

# **FUTURE-PROOFING ASSETS AMID UNCERTAINTY**

**Australia Edition**





# Aging assets

## How to prepare for an uncertain future

There is no turning back the clock. As the global COVID-19 health crisis transitions into an economic crisis, governments and businesses around the world face many fundamental challenges in the coming months and years. Many organizations will find themselves struggling for survival in the post-pandemic economic downturn as global supply chains fracture and break, and liquidity dries up – despite the anticipated upturn in government investments in infrastructure which will be needed to stimulate the economy and overturn significant unemployment trends.

With a predicted decline in global trade of between 13% and 32% in 2020 (source: WTO), leaders of business and government will have to readjust to this ‘new normal’ of business volatility and market uncertainty. Many of them will be doing so while also working within the very real constraints of aging assets across industrial and public sectors.





## THE PERILS OF AGE

Even before the pandemic began, clients across the world had been telling us candidly that aging assets were a significant cause for concern. After the financial crisis of 2008, investment in critical areas such as industrial treatment plants, production lines and manufacturing real estate had been held back because corporations and supply chains were being squeezed in order to hit financial targets. At the time, this too was described as a ‘new normal’, and for the last ten years, many industrial leaders have had to make do with very little.

Public sector clients had been facing a similar challenge – of doing more with less – and struggling with the lack of knowledge around the condition of their existing aging assets, and how to then prioritize their repair or renewal with fewer resources.

These challenges have not gone away and will need to be confronted in the new era ahead. They can be characterized as:

- **Knowledge gaps** – knowing the critical assets and the scale of the problem of aging assets, both within your organization and your supply chain. The situation is made worse in both the private and public sectors by institutional knowledge leaving the door as baby boomers retire in large numbers.
- **Resource management** – financial, manpower, technical, supply chain – to ensure the reliability and availability of those assets. Affordability is also a major concern in the public sector.
- **Optimization** – from process management, to the balance between operational expenditure vs capital expenditure – and an often-challenged capital planning process, in order to repair, refurbish, remediate or renew assets.
- **Future proofing** – preparing for an age of uncertainty, managing the increasing complexity that comes with intelligent assets, and embracing digital tools and services for greater optimization, including the explicit involvement of the end-user or customer. Within the public sector, the investment gap is growing and is placing greater pressure on future refurbishment regimes.
- **Sustainability and resiliency** – incorporating these principles within a business environment where their adoption is challenged by short-term issues around liquidity and a client’s ability to operate profitably – or ability to operate at all. For public sector organizations, this also means embracing decarbonization, moving towards clean energy sources, progressing the circular economy, and mitigating the effects of climate change.



In the short term, the easing of the pandemic will most-obviously place immediate pressure on aging assets as public and private sector organizations will be competing concurrently for the financial and technical resources needed to re-start production lines or re-start maintenance programs. In the medium- to long-term, the challenge remains of understanding the scale and condition of assets, how to optimize them, and how to future proof them.

## DIGITAL ADOPTION

The challenge is not insurmountable. Almost perversely, the COVID-19 pandemic has created the conditions within which organizations can legitimately take-stock of their current business structure and working practices, and ask if they are likely to best-fit the post-pandemic world that’s unfolding in front of us.

Organizations will also need to turn to digital tools to help them on that journey. One of the few positive outcomes of COVID-19 has been the widespread adoption of digital ways of working to help people in organizations to do their work safely and remotely – leading to greater collaboration across many enterprises. A similar approach needs to be taken towards digital asset management and optimization, which will be critical in the optimization and management of aging critical national infrastructure.

Digital asset management still has several barriers to overcome – perceptions of cost, the challenge of change-management and cultural issues, and finding the right advisory and delivery organizations to help – but it’s clear that the coming months and years will be unprecedented in the changes that they will bring.



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## The common challenges of dealing with aging assets

Organizations face a common set of challenges when it comes to asset management and optimization. Although the level of complexity may have increased because of the COVID-19 pandemic, the challenges still remain of knowing what condition and state of repair assets are in, along with the associated risks and demands that this places on resources and capital-planning processes. Asset types may differ across industry sectors and across public and private sector organisations, but there are significant common challenges.





## KNOWLEDGE GAPS

“My concern is always getting hit by surprises, and trying to react without resources or plans in places to deal with that.” (US Department of Transport Senior Engineer)

Organizations continue to wrestle with understanding the scale of the problem relating to aging assets. First and foremost, this relates to assets under their own control, but it also extends to knowing the problems being faced by interconnected supply chains in the light of global events. One continual fear of organizations around the world is of not being in control – or not being able to manage their assets properly – and many organizations are struggling to close knowledge gaps due to the impact of an aging workforce.



