OXFORD ECONOMICS AUSTRALIA

MARKET ANALYSIS OF FUTURE INFRASTRUCTURE DELIVERY DEMANDS

REPORT PRODUCED FOR DEPARTMENT OF TRANSPORT AND MAIN ROADS

SEPTEMBER 2023 - FINAL REPORT

Oxford Economics Australia

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September 2023

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EXECUTIVE SUMMARY

The decade ahead represents a period of major infrastructure investment and delivery in Australia and more specifically Queensland. Understanding the delivery demand on contractors in Queensland, with further analysis at a regional level, is important for the Department of Transport and Main Roads (TMR) to identify potential resource constraints likely to impact the delivery of projects over the next decade.

The project pipeline features several projects to be delivered for the 2032 Olympics. These include the redevelopment of Brisbane's Gabba Stadium and the Brisbane Live Arena. Unlike other infrastructure developments, these projects have hard deadlines which is expected to put unique pressure on the industry to ensure these projects are delivered in time for the games.

Major steps in the energy transition are scheduled to take place over the coming decade. The Queensland project pipeline features several major wind, solar and pumped hydro projects which will go a long way in decarbonising energy generation and storage in the sunshine state.

There are also major commitments to improving the energy ratings of buildings, with all Olympics buildings to achieve 6-star energy ratings. The International Olympic Committee (IOC) requires Brisbane 2032 to be climate-positive with a large emphasis on planning for the legacy beyond the games. This is on top of a general trend to reduce the embedded carbon in infrastructure with an increased focus on sustainability and reducing the carbon footprint of projects. This has the potential to place increased pressure on key components and green building materials.

The current surge in construction cost escalations is not expected to dissipate quickly. Despite cost pressures easing from its spikes in FY22 and FY23, construction costs are expected to remain at a higher base than previously going forward. This creates challenges in assessing the true size of the pipeline and its feasibility to be delivered.

All levels of construction activity and project values quoted throughout the report refer to the estimated value of construction work done (unless otherwise reported). This was done to align with the Australian Bureau of Statistics' (ABS) standard measurement of construction activity and to ensure consistency when comparing values.

Key Findings:

- Over the next decade, total construction work done (activity), excluding oil & gas, is expected to rise to unprecedented levels. Annual activity in Australia - excluding oil & gas - is expected to reach $248bn (constant FY21 prices) by FY32, compared to a previous peak of $209bn in FY13.[1]

- National construction activity is expected to be concentrated over the five years to FY32, with an annual average of $258bn. Strong investments in renewable energy, a pick-up in residential construction, rising public investment, and Olympics-related projects are all set to occur around this period.

[1] Oil & gas activity, especially during the 2012-2014 period, generally does not require the same resources as other sectors due to a significant amount of prefabricated products being imported from overseas.

- In Queensland, activity – excluding oil & gas - is forecast to significantly ramp up over the outlook through FY32, averaging $51bn per year compared to an average of $40bn per year over the past decade. The outlook is underpinned by major Olympics-related projects in South East Queensland, a shift towards renewable energy generation, and significant public investment into the transport and health sectors.

- Construction activity will largely be concentrated in South East Queensland. Public investment is expected to provide a substantial boost in activity in the transport and health sectors. Additionally, the 2032 Olympics will sharply lift construction activity, particularly in Brisbane, in the latter half of the decade.

- Transport infrastructure activity is expected to remain strong in South East Queensland through FY32. Several mega projects are expected to be completed in time for the Olympics to support elevated levels of tourism during the games. These include the $4.4bn Cross River Rail that is currently under construction, and the $1.3bn Logan and Gold Coast Faster Rail[2].

- Olympics-related infrastructure is anticipated to contribute over $10bn in construction activity to South East Queensland from FY25 to FY32. Venue-related construction is expected to contribute to nearly half of this, including the $1.7bn Gabba Stadium Rebuild and the $1.5bn Brisbane Live Arena.

- The Central Queensland region is anticipated to be supported by strong engineering construction activity. EC activity is anticipated to increase by 80% from FY22 to FY28 (9% annualised) driven by the Pioneer-Burdekin Pumped Hydro Project. Additionally, investment in hydrogen production facilities, particularly around Gladstone, is expected to lift activity in the heavy industry sector towards the end of the decade. The $2.6bn H2-Hub™ Gladstone facility is expected to provide a substantial boost to activity in the region from mid-decade.

- The Southern and Northern regions are anticipated to be supported by large renewable energy infrastructure projects. Additionally, the new hospitals in Toowoomba and Bundaberg are expected to considerably add to activity in the Southern Queensland region through the latter half of the decade.

- Investment in renewable energy generation is anticipated to lift construction activity sharply across Queensland. Activity in the electricity sector is anticipated to average $4bn annually through FY32. Solar and wind projects are expected to support activity in the near term, while pumped hydro is expected to substantially boost activity towards the end of the decade. Key mega projects include the Borumba Dam Pumped Hydro in Southern Queensland and the Pioneer-Burdekin Pumped Hydro in Central Queensland, which are expected to cost over $10bn each (including machinery and equipment).

- The Queensland Health and Hospitals Plan will see a flurry of publicly funded hospital projects around the state. These projects are scheduled to begin work in the second half of the decade. Key projects include the $1bn Toowoomba Hospital, the $1bn

[2] Values quoted are estimates of the expected value of construction work done.

Coomera Public Hospital, and the $800mn Bundaberg Hospital. Additionally, there are several large hospital expansion projects around South East Queensland, including expansions to the Redcliffe and Ipswich hospitals.

- Many cost escalation indicators are expected to remain elevated in FY23 and beyond alongside new peaks in national construction activity. For Queensland, the lead-up to the 2032 Olympics and major utilities projects related to the clean energy transition will further underpin elevated costs and potential resource constraints.

- Construction wages growth in Queensland is anticipated to slightly outpace the national average from FY26-FY32, averaging 3.7% p.a. compared to the national average of 3.6% p.a. The outlook is underpinned by a strong pipeline of construction activity in the lead up to the 2032 Olympics and consequently greater demand for workers.

Deliverability Risks

- The sharp ramp up in construction activity from mid-decade through FY32 will likely lead to risks in the timing and deliverability of certain projects. The 2032 Olympics and the Queensland Government's renewable targets by 2035 are considered key drivers to this risk.

- Olympics-related projects are considered to have hard deadlines, with a number of large projects, such as stadiums, sporting facilities, and Olympic villages, needing to be completed by early 2032. The substantial size of construction activity required (over $10bn from FY25 to FY32) will add considerable constrains to market capacity.

- Additionally, Olympics-enabling projects that are not directly built for the Olympics are likely to be prioritised for completion. This is particularly the case for large transport infrastructure projects that will help move people around easily. Examples include the $1.3bn Logan and Gold Coast Faster Rail and the $1.4bn Coomera Connector - Stage 1 (Coomera to Nerang), which will improve transportation between Brisbane, Gold Coast, and Sunshine Coast (and their respective Olympic villages).

- The announced Gympie Road Tunnel has not been explicitly included in the major project list used to underpin our forecast for transport construction activity due to the lack of public details on timing, project size and committed funding. We acknowledge the Palaszczuk Government's investment of $35mn towards a detailed investment proposal, with the prospect of committed funding being upside risk to the outlook.

- Major renewable energy projects are also expected to have somewhat hard deadlines due to the Government's renewable targets by 2035, including 70% renewable energy target by 2032 and 80% by 2035. The $4bn in annual electricity activity will add substantial capacity constraints, especially towards the second half of the decade.

- In particular, the Borumba and Pioneer-Burdekin Pumped Hydro projects are mega projects that are expected to help achieve the renewable targets. However, pumped hydro is relatively new technology and the costs and timing have generally been underestimated previously. Consequently, these projects add a lot of uncertainty around capacity requirements, and when the resources are required.

- There is a material risk that the pipeline of hospital projects is unachievable by FY32 as many of the large hospital projects are scheduled in the second half of the decade. In particular, hospital projects in South East Queensland see material risk to delays as the pipeline of Olympics-related projects are expected to exhaust a significant share of resources.

- The pickup in residential and non-residential building construction from mid-decade across the states, especially New South Wales and Victoria, may add further risks to project delays and costs. Additionally, national efforts to decarbonise will see intense competition for green resources which could add further risks for Olympics building infrastructure projects (which requires 6-Star Energy Ratings) and renewable energy generation projects.

1 INTRODUCTION

The Infrastructure Management and Delivery Division (IMD) within the Department of Transport and Main Roads (TMR) has engaged Oxford Economics Australia to produce analysis and insights to assess the current and upcoming infrastructure delivery demands over the next 10 years.

This report provides an understanding of construction delivery demand on contractors in Queensland by considering the pipeline of projects in Queensland and overall anticipated construction activity in Australia that will compete for limited resources. The analysis is split geographically to grant specific insights into South East, Northern, Central and Southern Queensland, and categorises funding between public and private sources to quantify the amount of public funding needed. Australian and Queensland construction activity is assessed in the context of resource requirements and material cost escalation, offering an indication of how material costs are likely to grow over the next 10 years.

The report focuses on three key categories of construction:

- **Engineering construction:** includes all major infrastructure construction, excluding any associated building components. The categorisation of engineering construction activity in this report is consistent with the Australia Bureau of Statistics (ABS) Engineering Construction Activity statistics publication.
- **Non-Residential building construction:** includes all buildings primarily intended for purposes other than long-term residence. The categorisation of non-residential building activity in this report is consistent with the ABS Building Activity statistics publication.
- **Residential building construction:** includes all buildings intended for long-term residence. The categorisation of residential building activity in this report is consistent with the ABS Building Activity statistics publication.

Detailed definitions of each sub-sector within the above three key categories are included in Appendix A1.

The report has been structured as follows:

Section 2: includes an overview of historical trends and the outlook for construction activity across the major construction sectors. The section features analysis at both a national and state level, with a focus on Queensland.

Section 3: provides a detailed analysis of construction across Queensland at a sector and sub-sectoral level and includes insights on the expected project pipeline across the key construction sectors. This section also features insights on activity across the four Queensland regions at a sub-sector level.

Section 4: includes an overview of the recent trends and the 10-year outlook for construction costs with a focus on key cost categories. This section also features commentary on the key drivers of cost escalation and key risks to the outlook.

Section 5: provides a summary of the insights and conclusions of the report. This section highlights the sectors that are expected to see activity reach unprecedented levels of activity over the next decade and key risks to the outlook.

A glossary of abbreviations used in this report then follows, along with appendices including sector and region definitions (Appendix A1) and detailing the modelling methodology (Appendix A2). Project values quoted relate to construction work done (or yet to be done) rather than total project values.

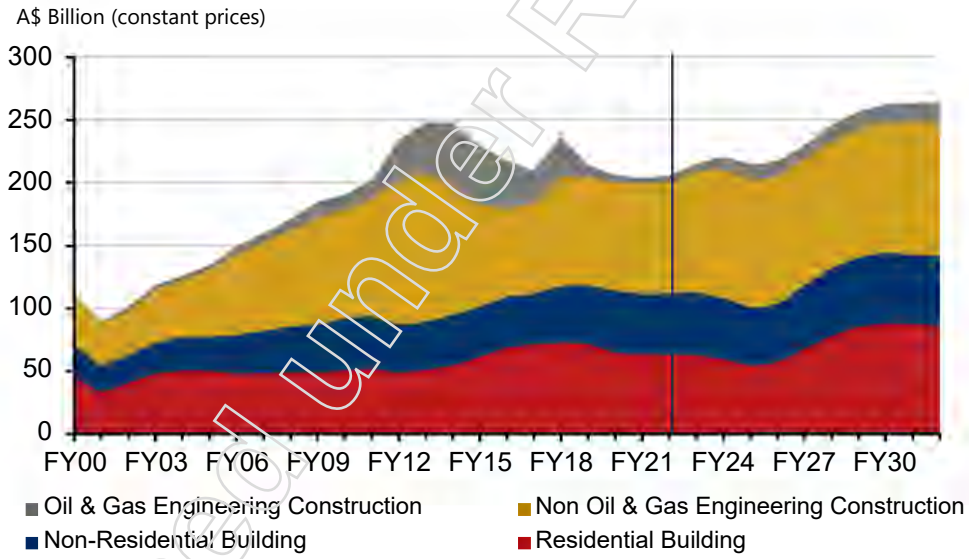
2 CONSTRUCTION ACTIVITY OVERVIEW

2.1 AUSTRALIA

2.1.1 Historical trends

Historically engineering construction activity has been the single largest component of total construction work done. This sector has also been quite volatile over the past two decades. Construction activity ramped up through the 2000s and into the early 2010s, driven by the mining boom in Western Australia, Queensland and the Northern Territory. A simultaneous surge in oil & gas construction activity saw total activity peak at $246bn in FY14. Liquefied natural gas (LNG) is the main component of Australia's oil & gas sector. Most of the construction value for this LNG boom however was imported modules, and not strictly local construction activity. Therefore, it's important to differentiate oil & gas construction work done from other engineering construction activity, as shown in Fig. 1, to get a more accurate sense of Australian activity.

Fig. 1. Total Construction Work Done, Australia

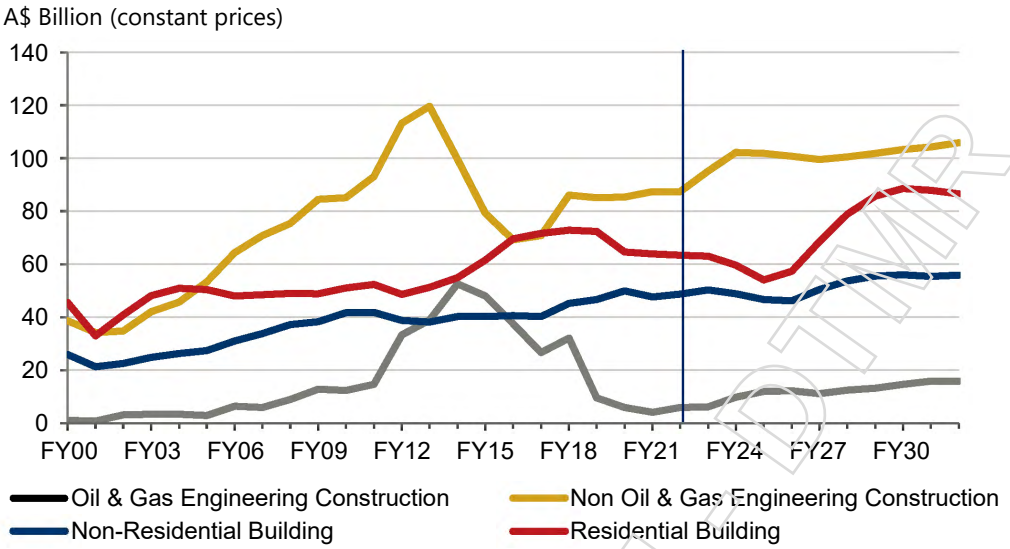


Source: Oxford Economics Australia/ABS

The ramp up in mining production capacity and falling commodity prices triggered a downturn of activity in the engineering construction sector. However, this engineering construction downturn was largely offset by a simultaneous upturn in residential construction from FY14 to FY19, as shown in Fig. 2. The residential building boom was largely concentrated in the major capital cities with a significant ramp up in the construction of apartments.

Non-residential construction also increased with several major private and publicly funded projects taking place. This returned total construction activity (excluding oil & gas) in FY18 near previous peak levels despite a significant reduction in engineering construction activity.

Fig. 2. Total Construction Work Done, Australia

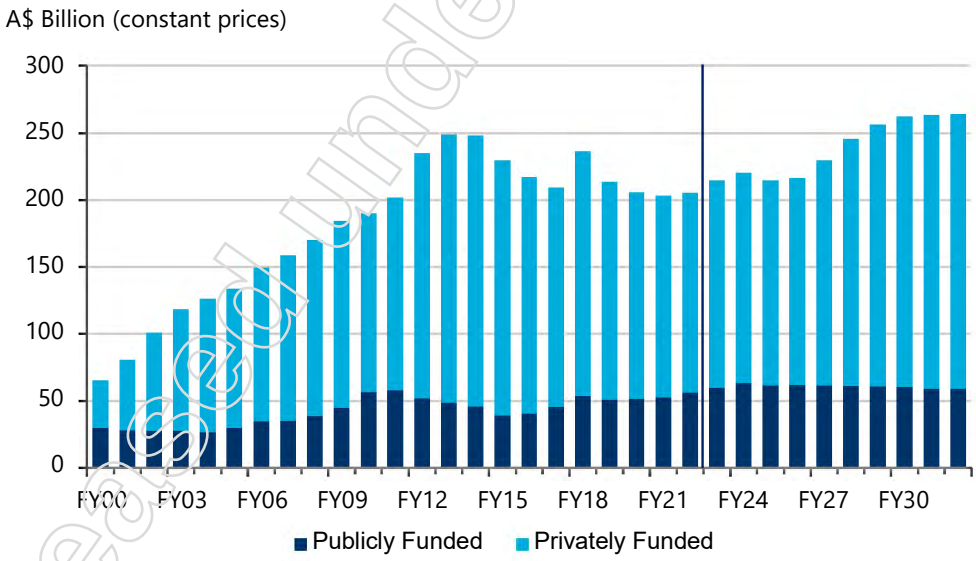


Source: Oxford Economics Australia/ABS

2.1.2 Recent trends & outlook

Total construction activity proved resilient through the pandemic, holding fairly flat at $202bn over the three years to FY22. Significant government stimulus and publicly funded infrastructure projects helped support activity across the construction industry.

Fig. 3. Total Construction Activity Work Done, by Funding, Australia



Source: Oxford Economics Australia/ABS

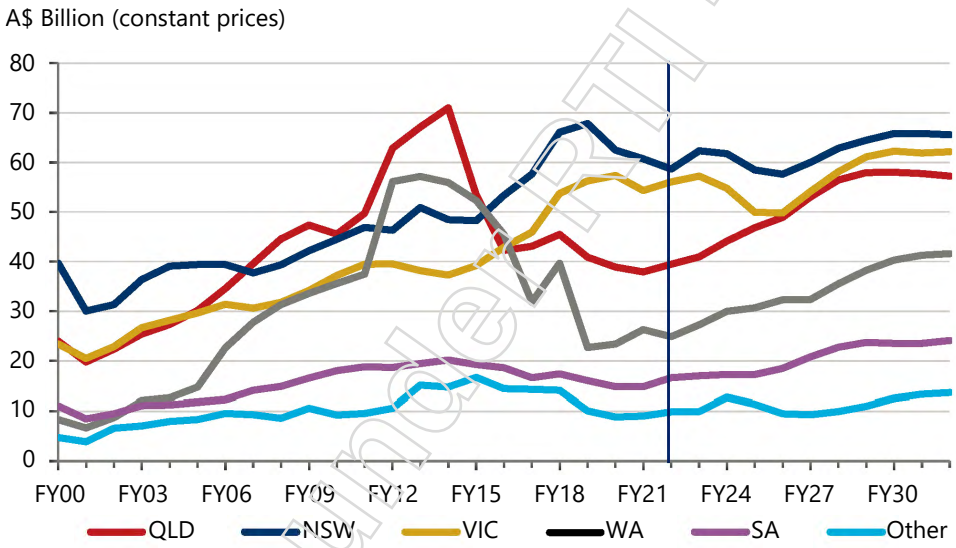
Over the next decade, total construction activity is expected to rise to an unprecedented level, as shown in Fig. 3. Much of this growth is expected to be concentrated over the five years to FY32, as the upswing in the engineering construction activity coincides with an upturn in building activity.

Non-oil and gas construction activity is expected to surpass the previous peak, reached during the mining boom, however there is significant concerns as to whether the industry has enough capacity to deliver this influx of work. It's expected that engineering construction will continue to

account for a large portion of the activity, averaging 48% of total construction activity over the next decade.

Construction activity is anticipated to be concentrated in New South Wales, Victoria, and Queensland. Activity in New South Wales and Victoria is expected to slump through the mid-decade due to rising interest rates and capacity issues reducing building construction activity. This dip in activity, particularly in the residential and non-residential building sectors, may alleviate some resources to help support growing demand in Queensland. Nonetheless, activity in both states is expected to recover through FY32, with an average growth of 1% p.a. from FY22 to FY32. The positive outlook for New South Wales and Victoria is underpinned by strong economic performance, rapid population growth, and rising public investments. Queensland is expected to see strong growth in activity throughout the forecast period, averaging 4% growth from FY22 to FY32. Activity in Queensland is anticipated to reach similar, albeit lower, levels compared to New South Wales and Victoria. The 2032 Olympics and strong public investment in health and transport are expected to be the main drivers of Queensland's outperformance.

Fig. 4. Total Construction Work Done, by State

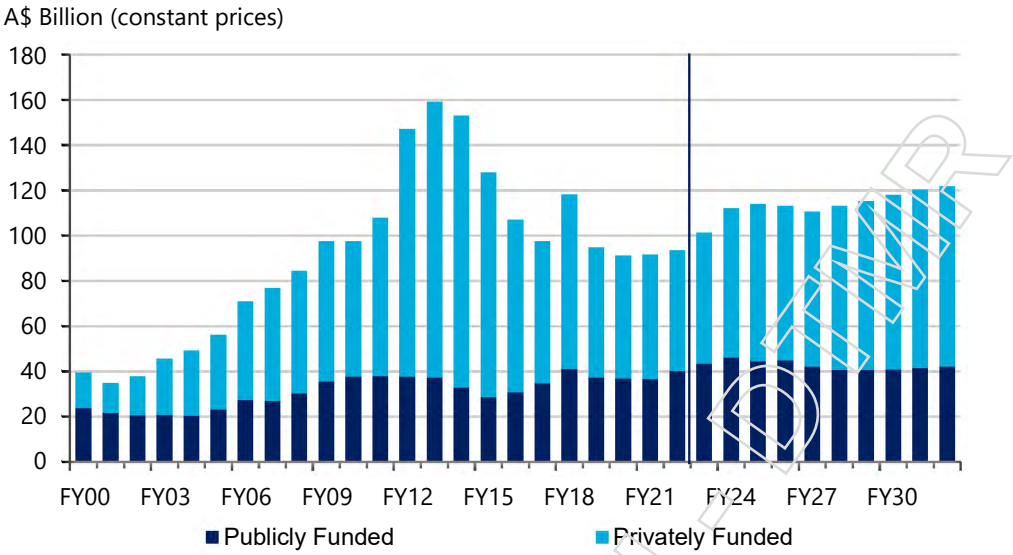


Source: Oxford Economics Australia/ABS

Engineering construction

A significant pipeline of publicly funded infrastructure projects has helped support activity in the sector through the pandemic period. Several major transportation projects are taking place across Australia, such as Sydney and Melbourne's Metro Rail projects as well as Brisbane's Cross River Rail. This transportation boom has offset the weakness in the mining and utilities sectors.

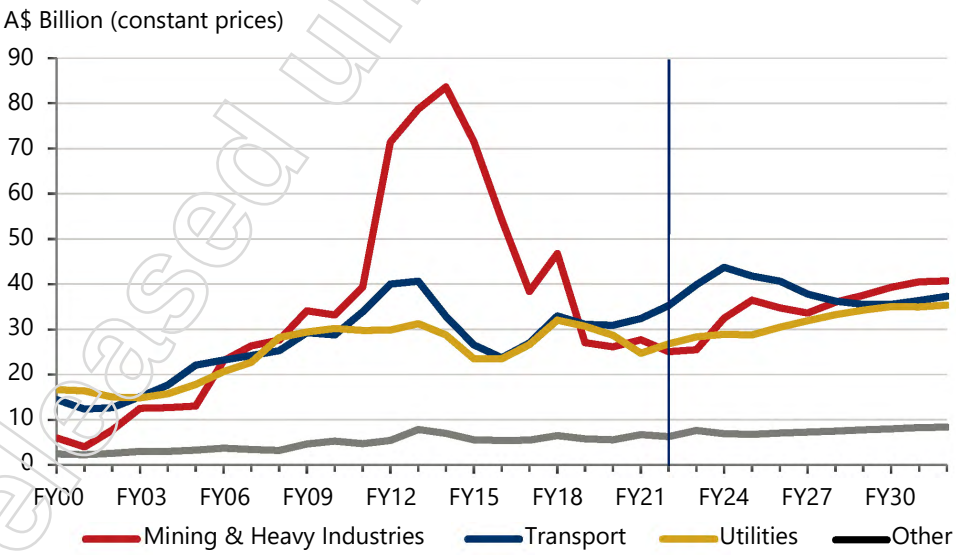
Fig. 5. Engineering Construction, by Funding, Australia



Source: Oxford Economics Australia/ABS

The transportation infrastructure boom is forecast to continue over the coming years, supported by a large pipeline of major publicly funded projects in Sydney, Melbourne and Brisbane, as shown in Fig. 6. The forecasted level of activity assumes that government will not get through their announced pipeline on schedule as rising input cost inflation and industry capacity constraints continue to weigh on activity. The recently announced review of the Federal Infrastructure Investment Program suggests that governments will re-evaluate their investment plans in light of these headwinds, and not blindly push ahead with them. However, there remains a risk that capacity constraints bite harder than is anticipated and governments delay or abandon more work than expected.

Fig. 6. Engineering Construction, by Industry, Australia



Source: Oxford Economics Australia/ABS

Utilities construction activity is forecast to see a gradual uptick over the next decade. Significant investment in decarbonising the energy grid is expected to drive activity, as the nation works towards its emissions reduction targets. There is already significant investment occurring in the

transmission network, and work is progressing on several large-scale renewable energy generation projects, particularly in the eastern states.

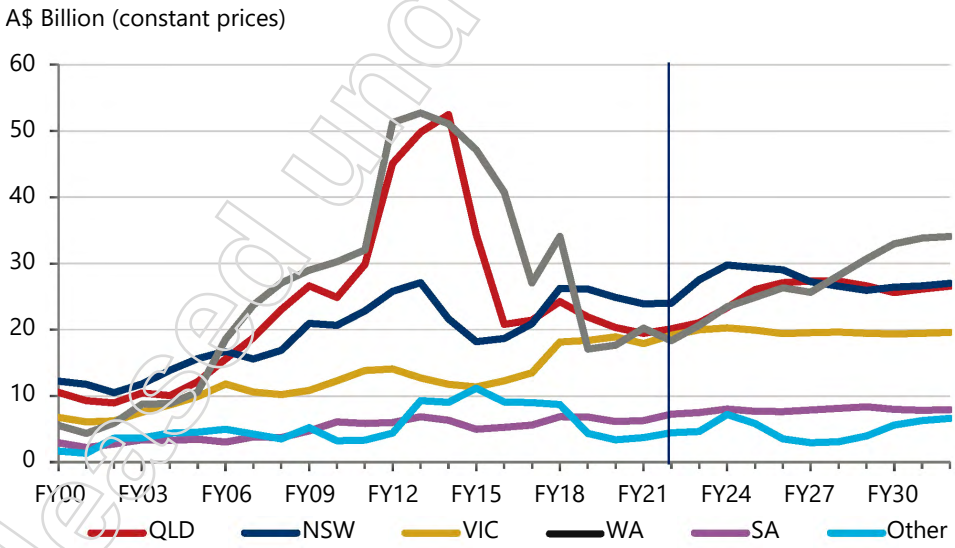
Construction activity in the mining and heavy industries sector is expected to remain quite flat over the next two years. Investment in several iron ore, lithium, copper and gold mine developments is expected to support activity, as falling coal and coal handling construction activity continues to weigh over the sector. While there is a pipeline of new projects, they will likely struggle to get off the ground. As a result, a number of these projects have been excluded from the forecasts, such as the Middlemount Coal Project in Queensland.

Mining and heavy industries construction activity over the medium to long term will be underpinned by both replacement/repair of the pre-existing capital stock and new work across traditional metals, mineral sands and rare earth metals. There has been a significant number of hydrogen projects recently announced. However, the current labour shortages, funding constraints and developments in technology required are expected to result in only a handful of those announced proceeding to construction. The hydrogen boom is anticipated to start later in the decade and continue through the 2030s.

Western Australia is expected to see a significant uptick in engineering construction activity over the back end of the decade, as shown in Fig. 7, with the ramp up in oil and gas activity anticipated to be slower than announced. This comes as several major projects in this sector continue to face ongoing disruptions.

Engineering construction activity in Queensland and New South Wales is anticipated to increase over the next few years, driven by increased activity across many of the key sectors. Activity in Victoria and South Australia is forecast to remain relatively elevated over the next decade, with significant activity to take place in the transport and utilities sectors.

Fig. 7. Engineering Construction Work Done, by State

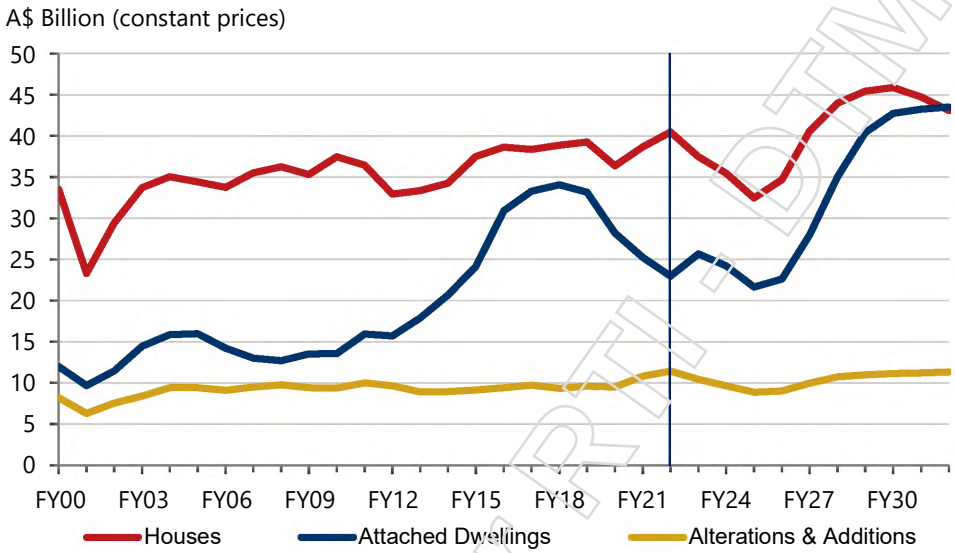


Source: Oxford Economics Australia/ABS

Residential Building

Residential construction commencements surged through FY21. In addition to demanding more space, this increase was driven by households accruing considerable savings through the pandemic and having access to record-low mortgage rates, granting a significant boost to borrowing capacity. Access to the HomeBuilder program and state level incentives also spurred demand. Spill overs from these programs helped to support activity through FY22.

