# Maintenance in Australia
## 2010 – 2025

"Maintenance spending was on pause during the economic downturn. However, the maintenance market is now on the threshold of a significant upturn driven by a return to stronger economic growth and incomes, higher rates of capacity utilisation and significant additions to the capital stock brought about by high levels of investment over several years."

EXTRACT TO INDICATE THE GENERAL NATURE OF THE REPORT

INFRASTRUCTURE AND MINING

BIS Shrapnel
BUSINESS RESEARCH AND FORECASTING

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## 1.2 Background to the roads maintenance sector

Road maintenance is one of the largest maintenance sectors in Australia. This chapter provides information on the size and structure of the sector, the nature of maintenance arrangements and the outlook for road maintenance work.

For a more comprehensive examination of road maintenance than is possible here, see our companion report — *Road Maintenance in Australia, 2009 to 2024*.

There are almost 140,000 kilometres of highways and arterials in Australia, but the local road network is almost five times larger. The make-up of the road maintenance sector in Australia is described in the table below.

**Table 1.1: Australia's Road System**

| Type of road | Length km | Lane Length km | Travel million vehicle km | Maintenance Activity 2007/08 - $m | No. of Purchasers |
|---|---|---|---|---|---|
| **Highways and Arterials** | **139,832** | **328,911** | **169,238** | **2,441** | **8** |
| Rural | 122,064 | 272,598 | 82,085 | 1,391 | 8 |
| Urban | 17,768 | 56,314 | 87,152 | 1,050 | 8 |
| **Local Roads** | **675,110** | **1,354,979** | **48,764** | **2,592** | **565** |
| Rural | 576,720 | 1,148,733 | 16,203 | 1,301 | 334 |
| Urban | 98,390 | 206,246 | 32,561 | 1,291 | 231 |
| **Private Toll Roads** | **132** | **723** | **2,779** | **68** | **2** |
| All Roads | 815,074 | 1,684,613 | 220,780 | 5,102 | 575 |

*Length & Lane Length:2007, Travel:2007/08* Sources: BITRE, NOLG, ACLG Snapshot

## 1.3 Size and structure of the maintenance market

The total value of road maintenance in Australia in 2007/08 (the latest year for historical data) was $5.014 billion, with the portion of work performed by contractors at $1.822 billion. These values are both in constant prices, i.e. prices adjusted for inflation.

### 1.3.1 Road categories

The largest road maintenance purchasers are the state road authorities. The value of road maintenance for local governments is broadly similar to the state road authority work. Local road maintenance is generally the largest category, but strong recent growth in highways and arterials maintenance work (via several national funding programs) and various financial issues for Local Government has narrowed the gap. Local roads still make up the bulk of the network, but these roads are not as heavily trafficked and the value of maintenance per kilometre on them is much less.

**Highways and Arterials** are a network of major roads, including links between capital cities as well as key urban and rural corridors. Although a smaller road system, these roads receive a large amount of traffic and, despite being of a higher standard, require substantial maintenance each year. This category includes the former National Highway System (NHS) (now part of the National Network). Whereas the Federal Government had complete responsibility for the NHS, the National Network is under the care of State and Federal Governments.

The Federal contribution to National Network maintenance was capped to just $300 million per year until 2008/09 (save for natural disaster funds and the stimulus): this saw the States' contribution increase in importance. We believe the Federal contribution topped $430 million in

