Infrastructure
NSW

State of Infrastructure Report

2022-23 review of the NSW Government asset portfolio

June 2023

Acknowledgement of Country

Infrastructure NSW acknowledges the Traditional Custodians of the lands where we walk, work and live, and pays respect to their Elders past and present.

We acknowledge and respect their continuing connection to the land, seas and waterways of NSW, and the continuation of their cultural, spiritual and educational practices.

In preparing the State of Infrastructure Report, we acknowledge the importance of Aboriginal and Torres Strait Islander people's unique history of land and water management, and of art, culture and society, that began over 65,000 years ago.

Glossary

Acronym	Definition
AM	Asset management
AS	Australian Standard
ICT	Information and communications technology
IPD	Infrastructure Performance Data
IT	Information technology
LAHC	Land and Housing Corporation
NSW	New South Wales
TAHE	Transport Asset Holding Entity

This report was produced with the assistance of the Treasury, government agencies in scope of Treasury policy TPP19-07 and specialist consultants. Infrastructure NSW thanks all contributors.

Views expressed in this report are Infrastructure NSW's opinion based on a desktop review of agency documentation and engagement. They should not be construed as definitive measures of asset performance or safety.

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01

Executive summary

Executive summary

Infrastructure investment must be sustainable

The infrastructure asset base of the NSW State Government has increased over the last 10 years, from a written down value of $200 billion to $450 billion. A further $116.9 billion in capital investment is expected in the four years to 2025-26. Over the same 10-year period, the investment in recurrent maintenance expressed as a percentage of the asset base has declined from 1.4% to just 1%, despite the maintenance expenditure nearly doubling from $2.2 billion to $4.2 billion. While the relationship between the level of maintenance expenditure and asset value is complex, this escalating level of investment comes at a high cost to the NSW Government's debt position and is not sustainable.

Yet infrastructure investment is critical to the delivery of the Government's priorities. A sustainable infrastructure investment program supports population growth, housing supply and affordability, and public services. Sustainable infrastructure investment strengthens the competitiveness of NSW industries, capitalises on new economic opportunities and supports the Government's social and environmental policy goals.

Asset management by government agencies is the cornerstone of sustainable infrastructure investment. It enhances the reliability, efficiency, resilience and longevity of critical infrastructure, equipment and systems necessary for services provided by the agencies. By proactively managing and maintaining assets, agencies can mitigate risks of failure, reduce downtime and achieve long-term cost savings, all of which contribute to uninterrupted and efficient service delivery. Moreover, it facilitates informed resource allocation and decision-making for both recurrent and capital spending, ensuring that public funds are used effectively to maximise service quality and reach.

The *Asset Management Policy for the NSW Public Sector* (NSW AM Policy) was introduced in 2019 to improve asset management in government agencies. Infrastructure NSW provides independent assurance to the Government on the NSW AM Policy's implementation and the extent to which its outcomes are being achieved. The State of Infrastructure Report (SOIR) provides this advice. The SOIR uses agencies' asset planning documents to assess the performance of the asset portfolio and highlight its risks and opportunities.

The challenges facing the asset portfolio are increasing in scale and complexity

The asset management capability of NSW State agencies is steadily improving. The most recent assurance reviews showed improvement from the previous year with a significant (~35%) increase in the number of agencies achieving a risk rating of 3 or better.* However, continued focus is still required given recent trends impacting the asset portfolio. The trends identified are as follows:

- **Extreme weather** events have impacted the condition of agencies' assets directly, as well as indirectly by diverting resources and maintenance funds to repair and replace assets. This is particularly the case for regional roads, where resources that are required for maintenance are unavailable due to the need to repair local council roads after heavy rain. To understand the impacts of shock events, agencies were asked to report on any revenue impacts from these events and any operational spend to address shocks and stresses as a percentage of their overall operational expenditure.

* Risk-based ratings range from 1 (Highest risk) to 4 (lowest risk).

- Although there is some evidence of agencies **integrating resilience** thinking into decision-making and new asset design, more needs to be done. Fifty per cent of agencies in the scope of the NSW AM Policy have an asset management assurance recommendation to improve how resilience is incorporated into their practices. The resilience of the asset portfolio is critical to reliable service delivery both on a day-to-day basis and during extreme events.
- Most agencies are reporting **an increasing maintenance liability**. However, agencies use different methods to assess maintenance and renewal priorities. This creates challenges for government decision-makers to direct expenditure for maximum impact.
- Most sectors report **issues with ageing assets**, which may not be fit-for-purpose. This presents challenges with maintenance and modernisation, impacting service delivery.
- Despite the improvement in the **scope and quality of data** provided for the SOIR, most agencies remain in transition to compliance with the NSW AM Policy. Data and information capabilities, which are fundamental to robust decision-making and prioritisation, are still in development. There was no infrastructure performance category where all agencies complied with the data requirements

Infrastructure investment needs to be balanced to deliver optimised outcomes

The last 10 years have seen a massive increase in the number and scale of megaprojects (value > $1 billion). These projects are high-risk and add to the complexity of the Government's asset portfolio.[1] Over the same period, spending on maintenance has reduced from 1.4% of the value of the asset portfolio to just 1% and has been as low as 0.9% for several years. This reduction increases the risk of asset failures or degradation, reduces the lifespan of assets and reduces the resilience of the network.

Sustainable infrastructure investment is enhanced through proposals being compared as a holistic range of options regardless of whether the funding is capital or recurrent so that expenditure is cost-effective, so that the most cost-effective proposals that align with government priorities are selected. This will encourage a focus on maximising the value of existing assets by ensuring they are properly maintained and replaced, opportunities to extract more value are realised and capabilities are enhanced through minimalist, low-risk, interventions. See recommendation 1 overleaf.