Fig. 8. Residential Building Construction, by Sub-sector



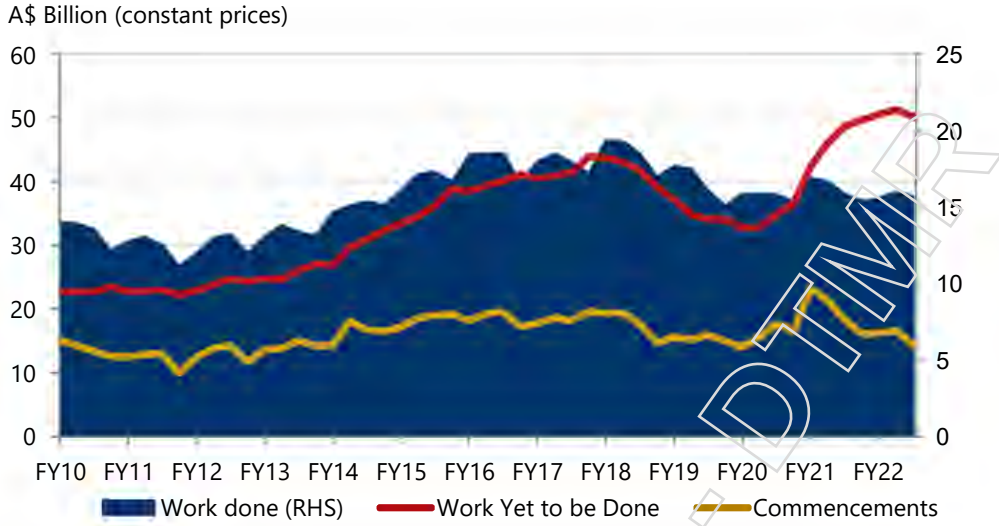
Source: Oxford Economics Australia/ABS

However, momentum in the residential sector has slowed significantly through FY23. Although some sources for optimism have firmed such as population growth and the sharp return of overseas migrants, these aren't expected to benefit new dwelling construction until the back half of the decade. The RBA has lifted interest rates aggressively over the past twelve months. The cash rate target has increased from 0.1% to 4.10%[3]. A tightening cycle like this has a strong correlation with downturns in dwelling construction.

The residential sector continues to face significant capacity issues, with longer lags between approval, commencement and completion expected this cycle. As shown in Fig. 9, a significant backlog of work yet to be done remains with material supply constraints also hampering activity.

[3]Statement by Philip Lowe, Governor: Monetary Policy Decision: July 2023. Retrieved from https://www.rba.gov.au/media-releases/2023/mr-23-16.html

Fig. 9. Quarterly Residential Building Construction, by Work Category



Source: Oxford Economics Australia/ABS

Leading indicators for new home sales are uniformly tracking downwards, as households react to the previously mentioned deteriorating credit availability, rising costs, lengthy delays, and industry uncertainty. This saw property prices fall across all major markets and turnover slow through 2022. A meaningfully higher dropout rate through all development stages is anticipated in this current environment, with many recent purchasers facing higher interest rates and build costs than previously budgeted. Over the first six months of 2023, property prices have surprised to the upside, increasing 4%. Signs are emerging however that price momentum will run out of steam later this year.

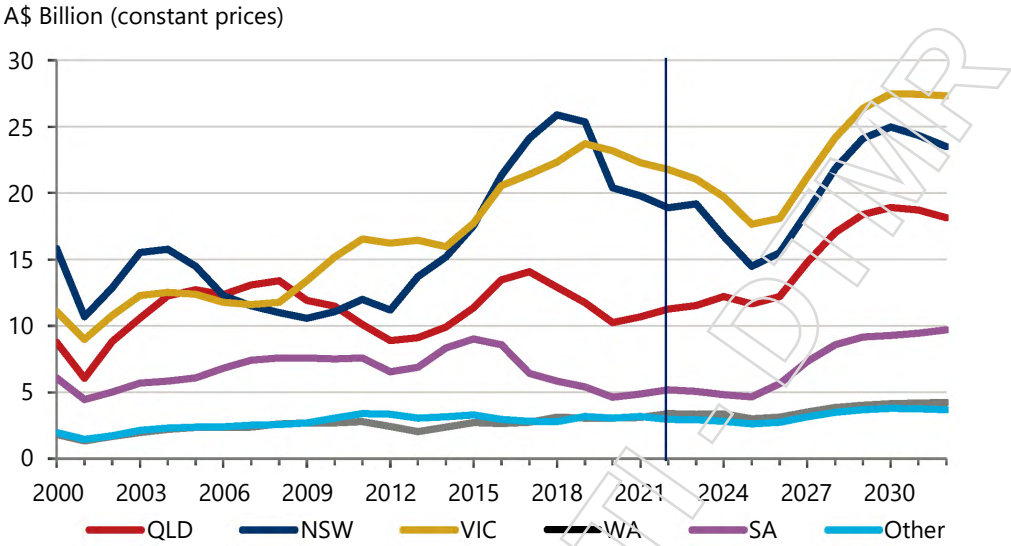
The cash rate is now expected to peak at 4.6% by September 2023. While some input cost pressures have subsided, annualised construction cost growth is expected to remain in double-digit territory through much of 2023. These dampening factors are expected to continue to drag on activity in the near term. Preventing a greater downturn is the record volume of land lots sold on the fringe of Australia's major cities in 2021, which combined with sustained industry capacity issues, will put a floor under house commencements.

Attached dwellings are forecast to hold steady at a subdued base with build-to-rent (BTR) and social housing providing support. Our project tracking suggests there were 5,900 BTR unit commencements in FY23, with a further 15,000 geared to commence across FY24 and FY25. This growth trajectory is being supported by recent policy tweaks in the 2023 -24 Federal Budget. These include halving the withholding tax applied to payments to non-resident members of managed withholding trusts and raising the maximum depreciation rate developers can apply to capital works on BTR projects. Elsewhere, state governments continue to introduce supportive policies of their own. This suggests there is significant upside for the sector with the strong growth trajectory anticipated to endure. The stock of active units is expected to reach 100,000 by FY30.

Previous downturns have triggered government stimulus, both at the federal and state level. In part backed by growing community concerns surrounding housing affordability, there is a growing prospect of government intervention this cycle, both to ensure that houses already on the books are completed and to patch over the slump in new sales that will hit ground-level in 2024. Without such action, a steeper and more protracted downturn is a distinct possibility. Through the National Housing Accord, the Federal Government has flagged a target to facilitate one million homes by

2029.[4] The current downturn is making this an increasingly unrealistic prospect without aggressive action in the next few years.

Fig. 10. Residential Construction, by State



Source: Oxford Economics Australia/ABS

Based on current expectations it is anticipated that growth will return across the country from FY26, as shown in Fig. 10. Falling interest rates, higher rental yields, the return of price growth, and the normalisation of industry capacity will establish fertile ground for the next upturn.

It is forecast that over the FY28–FY32 period, residential construction activity will average $85bn annually, a rate of construction that allows the dwelling stock balance to move back to a balanced position. While incremental population growth is set to ease back softly, the ageing of the population will see smaller households on average formed. Rising rates of demolitions and smaller dwellings with fewer bedrooms on average will also add to the dwelling requirement, especially in Australia's major cities.

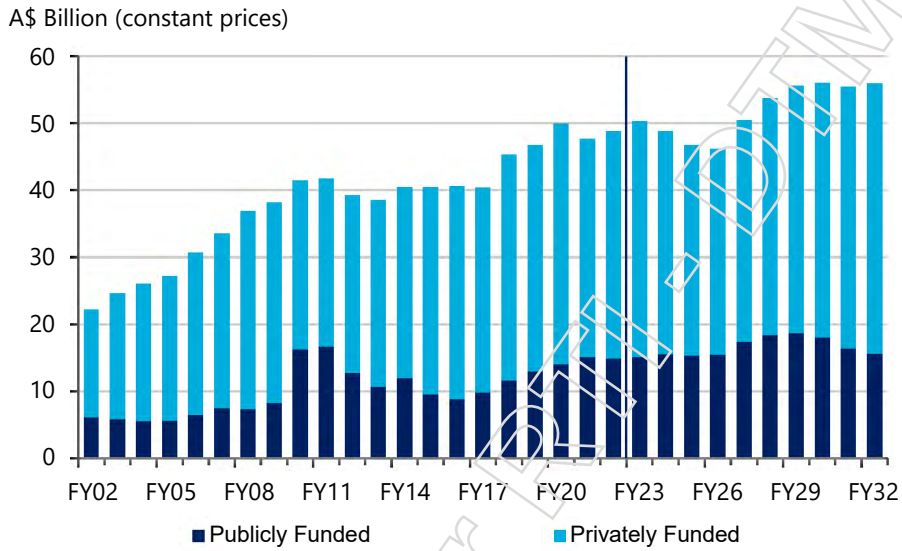
Beyond the current amplified cost cycle, the real cost to build a new dwelling is also forecast to rise over the long run. Home construction is carbon intensive and will evolve to meet new standards and price benchmarks to fit a national carbon reduction target of more than 40% by 2030. Higher levels of specification to reduce ongoing energy requirement is anticipated (e.g. double glazing, insulation). The cost of carbon-intensive inputs into dwelling construction (steel, cement etc.) is also set to become more costly on balance.

[4] For more details see https://ministers.treasury.gov.au/sites/ministers.treasury.gov.au/files/2022-10/national-housing-accord-2022.pdf.

Non-residential building construction

Non-residential building activity proved resilient through the pandemic, holding reasonably flat at $49bn over the three years to FY22. Record construction of warehouses and strong public health activity offset subdued activity in the office, retail and accommodation sectors all suffering from their exposure to pandemic-related headwinds. Continued elevated school investment and a series of major defence and prison projects also supported activity.

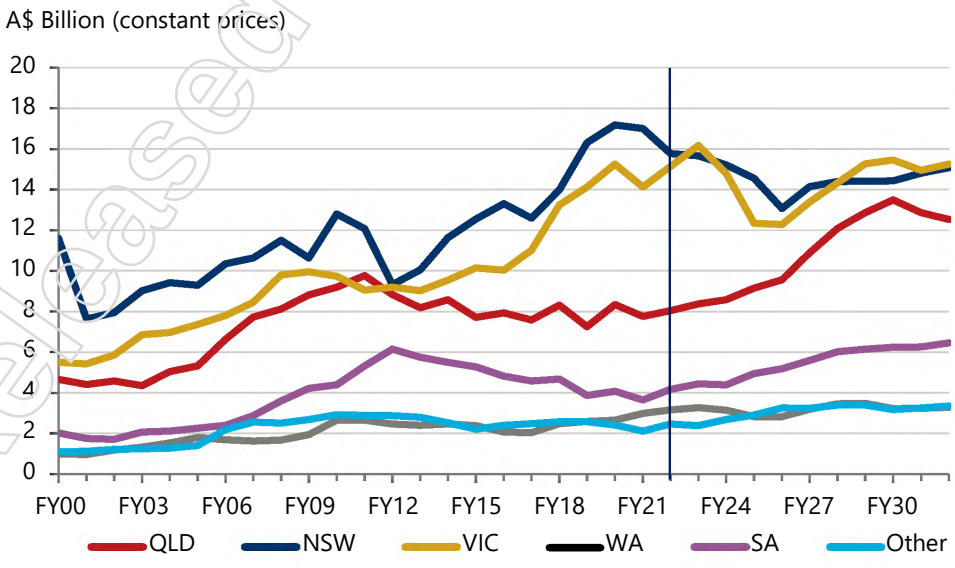
Fig. 11. Non-residential Building Construction, by Funding, Australia



Source: Oxford Economics Australia/ABS

Geographically a large portion of this activity was centred around New South Wales and Victoria. Both states featured strong economic performance, rapid population growth and rising public investment. Notable projects that took place over this period included the construction of the $800mn centrepiece of the Parramatta Square Development, the award-winning Quay Quarter Tower development in Sydney's CBD, a $1.1bn maximum security prison near Geelong and the state-of-the-art redevelopment of Allianz Stadium near Sydney's CBD.

Fig. 12. Non-residential Building Construction, by State

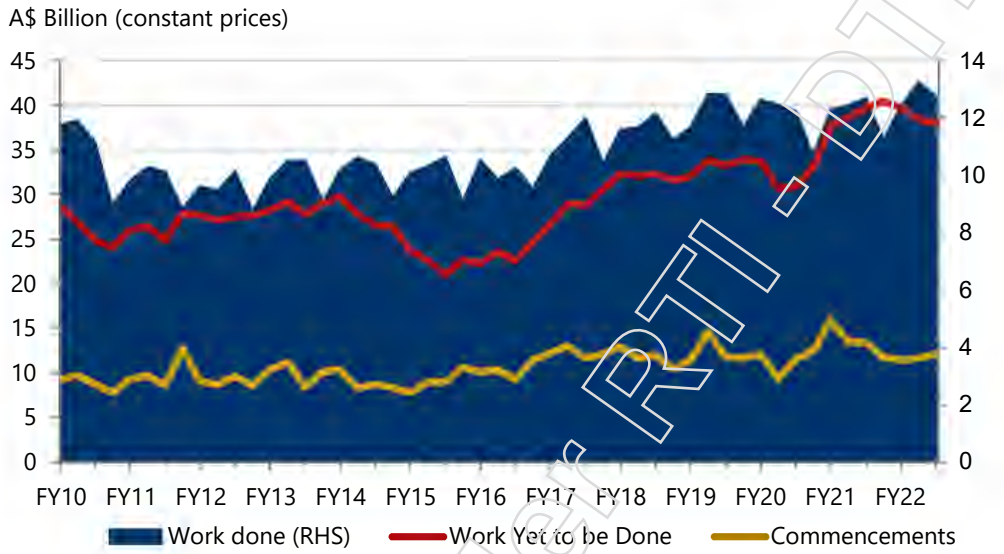


Source: Oxford Economics Australia/ABS

While the approval lead has been solid, a rising dropout rate to commencement appears to be playing through. Capacity issues are also slowing the rollover of builders onto new projects. Activity through FY23 is expected to have been supported by an elevated level of work yet to be done still in the pipeline, as shown in Fig. 13.

Rising borrowing costs are also weighing on previous business investments. Non-residential build costs have also rebased higher which is further testing development feasibilities. Non-residential construction costs gained almost 9% over FY22, with a similar rate of price escalation seen through FY23.

Fig. 13. Quarterly Non-residential Building Construction, by Activity Type, Australia



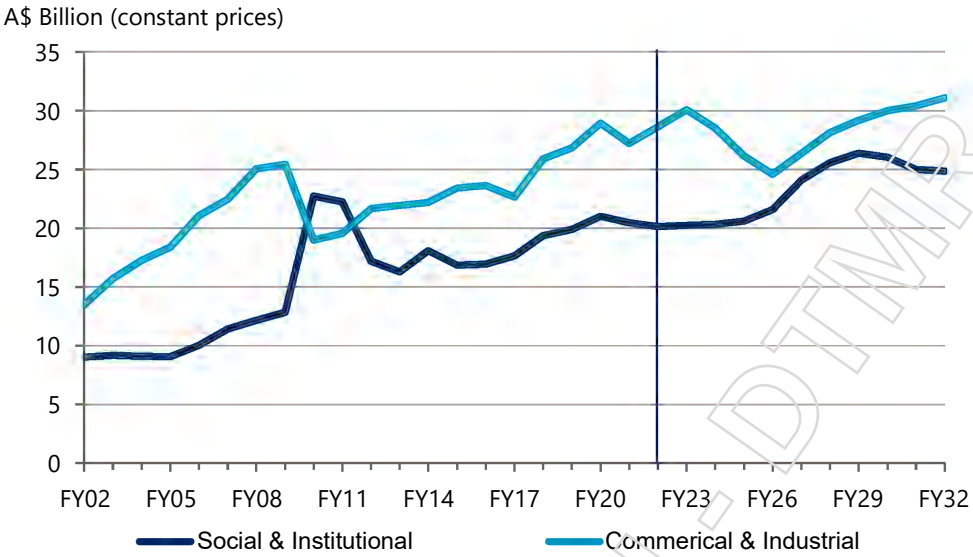
Source: Oxford Economics Australia/ABS

National non-residential building construction activity is forecast to ease back over the next three years, with investment afflicted by tightening credit availability and build costs rebasing higher. Nonetheless, total annual activity is set to remain near $49bn. Robust public investment across health, defence and transport are in play, along with rising overseas migration backstopping hospitality and education-related building. This is evident through the outlook for social and institutional non-residential building construction shown in Fig. 14.

It is forecast that FY25 will represent the bottom of the cycle, with activity remaining relatively flat through FY26. FY27 is expected to see a sharp uptick of 9% in activity. This strong year is underpinned by several major hospital developments breaking ground. Facilities related to the 2032 Brisbane Olympics are also anticipated to begin construction, boosting the entertainment sector. FY27 is also expected to see a firming of private investment in response to easing borrowing costs and rising pressure on several asset classes.

Total non-residential construction activity is expected to remain at record levels over the FY28 to FY32 period, averaging $55bn annually. While population growth is forecast to gradually ease, limiting the need for extra capacity, the non-residential building stock will continue to grow, requiring increased refurbishment work.

Fig. 14. Non-residential Building Construction, by Sector, Australia



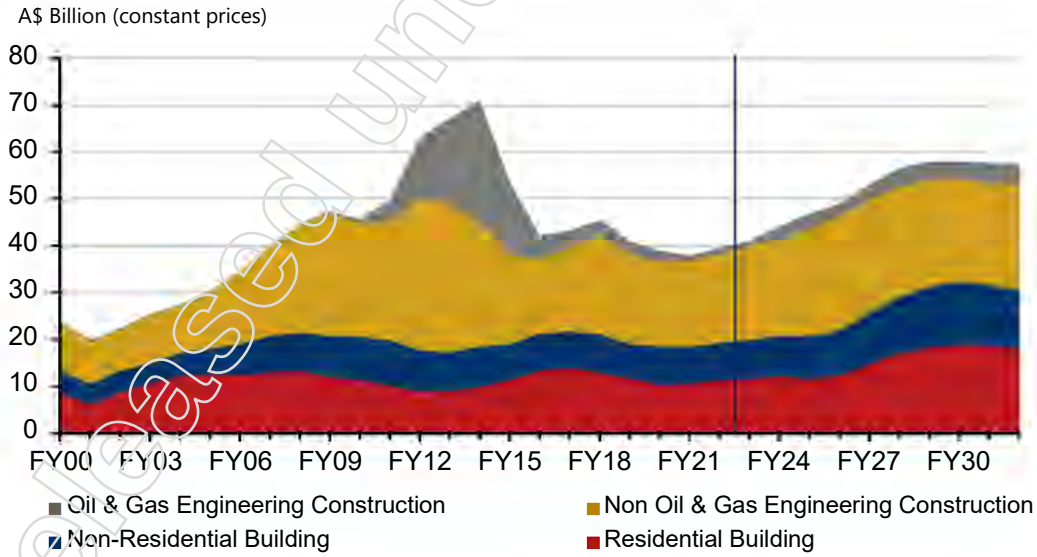
Source: Oxford Economics Australia/ABS

2.2 QUEENSLAND

2.2.1 Historical trends

The early 2010s featured a major upturn in total construction activity, with much of the national activity concentrated in Queensland. This boom was spurred by a boom in mining investment in the state, particularly in oil & gas projects. QGC's $14bn Curtis LNG project and the Santos led Gladstone LNG project were two notable LNG developments to occur during this period.

Fig. 15. Total Construction Work Done, by Sector, Queensland



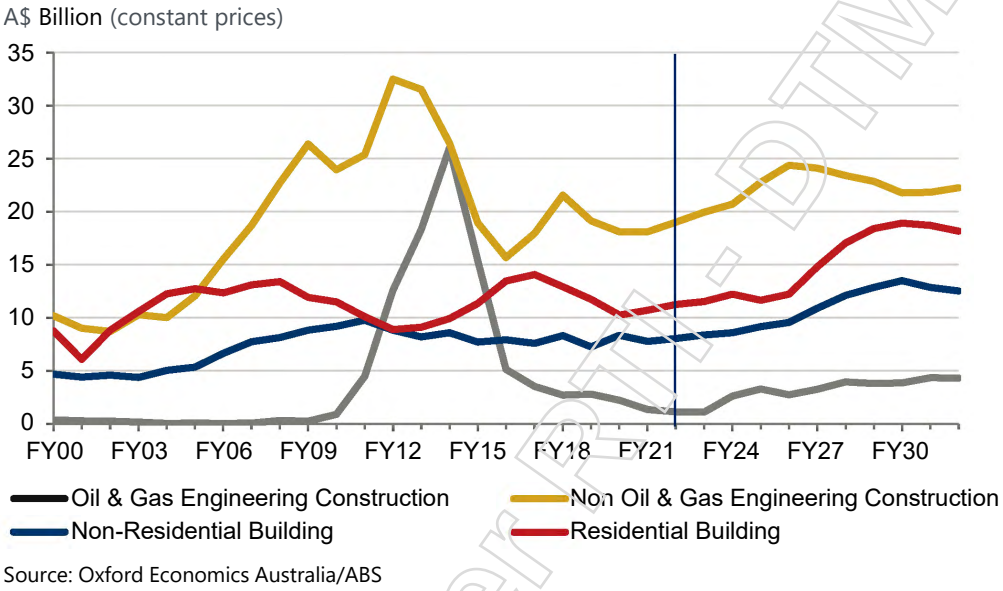
Source: Oxford Economics Australia/ABS

The fall in oil & gas engineering construction has been quite dramatic following the FY13 peak in activity, as shown in Fig. 16. Activity fell back substantially as the mining boom transitioned from the construction phase to the production phase. Looking past the drop back in oil & gas construction, the fall in construction activity has been less exaggerated. An increase in residential building construction activity helped support activity coming off the LNG boom. This

increase in activity was focused on the construction of attached dwellings, where annual activity doubled between FY13 and FY17.

Non-oil & gas engineering construction in the state troughed in FY16. An uptick of utilities and transport construction drove an increased level of activity in FY18. That year saw major construction on the state's NBN infrastructure as well as the start of construction on Toowoomba's second range crossing project.

Fig. 16. Total Construction Work Done, by Sector, Queensland

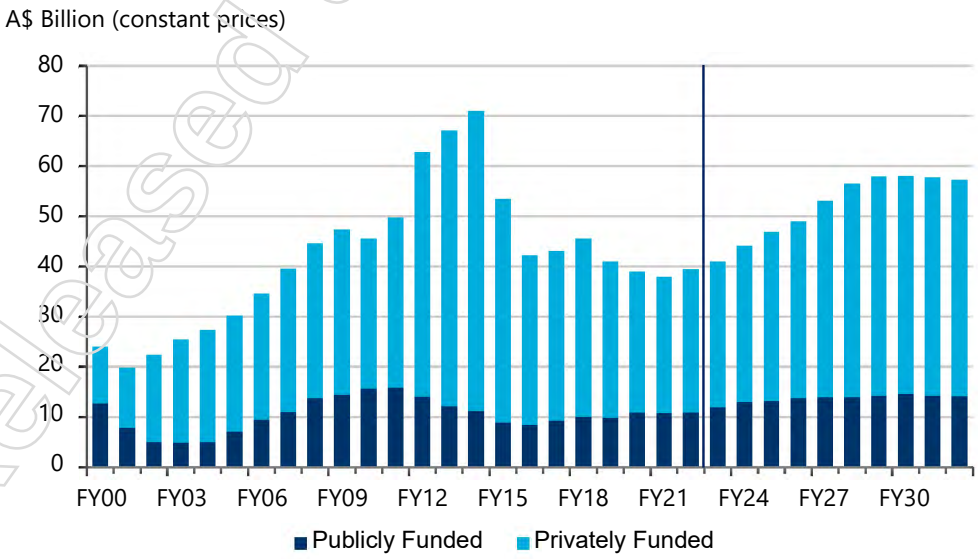


Source: Oxford Economics Australia/ABS

2.2.2 Recent trends & outlook

Total construction activity in Queensland remained relatively stable through the pandemic period, averaging $39bn over the three years to FY22. Increased government stimulus and record low interest rates drove a rebound in residential building construction activity.

Fig. 17. Total Construction Work Done, by Funding, Queensland



Source: Oxford Economics Australia/ABS

Over the next decade, total construction activity in Queensland is forecast to significantly ramp up, as shown in Fig. 17. Average annual activity over the next decade is expected to be 7%

higher than the past decade. This outlook is underpinned by several major Olympics-related projects as well as significant investment in the energy and health sectors.

2.2.3 Market capacity constraints

The ramp up in activity is expected to have significant implications for market capacity, particularly for construction labour supply. Historically, when construction has overtaken previous heights of investment, supply capacity had to rise to meet the new peak in demand which saw significant constraints.

These implications could be seen during the previous peak in the early 2010s. Employment in the Queensland construction sector reached a historical peak of 242,000 in 2008 in the lead up to the construction boom, which was the highest level of construction employment until 2019. Construction wages growth in Queensland were also much higher during this period, spiking above 5% in FY09 and FY12, compared to a long-term average (2000-2022) of 3% (See Section 4.3.1 for more information on wages). The lack of construction employment growth after 2009 despite strong wages growth and high construction activity suggested an imbalance between the demand and supply of construction resources. Specifically, this suggested that labour supply was likely constrained during this period due to record-high levels of construction activity.

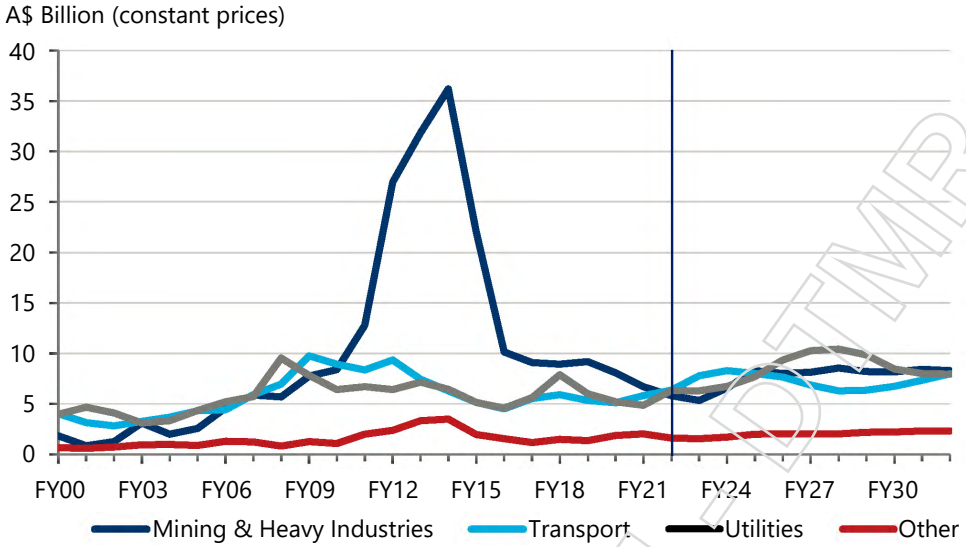
Similar constraints, particularly labour shortages, are expected to occur over the next decade as construction work done (excluding oil & gas) reaches new peaks during the latter half of the decade. Construction work done (excluding oil & gas) in Queensland is anticipated to reach around $54bn by 2030, compared to the previous peak of $50bn in 2012. The oil & gas sector is excluded when considering market capacity due to the sector being much less resource intensive (The oil & gas sector, especially during the LNG boom, tends to utilise prefabricated and modularised construction components that are imported from overseas).

Engineering construction

Activity in Queensland's engineering construction sector has been relatively subdued in recent years, with annual activity averaging just under $20bn over the last three years. Several transportation projects have helped support activity in the state. Notable projects include Brisbane's Cross River Rail and several major Bruce Highway upgrade program developments.

The near-term increase in the engineering construction sector is anticipated to be largely driven by a transportation infrastructure boom, as shown in Fig. 18. Activity in the transport sector is projected to peak in FY24, with major activity on several publicly funded projects expected to occur. As mentioned previously, the forecasted level of activity already assumes that the government will not get through their announced project pipeline. There is a material downside risk that elevated input cost and industry capacity constraints have a greater impact than currently expected. This may cause the government to delay or abandon more work than currently expected.

Fig. 18. Engineering Construction Work Done, by Industry, Queensland



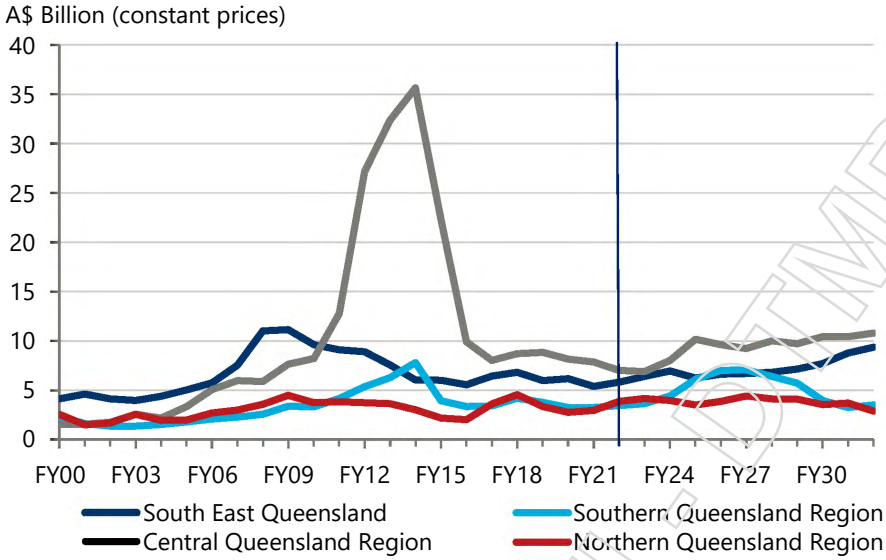
Source: Oxford Economics Australia/ABS

Beyond this transportation boom, increased activity in the utilities and mining and heavy industries sectors is expected to drive activity through to FY32. There is expected to be major investment in the state to decarbonise the energy grid and reach the government's emissions reduction targets. The outlook is supported by several major renewable energy generation projects. These include the Herries Range and MacIntrye wind farm projects as well as several major pumped hydro projects, including the Borumba Pumped Hydro project, which are expected to commence construction later in the decade.

