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Northern Territory Infrastructure Investment Update

2016

Engineers Australia Infrastructure in the Northern Territory Report 2016

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NORTHERN TERRITORY

Infrastructure Investment Update 2016

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a sustainable world.*

Key points

The 2010 Engineers Australia Infrastructure Report Card (IRC) assessed the status of the Northern Territory's infrastructure as 'adequate but in need of major changes to cope with the future'. Since then, the development of the Northern Territory economy has expanded significantly as a result of the expansion of the oil and gas sector, as well as other aspects of the resources boom. The scale of investment in engineering construction in these industries has been extraordinary, nationally and in the context of the Territory economy.

The Territory recorded the highest construction levels on record in 2014-15, while the figures everywhere else in Australia make clear the resources construction boom is well and truly over.

Significant infrastructure development has been associated with direct construction of resources facilities, and the scale of construction has been exceptionally high by Territory standards.

Taken at face value, the scale of infrastructure development since 2010 suggests that the necessary 'major changes' identified in the 2010 IRC have occurred. This report will examine whether this is indeed the case. The report also examines trends in public sector infrastructure development to evaluate how events since 2010 compare to those between the 2005 and 2010 IRCs.

The analysis is based on Australian Bureau of Statistics (ABS) statistics on engineering construction statistics, which are reliable indicators of infrastructure development and construction completed on other engineering assets. While the statistics aren't ideal, they are the most reliable ones available. Government infrastructure agencies at all levels are responsible for improved infrastructure information and statistics. Engineers Australia has argued for better and more comprehensive infrastructure information as an integral part of greater transparency and community engagement in infrastructure discussions and decisions.

Engineers Australia believes infrastructure development is a crucial enabler of productivity growth. We know that productivity growth has been responsible for almost all historical improvements in Australia's living standards and the Australian

Treasury, among other reputable authorities, expect this to be the case in the future. Unless Australia becomes more productive living standards will stagnate or, more likely, fall as the population ages. Accordingly, this is an area of policy that all states and territories must actively pursue.

The Northern Territory has experienced above average economic growth and growth in living standards for some time. An important driver has been the extraordinary growth in and scale of resources sector construction, including on necessary supportive infrastructure. This report shows that despite the record level of construction in 2014-15, other indicators suggest that the Territory will not be an exception to the ending

The report finds that Northern Territory public sector infrastructure development during the five years since the 2010 IRC is almost identical to what occurred in the preceding five years.

of the resources sector construction boom. It does, however, have the advantage that the boom could persist a little longer than in other resources jurisdictions, creating a window for re-appraisal of generally accessible infrastructure. This is critical because general business and community benefits from resources sector infrastructure are too limited

to support the greater economic diversity needed for broader based future economic growth.

In contrast to private sector resources related infrastructure, public sector infrastructure development maximises accessibility by the business and general community. The report finds that Northern Territory public sector infrastructure development during the five years since the 2010 IRC is almost identical to what occurred in the preceding five years. The Territory economy is now 27.5 per cent larger and its population is 6.2 per cent larger. These results do not live up to the major changes recommended in the 2010 IRC and call into question whether there has been any improvement in the Territory's generally accessible infrastructure.

Engineers Australia believes the scale and pace of private sector resources sector construction, including associated infrastructure, is an important and indispensable facet of the Territory's development and economic growth. However, global conditions point to serious risks confronting many resources industries, including energy resources, and government focus on resources has limited attention on infrastructure issues beyond the resources sector. Consistent future growth requires greater economic diversity which in turn is dependent on the availability of infrastructure services to business and community generally. There has been considerable private sector construction in the Territory but because much of this is associated with increased construction on resources and heavy industry projects its contribution to productivity and economic growth will occur through the contribution of the related resource facility and not through economic activity generally.

The absence of a decisive trend in public sector infrastructure suggests that the major changes recommended in the 2010 IRC have not been made. As a result the territory's public sector infrastructure has at best maintained the status quo but could be experiencing heightened pressures from economic and population expansion. Its rating is confirmed in 2015 as adequate but in need of major changes to be fit for purpose.

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Introduction

Engineers Australia has drawn attention to problems with the Northern Territory's infrastructure in its *Infrastructure Report Cards (IRC)*, the first of which was released in 2005¹, then updated in 2010.

While there have been many infrastructure improvements in the past decade, Engineers Australia is far from convinced that governments have adequately dealt with the problems identified. This position is supported by a recent report on public infrastructure by the Productivity Commission², particularly in relation to infrastructure planning and governance.

The Commission also recently released an update on Australia's productivity progress³. In 2013-14, Australia's multi-factor productivity growth was 0.4 per cent compared to an average of 0.8 per cent per year between 1973-74 and 2013-14. Of the 12 market sector industries examined, six recorded increases in multi-factor productivity and six recorded falls. The report also emphasised that public infrastructure and its efficient provision was critical for productivity growth and repeated the recommendations it proposed in its infrastructure report, particularly those dealing with governance arrangements. This included processes dealing with project selection, project financing and ongoing operations.

In January 2013 the Territory Government established the Northern Territory Planning Commission to manage anticipated growth and to proactively set the strategic framework for better integrated land use, transport and infrastructure planning. The Commission is an independent advisory body that develops plans and planning policies and provides advice to Government on significant developments⁴. Infrastructure issues are also dealt with by the Northern Territory Department of Lands and Planning which has issued a 10 year infrastructure strategy describing key parameters for infrastructure development and current trends in infrastructure investment⁵. Documents accessed on the web sites of these agencies are fairly descriptive with comparatively little hard statistical information.

Engineers Australia's last assessment of the status of the Territory's infrastructure was in 2010. This indicated that the territory's infrastructure at the time was just adequate to cope with current and future requirements. In the five years to June 2015, the Territory economy expanded by 27.5 per cent and its population has increased by 8.3 per cent in the past five years. Both changes signal that more infrastructure services were needed simply to maintain the status quo. The key question is whether status quo is good enough? When productivity growth is low and infrastructure is just adequate, are the pre-conditions for improved standards of living in place?

While there have been many infrastructure improvements in the past decade, Engineers Australia is far from convinced that governments have adequately dealt with the problems identified.

1 Productivity Commission, Public Infrastructure Inquiry Report, No 71, May 2014, www.pc.gov.au

2 See <https://www.engineersaustralia.org.au/infrastructure-report-card>

3 Productivity Commission, Productivity Update, July 2015, www.pc.gov.au

4 See www.planningcommission.nt.gov.au

5 See www.dlp.nt.gov.au Building the Future, the Northern Territory Government's Ten Year Infrastructure Strategy

Engineers Australia's Principles for Infrastructure Development

Engineers Australia is committed to the view that infrastructure is the essential enabler of productivity growth, vital to preserve our current standard of living. This argument applies equally at state, territory and national levels.

To be effective, infrastructure must be fit for purpose, and the flow of infrastructure services needs to move ahead of population growth and economic growth. It should also use the best available technology to manage existing infrastructure assets and to develop new ones.

Any new infrastructure development should encompass the following principles:

- *Infrastructure must be managed to advance socio-economic goals not political ones.*
- *Infrastructure planning without land use planning is not sensible.*
- *Infrastructure planning is not optional – it is an integral role of government.*
- *The private sector is a key player, which means infrastructure is not the exclusive preserve of governments.*
- *Infrastructure must be managed sustainability and over its full expected life.*
- *Infrastructure governance must be rigorous and be removed from political agenda.*
- *ICT-enabled infrastructure delivers more value for money, especially in coordinated system.*
- *Short-term acquisition practices should be discarded in favour of whole of life considerations.*

The state of infrastructure in the Northern Territory

OUR APPROACH AND RESEARCH DATA

Infrastructure has been very topical in the Territory in recent years. There has been considerable institutional change with the formation of Territory Planning Commission and government decisions to reform some government agencies responsible for infrastructure and its delivery. Politicians are naturally inclined to highlight the progress made and this has added to the perception that a lot is going on.

But the perennial problem when it comes to infrastructure is objective information. In its recent report on Public Infrastructure, the Productivity Commission experienced difficulties and resorted to a patchwork of available statistics.

We're still lacking contemporary information about the status of existing infrastructure, how well it is delivering services and whether or not the flow of services is keeping up with population and economic growth. Reliance on rigorous quantitative assessments of new project proposals remains an uncertain business, and remnants of the common 'statues and edifies' approach can still be found.

This report puts contemporary developments in the Northern Territory into perspective by looking at Australian Bureau of Statistics (ABS) data on engineering construction. This data provides reliable and objective measures for:

- On-the-ground progress of infrastructure projects
- How much engineering construction has been completed
- What remains in the system
- What new work has commenced.

These statistics relate to additions to the infrastructure stock through work completed on new infrastructure assets. The ABS protocols differentiate the statistics from financial figures that appear in budgets and news accounts. As these protocols are applied consistently over

time, the resulting trends are reliable indicators of infrastructure changes.

Changes since 2010, the year of the last Engineers Australia infrastructure assessment, are compared to the long-term trends, and developments in the most recent year. The period examined is from June 1991 to June 2015.

Historically, governments primarily developed Australia's infrastructure with nearly all work undertaken by public sector agencies. Gradually, more and more work was contracted to private sector businesses for implementation. There is now increasing private sector involvement in

There has been considerable institutional change with the formation of Territory Planning Commission and government decisions to reform some government agencies responsible for infrastructure and its delivery.

the development, ownership and delivery of infrastructure services through new financial arrangements. Some governments have chosen to privatise certain infrastructure assets along with the ongoing responsibility for new investment in these infrastructure assets. These developments mean that it is no longer sufficient to monitor trends in public sector engineering construction.

In this report we use the Infrastructure Australia definition of economic infrastructure. This includes roads, bridges, railways, harbours, the

electricity sector, the water and sewerage sector, and telecommunications assets. It is debateable whether or not recreational facilities should also be included, but in this report they are not. Changes in engineering construction on resources sector facilities, heavy industry and uncategorised activities are also briefly examined to establish a basis for judging the connection between so-called resources-related activity and changes in conventional infrastructure. In all asset classes examined, the trends in public and private sector activity are compared. All statistics have been deflated and are expressed in constant 2012-13 prices.