## RESOURCE MANAGEMENT

“You need flexibility in the way you deal with assets, with cost, risks, budgets and time – and on contracts too.” (Dutch National Transport Agency, Asset Manager)

A common thread between public and private sector organizations is that both are looking for flexibility, for more cost-efficiency, ensuring that budgets are spent in the right way, and with improved reliability, greater levels of safety, and lower levels of embedded carbon. And both have challenges in balancing the capital planning processes with ongoing operational expenditure. Life-cycle costs need increased attention.

## OPTIMIZATION

“Projects get launched with someone just putting in a budget, with no up-front definition, no program, no sites, and so you’re constantly behind. It creates real challenges for asset optimization.” (Multinational Industrial Manufacturer)

Organizations are wrestling with the challenge of trying to get the balance right between capital and operating expenditure. This often requires culture-change, a re-examination of corporate governance, and putting the right systems and processes in place to ensure optimization occurs, leading to true lifecycle asset management. The opportunity now presented by COVID-19 is to rethink how asset optimization decisions are framed. Clients have already been telling us privately that they would like to introduce values- or systems-based decision-making frameworks, which would help assets to be prioritized based upon their impact on a system – a road, rail or drinking water system, as opposed to just a pump or a road or a tunnel. This requires a more portfolio and program management-based approach.

## FUTURE PROOFING

“We are data rich and information poor. Many assets give us information now, but we don’t know what to do with that data, as we haven’t yet unlocked the value from those smart assets.” (Digital Asset Management, UK Transport Operator)

Organizations are facing increased pressure to pick the ‘right’ digital solutions in an increasingly fragmented and diverse technological landscape. Investments in internet of things (IoT) platforms, supervisory control and data acquisition (SCADA), operations and enterprise management platforms and Digital Twins and AIP platforms have very different payback periods to more traditional capital investments. Additionally, this new era of market volatility reinforces the urgent need for organizations to prepare for a prolonged period of uncertainty. Doing nothing is not a viable option, and although the future is difficult to predict and will depend upon the scale and timeliness of government interventions around the world, it’s clear that the future will involve trying to manage the increasing complexity that comes with intelligent assets, and embracing digital tools and services for greater optimization. Future proofing also means being better-prepared to accommodate societal changes and changing demands from stakeholders.





*“If we can do a good job in maintaining assets and ensuring that we are taking care of them from a life-cycle perspective, that will do a better job in addressing the climate change issue too.”*

*US Transport Infrastructure Owner/Operator*

### **SUSTAINABILITY AND RESILIENCY**

“If we can do a good job in maintaining assets and ensuring that we are taking care of them from a life-cycle perspective, that will do a better job in addressing the climate change issue too.”  
(US Transport Infrastructure Owner/Operator)

Although short term issues around liquidity – and business viability – are creating challenges for the sustainability agenda, there is enough momentum behind sustainability principles for this agenda to continue in the coming years. The pandemic has also highlighted the need for continued focus on resiliency, namely the ability to understand and respond effectively to hazards and stresses, as the consequences of chronic underinvestment ripple through aging assets with increasing speed.

In the coming months and years, organizations will come to be defined by how they deal with the market uncertainty and volatility. Some, for example, have been able to quickly retool production lines in order to produce vital PPE equipment for those on the medical front lines. For many, the enforced shutdown now provides an opportunity to rethink and to reset business processes, particularly around aging assets – within their own organization and within the supply chains upon which they rely.

We may be about to enter a new period of openness in the global supply chain, and cooperation between asset owners, operators and service providers.







## The challenge of aging assets in the private sector

If necessity is the mother of invention, the next few years will need to be very inventive for industrial and manufacturing organizations around the world. Many industrial organizations have shown that it's possible to implement change quickly, as production lines are reconfigured around the world to make essential parts for ventilators, personal protective equipment (PPE) or sanitizer products.





However, large-scale re-tooling of manufacturing facilities in the short term will remain a challenge for most, made worse by the fragility of the global supply chain. Many are finding that they have unintentionally relied on a small number of critical component or chemical manufacturers, which will lead to a greater level of supply chain scrutiny and assurance as the pandemic eases. And many of those suppliers are themselves struggling with aging assets.

Another accelerated trend will be the use of additive manufacturing processes into existing industrial work-flows. The technology is proven and is already in large-scale use by a number of early adopters, and the renewed focus on corporate resiliency plans will lead many to explore how additive manufacturing can enable greater flexibility in the future.

