

Best practice asset management of essential public infrastructure



IPWEA

INSTITUTE OF PUBLIC WORKS
ENGINEERING AUSTRALASIA

How investing in asset management professionals can deliver a better return on investment on infrastructure and an improved outcome for Australian communities.



Foreword

Infrastructure such as water supplies, roads, sanitation, and public buildings are by far the largest investment and most complex assets that a community owns. Public infrastructure assets provide essential services that underpin many aspects of community wellbeing.

Around the world we continue to see significant changes and challenges in the field of public infrastructure asset management. More than ever, our communities are 'requiring' or 'expecting more from public infrastructure, making every dollar count.'

The role of custodian and investment decision maker for effective, efficient, and safe public infrastructure services is essential. Balancing the levels of investment across competing priorities in a changing world is not easy.

Any potential gaps in funding need to be understood and managed to minimise service interruptions and intergenerational inequity. This need for risk-based programming of multi-generational investment by the community, is the key challenge of public infrastructure asset management. IPWEA's Asset Management Pathway features courses that provide the skills and knowledge for people and organisations delivering services from infrastructure. It provides confidence for communities that investment programmes deliver value for money at an affordable price.

IPWEA recognises that continuously seeking to help grow and maintain infrastructure asset management capability can bring significant benefits. From creating employment opportunities to sustaining our natural environment, asset management of public infrastructure is the foundation of resilient communities and their long-term wellbeing. IPWEA supports infrastructure managers to be able to understand and respond to the current and emerging infrastructure management needs faced by our planet.

Myles Lind
President

IPWEA Australasia





Executive Summary

Sustainable and affordable service delivery from infrastructure is critical for the successful economic, environmental and social activity of the nation.

Infrastructure assets such as roads, bridges, playgrounds and community centres provide the foundation for local, rural, regional, and metropolitan communities, and are critical in fostering economic activity and community wellbeing.

Yet there is a widening gap in Australia between the building of infrastructure and the process of planning which is undermining the optimal service delivery of these assets over the long-term.

Historically, there has been poor co-ordination between Federal and State/Territory Governments in managing the infrastructure investment for our communities. Fresh thinking is required, and hard choices need to be made.

Of the three levels of government in Australia, it is our local councils who are closest to the community. They are challenged with managing sustainable outcomes for long-life infrastructure whilst often working within tight fiscal constraints.

At the same time, there is a growing shortage in the number of skilled and educated professionals trained and available to manage the portfolio of public infrastructure assets.

Within this context, the task of managing infrastructure assets and services has become more complex in Australia due to rapidly changing circumstances such as natural disasters, shifting demographics, emerging technologies and the impacts of the COVID-19 pandemic. ▶

- ▶ These factors have disrupted planning, stretched supply chains, stressed communities and added more pressure onto infrastructure delivery programs already challenged by structural and resourcing issues.

The Institute of Public Works Engineers Australasia (IPWEA) is the leading advocate for the advancement of professional and accredited asset management practice,

and believes a key solution to the challenges of managing infrastructure assets and services is to urgently ensure that asset managers have access to ongoing and accredited professional education.

IPWEA argues that to achieve a better national outcome requires a skilled workforce of educated professionals with a clear purpose and career path.

In 2022, there is no co-ordinated national strategy to education and skill development in the asset management profession, an absence which heightens risk around the cost-effective use of public funds and undermines the delivery of quality services to the community.

Australia needs a strong pipeline of talent which views asset management as a viable and rewarding long-term profession. Achieving this demands a strategic commitment to the professional development and accreditation of asset managers.

IPWEA also recommends a collaboration between agencies and stakeholders as the best way to deliver this, combining current and future employers, current asset managers and the education sector to raise the profile, understanding and value of the profession.

One way to achieve this is for Federal government to fund educational programs that raise capacity and asset management practice. There should be commitment to an industry wide uplift of skills in Asset Management, which will deliver better value for infrastructure and delivery programs over the short, medium, and long term.

A dedicated and skilled asset management profession is critical for the optimal delivery and maintenance of public infrastructure.

Until now, Australia's approach has been to import skilled labour to relieve the pressure of the skills gap, however, a more sustainable approach is required.

It's time for good asset management practice to become a priority, not just to maintain the 'business as usual' economy but to improve the performance of our assets, ensure safe environments for our communities, spearhead sustainable practices, reduce intergenerational inequity and build resilience for the challenges that lie ahead.



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1. What is Asset Management?

A large proportion of public works infrastructure assets in Australia are delivered and managed by the local government sector, and by members of IPWEA.

Asset management is recognised internationally as a discipline applied to the management of public works infrastructure and services.

Good asset management is concerned with the financial, social and environmental sustainability of delivering services to our communities through the provision and management of public infrastructure.