Measurement of the maintenance liability must be standardised

Prioritisation of asset maintenance funding to align with government priorities and service outcomes requires accurate data and analysis that can be compared between agencies. A consistent methodology for the calculation of the asset maintenance liability enhances financial predictability, facilitates cross-agency benchmarking, and promotes transparency, which is vital for public trust. Moreover, it helps in risk mitigation by identifying potential asset failures, thus enabling proactive interventions to ensure service reliability and safety, ultimately leading to better performance outcomes. Infrastructure NSW is finalising a standardised methodology for agencies to calculate and report their maintenance and renewals liability. Implementation of this methodology will provide robust and consistent data to facilitate effective prioritisation of investment. See recommendation 2 overleaf.

Assets remain vulnerable to shocks and stresses

Natural and human hazards, such as extreme weather events and cyber attacks, have damaged assets, driven up costs, degraded service delivery and increased risk. There is no whole-of-government-mandated method or criteria for assessing the vulnerability of assets. Consistent and robust vulnerability assessments for government assets play a crucial role in identifying and mitigating potential risks, thereby increasing the resilience of the network by reducing the impact of extreme events on the performance of assets and service delivery. These assessments also provide crucial insights that contribute to effective lifecycle management of assets, enabling more accurate maintenance scheduling, cost-effective resource allocation, and ultimately, more informed decision-making. See recommendation 3 below.

The nature of infrastructure is dynamic

Almost all agencies reported changes in the way customers use their assets due to changing demographics, increasing expectations and the use of digital technologies. Combined with the increasing size and interconnectivity of the asset portfolio, these trends are escalating the complexity of asset management. To meet this challenge, the sophistication of asset management in government agencies will need to continue to evolve beyond the end of the NSW AM Policy transition period in June 2024. The Asset Management Assurance function must also evolve to drive further development and Government must remain informed of changes in the environment and their impact on infrastructure needs. See recommendation 4 below.

The existing asset base can be leveraged to deliver improved outcomes

Good asset management ensures capacity can be utilised (where it exists) and interventions are focused on enhancing existing assets. Identifying and capitalising on these opportunities requires accurate information about an agency's asset portfolio and effective decision-making tools.

Agencies with high levels of asset management maturity are demonstrating good practice. For example, the Department of Education's Share our Space initiative provides community access to school sports grounds and facilities out of school hours, unlocking further value from existing assets. However, this is an area where further improvement of asset management capability is required for most agencies. See recommendation 4 below.

Recommendations

Infrastructure NSW recommends the NSW Government endorse the following recommendations:

- **Reform the budget prioritisation process for infrastructure.** Treasury and Infrastructure NSW to develop reforms to the budget prioritisation process that will enable the prioritisation of proposed infrastructure investments between recurrent and capital funding sources. The objective is to direct funds to where they will best meet government priorities at optimal cost.
- **Consistent reporting of maintenance liability.** Infrastructure NSW to finalise the methodology in collaboration with Treasury and agencies to create a maintenance and renewals liability funding model. The model will inform infrastructure prioritisation reviews as part of the annual NSW Budget process.
- **Incorporate resilience considerations and vulnerability assessment outcomes into decision making.** Infrastructure NSW to work with Treasury and agencies to develop a consistent methodology to undertake vulnerability assessments on their asset base to inform adaptation planning for improved resilience. Resilience considerations to be incorporated into the budget planning process to aid budget prioritisation.
- **Evolve the whole-of-government asset management policy.** Infrastructure NSW, working with Treasury, to ensure that the asset management policy remains fit-for-purpose to deal with the expected challenges of the next decade, that opportunities to unlock value between sectors are realised and that government is provided with the information required to make informed and cost-effective decisions in an increasingly complex environment.

02

Background and context

Background and context

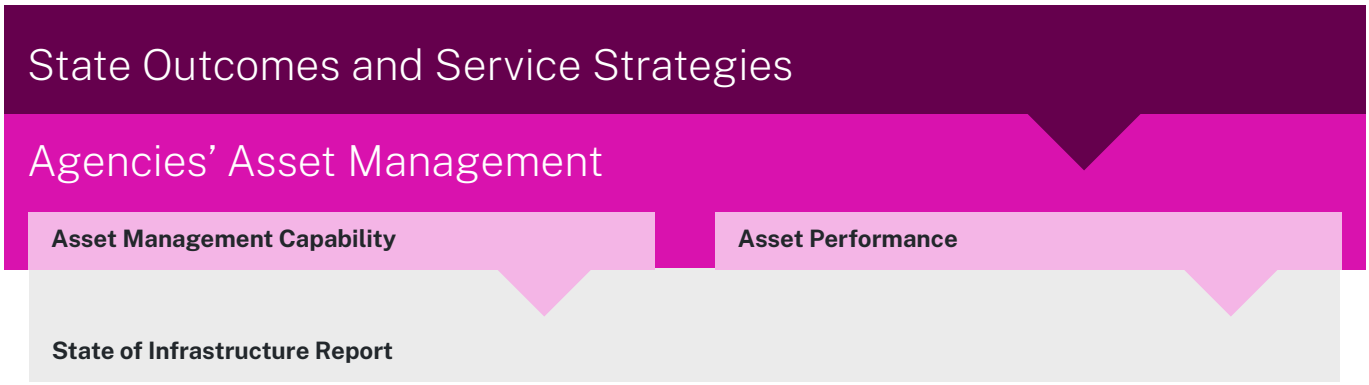
About this report

The State of Infrastructure Report summarises the performance of the NSW Government asset portfolio and highlights risks and opportunities related to service delivery and state outcomes.

The report does not define infrastructure solutions. However, the report's findings inform the State Infrastructure Strategy, NSW Budget and other NSW Government planning and prioritisation processes.

This report is a key output from Infrastructure NSW's Asset Management Assurance function (see Figure 1). It is an independent, evidence-based performance assessment of the NSW Government asset portfolio.[2]

Figure 1 — State of Infrastructure Report



It provides NSW Government with visibility of the effectiveness of the Asset Management (AM) Policy, which was introduced in 2019 to strengthen the accountability, performance and capability of agencies' asset management practices. The policy aims to:

- bolster asset management capability
- optimise asset utilisation and resilience
- strengthen financial stability
- direct efficient investment in existing assets.

It strives to augment benefits from all assets through the use of advanced technology, data, adaptability, and predictive life-cycle maintenance strategies.

