



ENGINEERS
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Tasmania Infrastructure Investment Update

2016

Engineers Australia Infrastructure in Tasmania Report 2016

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Infrastructure Investment Update 2016

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a sustainable world.*

Key points

Engineers Australia calls on the public sector to strategically address the issues arising from Tasmania's infrastructure challenges.

Increasing pressure has been placed on Tasmania's infrastructure assets over the last 25 years.

Since 1990-91, the population in Tasmania has increased 10.7 per cent and the size of the state's economy has increased by 60.2 per cent. To meet these pressures combined annual public and private sector engineering construction on infrastructure has increased by 75 per cent, and if non-engineering infrastructure components are included it increased by 99 per cent.

Engineering construction on infrastructure assets has been inconsistent over the last five years.

The 2010 Tasmanian Infrastructure Report Card recommended that investment in infrastructure must increase overall. Since that report, Tasmania's engineering construction has recorded average annual growth of 1.5 per cent per year overall, however this has been inconsistent. Between 2010-11 and 2012-13, strong growth of 4.3 per cent was recorded, followed by negative growth of 2.5 per cent for the last two years.

The public sector's investment has dropped in the last two years.

The public sector has been responsible for the majority of engineering construction on infrastructure in Tasmania, and in the last five years it has consistently made up around 80 per cent of the total construction on infrastructure. Our concern is that the growth has been inconsistent; in the last two years the public sector has recorded negative growth of 4.3 per cent.

Tasmanian average annual GDP growth is not as strong as national averages.

Tasmania has been lagging behind the national averages in Gross Domestic Product (GDP) growth, GDP growth per person, and in population growth. In 2014-15 Tasmania made up 2.2 per cent of the nation's population, yet only made up 1.6 per cent of the nation's GDP. In the last five years alone, Tasmania recorded GDP growth of only 0.4 per cent, which is much lower than the 2.7 per cent recorded for Australia as a whole. GDP growth per person tells a similar story. Looking at the last five years the growth recorded for Tasmania is 0.1 per cent compared to 1.1 per cent for Australia overall.

The public sector needs to lead the way in new infrastructure development.

The public sector is the main contributor to infrastructure construction and it has the ability to change the current trend. For if the current trends continue, the 2010 Engineers Australia Infrastructure Report Card rating of 'adequate' is at risk of slipping to a poor or inadequate state in the near future.

The public sector needs to lead the way in promoting productivity growth, and improving the standard of living for Tasmanians. Recent budget announcements are promising, but this needs to translate into consistent strong numbers.

Introduction

Long term infrastructure planning and development is an enabler of productivity growth. Growth has been, and will continue to be, responsible for much of the improvements in Australia's living standards and this relationship is expected to continue into the future. Without productivity growth Australian living standards will stagnate and, as the population ages, it is possible that our standard of living could fall.

Since the Global Financial Crisis, Australia's GDP growth and growth in GDP per capita have been at comparatively low levels and we've seen the nation's productivity growth fall below historical averages. At the same time, Tasmania has consistently recorded GDP growth and GDP growth per person below the national average. To support and grow the state's economy, and to meet its future economic and social goals, Tasmania must have capable infrastructure assets.

The 2010 Engineers Australia Tasmanian Infrastructure Report Card (IRC) noted that Tasmania's infrastructure was stressed, and most of its assets were rated as adequate or poor in condition. The report card highlighted that critical changes were required to make infrastructure in the state fit for current and future needs, and that there was no long-term integrated infrastructure planning in the state. The maintenance and rejuvenation of ageing assets need funding on a sustainable basis and, at the time of the report, there was also no decision-making body which would provide transparent infrastructure recommendations.

Five years on from the 2010 IRC, Engineers Australia remains concerned about some of the key points raised, and does not believe adequate action has been taken to address these issues. Current trends in engineering construction in the state shows growth is slowing down, and in the past two years negative growth was recorded.

The public sector has long been the majority contributor to engineering construction on infrastructure in Tasmania and recent trends show that the public sector is increasingly making up a higher percentage.

PUBLIC INVESTMENT NEEDS TO SET THE PACE

Private sector construction is usually biased towards infrastructure projects that are likely to service specific private service business activities. Much of the infrastructure construction completed by the private sector includes work which is in support of specific projects to suit the investing company, rather than the general population. For this reason, public sector infrastructure investment is a better gauge on progress.

If current growth trends are to be reversed, it will need to start with positive growth in the public sector.

One step in the right direction since the last Infrastructure Report Card has been the agreement to establish Infrastructure Tasmania (ITas). ITas is a government body which coordinates, plans and assesses all major infrastructure proposals in Tasmania, and it puts together a prioritised infrastructure projects pipeline. A few of the initial infrastructure projects that will be considered by ITas include the possible Bridgewater Bridge replacement project, a proposed plan for light rail through Hobart, and a state road audit¹.

Engineers Australia accepts that it is unlikely that infrastructure will ever be perfect but an emphasis on infrastructure policy that has a strong purpose towards productivity and economic growth will be key to the future prosperity of Tasmania. In the 2015-16 state budget, the Tasmanian government announced that it will invest \$1.8 billion in infrastructure projects over a four year forward estimate period². This four year infrastructure program is 14 per cent larger than the four year program contained in the 2014-15 budget, however large amounts of the allocated funds have been pushed to forward estimate years.

Political announcements often cheer the triumphs of the government's infrastructure achievements, but these announcements need to reflect strong long-term infrastructure construction numbers. The recent announcement for infrastructure investment is encouraging. The investment necessary to change the current situation requires numbers as strong as what has been presented in the most recent budget. To produce positive growth outcomes for the state, these numbers must continue in the future.

¹ Tasmanian Government Department of State Growth, Infrastructure Tasmania, www.stategrowth.tas.gov.au

² Tasmanian Government, Department of Treasury, 2015-16 Budget, Infrastructure Investment, www.treasury.tas.gov.au

The state of infrastructure in Tasmania

OUR APPROACH AND RESEARCH DATA

This report puts contemporary developments in Tasmania into perspective by looking at Australian Bureau of Statistics (ABS) data on engineering construction³. These statistics provide 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 current stock of infrastructure through work completed on new infrastructure assets. The period examined in this report is from June 1990 to June 2015.

Although these statistics are not ideal for a comprehensive analysis, they are the best available. For almost a decade, Engineers Australia has advocated for governments to publish comprehensive statistics on the nation's infrastructure to inform community discussions and to provide the basis for new infrastructure decisions.

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 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. This means that it is no longer sufficient to look at only public sector engineering construction.

Unfortunately, ABS statistics do not delineate between cities in each state, so this report will analyse the state of Tasmania as a whole. In this report we use Infrastructure Australia's definition of economic infrastructure. This includes roads, bridges, railways, harbours, the electricity sector, the water and sewerage sector and telecommunications assets. Changes in engineering construction in heavy industry, recreation facilities, and other uncategorised activities are also analysed briefly, but separate from economic infrastructure. The asset classes are examined for trends in public and private sector, and all statistics have been deflated and expressed in constant 2012-13 prices.

There is now increasing private sector involvement in the development, ownership and delivery of infrastructure services through new financial arrangements.

³ ABS, Engineering Construction, Australia, Cat No 8762.0, electronic releases, www.abs.gov.au

Tasmania: the state in context

The Tasmanian economy and population is expected to grow over the next 15 years, but at a lower rate than Australia as a whole. The population is projected to reach 560,000 people in 2031, an increase of 9 per cent on 2011 population levels⁴. Although this growth may be modest in comparison to the rest of Australia, Tasmania will still require infrastructure that will meet the demand of this growth.

Table 1 shows how Tasmanian average annual growth compares with Australia as a whole. The time periods examined are long term, 10 years, five years and one year averages. For all categories, Tasmania has fared poorly against the Australian averages recorded. Over the last 25 years Tasmania's real GDP grew from \$16 billion to \$25 billion at a total increase of 60.2 per cent. At the same time the state's population grew from 466,802 people to 516,926 people at an increase of 10.7 per cent.

TABLE 1: BENCHMARK STATISTICS

Period	TAS average annual growth (per cent) in			Australia average annual growth (per cent) in		
	GDP	GDP per person	Population	GDP	GDP per person	Population
1990-91 to 2014-15	2.0	1.6	0.4	3.2	1.9	1.3
2005-06 to 2014-15	1.2	0.6	0.6	2.8	1.1	1.7
2010-11 to 2014-15	0.4	0.1	0.3	2.7	1.1	1.6
2014-15	1.6	1.3	0.4	2.4	1.0	1.4

Both increases show the recent pressures placed on current infrastructure assets, signalling that Tasmania needs improved infrastructure services to simply maintain the status quo. When productivity growth is low and infrastructure is just adequate, the pre-conditions for improved standards of living are no longer in place. Standard of living as measured by GDP per person has increased 44.5 per cent from \$34,149 per person to \$49,329 per person. Even with this improvement, Tasmania still has the lowest numbers recorded in Australia.

Table 1 makes it clear that Tasmania is lagging behind the national growth averages in all categories excluding the 2014-15 financial year. The long-term average of 2.0 per cent per year for GDP growth is lower than the Australian average of 3.2 per cent. This is no better when looking at the past five years where Tasmania recorded 0.4 per cent compared to 2.7 per cent for the nation.

The GDP growth per person tells a similar story. Tasmania's long-term average of GDP growth per person is 1.6 per cent, which is below the national average of 1.9 per cent. In the last five years the growth drops to 0.1 per cent for Tasmania compared to 1.1 per cent for Australia overall.

Population growth in Tasmania is also lower than the national averages, but it has not changed too much when comparing recent growth to the long term trends. Tasmania makes up 1.6 per cent of the nation's GDP and 2.2 per cent of the nation's population, further indicating that Tasmanians' standard of living is not growing as strongly as it is for the rest of the nation.