Unfortunately, ABS statistics do not delineate between cities in each state, so this report will analyse the state as a whole. Also the statistics do not delineate the infrastructure connecting cities and supporting specific economic projects. This means private sector engineering construction designed to service mines, gas and oil wells, and other resources facilities are compounded with statistics relating to private sector engineering construction on more conventional infrastructure. In states where this type of private sector activity is high, the best measures of infrastructure development are public sector trends with qualitative assessments of private sector trends as a supplement.

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The Northern Territory in context

The Northern Territory's GDP increased by 136.4 per cent from \$9.5 billion in June 1991 to \$22.5 billion in June 2015; the Territory's population increased by 47.4 per cent, from 165,493 to 243,911 and the standard of living, as measured by GDP per person, increased by 60.0 per cent from \$57,533 per person to \$92,107 per person, second only to WA. How these changes occurred and how they compare to Australia as a whole is examined in Table 1. In this Table 2005-06 to 2014-15 corresponds to the period since the first IRC and 2010-11 to the period since the last IRC.

In June 1991, the Northern Territory's gross product was 1.3 per cent of national gross product and its population was 0.96 per cent of the national population. The Territory's standard of living was 30.1 per cent higher than the national average; \$57,533 per person compared to \$44,155 per person. Over the long term, Territory economic growth has been higher than at national level so that the Territory's share of GDP increased to 1.4 per cent. Until recently, Territory population growth was higher than national growth. The opposite has occurred

since 2010. However, the strength of Territory economic growth has meant consistent increases in the Territory's standard of living so that in 2014-15 it was 34.2 per cent higher than the national figure of \$68,609 per person.

The Territory's economy has performed much better than the national economy for a long time and there is no sign of the slowdown in growth observed at the national level. However, national and international indicators suggest that the global commodities boom is now over. Although the effects are not yet evident in the Territory, it is unlikely that the Territory will be able to avoid the consequential fallout. The benefit of the delayed reaction is that Territory authorities have more time to plan for the necessary economic adjustment. Engineers Australia believes that the lynchpin for adjustment must be productivity growth achieved through investment in enabling economic infrastructure. The Intergenerational Reports have demonstrated the critical connection between productivity growth and growth in GDP per person.

An added benefit of current economic growth is that

government revenue is sufficient to fund adjustment policies.

Infrastructure development should anticipate the future demand for infrastructure services. While just in time management is common in consumer logistics, its application to infrastructure means that infrastructure can be a barrier rather than an enabler for productivity growth. A key determinant of the demand for infrastructure is population growth. Projections of the future are usually fraught, but within well-known limitations the ABS has prepared projections of Australia's future population in states and territories and in each capital city⁶. These projections suggest that by 2030, well within the lives of many current infrastructure assets, the Territory's population will increase by 25.6 per cent to 312,429. In many other jurisdictions, most population growth is expected to be in capital cities. In the Territory, 46.2 per cent of the increase is expected to occur in Darwin and the remainder throughout other towns and settlements. This pattern means that the distribution of infrastructure development will be as important to the Territory as its quantum.

TABLE 1: USEFUL GROWTH BENCHMARK STATISTICS (AVERAGE ANNUAL %)

Location	NT			Australia		
	Period	GDP	GDP/Person	Population	GDP	GDP/Person
1990-91 to 2014-15	3.7	2.1	1.7	3.2	1.9	1.3
2005-06 to 2014-15	4.2	2.3	1.7	2.8	1.1	1.7
2010-11 to 2014-15	5.0	3.6	1.2	2.6	1.1	1.6
2014-15	10.5	10.1	-0.1	2.5	0.8	1.4

⁶ ABS, Population Projections, Australia, 2012 to 2101, November 2013, Cat No 3222.0, www.abs.gov.au

Trends in Engineering Construction

In 1990-91, 86.4 per cent of the Northern Territory’s engineering construction was undertaken by the public sector which completed \$218.7 million of work compared to \$34.5 million by the private sector. Figure 1 shows that this relationship predominated until about 2000-01 when there was a large step-wise increase in private sector construction. This graph shows the extraordinary construction levels that have dominated Territory policy discussions. To fully appreciate these events, disaggregation is essential.

Our initial disaggregation is by sector and within each sector according to whether construction is economic infrastructure or not. Figure 2 shows cumulative trends for the Northern Territory public sector and Table 2 provides detailed statistics. There are three points to note in this illustration:

- In constant prices terms, Northern Territory public sector infrastructure construction has not

increased; in 1990-91, it was \$218.7 million and in 2014-15, \$209.9 million. There have been several peaks, as high as \$274.4 million in 1994-95 and a similar level in 2010-11, but most peaks were followed by much lower activity, the most recent in 2012-13 with \$131.3 million.

- Northern Territory public sector infrastructure construction is highly variable. This degree of variability creates difficulties for maintaining skilled work forces and this contributes to periodic skill shortages.
- The bulk of Territory public sector engineering construction is economic infrastructure with very low levels of construction on other components. This is not entirely unexpected so far as resources and heavy industry construction, but public sector construction on recreational facilities is also covered by this comment.

FIGURE 1: CUMULATIVE PRIVATE AND PUBLIC SECTOR ENGINEERING CONSTRUCTION, NORTHERN TERRITORY, 1990-91 TO 2014-15

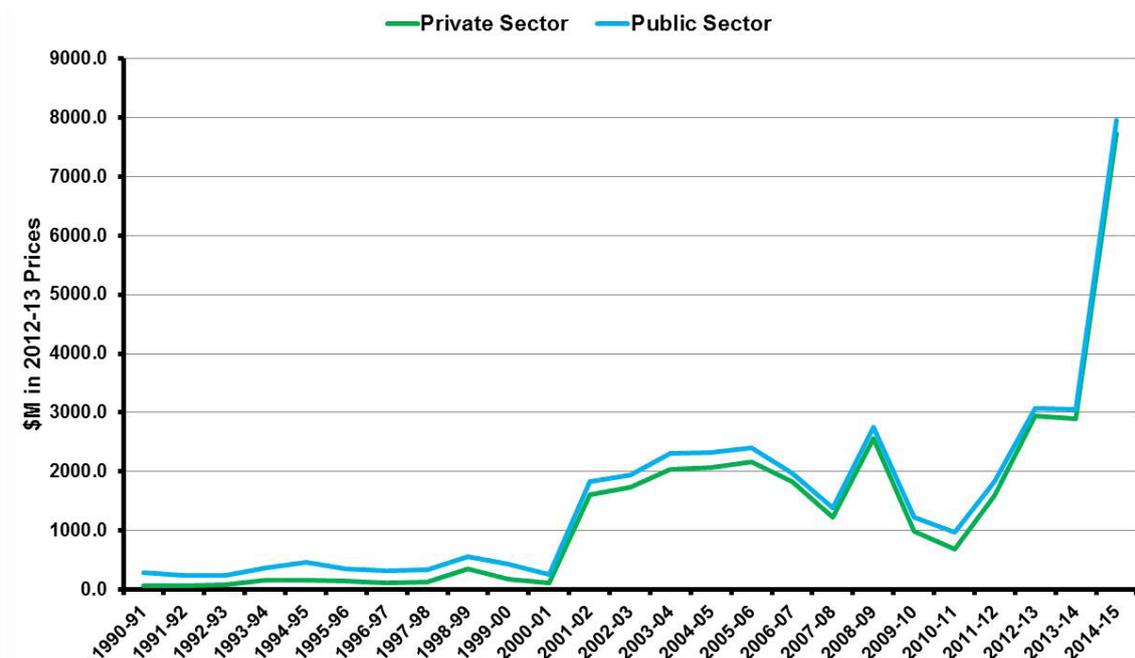
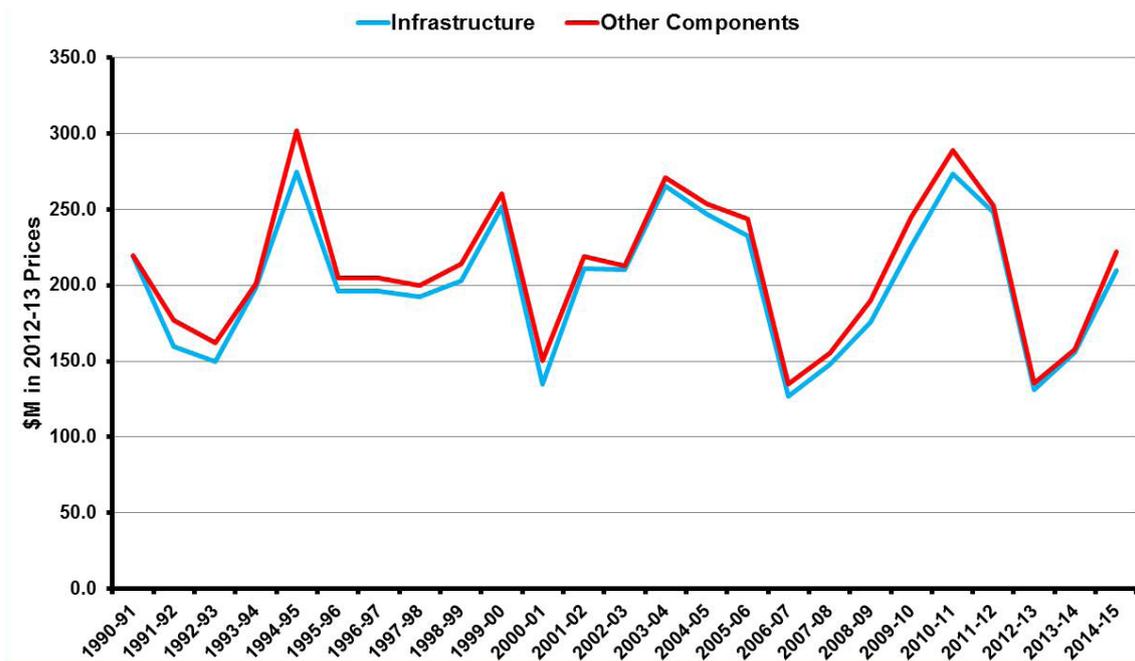


Figure 3 illustrates cumulative Northern Territory private sector trends in engineering construction and detailed statistics are given in Table 3. There are three points illustrated here:

- There has been a seismic shift in private sector engineering construction in the Northern Territory. In 1990-91, it was just 13.6 per cent of Territory engineering construction and this has now changed dramatically so that in 2014-15, public sector engineering construction was just 2.8 per cent of Territory construction.
- The increase in private sector engineering construction evident from Figure 1 was mainly from the non-infrastructure components of engineering construction. This conclusion extends to the strong burst of construction completed in 2014-15.
- There was two notable periods of higher infrastructure construction: first, between 2001 and 2005 and second, a rising trend in infrastructure construction beginning about 2011 and still continuing.
- Private sector engineering construction on infrastructure facilities specifically required to support resources sector facilities are included in private sector infrastructure statistics. Thus, construction of a mine is included in engineering construction on the resources sector, but construction of the rail line to haul ore from mine to port and the construction of the port facilities are included in the appropriate infrastructure asset category in Table 3.