Figure 2 — NSW AM Policy outcomes

Infrastructure NSW prepares the reports, with help from NSW Treasury and agencies, for:

- NSW Cabinet, as custodians of the NSW Government asset portfolio
- NSW Treasury, as owner of the NSW AM Policy
- Cluster and agency executive teams, as managers of the asset portfolio
- The people of NSW as the users of the infrastructure.

This State of Infrastructure Report relies on information provided by agencies,[3] meaning it is constrained by the quality and availability of agencies' asset data. Most NSW Government agencies in scope of the AM Policy are working towards full compliance with the policy by June 2024.

Despite investment in human and financial capital to improve asset management capabilities, many agencies experience challenges in reporting comprehensively on cost, risk and performance of their asset base.

NSW Government asset portfolio

Good asset management practice, which is driven by the NSW AM Policy, seeks to enable agencies and the Government to utilise data and evidence to effectively balance cost, risk and asset performance in decision-making. This is critical given the size of the NSW Government's non-financial asset portfolio, which is valued at $450.3 billion.

Additionally, the ability of agencies to deliver services and outcomes is under increasing pressure from tightening fiscal constraints, population growth, extreme weather events, higher citizen expectations, new assets entering service and the ageing of the legacy asset base.

The $450.3 billion valuation represents the written down, or depreciated, value for the end of the 2022-23 financial year.[4]

The valuation includes the asset portfolios of all NSW Government agencies, excluding public financial corporations. It comprises the following asset types:

- **infrastructure systems** (assets such as roads, bridges, railways, ports, dams and pipelines) – **$231.5 billion**, 51.4% of the portfolio
- **land and buildings** – **$199.4 billion,** 44.3% of the portfolio
- **plant and equipment** – **$18.7 billion**, 4.2% of the portfolio
- **investment properties** – **$0.6 billion**, 0.1% of the portfolio.

Table 1 — Table 1: Asset value by type[5]

Prior years					
Asset type ($ billions)	**Actual 2018**	**Actual 2019**	**Actual 2020**	**Actual 2021**	**Actual 2022**
Infrastructure systems	160.2	202.6	202.6	201.7	220.3
Land and buildings	161.6	169.5	169.5	172.5	198.3
Plant and equipment	17.3	17.0	17.0	16.7	17.5
Investment properties	0.6	0.7	0.7	0.6	0.6
TOTAL	**339.7**	**389.8**	**389.8**	**391.5**	**436.8**

Table 2 — Asset value by type[6]

Budget and forward estimates				
Asset type ($ billions)	**Budget 2023**	**Estimate 2024**	**Estimate 2025**	**Estimate 2026**
Infrastructure systems	231.5	248.2	260.2	273.5
Land and buildings	199.4	205.5	211.0	215.5
Plant and equipment	18.7	18.9	18.7	18.2
Investment properties	0.6	0.6	0.6	0.6
TOTAL	**450.3**	**473.2**	**490.5**	**507.9**

The growth in infrastructure systems through to 2025-26 is driven by record investment in major transport projects over recent years; in particular, the Sydney Metro network. A more modest (but still significant) increase is expected in land and buildings as the Government's investment in schools and hospitals continues, while plant and equipment and investment properties are expected to remain relatively stable.

Portfolio by sectors

Infrastructure NSW reviews the asset portfolio by sectors based on similar or related service outcomes. Sector analysis remains unimpacted by machinery of government changes when agencies and assets move between clusters.

Table 3 displays the portfolio values of assets within each sector.[7]

Table 3 — NSW Government asset portfolio values[8]

Sector	Asset portfolio value $m	Asset portfolio value %
Transport (incl. TAHE)	$218,554.0	47.77%
Social housing	$66,734.5	14.59%
Education	$45,929.6	10.04%
Water	$30,844.2	6.74%
Health	$26,582.9	5.81%
Parks and recreation	$24,948.5	5.45%
Cultural institutions	$12,570.1	2.75%
Justice and emergency services	$12,383.4	2.71%
Electricity	$8,819.9	1.93%
Primary industries and sustainable land use	$3,349.8	0.73%
Workspace	$1,072.6	0.23%
Telecommunications	$758.1	0.17%
Information technologies	$193.9	0.04%
Other (includes development authorities and land banking agencies)	$4, 796.6	1.05%
Total	**$450,257.6**	**100%**

Note: Consolidated totals do not equal the sum of individual sector totals due to infra-sector eliminations and the inclusion of centrally held provisions.

Portfolio by sector for agencies in scope only

This report covers the asset portfolios of 44[9] NSW Government agencies in scope of the AM Policy, as well as the assets of the Transport Asset Holding Entity (TAHE).

As a state-owned corporation, TAHE is exempt from the requirements of the NSW AM Policy; however, information was provided on its Sydney Trains and Country Regional Network assets.

Agencies outside the scope of the AM Policy and not covered by this report include:

- state-owned corporations[10] including Sydney Water, Water NSW, Hunter Water, Essential Energy and the Newcastle Port Corporation
- public financial corporations
- agencies granted exemption such as small agencies that control asset portfolios comprising solely of office equipment for their own workspaces
- local councils.

Table 4 displays the written down portfolio values of assets within each sector in scope of the NSW AM Policy. These assets represent 85%2F† of the total value of the NSW Government non-financial asset portfolio.[11]

Table 4 — Table 4: NSW Government asset portfolio values for assets in scope of the NSW AM Policy[12]

Sector	Asset portfolio value $m
Transport (excluding TAHE‡)	$191.964.4
Social housing	$66,734.5
Education	$45,927.3
Health	$26,580.5
Parks and recreation	$24,948.5
Cultural institutions	$12,570.1
Justice and emergency services	$12,282.2
Primary industries and sustainable land use	$1,964.8
Workspace	$1,072.6
Water (Hunter Valley Flood Mitigation Scheme only)	$804.9
Telecommunications	$758.1
Information technologies	$193.9
Other[13]	$4,051.91
Total value of in–scope agencies	**$389,853.7**
Total value as a % of the total NSW Government asset portfolio	**85%**

‡ TAHE's assets have a value of $26.1 billion using the discounted future earnings valuation approach.