Mining and heavy industries construction activity is also forecast to increase over the medium to long term. The project pipeline includes several major developments including several coal projects. Although new coal mines are expected to struggle to get off the ground, it is expected that expansions of existing mines will go ahead. The demand for Queensland's high-quality coking coal is expected to remain elevated through the forecast, particularly as the global energy transition drives demand for steel. Queensland is also expected to undertake the development of the H2-Hub™ in Gladstone which includes an industrial-scale green hydrogen and ammonia production facility.

Engineering construction activity has largely been concentrated around the South East and Central Queensland regions. Activity in the South East is largely dominated by construction in the transport and utilities sectors. Transport activity, particularly road and railway projects, are expected to support engineering construction in the South East in the near term, while energy-related projects are expected to boost activity in the latter half of the decade. On the other hand, the Central Queensland Region is largely dominated by the mining sector, particularly around coal. Although thermal coal projects are expected to decline with the transition towards renewable energy generation, coking coal is still critical to satisfying the elevated demand for steel, and a subsequent lift in LNG activity will support the mining sector in the Central Queensland Region.

Fig. 19. Engineering Construction Work Done, by Region, Queensland

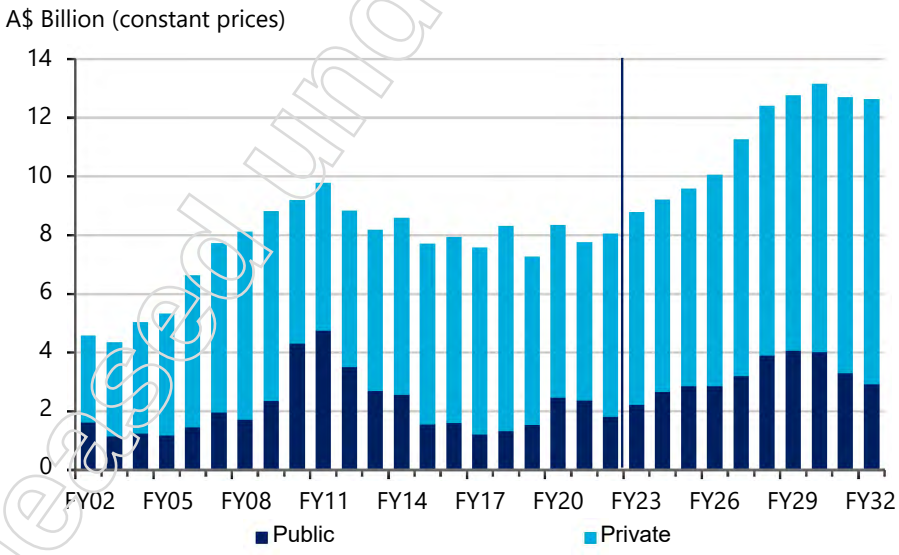


Source: Oxford Economics Australia/ABS

Non-residential building construction

Non-residential building activity has failed to gain any real momentum in recent years. Publicly funded activity helped support activity through the pandemic whilst private investment receded. Rising public spending is expected to add further activity over the next few years. Activity is anticipated to increase in the education, entertainment and health sectors, including the $1bn New Toowoomba Hospital and the $800mn New Bundaberg Hospital.

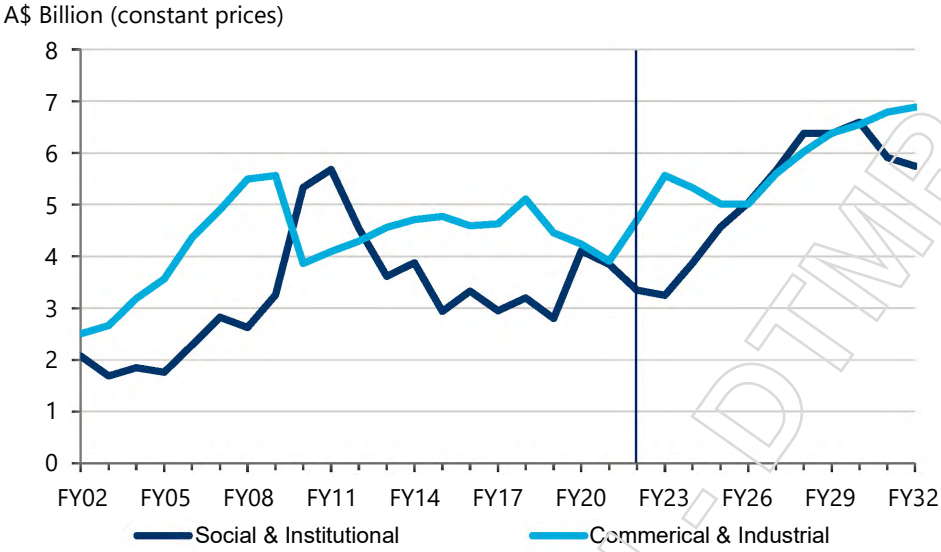
Fig. 20. Non-residential Building Construction, by Funding, Queensland



Source: Oxford Economics Australia/ABS

With the return of tourism flows and rising population growth, the private sector has increasingly begun to look beyond the impacts of the pandemic. This year has seen commercial & industrial building activity rise significantly, driven by firming office investment, surging transport commencements related to Cross River Rail station building, and a very high rate of industrial investment.

Fig. 21. Non-residential Building Construction, by Sector, Queensland

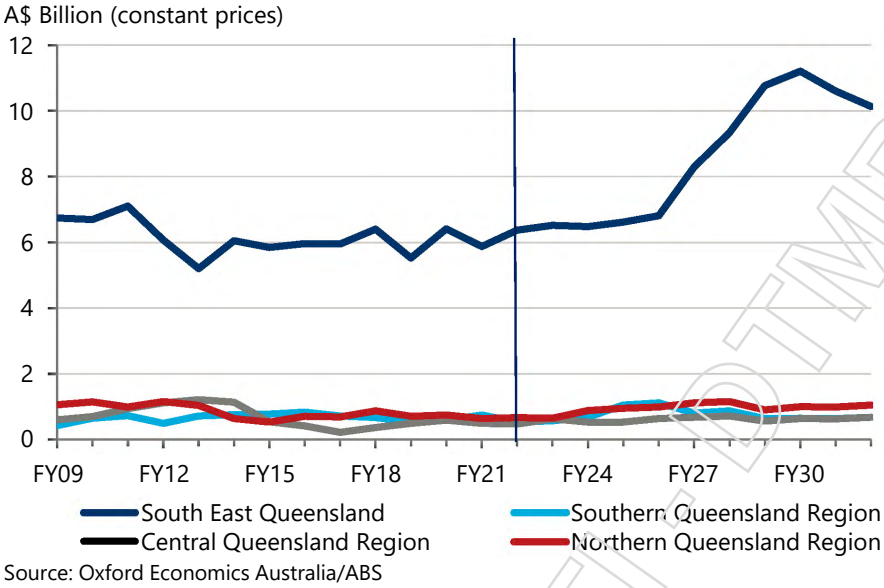


Source: Oxford Economics Australia/ABS

Non-residential building construction activity in Queensland is forecast to trend upwards through to FY30, reaching unprecedented levels. Projects related to the 2032 Olympics are expected to begin to drive a lot of this growth from around mid-decade. The entertainment & recreations sectors are expected to see the biggest boost in activity as the state prepares for the games. Annual activity is expected to average $12.8bn over the FY28-FY32 period, eclipsing previous record levels of non-residential building construction in the state. A continuation of the strong trend in population growth underpins the long-term outlook for Queensland.

Non-residential construction activity is mostly concentrated in the South East Queensland region where most of the population is located (Fig. 22). The ramp up in activity from the mid-decade will also be largely concentrated in the South East. Olympics-related projects around Brisbane's entertainment and recreational sector, including the new Brisbane Live Arena, and the Gabba Stadium rebuild will lead the unprecedented levels of activity. The Southern Queensland and Northern Queensland regions are expected to see strong growth in the near term, driven by significant hospital projects, including the construction of new hospitals in Toowoomba and Bundaberg. Meanwhile, the Central Queensland region is expected to see relatively flat levels of activity, with major support underpinned by the public sector.

Fig. 22. Non-residential Construction Work Done, by Region, Queensland

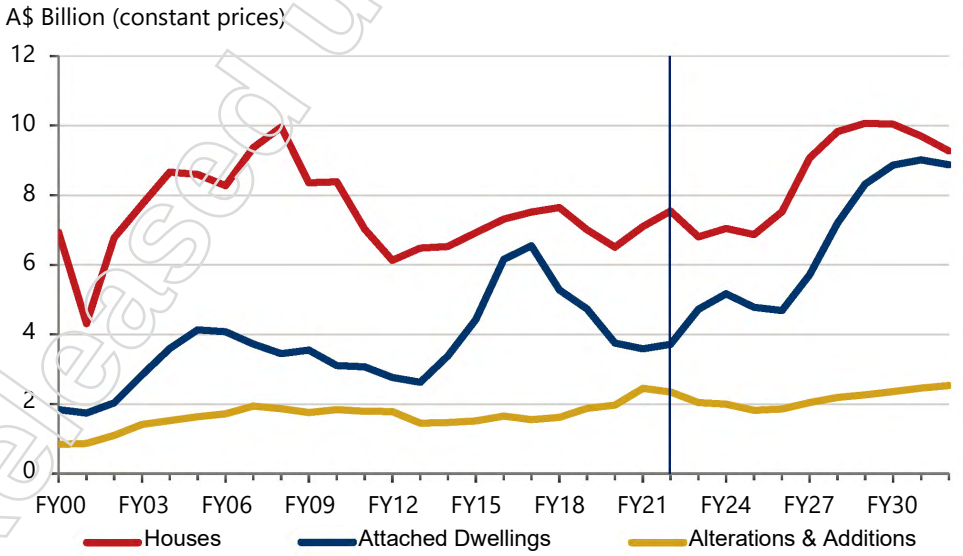


Source: Oxford Economics Australia/ABS

Residential building construction

Queensland's residential construction rebounded in FY21, following a four-year decline in activity. Record low interest rates, the HomeBuilder program and the $5,000 Regional Home Building Boost Grant helped release pent-up demand for new dwellings which grew solidly over the pandemic. This demand largely showed through house construction, as shown in Fig. 23. Alterations & Additions also saw a significant increase in activity through the pandemic, fuelled by increased household savings balances and the additional time people were spending at their dwelling.

Fig. 23. Residential Building Construction, by Sub-sector, Queensland

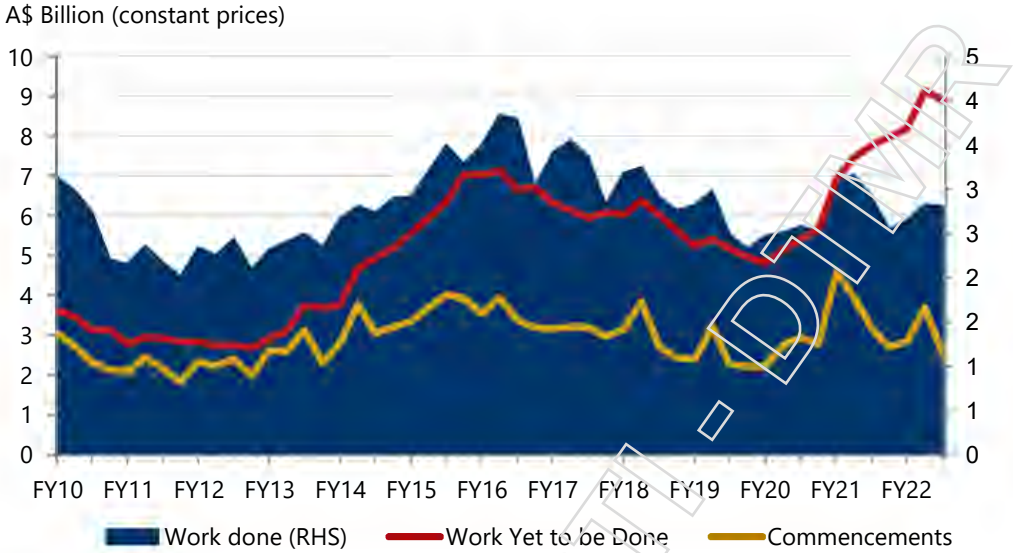


Source: Oxford Economics Australia/ABS

Capacity issues are currently holding back residential construction activity in Queensland. This has led to a significant backlog of work developing out, with a high value of work yet to be done, as shown in Fig. 24. Anecdotally, the average time to build a new house increased to

nearly 12 months in 2022, but we expect this to normalise over the next 18 months, back towards the pre-pandemic average of 6-7 months.

Fig. 24. Quarterly Residential Building Construction, by Activity Type, Queensland



Source: Oxford Economics Australia/ABS

The overhang of fixed-priced contracts signed when input prices were significantly lower and delays that are pushing out payment milestones continue to make it a difficult environment for builders. Both profitability and cashflow are being challenged, which is echoing through in a rising rate of administrations that will continue this year. While rising administrations will contribute to further delays, impacted projects have typically reached completion.

New orders have fallen back significantly, and a substantially higher drop-out rate is expected as higher interest rates and build costs make project financing more challenging. Industry capacity is expected to adjust over the rest of 2023, allowing builders to work through the significant backlog of work.

The outlook is favourable for Queensland beyond the current challenges. Queensland's nation leading population growth and the weaker supply outlook means that pressure on the housing stock is set to endure, setting a strong platform for growth once the current monetary tightening cycle ends. Adding to this, the 2032 Olympics should provide a sustained boost to developer and buyer optimism from mid-decade.

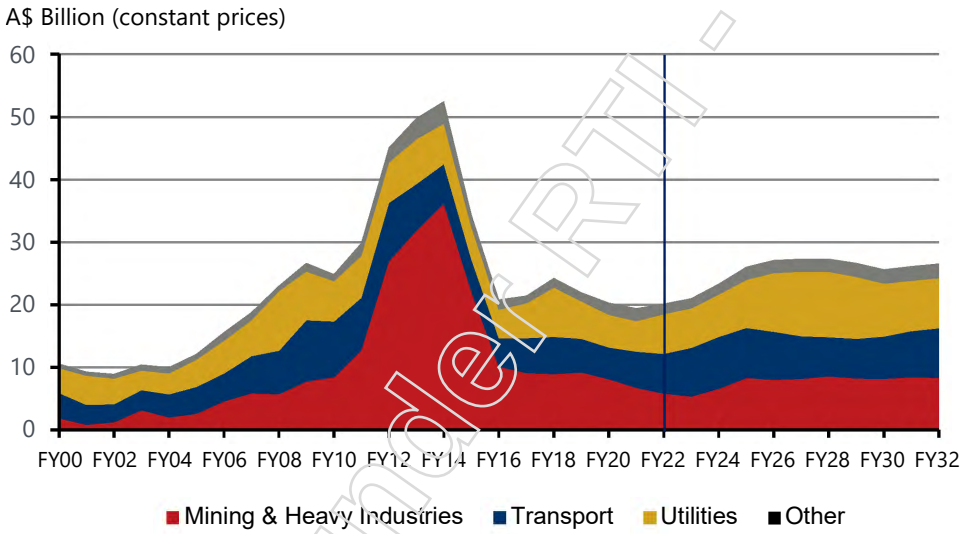
Annual residential construction activity is forecast to average $18bn over the four years to FY32. Queensland's population growth rate is expected to remain above the national rate as the state continues to be a magnet for interstate migration. This will see the underlying demand for dwellings hold to an elevated profile.

3 DETAILED QUEENSLAND CONSTRUCTION BY SECTOR

3.1 ENGINEERING CONSTRUCTION

Engineering construction activity has been relatively subdued in recent years due to a decline in mining activity (Fig. 25). Activity is expected to increase through the mid-decade supported by substantial investment in public transport infrastructure and a pickup in mining activity. Beyond this, the transition towards cleaner energy is expected to support the electricity and heavy industry sectors through FY32. The state's growing population is also expected to support engineering construction activity, particularly in the utilities sector.

Fig. 25. Engineering Construction Work Done, by Sectors, Queensland



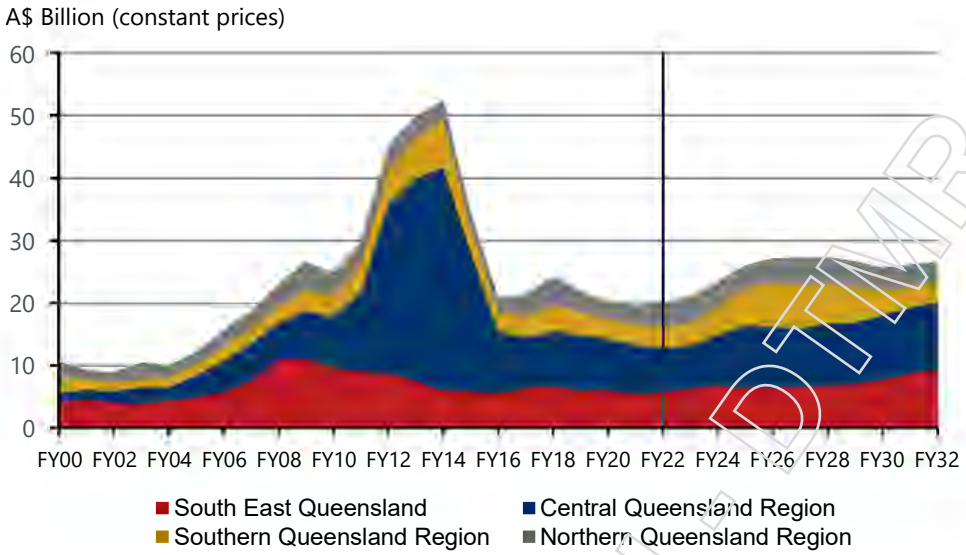
Source: Oxford Economics Australia/ABS

Most of the engineering construction activity is anticipated to occur in South East Queensland and around the Central Queensland region (Fig. 26). Activity in the South East will largely be dominated by transport and utilities infrastructure projects, while the Central Queensland region will mostly see mining and heavy industry activity.

Electricity infrastructure projects are expected to significantly increase construction activity across all regions. South East Queensland is expected to see most of the activity around electricity distribution due to its large and growing population. Meanwhile, renewable generation activity is anticipated to occur across the rest of the state.

The hydrogen industry is expected to lift heavy industry activity, which is anticipated to affect the Central Queensland region the most, and to some extent the Northern region, especially around Gladstone and Townsville. However, there is considerable uncertainty around the timing and actual costs for the mega hydrogen projects.

Fig. 26. Engineering Construction Work Done, by Regions, Queensland

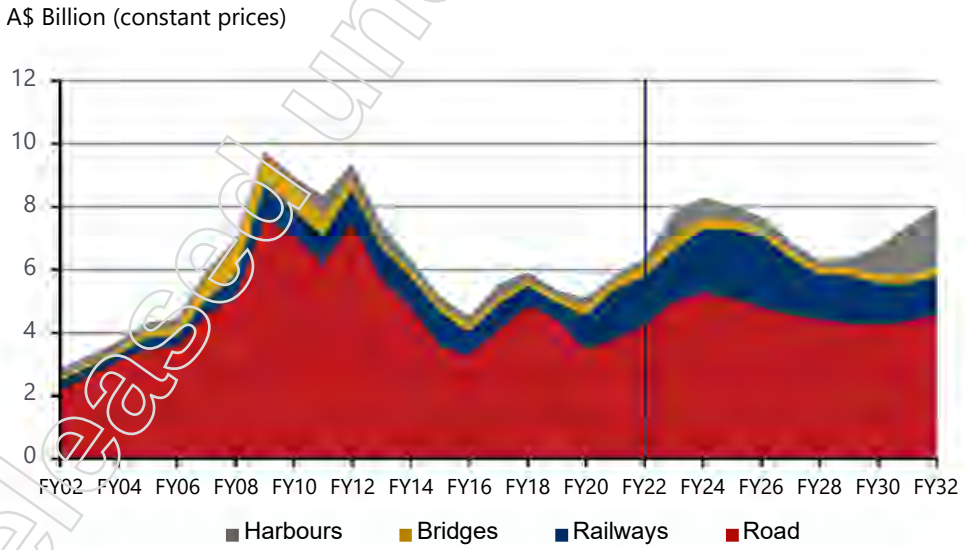


Source: Oxford Economics Australia/ABS

3.1.1 Transport

Transport engineering construction is largely dominated by road projects (Fig. 27). Consequently, transport engineering construction has declined significantly since its elevated levels in late 2000s to early 2010s as road construction activity in South East Queensland cooled following the flood induced uplift in activity. Public infrastructure activity, particularly in road and railways, have picked up since the COVID-19 pandemic and are anticipated to significantly lift transport activity through mid-decade.

Fig. 27. Transport Construction Work Done, by Sub-sectors, Queensland

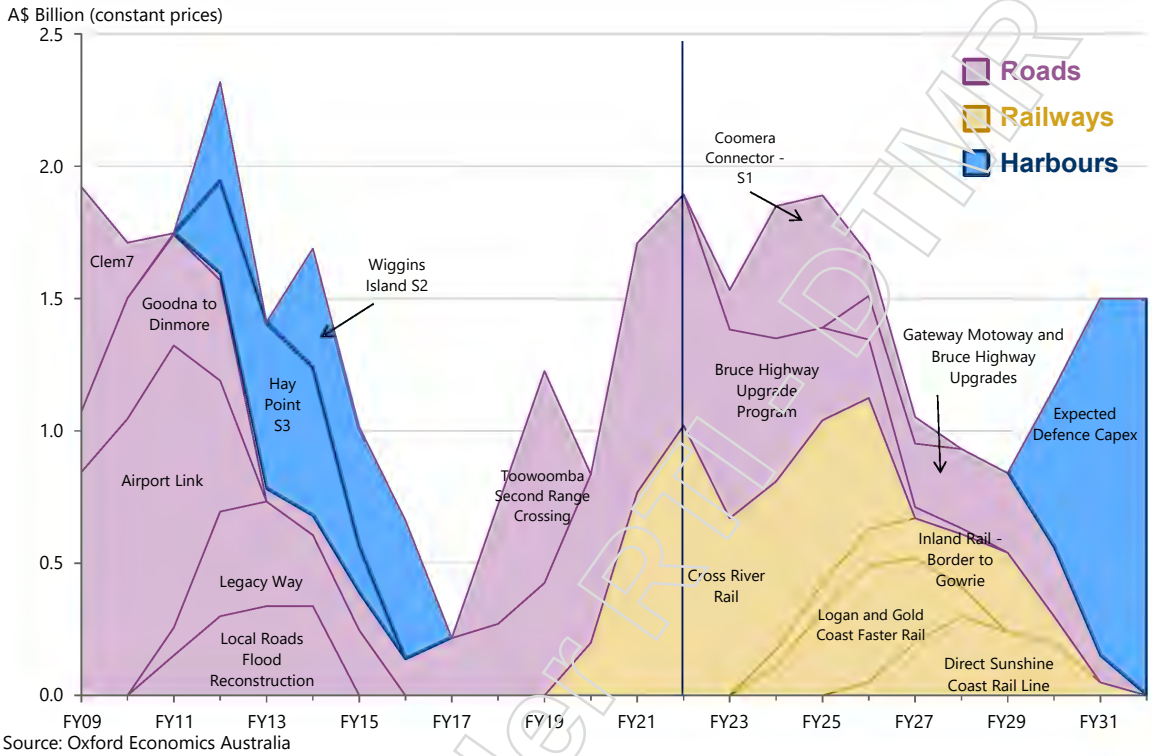


Source: Oxford Economics Australia/ABS

Railway construction activity will reach unprecedented levels due to several mega projects in the pipeline (Fig. 28). Key projects include the $4.4bn Cross River Rail currently under construction, and the $1bn Inland Rail – Border to Gowrie project which is expected to start

works in FY24.[5] Defence spending is expected to significantly lift harbour construction activity from around FY30. The rest of this section will cover the subsectors in greater detail.

Fig. 28. Major Transport Projects above $1bn work done, Queensland



Source: Oxford Economics Australia

Note: **Gateway Motorway and Bruce Highway Upgrades (GMBHU)** includes upgrading the Gateway Motorway (Bracken Ridge to Pine River), Bruce Highway (Gateway Motorway to Dohles Rocks Road), Gympie Arterial Road (Strathpine Road to Gateway Motorway), and delivering north-facing ramps at Dohles Rocks Road interchange to the Bruce Highway; ***Commera Connector – Stage 1*** includes the Coomera to Nerang section of the project also known as 'the second M1'; ***Bruce Highway Upgrade Program*** includes Bruce Highway Upgrades projects outside the GMBHU, such as the Mackay Ring Road (Stage 1), Bruce Highway – Cairns Southern Access Corridor (Stage 3), Edmonton to Gordonvale), Cooroy to Curra (Section D), Caloundra Road to Sunshine Motorway and other safety and capacity improvements. **Direct Sunshine Coast Rail Line** is currently under business case and therefore have no committed funding. The project cost (and work done value) above is taken from the previously estimated project cost of $1.6bn before the review.

Roads & Bridges

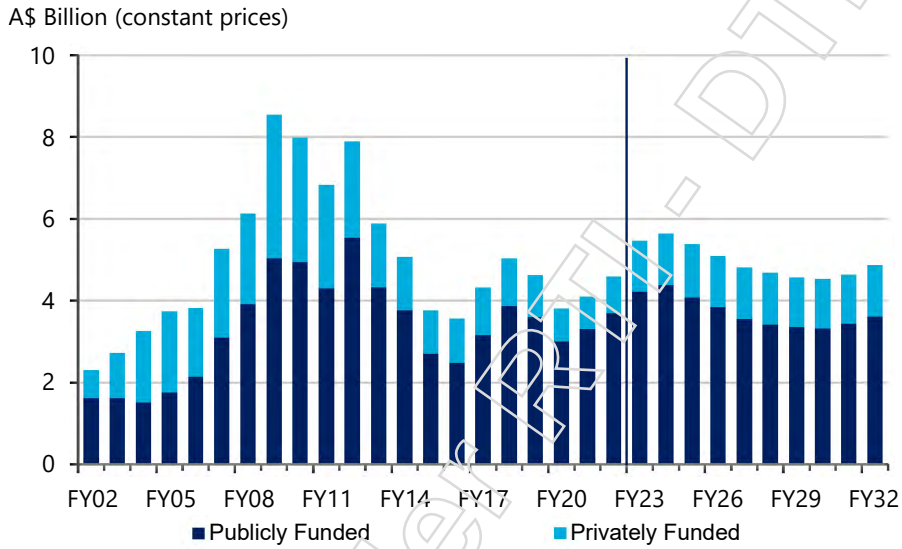
Road and bridge construction slumped during the COVID-19 pandemic but picked up over FY22 as movement restrictions and supply constraints eased. Funding for road and bridge projects has largely come from the public sector (Fig. 29). The state's commitment to significant road projects such as the Bruce Highway Upgrade has driven the recent pickup in activity. Going forward, public-funded projects are expected to continue to dominate road construction activity.

[5] Note that the Inland Rail Queensland arm (Border to Gowrie, Gowrie to Helidon, Helidon to Calvert, and Calvert to Kagaru) is currently subject to review at the time of this report.

Key projects that are expected to support activity in the near term include the $1.4bn Coomera Connector (Stage 1), Coomera to Nerang, which started construction in early 2023 and the Pacific Motorway (Daisy Hill to Logan Motorway) expected to start works in FY24.

The announced Gympie Road Tunnel[6] has not been explicitly included in the major project list used to underpin our forecast for road construction activity due to the lack of public details on timing, project size and committed funding. We acknowledge the Palaszczuk Government's investment of $35mn towards a detailed investment proposal, with the prospect of committed funding being upside risk to the outlook.

Fig. 29. Road & Bridge Construction Work Done, by Funding, Queensland



Source: Oxford Economics Australia/ABS

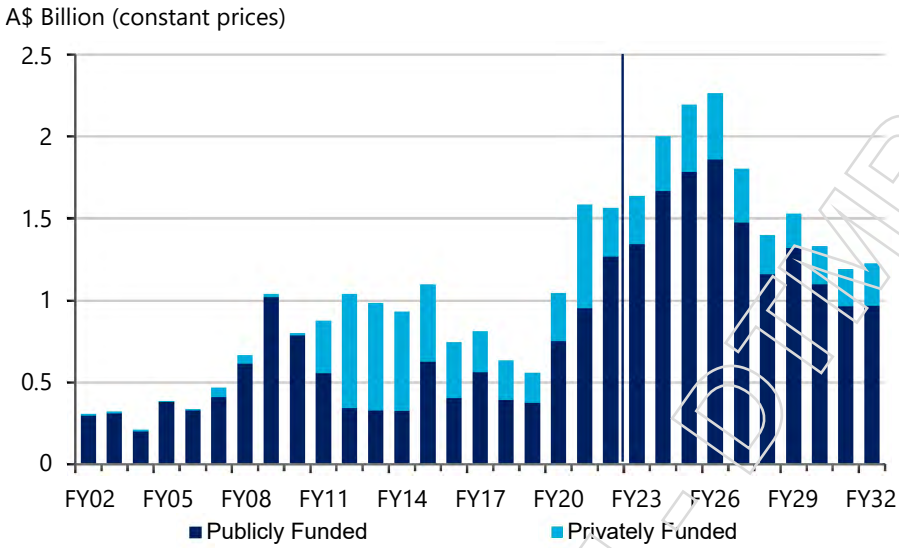
Railways

Railway construction activity has risen significantly in recent years, driven by large public-funded projects around the metropolitan areas in South East Queensland. Key projects included the Cross River Rail and the Brisbane Metro which started construction in FY20 and FY21, respectively. Railway activity is anticipated to increase over the medium term before falling back in FY27. Nonetheless, activity is anticipated to remain somewhat elevated compared to historical levels through FY32 supported by the strong outlook for population growth.

Public-funded projects are anticipated to continue supporting railway construction (Fig. 30). Key projects include the $660mn Gold Coast Light Rail – Stage 3, Broadbeach South to Burleigh Heads (commenced in FY23), the $1bn Inland Rail - Border to Gowrie (expected to start in FY24), and the $1.3bn Logan and Gold Coast Faster Rail (expected to start in FY24). Private-funded construction activity is expected to pick up from FY24, largely driven by mining-related projects around Central Queensland.