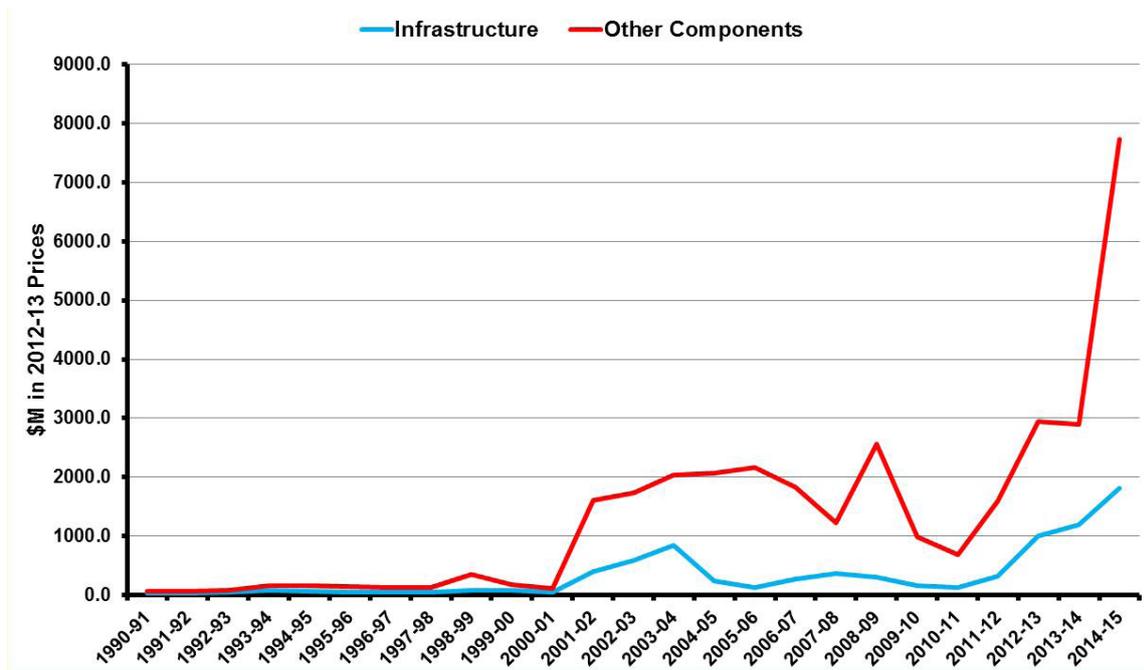
FIGURE 2: TRENDS IN THE MAIN COMPONENTS OF PUBLIC SECTOR ENGINEERING CONSTRUCTION, NORTHERN TERRITORY, 1990-91 TO 2014-15



Although the mine related infrastructure is essential and contributes to overall economic growth, this type of infrastructure is differentiated from more conventional infrastructure by accessibility to the infrastructure services provided. Infrastructure specifically built to service a mine typically has limited accessible because it is located where the infrastructure service is required. Such a rail line is unlikely to provide commuter transit. Conventional infrastructure, on the other hand, is generally located to maximise the provision of infrastructure services to business and the community at large. Some private sector infrastructure is of course analogous to public sector infrastructure, for example, the Alice Springs to Darwin railway. However, it is important to bear in mind that infrastructure spill-overs from the resources boom overstate private sector infrastructure statistics.

Infrastructure specifically built to service a mine typically has limited accessible because it is located where the infrastructure service is required.

FIGURE 3: TRENDS IN THE MAIN COMPONENTS OF PRIVATE SECTOR ENGINEERING CONSTRUCTION, NORTHERN TERRITORY, 1990-91 TO 2014-15



**TABLE 2: PUBLIC SECTOR ENGINEERING CONSTRUCTION ON INFRASTRUCTURE,
NT, 1990-91 TO 2014-15, \$M IN 2012-13 PRICES**

Year	Roads	Bridges etc	Electricity & Pipes	Water & Sewerage	Telecommunications	Infrastructure
1990-91	125.8	4.2	7.8	16.8	64.2	218.7
1991-92	86.8	5.3	8.2	9.9	49.2	159.3
1992-93	71.7	10.0	9.4	15.5	43.2	149.8
1993-94	119.8	7.7	7.8	19.1	43.9	198.3
1994-95	151.5	5.8	55.6	6.9	54.8	274.4
1995-96	85.0	28.3	18.8	21.6	42.4	196.0
1996-97	101.0	55.2	11.4	3.8	24.3	195.8
1997-98	100.8	36.3	16.4	15.3	23.8	192.6
1998-99	104.8	15.6	33.7	12.1	36.5	202.6
1999-00	96.8	23.6	49.5	14.5	67.7	252.0
2000-01	35.3	4.3	14.6	15.5	65.1	134.8
2001-02	31.2	63.1	9.9	22.7	83.9	210.7
2002-03	43.3	62.8	17.0	12.7	74.3	210.1
2003-04	76.4	60.7	11.2	23.7	93.2	265.2
2004-05	91.6	31.0	18.6	29.3	76.5	246.9
2005-06	68.1	22.6	27.3	23.3	91.4	232.6
2006-07	70.9	6.7	8.2	7.3	33.8	126.9
2007-08	98.3	13.1	18.7	17.4	0.1	147.6
2008-09	104.0	35.3	14.7	21.4	0.5	176.0
2009-10	139.9	20.9	12.6	32.7	19.9	225.9
2010-11	131.6	25.6	16.1	40.2	59.7	273.3
2011-12	130.7	23.0	25.2	33.2	35.8	247.9
2012-13	84.6	18.9	3.3	11.5	13.1	131.3
2013-14	112.8	9.2	2.3	10.4	21.0	155.7
2014-15	150.9	4.3	5.7	4.7	44.4	209.9

**TABLE 3: PRIVATE SECTOR ENGINEERING CONSTRUCTION ON INFRASTRUCTURE,
NT, 1990-91 TO 2014-15, \$M IN 2012-13 PRICES**

Year	Roads	Bridges etc	Electricity & Pipes	Water & Sewerage	Telecommunications	Infrastructure
1990-91	21.5	2.1	1.4	9.5	0.0	34.5
1991-92	29.8	2.6	0.2	1.8	0.0	34.4
1992-93	14.8	31.6	2.6	2.1	0.1	51.2
1993-94	26.2	40.6	9.9	1.6	1.0	79.3
1994-95	14.3	13.3	25.5	4.2	0.6	57.8
1995-96	13.5	0.0	23.4	5.0	1.1	43.0
1996-97	26.4	8.0	12.0	0.0	0.1	46.5
1997-98	38.3	2.5	4.7	5.4	1.8	52.7
1998-99	56.6	7.9	2.0	6.6	1.3	74.4
1999-00	54.0	2.5	12.8	9.3	1.1	79.7
2000-01	20.6	10.9	11.0	9.0	0.2	51.7
2001-02	69.7	292.7	2.1	34.3	0.1	398.8
2002-03	53.0	462.2	9.5	55.4	1.4	581.5
2003-04	27.0	50.5	734.2	9.9	23.0	844.7
2004-05	44.2	3.5	167.9	11.3	10.5	237.4
2005-06	54.6	42.9	10.4	3.6	16.9	128.5
2006-07	68.0	57.8	6.6	65.1	69.7	267.2
2007-08	51.0	51.7	58.2	57.1	151.9	369.9
2008-09	25.0	22.3	98.7	47.1	104.0	297.0
2009-10	20.2	12.2	14.1	24.9	83.5	155.0
2010-11	46.5	2.9	4.7	28.8	48.2	131.0
2011-12	98.9	18.0	61.6	72.0	64.6	315.2
2012-13	73.0	610.3	173.8	103.8	35.8	996.7
2013-14	89.4	662.4	346.3	42.6	46.9	1187.7
2014-15	108.1	26.8	1576.7	58.0	47.3	1816.9

Asset growth rates

It's important to understand how specific asset classes are growing over these time periods.

In the case of the Northern Territory an important observation concerns the degree of annual variability in infrastructure construction, particularly for infrastructure asset classes. This variability appears to increase as the size of jurisdictions becomes smaller.

High annual variability complicates comparisons over time. Tables 4 and 5 try to deal with this problem by averaging engineering construction growth rates over at least a five year period. However, the extraordinary changes experienced in the Territory in recent years means that this technique has limited effectiveness.

In the tables, the periods selected for averaging are as follows; 1990-91 to 2014-15 gives the long term average; 2005-06 to 2014-15 is the period since the first Territory IRC was released; 2010-11 to 2014-15 is the period since the 2010 IRC. Figures for last year are also included. The most useful figures are the growth rates for public sector infrastructure construction, but the issue of variability becomes evident for public sector asset classes.

Before moving on to discuss changes relating to specific asset classes it is useful to refer to the importance of developments in the LNG industry to recent infrastructure developments in the Northern Territory. The Territory is now Australia's second export LNG hub. Developments began in

TABLE 4: SUMMARY OF AVERAGE ANNUAL GROWTH RATES, INFRASTRUCTURE COMPONENTS, NT, PRIVATE & PUBLIC SECTORS

Period	Roads	Bridges etc	Electricity & Pipes	Water & Sewerage	Telecommunications	Infrastructure
Private Sector						
1990-91 to 2014-15	24.1	357.6	505.9	85.8	266.8	50.9
2005-06 to 2014-15	21.3	470.0	242.9	173.3	41.9	44.6
2010-11 to 2014-15	52.0	730.2	358.7	37.4	-4.2	82.7
2014-15	20.9	-96.0	355.3	36.1	1.0	53.0
Public Sector						
1990-91 to 2014-15	6.6	72.9	37.1	22.2	186.3	4.0
2005-06 to 2014-15	8.3	1.8	18.3	0.1	438.7	3.1
2010-11 to 2014-15	5.0	-22.0	22.9	-24.9	53.8	3.6
2014-15	33.7	-53.3	146.5	-55.2	111.6	34.8
Both Sectors Combined						
1990-91 to 2014-15	7.6	166.7	176.6	32.2	6.6	18.5
2005-06 to 2014-15	8.7	141.1	109.9	16.0	5.5	20.3
2010-11 to 2014-15	13.0	275.2	170.1	9.2	4.0	43.1
2014-15	28.0	-95.4	353.9	18.2	35.2	50.9

2006 with the commissioning of the East Timor to Darwin gas pipeline and the on shore processing facility. In 2016 the Ichthys LNG project will come on line and processing, pipeline, port, transport and utility requirements are all reflected in the private sector statistics. Other oil and gas related projects include the construction of a marine supply base, maintenance and operations hub and a common user area all in Darwin. Individual projects are large in the national context and huge in the Territory context. Collectively these projects have dominated engineering construction and infrastructure in the Territory since the 2010 IRC. Many of the private sector trends discussed below reflect this work.