Infrastructure NSW advises against making assumptions about the relative importance of sectors based on their asset portfolio value.

Telecommunications assets, for example, represent a minor share of the total portfolio value while being critical to services and communities, particularly in times of crisis.

Intangible value, such as heritage value, national significance or the contribution assets make to people's wellbeing, also shape the value a portfolio has to the communities it serves.

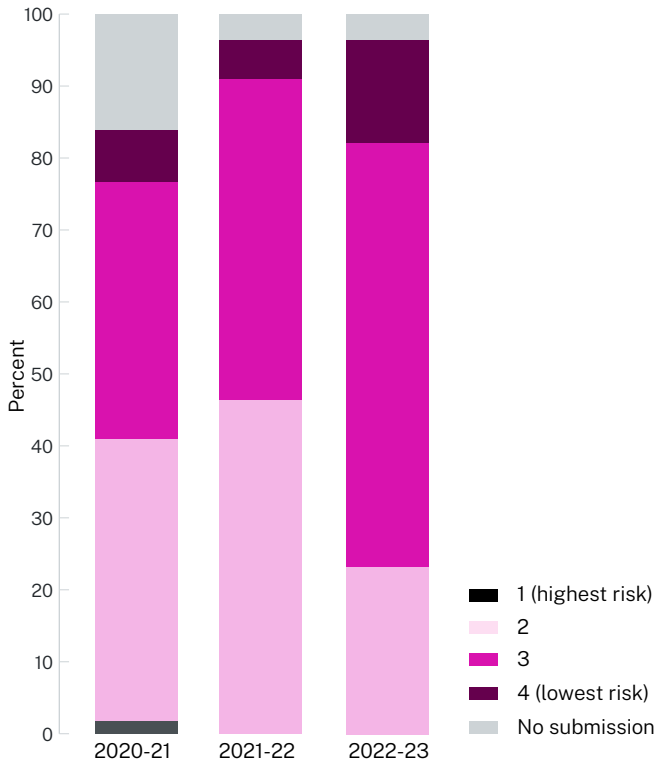
Portfolio trends

Analysis of data from several sources by Infrastructure NSW has identified trends that are relevant to the management of the State's asset base. The key trends identified are detailed below.

Asset management capability is improving

Since the introduction of the NSW AM Policy in 2019, the asset management capability of NSW State agencies is steadily improving. Most agencies have in place implementation plans that detail programs and initiatives to establish asset management frameworks that align with industry standards. Infrastructure NSW has assessed and reported on the asset management capability through its assurance activities. Asset management assurance reviews conducted for FY23 showed improvement in agencies' asset management processes and practices from the previous year, with a significant (~35%) increase in the number of agencies achieving a risk rating of 3 or better.[14]

Figure 3 — Agencies' asset management assurance risk ratings from FY21 to FY23



Improving asset management requires better data

Despite the improvement in the scope and quality of data provided for the State of Infrastructure report, most agencies remain in transition to compliance with the NSW AM Policy. Data and information capabilities, which are fundamental to robust decision-making and prioritisation, are still in development.

The need for better data is highlighted by the low responses of agencies to performance measures regarding asset utilisation and spare capacity, which demonstrates that few have a good understanding of the potential capacity within their asset base. Some agencies still do not have reliable asset data to inform decision-making.

Assets are ageing

All sectors report issues with ageing assets, which may not be fit-for-purpose. For example, the Department of Communities and Justice reported that 70% of courthouses in NSW are more than 100 years old and 75% of these are heritage listed.

Agencies that reported a higher proportion of ageing assets were more likely to report an increased number of high risk safety incidents. Without appropriate interventions, older assets can present challenges to maintenance and modernisation, which can impact service delivery.

The maintenance liability is growing

For every asset over which an agency has custodianship, there is an associated maintenance and renewal obligation (or liability) that ensures required service outcomes can be delivered at acceptable levels of risk.

Understanding and articulating the extent of this maintenance and renewal liability, together with the associated costs and risks of meeting this liability, is vital to communicating the funding requirements necessary to deliver the most value from the asset base.