[6] Queensland Government, retrieved from https://statements.qld.gov.au/statements/97905

Fig. 30. Railways Construction Work Done, by Funding, Queensland

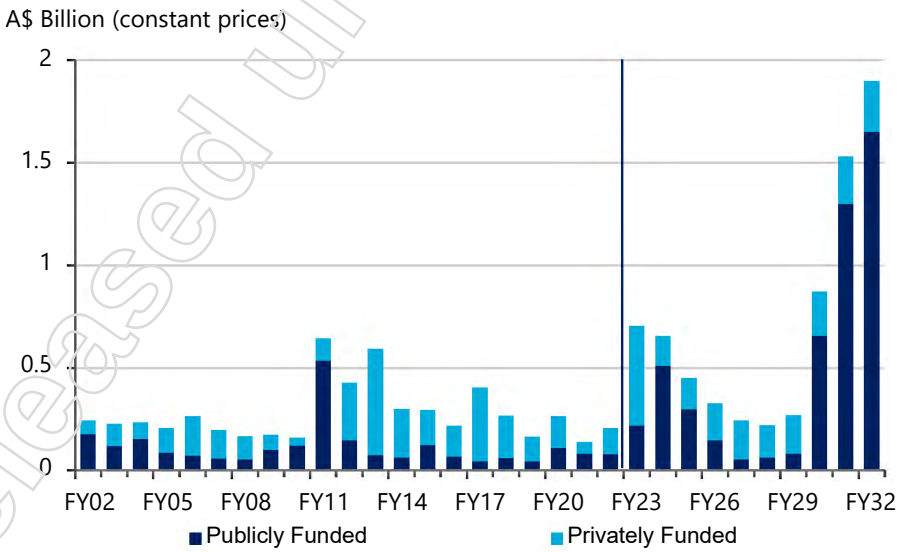


Source: Oxford Economics Australia/ABS

Harbours

Harbour construction activity has declined significantly since the mining boom period. Activity is expected to pick up significantly in FY23 through the mid-decade with several large projects around Townsville and Central Queensland. This includes the $532mn Gatcombe and Golding Cutting Channel Duplication Project and two Port of Townsville projects (channel upgrade that is currently under construction and the outer harbour expansion through FY24). Beyond this activity is expected to remain subdued until FY30, which will then see a substantial increase in activity from defence spending.

Fig. 31. Harbours Construction Work Done, by Funding, Queensland



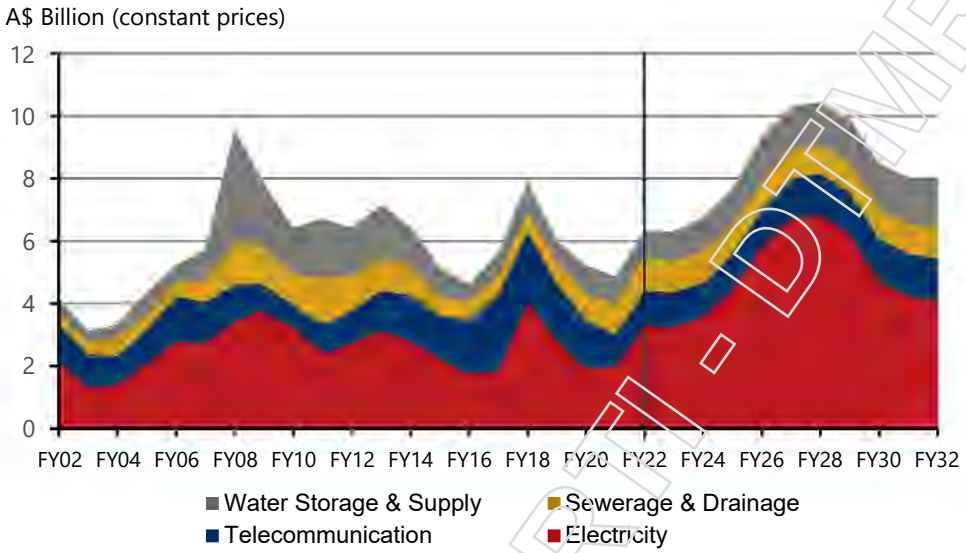
Source: Oxford Economics Australia/ABS

3.1.2 Utilities

Utilities engineering construction activity has been moderate in recent years. The electricity and telecommunication sectors have driven most of the activity, contributing around 70% of utilities

activity over the past five years. The sector is expected to experience modest growth through FY32 alongside a strong population outlook in Queensland and investment into renewable energy. The rest of this section will cover the utilities subsectors, which include electricity, telecommunication, sewerage & drainage, and water storage & supply.

Fig. 32. Utilities Construction Work Done, by Sub-sector, Queensland

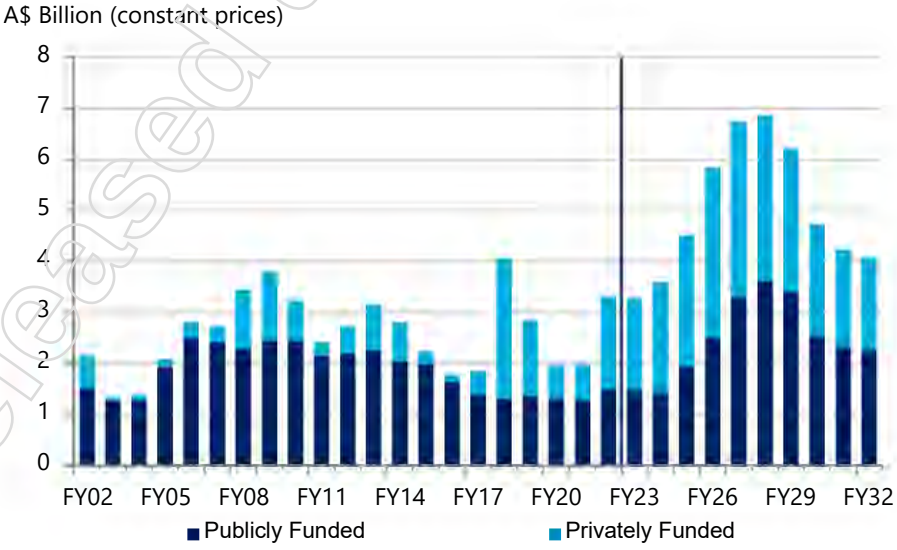


Source: Oxford Economics Australia/ABS

Electricity

Construction activity in the electricity sector has been volatile in recent years due to fluctuations in privately funded activity (Fig. 33). Activity peaked in FY18 supported by private investment in several large wind farm and solar farm projects. Private-funded projects slumped during the COVID-19 pandemic but have picked up over FY22 supported by large renewable projects such as the $378mn 1000MW Wandoan South Solar project.

Fig. 33. Electricity Construction Work Done, by Funding, Queensland



Source: Oxford Economics Australia/ABS

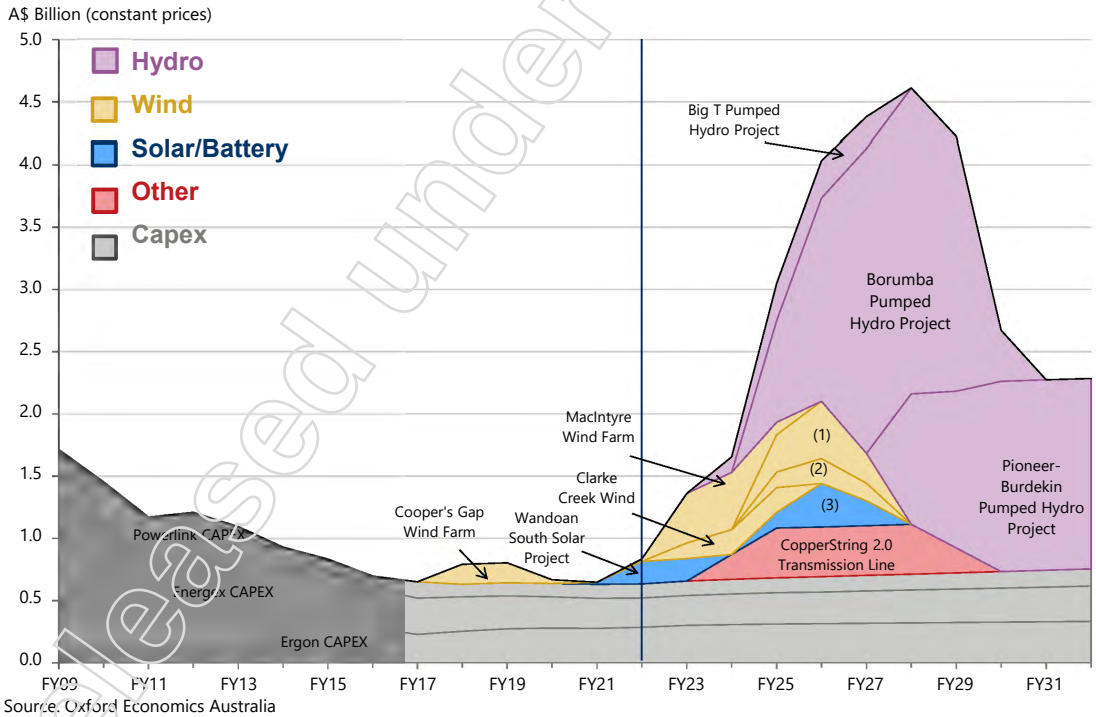
Construction activity in the electricity sector is expected to grow steadily with the transition towards renewable energy generation. There is a strong pipeline in renewable energy

generation projects through FY32 (Fig. 34). In the near term, solar and wind projects are expected to contribute to a significant share of renewable generation activity, with several key projects including the $980mn MacIntyre Wind Farm (currently under construction), $1bn Herries Range Wind Farm (expected to start in FY25) and the $675mn Bulli Creek Clean Energy project (expected to start in FY25).

Pumped hydro projects are also expected to support activity, especially in the latter half of the decade. Key mega projects in pumped hydro include the Borumba Dam Pumped Hydro (expected to start in FY25) and the Pioneer-Burdekin Pumped Hydro (expected to start late in the decade). It is noted that there is significant uncertainty over the cost and timing of some of these projects due to its relatively new technology. In particular, the Queensland Government has announced that the Borumba Dam Pumped Hydro will cost around $14bn with $6bn of committed public funding.[7] Other large hydrogen projects that have been announced but have uncertain funding or timing includes the Queensland Solar Hydrogen Facility and the Central Queensland hydrogen project that have both been proposed to be built near Gladstone.

The transition towards renewable generation will also require substantial investment in the transmission network. The transition is currently constrained as the network has largely been designed around large, centralised generations, whereas renewable generators are more geographically dispersed. Consequently, investment in the transmission network is expected to pick up significantly to support renewable generation. Key projects include the $200mn Galilee Basin Transmission Project (currently under construction) and the $2bn CopperString 2.0 Transmission Line (expected in FY24).

Fig. 34. Major Electricity Projects above $350mn work done, Queensland



Source: Oxford Economics Australia

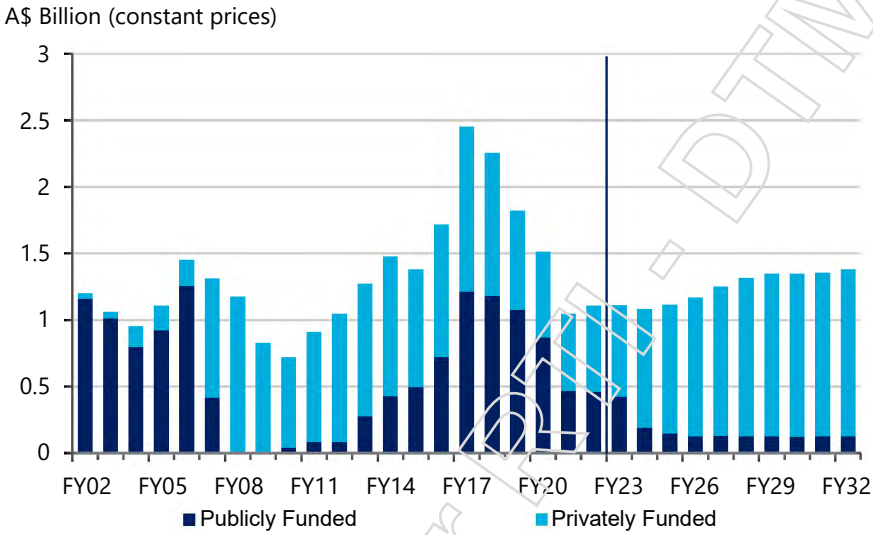
Note: project (1) is the Herries Range Wind Farm; project (2) is the Tarong West Wind Farm; project (3) is the Bulli Creek Clean Energy Project.

[7] Note that the numbers provided here are referring to the amount of investment quoted by Queensland Hydro, and therefore will include the cost of machinery & equipment. Nonetheless, the construction work done component is still expected to contribute a sizable share of the cost.

Telecommunication

The telecommunication sector generally consists of a large number of small projects. However, the National Broadband Network (NBN) has boosted telecommunication activity significantly in recent years. A large share of the NBN construction activity occurred between FY17 to FY19 and is expected to support activity through FY24. Beyond this, construction activity is expected to grow steady through to FY32, supported by the state's growing population.

Fig. 35. Telecommunication Construction Work Done, by Funding, Queensland

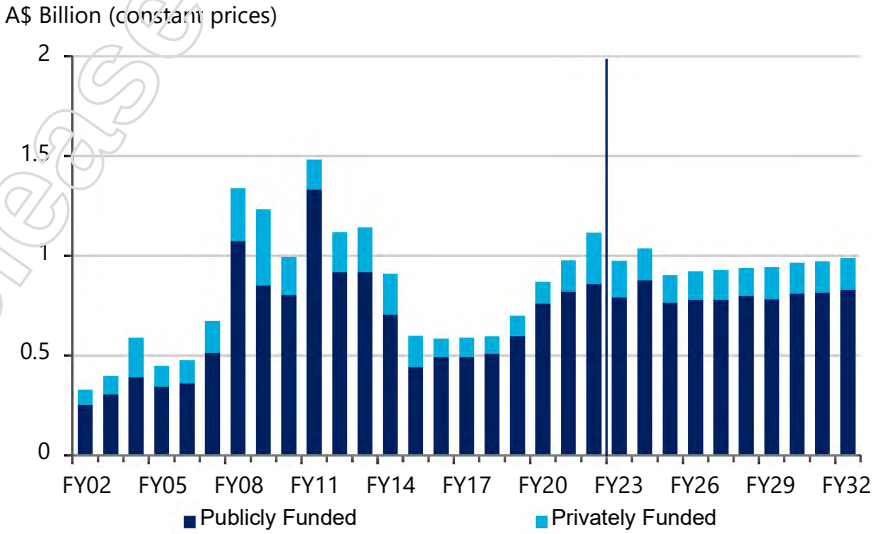


Source: Oxford Economics Australia/ABS

Sewerage & Drainage

Sewerage & drainage infrastructure is largely dominated by public funding in response to needs of population growth and housing expansion. Activity has declined significantly since its peak in FY11, but has picked up significantly from FY19. Sewerage & drainage activity is expected to fall in FY23, following the completion of the Queensland Urban Utilities' 10-year program. Nonetheless, the strong population outlook in Queensland is expected to support the sector through to FY32.

Fig. 36. Sewerage & Drainage Construction Work Done, by Funding, Queensland

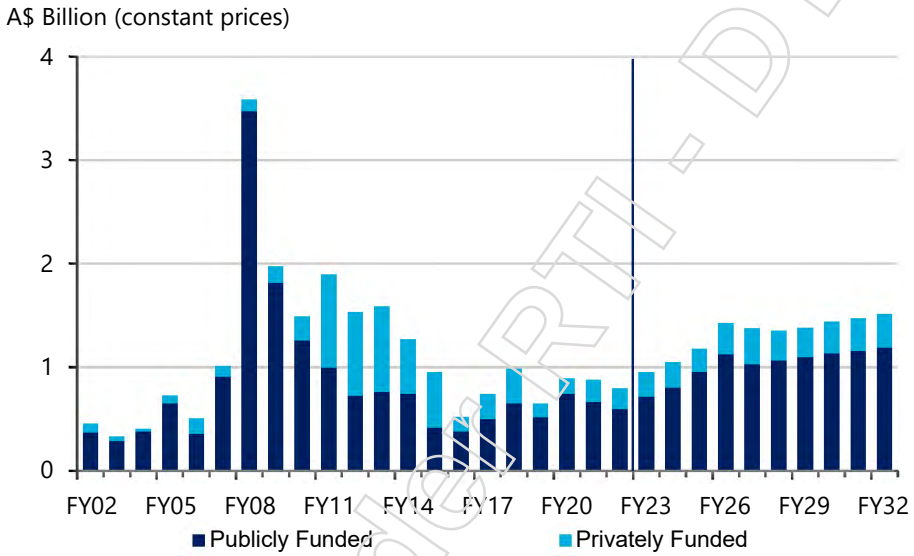


Source: Oxford Economics Australia/ABS

Water storage & supply

The water storage & supply sector is also dominated by public funding, generally in response to population growth and housing activity. Water construction activity boomed over the late 2000s to early 2010s in response to prolonged drought conditions during that period. Since then, activity has fallen back significantly, but has remained relatively stable over recent years. The sector is expected to see an upward trend in activity alongside Queensland's growing population. Several large publicly funded projects are expected to drive the growth in activity, including the $450mn Somerset Dam Upgrade (expected to start in FY24) and the $720mn Paradise Dam Improvement in Bundaberg (expected to start in FY24).

Fig. 37. Water storage & Supply Construction Work Done, by Funding, Queensland

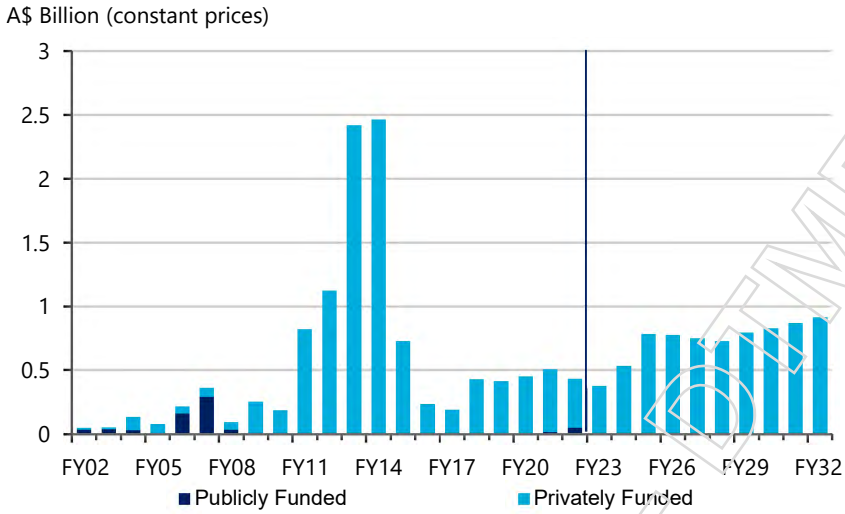


Source: Oxford Economics Australia/ABS

Pipelines

Pipeline construction is generally linked closely to oil & gas construction, which is dominated by private investment. As a result, activity in this sector followed the LNG boom in the early 2010s and has fallen back since (more information on the oil & gas sector in section 3.1.3). Pipeline construction activity is expected to trend upwards with oil & gas construction activity. In particular, the $2.6bn Northern Gas Pipeline Extension is expected to provide a significant boost in activity in FY24 to FY27.

Fig. 38. Pipelines Construction Work Done, by Funding, Queensland



Source: Oxford Economics Australia/ABS

3.1.3 Mining & heavy-industry related

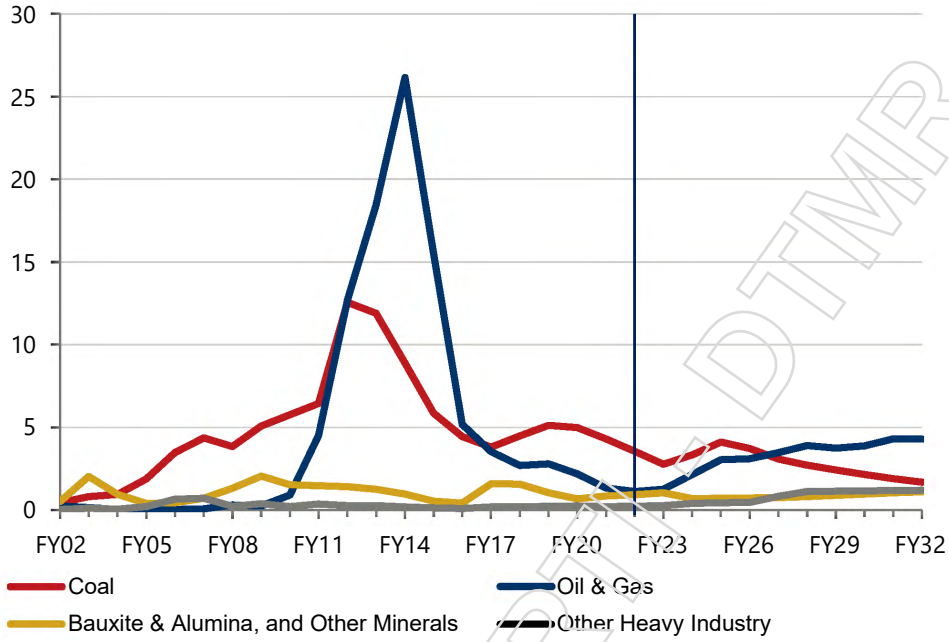
The mining & heavy industry sector has seen a substantial fallback in activity since the mining boom. In particular, oil & gas activity has retreated from its significant spike in the early 2010s from mega projects such as the QGC's Curtis LNG project and the Santos led Gladstone LNG project. The mining industry in Queensland has generally been dominated by the coal sector. Coal infrastructure projects around the Central Queensland Region, such as the $980mn Carmichael Coal Project, have provided much of the support for mining-related construction activity in recent years.

Going forward, coal activity is expected to remain moderate in the near term as shown in Fig. 39. This is driven by a number of large projects currently under construction and in the pipeline around the Central Queensland region. Key projects include the $800mn Olive Downs project currently under construction, and the $975mn Saraji East and $900mn Winchester South projects that are expected to start construction in FY24. Beyond this, coal activity is expected to trend downwards as the nation continues to shift towards renewable energy generation. Oil & gas activity is anticipated to pick up in FY24 and continue trending upwards through FY32. The ramp up in oil & gas activity is largely driven by a ramp up in activity from the Surat Gas Expansion projects.

Other mining and heavy industry related activity is expected to increase significantly from the mid-2020s through FY32. This is largely driven by the ramp up in hydrogen production facilities, such as the $2.6bn H2-Hub™ Gladstone facility.

Fig. 39. Mining & Heavy Industry Construction Work Done, by Sub-sectors, Queensland

A$ Billion (constant prices)



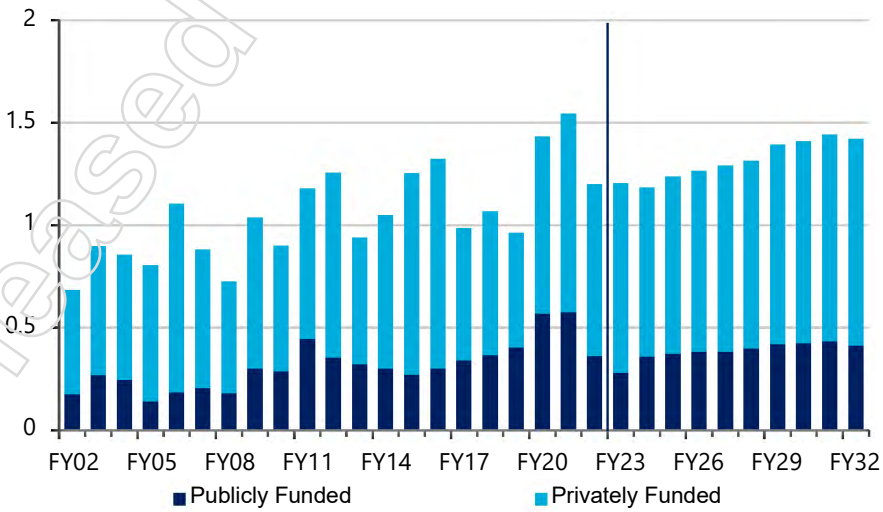
Source: Oxford Economics Australia/ABS

3.1.4 Recreation and Other Engineering Construction

Recreation and other engineering construction includes golf courses, playing fields, stadiums, swimming pools, landscaping, park construction and other projects not elsewhere classified. Construction activity in this sector is generally related to population growth and general economic activity. Growth in population and the residential sector is anticipated to help support recreation activity over the forecast period.

Fig. 40. Recreation and Other Eng. Construction Work Done, by Funding, Queensland

A$ Billion (constant prices)



Source: Oxford Economics Australia/ABS

3.1.5 Regional Analysis

South East Queensland

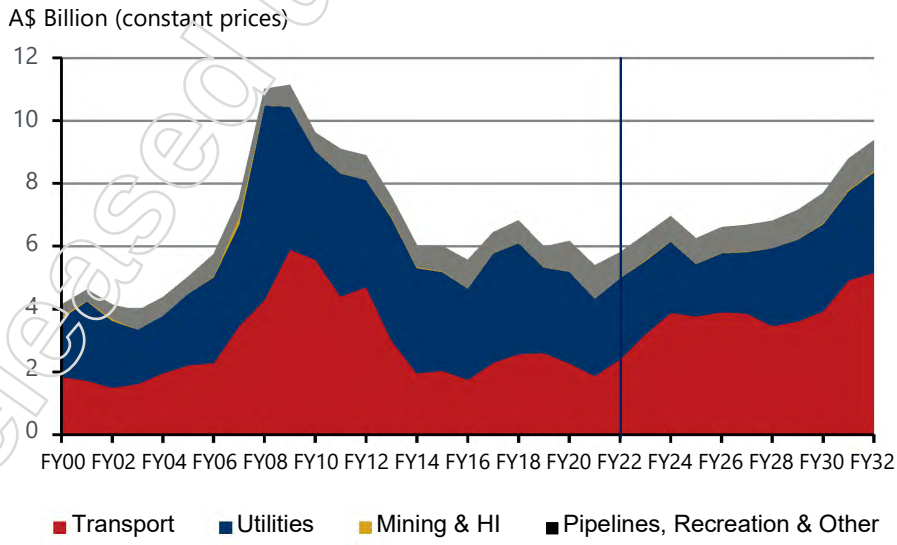
Engineering construction activity in South East Queensland is largely dominated by transport and utilities infrastructure projects as most of the state's population resides here. The road and railway sectors are expected to contribute the most to activity through the mid-decade (Fig. 41). Beyond this, transport and utilities activity are anticipated to remain strong alongside strong population growth in Brisbane, Gold Coast and the Sunshine Coast. In particular, construction activity in the electricity and water sectors are anticipated to significantly boost activity in South East Queensland from mid-decade through FY32 to support strong population growth.

Road construction has been the largest contributor to construction activity in the region and is expected to remain the greatest driver of activity through FY32. Several large projects, including the $1.4bn Coomera Connector – Stage 1 in Gold Coast (connecting Coomera and Nerang), will provide a boost to activity through the mid-decade. Beyond this, large road projects around the Greater Brisbane area are expected to significantly lift activity, such as the $1.4bn Gateway Motorway and Bruce Highway Upgrades that is expected to start works around FY28.

Railway construction activity in South East Queensland has reach unprecedented levels in FY22 due to activity from the Cross River Rail in Brisbane. Activity is expected to peak in FY26 upon the completion of the Cross River Rail but remain elevated through FY32, supported by the Inland Rail – Border to Gowrie project and the Direct Sunshine Coast Rail Line connecting the Sunshine Coast and the Brisbane regions.

Some of these large projects are still under review and will depend on the availability of resources and funding from the State and Federal government. For example, the Inland Rail – Border to Gowrie is currently under review and the Direct Sunshine Coast Rail Line is subject to a detailed $14mn business case but with no committed funding. Nonetheless, we expect these transport-related projects will likely be prioritised to support SEQ's growing population and the 2032 Olympics.

Fig. 41. Engineering Construction Work Done, South East Queensland



Source: Oxford Economics Australia/ABS

Southern Queensland Region

Engineering construction activity in the Southern Queensland region has largely been dominated by the road, electricity and mining-related sectors (Fig. 42). The region benefited from the LNG boom in the mid-2010s with several large gas and gas-related projects (i.e. gas pipelines and gas power stations) around the Darling Downs – Maranoa area. The coal sector has also contributed to mining activity, particularly around the Darling Downs – Maranoa and Wide Bay areas.

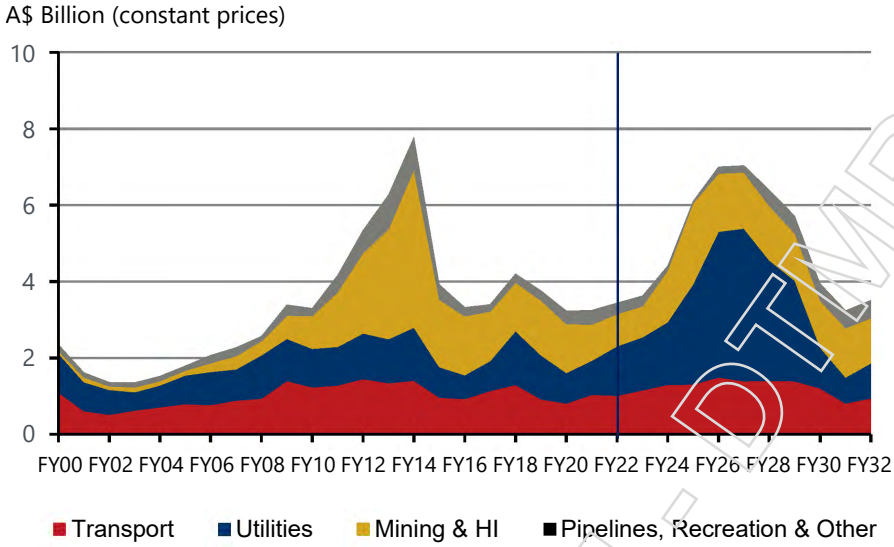
Mining activity in the Southern Queensland region is expected to increase through the mid-decade, then fall back through FY32 as coal activity fades. Oil & gas activity is expected to remain a significant driver of mining activity in the region. Several large projects include the $4.9bn Surat Gas Expansion projects and the $810mn Western Surat Gas Project that are both currently under construction and is anticipated to support activity through the forecast period.