## Table 2.1: Organisations with Responsibility for Rail Infrastructure

| Business Name | Ownership | Route km | Infrastructure responsibility |
|---|---|---|---|
| **New South Wales** | | | |
| RailCorp NSW | NSW Govt | 1,815 | NSW metropolitan rail network |
| Australian Rail Track Corporation (ARTC) | Commonwealth Govt | 3,440 | Long term lessee of interstate and Hunter Valley rail track in NSW |
| Rail Infrastructure Corporation (RIC) | NSW Govt | 5,873 | Owner of residual NSW country lines |
| BHP Steel Port Kembla | Bluescope Steel Australia (formerly BHP Steel) | 190 | Rail infrastructure to Wollongong coal mines and within Port Kembla steel works |
| Southern & Silverton Rail | South Spur Rail Services | 56 | Owns a small stretch of rail linking Cockburn (SA) & Broken Hill |
| Metro Light Rail | Metro Transport Sydney | 7 | Light rail (tram) system in Sydney |
| Metro Monorail | Metro Transport Sydney | 4 | Sydney Monorail |
| Skitube | Transfield/Kumagai | 9 | Bullocks Flat to Mt Blue Cow in NSW Snowy Mountains |
| **Victoria** | | | |
| Australian Rail Track Corporation (ARTC) | Commonwealth Govt | 760 | Long term lessee of the interstate rail track in Victoria |
| V/Line Passenger | Victorian Government | 4,100 | Intrastate and regional rail network operator |
| Metro Trains Melbourne | MTR Corporation, John Holland Group and United Group Rail | 830 | Franchisee of suburban rail infrastructure in Melbourne (formerly Hillside Trains), including lines formerly operated by National Express |
| Yarra Trams | Keolis Downer EDI Rail (KDR) Victoria | 249 | Franchisee of suburban tram infrastructure in Melbourne including tram lines formerly operated by National Express. |
| **Queensland** | | | |
| QR | QLD Govt | 10,000 | Integrated owner of passenger and freight track in Queensland |
| Rio Tinto Aluminium | Rio Tinto | 19 | Andoom to Weipa in Cape York |
| ARTC | Commonwealth Govt | 127 | Long term lessee of the standard gauge interstate rail line from the Queensland border to Acacia Ridge (Brisbane) |
| Brisbane Airport Rail Link | Airtrain CityLink Limited | 9 | Owner of the Brisbane Airport Rail Link under BOOT arrangement with the Queensland Government |
| Sugar Cane Railways | Various | 4,150 | A diverse collection of rail lines, known as 'tramways', serving Queensland's sugar cane industry |
| **South Australia** | | | |
| ARTC | Commonwealth Govt | 3,900 | Owners of the interstate track between Kalgoorlie in WA, Alice Springs in NT, Broken Hill in NSW and the Victorian border |
| Genesee & Wyoming Pty Ltd | Genesee & Wyoming Inc. | 1,367 | Owners of the South Australian intra-state network previously owned by Australian National |
| OneSteel Whyalla | OneSteel | 128 | Rail infrastructure servicing Whyalla Steelworks |
| Flinders Power | NRG Energy | 250 | Rail link from Leigh Creek coal mine to power stations at Port Augusta |
| TransAdelaide | SA Govt | 140 | Suburban train and train network in Adelaide |
| **Western Australia** | | | |
| ARTC | Commonwealth Govt | 786 | Owners of the interstate track between Kalgoorlie and SA |
| WestNet Rail | Prime Infrastructure | 5,100 | Lessee of ex-Westrail intrastate freight rail network |
| PTA | WA Govt | 110 | Urban and country passenger train network in WA |
| BHP Billiton Iron Ore | BHP Billiton | 734 | Rail network linking the Mt Newman, Mt Goldsworthy and Yandi joint ventures to Port Hedland in Northwestern WA |
| Hamersley Iron | Hamersley Iron (owned by Rio Tinto) | 868 | Rail network linking Yandi, Paraburdoo, Brockman & Mt Tom Price to Dampier in Northwestern WA |
| Pemberton Tramway | Pemberton Tramway | 57 | Private tourist railway in south west WA |
| Robe River Railroad | Pilbara Iron | 316 | Rail network linking Pannawonica and Cape Lambert in Northwestern WA. |
| Fortescue | Fortescue Metals Group Ltd | 290 | Rail network linking the Cloudbreak mine to the Herb Elliot Port |
| **Tasmania** | | | |
| Tasmanian Railway | Tasmanian Government | 890 | Manage the rail network infrastructure and operate the rail business in Tasmania |
| **Northern Territory** | | | |
| AustralAsia Railway | Asia Pacific Transport Consortium (incl. ARG, Brown & Root, Barclay Mowlem) | 1,420 | Consortium developed the Alice Springs to Darwin Railway and also owns Tarcoola (SA) to Alice Springs line |
| ARTC | Commonwealth Govt | 314 | Long term lessee of the interstate track between Alice Springs and SA |
| **Total Australia** | | **48,318** | |

are big differences between ports in the exact delineation or responsibility for maintenance of the various assets at the port.

The terminal operators will usually have responsibility for the mechanical and electrical maintenance of any stevedoring or material handling/loading equipment (container cranes, forklifts, reachstackers, RORO equipment, bulk loaders, etc.).

The port authority will typically have responsibility for marine civil assets (Channels, Berths, Wharves, Terminals, Roads, Electricity), navigational aids, grounds and some floating plant (dredgers, tugs, survey vessels, barges and other small crafts). Terminal buildings can be the responsibility of either party.