Good economic policy would recognise these connections and stimulate productivity through innovation policies and through infrastructure development.

⁴ Infrastructure Australia, Infrastructure Australia Audit, May 2015, www.infrastructureaustralia.gov.au

Engineers Australia's Principles for Infrastructure Development

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 a coordinated system.*
- *Short-term acquisition practices should be discarded in favour of whole of life considerations.*

Trends in engineering construction

The construction figures in Figure 1 primarily fall within Engineers Australia’s definition of infrastructure and can be further broken down into the subcategories detailed in Table 2, which includes roads, bridges, electricity, water and telecommunications. The blue line below represents engineering construction completed by the private sector. The gap from the blue line to the red line represents engineering construction completed by the public sector. As demonstrated below, the public sector has been a major contributor to engineering construction, with the private sector increasing its contribution since the early 2000s.

In 1990-91, the public sector undertook the majority of engineering construction with \$523 million in work completed, compared to \$25.8 million by the private sector. This breakdown has been consistent over the last 25 years with the public sector responsible for the majority of construction on infrastructure assets in every year except for 2001-02 where it was close to a 50/50 share. In the last five years, the public sector has consistently made up around 80 per cent of the total construction on infrastructure.

Public sector construction has been strongest in the last 10 years, while the private sector was at its strongest between 2004 and 2009. At the public sector’s peak in 2012-13 it recorded \$835 million (Table 2) in engineering construction on infrastructure compared to the private sector peak of \$416 million in 2006-07 (Table 3).

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

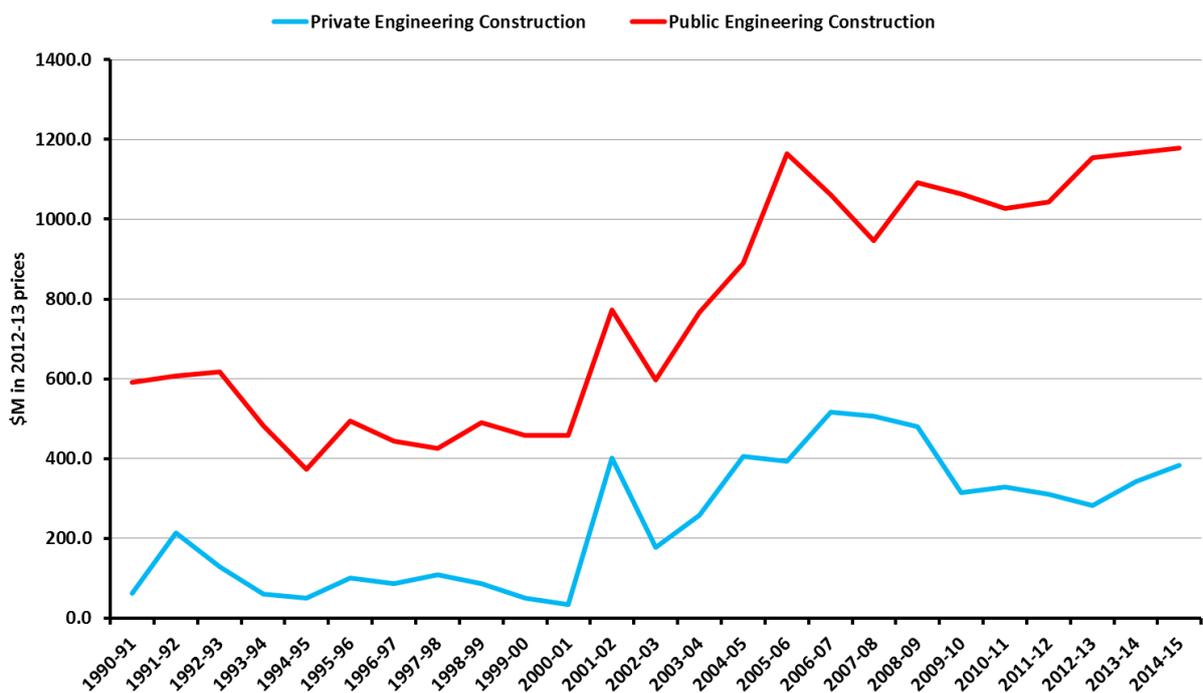
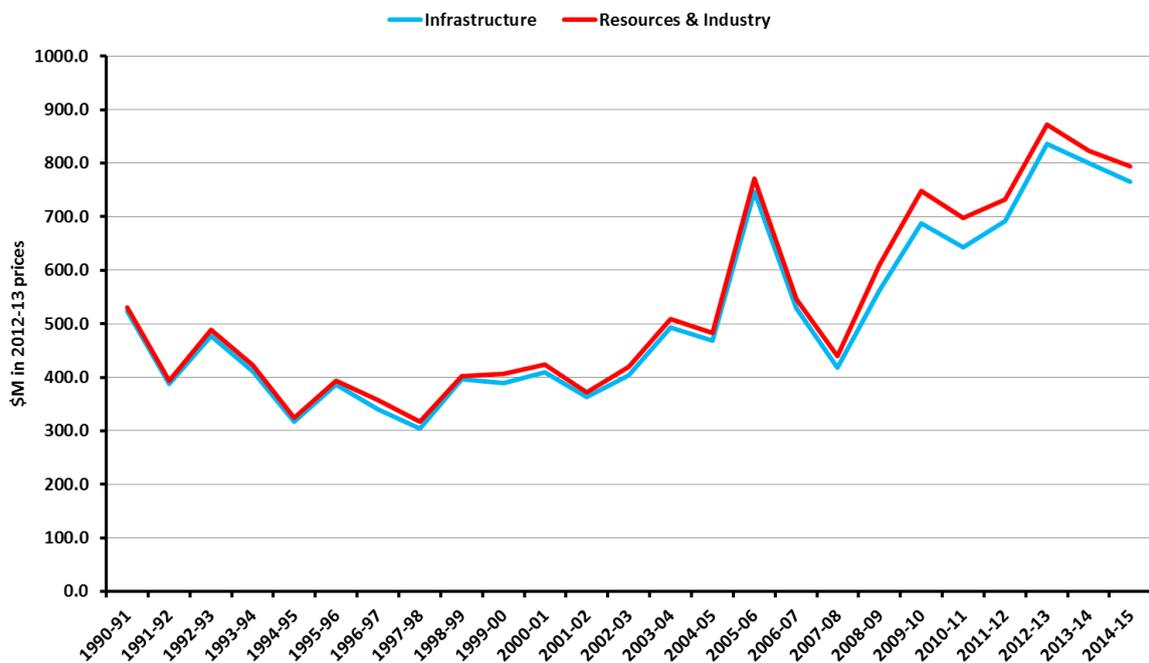


Figure 2 demonstrates the differences between engineering construction on infrastructure and engineering construction on recreation, heavy industry, and other engineering construction for the public sector.

Public sector engineering construction is primarily on infrastructure. Most of the gap that is shown between the infrastructure and total engineering construction trends is accounted for by engineering construction on recreational facilities.

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



Detailed statistics for public sector engineering construction on the various types of infrastructure assets are shown in Table 2, with the biggest construction years being 2012-13 and 2013-14.

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

Period	Roads	Bridges, railways & harbours	Electricity & pipelines	Water & sewerage	Telecommunications	Total infrastructure
1990-91	183.2	44.2	76.2	179.5	40.0	523.1
1991-92	151.8	20.8	72.8	114.4	28.0	387.8
1992-93	217.5	44.2	55.4	104.8	55.4	477.3
1993-94	187.8	46.4	40.8	77.2	59.0	411.2
1994-95	162.3	13.7	18.5	18.6	104.8	317.8
1995-96	197.7	4.3	33.3	42.8	108.0	386.1
1996-97	170.0	5.8	26.7	28.5	108.9	339.9
1997-98	141.1	11.0	25.3	20.0	107.1	304.5
1998-99	133.5	16.8	118.4	41.5	85.9	396.2
1999-00	162.8	24.1	74.4	32.9	95.1	389.2
2000-01	172.3	24.7	86.5	26.0	100.2	409.7
2001-02	133.6	31.7	73.7	39.4	84.4	362.7
2002-03	132.6	33.5	99.4	61.2	77.5	404.3
2003-04	114.6	19.5	242.4	63.5	53.3	493.3
2004-05	160.3	17.3	188.6	41.6	61.2	469.0
2005-06	165.9	16.7	396.2	71.0	96.5	746.2
2006-07	169.7	23.3	228.9	75.4	32.2	529.4
2007-08	163.2	33.4	166.0	49.4	5.6	417.6
2008-09	183.5	24.0	270.2	83.9	0.7	562.2
2009-10	177.3	32.9	350.7	111.7	14.8	687.4
2010-11	241.4	48.6	220.3	112.7	19.9	643.0
2011-12	168.2	57.9	273.1	148.1	44.0	691.3
2012-13	133.3	65.1	361.2	158.7	117.2	835.5
2013-14	182.5	89.1	236.9	138.1	152.8	799.4
2014-15	201.6	76.6	216.2	162.0	108.5	764.8

Figure 3 demonstrates private sector construction on infrastructure compared to construction on engineering construction on recreation, heavy industry and other engineering construction. The primary difference between Figure 2 and Figure 3 is the more pronounced gap between the trends, especially in the more recent years.

Where private engineering construction on infrastructure facilities was specifically needed to support the resources sector facilities, it has been included in the infrastructure tally.