Road construction activity in the region is largely dominated by highway infrastructure. The Bruce Highway Upgrade program is expected to provide a substantial boost to activity through FY27. This includes the $800mn Bruce Highway (Cooroy to Curra) Section D upgrade (Woondum to Curra) project that is currently under construction and the $250mn Bruce Highway (Gympie-Maryborough), Tiaro Bypass construction four lane bypass project that is expected to start works in FY25. Additionally, the $325mn Inland Freight Route Charters Towers to Mungindi Upgrades is expected to support activity through FY31.

Going forward, much of the construction activity in the Southern region will be dominated by the electricity sector. The Southern region has seen a significant pickup in electricity activity due to a number of renewable generation infrastructure being built. This included the $350mn Cooper's Gap Wind Farm in Wide Bay and the $73mn Darling Downs Solar Farm. Activity around renewable generation infrastructure is expected to significantly increase through FY26, supported by mega projects such as the $1bn Herries Range Wind Farm and the $675mn Bulli Creek Clean Energy Project.

Additionally, the Borumba Dam Pumped Hydro is expected to add significantly to activity in the region from FY25 to FY30, with an estimated total work done value of $9.8bn over this period. However, there is significant uncertainty over the cost and timing of some of this project due to its relatively new technology. Nonetheless, the project has secured $6bn of committed public funding. This alongside the other major project mentioned above will see total construction activity in the Southern Queensland region reach levels similar to the LNG boom during the early 2010s. As a result, we expect material risk of capacity constraints in the late-decade as resources (particularly labour) compete with South East Queensland (particularly Olympics-related projects) and the other mega Pumped Hydro project (Pioneer-Burdekin) in the North.

Fig. 42. Engineering Construction Work Done, Southern Queensland Region



Source: Oxford Economics Australia/ABS

Central Queensland Region

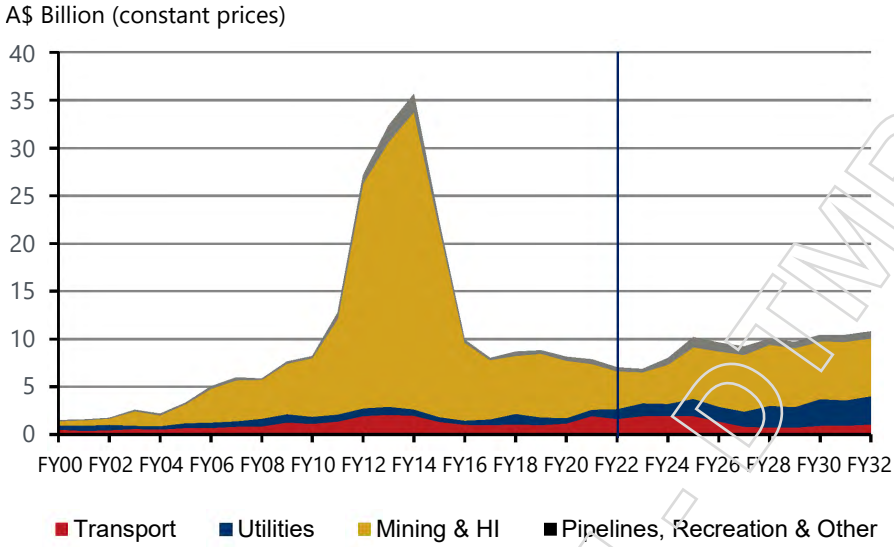
Engineering construction activity in the Central Queensland Region is largely dominated by the mining and heavy industry sector (Fig. 43). The LNG boom in the early to mid-2010s saw several mega projects such as the $14bn Curtis LNG Project in the Central Queensland area. Excluding the LNG boom, coal activity has generally been the major driver of engineering construction activity, particularly around the Mackay – Isaac – Whitsunday area. Going forward, the oil & gas and electricity sectors are expected to drive engineering construction activity as coal activity retreats.

Coal activity is expected to remain somewhat strong through the mid-decade due to several large projects in the pipeline, including the $975mn Saraji East project and the $900mn Winchester South project that are expected to begin work in FY24, and finish around FY26/FY27. However, activity is expected to decline through FY32 as the nation transitions out of coal-powered generation and towards renewable generation.

The oil & gas and the heavy industry sectors are expected to grow significantly in the Central Queensland region as coal-related activity fades. Nonetheless oil & gas activity will remain well below its levels during the LNG boom as investments will largely focus on renewable energy rather than fossil fuels. Investment into hydrogen production facilities is expected to lift heavy industry activity from mid-decade through FY32. In particular, Gladstone is anticipated to be one of the largest hydrogen hubs, which will attract strong renewable energy investment and engineering construction activity in the Central Queensland region. The $2.6bn H2-Hub™ Gladstone facility is expected to provide a substantial boost to engineering construction activity in the region from FY24 to FY30.

Activity around renewable generation infrastructure is anticipated to support activity in the electricity sector through FY32. Key projects in the Central region includes the $378mn Wandoan South Solar project that is currently under construction and was planned to finish by FY23, and the $700mn Clarke Creek Wind and Solar Farm (stages 1 and 2) that will ramp up construction in FY24.

Fig. 43. Engineering Construction Work Done, Central Queensland Region



Source: Oxford Economics Australia/ABS

Northern Queensland Region

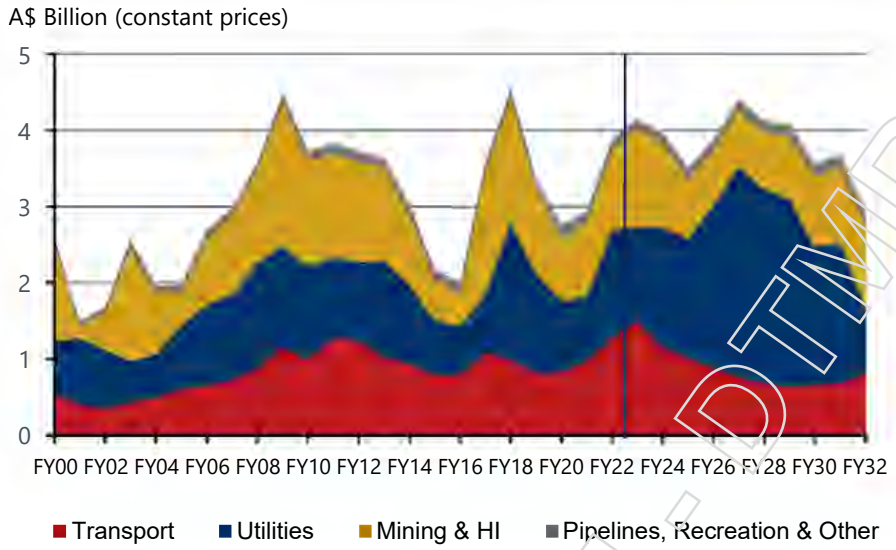
The road, electricity, and mining & heavy industry sectors have contributed the most to engineering construction activity in the Northern Queensland region. In particular, mining activity in the region has mostly been focused on bauxite, alumina and other minerals (such as copper, lead, zinc). Activity is expected to remain relatively flat through FY32 at an average of around $3.4bn annually (Fig. 44).

Road infrastructure activity is expected to remain elevated through the mid-decade with major support from the Bruce Highway projects (e.g. Cairns Southern Access Corridor Stage 3 - Edmonton to Gordonvale, Cairns Southern Access Corridor Stage 5 - Foster Road upgrade intersection, Townsville Ring Road Stage 5), which are expected to support road activity through FY26. Activity is then anticipated to fall back as these major projects finish up.

The transition towards renewable energy is anticipated to significantly lift activity in the electricity sector in Northern Queensland through FY32. Several mega projects in the pipeline include the $2bn CopperString 2.0 Transmission Line that is expected to start works in FY24 through FY29 and the $8.4bn Pioneer-Burdekin Pumped Hydro project that is expected to commence construction late in the decade to be operational by FY36.

The mining sector is expected to remain largely supported by activity in bauxite, alumina and other minerals. Key projects in the northern region include the $500mn Eva Copper project that is expected to start works in FY24 and the $300mn SCONI Scandium Project (processing plant component) in FY26. The heavy industry sector is anticipated to increase in the tail-end of the decade as some areas in the north, particularly Townsville, have been considered as potential opportunities for investment in hydrogen production.

Fig. 44. Engineering Construction Work Done, Northern Queensland Region

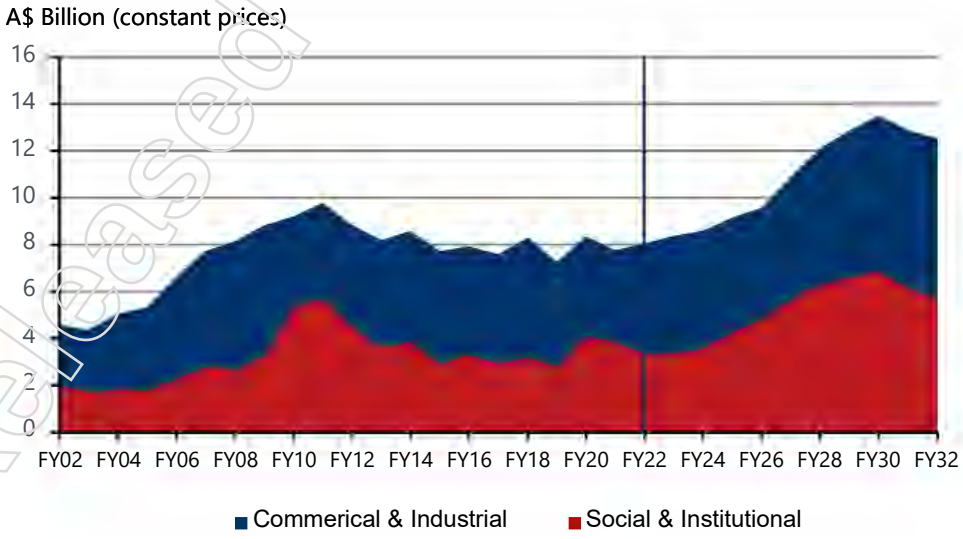


Source: Oxford Economics Australia/ABS

3.2 NON-RESIDENTIAL BUILDING CONSTRUCTION

Non-residential building construction activity in Queensland is forecast to trend upwards through to FY30. Social & institutional construction, particularly in the entertainment, education and health sectors are set to lift sharply over this period (Fig. 45). A flurry of major hospital projects are scheduled to begin works as part of the Queensland Health and Hospitals Plan. On the commercial & industrial side, office building is expected to remain elevated over the forecast horizon with large office building projects around Brisbane, such as the $500mn Waterfront Brisbane - North Tower project supporting activity. Meanwhile, projects related to the 2032 Olympics are expected to begin driving growth in non-residential building construction from around mid-decade. The entertainment & recreations and accommodations sector are expected to see the biggest boost in activity as the state prepares for the games.

Fig. 45. Total Non-residential Construction Work Done, by Sector, Queensland

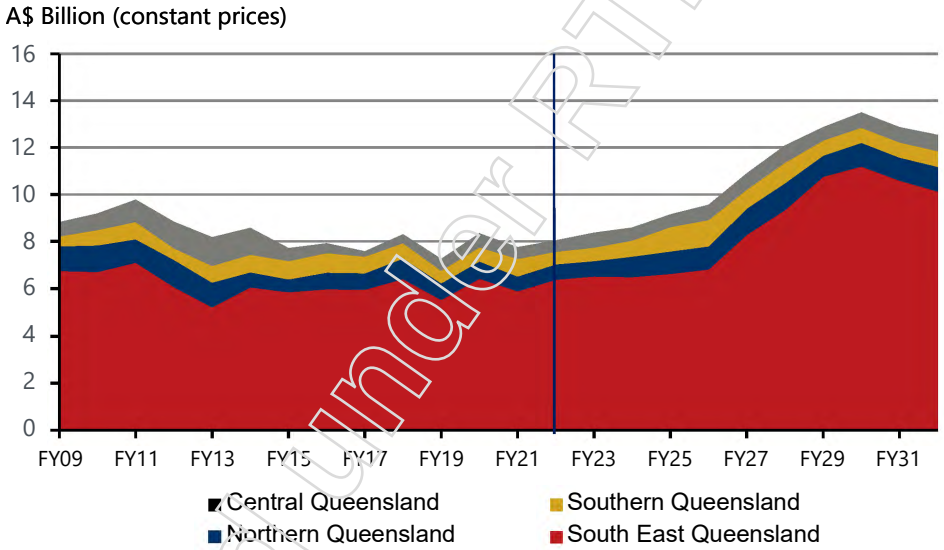


Source: Oxford Economics Australia/ABS

The share of non-residential construction has largely been concentrated in the South East Queensland region where most of the Queensland population resides (Fig. 46). Going forward non-residential building activity in South East Queensland is expected to remain relatively flat in the near-term with most of the construction activity centred around the education, office and retail sectors. However, activity is expected to ramp up in the mid-decade following up to the 2032 Olympics led by large projects around Brisbane's entertainment and recreational sector, including the new Brisbane Live Arena, and the Gabba Stadium rebuild.

The Southern Queensland and Northern Queensland regions are expected to see strong growth in the near term. This is largely driven by significant hospital projects, including the construction of new hospitals in Bundaberg ($800mn), Toowoomba ($1bn), Townsville ($300mn), and the expansion in Cairns ($170mn). Additionally, the $420mn defence project in Townsville (Australia-Singapore Military Training Initiative - Greenvale) will add to activity in the North. Meanwhile, the Central Queensland region is expected to see relatively flat levels of non-residential activity, with some major support from the public sector, including the Australia-Singapore Military Training Initiative in Shoalwater Bay and the $175mn hospital expansion in Mackay.

Fig. 46. Total Non-residential Construction Work Done, by Regions, Queensland



Source: Oxford Economics Australia/ABS

3.2.1 Commercial & industrial

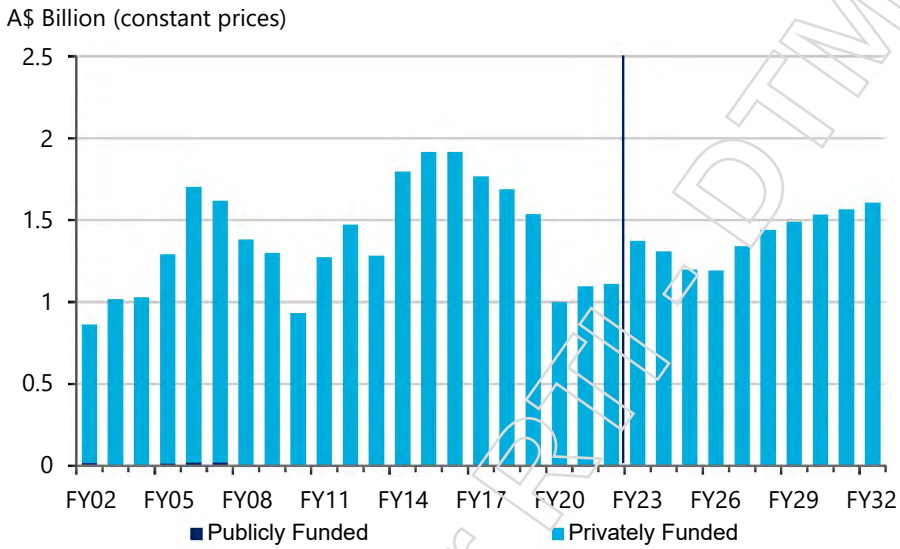
This section outlines the trends and outlook for each of the sub-industries for commercial & industrial construction. We note that there are several precinct projects that are planned to support the 2032 Olympic games but are not directly included in the project listing due to uncertainty around funding or timing. This may add some upside risks to the commercial and industrial sectors leading up to FY32. Several key projects around Brisbane include the $750mn Buranda Village, and the Northshore Hamilton Precinct development. The sub-sectors discussed in this section include retail, offices, accommodation, transport, factory, warehouse, and other commercial & industrial.

Retail

Retail construction has slowed in recent years leading up to the pandemic after a wave of activity in Brisbane, Gold Coast and Toowoomba between FY14 and FY18. Nonetheless, the construction of retail shopping in the Queen's Wharf Brisbane is expected to lift retail

construction activity over FY23 and FY24. subsequently, construction activity in the retail sector is expected to remain relatively muted (Fig. 47). Rising interest rates, and consequently a squeeze on household budgets is expected to drag on retail trade in the near term. Furthermore, a structural shift towards online shopping since the pandemic is likely to keep retail growth relatively subdued going forward when compared to elevated levels of activity historically.

Fig. 47. Retail Construction Work Done, by Funding, Queensland

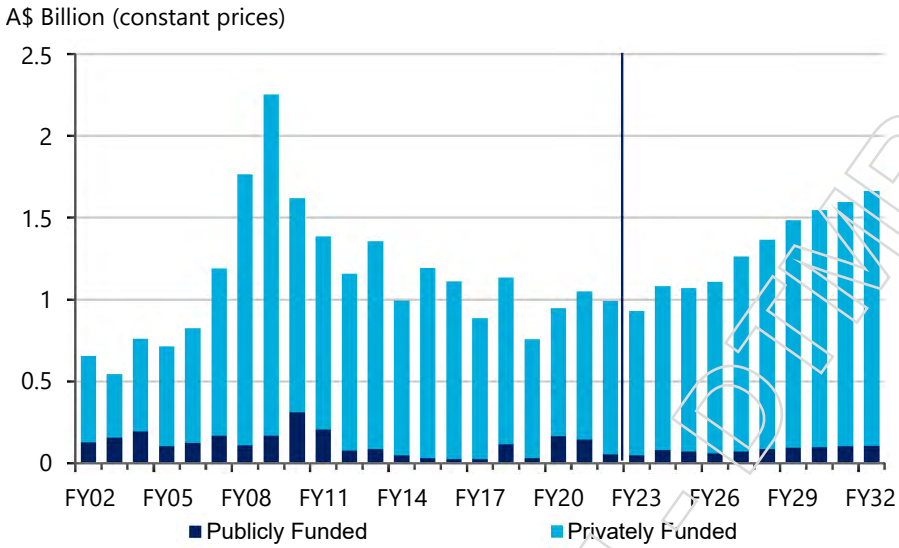


Source: Oxford Economics Australia/ABS

Offices

Office building construction has declined since the boom around FY08 – FY13. Several large private projects in Brisbane will support office building activity over FY23 and FY24, including the $200mn 205 North Quay project and the $265mn 360 Queen Street project. Going forward, office construction activity is expected to continue on an upward trend as shown in Fig. 48, supported by a growing services sector in the metropolitan areas of Queensland. The upcoming $500mn Waterfront Brisbane – North Tower project, which is expected to start construction in FY24, will provide substantial support in the near term.

Fig. 48. Office Construction Work Done, by Funding, Queensland

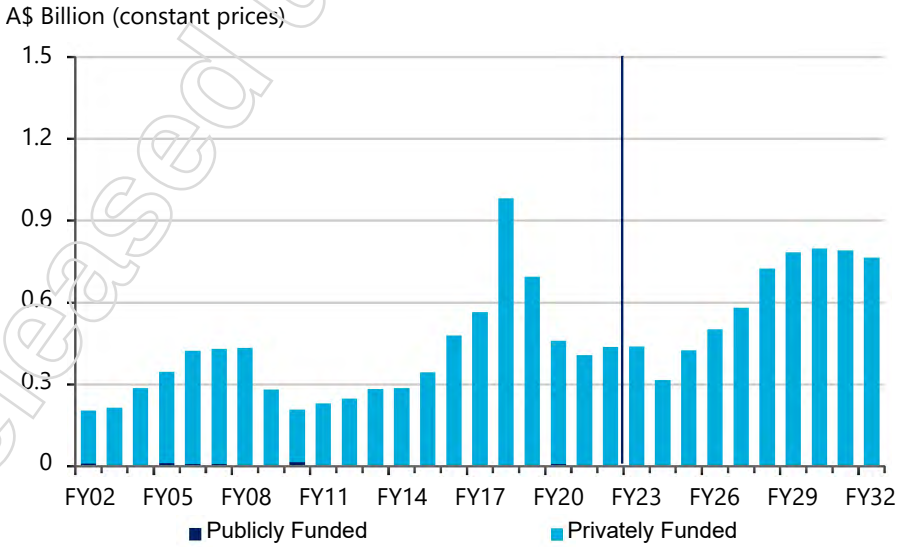


Source: Oxford Economics Australia/ABS

Accommodation

Accommodation construction activity was strong leading up to the COVID-19 pandemic with several large hotel projects around Gold Coast and Brisbane. Since then, activity in the sector has come down but remained relatively stable with large casino projects, such as The Star's Dorsett Hotel and the New Brisbane Casino, providing much of the support for hotel building activity. Going forward, the state's strong tourism industry and the Olympics are expected to continue supporting construction in the accommodation industry, particularly in South East Queensland. Some notable projects that are expected to start around the mid-decade include the Avani Mooloolaba Beach Hotel in Sunshine Coast and the La Pelago Tower 1 Hotel in Gold Coast.

Fig. 49. Accommodation Construction Work Done, by Funding, Queensland



Source: Oxford Economics Australia/ABS

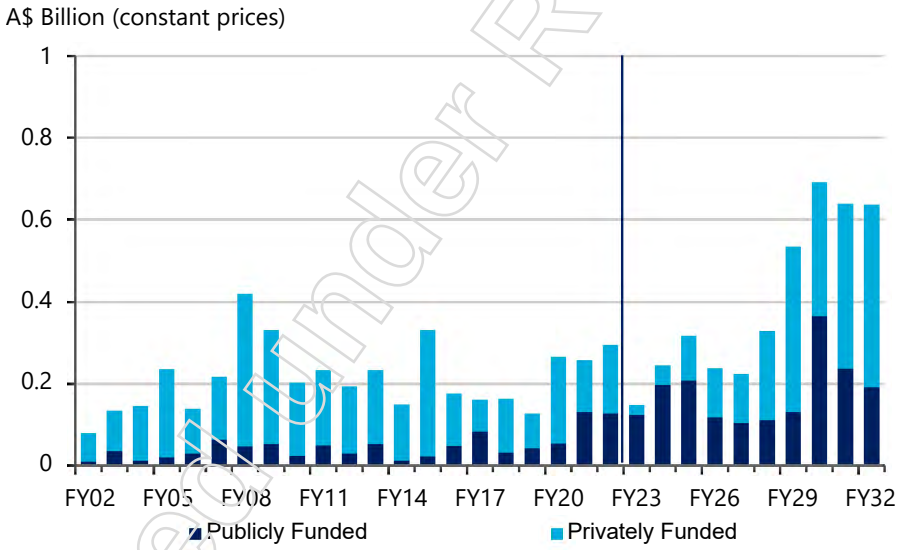
Transport

There has been an increase in public-funded non-residential transport projects in recent years as shown in Fig. 50, largely consisting of new car parks and station upgrades across Brisbane and the Sunshine Coast. Publicly funded projects are expected to support the large proportion of transport construction activity in the near term, including the Cross River Rail station building and the Brisbane Metro Depot. Meanwhile, private-funded projects are expected to pick up around FY24 with several airport projects around Brisbane and Townsville.

Strong population growth, particular in the South East, is expected to lead to a significant increase in transport construction activity in the medium to longer term. A notable project earmarked towards the end of the decade is the $1.3bn Brisbane Airport Third Terminal, which is to be completed in time for the Olympic games.

There are also considerable upside risks in transport building activity in the lead up to the 2032 Olympics. While transport projects may not directly be needed to conduct the games, improvement in transport infrastructure will improve efficiency in moving tourists and athletes during the event. Additional upgrades to the Brisbane Airport, such as the future Western and Northern terminals, and further developments on the upcoming third terminal could add over $3bn in activity, though the timing of these projects is uncertain.

Fig. 50. Transport Construction Work Done, by Funding, Queensland

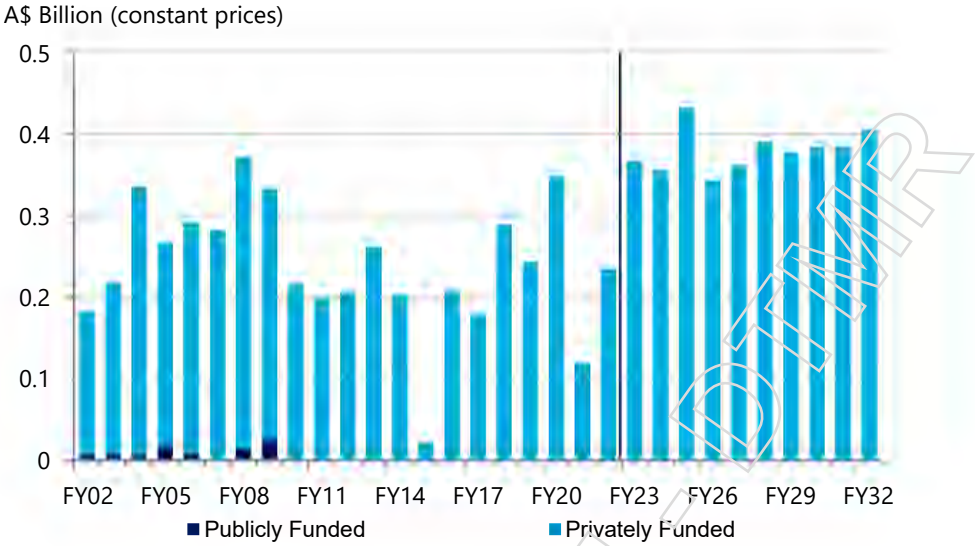


Source: Oxford Economics Australia/ABS

Factory

Factory construction activity has remained relatively stable over time (Fig. 51). However, activity over FY21 and FY22 has been somewhat weaker following the completion of several factories in Brisbane in the years prior. Nonetheless, activity has picked up from FY23 with projects in the pipeline, including the Frucor Suntory Plant in Swanbank, the Train Manufacturing Facility in Torbanlea, and the Visy Glass Container Production Facility between Gold Coast and Brisbane.

Fig. 51. Factory Construction Work Done, by Funding, Queensland

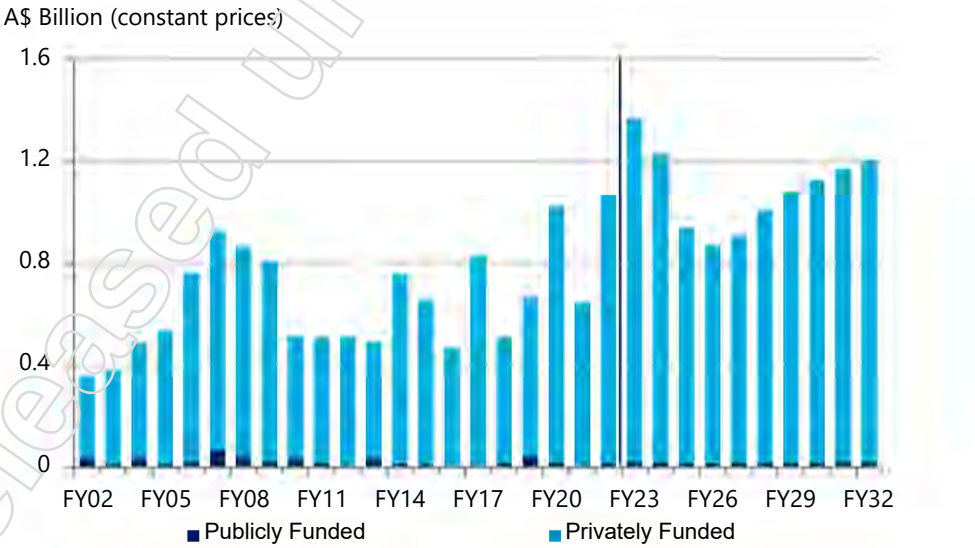


Source: Oxford Economics Australia/ABS

Warehouse

Warehouse construction activity has increased over recent years and has become one of the main contributors to total non-residential construction activity. This is largely driven by the large number of warehouse construction projects around the South East Queensland region. These projects are expected to significantly lift warehouse construction activity over FY23 and FY24 (Fig. 52). Beyond this, warehouse construction activity is expected to come down over the mid-decade before growing steadily through the forecast period to meet the demand for greater inventory space by the growing e-commerce sector.

Fig. 52. Warehouse Construction Work Done, by Funding, Queensland



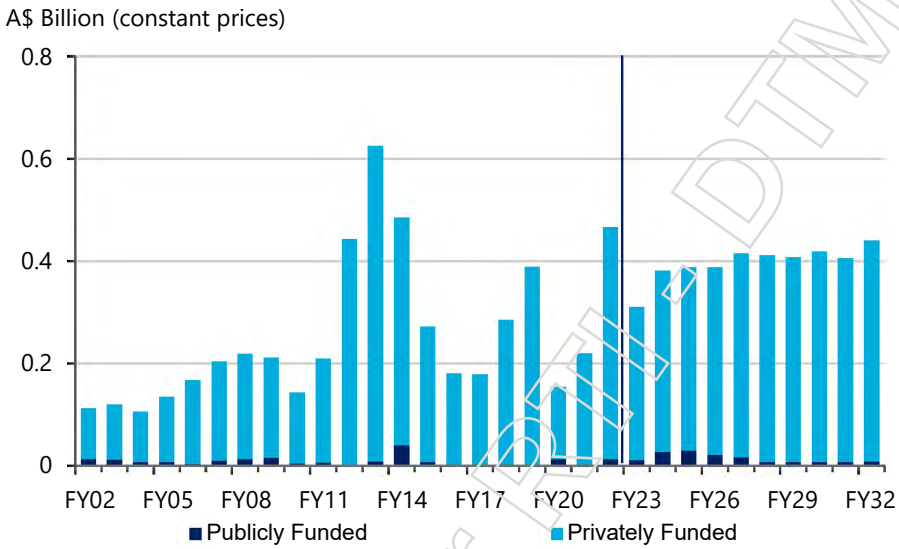
Source: Oxford Economics Australia/ABS

Other commercial & industrial

Other commercial and industrial construction includes various non-residential buildings that are not elsewhere classified, such as agricultural buildings, data centres, depots, and various

infrastructure & accommodation buildings in the mining sector. The construction of these types of buildings, has come down significantly since the mining boom (Fig. 53). Some notable projects in recent years include the Adani Rail Construction Camps in Mackay, and the Gold Coast Water and Sewer Depot. Going forward, construction activity is expected to remain relatively flat, with some expected projects including the Pump Station in Burdekin, and the NextDC Data Centre (Stage 2) in Fortitude Valley.