**Table 3.3: Estimated Maintenance Expenditure — Ports 2009/10**

| | $m | % of Total |
|---|---|---|
| **Total maintenance expenditure** | 276 | 100% |
| **By party responsible:** | | |
| - Funded by port authorities | 179 | 65% |
| - Funded by terminal operators | 97 | 35% |
| **By type of maintenance:** | | |
| - Channel dredging | 66 | 24% |
| - Sea wall & breakwater repairs | 17 | 6% |
| - Repairs to equipment (cranes, ro-ro equip. etc.) | 58 | 21% |
| - Corrosion mitigation and restoration | 66 | 24% |
| - Repairs to buildings & infrastructure | 55 | 20% |
| - Miscellaneous | 14 | 5% |
| **By who does the work:** | | |
| - Work done by contractors | 201 | 73% |
| - Work done in-house | 75 | 27% |

In many ports however, there are specific, single purpose berths which are the complete responsibility of the terminal operator.

In total, we estimate that around 65 per cent of maintenance work, worth around $179 million, is funded by the port authorities, with the remaining 35 per cent, or $97 million worth of work, being funded by, and the responsibility of, terminal operators (see table 3.3).

## 3.3 Outlook for port maintenance expenditure

### 3.3.1 Drivers of maintenance work

Maintenance expenditure in the ports sector is dependent on the amount of physical port infrastructure, its age and the degree of utilisation of port capacity. Local environmental conditions are also important in determining the extent and type of maintenance activities required at particular ports. Trade volumes and economic conditions also impact, as they contribute to revenues of port authorities and their ability to raise charges, as well as the profitability of stevedoring companies and their willingness to fund maintenance works.

interconnector cable to Victoria in 2005. The Snowy region was abolished on 1 July 2008 through a regional boundary change, with the area now split between the Victoria and New South Wales regions of the NEM. The other regions follow jurisdictional boundaries.

## 5.3 Size and structure of the electricity maintenance market in 2009/10

We estimate that the total size of the maintenance market in 2009/10 was $2.8 billion. Of this, we estimate that the total value of work contracted out was approximately $1.5 billion, or 53 per cent of the total.

In 2009/10, it is estimated that the largest share of electricity maintenance (68.3 per cent) was spent on distribution assets, reflecting the age, size and value of the asset base. This is predominately comprised of pole and overhead line maintenance, substation maintenance and vegetation controls, but also includes expenditure on the inspections of poles and other assets. Generation maintenance is the next largest subsector, with the main types of activity being boiler and turbine maintenance, with relatively less spent on buildings and infrastructure, valves, pumps and filters. Maintenance of substation plants, high voltage transmission lines, poles and trees determine the bulk of activity in the transmission sub-sector, which accounts for around 9.4 per cent of all electricity maintenance expenditure.

As can be seen in Chart 5.1, total maintenance expenditure fell substantially between the mid 1980's and mid 2000's. Efficiency gains from electricity deregulation and reform led to a substantial trend decline in maintenance spending through the 1990s, with activity reaching a trough by 1999. However, another surge in investment — particularly in new generation assets — combined with a weakening in the gains from efficiency improvements has seen total maintenance spending shift upwards again since 2005, although it is still below the levels recorded in the mid-1980s in real terms.

### 5.3.1 Drivers of maintenance expenditure and forecasts

In the electricity generation, transmission and supply sector, an enormous quantity of generating capacity was built in the 1970s and mid 1980s in anticipation of a sustained boom in minerals and secondary processing investment which did not eventuate. The result was a large oversupply of electricity. But this oversupply was gradually absorbed and strong economic growth, increasing energy intensity and the upturn in minerals investment in the late 1990s saw some states encounter electricity capacity constraints. This started the upswing in activity which continues today.

It is expected that the main driver of maintenance expenditure over the short-term will be the need for new infrastructure, in the form of additions to the existing network. The issue of climate change (in terms of targets on carbon emissions and the use of renewable energy) is likely to affect the generation industry in particular in the future, although the current Government has recently pushed back the date for implementation of the Emissions Trading Scheme (ETS) until 2013 at the earliest. This means that any trend away from coal or oil product-powered stations will not occur until later in the decade.

The major driver of continued strong activity will be the need to invest in generation capacity (in line with recommendations from NEMMCO to do so in most states by the early 2010s). A strong mining sector will continue to be an important driver of demand for electricity, while increasing household demand (via rising energy intensity and particularly population growth) will also contribute, and require extensions to both transmission and distribution networks in most states.