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

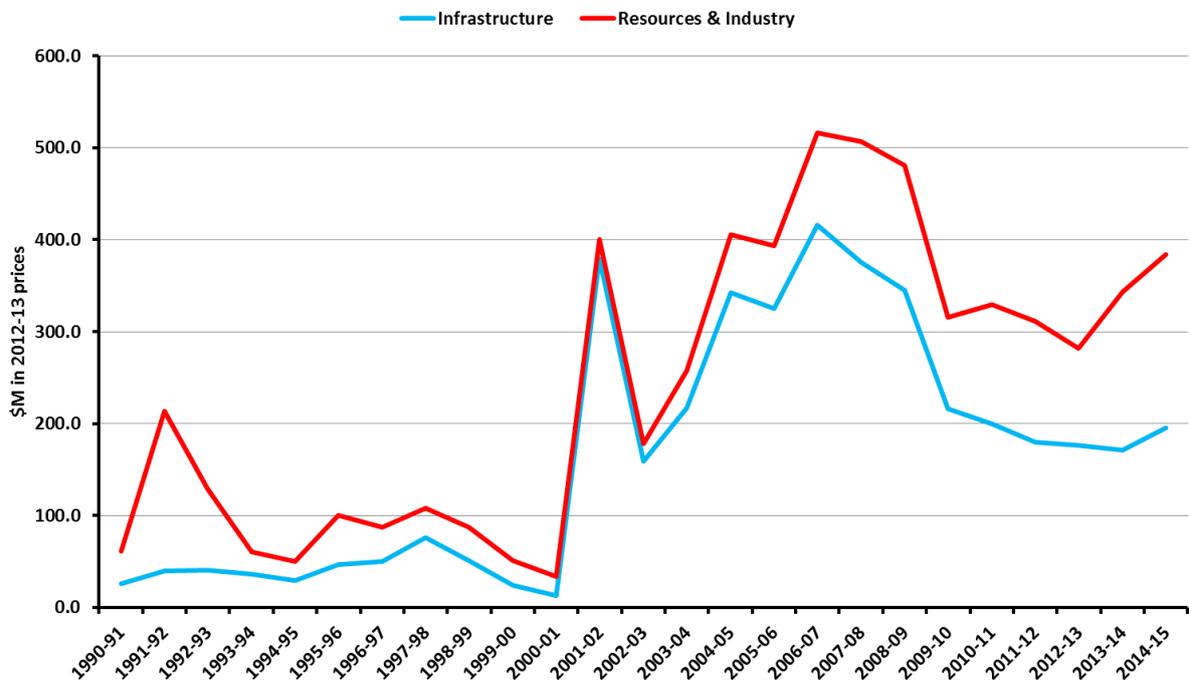


Table 3 details private sector engineering construction investment in specific types of infrastructure assets.

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

Period	Roads	Bridges, railways & harbours	Electricity & pipelines	Water & sewerage	Telecommunications	Total infrastructure
1990-91	22.2	0.5	0.3	2.8	0.0	25.8
1991-92	34.9	0.4	0.1	4.3	0.0	39.7
1992-93	37.4	0.0	0.0	3.0	0.0	40.4
1993-94	27.7	2.7	0.3	2.0	3.6	36.4
1994-95	24.2	0.9	0.7	3.1	0.3	29.1
1995-96	35.5	0.3	1.4	9.9	0.0	47.2
1996-97	46.6	0.5	1.4	1.7	0.0	50.1
1997-98	73.6	0.3	0.3	1.8	0.0	75.9
1998-99	47.8	0.1	0.2	3.4	0.0	51.5
1999-00	12.3	2.2	0.0	8.5	0.9	23.9
2000-01	8.9	1.0	0.8	1.4	1.4	13.4
2001-02	8.5	0.0	355.9	0.4	15.0	379.8
2002-03	24.5	0.5	120.1	6.7	7.3	159.2
2003-04	57.4	3.1	143.1	14.0	0.0	217.5
2004-05	46.1	1.2	279.7	13.7	1.5	342.1
2005-06	46.1	2.9	245.1	31.1	0.3	325.5
2006-07	51.9	1.5	197.2	40.9	124.9	416.4
2007-08	41.4	8.7	119.3	34.7	170.9	375.1
2008-09	37.8	6.9	155.0	58.3	87.0	345.1
2009-10	29.2	2.1	74.2	52.0	58.5	216.0
2010-11	43.3	1.8	45.5	37.3	71.6	199.5
2011-12	62.3	0.9	42.4	30.0	44.6	180.2
2012-13	41.9	7.3	42.3	48.1	36.7	176.3
2013-14	36.9	5.5	71.3	14.9	42.2	170.8
2014-15	88.0	2.3	22.9	25.4	57.3	195.9

Asset growth rates

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

We will break down the assets described in Tables 1 and 2 and review them individually over the same time periods shown. Growth rates are summarised below in Tables 4 and 5.

Table 4 demonstrates that although there have been rises in the majority of infrastructure sectors in recent years by the public sector, in the last year there has been negative growth overall. However, the private sector has recorded overall growth in the most recent year. Table 5 demonstrates that the private sector is responsible for

the majority of growth for construction on non-infrastructure assets in the state, with 16.8 per cent growth recorded in the most recent year.

It must be noted that the degree of variability recorded for some of the infrastructure assets in Tables 4 and 5 is quite large in some cases, and that can be attributed in part to the smaller size of the state's economy. One big project in the state can greatly influence the growth rate recorded. The degree of variability in a small state can also have flow on effects to the workforce which is affected by boom bust cycles that can result in skills shortages.

TABLE 4: SUMMARY OF AVERAGE ANNUAL PERCENTAGE GROWTH RATES, INFRASTRUCTURE COMPONENTS, PRIVATE AND PUBLIC SECTORS

Period	Roads	Bridges, railways & harbours	Electricity & pipelines	Water & sewerage	Telecommunications	Total infrastructure
Private sector						
1990-91 to 2014-15	19.6	442.3	2027.7	87.0	1907.9	114.2
2005-06 to 2014-15	14.7	102.7	-13.9	21.5	4511.1	-4.0
2010-11 to 2014-15	37.2	106.3	-9.0	2.8	3.6	-1.6
2013-14 to 2014-15	63.3	-41.7	0.4	0.7	25.4	5.8
Public sector						
1990-91 to 2014-15	2.4	13.4	22.6	10.4	100.1	3.7
2005-06 to 2014-15	4.3	19.0	10.9	18.9	229.1	7.9
2010-11 to 2014-15	6.5	20.4	-4.8	8.8	64.7	2.7
2013-14 to 2014-15	23.7	11.4	-21.6	2.2	0.7	-4.3
Both sectors combined						
1990-91 to 2014-15	3.0	13.1	29.7	11.4	11.7	4.4
2005-06 to 2014-15	5.3	18.7	-1.8	17.8	16.9	2.6
2010-11 to 2014-15	10.4	19.6	-7.4	4.6	21.4	1.5
2013-14 to 2014-15	28.6	7.0	-23.0	-1.8	5.9	-2.5

*One big project in the state
can greatly influence the
growth rate recorded.*

TABLE 5: TOTAL ENGINEERING CONSTRUCTION ON INFRASTRUCTURE, 1990-91 TO 2014-15, \$M 2012-13 PRICES

Period	Roads	Bridges, railways & harbours	Electricity & pipelines	Water & sewerage	Telecommuni- cations	Total infrastructure
1990-91	205.3	44.7	76.5	182.4	40.0	549.0
1991-92	186.7	21.2	73.0	118.7	28.0	427.5
1992-93	254.9	44.3	55.4	107.8	55.4	517.7
1993-94	215.5	49.1	41.1	79.2	62.6	447.6
1994-95	186.5	14.6	19.1	21.7	105.0	347.0
1995-96	233.3	4.6	34.7	52.7	108.0	433.2
1996-97	216.6	6.3	28.1	30.1	108.9	390.0
1997-98	214.6	11.3	25.6	21.8	107.1	380.4
1998-99	181.3	16.9	118.6	44.9	85.9	447.6
1999-00	175.1	26.3	74.4	41.4	96.0	413.1
2000-01	181.2	25.7	87.3	27.4	101.6	423.2
2001-02	142.0	31.7	429.6	39.8	99.4	742.5
2002-03	157.1	34.1	219.5	67.9	84.8	563.4
2003-04	172.0	22.5	385.5	77.5	53.3	710.8
2004-05	206.3	18.5	468.3	55.3	62.7	811.2
2005-06	212.0	19.6	641.3	102.1	96.8	1071.8
2006-07	221.6	24.7	426.1	116.3	157.1	945.8
2007-08	204.6	42.1	285.3	84.1	176.5	792.6
2008-09	221.3	30.9	425.2	142.2	87.7	907.4
2009-10	206.5	35.0	424.8	163.7	73.2	903.3
2010-11	284.8	50.4	265.8	149.9	91.6	842.5
2011-12	230.5	58.8	315.5	178.0	88.6	871.5
2012-13	175.2	72.5	403.5	206.8	153.9	1011.8
2013-14	219.3	94.6	308.3	153.0	195.0	970.2
2014-15	289.5	78.8	239.1	187.4	165.8	960.7