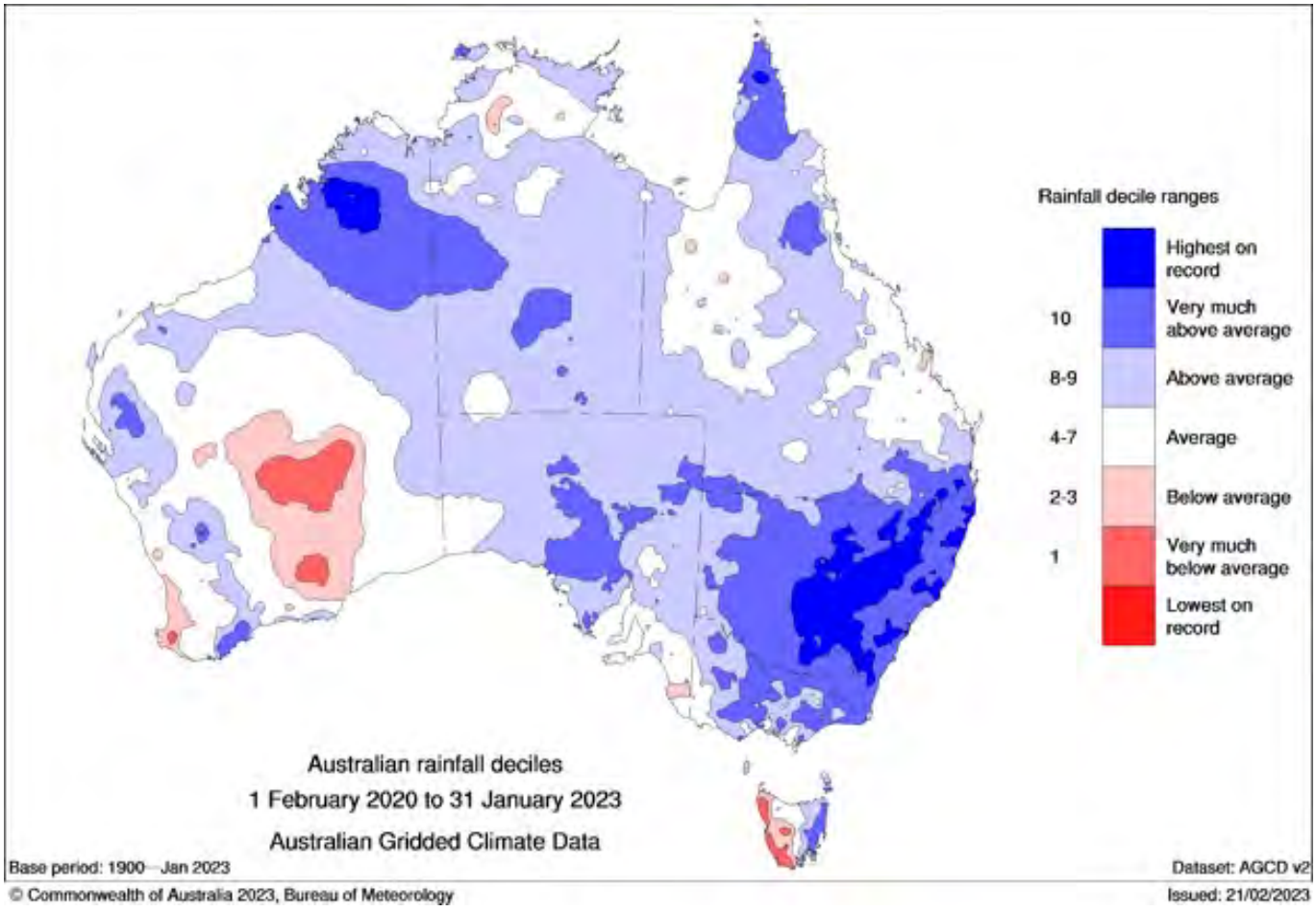
The cost of meeting this maintenance and renewal liability is significant and growing. Most agencies are reporting an increasing maintenance liability. The increasing maintenance liability, when considered with the deterioration in the value of maintenance spend as a percentage of asset value, indicates that greater maintenance funding is likely required to maintain the ability of the asset base to meet the NSW Government's objectives. Underfunding of maintenance may impact service delivery (noting that there are other, non-infrastructure factors that may impact or mitigate service delivery), shorten the life of assets and increase the cost of maintenance.

Extreme weather has impacted the portfolio

La Niña has dominated weather patterns in recent years, which has resulted in higher rainfall and increased flood events in NSW.

The three years between February 2020 to January 2023 were the wettest on record for much of NSW, as shown in the map below.

Figure 4 — Australian rainfall deciles 2020 to 2022 (source: Australian Government, Bureau of Meteorology)



Extreme weather events have impacted the condition of agencies' assets directly, as well as indirectly, by diverting resources and maintenance funds to repairing and replacing damaged assets.

For example, it has been difficult to conduct maintenance on regional roads when the resources required, which are often scarce in regional areas, are diverted to repairing damage to local council roads after rain events.

Flood mitigation infrastructure in the Hunter Valley has been impacted by three major flood events in the last two years. A total of 11 flood events have occurred in the region since the construction of the flood mitigation infrastructure in 1955, highlighting the increased frequency of recent flood events. If this frequency continues to rise, the overall condition of impacted assets will deteriorate, reducing the ability of the flood mitigation assets to meet service levels.

Resilience needs to be integrated into decision-making

Increasing natural and human-induced hazards, including extreme weather events, rising sea levels and cyber-attacks are changing agencies' operating environments demanding new approaches to service delivery that take account of the vulnerability of the asset base (i.e. its susceptibility to damage) and the steps necessary to increase its resilience (i.e. its ability to withstand and bounce back quickly) in the face of shocks and stresses. Both are critical aspects of asset management that need to be addressed if the benefits of investment are to be sustained, and service outcomes consistently achieved.

Although there is some evidence of agencies integrating resilience thinking into decision-making and new asset design, more needs to be done. Fifty per cent of agencies in scope of the NSW AM Policy have at least one asset management assurance recommendation related to improving how resilience is incorporated into their practices.

There is no single whole-of-government method for assessing the vulnerability and resilience of asset portfolios although several agencies are taking steps to better understand risks and commission vulnerability assessments. There is an opportunity to provide additional guidance to agencies in these areas to support robust and consistent assessments that feed agencies' asset management decision making (and Asset Management Plans) and that ensure Government is able to take a holistic and systematic approach to resilience improvement across all portfolios.

03

Challenges and opportunities

Challenges and opportunities

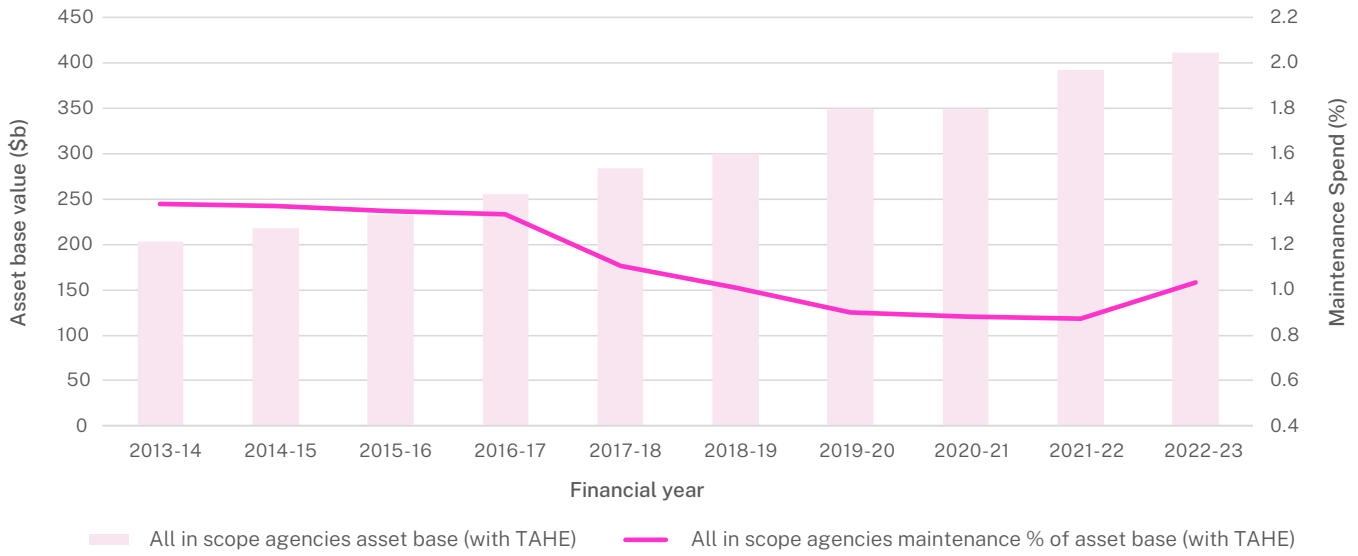
Infrastructure investment needs to be balanced to deliver maximum outcomes

