98264	1.00965	1.01341	1.10484	1.23044	1.33346	1.00000
<b>Weighted stock disability factors by category (b)</b>									
Schools education	0.19953	0.18751	0.21156	0.20792	0.19823	0.23026	0.18477	0.31552	0.20139
Post secondary education	0.04615	0.04548	0.04724	0.04873	0.04627	0.04852	0.06043	0.07832	0.04709
Admitted patients	0.17858	0.17280	0.17880	0.17673	0.19745	0.20023	0.14297	0.28628	0.17944
Community and other health	0.06809	0.07336	0.07858	0.09207	0.07440	0.09230	0.09070	0.15571	0.07624
Welfare and housing services	0.05483	0.05038	0.05626	0.05358	0.06303	0.07120	0.04202	0.13710	0.05551
Services to communities	0.02220	0.02039	0.02604	0.03029	0.02644	0.01972	0.01673	0.11373	0.02445
Justice services	0.12657	0.11553	0.13545	0.13734	0.12923	0.14832	0.13359	0.38345	0.13016
Transport services	0.03036	0.03156	0.02673	0.02663	0.02582	0.01762	0.02365	0.01665	0.02867
Services to industry	0.04150	0.04178	0.04329	0.04640	0.04684	0.05022	0.04173	0.05795	0.04320
Other expenses	0.21070	0.21106	0.21014	0.21591	0.21672	0.23627	0.26313	0.28516	0.21385
Weighted stock factor	0.97852	0.94983	1.01410	1.03559	1.02443	1.11465	0.99972	1.82988	1.00000
Discounted and smoothed stock factor	0.97946	0.95669	1.01297	1.03324	1.02106	1.10115	1.00586	1.72512	1.00000

(a) Rescaled category specific stock factors.

(b) Expense use disabilities have been weighted using depreciation data. The depreciation weights are shown in Table 21B-3.

Source: Commission calculation.

**Table 21B-6 Calculation of depreciation weighted stock disability factors for the Depreciation category, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
<b>Unweighted stock disability factors by category (a)</b>									
Schools education	0.99079	0.93107	1.05053	1.03243	0.98432	1.14337	0.91747	1.56674	1.00000
Post secondary education	0.98008	0.96590	1.00315	1.03492	0.98250	1.03033	1.28335	1.66325	1.00000
Admitted patients	0.99520	0.96298	0.99647	0.98490	1.10039	1.11587	0.79678	1.59540	1.00000
Community and other health	0.89313	0.96222	1.03078	1.20765	0.97593	1.21065	1.18968	2.04250	1.00000
Welfare and housing services	0.98770	0.90752	1.01350	0.96515	1.13543	1.28246	0.75700	2.46956	1.00000
Services to communities	0.90776	0.83375	1.06491	1.23846	1.08119	0.80644	0.68414	4.65085	1.00000
Justice services	0.97245	0.88759	1.04062	1.05514	0.99284	1.13955	1.02632	2.94601	1.00000
Rural roads	0.80453	0.71205	1.13930	1.50444	1.27305	1.04526	0.31614	5.41414	1.00000
Urban roads	0.99198	1.02311	1.01568	1.00012	0.90917	0.99738	1.17400	0.78011	1.00000
Transport services	1.05914	1.10078	0.93246	0.92892	0.90075	0.61449	0.82488	0.58085	1.00000
Services to industry	0.96072	0.96703	1.00217	1.07397	1.08432	1.16244	0.96597	1.34139	1.00000
Other expenses	0.98526	0.98693	0.98264	1.00965	1.01341	1.10484	1.23044	1.33346	1.00000
<b>Weighted stock disability factors by category (b)</b>									
Schools education	0.13331	0.12528	0.14135	0.13892	0.13244	0.15384	0.12345	0.21081	0.13455
Post secondary education	0.03084	0.03039	0.03156	0.03256	0.03091	0.03242	0.04038	0.05233	0.03146
Admitted patients	0.11931	0.11545	0.11947	0.11808	0.13192	0.13378	0.09552	0.19127	0.11989
Community and other health	0.04549	0.04901	0.05250	0.06151	0.04971	0.06167	0.06060	0.10404	0.05094
Welfare and housing services	0.03664	0.03366	0.03759	0.03580	0.04211	0.04757	0.02808	0.09160	0.03709
Services to communities	0.01483	0.01362	0.01740	0.02023	0.01766	0.01318	0.01118	0.07599	0.01634
Justice services	0.08457	0.07719	0.09050	0.09176	0.08634	0.09910	0.08925	0.25620	0.08696
Rural roads	0.16020	0.14178	0.22686	0.29957	0.25349	0.20813	0.06295	1.07807	0.19912
Urban roads	0.13168	0.13581	0.13483	0.13276	0.12069	0.13240	0.15584	0.10356	0.13275
Transport services	0.02029	0.02108	0.01786	0.01779	0.01725	0.01177	0.01580	0.01112	0.01915
Services to industry	0.02773	0.02791	0.02893	0.03100	0.03130	0.03355	0.02788	0.03872	0.02886
Other expenses	0.14077	0.14101	0.14040	0.14426	0.14480	0.15786	0.17581	0.19053	0.14288
Weighted stock factor	0.94566	0.91221	1.03924	1.12424	1.05864	1.08527	0.88674	2.40423	1.00000
Discounted and smoothed stock factor	0.95207	0.92518	1.03436	1.10749	1.04852	1.07536	0.91121	2.20677	1.00000