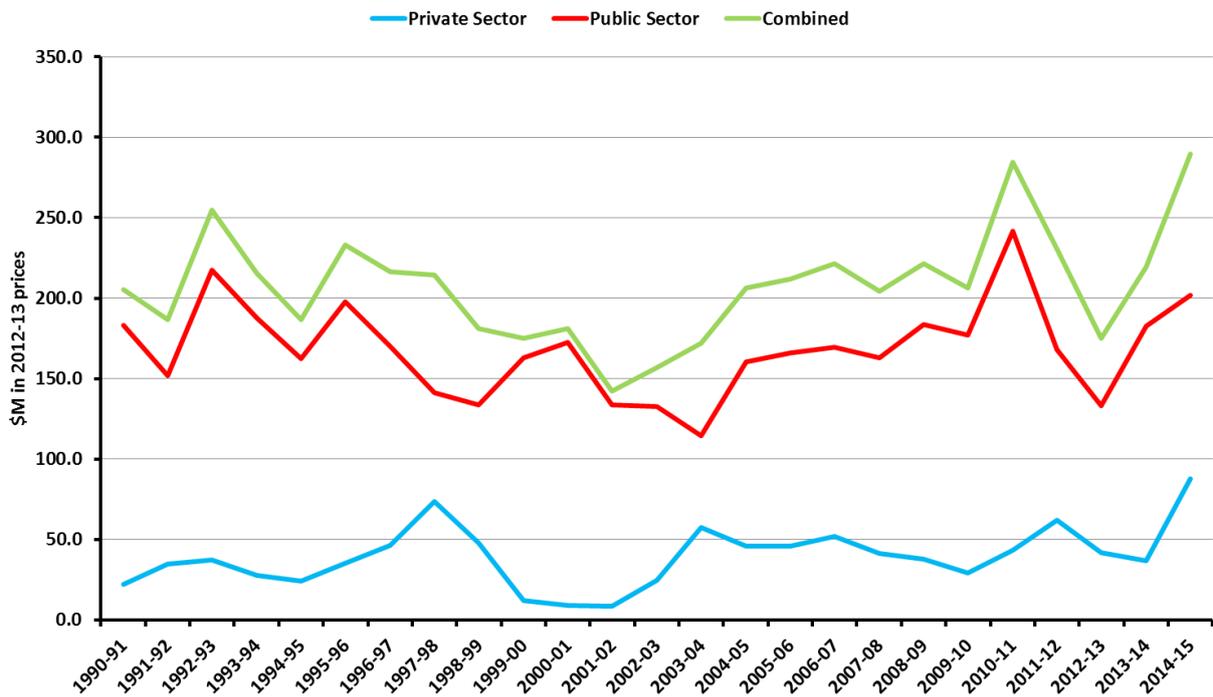
Roads

The infrastructure spend on Tasmania's road is inconsistent, spiking only when there are major projects underway.

Figure 4 expresses the trends in private and public sector engineering construction on roads, highways and subdivisions in constant 2012-13 prices and covers:

- Parking areas
- Cycle paths
- Airport runways
- Pedestrian and vehicle overpasses
- Traffic lights
- Roundabouts
- Associated road drainage works
- Street and highway lighting
- Road resurfacing
- Kerbing and guttering
- Road tunnels.

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



In 1990-91, total construction on roads was \$205.3 million, growing to \$289.5 million in 2014-15.

The 2010 Tasmania Infrastructure Report Card noted that there would need to be better funding and delivery of road infrastructure to improve in the future. Since that report, construction on road assets may have grown, but it has been far too inconsistent as seen in Figure 4.

PUBLIC INVESTMENT

Public sector construction on roads has grown from \$183.2 million in 1990-91 to \$201.6 million in 2014-15 at an average increase of 2.4 per cent per year. In 1990-91 public sector construction made up 44.5 per cent of total construction in that year, which compares to 25.3 per cent of total construction in 2014-15.

The spike in construction in 2010-11 may be partially due to the North East Freight Roads Program, which had a budget of \$42.5 million jointly funded by the Australian Government and the Tasmanian Government. The recent spike would most likely be attributed to the Midland Highway 10 Year Action Plan⁵.

PRIVATE INVESTMENT

Private sector construction on roads has grown from \$22.2 million in 1990-91 to \$88 million in 2014-15 at an average increase of 19.6 per cent per year. There is no real obvious spike in private sector roads construction, with 2014-15 recording the highest construction numbers. At this time, private sector construction on roads made up 22.9 per cent of total private sector construction.

Construction on road assets may have grown, but it has been far too inconsistent.

⁵ Tasmanian Government Department of State Growth, Midland Highway 10 Year Action Plan, www.midlandhighway.tas.gov.au

Bridges, railways and harbours

Over the last 25 years, investment in bridges, railways and harbours in Tasmania has been dominated by the public sector, peaking in 2013-2014.

Figure 5 represents the following types of engineering infrastructure, expressed in constant 2012-13 prices:

- **Bridges** that support roads, railways, causeways and elevated highways
- **Railways:** tracklaying, overhead power lines and signals, platforms, tramways, tunnels for underground railways and fuel hoppers
- **Harbours:** boat and yacht basins, breakwaters, retaining walls, docks and piers, terminals, wharves, dredging works and marinas.

In 1990-91, total engineering construction spent on bridges, railways and harbours was \$44.7 million growing to \$78.8 million in 2014-15.

In 2010, the Tasmania Infrastructure Report Card rated rail in Tasmania as inadequate for current and anticipated future purposes. Since that time, construction on rail infrastructure has improved greatly, and this has been driven by the public sector.

PUBLIC INVESTMENT

Public infrastructure construction on bridges, railways and harbours grew from \$44.2 million in 1990-91 to \$76.6 million in 2014-15. Growth in public sector construction was most prevalent between 2009-10 and 2013-14 with average annual growth of over 30 per cent recorded for that five-year period.

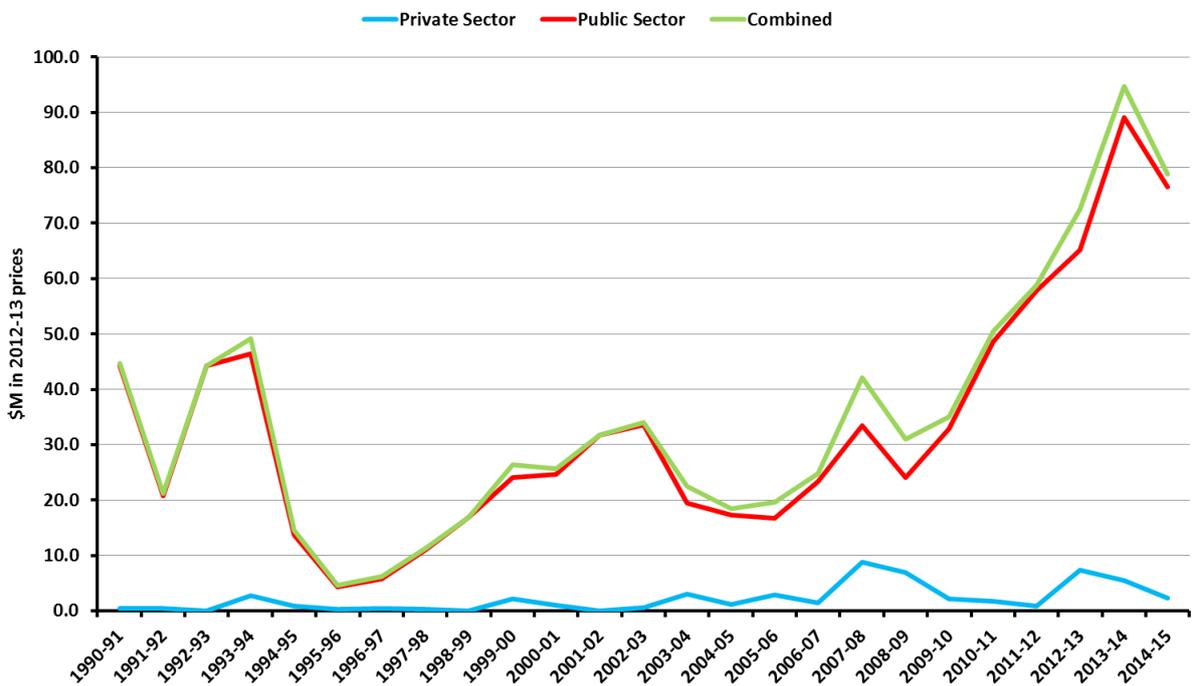
In 2013-14 at its peak, public sector construction on these assets was 10.8 per cent of total public sector construction. The spike seen in that year is likely attributed to funding from the Australian and Tasmanian Government to the Tasmanian Freight Rail Revitalisation Program⁵.

PRIVATE INVESTMENT

Private infrastructure construction on these assets grew from \$0.5 million in 1990-91 to \$2.3 million in 2014-15. Growth in private sector construction on these assets was most notable with a small spike in construction between 2007-08 and 2009-10 hitting \$8.7 million. Even at this time private sector construction on these assets accounted for only 1.7 per cent of total construction.

⁶ Truss, W (Minister for Infrastructure and Regional Development), 2014, Building Tasmania's Transport Infrastructure for the 21st Century, Media Release, www.minister.infrastructure.gov.au

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



Construction on rail infrastructure has improved greatly, and this has been driven by the public sector.

Electricity generation, distribution and pipelines

The primary contributor to engineering construction on these assets has been alternated between sectors over the past 25 years, depending on the activities of the moment.