Context

The last few years have seen an increasing level of capital investment in new projects and particularly for investment in megaprojects (value > $1B).[15]These projects are high-risk, add to the complexity of the portfolio, and can result in significant time and cost overruns. Infrastructure NSW's Trends and Insights reports have consistently found that megaprojects are more likely to be at risk compared to other projects. In 2022, megaprojects were 2.5 times more likely to be not-on-track compared to projects under $1 billion in value.

Over the same period, spending on recurrent maintenance has reduced from 1.4% of the value of the asset portfolio to just 1%. For the three years from 2019 to 2021, the value of recurrent maintenance was just 0.9% of the value of the asset portfolio.

Figure 5 — Maintenance expenditure against asset value



The relationship between maintenance spend and asset value is complex in an environment where a significant portion of new assets are being brought online. Newer assets typically have lower maintenance costs than they do later in their lifecycle. However, modern assets often have higher maintenance and operating costs due to issues such as larger ICT components and greater mechanical and electrical requirements (particularly roads tunnels and assets with large data rooms).

The lack of comprehensive data prevents Infrastructure NSW from reaching a definitive conclusion. However, the increasing maintenance liability being reported by most agencies suggests that the reduction of maintenance investment as a proportion of asset value is having an impact on the condition of assets. This reduction increases the risk of asset failures or degradation, reduces the lifespan of assets and reduces the resilience of the infrastructure network.

Current situation

Sustainable infrastructure investment requires that all interventions be compared as a holistic range of options so that the most cost-effective proposals that align with government priorities are selected. This will encourage a focus on maximising the value of existing assets by ensuring they are properly maintained and replaced, opportunities to extract more value are realised and capabilities are enhanced through minimalist, low-risk interventions.

To facilitate effective prioritisation, Infrastructure NSW recommends an approach to portfolio decision-making and investment that, in order of priority:

enables

agencies to realise the inherent potential of assets through decisions that restore, replace and preserve the asset base, building its resilience to resist and absorb hazards

unlocks

latent capacity in the asset base to accommodate demand, share asset capability between agencies and build resilience by using assets differently and adapting to change

creates

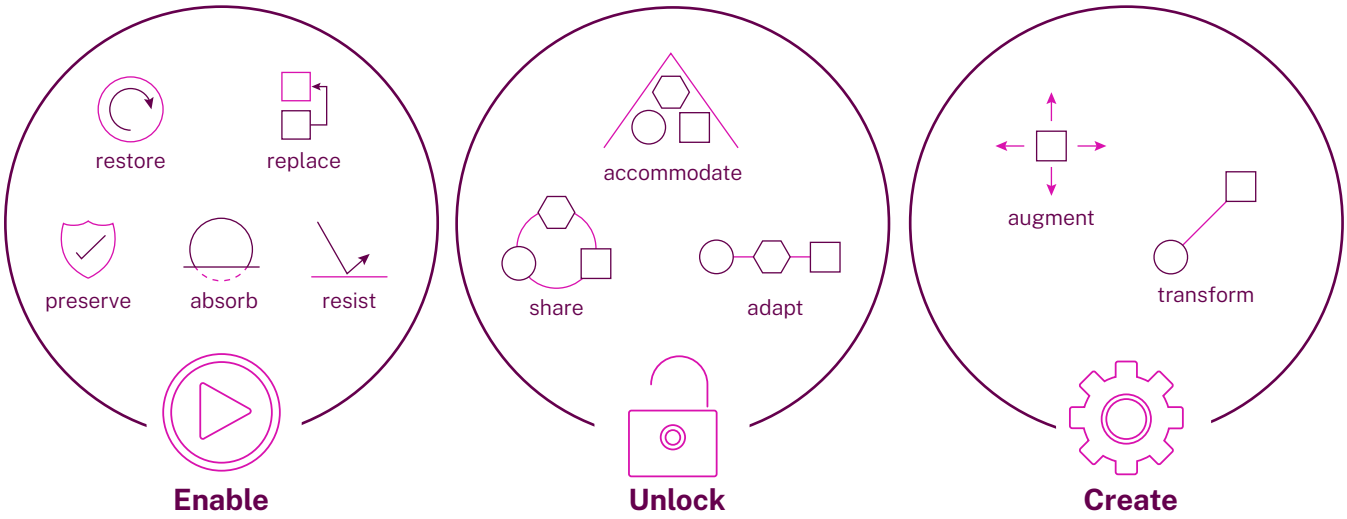
new capability by augmenting and upgrading the asset base where existing assets do not have the required capacity or functionality, helping to boost resilience through transformation or building back better.

Capital projects to deliver new assets should only be considered where these options have been explored and they do not deliver the required service need. Undertaking this analysis effectively requires that all infrastructure interventions along the above continuum be considered as a seamless range of options to select the most cost-effective proposals that align with government priorities.

This approach seeks to optimise the performance of agencies' existing portfolios, identify opportunities to share and leverage assets across agencies and clusters before, and only where justified, introducing additional complexity through new infrastructure.