The International Standard on Asset Management ISO 55000 defines asset management as: "...the coordinated activity of an organisation to realise value from assets".

The purpose of managing infrastructure assets to deliver services to the community is reinforced in IPWEA's International Infrastructure Management Manual (IIMM):

To meet a required level of service, in the most cost-effective manner, through the management of assets for present and future customers.

Asset management builds an understanding of the cost, risk and performance trade-offs in the short, medium, and long-term, when making decisions regarding community owned infrastructure assets.

Asset management is about ensuring infrastructure assets and services that the community value are delivered efficiently today – whilst providing certainty for the generations of tomorrow.



2. What is an Asset Manager responsible for?

Modern infrastructure asset management is much more than the acquisition, operation, maintenance and disposal of physical assets.

Asset Managers are charged with providing insight on the way infrastructure delivers services to our communities.

To achieve this goal, Asset Managers need to understand key questions, such as how demand for the asset will change over time due to changing circumstances such as climate, demographics and technology.

Asset Managers consider the current state of existing assets, future renewal, upgrade and maintenance costs, and at what point they should intervene to upgrade, replace or dispose of the assets.

Asset Managers consider a 'whole of life' view that ensures assets are built to adequately discharge their purpose, are monitored, well maintained, and have an adequate program of renewal and acquisition, to ensure that the services they deliver are affordable and sustainable.

Global standards have been developed which enable asset managers to take a holistic approach to governance, ensuring that physical assets can best serve their communities. Driving these are multidisciplinary frameworks created from collaborations between engineers, accountants and project managers, along with all other stakeholders.

Asset Managers increasingly use data and new technologies to inform source accurate and real-time insights to determine more predictive procedures and policies.

Asset Managers work within a family of international standards known as ISO 55000 and 31000 – which articulate current best practice around a strategic asset and risk management framework.

There is also an ISO asset management maturity model which has been published enabling organisations to compare their practices against the standards.

Around 60% of IPWEA's Australian and NZ based members work in the direct management of public assets in the local government sector.





3. Communities and Asset Management

When children look at a playground in a public park, they think of a place to enjoy with their friends.

When an Asset Manager looks at the same playground, they assess performance from a safety, maintenance and renewal perspective, review whether it is 'fit for purpose', determine its utilisation rates, and consider the risks associated with the asset, and what the future needs of the community could be.

A key consideration for the asset manager is:

- is it safe, fit for purpose, under or over utilised,
- at what point do we need to intervene,
- what treatment(s) do we apply,
- how much will it cost the community now and into the future?

Sound and effective investment decisions are fundamentally driven by this concept. Without regular monitoring, the value offered to our communities is undermined and risks wasting resources while also delivering sub-optimal outcomes.

Climate change can also impact infrastructure performance, likely accelerating investment decisions on adaptation and resilience

measures. We must be armed with the intellect to respond effectively and have a clear plan of action in place.

Many asset managers formulating recommendations for these decisions are likely to be employed by local government, which is responsible for one-third of all of Australia's public infrastructure assets. Of the three levels of government in Australia, local government is the most asset intensive.¹

Local governments are close to their communities and have unique insights into local and community needs.

Councils determine service provision according to these needs while meeting the requirements of state and territory legislation.

It is therefore an imperative we have a skilled workforce capable of effectively communicating the options and costs of infrastructure service delivery.

1. Research undertaken by the Local Government Association of South Australia suggests that SA councils have approximately three times as many assets relative to income as the State Government, and the State Government has about three times as many assets relative to income as the Commonwealth. There is no reason to believe local governments elsewhere would be less asset intensive. A high proportion of the operating costs they incur are associated with initially providing and then operating, maintaining, and renewing long-lived infrastructure assets. Depreciation alone represented 21% of total local government expenses in 2019-20. ABS Cat. 5512.

4. Challenges Facing Asset Management

According to the 2021 National State of the Assets (NSoA) report by the Australian Local Government Association, the estimated replacement cost of local government assets – excluding land and plant and equipment – was in the order of \$533 billion.



The report, compiled from data provided by 454 councils – 85% of all councils – across seven asset categories, rated the assets in good, fair and poor condition, function and capacity.

The NSoA report found that 9% of local government infrastructure assets have poor function with limited ability to meet a program and service needs, while 9% of assets have poor capacity with demand exceeding or being well below design capacity displaying significant operational issues.

It also found that around 10% of local government assets are in poor condition requiring close monitoring.

The estimated replacement cost of these poor performing assets is approximately \$51 billion.

The NSoA reveals between 20% and 26% of local government assets, worth between \$106 - \$138 billion are in fair condition.

While they meet current demand, they will become increasingly costly to maintain as they continue to age.