Figure 6 shows trends in private and public sector engineering construction in constant 2012-13 prices and includes:

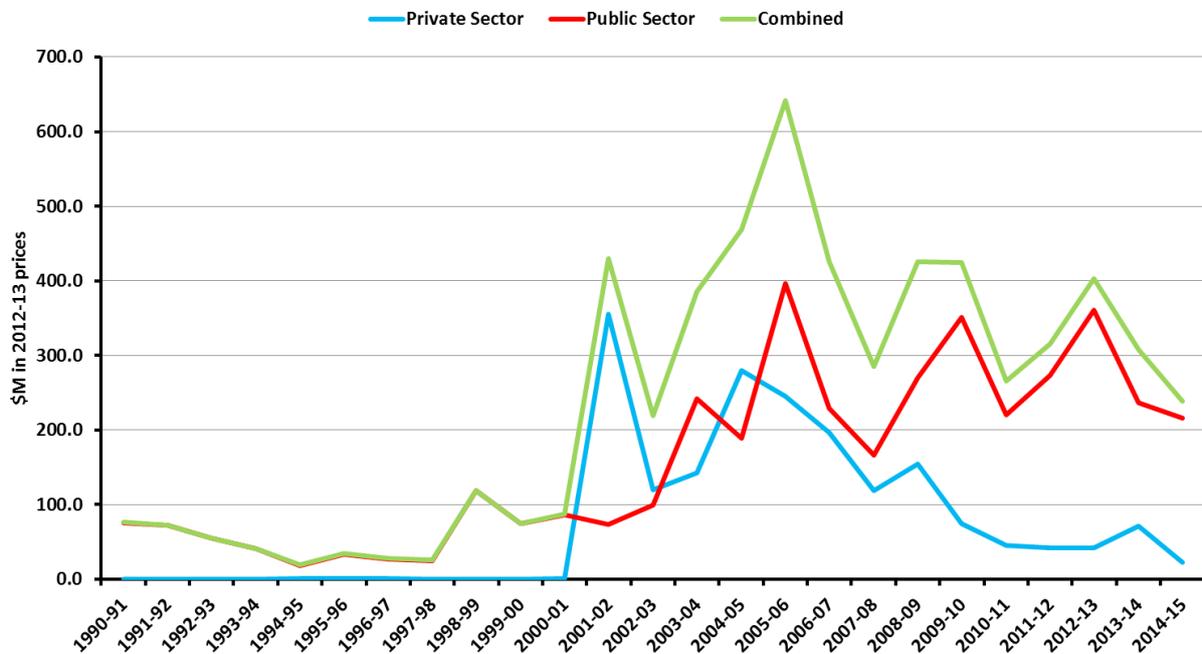
Electricity facilities:

- Power stations
- Substations
- Hydro-electric generating plants
- Associated work for towers
- Chimneys
- Transmission and distribution lines.

Pipelines:

- Oil and gas pipelines
- Urban supply mains for gas
- Pipelines for refined petroleum products, chemicals and foodstuffs.

FIGURE 6: TRENDS IN PRIVATE AND PUBLIC SECTOR ENGINEERING CONSTRUCTION ON ELECTRICITY GENERATION AND DISTRIBUTION AND PIPELINES IN TAS, 1990-91 TO 2014-15



In 1990-91, total engineering construction spent on electricity and pipelines was \$76.5 million, growing to \$239.1 million in 2014-15.

The 2010 Tasmania Infrastructure Report Card acknowledged significant infrastructure works completed on these assets, with upgrades to transmission and distribution systems as major developments for electricity in Tasmania. The major electricity infrastructure project in Tasmania during this time has been the Basslink Interconnector which connects Tasmania's electricity supply to the mainland. The Basslink Connector project was established in 2000 and was active in the Australian electricity market in 2006⁷.

PUBLIC INVESTMENT

Public sector infrastructure construction on electricity and pipelines in 1990-91 was \$76.2 million growing to \$216.2 million in 2014-15. In 2005-06 at its peak of construction, public sector construction on these assets accounted for 51 per cent of all public sector construction.

PRIVATE INVESTMENT

The private sector contribution barely existed in the 1990s, dominated in the early 2000s, and then slowly fell away again in recent years. In 1990-91, the private sector spent \$0.3 million on these assets, growing to \$355.9 million in 2001-02, before falling away to \$22.9 million in 2014-15. At its peak in 2001-02 private sector construction on these assets accounted for 88.8 per cent of all private sector construction.

The major electricity infrastructure project in Tasmania during this time has been the Basslink Interconnector which connects Tasmania's electricity supply to the mainland.

7 Basslink, The Basslink Interconnector www.basslink.com.au

Water, sewerage and drainage facilities

Figure 7 shows trends in water storage and supply, sewerage and drainage construction over the last 25 years, at 2012-13 constant prices. This infrastructure includes:

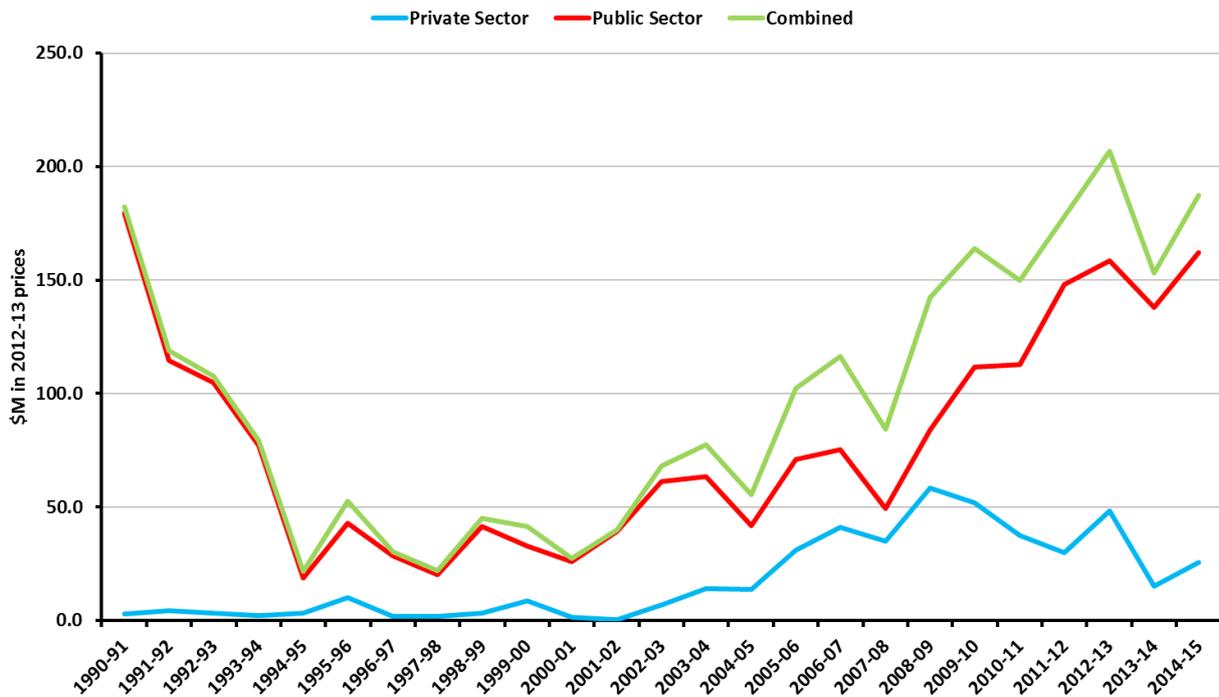
Water storage and supply

- Dams, weirs, reservoirs
- Embankments for water diversion
- Water pipelines, mains and treatment plants
- Prevention and erosion
- Aqueducts and water conduits
- Systems conveying water to residences, commercial and industrial establishments.

Sewerage and drainage

- Sanitary and storm sewers
- Sewerage treatment plants
- Storm water drains and drainage systems.

FIGURE 7: TRENDS IN PRIVATE AND PUBLIC SECTOR ENGINEERING CONSTRUCTION ON WATER, SEWERAGE AND DRAINAGE FACILITIES IN TAS, 1990-91 TO 2014-15



In 1990-91, total engineering construction on water and sewerage was \$182.4 million, growing slightly to \$187.4 million in 2014-15.

PUBLIC INVESTMENT

Public sector infrastructure construction on these assets fell from \$179.5 million in 1990-91 to \$26 million in 2001-02, growing again to \$162 million in 2014-15. Construction by the public sector in 1990-91 accounted for 33.8 per cent of total public sector construction, while in 2014-15 it accounted for 20.4 per cent of total construction.

The 2010 Tasmanian Infrastructure Report Card noted that in 2009 reforms of the water and sewerage sector would improve services, provided the funding materialises. Looking at Figure 7, construction by the public sector on water, sewerage and drainage facilities has improved with strong growth from 2009-10. Much of the water construction is related to water quality or supply upgrades, or to irrigation schemes throughout Tasmania, and recently the Australian government has announced that \$60 million in funding will support Tasmanian water infrastructure projects⁸.

PRIVATE INVESTMENT

Private sector construction on these assets grew from \$2.8 million in 1990-91 to \$25.4 million in 2014-15. Construction by the private sector also peaked in 2008-09 with \$58.3 million being spent in that year. At its peak, private sector construction on these assets accounted for 12 per cent of total private sector construction.

*Construction
by the public
sector on water,
sewerage and
drainage facilities
has improved
with strong
growth from
2009-10.*

⁸ Joyce, B (Minister for Agriculture and Water Resources), 2015, Water infrastructure for Tasmania's future, Media Release, www.agricultureminister.gov.au

Telecommunications

Over the past 25 years, the balance of public and private sector telecommunications infrastructure investment has changed, largely due to the privatisation of Telstra. The rollout of the National Broadband Network (NBN) has led to a more recent uplift in public sector engineering construction.