In the case of the Northern Territory an important observation concerns the degree of annual variability in infrastructure construction, particularly for infrastructure asset classes.

TABLE 5: SUMMARY OF AVERAGE ANNUAL GROWTH RATES, REMAINING COMPONENTS, ENGINEERING CONSTRUCTION, NT

Period	Infrastructure	Resources & Heavy Industry	Recreation & Other	Total Non-infrastructure	Total Engineering Construction
Private Sector					
1990-91 to 2014-15	50.9	175.4	52.8	126.6	84.0
2005-06 to 2014-15	44.6	45.6	45.9	42.9	35.7
2010-11 to 2014-15	82.7	82.6	25.3	77.3	70.8
2014-15	53.0	265.7	3.1	247.9	167.8
Public Sector					
1990-91 to 2014-15	4.0	8899.1	53.7	125.7	4.0
2005-06 to 2014-15	3.1	-17.0	41.9	51.0	3.4
2010-11 to 2014-15	3.6	-40.0	51.1	70.2	3.3
2014-15	34.8	0.0	401.2	500.2	40.9
Both Sectors Combined					
1990-91 to 2014-15	18.5	159.9	37.4	103.3	40.8
2005-06 to 2014-15	20.3	45.6	36.7	42.4	29.5
2010-11 to 2014-15	43.1	82.7	20.1	76.3	59.2
2014-15	50.9	265.8	10.1	248.2	161.2

Roads

In 1990-91, the Northern Territory completed \$147.3 million of road construction. This was 58.2 per cent of Territory infrastructure construction; much higher than the corresponding national share of 35.2 per cent. Road construction was by far the most important area of the Territory's infrastructure development. Figure 4 shows that the importance of road construction did not insulate it from high annual variability. Long term average growth in road construction has been 7.6 per cent per year but has accelerated over time.

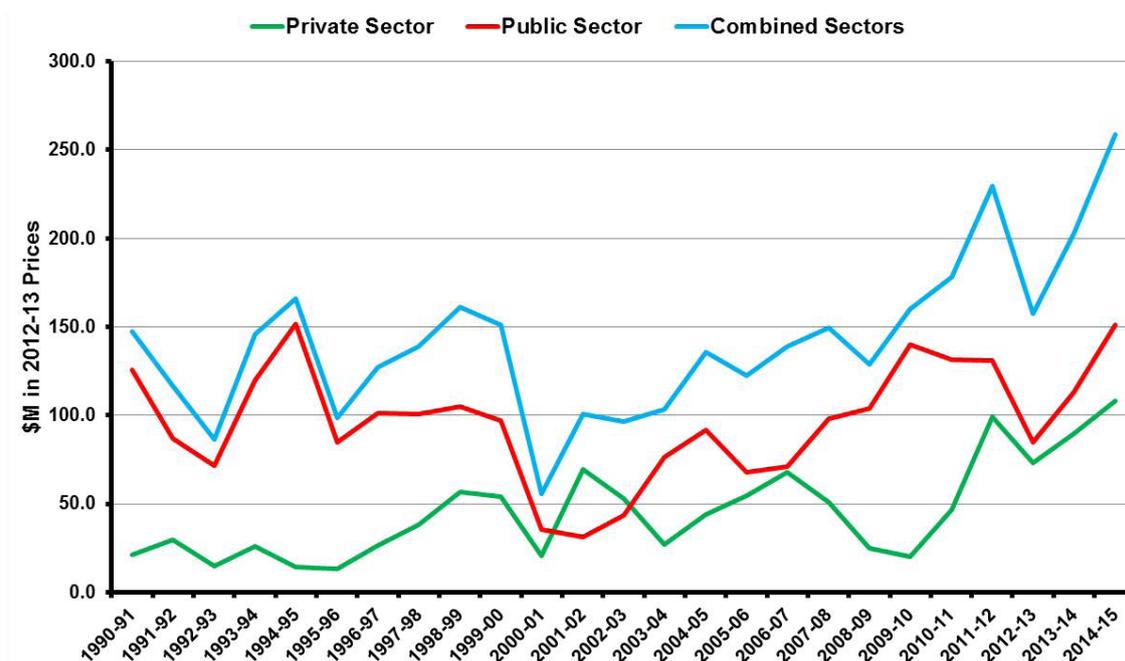
In the 2005 IRC Territory roads were assessed as adequate overall with a higher assessment applying to national roads and lower ones to Territory and local roads. Between 2005 and the 2010 IRC road construction increased in four of the five years to be \$178.1 million in 2010-11. Increased road construction was mainly by the public sector with an initial two year rise followed by sharp falls in the next three years in the private sector. The 2010 IRC outcome did not advance the 2005 assessment and the Territory's roads continued to be seen as adequate overall. Within this assessment a small increase in the status of national roads was offset by deterioration in the status of local roads

to "poor". The status of Territory roads remained unchanged at adequate.

Since the 2010 IRC road construction has grown by an average of 13.0 per cent per year from \$178.1 million in 2010-11 to \$259.0 million in 2014-15 with a regressive hiccup in 2012-13. Public sector road construction followed a roller-coaster path initially plateauing for two years at the 2009-10 level of over \$130 million then experiencing a sharp drop to \$84.6 million in 2012-13. Construction increased in the subsequent two years and was \$150.9 million in 2014-15. This apparent high level is put into perspective by noting that it was slightly less than the level of road construction in 1994-95.

Private sector road construction in the Territory has historically been low, remaining less than \$50 million in most years up to 2010-11 when it was \$46.5 million. Since then the trend has been sharply up and by 2014-15 there was \$108.1 million of private sector road construction in the Territory. It is likely that a substantial portion of this increase is explained by private sector road construction to support resources projects.

FIGURE 4: TRENDS IN PRIVATE AND PUBLIC SECTOR ENGINEERING CONSTRUCTION ON ROADS, NORTHERN TERRITORY, 1990-91 TO 2014-15



Bridges, Railways and Harbours

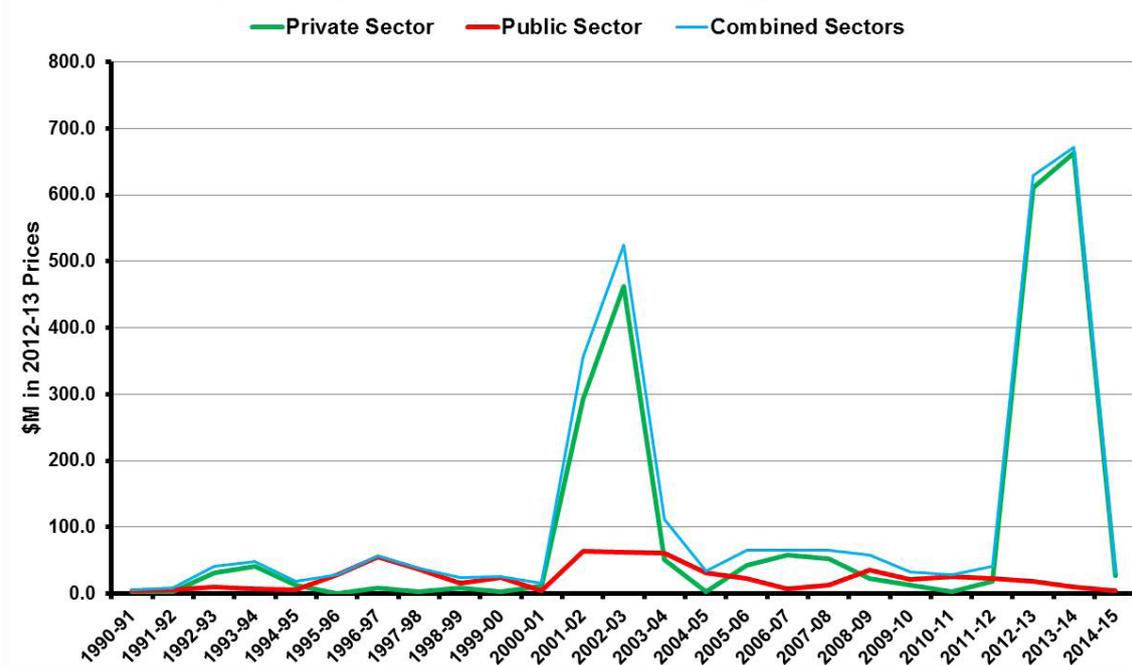
An unfortunate aspect of the ABS Engineering Construction Survey is that State and Territory statistics for infrastructure asset classes are not available for each individual class. Because the statistics are collected through a survey, disaggregation by jurisdiction and by asset class can encounter standard error problems. To deal with this issue the ABS aggregates some asset classes and the first of these is bridges, railways and harbours.

In 1990-91, engineering construction completed on bridges, railways and harbours in the Northern Territory was \$69.3 million and was 2.5 per cent of Territory infrastructure construction. For most of the twenty five years to 2014-15, construction in this area was very low but punctuated by two large scale spikes. The first was between 2001-02 and 2003-04 with the construction of the Alice Springs

to Darwin railway and the second was between 2012-13 and 2013-14 with the reconstruction of the port of Darwin and the associated LNG export facilities. The character of these spikes is aptly illustrated in Figure 5.

In the 2005 IRC Territory rail infrastructure was assessed as “very good” and port infrastructure was assessed as “good” but warranting minor changes. The construction of the Alice Springs to Darwin railway was clearly reflected in this assessment. Between 2005 and 2010, construction on bridges, rail and port facilities proceeded in line with earlier trends varying between \$64 million in 2006 to 2008 and lower levels around \$30 million in later years. The 2010 IRC reassessed the status of Territory railways as “C+”, better than adequate but requiring major changes and the same rating for port facilities.