This focus on supporting and optimising existing assets will increase performance, improve resilience to shocks and stresses and reserve investment in new or upgraded assets for situations where there are fitness for purpose and capacity constraints.

Figure 6 — Portfolio decision-making approach - enable, unlock, create



This approach will also:

- facilitate comparison of the full range of potential interventions in order to deliver maximum service value for the lowest cost
- leverage agencies' growing asset management maturity.
- encourage further investment in agency asset management capabilities, to support future decision-making.

Recommendation

Reform the budget prioritisation process for infrastructure. Treasury and Infrastructure NSW to develop reforms to the budget prioritisation process that will enable the prioritisation of proposed infrastructure investments between recurrent and capital funding sources. The objective is to direct funds to where they will best meet government priorities at optimal cost.

Key components of the proposed budget prioritisation process, to be further refined with Treasury, will include:

- holistic consideration and prioritisation of infrastructure interventions, regardless of funding source, including maintenance and renewals, upgrades and new capital projects.
- requiring asset planning documents as the basis for proposing infrastructure interventions. Proposed infrastructure investments should demonstrate alignment with asset planning documents as the basis for the strategic planning of the infrastructure portfolio and the articulation of how the portfolio supports service outcomes and government priorities.
- inclusion in budget proposals of whole-of-life costs (especially maintenance, operating costs, depreciation and impacts on biodiversity) so that the full cost of the intervention can be assessed during infrastructure prioritisation.
- preparation and presentation of budget proposals for maintenance and renewal funding in accordance with the maintenance and renewals liability funding methodology. This will facilitate better comparison between agencies.

Measurement of the maintenance liability must be standardised

Context

Prioritisation of asset maintenance funding to align with government priorities and service outcomes requires accurate data and analysis that can be compared between agencies. A consistent methodology for the calculation of the asset maintenance liability enhances financial predictability, facilitates cross-agency benchmarking and promotes transparency, which is vital for public trust.

Moreover, it helps in risk mitigation by identifying potential asset failures, thus enabling proactive interventions to ensure service reliability and safety, ultimately leading to better performance outcomes.

Infrastructure NSW is finalising a standardised methodology for agencies to calculate and report their maintenance and renewals liability. Implementation of this methodology will provide robust and consistent data to facilitate effective prioritisation of investment.

Current situation

Service outcomes rely on assets performing to expected levels. Most assets have an associated maintenance (and eventual renewal) liability to sustain performance.

Many agencies report outstanding (and unfunded) maintenance and renewals liability. Those that received stimulus funding in recent years have concerns that unfunded liability will not be addressed in the long term due to the temporary nature of this funding and its inability to bridge the recurring gap between annual maintenance and renewals requirements, and the agency's annual budget.

Asset management requires agencies to balance their resources to optimise cost, risk and performance. Their (growing) ability to do this can mask the extent and impact of any unfunded liability. The severity of a situation may not be evident until assets become unavailable.

The need to effectively allocate maintenance and renewals funding remains. However, agencies use different methods to assess maintenance priorities and renewal opportunities. This creates challenges for government decision-makers to direct expenditure for maximum impact.

In response to this challenge, agencies are:

- adjusting budgets to accommodate the immediate-term maintenance requirements of assets transferred from other agencies
- making additional applications for funding in cases where the business case has not made provision for an appropriate level of maintenance costs, or where requested funding has not been provided
- extending the life of support agreements (e.g. ICT assets) to ensure their continued availability and reliability
- removing assets from service and reducing the services offered when asset performance and risk reach unacceptable levels
- using more joint procurement approaches to tackle the rising costs of maintenance

Recommendation

Consistent reporting of maintenance liability. Infrastructure NSW to finalise the methodology in collaboration with Treasury and agencies to create a maintenance and renewals liability funding model. The model will inform infrastructure prioritisation reviews as part of the annual NSW Budget process.

Assets remain vulnerable to shocks and stresses

Context

Increasing natural and human hazards, such as extreme weather and cyber attacks, have damaged assets, driven up costs, degraded service delivery and increased risk.

Extreme events challenge the resilience of the asset base, testing its ability to withstand and absorb loads (often higher than those for which it was designed). The resulting impacts may increase reactive maintenance, trigger early asset/system renewal and, in the case of physical assets, make access for remediation more difficult. These factors drive up cost and risk.

There is no whole-of-government mandated method or criteria for assessing the vulnerability of assets. Consistent and robust vulnerability assessments for government assets play a crucial role in identifying and mitigating disaster risk, thereby increasing the resilience of the network by reducing the impact of extreme events on the performance of assets and service delivery.

These assessments also provide crucial insights that contribute to effective lifecycle management of assets, enabling more accurate maintenance scheduling, cost-effective resource allocation and, ultimately, more informed decision-making.

Current situation

There is some evidence that agencies have incorporated resilience thinking into risk frameworks, decision-making and the design of new assets. However, this area needs focus, with 50% of agencies in scope of the NSW AM Policy having an asset management assurance recommendation to improve how resilience is incorporated into their practices.

Agencies report:

- impacts to their operation expenditure due to shock events, requiring adjustment of expenditure (and deferred maintenance) to address the impacts (15 agencies reported impacts)
- assets operating outside original design limits that are degrading at an increased rate
- increasingly complex cyber security as more infrastructure has ICT components
- some assets are more susceptible to natural hazards
- insured values that do not reflect the cost of replacement, requiring agencies to meet the shortfall
- rising sea levels could overwhelm some assets, rendering them inoperable
- increasing demand for agencies to respond to climate-related issues such as pest and disease control

Recommendation

Incorporate resilience considerations and vulnerability assessment outcomes into decision-making. Infrastructure NSW to work with Treasury and agencies to develop a consistent methodology to undertake vulnerability assessments on their asset base to inform adaptation planning for improved resilience. Resilience considerations to be incorporated into the budget planning process to aid budget prioritisation.

The nature of infrastructure is dynamic

Context

The increased cost of living, hybrid working, technological advances, changing customer expectations and climate change are examples of factors that are changing how customers use and consume assets and their asset-related needs.