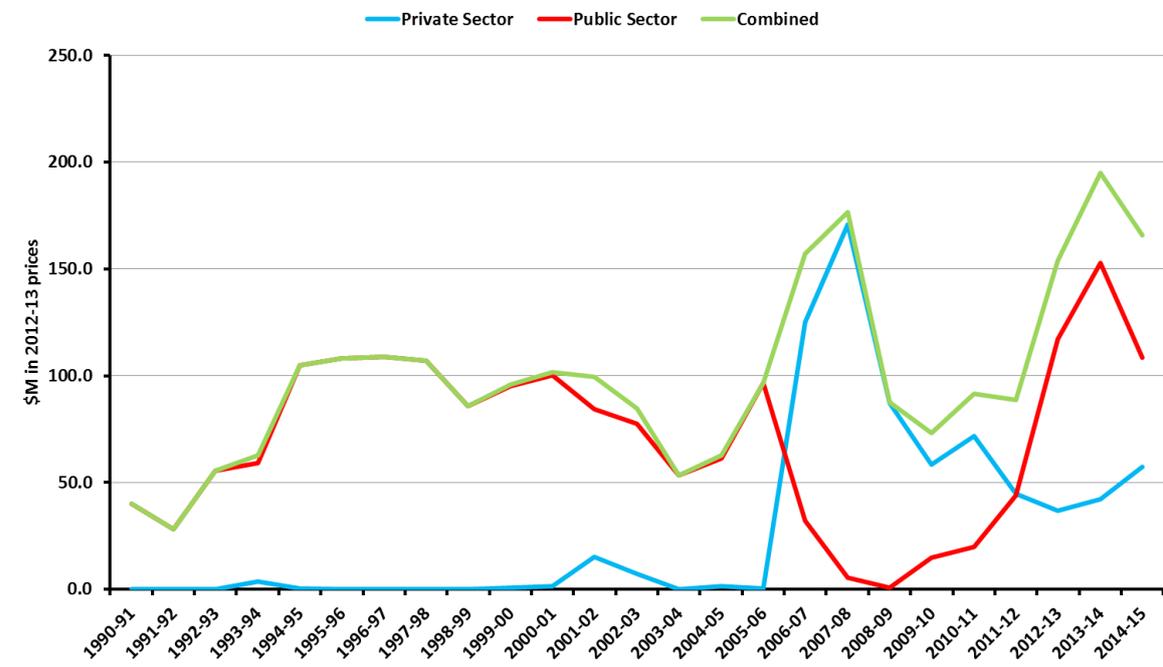
The telecommunications engineering construction covered by Figure 8 (at 2012-13 constant prices) includes:

- Mobile phone, radio, television, microwave and radar transmission towers
- Telephone lines
- Underground cables and coaxial cables.

In 1990-91, total engineering construction on telecommunications was \$40 million, which grew to \$165.8 million in 2014-15. The average growth over this period was 11.7 per cent per year.

The federal Government's privatisation of Telstra, 31 per cent of which was in 2006⁹, explains much of the changes in private and public sector construction outlined below.

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



9 Telstra, The Telstra Story, www.telstra.com.au

PUBLIC INVESTMENT

Public sector infrastructure construction on these assets fell from \$40 million in 1990-91 to almost zero in 2008-09, before lifting again to \$108.5 million in 2014-15. Construction by the public sector was reasonably steady through the 1990s and the early 2000s, before a dramatic fall in construction in 2007-2008, where public construction on these assets dropped to extremely low levels. In 1996-97 public sector construction on these assets accounted for 30.5 per cent of total public sector construction. At its peak of \$152.8 million in 2013-14, it accounted for 18.6 per cent of total construction. The recent growth seen in the public sector is likely attributed to the rollout of the NBN.

PRIVATE INVESTMENT

Private sector construction on these assets grew dramatically from no construction in 1990-91 to \$170.9 million in 2007-08, falling away to \$57.3 million in 2014-15. Private sector construction on telecommunications was at low levels until strong growth occurred from 2005-06 to 2007-08, which coincided with the drop in public sector construction. The private sector has been responsible for the majority of telecommunications construction up until 2012-13. In 1990-91 telecommunications didn't account for any private sector construction on engineering infrastructure, but at its peak in 2007-08 it accounted for 33.7 per cent of total private sector construction.

Over the past 25 years, the balance of public and private sector telecommunications infrastructure investment has changed.

Non-infrastructure engineering construction

There are some elements of engineering construction that fall outside our definition of infrastructure. It is debatable whether recreational facilities should be included in infrastructure or not, but as these areas contribute to economic growth we believe it is worth discussing these construction trends.

HEAVY INDUSTRY

Tasmania's private sector takes the lead in the range of heavy industry sectors which contribute to engineering construction in the state. This includes the Mount Lyell copper mine and pulp mill operations.

Figure 9 shows trends in public and private sector engineering construction in heavy industry in the last 25 years, in 2012-13 constant prices. This includes:

- Construction and production of oil, gas, coal, bauxite, alumina (and other materials)
- Storage and distribution facilities
- Refineries, pumping stations and mines
- Chemical plants
- Blast furnaces
- Steel mills and other industrial processing plants and ovens.

Total engineering construction on heavy industry grew from \$31.9 million in 1990-91 to \$162.7 million in 2014-15.

PUBLIC INVESTMENT

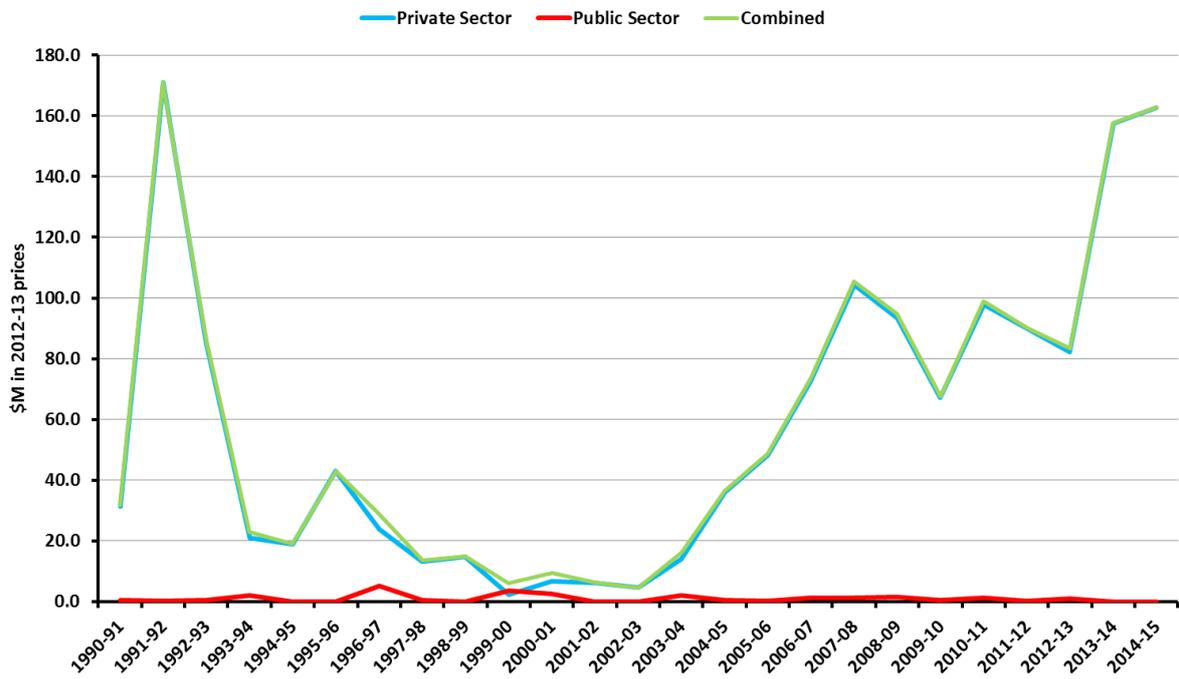
Public sector construction on heavy industry has consistently remained at low levels over the last 25 years. The peak time for public sector construction on heavy industry infrastructure was in 1996-97 when construction reached \$5.1 million, accounting for only 1.4 per cent of total public sector construction in this year.

PRIVATE INVESTMENT

The private sector is responsible for the majority of construction on heavy industry, and this has been evident for the last 25 years. Private sector construction on heavy industry has grown from \$31.4 million in 1990-91 to \$162.7 million in 2014-15. There have been a number of years where private sector construction has been high, including 1991-92, 2007-08 and between 2013 and 2015. In 1991-92 private sector construction on these assets accounted for 79.9 per cent of total private sector construction.

The private sector is responsible for the majority of construction on heavy industry, and this has been evident for the last 25 years.

FIGURE 9: TRENDS IN PUBLIC AND PRIVATE SECTOR ENGINEERING CONSTRUCTION ON RESOURCES AND HEAVY INDUSTRY IN TAS, 1990-91 TO 2014-15



Recreation facilities

This class of engineering construction includes:

- Golf courses
- Playing fields and stadiums
- Racecourses
- Swimming pools
- Landscaping and park construction.

Total engineering construction on recreation facilities grew from \$11.2 million in 1990-91 to \$92.3 million in 2009-10, falling away to \$54.5 million in 2014-15.