(a) Rescaled category specific stock factors.

(b) Expense use disabilities have been weighted using depreciation expenses by category. The depreciation weights are shown in Table 21B-4.

Source: Commission calculation.

**Table 21B-7 Road stock and cost disability factors for the road investment assessment, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
<b>Road stock disability factors</b>									
Rural roads	0.78078	0.67186	1.15468	1.56415	1.32111	1.05924	0.21230	6.02768	1.00000
Urban roads	0.99412	1.02667	1.01437	0.99420	0.89989	1.00109	1.19306	0.73972	1.00000
<b>Discounted and smoothed road stock factors</b>									
Rural roads	0.80453	0.71205	1.13930	1.50444	1.27305	1.04526	0.31614	5.41414	1.00000
Urban roads	0.99198	1.02311	1.01568	1.00012	0.90917	0.99738	1.17400	0.78011	1.00000
<b>Road cost factor</b>	<b>1.01310</b>	<b>0.98175</b>	<b>0.99928</b>	<b>1.03302</b>	<b>0.99380</b>	<b>0.96978</b>	<b>0.83435</b>	<b>1.08458</b>	<b>1.00000</b>

Note: These factors are applied to rural and urban roads stock in the calculation of assessed roads investment. To obtain a combined roads stock factor the discounted and smoothed factors should be weighted 60 per cent for rural roads and 40 per cent for urban roads.

Source: Commission calculation.

**Table 21B-8 Calculation of investment weighted cost factors for the non-road investment assessment, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
<b>Unweighted cost disability factors by category</b>									
Schools education	1.01201	0.98989	0.98430	1.01748	0.98865	0.97709	1.02463	1.09272	1.00000
Post secondary education	1.01696	0.99119	0.98021	1.01134	0.98662	0.97543	1.03305	1.05070	1.00000
Admitted patients	1.01603	0.99159	0.98121	1.01086	0.98735	0.97713	1.03161	1.04906	1.00000
Community and other health	1.00947	0.96926	1.03033	1.19741	0.96397	1.20394	1.20387	1.93289	1.00000
Welfare and housing services	1.00183	0.98242	0.99989	1.02699	0.99240	0.99152	0.99658	1.18090	1.00000
Services to communities	1.00941	0.83376	1.06515	1.23861	1.08117	0.80646	0.68423	4.64517	1.00000
Justice services	1.00936	0.96959	0.99644	1.04169	0.98305	0.97516	0.99560	1.28023	1.00000
Transport services	1.01159	0.99380	0.98630	1.00805	0.99085	0.98391	1.02334	1.03694	1.00000
Services to industry	1.01179	0.99347	0.98584	1.00856	0.99068	0.98451	1.02468	1.04042	1.00000
Other expenses	0.99773	1.01193	1.00300	0.99118	0.97644	0.97501	0.98903	1.05727	1.00000
<b>Weighted cost disability factors by category (a)</b>									
Schools education	0.17962	0.17569	0.17470	0.18059	0.17547	0.17342	0.18186	0.19394	0.17748
Post secondary education	0.03365	0.03280	0.03244	0.03347	0.03265	0.03228	0.03418	0.03477	0.03309
Admitted patients	-0.07473	-0.07293	-0.07217	-0.07435	-0.07262	-0.07187	-0.07587	-0.07716	-0.07355
Community and other health	0.19138	0.18571	0.18796	0.19536	0.18703	0.18543	0.19125	0.22621	0.18959
Welfare and housing services	0.08724	0.08555	0.08707	0.08943	0.08642	0.08634	0.08678	0.10283	0.08708
Services to communities	-0.03052	-0.02983	-0.03046	-0.03159	-0.03028	-0.02575	-0.02284	-0.03464	-0.03024
Justice services	0.12047	0.11573	0.11893	0.12433	0.11733	0.11639	0.11883	0.15280	0.11936
Transport services	0.17836	0.17522	0.17390	0.17773	0.17470	0.17348	0.18043	0.18283	0.17631
Services to industry	0.10155	0.09971	0.09894	0.10122	0.09943	0.09881	0.10284	0.10442	0.10036
Other expenses	0.22001	0.22314	0.22117	0.21856	0.21531	0.21500	0.21809	0.23314	0.22051
<b>Weighted cost factor</b>	<b>1.00703</b>	<b>0.99079</b>	<b>0.99248</b>	<b>1.01476</b>	<b>0.98544</b>	<b>0.98353</b>	<b>1.01556</b>	<b>1.11914</b>	<b>1.00000</b>