Shifts in behaviour place different demands on the asset base. In some cases, these changes mean assets need to be adapted, upgraded or even replaced to meet expectations. In others, assets cannot be configured to meet new needs or require additional supporting infrastructure.

Customer expectations and demand for services are driving investment in new assets, increasing the size and complexity of portfolios. This increases maintenance and renewals liability, requires an understanding of new asset types and technologies, and can make legislative and reporting obligations more challenging to meet. Access to the right information will optimise decision-making.

At their most extreme, these shocks and stresses can change perceptions and behaviours, resulting in a different set of needs.

Current situation

Almost all agencies reported changes in the way customers use their assets due to changing demographics, increasing expectations and the use of digital technologies. Agencies are identifying and incorporating macro trends into decision-making, resulting in requests for new or upgraded assets to meet service outcomes. Continued customer engagement informs decision-making to understand how best to accommodate how customers want to use assets.

Some agencies express concern about the ability to fund assets to meet these demands.

Agencies report that:

- Net-zero considerations will require different assets to be used or enabled (e.g. zero emission public transport, electric vehicles).
- Population growth in Western Sydney and migration to regional NSW increases the utilisation of some assets.
- Changing technology, such as telehealth, safety standards and contemporary ways of working, particularly in areas such as health and education, must be integrated into infrastructure and sometimes require significant modifications to existing assets to be effective.
- Household composition is changing, as is demand for specialist housing solutions. Social housing of different sizes is required to avoid over and under-utilisation.

Combined with the increasing size and interconnectivity of the asset portfolio, these trends are escalating the complexity of asset management. To meet this challenge, the sophistication of asset management in government agencies will need to continue to evolve beyond the end of the NSW AM Policy transition period in June 2024. The Asset Management Assurance function must also evolve to drive further asset development.

Infrastructure NSW is progressing a strategy to drive the continuing development of the NSW AM Policy. This will establish the best approach to identifying policy changes that can build upon the capability improvements delivered to date and ensure the NSW Government has the necessary capability to make the best decisions in an increasingly complex environment.

Recommendation

Evolve the whole-of-government asset management policy. Infrastructure NSW, working with Treasury, to ensure that the asset management policy remains fit-for-purpose to deal with the expected challenges of the next decade, that opportunities to unlock value between sectors are realised and that government is provided with the information required to make informed and cost-effective decisions in an increasingly complex environment.

The existing asset base can be leveraged to deliver improved outcomes

Context

Good asset management identifies and optimises capacity that can be utilised (where it exists) and ensures interventions are focused on enhancing existing assets. Agencies are not incentivised to consider asset management solutions that unlock latent capacity in their portfolios by using assets differently or by working across government to share spare capacity.

Identifying and capitalising on these opportunities requires an accurate picture of an agency's asset portfolio and effective collaboration across government.

Current situation

Agency responses to the performance measures of asset utilisation and spare capacity demonstrated that few have a good understanding of potential capacity within their asset bases. However, there are examples of good practice:

- **Shared assets:** Department of Education's Share our Space initiative enables councils and sporting associations to use school sports grounds and play equipment out of school hours.
- **Integrated solutions:** Transport for NSW promotes walking and cycling as the preferred mode of travel for shorter journeys, partnering with councils and communities to co-design solutions, making footpaths and cycleways part of an integrated transport solution.
- **Different models of service delivery:** Education, Health and Justice adapted to new service models to respond to COVID-19 challenges, demonstrating how technology can augment or replace traditional asset use.
- **Digitised assets and solutions:** Transport for NSW's Intelligent Traffic Light System increases the capacity of existing roads at a low cost compared to adding additional lanes or roads, while the digitisation of collections held by cultural Institutions improves preservation of the collection and access to it for a wider audience.

These initiatives provide high value to the community at low cost. Delivering more of these initiatives requires an updated asset management policy that is suited to driving the contemporary behaviours, skills and tools required to identify and capitalise on these opportunities.

Recommendation

Evolve the whole-of-government asset management policy. Infrastructure NSW, working with Treasury, to ensure that the asset management policy remains fit-for-purpose to deal with the expected challenges of the next decade, that opportunities to unlock value between sectors are realised and that government is provided with the information required to make informed and cost-effective decisions in an increasingly complex environment.

Endnotes

1 Infrastructure NSW, 2023, Trends and Insights 2022.

2 For agencies within the scope of the NSW Asset Management Policy.

3 More information is provided in Appendix A.

4 As presented at the time of the 2021-22 NSW Budget.

5 Prior years as shown in the 2021-22 NSW Budget.

6 Budget and forward estimates as shown in the 2021-22 NSW Budget

7 These values are budget projections to the end of 2022-23 provided by NSW Treasury. They may differ from figures in agencies' annual reports and asset planning submissions, which can cite unaudited or audited actuals for the previous financial year.

8 Consolidated total may not equal the sum of individual sector totals due to intra-sector eliminations and the inclusion of centrally held provisions.

9 There are 53 agencies in scope of the Policy. Nine agencies (with a combined value of $4.28 billion) are not discussed in this report due to the nature of their operations or due to limited information. These are identified in Appendix B.

10 With the exception of TAHE. Its rail assets are covered by this report, despite it being a state owned corporation.

11 This ratio may adjust from year to year due to the fact that the consolidated total of all infrastructure sectors may not equal the sum of individual sector totals due to intra-sector eliminations and the inclusion of centrally held provisions.

12 These values are budget projections to the end of 2022-23 provided by NSW Treasury and exclude TAHE.

13 The value captured in 'Other' comprises the assets held by the Hunter and Central Coast Development Corporation, Lands Administration Ministerial Corporation, NSW Electoral Commission, Planning Ministerial Corporation, Infrastructure NSW, Waste Assets Management Corporation and Western Parkland City Authority.

14 Risk-based ratings range from 1 (Highest risk) to 4 (lowest risk).

15 Infrastructure NSW, 2023, Trends and Insights 2022.

Infrastructure NSW

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