**Table 6.5: Gas Distribution Maintenance by State, 2009/10**

| State | Maintenance ($M, 2007/08 prices) | Proportion of Total |
|---|---|---|
| New South Wales + ACT | 38.9 | 28.2% |
| Victoria | 49.0 | 35.5% |
| Queensland | 16.5 | 11.9% |
| South Australia | 12.3 | 8.9% |
| Western Australia | 20.3 | 14.7% |
| Northern Territory | 0.9 | 0.7% |
| Tasmania | 0.2 | 0.2% |
| **AUSTRALIA** | 138.1 | 100.0% |

Source: BIS Shrapnel

### 6.3.1 Main types of maintenance activities

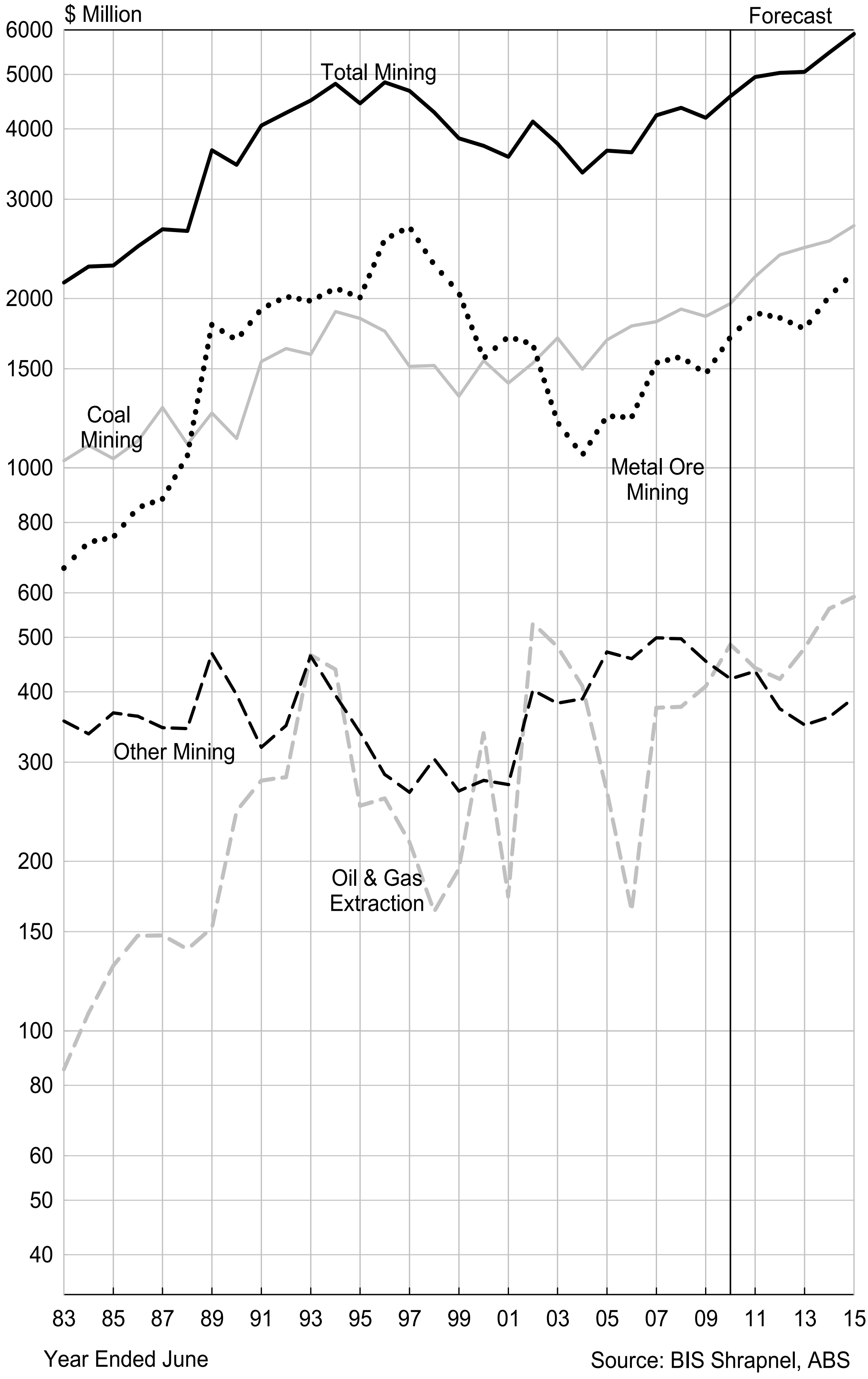
Maintenance activities differ substantially between gas transmission and gas reticulation organisations. Both sub-sectors, however, spend a significant proportion of their maintenance budget on pipeline inspections, valves and regulators, and metering repairs.

Maintenance in the distribution sub-sector tends to be more response-oriented than in the transmission sub-sector. The cost of maintaining emergency units to deal with leaks as they occur is a major part of distribution maintenance, at up to 20 per cent of total expenditure. In the transmission sub-sector, compressor station maintenance forms a large part of expenditure, along with meter maintenance and civil/easement works.