(a) For the investment assessment, cost disabilities have been weighted using investment. The weights are shown in Table 21B-3.

Source: Commission calculation.

**Table 21B-9 Calculation of depreciation weighted cost factors for the Depreciation category, 2008-09**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Average
<b>Unweighted stock disability factors by category</b>									
Schools education	1.01201	0.98989	0.98430	1.01748	0.98865	0.97709	1.02463	1.09272	1.00000
Post secondary education	1.01696	0.99119	0.98021	1.01134	0.98662	0.97543	1.03305	1.05070	1.00000
Admitted patients	1.01603	0.99159	0.98121	1.01086	0.98735	0.97713	1.03161	1.04906	1.00000
Community and other health	1.00947	0.97954	0.99144	1.03045	0.98653	0.97806	1.00879	1.19320	1.00000
Welfare and housing services	1.00183	0.98242	0.99989	1.02699	0.99240	0.99152	0.99658	1.18090	1.00000
Services to communities	1.00941	0.98650	1.00745	1.04465	1.00153	0.85155	0.75525	1.14580	1.00000
Justice services	1.00936	0.96959	0.99644	1.04169	0.98305	0.97516	0.99560	1.28023	1.00000
Roads	1.01310	0.98175	0.99928	1.03302	0.99380	0.96978	0.83435	1.08458	1.00000
Transport services	1.01159	0.99380	0.98630	1.00805	0.99085	0.98391	1.02334	1.03694	1.00000
Services to industry	1.01179	0.99347	0.98584	1.00856	0.99068	0.98451	1.02468	1.04042	1.00000
Other expenses	0.99773	1.01193	1.00300	0.99118	0.97644	0.97501	0.98903	1.05727	1.00000
<b>Weighted stock disability factors by category (a)</b>									
Schools education	0.13617	0.13319	0.13244	0.13691	0.13303	0.13147	0.13787	0.14703	0.13455
Post secondary education	0.03200	0.03119	0.03084	0.03182	0.03104	0.03069	0.03250	0.03306	0.03146
Admitted patients	0.12181	0.11888	0.11764	0.12119	0.11837	0.11715	0.12368	0.12577	0.11989
Community and other health	0.05142	0.04989	0.05050	0.05249	0.05025	0.04982	0.05138	0.06078	0.05094
Welfare and housing services	0.03716	0.03644	0.03709	0.03809	0.03681	0.03678	0.03696	0.04380	0.03709
Services to communities	0.01649	0.01612	0.01646	0.01707	0.01636	0.01391	0.01234	0.01872	0.01634
Justice services	0.08778	0.08432	0.08665	0.09059	0.08549	0.08480	0.08658	0.11133	0.08696
Roads	0.33621	0.32581	0.33163	0.34283	0.32981	0.32184	0.27690	0.35994	0.33187
Transport services	0.01937	0.01903	0.01889	0.01931	0.01898	0.01884	0.01960	0.01986	0.01915
Services to industry	0.02920	0.02868	0.02846	0.02911	0.02859	0.02842	0.02958	0.03003	0.02886
Other expenses	0.14256	0.14459	0.14331	0.14162	0.13951	0.13931	0.14131	0.15106	0.14288
Weighted cost factor	1.01017	0.98814	0.99390	1.02102	0.98825	0.97303	0.94870	1.10138	1.00000

(a) For the depreciation assessment, expense category cost disabilities have been weighted using depreciation data. The depreciation weights are shown in Table 21B-4.