While bearing the responsibility for managing more than its fair share of infrastructure, the local government sector raises less than 4%

of Australia's total tax revenue and accounts for only 6% of total public sector spending.

At the same time, there is a shortage of asset managers. In 2017, the Local Government NSW (LGNSW) Workforce and Future Skills report revealed asset managers were sixth on a list of top 10 professions for which there was a skills shortage.

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More recently, LGNSW's Local Government Priorities Report NSW, issued in the wake of the 2021-2022 State Budget, found that four in five NSW local governments are experiencing skills shortages in engineering, asset management and planning.

In the past, Australia has used immigration to deal with skills shortages across a range of sectors. However, due to Australia's COVID-19 response of shutting our international borders, that will not be an option for some time.





5. When Assets Fail

So, while the sector suffers a skilled labour shortage, there is growing concern as to how effectively Australia's infrastructure assets are being managed. Australia has experienced catastrophic events due to infrastructure failures and communities demand answers as to why.

The 2007 Piles Creek disaster on the Central Coast of New South Wales saw a family of five lose their lives when a section of roadway collapsed during a significant rain event.

The coronial inquest found that authorities not only knew about the dangers but lacked the competency to act.

In Melbourne, the collapsing Central Pier in August 2019 endangered the lives of hundreds and put 1300 jobs at risk.

In 2020, the IPWEA (NSW) Timber Bridge Management Report found that more than 300 local government-controlled bridges in the rural and coastal regions of the state were in poor condition and were often located in areas with wet climates and steep terrain. This type of environment results in shorter useful asset lives and higher costs to maintain and replace these types of structures compared to other regions.

These events and insights all point to crucial failures in asset management practices, which result not only in economic impacts but also have consequences on social, environmental, and political outcomes.

They expose failures in one of the basic tenets of asset management, which is taking a whole of life approach. Asset Managers need to know how to intervene at strategic points in the life of an asset to ensure it meets its intended purpose throughout its useful life, efficiently and safely.

The best way to do this is to have credible, reliable and up-to-date forecasts in an Asset Management Plan(s) which is aligned to the long-term financial strategy and plan that clearly communicates what the trade-offs are on cost, performance and risk.

6. Asset Managers need continual upskilling

Asset managers not only manage assets, but they are assets in themselves. That is why Asset Managers need to keep up their skills through ongoing training and education.

This creates a win-win for the sector. Asset managers continue to develop their careers through the acquisition of new and upgraded skills, and the organisations which employ them – governments, and/or infrastructure owners – see a better return on their investments because the built assets are better managed throughout their lifecycle.

IPWEA members are directly responsible for much of the infrastructure which people use and rely on every day. These include the roads, bridges, buildings, parks, stormwater, water & wastewater which are at the heart of keeping the economy moving.

Keeping these assets functioning at optimal performance requires good management skills. Asset managers, in many cases

are IPWEA members, have pro-actively trained themselves in asset management, thereby improving service outcomes for our communities.

In the May 2021, the Australian Government announced a 10-year \$110 billion infrastructure program supporting jobs, driving growth and helping to build Australia's way back from the COVID-19 pandemic.

Classic Keynesian economic theory tells us that the injection of government funding will stimulate business activity, promote individual and corporate spending and drive economic growth.

This is welcome, however the rhetoric up until now hasn't addressed the necessary skills, capabilities, and management of these new and existing assets over the long-term. People and capability are vitally important factors that have been overlooked.



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7. A Solution

IPWEA has developed an Asset Management Pathway program of courses which draw on the Institute's leading manuals such as the International Infrastructure Management Manual (IIMM), and supporting tools and templates which have been setting benchmarks for asset management since 2000.

IPWEA courses are taught by experienced practitioners, include practical outcomes and assessments, and present a new educational pathway for asset management professionals which has no barriers to entry.

Partnering with local government associations has proved to be an effective delivery model for the course, with practitioners upskilling and simultaneously applying the methodologies in practice.

IPWEA's Foundations course has been rolled out to staff at six South Australian councils, with funding from the state government and with the Local Government Association of South Australia (LGASA) administering the program.

The course was delivered online, reducing cost and allowing participants to study in their own time, acquiring knowledge and skills which will drive innovation and efficiency at their councils for years to come.

Already underway, the South Australian example provides a model for how Governments can collaborate with

professional organisations to roll out skills development on a national basis.

To achieve this outcome requires commitment from all levels of government in prioritising asset management training, as this is the key to keeping the assets performing at optimal levels.

When infrastructure projects are announced, a way forward would be for a portion of the budget to be ring fenced for the education of managers and staff.

This would ensure that skills development became embedded in the planning and budgeting process for infrastructure projects.