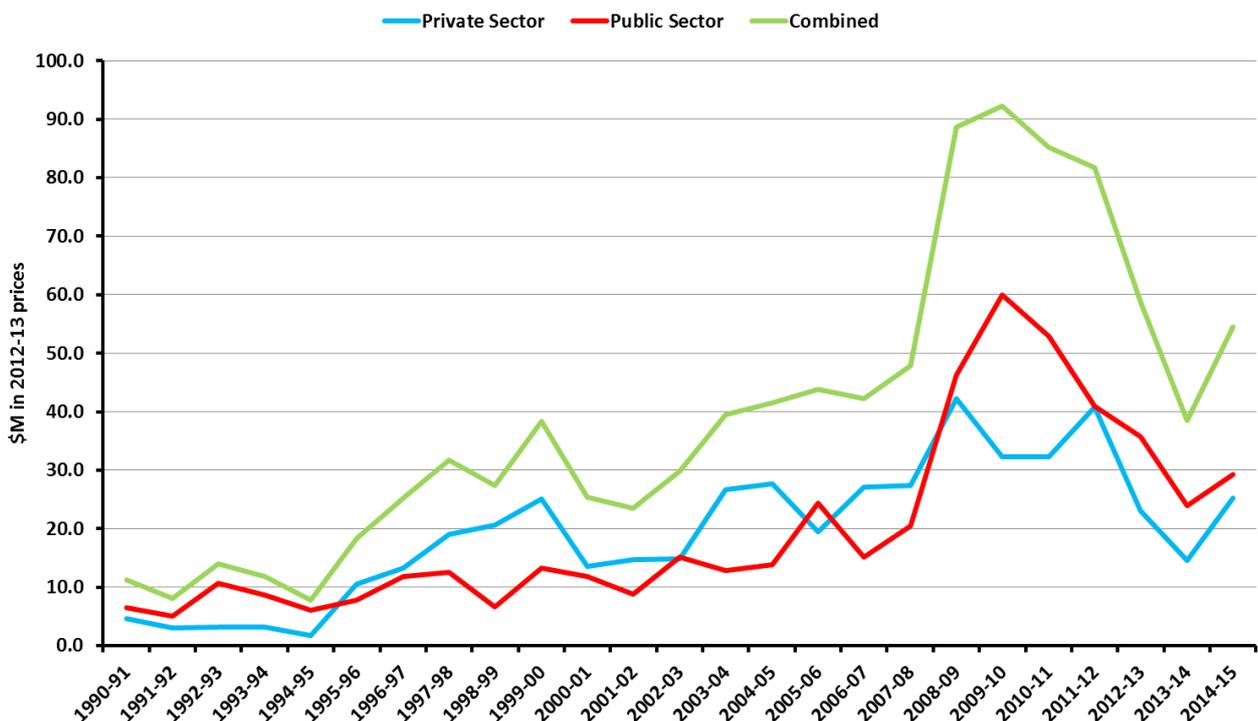
PUBLIC INVESTMENT

Public sector construction on recreation facilities has grown from \$6.6 million in 1990-91 to \$29.3 million in 2014-15. The height of public sector construction on these assets was in 2009-10 when construction reached \$59.9 million. At this peak public sector construction on these assets made up eight per cent of total public sector construction.

PRIVATE INVESTMENT

The private sector construction on these assets has grown from \$4.6 million in 1990-91 to \$25.2 million in 2014-15. The private sector peak in 2011-12 was \$40.8 million, accounting for 13.1 per cent of total private sector construction.

FIGURE 10: TRENDS IN PUBLIC AND PRIVATE SECTOR ENGINEERING CONSTRUCTION ON RECREATION FACILITIES IN TAS, 1990-91 TO 2014-15



Looking forward

Having reviewed infrastructure and engineering construction in Tasmania over the last 25 years, we now need to look towards the future. By their nature these are long running projects with lengthy periods of planning and design, negotiation, approval, financing and then the build process itself. The data discussed so far only details engineering construction completed, so what is now in the pipeline?

NEW PROJECTS

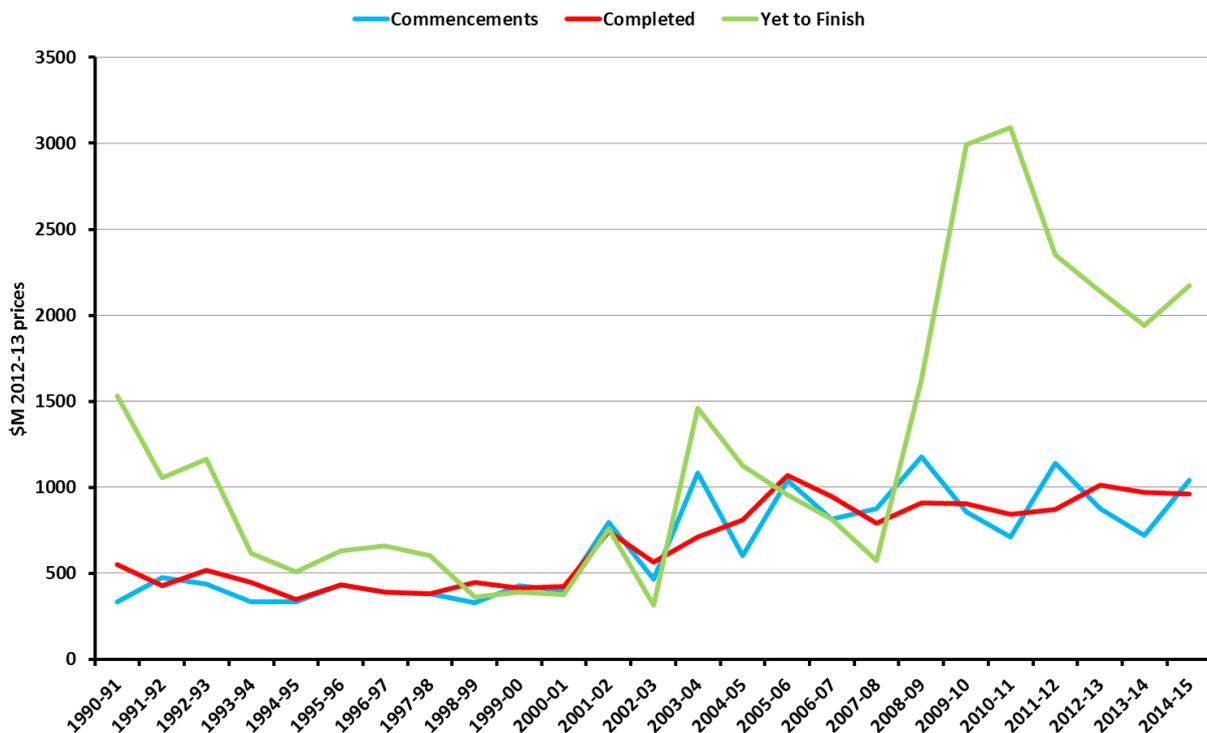
We are using statistics which provide insight into how much construction work is still in the system as work not yet completed, and other infrastructure projects that have just commenced.

We cannot be certain all these projects will eventually reach completion, which is worth noting for subsequent reports because uncompleted work will not necessarily convert into completion statistics.

This only gap in our approach relates to projects that are still in the planning phase, and have not yet commenced.

Figure 11 shows trends for infrastructure projects in Tasmania, comparing projects that have commenced, that are yet to be completed, and that have been completed. Consistent with Figure 1, completed work has remained reasonably steady over the past five years. Commencements closely follow the trend seen in work completed statistics, jumping above and below the work completed line.

FIGURE 11: THE INFRASTRUCTURE PIPELINE IN TASMANIA, PUBLIC AND PRIVATE SECTORS



The green line represents work which is still in the system and is yet to be completed (note that this may include cost variations during construction). Looking at Figure 11 there is a large amount of work yet to be completed. As of 30 June 2015 there was \$2.2 billion in infrastructure incomplete. This compares to \$960 million in work which was completed in 2014-15.

At the present rate of infrastructure completion there is sufficient work outstanding for the next 2.3 years. Although this seems like an ample amount of work, the work yet to be completed has fallen 29.6 per cent since 2010-11, while the work being completed has grown by 14 per cent in the same time period. More work is being completed while the work yet to finish is falling.

Figures 12 and 13 divide the Tasmanian infrastructure pipeline into public and private sector components.

Figure 12 shows there is a large overhang of work yet to be completed for the public sector.

Figure 13 shows the work that is yet to be completed has fallen dramatically in the last few years, and this is now level with completions and commencements. For the public sector at the current rate of completion, there is 2.7 years of work in the system, while there is only 0.5 years of work for the private sector.