Source: Commission calculation.

## APPENDIX 21C: COMBINING ROADS STOCK FACTORS

- 1 This appendix describes the derivation of the expenditure weights used to combine the disability factors for the roads investment assessment.
- 2 The chapter on the Roads assessment describes the method in detail. The method is based on the work of the National Transport Commission (NTC), in which it apportions road expenses reported to it by the States into those attributable to road use and those which are not. It also allocates attributable costs to different classes of use, such as traffic.
- 3 States report expenses to the NTC in a range of categories. For the purposes of the investment assessment, we have used only the capital-related expenditures to derive investment expenditure weights. These are: pavement improvements (NTC category F1); bridge improvements (category F2); and land acquisition, earthworks, extensions (category F3).
- 4 Table 21C-1 shows the derivation of the expenditure weights for the roads disabilities in the investment assessment for 2008-09. Reported urban and rural expenses were allocated to the disabilities and the shares of total expenditure allocated to each disability are the weights the Commission used to combine State specific measures of disability to derive assessed State roads investment.
- 5 The weights suggest road length is a more important driver of road investment expenses than road use (measured using traffic volume and heavy vehicle use) because it affects 66.0 per cent of State capital expenditure, compared with 18 per cent for road use.
- 6 As discussed in the main body of this chapter, the expense weights used in the assessment are a six year average of the annual weights and are applied to urban and rural roads stocks separately. The final weights for combining urban and rural roads disability factors are shown in Table 21C-2. The urban roads disability factor is applied to urban road stock and the rural roads disability factor is applied to the rural roads stock.

**Table 21C-1 Weighting of Roads expense disabilities, 2008-09**

NTC Category	Disabilities								Expenses
	Urban road length	Urban traffic volume	Urban HV use	Urban bridges	Rural road length	Rural traffic volume	Rural HV use	Rural bridges	Total
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
<b>F1. Pavement improvements</b>									
Urban	721.9	0.0	590.6	0.0	0.0	0.0	0.0	0.0	1 312.5
Rural	0.0	0.0	0.0	0.0	339.4	0.0	277.7	0.0	617.1
<b>F2. Bridge improvements</b>									
Urban	0.0	0.0	0.0	570.2	0.0	0.0	0.0	0.0	570.2
Rural	0.0	0.0	0.0	0.0	0.0	0.0	0.0	565.9	565.9
<b>F3. Land acquisition, earthworks, extensions</b>									
Urban	2 392.7	265.9	0.0	0.0	0.0	0.0	0.0	0.0	2 658.5
Rural	0.0	0.0	0.0	0.0	1 194.7	132.7	0.0	0.0	1 327.4
<b>Total</b>	<b>3 114.5</b>	<b>265.9</b>	<b>590.6</b>	<b>570.2</b>	<b>1 534.0</b>	<b>132.7</b>	<b>277.7</b>	<b>565.9</b>	<b>7 051.6</b>
Disability weight (% of total expenses)	44.2	3.8	8.4	8.1	21.8	1.9	3.9	8.0	100.0

Note: The table includes only those expenses on capital items reported by States to the NTC.

Source: Commission analysis of NTC data.

**Table 21C-2 Rural and urban roads capital expenditure weights**

	Road length	Traffic volume	Heavy vehicle use	Bridges	Total
	%	%	%	%	%
<b>Raw expenditure weights (a)</b>					
Urban	42.3	3.6	8.3	6.7	60.9
Rural	26.4	2.3	4.9	5.5	39.1
<b>Final expenditure weights (a)</b>					
Urban	69.5	5.9	13.7	10.9	100.0
Rural	67.6	5.8	12.5	14.1	100.0

(a) The proportions are based on a six year average of disability weights derived using the allocation method shown in Table 21C-1.

Source: Commission analysis of NTC data.