Fig. 53. Other Comm. & Industrial Construction Work Done, by Funding, Queensland

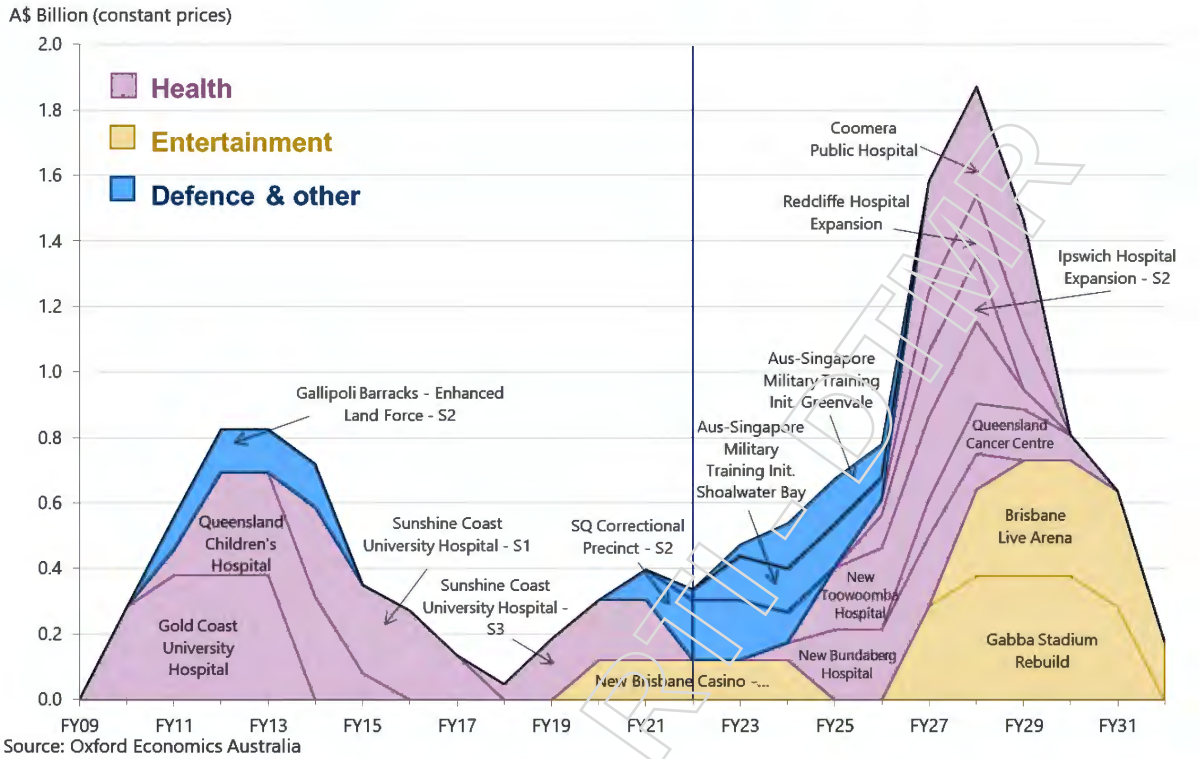


Source: Oxford Economics Australia/ABS

3.2.2 Social & institutional

Major health and Olympics-related developments are expected to significantly lift social & institutional activity in the latter half of the decade. Several mega projects in the pipeline includes the new hospitals in Toowoomba and Bundaberg, the Gabba Stadium Rebuild and the Brisbane Live Arena Development (Fig. 54). The timing of these projects coincides with the major Olympics-related projects, which adds material risks around the timing if capacity constraints materialise (more information on Olympics-related activity in section 3.3). The rest of the section will discuss in detail the social & institutional sub-sectors, including education, aged care, health, entertainment & recreation, and other social & institutional.

Fig. 54. Major Social & Institutional Projects above $400mn work done, Queensland



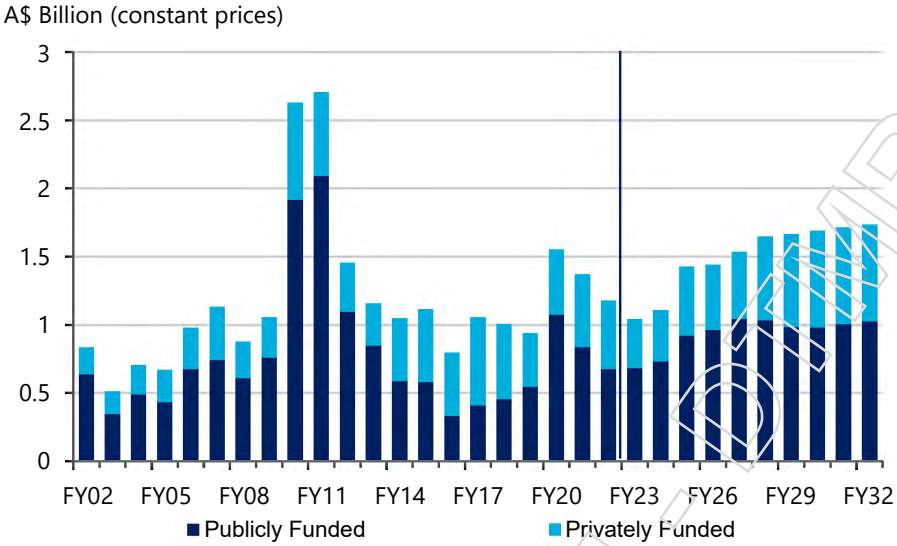
Source: Oxford Economics Australia

Education

Construction activity in the education sector has been strong since the pandemic due to an increase in public spending. The education sector is expected to remain one of the largest contributors to non-residential construction activity, supported by strong inflows of overseas students and strong population growth.

Public investment is anticipated to drive most of the growth in the education sector going forward (Fig. 55). There are a number of primary and secondary school projects in the pipeline across the state, particularly around the Brisbane area. Furthermore, several large university projects are also set to lift construction activity, including the UQ Health and Recreation Centre, and two new buildings at Griffith University.

Fig. 55. Education Construction Work Done, by Funding, Queensland

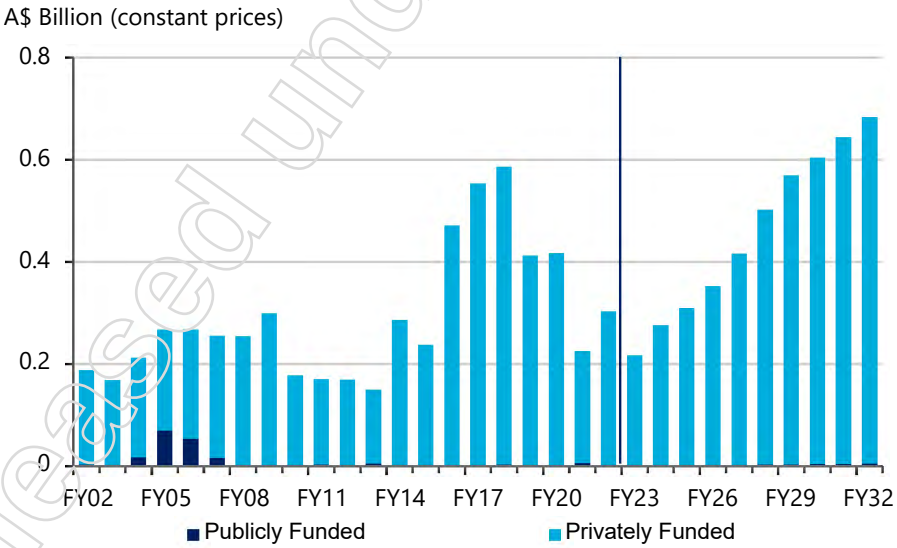


Source: Oxford Economics Australia/ABS

Aged care

Aged care construction peaked in FY18 driven by a gradual aging population, a stable economic environment and relatively low borrowing costs. Since then, activity has fallen back to around historical levels and is expected to fall in FY23 as the sector struggles post-pandemic (Fig. 56). Going forward, construction activity in the aged care sector is anticipated to accelerate as the 80+ age group cohort expands.

Fig. 56. Aged care Construction Work Done, by Funding, Queensland



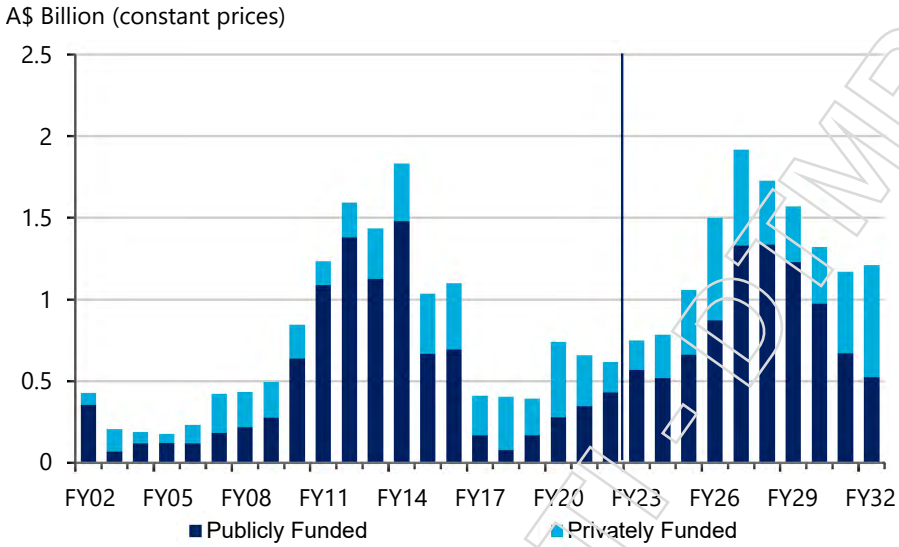
Source: Oxford Economics Australia/ABS

Health

Construction in the health industry has been relatively weak since the last wave of public spending in the early 2010s. However, activity is expected to pick up significantly past FY25 (Fig. 57). The Queensland Health and Hospitals Plan will see a flurry of publicly funded hospital projects scheduled to begin work in the second half of the decade. Additionally, private

investment in healthcare is set to hold strong, supporting this positive outlook alongside a series of publicly funded mega projects.

Fig. 57. Health Construction Work Done, by Funding, Queensland



Source: Oxford Economics Australia/ABS

Several mega projects in the pipeline include the $1bn Toowoomba and the $800mn new Bundaberg Hospital, that are both expected to begin works around mid-decade. Additionally, several large hospital projects in South East Queensland, including the $1bn Coomera Public Hospital and several hospital expansions around the Brisbane area are expected in the pipeline. These expansions include the $600mn Redcliffe Hospital and $500mn Ipswich Hospital that are expected to start works around FY26.

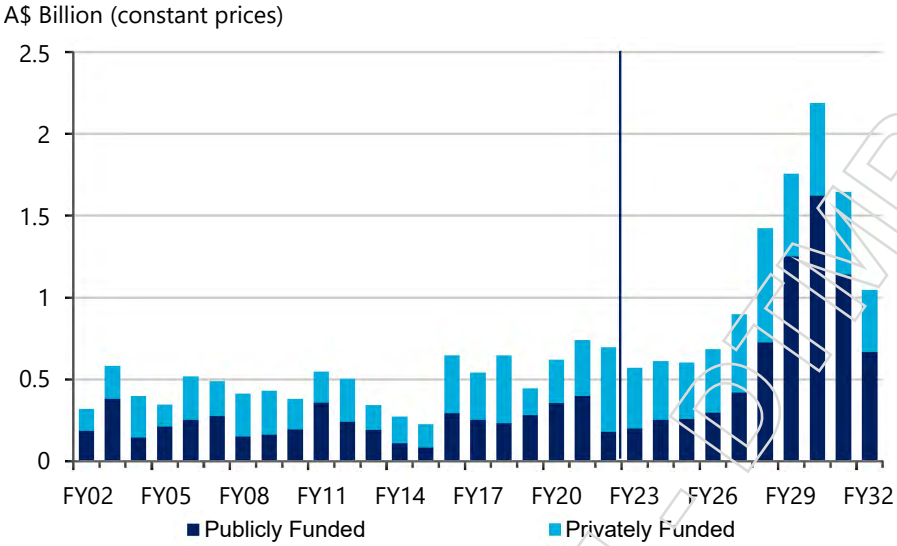
It is important to note that the actual timing of the major hospital projects above is somewhat uncertain. There is material risk that the pipeline of hospital projects is unachievable by FY32, particularly in the lead up to the Olympics. This is because the pipeline of Olympics-related projects will take priority and will most likely exhaust a significant share of construction resources.

Entertainment & recreation

Activity has been relatively strong in recent years with several public and private funded projects across Queensland (Fig. 58). Major projects included the Townsville Stadium and Entertainment Centre, the Cairns Convention Centre Expansion, and Ipswich Central Civic Project.

Construction activity is anticipated to remain modest in the near term supported by a few large projects that are currently underway, such as the entertainment component of the New Brisbane Casino and a new venue at the Queensland Performing Arts Centre. Olympic-related projects will provide elevated levels of support from mid-decade, with the $1.7bn Gabba Stadium Rebuild set to break ground in FY27 and the $1.5bn Brisbane Live Arena development expected to start in FY28 (more information on the Olympics in section 3.3).

Fig. 58. Ent. & Recreation Construction Work Done, by Funding, Queensland



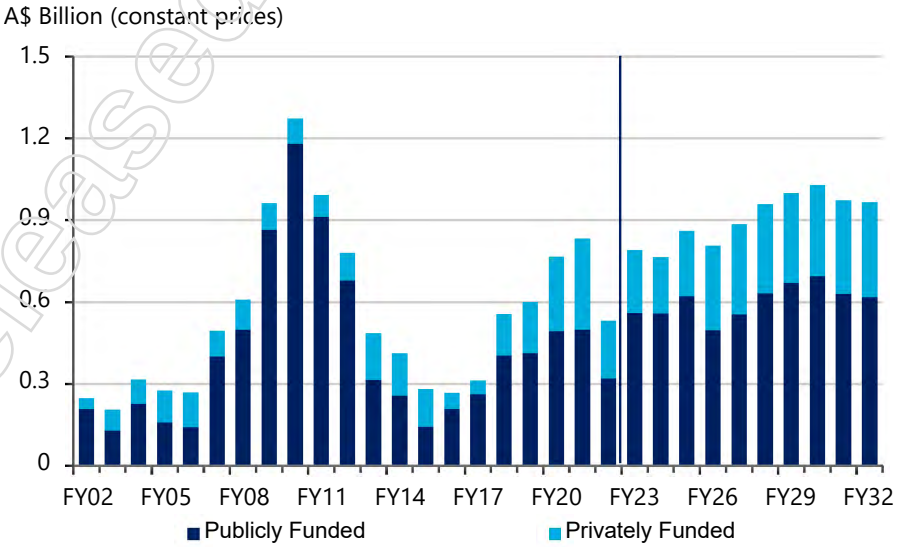
Source: Oxford Economics Australia/ABS

Other social & institutional

Other social & institutional construction incorporates non-residential buildings not included in the previous sectors. Key components include defence buildings, emergency services buildings, prison/detention centres and religious buildings. There have been several large defence and prison projects in recent years that have supported activity, including new RAAF Base facilities in Amberley and Townsville, and the second stage of the Southern Queensland Correctional Precinct in Gatton.

Going forward, activity is anticipated to grow steadily with public spending supporting the Defence sector and Olympic-related projects. Major projects expected in the second half of the decade include the Australia-Singapore Military Training Initiative in Townsville and Shoalwater Bay, the Olympic Games International Broadcasting Centre, and the Main Press Centre in Brisbane.

Fig. 59. Other Social & Institutional Work Done, by Funding, Queensland



Source: Oxford Economics Australia/ABS

3.2.3 Regional Analysis

Southeast Queensland

Non-residential construction activity in South East Queensland has remained relatively flat over the last decade (Fig. 60). Nonetheless, the South East region has contributed around three-quarters of the State's total non-residential construction activity. The Commercial & Industrial sectors have seen most of the activity in recent years due to strong growth in office building, retail, and warehousing, albeit retail activity has softened since the pandemic due to a rise in online shopping. The education industry has also experienced strong levels of activity in recent years. Going forward, these sectors are expected to remain strong growth drivers in the South East Queensland region. Additionally, The Queensland Health and Hospitals Plan and the 2032 Olympics will see a significant lift in non-residential activity in the second half of the decade.

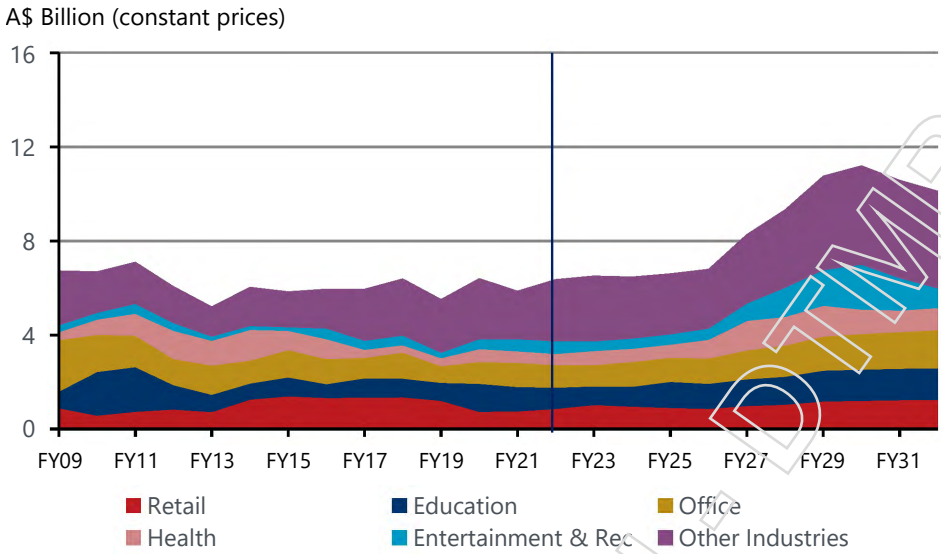
Office building construction is anticipated to remain strong going forward. In the near term, the strength in office building construction is reflected by the large projects in Brisbane, including the 205 North Quay - Services Australia Office and the 360 Queen Street building. Furthermore, the Waterfront Brisbane - North Tower project is expected to provide over $500mn of construction work starting in FY24. Beyond this, activity is expected to continue upward trending as Brisbane's business and financial services industries grow.

Warehouse construction is expected to see a strong lift from FY23 to F24. This is reflective of many medium-size warehouse projects ($20-35m) currently underway around Brisbane and Gold Coast. Going forward, warehousing activity is expected to remain trending upward as the shift towards online shopping will require e-commerce businesses to increase their inventory capacity.

The education sector is anticipated to grow steadily over the forecast period. There are several construction work for public and primary schools from the QLD government that are currently underway. There are also a few large projects expected, such as the N82 Arrivals building at Griffith University, and the Integrated East Brisbane State School, which are expected to begin work in FY25. The growth in this sector is also underpinned by anticipated strong population growth in the South East Queensland region, particularly around Greater Brisbane.

The Queensland Health and Hospitals Plan and the 2032 Olympics are anticipated to provide a sharp boost to construction activity in the second half of the decade. This will largely be reflected in the Health industry and the Entertainment & Recreation industry. The health industry is expected to see a significant lift from around FY26 with the new $1bn Public Hospital at Coomera and several large hospital expansion projects around Brisbane, such as the Ipswich Hospital and the Redcliffe Hospital. The Entertainment & Recreation industry is anticipated to see a historical-high level of activity through to FY32 underpinned by numerous stadium and sports facility projects for the Olympics. In particular, the $1.7bn Gabba Stadium Rebuild is set to begin construction in FY27 and the $1.5bn Brisbane Live Arena development is expected to start in FY28. The size and nature of the Olympics-related projects poses risks to market capacity as these projects will likely be prioritised and must be completed in time for the games (more information on Olympics-related activity in section 3.3).

Fig. 60. Non-Residential Construction Work Done, South East Queensland



Source: Oxford Economics Australia/ABS

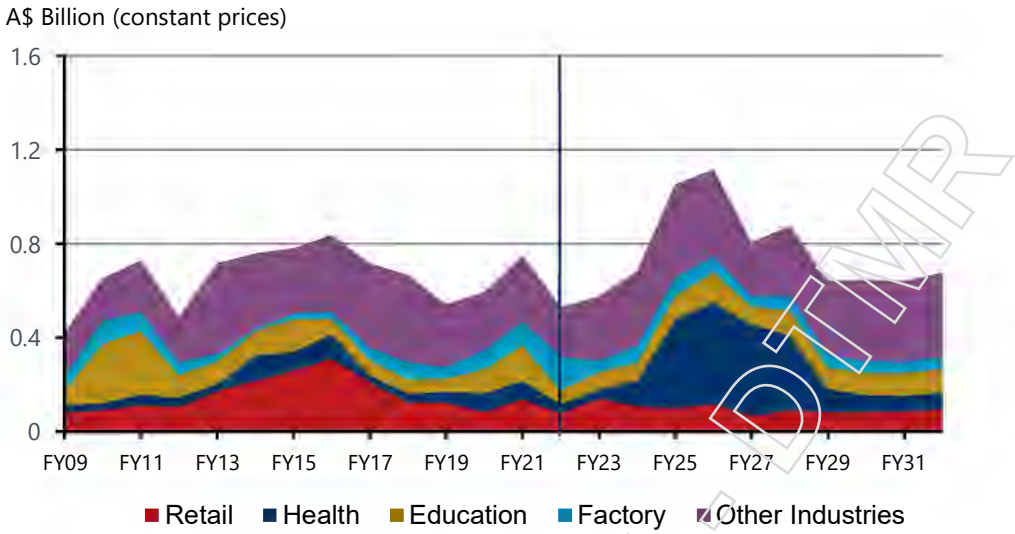
Southern Queensland Region

The Southern Queensland region has seen a decline in activity levels since the last wave of retail construction activity around Toowoomba and Hervey Bay. The $150mn Queensland Regional Quarantine Centre in Toowoomba provided some support to activity over FY21 and FY22. Construction activity in the region is expected to remain modest but will pick up significantly in FY25 from large health-related projects and the Clive Berghofer Stadium (Fig. 61).

In the near term, the retail, education, and factor sectors are expected to provide some support to activity. Some notable projects include the Hervey Bay Bulky Goods Centre, and the Bundaberg Brewed Drinks Facility, which will provide support to the retail and factory sectors through to FY24. Additionally, the $125mn Train Manufacturing Facility in Torbanlea and the $50mn Boeing Facility in Wellcamp are anticipated to provide a boost to factory building activity through to FY26.

The Queensland Health and Hospitals Plan is anticipated to provide a substantial boost to activity from FY25 to FY29. The two major projects include the $1bn new Toowoomba Hospital and $800mn new Bundaberg Hospital. Additionally, the $110mn Clive Berghofer Stadium is expected to begin construction in FY29, providing support to the Entertainment & Recreation sector.

Fig. 61. Non-Residential Construction Work Done, Southern Queensland



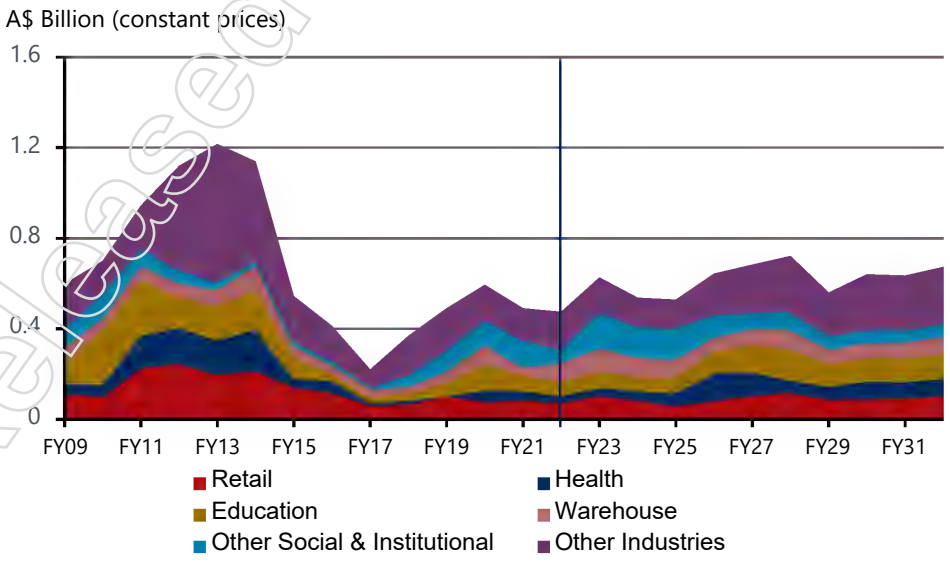
Source: Oxford Economics Australia/ABS

Central Queensland Region

The Central Queensland region saw a period of elevated activity from FY11 to FY14 due to a number of large projects in health, retail, and mining accommodation villages around the Mackay and Fitzroy area. Activity in the region has declined since then (Fig. 62). However, public investment has supported construction activity in the region over recent years. In particular, there have been large public projects around the Fitzroy area, including the $170mn Capricornia Correctional Centre Expansion in Rockhampton and the $70mn Shoalwater Bay Training Area.

Going forward, activity is expected to remain relatively flat, with some major support from the public sector, including the $500mn Australia-Singapore Military Training Initiative that is currently under construction in Shoalwater Bay, and the $175mn Mackay Hospital expansion that is anticipated to start construction in FY25.

Fig. 62. Non-Residential Construction Work Done, Central Queensland



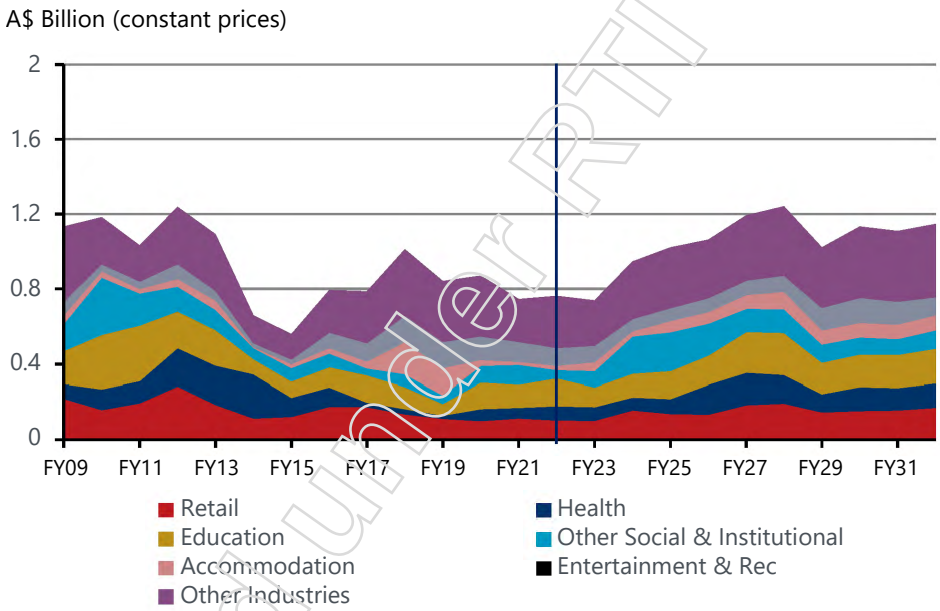
Source: Oxford Economics Australia/ABS

Northern Queensland Region

Construction activity in the Northern Queensland region has fallen significantly since FY13, with many large public and retail projects providing a significant boost around that period. Since then, the tourism-related sectors (such as Entertainment & Recreation and Accommodation) have provided sizable support to construction activity, particularly around Cairns and Townsville. Recently completed large projects include the $240mn Townsville Integrated Stadium and Entertainment Centre, and the $140mn Cairns Convention Centre expansion.

Activity is anticipated to remain flat over FY23 before picking up through FY28 (Fig. 63). Underpinning this is the $420mn Australia-Singapore Military Training Initiative in Townsville that is currently under construction, and numerous hospital projects. Some large hospital projects that are currently under construction include the Cairns Base Hospital's emergency department and mental health unit and the Weststate Private Hospital in Townsville. More notably, the $300mn Townsville University Hospital and the $170mn Cairns Hospital expansion are expected to significantly lift activity in the region through to FY28.

Fig. 63. Non-Residential Construction Work Done, Northern Queensland



Source: Oxford Economics Australia/ABS

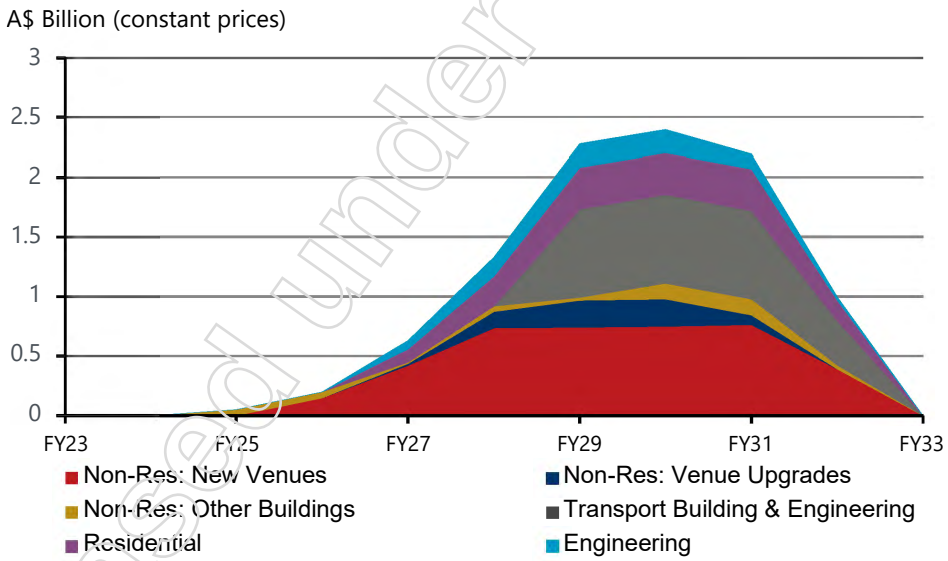
3.3 OLYMPICS-RELATED CONSTRUCTION ACTIVITY

The 2032 Olympics will require Brisbane to have adequate infrastructure to conduct the games and to support elevated levels of tourism. Consequently, the Queensland Government will be investing heavily in stadiums, sports facilities, transport, and Olympic villages to support the games. Local governments have also aligned their goals to enabling the Olympics. For example, the Brisbane City Council have been active in the planning and delivery of major public transport upgrades (such as the Brisbane Metro and Cross River Rail). As a result, construction activity will substantially boost from mid-decade through FY32, with Olympics-related activity expected to peak at $2.4bn in FY30 (Fig. 64).