FIGURE 12: THE PUBLIC SECTOR INFRASTRUCTURE PIPELINE, TASMANIA

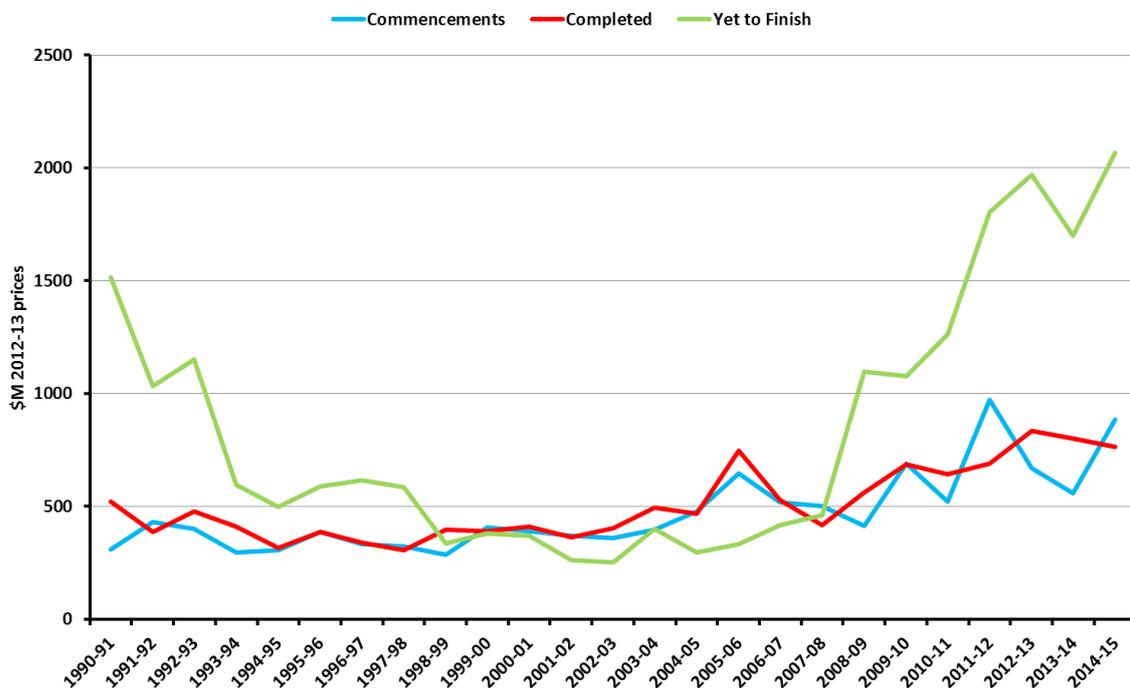
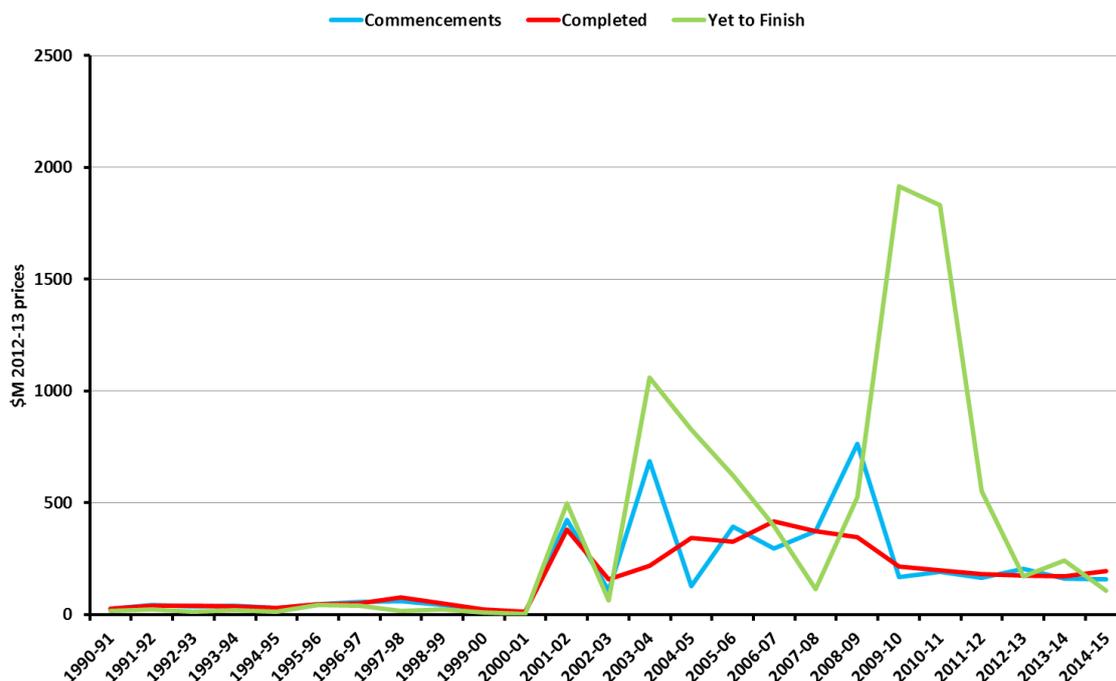


FIGURE 13: THE PRIVATE SECTOR INFRASTRUCTURE PIPELINE, TASMANIA



Looking at the 2014-15 trend directions for the components of infrastructure construction in Table 6, we can see in the last 12 months roads and water and sewerage have recorded growth in commencements, work yet to finish and in completions. Total infrastructure improved for commencements and construction yet to finish,

however this is only on the back of strong numbers recorded for the water and sewerage section. Overall infrastructure construction completions fell in the last 12 months, and have been falling since 2012-13. For all the sectors that recorded falls in completions for the last 12 months, the falls in construction numbers were not large numbers.

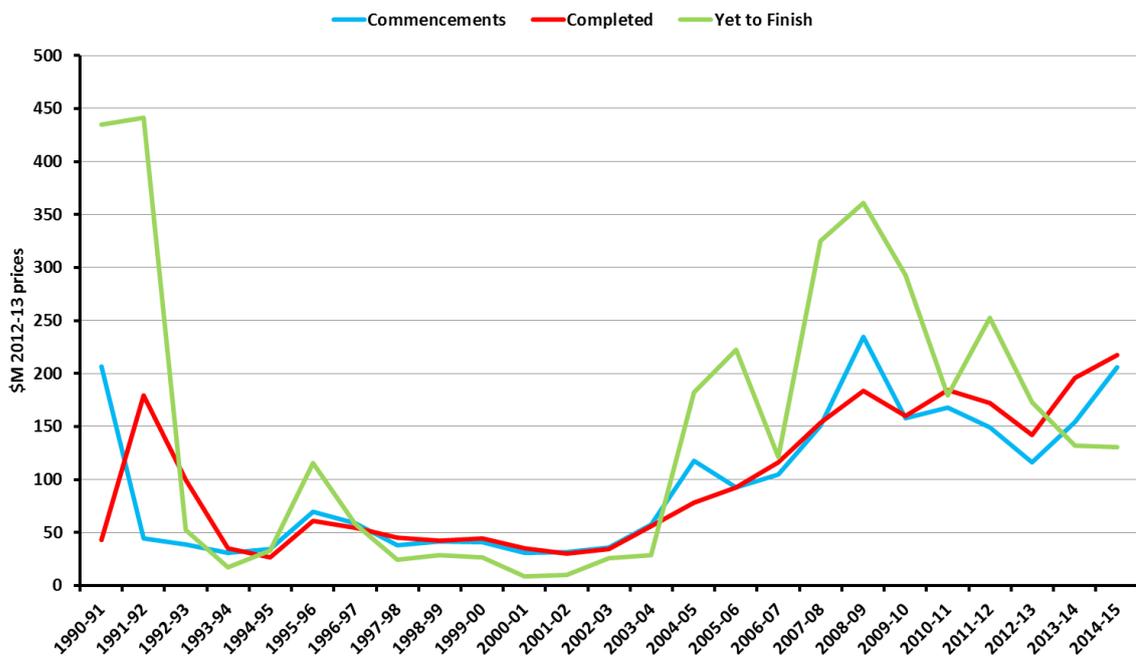
TABLE 6: OVERVIEW OF CHANGES, INFRASTRUCTURE COMPONENTS, TAS PIPELINE

Component	Commencements	Completed	Yet to finish
Roads	↑	↑	↑
Bridges etc	↓	↓	↓
Electricity etc	↓	↓	↑
Water & sewerage	↑	↑	↑
Telecommunications	↑	↓	↓
Infrastructure	↑	↓	↑

Figure 14 shows the trends in non-infrastructure components of engineering construction, principally the resource and heavy industry sectors and recreation facilities. Figure 14 shows steady growth in this area over the past decade. In 2014-15 there was \$217 million worth of construction on non-infrastructure assets completed in Tasmania. As of June 2015 there was still \$130 million of work yet

to be completed. At the current rate that non-infrastructure engineering construction is being completed, there is only 0.6 years' worth of work that is still in the system. The falling rate of work in the system is demonstrated by the green line in Figure 14, which has dropped below the amount of work completed.

FIGURE 14: THE PIPELINE OF NON-INFRASTRUCTURE ENGINEERING CONSTRUCTION IN TASMANIA, PUBLIC AND PRIVATE SECTORS



Conclusion

Over the last 25 years, expansions in Tasmania's economy and population have put pressure on the state's infrastructure. Since 1990-91, the population in Tasmania has increased 10.7 per cent and the size of the state's economy has increased by 60.2 per cent. At the same time, combined annual public and private sector engineering construction on infrastructure has increased by 75 per cent. When non-engineering infrastructure components are included, that percentage increases to 99 per cent.

Engineering construction on infrastructure is higher than the levels seen when the 2010 Engineers Australia Infrastructure Report Card was released but they have been inconsistent. For the last five years, there has been average annual growth of 1.5 per cent per year overall, but in the last two years construction completed has fallen at an average

Although Tasmania has recorded modest growth compared to the Australian average, the state's infrastructure assets have still been under pressure.

of 2.5 per cent per year. In 2010-11 engineering construction on infrastructure was \$843 million, growing to \$1 billion in 2012-13, before dropping to \$961 million in 2014-15. Although these numbers are higher than they were five years ago, the current two year trend is concerning. In the last year alone there have only been improvements in construction completion numbers for the roads and telecommunication sectors, with all other sectors recording falls.

Although Tasmania has recorded modest growth compared to the Australian average, the state's infrastructure assets have still been under pressure. In 2010, Tasmania's infrastructure assets were

rated as adequate, with major changes required to enable infrastructure to be fit for its current and future purposes.

An increase in spending on infrastructure assets is essential to improve the ability of Tasmania's assets to maintain current standards of living, and to manage the expected population and economic pressures of the future. It will be up to the public sector to continue to drive construction on infrastructure assets.

The public sector has been responsible for the majority of engineering construction on infrastructure, and in the last five years it has consistently made up around 80 per cent of the total construction on infrastructure. The average annual growth in the last five years for the public sector has been 2.7 per cent, compared to a fall of 1.6 per cent for the private sector in the same time frame. However, the private sector has been more prominent in the last two years, recording average annual growth of 5.8 per cent compared to a fall of 4.3 per cent for the public sector.

As the main contributor to infrastructure construction, the public sector needs to develop a pipeline of future infrastructure projects if it is to change this current overall trend. The most recent budget announcements are a good start and Engineers Australia believes that these strong numbers need to be consistent, and continue in the future, with a view to enable productivity growth in the state. Future budget allocations also need to consider a number of different infrastructure sectors as in 2014-15 only the roads and the water and sewerage sectors recorded growth in engineering construction.

Engineers Australia believes that if the current budget provisions are not consistent, and if the invested numbers are put off to future estimate years, Tasmania is at risk of having its infrastructure assets slip from a just adequate state, to a poor or inadequate state in the near future. The public sector needs to lead the way through infrastructure investment to promote productivity growth, and improve the standard of living for Tasmanians.



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