FIGURE 5: TRENDS IN PRIVATE AND PUBLIC SECTOR ENGINEERING CONSTRUCTION ON BRIDGES, RAILWAYS AND HARBOURS, NORTHERN TERRITORY, 1990-91 TO 2014-15



Electricity Generation and Transmission and Pipelines

At national level, separate engineering construction statistics are available for the electricity and pipeline sectors. At Territory level these statistics are combined. Electricity statistics include power stations, sub-stations, hydro-electric generating plants and associated work and transmission and distribution lines.

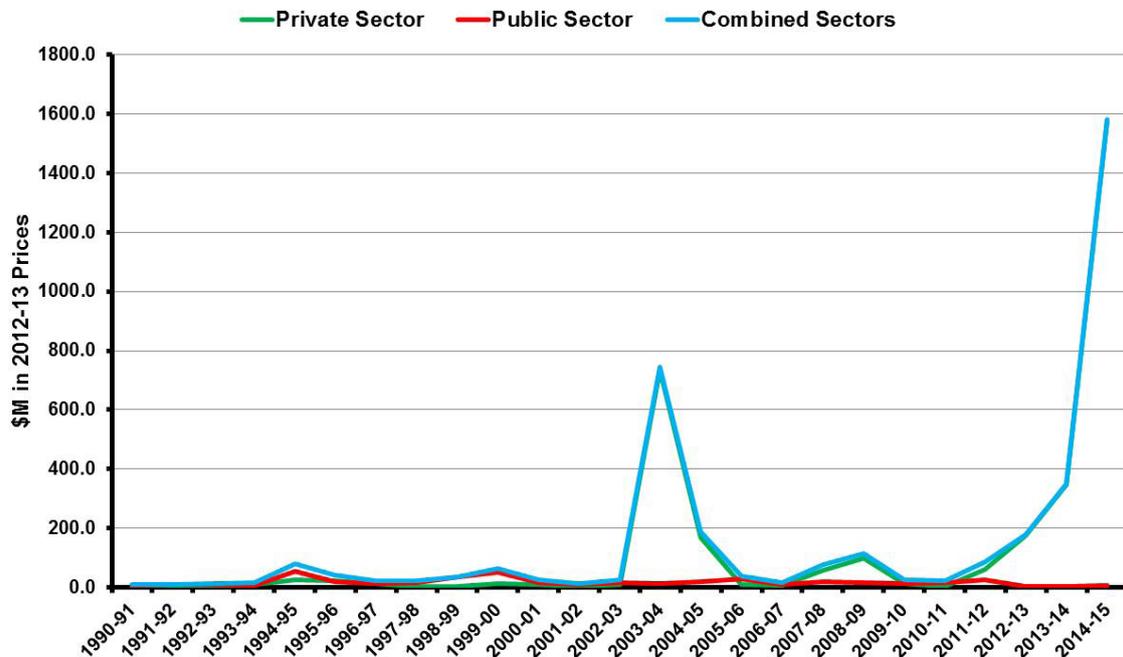
In the Northern Territory, the electricity sector substantially remains in public sector ownership. The pipelines sector includes oil and gas pipelines, urban gas mains and pipelines used in the manufacturing sector. The majority of these assets are owned and developed by the private sector.

The 2005 IRC assessed the Northern Territory electricity infrastructure as “good” but requiring minor changes and its gas infrastructure as “very

good” or fit for purpose. The electricity assessment was downgraded in 2010 to “adequate” but requiring major changes and there were some reservations attached to the gas assessment which never-the-less remained at “very good”.

The statistics in Tables 2 and 3 and their illustration in Figure 6 show a pattern not unlike the one in Figure 5 that is trends of very low construction punctuated by two sharp peaks. Public sector construction since 2010 comprised an initial two years averaging about \$20 million per year followed by three years of very low construction averaging about \$3.7 million per year. There is no support in construction figures for the past five years to suggest that the 2010 adequate assessment for electricity infrastructure should be reassessed.

FIGURE 6: TRENDS IN PRIVATE AND PUBLIC SECTOR ENGINEERING CONSTRUCTION ON BRIDGES, RAILWAYS AND HARBOURS, NORTHERN TERRITORY, 1990-91 TO 2014-15



The two spikes in Figure 6 are the result of major private sector pipeline activity. The first in 2003-04 and 2004-05 was construction on the Timor Gap to Darwin pipeline commissioned in 2006. This spike was considered in the 2005 IRC assessment. The second spike began in 2012-13 and has not yet concluded. At least two large projects are involved; the first is the Ichthys LNG project and the export facilities at Darwin and the second is the early stages of the gas pipeline linking the Northern Territory to the Eastern States gas market. In 2010-11, private sector construction in electricity and pipelines was a low \$4.7 million. The following year construction increased to \$61.6 million and has since sky-rocketed to be \$1,576.7 million in 2014-15. As the Tables show, this level of construction was five times the total of public sector infrastructure. Taking recent developments into account, a positive reassessment of the Territory's gas infrastructure is warranted.

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Water and Sewerage

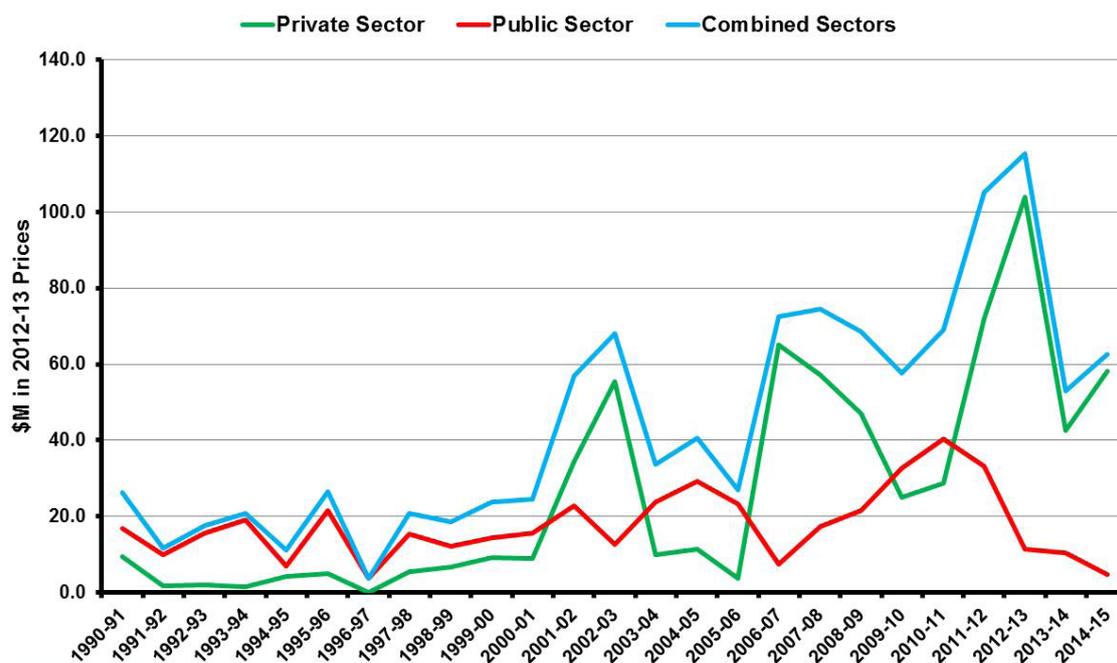
In 1990-91, Northern Territory engineering construction on water and sewerage was \$26.3 million and accounted for 10.4 per cent of the Territory’s infrastructure construction. Construction was dominated by the public sector which undertook about two-thirds of the work completed. Figure 7 shows that total annual construction on water and sewerage assets has increased over time but there has been a shift in the balance between public and private sector construction.

Public sector construction gradually increased over time to peak at \$29.3 million in 2004-05 before sharply falling to \$7.3 million in 2006-07. The five years leading up to the 2010 IRC assessment saw an increasing trend in public sector construction on water and sewerage construction which peaked at \$40.2 million in the assessment year. This period also coincided with higher than usual private sector

construction in this area. These trends influenced the 2010 IRC assessments which rated water infrastructure as adequate but requiring major changes. Although the trends described showed increased construction this was not sufficient to prevent a downgrading of status compared to the 2005 IRC assessment.

Since 2010 public sector construction on water and sewerage has fallen and private sector construction has increased. Within this broad result there have been fairly large annual fluctuations reflecting the start and subsequent completion of specific projects. Overall Territory construction on water and sewerage facilities has increased significantly since the 2010 IRC suggesting the potential for an assessment upgrade.

FIGURE 7: TRENDS IN PRIVATE AND PUBLIC SECTOR ENGINEERING CONSTRUCTION IN THE WATER SUPPLY & SEWERAGE SECTORS, NORTHERN TERRITORY, 1990-91 TO 2014-15