A commitment to education and training is key to delivering the best return on investment for critical projects and is a win not only for asset management professionals and the organisations which employ them, but for the community as well.

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8. Case study

Canada invested in Asset Management programs and it has paid off.

In Canada, the federal government is committed to a long-term funding initiative that aims to build the country's asset management capabilities.

Now in its fourth year and scheduled to run until 2025, the CAD\$110 million Municipal Asset Management Program (MAMP) funds training and resources for municipal (local government equivalent) asset managers.

As a result, the federal government believes Canadian municipalities will be empowered to make better-informed infrastructure investment and management decisions.

Canada understands that this is necessary because the nation is heavily reliant on public infrastructure such as roads to connect its population across vast distances, and because the country's harsh climate means the degradation of these assets is an ever-present threat.

The funding is being delivered by the Federation of Canadian Municipalities

(FCM) and the outcomes are being measured with a tool known as the Asset Management Readiness Scale (AMRS), which is divided into competencies.

Last year's results were encouraging. Of the 165 municipal asset management projects completed since MAMP's inception, 138 (or 84%) successfully helped municipalities advance along the scale.

The funding has been particularly effective at helping municipalities improve the way they process and analyse information about existing assets.

Of those receiving grants, 65% have advanced along the scale for the 'Data and Information' competency.

As a result, these municipalities are more likely to receive funding for priority projects improving the levels of service for their communities.





9. Conclusion

Australia has not been getting the best return on its investment in infrastructure because the nation has failed to adequately address the shortage of asset managers, and invest in their professional development.

Asset Management Plans have often been poorly integrated across jurisdictions, resulting in sub-optimal return on investment both financially and in quality at a local, regional, state and national level.

Outcomes are hampered by limited – non-existent or out-of-date – asset management plans which fail to account for regional differences in population, climate and topography.

At the same time, infrastructure needs are changing rapidly due to new technologies, and a skills shortage is prompting the allocation of unskilled people to roles critical in supporting better outcomes for our communities.

Climate change is demanding improved planning and response plans from infrastructure agencies, and yet research in this vital area suggests more work is needed.

Many asset managers work in isolation in their organisations and lack adequate leadership, support and resources to maintain and develop their skills and have few opportunities for vital networking and knowledge sharing with their peers.

This can be addressed, and the first step is to invest in the development of asset managers to create a highly skilled corps of skilled professionals.

Creating a defined and attractive career path for young talent will build a strong pipeline of young professionals who will view asset management as a viable, long-term career.

Most, if not all, Australians understand that infrastructure is critical to its economic future but is yet to understand the disconnect between strong investment in physical assets, and under investment in the people who are needed to manage them.

There are a wide range of risks if we fail to invest in the development of a skilled asset management profession.

Not doing so increases the risk that public funds are not spent effectively, and that our infrastructure underperforms in its key role in the economy and delivering services to the community.

We also risk being under prepared for a changing world that is witnessing environmental and social demands unfold.

There is, however, a solution at hand:
OUR PEOPLE.

Investing in them as we invest in physical infrastructure should be intrinsic in our planning processes. It will deliver strong and lasting benefits for the nation well into the future.



10. IPWEA Recommendations

As an organisation representing public works professionals directly responsible for managing the performance of built infrastructure assets, IPWEA is a key stakeholder and works to make a positive contribution to enhancing the quality of life of our communities.

To achieve this, IPWEA makes the following recommendations:

1. All levels of government **commit to educational programs that raises capacity** and asset management practice. An industry wide uplift of skills in asset management will improve the value for money proposition for infrastructure and the services they provide to our communities over the short, medium, and long term. ▶

- ▶ 2. Federal, State and Territory Governments **re-activate, in partnership with industry, the 'Local Government Financial Sustainability - Nationally Consistent Frameworks'** which was agreed to in 2007 and 2009 and report regularly on the outcomes. This will improve asset investment decisions, demonstrate compliance, improve services, outputs, and efficiencies.
3. Federal government to **require certain levels of proficiency in asset management practice** when providing infrastructure funding to State and Local Government. IPWEA believes that qualified asset management professionals will deliver better service and financial outcomes for the communities they serve. Focus is placed on maintaining a core level of proficiency as per the Nationally Consistent Frameworks.
4. State and Territory Governments **audit the long-term financial plan** of each local government to ensure alignment with the asset management plan lifecycle forecasts.
5. Local government be required to **audit and report the state of their infrastructure** (using a nationally accepted methodology, such as the National State of the Assets). Status reports to be provided to the Commonwealth Grants Commission as one of the inputs into the needs-based formula for Federal Financial Assistance Grants to local government.
6. Asset management to be recognised as a profession; **encouraging formal credentials and qualifications** that develop capacity aligning to global standards and best practice.





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