Over the past several years, distribution maintenance costs have been rising as a result of ageing and corrosion of the cast-iron distribution network. Repeat maintenance on ‘trouble spots’ is being ameliorated, however, by capital programs that replace cast-iron pipe with HP polypipe or PVC. By nature, maintenance in the distribution sub-sector tends to be more response-oriented than in the transmission sub-sector. The cost of maintaining rapid-response (30–60 minutes) emergency units to deal with leaks as they occur is a major component of reticulation maintenance expenditure. Metering repairs — which often involve replacement of faulty meters — are also a significant component.

On our estimates, around one quarter of transmission maintenance is spent directly on the pipeline and pipeline patrols, with compressors the next major maintenance category. This varies from year to year, however, depending on the type of pipeline maintenance required. Transmission maintenance is driven by the risk profile of the asset and is preventative in character as the consequences of a leak in a high-pressure pipe can be catastrophic, not only to the asset, but also to the security of gas supply to a region. Consequently, a large proportion of maintenance expenditure is spent on inspections, patrols and testing of cathodic protection. The isolated location and sheer distance of transmission pipe accentuates the costs of inspections. Overhauls of compressors and other periodic maintenance tasks such as intelligent pigging or, in more extreme situations, hot tapping or stoppling of transmission pipe, is relatively expensive and may cause the proportions of types of maintenance activity to vary significantly over time. Apart from pipeline maintenance, civil / easement works (including vegetation control, easement management of erosion and slippage, and general digging) is also a major component of transmission maintenance activity, as is the upkeep of information and communication technologies (ICT) including radio networks, control rooms and SCADA (system control and data analysis) systems.

**Chart 8.1: Mining Maintenance – By Sub-Sector**
**Constant 2007/08 Prices, $ Million**



## 10.3 Drivers of maintenance expenditure and forecasts

There are a number of drivers of total maintenance expenditure. These include:

- Safety; with stricter safety requirements, the need for maintenance has increased.
- The trend towards preventative maintenance, which has pushed up maintenance costs but has delivered reliability and less of a need to replace capital.
- Age of facilities.
- Business conditions in each sub-sector, with maintenance budgets often cut when profits are squeezed, and then expanded in better times.
- New investment: which can raise maintenance by increasing the capital stock of a firm, but this can also decrease maintenance if it replaces ageing equipment. Also, new equipment often boosts maintenance soon after it is installed, as teething problems need to be ironed out.
- Output levels: with higher output levels, assets are worked harder and more maintenance is required. However, maintenance will often rise in the early part of an upturn (rather than at the peak of the cycle) while there is still down-time in which to undertake the maintenance required prior to a boom.

Overall, business conditions seem to be a key driver of maintenance, with year-to-year profitability (and output growth) a factor in setting maintenance budgets. Maintenance expenditure increased by 3.4 per cent (in real terms) over 2001/02, reflecting the increasing profits across many sectors. In the subsequent years, maintenance expenditure decreased due to a combination spasmodic growth in light manufacturing and a strong preference by manufacturers to invest in new capital rather than maintain ageing capital.

This resulted in maintenance expenditure decreasing by an average of 2.3 per cent in the 5 years prior to 2007/08. These falls in maintenance expenditure coincide with the decline of some of the light manufacturing industries. In particular, TCOM continued its decline, whilst drought conditions led to the contraction in output and profits within the Food, Beverages and Tobacco (FBT) sub-sector. The sheer scale of the FBT sector means that the performance of this sector determines to a large extent the overall outcome for light manufacturing. After drought conditions eased in 2006/07, FBT staged a small recovery. However, this recovery was short-lived as gross value added continued its decline in 2007/08.

World economic conditions deteriorated sharply towards the end of 2008, precipitating a collapse in world trade. Meanwhile, domestic businesses and consumers pulled back on non-essential spending — such as ‘big ticket’ consumer durables in particular cars and capital equipment — as economic and financial conditions deteriorated following the onset of the GFC. Australian manufacturers responded quickly to the deterioration in conditions, especially the collapse in world demand for investment goods, by reducing production and quickly running down inventories in the last quarter of 2008. Overall, manufacturing output slumped in late 2008.

As the financial crisis began to adversely impact on the real side of the economy, in particular investment, the downturn in world industrial production accelerated through the first quarter of 2009. Motor vehicle production was hit particularly hard as sales of cars in major developed economies in March 2009 were 25 per cent lower from the level at the end of 2007. Moreover, for the group of OECD countries, industrial production fell 10.5 per cent in the March 2009

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