Telecommunications

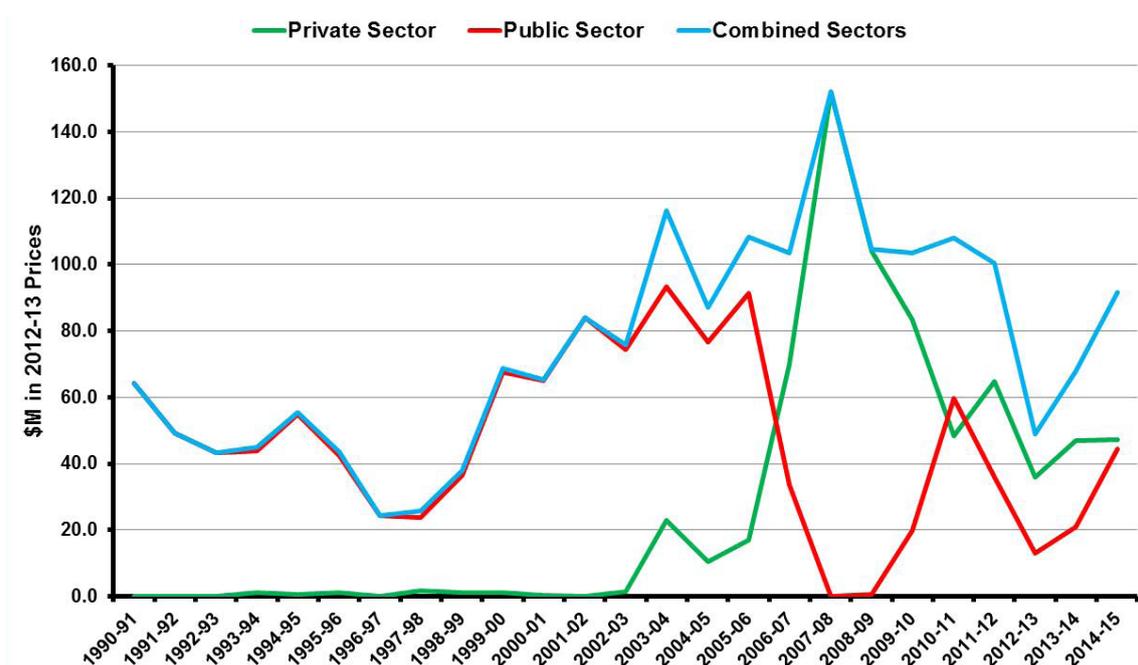
During the early years covered by this review, telecommunications facilities were predominantly in public ownership. Commonwealth telecommunications agencies began a process of merger and corporatisation in 1989 and in 1995 the name “Telstra” was adopted for Australian domestic business. Privatisation of Telstra began in 1997 and was completed in 2007 with the transfer of the final tranche of Commonwealth shares to the Future Fund. These events had profound implications for the balance between public and private components of engineering construction on telecommunications facilities and this is clearly evident in the public-private sector shifts illustrated in Figure 8.

In this discussion we focus only on the total construction trend in Figure 8. In 1990-91, Northern Territory telecommunications construction was \$64.2 million and accounted for 25.4 per cent of the Territory’s infrastructure construction that year. Construction trended downwards for the first eight years and by 1997-98 had fallen to \$25.7 million. Between then and 2007-08 construction trended upwards with periodic annual falls. By 2007-08 Territory telecommunications construction

was \$152.0 million. During the following three years leading to the 2010 IRC assessment telecommunications construction plateaued out at about the 2006-07 level averaging \$105 million per year. The 2010 IRC telecommunications assessment for the Territory was “C-”, not quite adequate requiring major changes.

Following the IRC, construction stayed at the plateau level for another year and then fell abruptly to \$48.9 million. During the last two years construction has once again grown so that by 2014-15 it had recovered to \$91.7 million. Both private and public sector construction fell, but the fall in the latter was larger. As the NBN program got into stride public sector construction has increased but private sector construction has plateaued out in the mid \$40 million. There is little in these statistics to suggest that an upgrade of the 2010 IRC is warranted. The NBN program has some way to go nationally as well as in the Territory. An important milestone is likely in 2016 when the NBN satellite facilities are due to commence operations. How the associated construction costs will be reflected in jurisdictional statistics is not yet known.

FIGURE 8: TRENDS IN PRIVATE AND PUBLIC SECTOR ENGINEERING CONSTRUCTION ON TELECOMMUNICATIONS, NORTHERN TERRITORY, 1990-91 TO 2014-15



Non-Infrastructure Elements of Engineering Construction

This section considers elements of engineering construction that fall outside our definition of infrastructure. As mentioned earlier, construction on recreational facilities is not part of the definition of infrastructure, a debateable definitional issue. Whatever one's view on this, the amount of construction in this area is an important element of the Territory economy and warrants attention.

Similarly, the Territory has benefited significantly from the resources boom and Government policies have prioritised development of the oil and gas sector. The commodities construction boom is

now largely over even though work on some large projects is far from complete. There are serious risks at play here that will be determined by the future course of commodities prices. The economics of most projects assume a long term price for the commodities involved. When actual commodity prices fall below that level, project economics no longer hold and project proponents are forced to re-evaluate their circumstances. The share market turmoil in the early weeks of 2016 is some evidence of this. In some cases commodity price fluctuations are seen as short term and project proponents will

TABLE 6: NON-INFRASTRUCTURE ELEMENTS OF PUBLIC SECTOR ENGINEERING CONSTRUCTION, NT 1990-91 TO 2014-15, \$M IN 2012-13 PRICES

Year	Infrastructure	Resources & Heavy Industry	Recreation & Other	Total Non-infrastructure	Total Engineering Construction
1990-91	218.7	0.1	1.0	1.0	219.7
1991-92	159.3	9.7	7.8	17.5	176.8
1992-93	149.8	4.1	8.1	12.3	162.1
1993-94	198.3	0.0	2.5	2.6	200.3
1994-95	274.4	24.8	2.5	27.2	301.7
1995-96	196.0	2.4	6.1	8.5	201.1
1996-97	195.8	0.0	8.7	8.7	204.5
1997-98	192.6	0.0	7.4	7.4	200.0
1998-99	202.6	3.9	7.6	11.5	214.1
1999-00	252.0	0.4	7.7	8.1	260.1
2000-01	134.8	4.4	10.8	15.2	150.1
2001-02	210.7	0.0	8.5	8.5	219.2
2002-03	210.1	0.0	2.9	2.9	213.0
2003-04	265.2	0.8	5.1	5.9	271.0
2004-05	246.9	0.1	6.3	6.4	253.3
2005-06	232.6	0.0	11.2	11.3	243.9
2006-07	126.9	0.1	7.8	7.9	134.8
2007-08	147.6	0.2	7.8	8.0	155.5
2008-09	176.0	0.0	13.7	13.7	189.7
2009-10	225.9	0.1	19.1	19.2	245.1
2010-11	273.3	0.0	15.7	15.7	289.0
2011-12	247.9	0.2	4.5	4.7	252.6
2012-13	131.3	0.0	4.2	4.2	135.6
2013-14	155.7	0.0	2.1	2.1	157.8
2014-15	209.9	2.1	10.4	12.5	222.4

decide to press on with development. In other cases this may prove to be impossible and projects can be moth-balled before completion.

In the Northern Territory, resources sector engineering construction and associated infrastructure development have dwarfed public sector infrastructure development. In the immediate future, it is important that this scale difference is known and understood by decision makers. Few commentators argue that there is no future for the oil and gas sector rather the issue is that there are more uncertainties than was the case a few

months ago. But just as important, the shift from construction to production phase in oil and gas means that the enormous amount of engineering construction involved will no longer contribute to the Territory economy and alternative sources of growth will need to be found.

Tables 6 and 7 complement Tables 2 and 3 and provide statistics on public and private sector non-infrastructure components of engineering construction. This statistics enable the scale of construction on infrastructure in each sector to be compared to the scale of construction in

TABLE 7: NON-INFRASTRUCTURE ELEMENTS OF PRIVATE ENGINEERING CONSTRUCTION, NT 1990-91 TO 2014-15, \$M IN 2012-13 PRICES

Year	Infrastructure	Resources & Heavy Industry	Recreation & Other	Total Non-infrastructure	Total Engineering Construction
1990-91	34.5	28.7	0.9	29.6	64.2
1991-92	34.4	26.7	0.0	26.7	61.1
1992-93	51.2	20.4	3.9	24.3	75.5
1993-94	79.3	82.7	5.0	87.6	167.0
1994-95	57.8	92.6	6.5	99.2	157.0
1995-96	43.0	93.0	8.8	101.8	144.8
1996-97	46.5	74.1	2.3	76.5	116.4
1997-98	52.7	51.0	23.6	74.6	127.3
1998-99	74.4	261.8	13.0	274.9	349.2
1999-00	79.7	73.4	20.1	93.5	173.2
2000-01	51.7	36.8	16.7	53.4	105.1
2001-02	398.8	1204.5	7.7	1212.2	1611.0
2002-03	581.5	1136.8	10.2	1146.9	1728.4
2003-04	844.7	1181.1	8.1	1189.2	2033.8
2004-05	237.4	1816.7	9.8	1826.4	2063.9
2005-06	128.5	2003.0	27.7	2030.8	2159.3
2006-07	267.2	1514.4	49.8	1564.2	1831.3
2007-08	369.9	809.3	53.2	862.5	1232.3
2008-09	297.0	2180.0	78.5	2258.5	2555.5
2009-10	155.0	741.4	90.6	832.0	987.0
2010-11	131.0	438.3	107.6	545.9	676.9
2011-12	315.2	1017.9	249.9	1267.8	1583.0
2012-13	996.7	1597.0	347.0	1944.0	2940.7
2013-14	1187.7	1585.7	115.5	1701.2	2888.9
2014-15	1816.9	5799.3	119.0	5918.3	7735.2

the resources and heavy industry sector and on recreational facilities to be compared.

RESOURCES AND HEAVY INDUSTRY

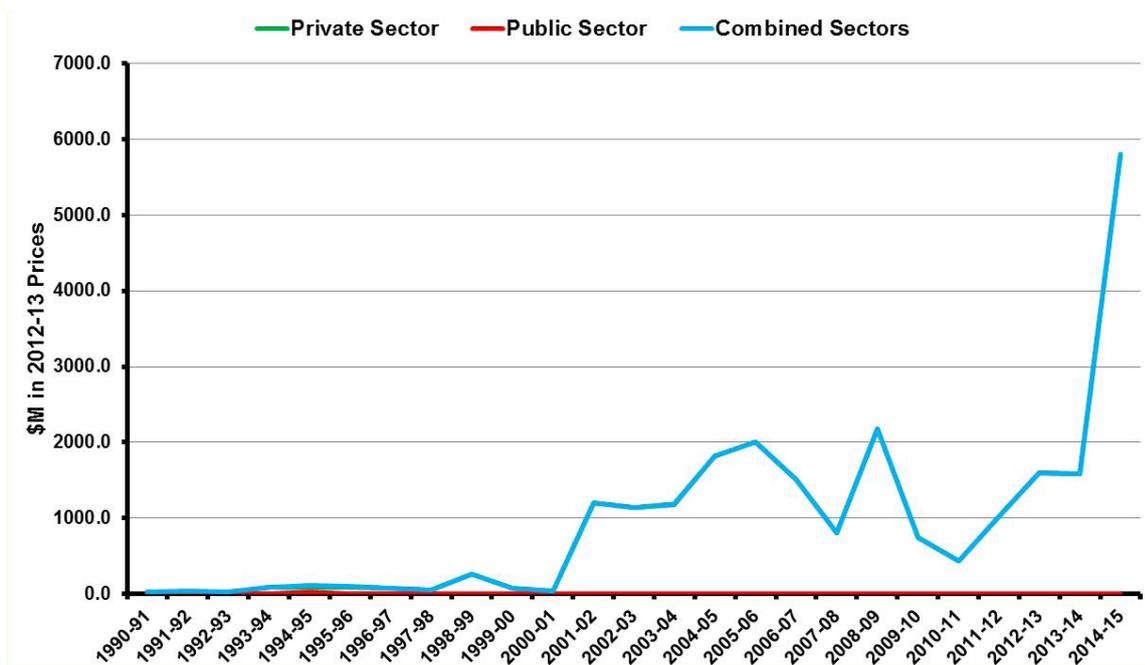
The trends in engineering construction in resources and heavy industry are illustrated in Figure 9. Other than small amounts of construction in isolated years, almost all engineering construction in resources and heavy industry has been by the private sector. In most years and in particular since 2001, public sector construction in this area has been negligible. In contrast, private sector engineering construction in resources and heavy industry has experienced an extraordinary expansion.