Olympics-related projects will have hard deadlines, with large projects needing to be completed by early 2032. This will add to capacity constraints in the pipeline of infrastructure projects, particularly with other mega projects that are also expected around this period (i.e., large hospital projects around South East Queensland and other regions, as discussed in section 3.2.2).

Additionally, the International Olympic Committee (IOC) requires Brisbane 2032 to be climate-positive with a large emphasis on planning for the legacy beyond the games. The Brisbane City Council is also actively ensuring a greener city and promoting a 'lasting legacy of infrastructure' such as promoting property upgrades or conversion of existing offices into residential property or other uses. This is on top of a general effort to decarbonise infrastructure, potentially placing increased pressure on key components and green building materials.

Fig. 64. Olympics-Related Construction Work Done, Queensland



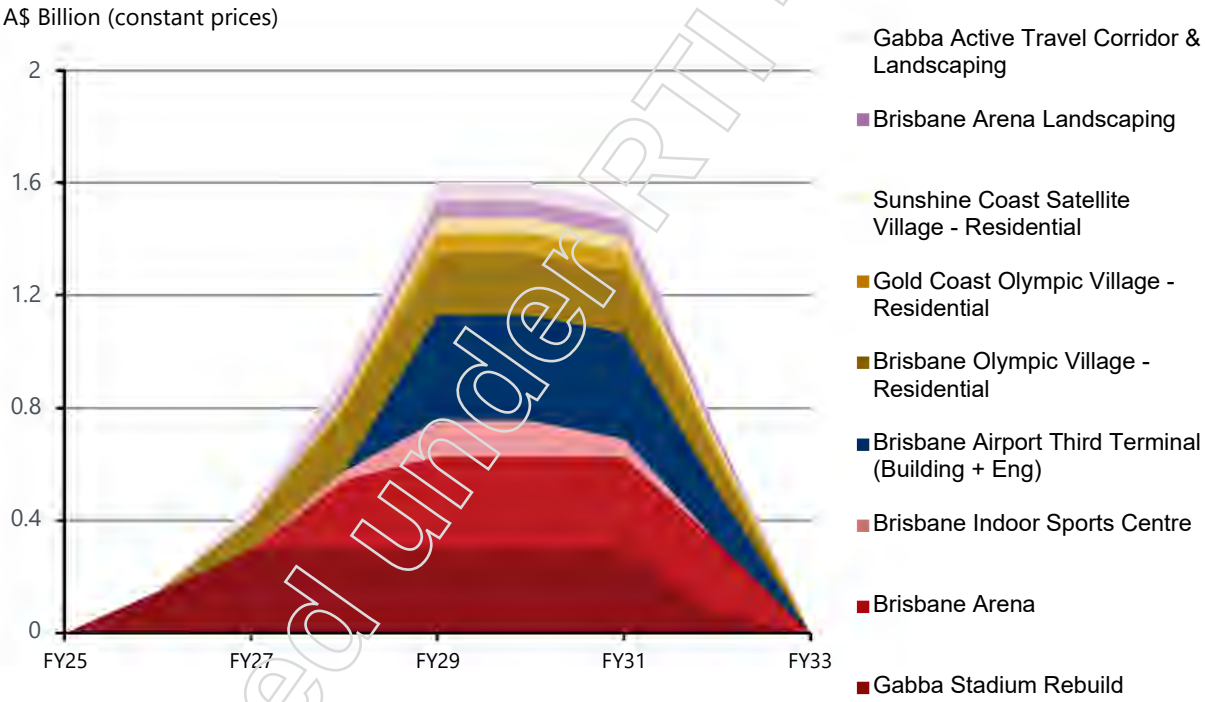
Source: Oxford Economics Australia/ABS

Olympics-related activity is expected to contribute over $10bn in construction activity from FY25 to FY32. Venue-related construction is anticipated to contribute nearly half of the activity (approximately $4.6bn) throughout this period. This includes the $1.7bn Gabba Stadium Rebuild that is expected to start construction in FY26 and the $1.5bn Brisbane Live Arena that is expected to start construction in FY27 (Fig. 65). Building construction activity (retail, accommodation, residential) around the Olympic villages in Brisbane, Gold Coast, and Sunshine Coast, are expected to add around $2bn in activity through FY32. The Brisbane Airport's Third Terminal is expected to add $1.6bn in building and engineering activity from FY29. Other engineering activity such as stadium landscaping and fields work are expected to add over $780mn.

These projects are not exhaustive of the potential Olympics-related projects in the pipeline. There are also several Olympics-related projects that have been announced but have not been included the project listing and forecasts due to uncertainty around its funding, timing, or commitment. Key projects that have been excluded includes the Gabba Precinct Hotel, the Gold Coast and Sunshine Coast airport upgrades, and the RNA Showgrounds Upgrade. These projects present an upside risk to the already elevated activity levels from mid-decade to FY32.

Additionally, Olympics-enabling projects that are not directly built for the Olympics will likely add to capacity constraints in the lead up to FY32. In particular, large transport infrastructure projects that will improve transportation capability and efficiency will likely look to finish construction in time for the games. Key projects include the $4.4bn Cross River Rail and the $800mn Brisbane Metro, which will help connect important locations within Brisbane (including the Brisbane airport, the CBD and the Gabba), and the $1.3bn Logan and Gold Coast Faster Rail and the $1.4bn Coomera Connector – Stage 1 (Coomera to Nerang), which will improve transportation between the Brisbane, Gold Coast, and the Sunshine Coast.

Fig. 65. Major Olympics Projects Above $200mn, Queensland



Source: Oxford Economics Australia/ABS

4 CONSTRUCTION COST ESCALATION

4.1 OVERVIEW

Costs for construction projects are typically linked to broader domestic demand trends in the building and construction industry. Regarding domestic demand trends, material inputs for construction projects such as concrete, quarry products and labour are used in many applications across the construction sector. We believe there is a positive correlation between construction activity and construction costs because high (and rising) levels of demand (i.e. construction activity) not only places pressure on the existing supply of inputs, boosting input prices, but also allows construction companies to raise their prices (and possibly margins). Where capacity constraints exist, rising construction activity can lead to strong increases in input prices as investment in new capacity is costly and takes time to come on stream. Consequently, a significant driver of growth in construction costs is the amount of construction activity taking place at any time.

Construction costs will often accelerate when the level of overall construction activity surpasses the previous peak. This typically coincides with the emergence of capacity constraints across broad areas of the construction materials and labour sectors, particularly if there has been little increase in capacity or skilled labour supply since previous peaks. Our construction activity forecasts indicate that total construction work done (excluding oil & gas which skews figures with overseas build components) will surpass the previous FY19 peak in FY23. Accordingly, many cost escalation indicators are expected to remain elevated in FY23 and beyond, even as pandemic related supply chain issues ease off. For Queensland, the lead-up to the 2032 Olympics and major utilities projects related to the clean energy transition will further underpin elevated costs and potential resource constraints.

Costs are also driven by changes in the prices of internationally traded inputs or commodities, such as fuel and steel. Overall, the three major commodities of concern – iron ore, coking coal and oil – have all experienced significant recoveries from the pandemic-induced lows of 2020 and are currently trading at near 10-year highs. Although they are expected to retreat from these highs over the period to FY27, the average prices in the ten years to FY32 will be somewhat higher than pre-pandemic prices. The exchange rate also influences the price of imported inputs and traded commodities, as most imports are priced in US dollars. The Australian dollar is heavily influenced by movements in Australia's basket of commodity prices and interest rate relativities between Australian and overseas interest rates (particularly US interest rates). The A$ averaged US$0.75 in FY21 and US$0.73 in FY22, having recovered from US$0.67 in FY20. The A$ is forecast to average US$0.67 in FY23, before gradually rising to US$0.77 in FY25, due to expected larger declines in US interest rates. Falls in Australian interest rates and declines in commodity prices are then expected to see a depreciation over FY26 to FY28, before stabilising into the next decade.

4.2 BROAD CONSTRUCTION INDICES

Most aggregated cost indices are implicit price deflators (IPDs) — that is they have been calculated implicitly by dividing current price estimates of activity by a constant price series generated by the Australian Bureau of Statistics. They capture the aggregate change in cost of construction within the related sector (including the change in margins).

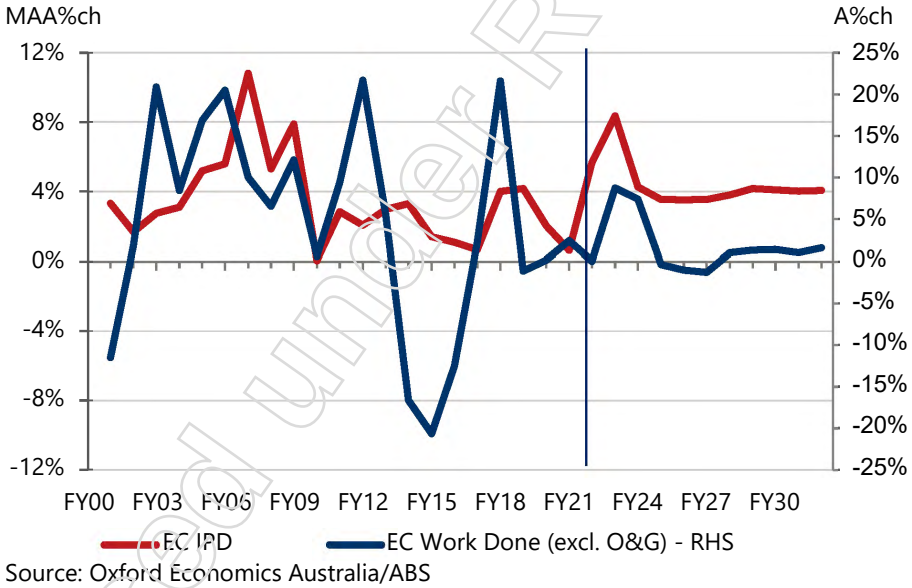
4.2.1 Engineering Construction IPD

The Engineering Construction (EC) IPD is an aggregate measure of the cost growth of work done for a given quarter. Historically, movements in the EC IPD have typically followed

movements in engineer construction activity, with increased activity heightening demand for inputs such as labour and steel and leading to upward pressure on construction costs (Fig. 66). The last boom in engineering construction, peaking in FY13 ($120bn, excluding oil and gas) driven by major transport and mining projects, saw the EC IPD grow at an average annual rate of 2.6% over FY11-13. As activity waned in the middle of the 2010's, construction cost pressures fell, with the IPD recording average growth of 1.0% over FY15-17. With severe supply and capacity constraints hitting the construction industry following the fallout from pandemic lockdowns and then the war in Ukraine, the prices for internationally exposed inputs into the EC IPD (e.g., diesel, copper, steel) skyrocketed, which drove a 5.7% rise in the IPD in FY22. Despite some easing of internationally influenced construction material prices, which soared over FY22, the first three quarters of FY23 have seen upward pressure on several domestically influenced prices, namely concrete and wages, which, in addition to record levels of construction activity, is expected to see the EC IPD rise a further 8.4% in FY23.

Beyond FY23, we expect international commodity markets to begin unwinding and normalise, which will see material price growth stabilise, or correct. However, high levels of construction activity and conditions will favour strong labour market outcomes (i.e., labour shortages driving up wages). As such, we expect that the EC IPD will grow at an average annual rate of 3.9% over the remainder of the outlook period (FY24-32).

Fig. 66. Engineering Construction IPD, Australia

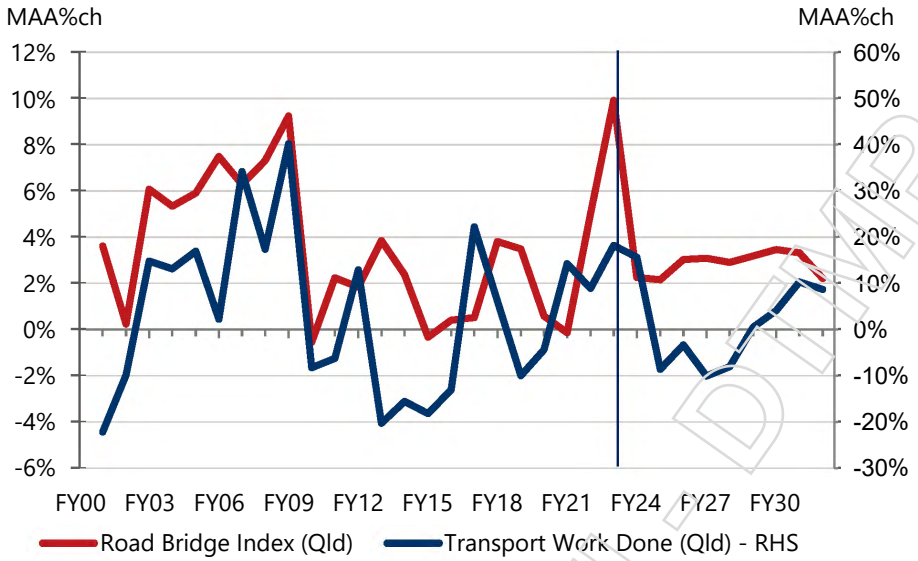


Source: Oxford Economics Australia/ABS

4.2.2 Road and Bridge Index

The Queensland Road and Bridge Index (RBI) is a weighted aggregation of input costs – with the major components consisting of construction wages, engineering design and construction, bitumen, cement, steel, hired plant and fuel. These construction inputs are heavily driven by both local demand pressures and international commodity prices.

Fig. 67. Road and Bridge Index, Queensland



Source: Oxford Economics Australia/ABS

Queensland's transport boom in the mid-2000s, driven by elevated road construction activity, saw a large uptick in the RBI, with annual growth peaking at 9.2% in FY09 (Fig. 67). Road construction activity then eased back, averaging $4.1bn per annum between FY15 and FY19, with reduced resource demand leading to eased price pressures which saw the RBI average 1.6% growth over the same period.

Growth in the RBI then dropped off over the pandemic, despite strong demand, as commodity prices weakened, or in the case of oil and fuel, declined. The RBI only exceeded its December 2019 level 18 months later – in June 2021.

Moving into 2022, the fallout from the war in Ukraine, with disrupted global commodity supplies (which compounded the already pandemic-related global supply chain disruptions), drove a 5.0% increase in the RBI. These international pressures have begun to unwind, but the base prices across the relevant material inputs remains at heightened levels, which will drive a record strong year of growth in FY23, close to 10.0%.

We anticipate that the RBI will begin to soften in late 2023 due to falling diesel and steel prices, but the significant pipeline of transport infrastructure projects (an average of $7.3bn per annum over the next 10 years versus $5.8bn per annum over the past 10 years) will ensure elevated levels of demand for construction inputs. As such, while growth in the RBI is expected to ease back from record levels, prices won't actually fall, and are expected to stay at elevated levels throughout the forecast period. With transport construction activity expected to peak in FY24, the growth in the RBI will reach a trough of 2.2% in FY25 – with expected falling bitumen prices through FY24 contributing to softening cost growth. We then forecast annual growth in the RBI of 3.0% between FY26-32 as high construction wages offsets any weakening in construction material prices.

4.3 KEY INPUTS FOR CONSTRUCTION

While there are a wide variety of resources and materials required for the wide variety of construction projects delivered in Australia, there are a few inputs that have a significant contribution to overall cost escalation, due to either their significant share of the overall project cost, as with construction wages, or the level of volatility in their price series, as with international commodities such as oil, iron ore and coal.

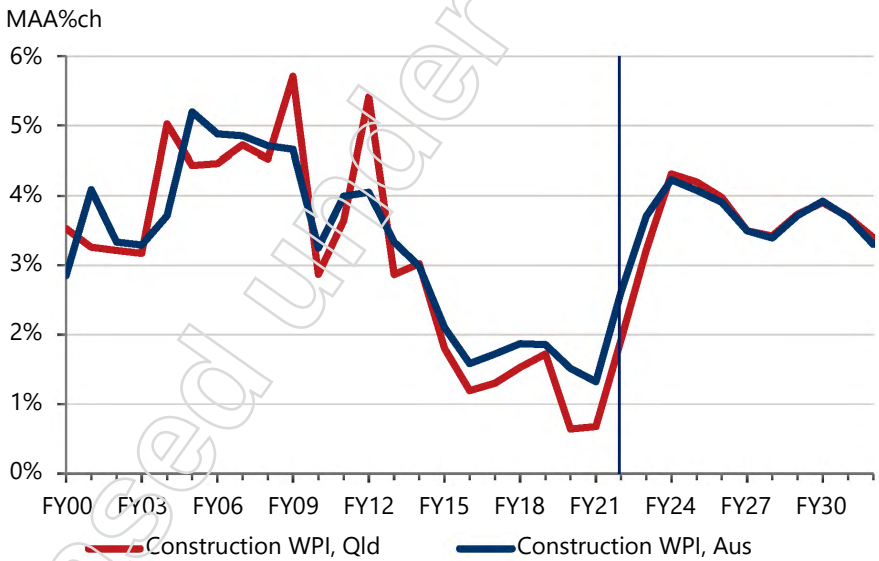
4.3.1 Construction wages

Construction activity (i.e., work done) normally has a strong influence on construction wages. Booming construction activity since the 2000/01 economic downturn has been a key driver of construction employment and construction wages, with the Queensland construction wage price index (WPI) averaging 4% growth per annum between FY00 and FY14 (3.9% per annum for Australia).

The GFC and subsequent world recession in late 2008/early 2009 brought about a contraction in construction employment but failed to impact on national construction levels with work in the pipeline, particularly engineering construction, driving activity to record levels. Nonetheless, FY09 marked the peak in Queensland construction wages growth at 5.7%, closely followed by 5.4% growth in FY12 as the state benefited from the booming mining and heavy industry sector. Employment levels subsequently declined and capacity constraints eased, resulting in a fall in the Queensland construction WPI to 1.2% in FY16. The Queensland construction WPI in the following three years to FY19 remained below 2%, with productivity growth struggling over this period.

Australian and Queensland construction sector activity and wages growth were then impacted by COVID-19 in 2020. The Queensland construction WPI averaged 0.7% in FY21, below the national average of 1.3% (Fig. 68). A larger decline in construction activity in FY21 in Queensland (compared to most other states) may have also contributed to the weaker outcome.

Fig. 68. Construction Wage Price Index, Australia and Queensland



Source: Oxford Economics Australia/ABS

Australian and Queensland construction wages are expected to strengthen appreciably over FY23 to FY26, particularly as construction activity levels surpass the recent FY18 peak in FY24 - excluding oil & gas engineering construction, which is excluded as a significant portion of the measured 'work done' includes large, imported modules/platforms, assembled on site. The increases in construction activity from FY22 will underpin higher wages due to strong labour demand and expected widespread skill shortages in the construction industry. Firms in the construction sector will need to raise wages to attract and retain workers.

Australian construction WPI is forecast to peak in FY24 at 4.2%, before easing over FY25 to FY28 as construction activity declines from FY25. Lower CPI inflation will also help to slow wages growth, while some increases in appropriately skilled workers – both from higher

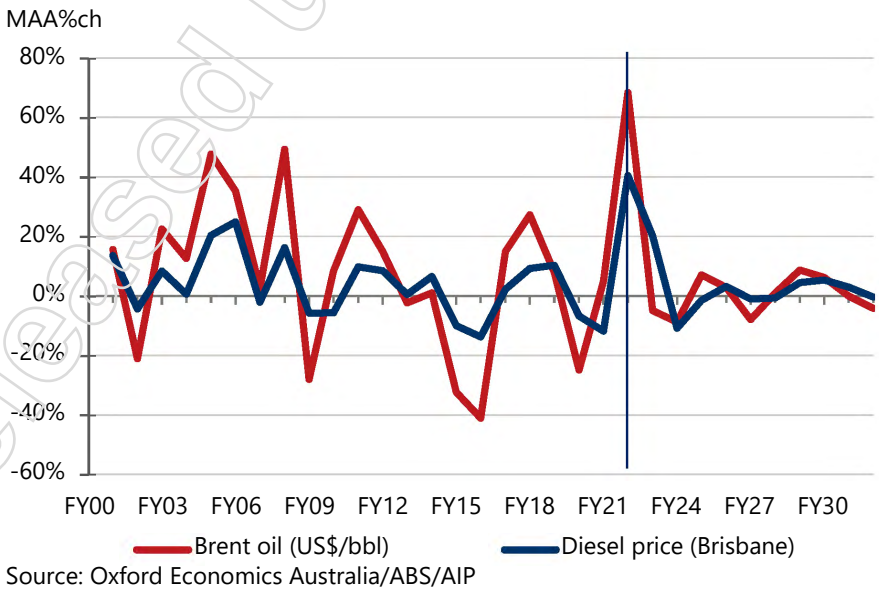
immigration and recent graduates/apprentices – will also slowly contribute to some easing in the skills shortages and wage pressures. We expect WPI growth to bottom out at 3.4% in FY28, but the strong rebound in construction activity over FY27 to FY29 is once again expected to see skills shortages manifest by FY28, leading to another jump in wages in FY29. In Queensland, construction wages growth will slightly outpace the national average from FY26-FY32, as a strong pipeline of construction activity in the lead up to the 2032 Olympics underpins demand for workers.

4.3.2 Brent oil and fuel prices

Brent Oil prices averaged US$91 per barrel (bbl) in FY22, with the A$ price surging 73% to A$126/bbl - a record high in nominal terms. The rebound in global demand post covid and associated strong price rises over 2021 was exacerbated by a supply shock mainly due to the Russian invasion of Ukraine in early 2022 and subsequent trade restrictions and supply disruptions. Global oil supplies are expected to improve over 2023, while oil demand will weaken in response to high oil prices and the global economic slowdown in response to higher interest rates. Oil prices are forecast to ease to US$88/bbl in FY23 and fall further in FY24 to average $US83/bbl. With the exchange rate forecast to appreciate, the end result will be a -9.3% decline in A$ oil prices in FY24. Although US$ oil prices are expected to increase back to around US$86-87/bbl over FY25-26 as the global economy recovers and oil demand strengthens, an expected appreciation in the A$ will keep A$ oil prices steady at around A$114/bbl. Over FY27-28 we expect to see supply and demand normalise, with US$ prices easing as the global economy accelerates its transition away from fossil fuels, but an expected depreciation of the A$ will keep prices above A$110/bbl into the next decade.

Movements in Brisbane diesel prices generally follow Australian diesel prices (as an average of state diesel prices published by the Australian Institute of Petroleum – AIP) which track global oil prices (in A$ terms), but with less amplitude (Fig. 69). This difference between Australian gate prices for diesel and global oil price movements are usually the result of refiner margins, transport costs or competition within the region, while changes to government fuel excise (which is now indexed to CPI inflation) also play a role.

Fig. 69. Brent Oil and Brisbane Diesel Price



Source: Oxford Economics Australia/ABS/AIP

The oil price shock in the first half of 2020 gave way to a corresponding dip in the price of fuel, with Brisbane diesel prices falling -6.7% and -11.8% in FY20 and FY21 respectively. With the

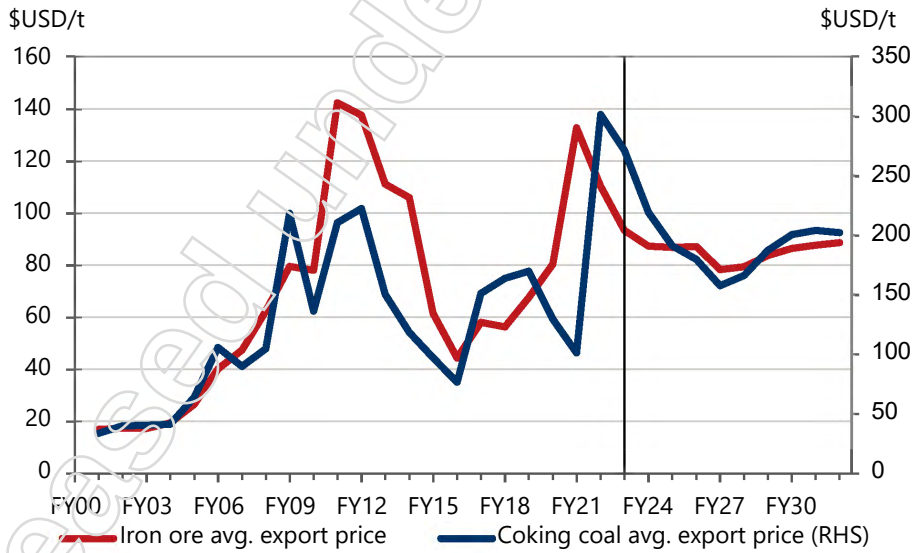
onset of the war in Ukraine and the subsequent energy crisis, oil prices shot up in early 2022. Brent crude oil prices in A$ terms jumped 73% in year average terms in FY22, while Brisbane diesel prices increased 40.4% (to average 174.8 cents/litre in FY22) - with the cut to the fuel excise in the June quarter muting the overall price increase at the bowser. With the temporary fuel excise cut (worth around 22 cents per litre for petrol) finishing in the December quarter and with refiner margins expected to widen again, diesel prices are expected to increase faster than oil prices in year-average terms in FY23 (20.2%), although fuel prices are expected to ease through the year.

Brisbane diesel prices are expected to fall -10.9% to average 187.2 c/l in FY24 and fall a further -1.5% in FY25, due to declines in oil prices. Over the remainder of the forecast period, diesel prices are forecast to gradually rise to 211 c/l by FY32.

4.3.3 Structural steel (coal and iron prices)

Structural steel prices are largely driven by movements in the main input costs of iron ore and coking coal, which are determined on international commodity markets. There are also local influences such as manufacturing wages, energy costs and the strength of construction, which is the main market for steel. Other global factors may also have an influence, such as the degree of over- or under-supply or demand influences in global steel production. In terms of the latter, substantial increases in Chinese steel production capacity over the 1990s and 2000s tended to constrain steel prices, compared to movements in the commodity inputs. However, over recent years, China has been closing old, inefficient, and high-polluting capacity, and this and other reductions in global oversupply has helped improve steel prices and margins. Steel prices now tend to be more influenced by movements in their input prices.

Fig. 70. Iron Ore and Coking Coal Prices ($USD/tonne)



Source: Oxford Economics Australia/ABS

Iron ore prices have been high since the dam collapse in Brazil reduced global supply in early 2019. Supply was further restricted over the course of the pandemic due to shutdowns of mines in Brazil, which was further exacerbated by the sanctions imposed on Russian exports, following the conflict in Ukraine.

On the demand side, iron ore prices have historically been highly correlated with the Chinese residential construction market, driven by the demand for steel in high density dwelling construction activity. FY22 saw the Chinese government impose strict curbs on the property sector which weighed down demand for steel, and subsequently iron ore. Furthermore,

Beijing's zero covid policy also curbed industrial production, while the enforcement of reduced steel production in an effort to curb emissions, combined to push down iron ore prices in FY22 and the second half of 2022.

Iron ore prices (using average export prices for Australia) fell back from the covid-induced high of US$171 in the June quarter 2021, and subsequently averaged US$110/t over FY22. Weaker demand saw prices fall back further in the second half of 2022 to a low of US$83/t in the December quarter 2022, before jumping to US$107/t in the recent March quarter 2023 as Chinese demand bounced back with the end of most of the covid restrictions. In the near-term, prices are expected to remain elevated before easing. New supply sources that are under construction will add to supply in the coming years, whilst demand is expected to hold firm despite a likely slowdown in global economic growth as governments continue to direct stimulus towards infrastructure construction. Overall, iron ore prices are expected to fall 17% in FY23, before stabilising at around US$92 over FY24 to FY26, and then subsequently easing to average US$88 over FY27 to FY29.

Coking Coal prices surged to historic highs in the first half of 2022 - with the benchmark Goonyella hard coking price leaping to over US$490 - due to the energy crisis brought about by the war in Ukraine. The average export coking coal price almost trebled to an annual average of $US302/tonne in FY22, compared to FY21 (US$101/t). With Russia accounting for just under 20% of global coal exports, continued sanctions weighed down on global export supplies over the second half of 2022 and into 2023, keeping prices high. Furthermore, the Indonesian governments temporary January ban on exports due to a period of high seasonal demand, and production disruptions in Australia due to severe flooding, put further upward pressure on thermal coal prices, which in turn flowed onto coking coal prices.

4.3.4 Concrete, cement and sand

The Concrete, Cement & Sand PPI is heavily driven by the level of construction activity in the economy – for this index we employ statistical techniques that take account of residential, non-residential and engineering construction activity in Queensland (excluding bauxite, alumina, pipeline and oil & gas-related work done, which have much less concrete per $m than other engineering construction categories) to predict future price levels.

Consecutive years of strong construction activity between FY03-FY09 led to substantial growth in the price of concrete, only to stumble in FY10 when demand dwindled from the GFC. The economic recovery within the construction industry would put a floor under the falling prices and prepare concrete for the next growth peak during the large wave of engineering construction at the beginning of the 2010's. Recent years have seen weaker growth in concrete prices, with below-par demand in the market caused by the fall-off in engineering construction activity from FY14.

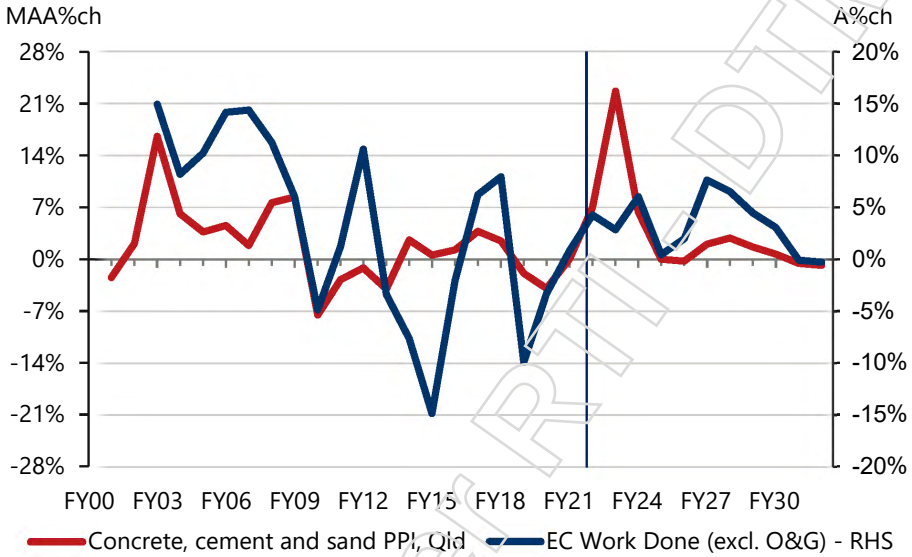
The Queensland Concrete, Cement and Sand PPI (used as a proxy for state prices) stabilised in FY21 after two years of falling prices, with the index reaching a trough in September 2020 to return to prices not seen since 2013. Since then, the index has grown 44% (to the March quarter, 2023) as demand pressures developed, with national construction activity reaching record levels in FY23. Higher energy costs are also set to exacerbate concrete prices over FY23, with the cost of manufacturing energy intensive clinker (an input into cement) rising since 2022. Consequently, concrete prices are forecast to rise 22.7% in FY23, before returning to more modest growth rates over the outlook.