With the exception of 1998-99, construction remained fairly modest between 1990-91 and 2000-01. As Figure 9 shows the next decade

was characterised by variable but high levels of construction that in most years were five or more times larger than public sector infrastructure construction. The main negative factor was a GFC inspired slowdown in 2009-10 and 2010-11. In 2014-15, construction increased to a level almost four times higher than the average in the preceding decade. Private sector engineering construction on resources and heavy industry completed that year was \$5.8 billion. This was 11.0 per cent of national engineering construction in this sector and twenty-six times public sector infrastructure construction. It is difficult to know how much private sector infrastructure construction was associated with its construction on resources and heavy industry, but a large proportion of the \$1.8 billion in infrastructure was involved.

These figures suggest that the direction of construction is continued expansion. It is difficult to

FIGURE 9: PRIVATE AND PUBLIC SECTOR ENGINEERING CONSTRUCTION IN RESOURCES AND HEAVY INDUSTRIES SECTOR, NORTHERN TERRITORY, 1990-91 TO 2014-15



accept that the extraordinary expansion in 2014-15 would simply collapse. A later section will review this using commencements statistics and statistics on uncompleted work under construction.

RECREATION AND OTHER

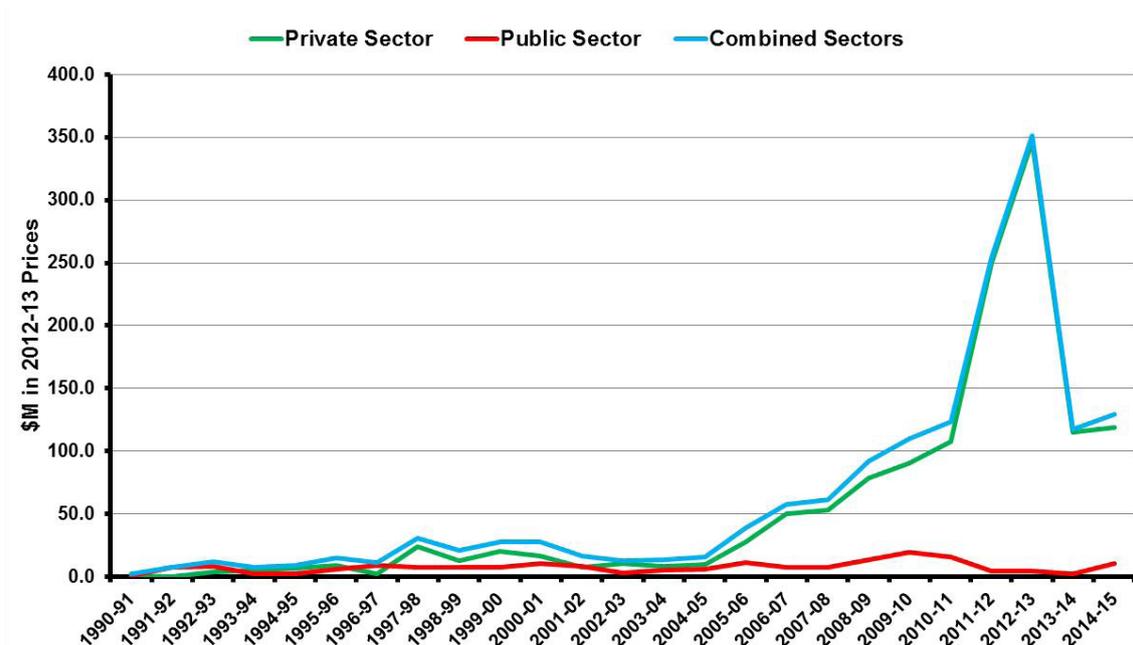
Trends in engineering construction of recreational facilities and “other” engineering construction are illustrated in Figure 10. Public sector engineering construction in this area has historically been small. In 2014-15 public sector construction was \$10.4 million, about 4.7 per cent of public sector construction. Construction that year was about five times as high as in the previous year but well below the peak construction level of \$19.1 million that occurred in 2009-10.

In contrast, private sector engineering construction on recreation and other has grown strongly,

particularly since about 2004-05. That year it was \$9.8 million and then embarked on a growth trend that peaked at \$347 million in 2012-13. The following year it fell to \$115.5 million and has plateaued at about this level.

It is difficult to accept that the extraordinary expansion in 2014-15 would simply collapse.

FIGURE 10: TRENDS IN PRIVATE AND PUBLIC SECTOR ENGINEERING CONSTRUCTION ON RECREATIONAL FACILITIES AND ‘OTHER’ CONSTRUCTION, NORTHERN TERRITORY, 1990-91 TO 2014-15



Looking Forward



This review has considered infrastructure and engineering construction work completed. Infrastructure projects by their very nature have long gestation periods, so these statistics tell only part of the story.

It's simply not feasible to delve into project gestation, but there are statistics that tell us how much uncompleted work is still in the construction system, as well as statistics on new work in progress. This reduces the knowledge gap to stages of project development prior to the actual commencement of work.

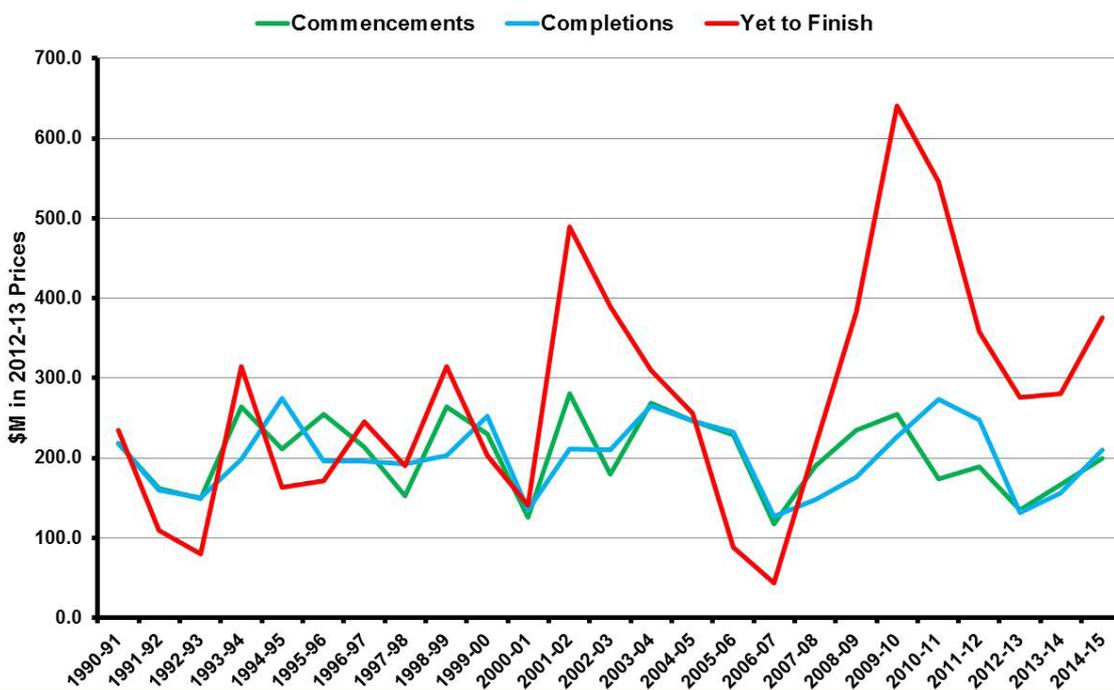
The underlying assumption is that once started projects proceed through to completion. While this may not always be the case – some projects are moth-balled before completion – there is no way to identify this effect other than to note that

uncompleted work will not register in completion statistics.

For present purposes we use the benchmark of the amount of work completed in the last year to gauge how much uncompleted work there is in the system and how much new work has commenced. Figure 11 begins this process by examining the public sector infrastructure pipeline. The blue line in Figure 11 repeats the public sector trend in construction on infrastructure shown in Figure 2. The green line shows the value of new public sector infrastructure commencements and the red line shows the value of work outstanding on public sector infrastructure projects that have not yet been completed.