The supply of quarry products (including gravel) is expected to be sufficient in meeting construction demand through FY30. However, given the strong pipeline of construction activity in Queensland, the Concrete, Cement and Sand PPI is not expected to recede materially. Instead, price will likely remain relatively stable and rebased at a higher level through to FY26

before additional pressure from rising construction activity and demand is expected to push prices further late in the decade.[8]

Major engineering projects will then begin to wrap up around the middle of the decade, along with a cooling residential construction market, which will see a slight downturn over FY26 and into FY27, flowing into weak price growth over those years. With construction activity and demand picking up again towards the end of the decade, the PPI growth is forecast to see moderate annual average of 2.8% over FY27-29.

Fig. 71. Concrete, Cement and Sand PPI, Queensland



Source: Oxford Economics Australia/ABS

[8] While the supply of quarry products is deemed adequate (due to adequate reserves and well-distributed availability throughout the State), there are still downside risks to supply owing to local council regulations that limit extraction. This could restrict supply and cause constraints if demand rises too quickly.

5 INSIGHTS AND CONCLUSIONS

The construction industry is expected to be under significant pressure over the next decade with major industry-defining developments earmarked for construction across Australia. Analysing the potential capacity constraints and demand for resources is critical to understand the deliverability of projects in the pipeline and where significant uncertainty exists.

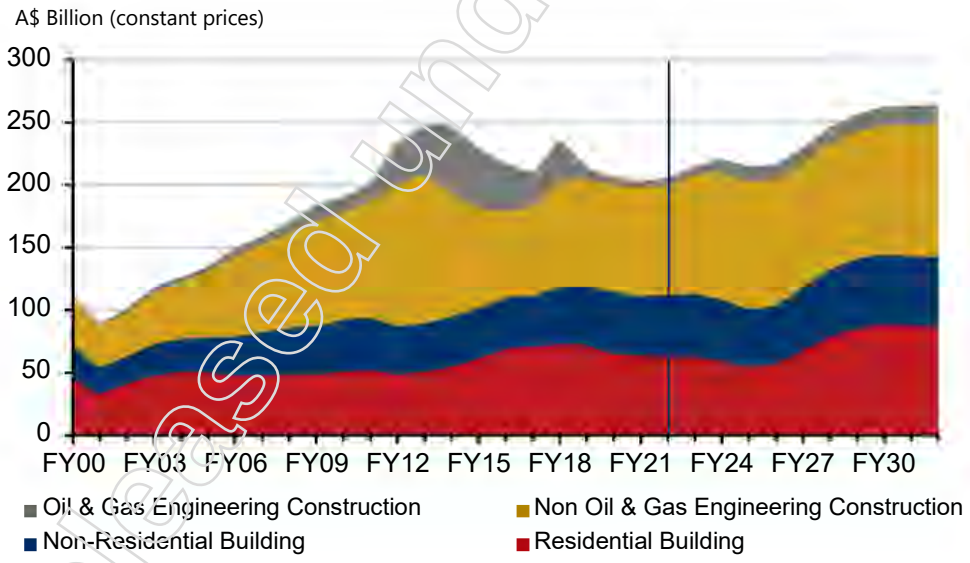
This report has aimed to provide TMR with a comprehensive outlook across all three major construction categories over the next 10 years, with a detailed focus on Queensland. Analysing the expected activity for each construction subsector and key trends across Queensland's regions presents greater insights into where deliverability constraints may emerge when all sectors are considered holistically.

5.1 CONSTRUCTION ACTIVITY OVERVIEW

Overall, the construction sector has proved relatively resilient through the pandemic, with sizeable government stimulus and a material list of publicly funded projects putting a floor under activity.

The decade ahead is expected to see an unprecedented level of construction activity undertaken. Much of this activity is expected to be concentrated over the five years to FY32, as elevated engineering construction activity coincides with the next wave of residential building activity. The energy transition is expected to drive a significant portion of activity, as the country works towards its emissions reduction targets. Major health projects and facilities related to the 2032 Brisbane Olympics are expected to drive non-residential building construction over this period.

Fig. 72. Total Construction Work Done, Australia



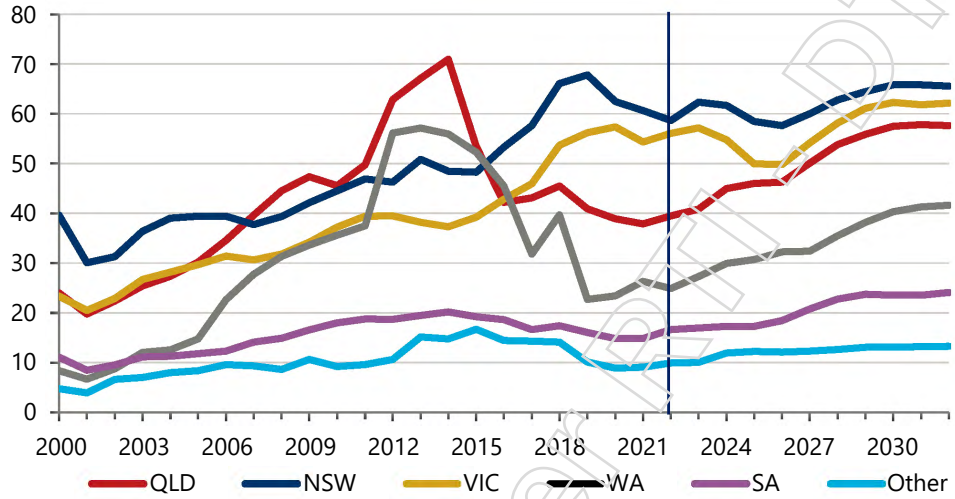
Source: Oxford Economics Australia/ABS

Total non-oil and gas construction (the sum of the three major sectors shown in Fig. 72) is expected to surpass previous record levels over the next 10 years. Construction activity across the three sectors is expected to be 16% higher than in the previous decade. This presents significant risks as to the deliverability of the current infrastructure pipeline, with activity across almost all sectors expected to increase.

The increase in activity is expected to occur in each state. Queensland, Western Australia and South Australia are forecast to see total construction activity continually trend up over the decade, due to less dramatic downturns in residential and non-residential building activity expected. The expected mid-decade dip in Victoria and New South Wales, particularly in the residential and non-residential building sectors, may unlock some additional resources to help meet the growing demand in Queensland. Projects directly and indirectly related to the Brisbane 2032 Olympics are expected to boost activity in Queensland to rival that of the southern states in the lead-up to the games.

Fig. 73. Total Construction Work Done, by State

A$ Billion (constant prices)



Source: Oxford Economics Australia/ABS

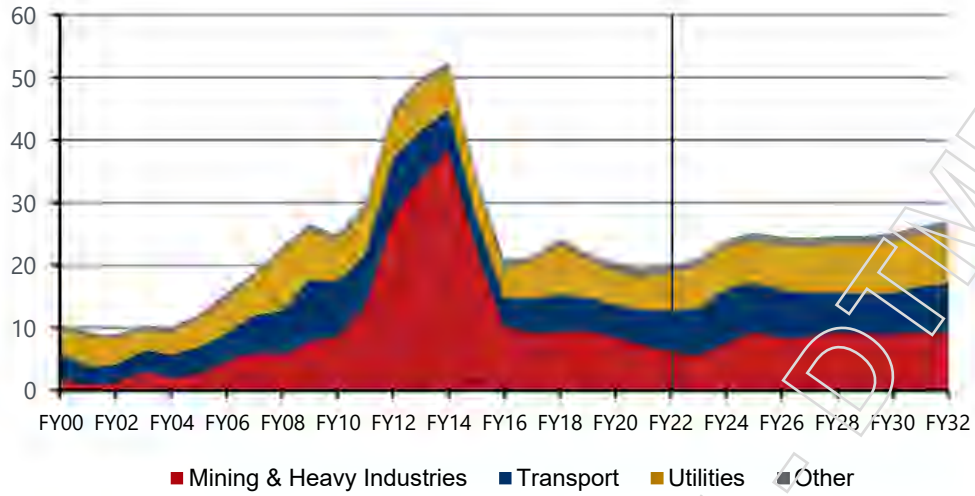
5.2 QUEENSLAND IN FOCUS

5.2.1 Engineering construction

Engineering construction activity across the state has been relatively tempered in recent years due to a decline in mining developments. The next few years are anticipated to see activity increase with significant investment in transportation infrastructure and a pick-up in mining activity. The renewable energy transition is expected to see a significant increase in activity in the utilities sector from mid-decade, as the state builds towards its renewable energy targets.

Fig. 74. Engineering Construction Work Done, by Sectors, Queensland

A$ Billion (constant prices)



Source: Oxford Economics Australia/ABS

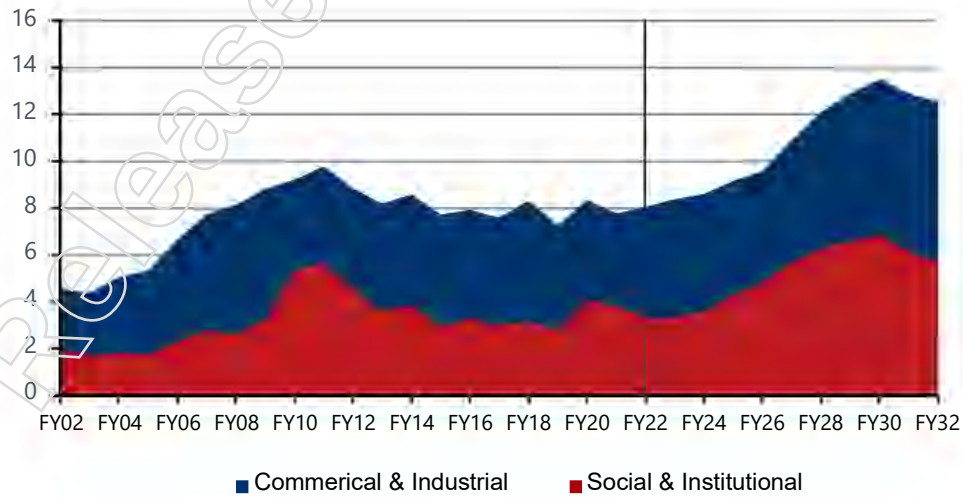
Much of the engineering construction activity is expected to be concentrated around the South East and the Central Queensland regions. The South East will be largely dominated by the construction of major transportation and utilities projects. The lead-up to the Olympics and the nature of the hard project deadlines will likely place additional pressure on the industry. The Central Queensland region is expected to see sizeable mining and utilities sector investment. Although thermal coal is expected to decline as renewable energy projects rise, coking coal remains a critical resource to meet global steel demand.

5.2.2 Non-residential building construction

Non-residential building activity has struggled to gain any significant momentum over the past few years. Publicly funded projects helped to support activity through the pandemic whilst private investment fell back. This wave of public funding is anticipated to bring further increases in activity over the next few years, with major projects in the health, education and entertainment sectors.

Fig. 75. Total Non-residential Construction Work Done, by Sector, Queensland

A$ Billion (constant prices)



Source: Oxford Economics Australia/ABS

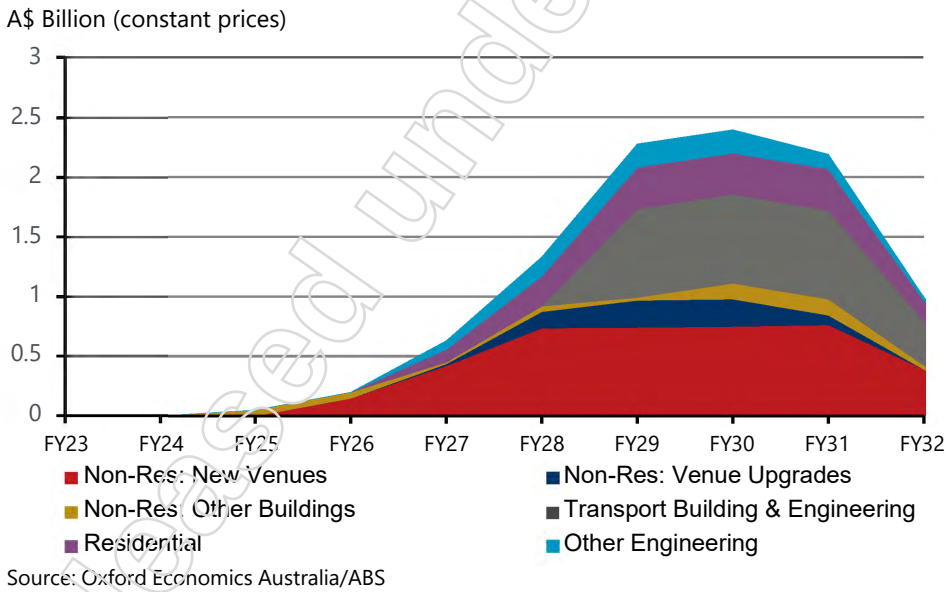
A resurgence in private sector activity is expected to see activity in Queensland progressively increase through to FY30. This is forecast to take the private sector activity to unprecedented levels. Olympics related projects are expected to drive growth from around mid-decade. Much of this activity will be focused in the entertainment & recreation sectors with several new venues and venue upgrades expected. Additionally, large hospital projects are also expected to start works from mid-decade, adding to the elevated levels of activity during this period. The continuation of the strong trend in Queensland's population growth further underpins the longer-term outlook.

The majority of the state's non-residential construction activity is expected to be focused in South East Queensland, where most of the state's population is located. Olympics-related activity will be concentrated in the South East, bringing the region to unprecedented levels of activity. Meanwhile, the Southern and North Queensland regions are expected to see growth in the near term, driven by significant hospital projects.

5.2.3 Olympics-related activity

The 2032 Brisbane Olympics is expected to drive activity in South East Queensland in the lead-up to the games. Olympics-related activity is currently estimated to contribute around $10bn of construction activity between FY25 and FY32, as shown in Fig. 76. There is potential for this contribution to expand with several Olympics-related projects not currently included due to uncertainty surrounding funding, timing and commitment. Additional Olympics-enabling projects are also expected to add to the activity. These include several transportation projects that will look to be finished before the games to add capacity and improve the efficiency of the transport network in the South East.

Fig. 76. Olympics-Related Construction Work Done, Queensland



Source: Oxford Economics Australia/ABS

All this activity concentrated in and around Brisbane is expected to put significant pressure on the construction sector. Olympics-related projects have immovable deadlines with all the large projects critical to conducting the games. This is likely to add to capacity constraints over this period with other major infrastructure projects also expected to be delivered.

Further to this, the IOC requires Brisbane 2032 to be the first climate-positive games held. This will bring increased demand for key components and green building materials and has the potential to lead to further cost escalation if shortages materialise.

5.3 COST ESCALATION & DELIVERABILITY RISKS

There is significant uncertainty over the current outlook for construction activity, with the strong pipeline of work forecast to underpin elevated input costs and higher prices expected to persist over the outlook. Oxford Economics has applied judgement to estimate what can be considered expected activity, rather than purely adopting all announced projects (particularly those without committed funding) and stated prospective timelines in our forecasts. The forecasts assume that the governments will not finish their announced pipeline on schedule as elevated input cost inflation and industry capacity constraints hinder construction activity. The announcement of the independent strategic review of the Federal Infrastructure Investment Programs suggests that governments will reassess their investment plans in the face of these headwinds, rather than naively pushing ahead with them. Even so, there is a material risk that capacity constraints lead to more of a crunch than expected and governments reprioritise and mothball more projects than currently anticipated. In particular, there is material risk that the pipeline of hospital projects is unachievable by FY32, particularly in combination with the rest of the construction pipeline in the lead up to the Olympics. Olympics-enabling projects will likely be prioritised with hard deadlines and therefore may exhaust more resources than currently anticipated.

A1 SECTOR & REGION DEFINITIONS

Fig. 77. Engineering construction sector definitions

Sector	Definition
Roads, highways and subdivisions	includes 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.
Bridges	includes those for the support of roads, railways, causeways and elevated highways.
Railways	includes tracklaying, overhead power lines and signals, platforms, tramways, tunnels for underground railways, and fuel hoppers.
Harbours	includes boat and yacht basins, breakwaters, retaining walls docks and piers, terminals, wharves, dredging works, and marinas.
Water storage and supply	includes dams, weirs, reservoirs, embankments for water diversion, water pipelines, mains and treatment plants, flood prevention and erosion, aqueducts, water conduits, systems conveying water to residences, commercial and industrial establishments.
Sewerage and drainage	includes sanitary and storm sewers, sewage treatment plants, stormwater drains, and drainage systems.
Electricity generation, transmission and distribution	includes power stations, sub stations, hydro electric generating plants, associated work i.e. towers, chimneys, transmission and distribution lines.
Pipelines	includes oil and gas pipelines, urban supply mains for gas, pipelines for refined petroleum products, chemicals, foodstuffs etc.
Recreations	includes golf courses, playing fields, racecourses, stadiums, swimming pools, landscaping, park construction.
Telecommunications	includes radio, television, microwave and radar transmission towers, telephone and telegraph lines and underground cables, coaxial cables.
Mining and heavy industry	includes construction of production, storage and distribution facilities, refineries, pumping stations, construction of mines, concentrators, aluminium smelters, chemical plants, blast furnaces, steel mills, other industrial processing plants, ovens
Other	other engineering construction not elsewhere classified, including unclassifiable projects, plant hire, etc.

Source: Oxford Economics Australia/ABS
See Australian Bureau of Statistics Functional Classification of Engineering Construction (catalogue number 1268.0.55.001) for more detail.

Fig. 78. Non-residential Sector Definitions

Sector	Definition
Accommodation	Buildings primarily used for providing short-term or temporary accommodation on a commercial bases. Includes hotels, motels, hostels and serviced apartments.
Aged care	Buildings used in the provision of aged care, aged care support or services supporting aged care facilities, excluding residential buildings (such as retirement villages).
Education	Buildings used in the provision or support of educational services except where the provision or support of educational services is a secondary function of the building and another class explicitly applies (such as the location of an independent retail outlet on the grounds of a University). Includes schools, universities, TAFE colleges, and research institutions.
Entertainment & recreation	Buildings used in the provision of entertainment and recreational facilities or services. Includes stadiums, museums, art galleries, community centres, clubs, sporting facilities, fitness centres, concert halls, casinos and cinemas.
Factory	Buildings housing, or associated with, production and assembly processes of intermediate and final goods and those converting fuels or environmental energy into electricity. Includes breweries, abattoirs, brickworks, assembly plants, steel works and testing laboratories.
Health	Buildings used in the provision of non-aged care medical services. Includes hospitals, medical clinics and dental practices.
Offices	Buildings primarily used in the provision of professional or financial services or public administration
Other commercial & industrial*	Commercial and industrial buildings not elsewhere classified and agricultural buildings. Includes petrol stations, carwashes, garages, mining related buildings, accommodation camps, oil depot buildings, boiler houses, industrial laboratories, greenhouses, bulk storage facilities, sheds, feedlot buildings, covered animal enclosures.
Other social & institutional^	Non-residential buildings not elsewhere classified including emergency services, utilities, temporary accommodation provided on a non-commercial basis and other care and public services not elsewhere classified. This covers emergency service facilities, court houses, prisons, detention centres, religious and military buildings.
Retail	Commercial buildings primarily used for the sale of goods to intermediate and end users and the provision of services on a shop-front basis except where another class of this division applies. Includes shopping centres, cafes, restaurants and bars.
Total non-residential	All buildings primarily intended for purposes other than long-term residence.
Transport	Commercial buildings primarily used in the provision of transport services, or facilities supporting transport services. Includes car parks, airports, freight terminals, train stations and transport maintenance facilities.
Warehouses	Buildings primarily used for the storage of goods, excluding bulk storage of produce and agricultural and aquacultural buildings.

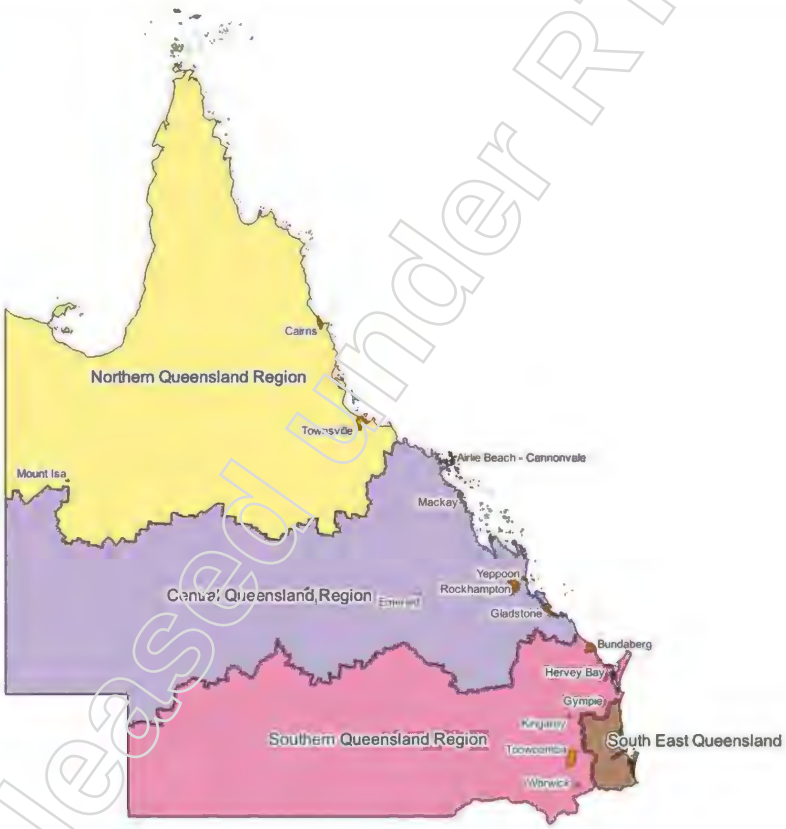
Source: Oxford Economics Australia/ABS
* Amalgamation of other commercial buildings, other industrial buildings and agricultural buildings classifications
^ Amalgamation of non-residential buildings not elsewhere classified and religion buildings classifications
See Australian Bureau of Statistics Functional Classification of Buildings (catalogue number 1268.0.55.001) for more detail.

Fig. 79. Residential Sector Definitions

Sector	Definition
Alterations & additions	Work on existing residential property requiring council approval and valued $10,000 and over.
Attached dwellings	Total attached and semi-detached dwellings (medium density + high density).
Conversions	Building activity conversion is building activity which converts a non-residential building to a residential building, e.g. the conversion of a warehouse to residential apartments
High density	Apartments/flats buildings four stories and over. Includes tower apartments.
Houses	Dwellings that are free standing (separated from other houses and buildings by space to allow access on all sides – at least 00 millimetres).
Medium density	Semi-detached dwellings (townhouses, villas, duplexes, row houses, terraces etc.) and apartments/flats up to three stories.
Total residential	Total residential building is comprised of houses and other residential building. It does not include dwellings in non-residential buildings.

Source: Oxford Economics Australia/ABS

Fig. 80. Queensland Regional Boundaries



Source: Oxford Economics Australia
Note: The regions have been defined in collaboration with TMR and align with the region boundaries defined in Administrative Boundries – Road Region Boundaries for Department of Tranport and Main Roads.pdf.

A2 APPENDIX – MODELLING METHODOLOGY

A1.1 ENGINEERING CONSTRUCTION ACTIVITY

In this report, all data and forecasts are in constant FY21 prices. Measurement in constant prices, or real terms, allows us to ascertain trends in the volume of work done rather than just measuring the nominal value (current prices). The Implicit Price Deflator (IPD) is a measure of price levels and is equivalent to the ratio of nominal to real values multiplied by 100. Project values quoted relate to construction work done (or yet to be done) rather than total project values. Values exclude the cost of land and repair and maintenance activity, as well as the value of any transfers of existing assets, the value of installed machinery and equipment not integral to the structure and the expenses for relocation of utility services. However, a contract for the installation of machinery and equipment which is an integral part of a construction project is included[9].

The forecasts in this report are the result of extensive analysis and research into each engineering construction sector. This research includes surveying major government departments, public sector authorities and private sector organisations to ascertain trends in investment, priorities and the possible impact of expenditure constraints. We also consult published project lists, state budgets, strategic transport planning documents and other published reports and maintain our own database of projects and historical estimates.

Our initial analysis, based on identifying individual projects and programs, is reviewed and revised in accordance with our understanding of the macroeconomic environment, the working of the investment cycle, likely developments in public finances and the outlook for influential sectors such as house construction and minerals investment. Our forecasts are the result of this combination of 'bottom-up' analysis (examining project lists and investment plans) and 'top-down' (considering the broad underlying drivers of construction in each sector, and our perspective on overarching constraints).

A1.2 NON-RESIDENTIAL BUILDING

Base forecast of non-residential building are produced at the commencement level (value of projects in the quarter they start). These forecasts are based on extensive industry and economic research done by Oxford Economics Australia. The tracking of major projects is a core aspect of this.

Lags and seasonal adjustments are then used to estimate the forward work done on commencements. These lags and seasonal adjustments are periodically updated using regression analysis and are based off the historical ABS building activity data. They are produced by sector and by value range (<$5m, $5-20m, $20-50m, >$50m) to account for structural differences. For example, a $1 million dollar project may only need to be lagged over three quarters, while a $100 million dollar project may need to be lagged over eight quarters.

Some building types are faster to construct. For example, a $20 million warehouse may only take three quarters to construct, while a $20 million-dollar multi-storey office may take six quarters.

[9] https://www.abs.gov.au/methodologies/engineering-construction-activity-australia-methodology/mar-2023

Adjustments are made for major outlier projects that do not fit the typical mould. They may be because of:

- **Size** – some of the major new hospitals being built, such as the $1bn New Women's and Children's Hospital in Adelaide can take up to five years to complete, significantly longer than the typical $50+ million health commencement
- **Cost variations** – some projects can end up costing notably below or above their stated commencement value. This may be because of an error in the ABS data, or that a project comes in significantly over budget.
- **Construction timeline variations** – some major projects involving significant prefabrication can be built much faster than is typical. This is especially the case for major mining-related buildings. Also, some major projects experience delays in construction, resulting in longer than typical construction timelines.

A1.2.1 Non-residential project listings

Project listings are put together by Oxford Economics Australia. They are produced based on information from a wide variety of sources and are updated on a rolling basis. Such sources include:

- Federal and state government budget papers
- Government and business press releases
- State planning authorities
- Photo maps
- Various news sources
- Contact with developers and agents
- Australian Bureau of Statistics data
- Other project and tendering databases

The primary focus is placed on tracking projects greater than $40mn. Projects above this level account for close to 30% of total non-residential construction. To increase accuracy a greater focus exists for the smaller states and territories, regional areas, and smaller industry subsectors (i.e. hotels, factories), are tracked down to the $20mn level.

Projects that are regarded as likely to go ahead (rated as having a 70%+ chance of proceeding) are directly included into our forecasts. Every effort is made to ensure our project listings are accurate, however, given the volatile nature and scale of the non-residential construction industry, some revisions and corrections are inevitable. Best estimates of project details such as commencement date and construction value are made where information is not readily available.

Project values are presented in current prices and are shaped to reflect estimated construction costs. Design, financing, equipment, land and other costs not related directly to physical construction are excluded.

A1.2.2 Approach to analysing regional construction activity

Developing regional engineering and non-residential building construction profiles at a subsector level is a complex challenge due to the lack of published data. First, we define the usage of the term 'residual' – the residual refers to the difference between known project activity in Queensland and the report level of construction subsector for the state by the ABS. Implicitly, a greater library of past and future projects would shrink the size of this residual. However, it would be difficult and time-consuming (beyond this project's scope) to shrink the residual to zero, as a range of projects including those valued at less than $1 million would need to be collected and sorted (across both public and privately funded works).

To develop regional estimates of construction activity, we utilised our in-house collection of major projects over a 33 year period (FY00-FY32). This includes both public and private projects. Each project was assigned to a particular region, with large scale projects (road and rail) assigned to multiple regions where appropriate. At this point, we now have state level forecasts of engineering & non-residential building activity across the subsectors, and we have regional estimates of activity based on the amassed collection of projects.

This leaves the residual (the difference between projects and total activity), which will need to be spread across the regions. This ensures that the total level of activity across the regions will add up to our forecasts for construction across the state. This is the most challenging part of the process, as for the most part, the residual will need to be manually spread across the regions based on expected construction profiles in that region. Certain subsectors are quite simple – for instance the oil & gas construction residual (as part of the mining and heavy industry subsector) has been spread across the Central and Southern regions. This was based on historical production across Queensland's gas basins and historical project activity in these regions.

Some subsectors are more difficult to estimate and forecast regionally. Sectors such as the road and rail subsectors have more room for error due to the large levels of activity expected in upcoming years. We have assigned the residual of more complex subsectors based on different values – for instance, for roads, the residual has been assigned based on each region's length of roads managed and population. The residuals for other sectors, such as water and sewerage, have been allocated according to the region's share of Queensland's total population. This isn't a particularly difficult assumption – keeping in mind that we are assigning construction values for activity that is relatively small (our project collection process naturally prioritises larger investment values).

A1.3 RESIDENTIAL BUILDING

Base forecasts of residential building are produced at the commencement level. These forecasts are based on extensive industry and economic research done by Oxford Economics Australia.

Lags and seasonal adjustments are then used to estimate the forward work done on commencements. These are periodically updated using regression analysis and are based off the historical ABS building activity data. They are produced by dwelling type. Manual adjustments are made where appropriate to correct anomalies.

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