The public sector infrastructure pipeline shows a pattern consistent with historical trends. Although commencements and completions have increased

FIGURE 11: THE PUBLIC SECTOR INFRASTRUCTURE PIPELINE, NORTHERN TERRITORY

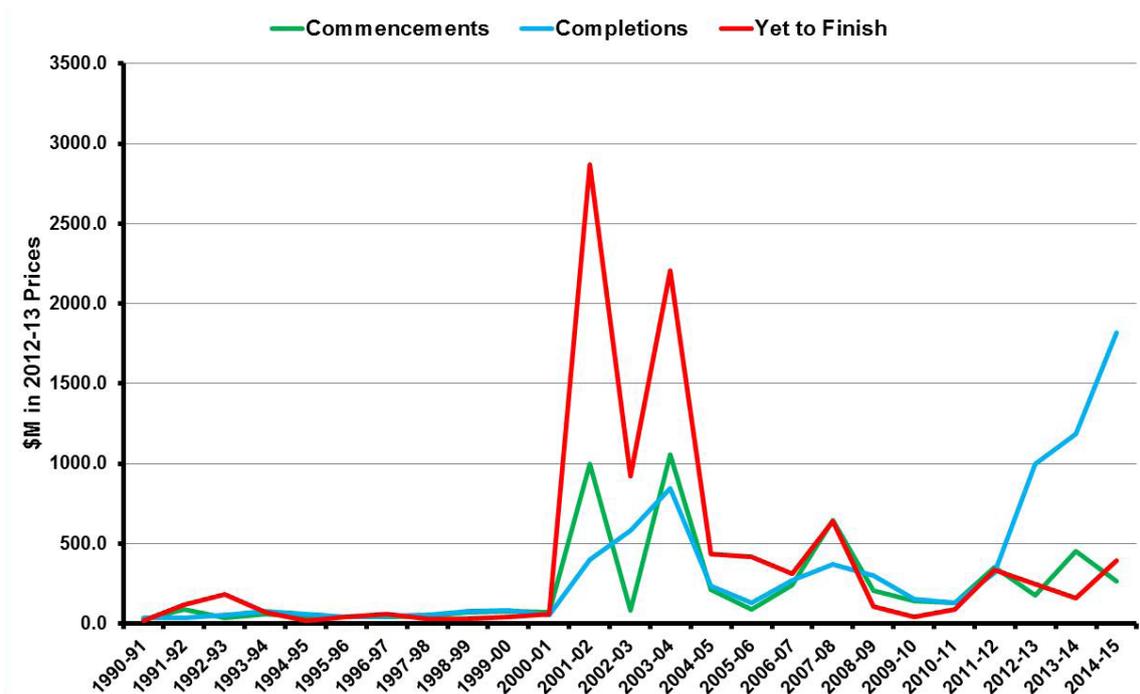


in the past two years, the 2014-15 levels were about the same as they were in 1990-91. In 2014-15, public sector infrastructure projects valued at \$199.1 million were commenced. At the 2014-15 rate of completions this is equivalent to 0.95 years of work. The value of uncompleted public sector infrastructure work was \$375.9 million which at the 2014-15 rate of completions was 1.79 years of work. Combining the two elements suggests that the present rate of public sector infrastructure will continue for 2.74 years.

The Territory's private sector infrastructure pipeline is illustrated in Figure 12. Here the blue line repeats the trend illustrated in Figure 3. The same colours are used to show the trend for new commencements and for unfinished work in the construction system. ABS statistics for uncompleted private sector infrastructure

The commencement statistics were published before the announcement of the gas pipeline which will connect the Northern Territory pipeline system to east coast gas markets.

FIGURE 12: THE PRIVATE SECTOR INFRASTRUCTURE PIPELINE, NORTHERN TERRITORY



construction were incomplete for the past three years for bridges, railways and harbours and for electricity and pipelines and accordingly for the relevant Territory totals. This limits our analysis to new commencements.

In 2014-15, private sector commencements on new infrastructure construction were \$264.2 million, equivalent to 0.15 years of work at the present rate of completions. The commencement statistics were published before the announcement of the gas pipeline which will connect the Northern Territory pipeline system to east coast gas markets. We would expect future statistics to show the effects of this project. Available incomplete statistics show that there was \$392.0 million in uncompleted private sector infrastructure work in the construction system equivalent to 0.22 years of work at the present rate of completions.

Since almost all non-infrastructure engineering construction is carried out by the private sector, Figure 13 illustrates the aggregate non-infrastructure construction pipeline. ABS statistics for construction work yet to finish were not available for the three years from and including 2012-13.

In 2014-15, private sector commencements in non-infrastructure components of engineering construction were \$516.2 million equivalent to 0.9 years of work at the present rate of completions. The statistics cover only \$44.9 million in unfinished construction on recreation and other which barely alters the remaining work life estimate.

The reason why some private sector unfinished construction statistics were not available is unknown. What we do know is that unfinished non-infrastructure construction is where the incidence of the falling commodity prices risk is. The two areas of infrastructure construction where the same data are unavailable are closely related infrastructure work. This situation is far from reassuring.

The Northern Territory has obtained significant economic benefits from the resources boom construction including associated infrastructure work. We analysed the infrastructure implications

Aside from an unknown quantum of uncompleted work in the system and newly announced projects, such as the Eastern States gas pipeline, it is highly likely that engineering construction in the Territory will return to the levels experienced before the resources boom in the next few years.

in an earlier section. So far as non-infrastructure construction is concerned, the picture is also in two parts. Work completed in 2014-15 was extraordinarily large.

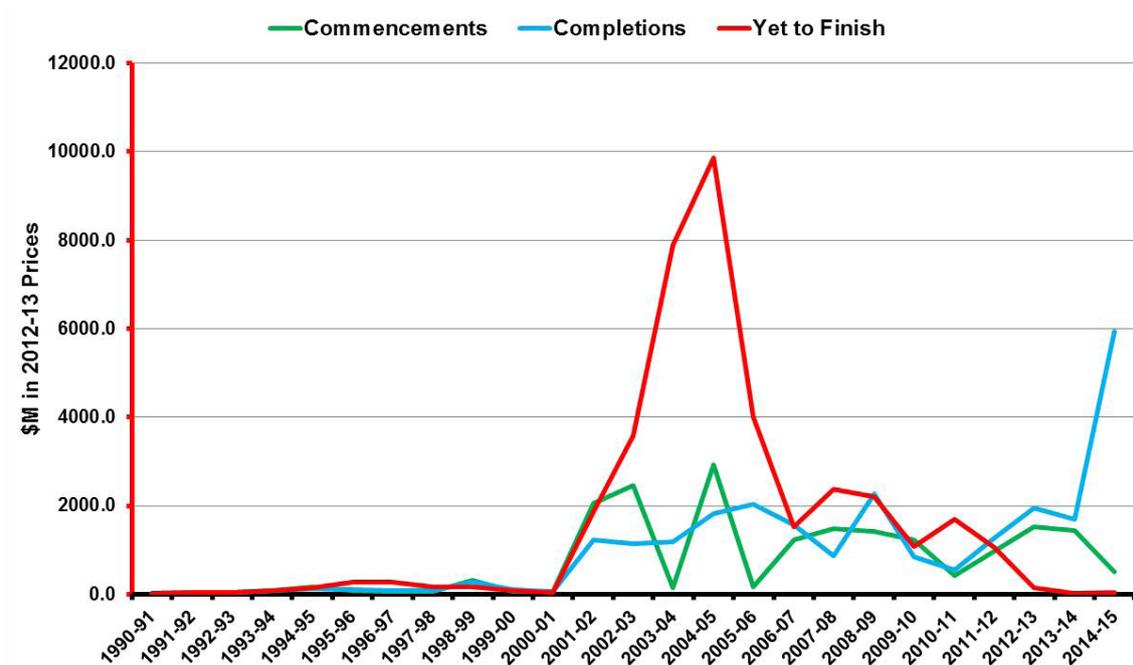
However, new construction commencements have fallen dramatically. That this has occurred is no surprise-it is in-line with changes observed in other resources jurisdictions. Some of those jurisdictions experienced the same difficulty with incomplete yet to finish statistics, notably Western Australia. However, these statistics were available for Queensland and showed that at the 2014-15 rate of completions there was 2.75 years of private sector non-infrastructure work yet to be completed. The availability of statistics in no way reflects on the commodities price risk and it is just as possible that there could be consequences in Queensland as in the Territory where the data problem was evident.

These complications aside, the rapid fall in new non-infrastructure commencements suggests that the resources sector construction boom in the

Territory is over. Aside from an unknown quantum of uncompleted work in the system and newly announced projects, such as the Eastern States gas pipeline, it is highly likely that engineering construction in the Territory will return to the levels experienced before the resources boom in the next few years.

There will be a flow of economic benefits from the focus on oil and gas linked to the global fortunes of these industries. Like the rest of Australia, the Northern Territory will soon need to address the issue of economic diversity and this is where the main importance of the analysis in this report lies. Statistics on public infrastructure in the Territory have not changed much over twenty-five years despite high year on year variability. Economic infrastructure is the enabler for productivity growth and the Territory's situation was judged to require major changes in 2010 and the evidence that this has occurred is not apparent.

FIGURE 13: THE PIPELINE OF NON-INFRASTRUCTURE ENGINEERING CONSTRUCTION, NORTHERN TERRITORY



Conclusion

In 2010, when Northern Territory infrastructure was last assessed its status was “C+”, slightly better than adequate but requiring major changes to be fit for purpose. Since then, the Territory economy has become 27.5 per cent larger and population has grown by 6.2 per cent. Population growth, however, appears to have stalled last year. These results indicate the pressures on the provision of infrastructure services that investment over the past five years needed to address simply to maintain the status quo.

Evaluating changes since 2010 is no simple matter and is complicated by whether private sector infrastructure development is generally accessible to business and the community or otherwise. Based on overall engineering construction on infrastructure, construction has significantly increased since the last IRC. In 2010-11, the first year after the IRC, construction increased to \$404.3 million, up by 6.1 per cent on the year before. Construction rapidly increased to be \$2.0 billion in 2014-15. Cumulative construction since the last IRC has been \$5.5 billion compared to \$2.1 billion in the five years leading to the 2005 IRC. These figures are all expressed in 2012-13 prices and suggest that infrastructure construction has more than doubled in real terms.

This is why it is important to assess the accessibility private sector infrastructure to business and the community at large. This infrastructure is often constructed specifically to service the needs of private sector projects. In the Territory the increasing trend in infrastructure construction has coincided with increased construction on resources and heavy industry projects. Although one cannot be precise, this association suggest that accessibility is much more limited than is the case for public infrastructure. This does not mean this infrastructure will not contribute to productivity and economic growth in the Territory. Rather its contribution to productivity and economic growth will occur through the contribution of the related resource facility and not through economic activity generally.

As a consequence, public sector infrastructure is the most appropriate gauge economy to assess the Territory’s progress. In 2009-10, the year of the last IRC, public sector infrastructure was \$225.9 million and the cumulative construction over this and previous four years was \$900 million. Since the IRC annual infrastructure construction has followed a roller coaster path with construction in 2014-15 at \$209.9 million, less than in 1990-91. Cumulative construction since the 2010 IRC was \$1.0 billion, 12.0 per cent higher than in the five years before 2010. Given Territory population and economic growth, these figures **at best** suggest that public sector infrastructure has maintained the status quo. Its rating is confirmed in 2015 as adequate but in need of major changes to be fit for purpose.

These figures at best suggest that public sector infrastructure has maintained the status quo. Its rating is confirmed in 2015 as adequate but in need of major changes to be fit for purpose.



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