More immediately, however, many organizations will find they can only continue operating efficiently and profitably if they look afresh at how they manage and optimize their aging assets. In addition to the general challenges of knowledge gaps, resource management, optimization, future proofing and sustainability and resiliency, organizations specifically need to address and overcome:

- the legacy of under-investment in assets;
- lack of optimization in the capital planning process, and inefficiency in the allocation of capital within organizations which results in an over-reliance on operating expenditure to ‘band aid’ aging assets – a “make do with what you have” approach;
- the challenge of repurposing aging assets that are no-longer fit for purpose, including the cost of remediating impaired assets.



### **Auto manufacturer wastewater infrastructure solutions**

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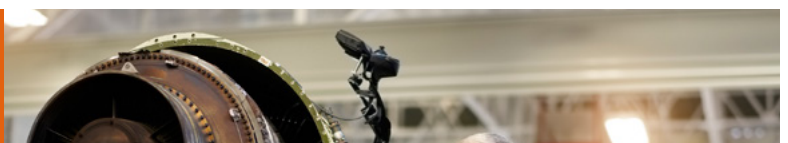
Following a three-month program to assess the condition, probability of failure and consequence of failure of wastewater management assets at key plants in North America (13), Mexico (4) and Canada (3), Arcadis helped the manufacturer to plan and budget for the most critical needs at each plant. The digital solution helped to identify the risks and replacement costs, and optimization items for each site, and the collective data was used to help the client enhance overall performance in compliance, technology, operation and maintenance, production, safety and financial performance.

### **UNDER-INVESTMENT IN ASSETS**

Since the financial crash of 2008/09 – and under the watchful glare of shareholders, regulators and consumers – companies have had to prioritize extending the technical life-time of existing assets rather than renewing or rebuilding them. This has largely meant only investing in assets which are critical to supporting a business or manufacturing process, and it has also meant deferring non-essential investment decisions until the next budget cycle.

As a result, many companies have had to manage an increasing number of age-related issues, including unexpected downtimes, safety issues, compliance issues, lack of transparency on capital investment decisions, and poor visibility on overall spend. Post-pandemic, organizations can also throw into the mix a lack of resources – manpower and financial – and a fragile global supply chain that is only as strong as its weakest link. Much work will need to be done in identifying where that weakest link actually is.

Companies have done the best that they can within the constraints they face, but the ‘new normal’ of business volatility and market uncertainty makes it imperative that aging assets are assessed – in your own organization and in that of your essential suppliers – and plans are put in place to optimize or renew.







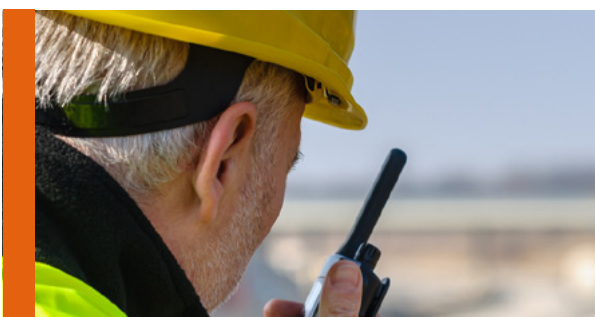
## PROBLEMS COMING HOME TO ROOST

The very best organizations are addressing the challenge of aging assets by using a system-engineering approach to align capital replacement programs, the design of new assets, and manage future operations. BIM tools and Digital Twins are used to ensure that operations have a clear view of the asset they are inheriting, and there is active engagement with their supply chains. Conversely, organizations that don't line up every stage of the asset lifecycle and who lack a comprehensive technology plan to address the mounting challenge of aging assets, will be left even further behind.

For many, this situation will reveal a significant organizational tension between capital expenditure and operating expenditure, especially as it relates to the capital planning process. The best-designed facilities increase productivity efficiencies, but the capital planning process in most companies doesn't match the workflow – or the factory-floor optimization – to the facility architecture. The approach is often: get the building up and running and then work out the process flow.

Anecdotally, many large industrial companies confide that they have an annual capital expenditure budgeting process in which projects are submitted with a pre-determined budget, behind which there is little-to-no up-front definition and a minimal schedule of works to achieve it. As a result, those responsible for managing the assets often find themselves behind the curve from the beginning of the capital expenditure program.

This situation arises because capital expenditure on new projects and new investments tends to be where the power and the political influence lies within an organization. Assets are also most-often viewed through the lens of the balance sheet – financial drivers – and in the months ahead, organizations need to try to close the gap that exists between capital expenditure and the operate-and-maintain part of the asset life cycle. Additionally, failure to consider the lifetime-costs of assets can lead to costly delays in decisions to repair, renew or rebuild, and masks what often turns out to be significant life-time asset costs.



## Using facility optimization to improve worker safety

An aerospace parts manufacturer engaged Arcadis to conduct a comprehensive multidisciplinary condition assessment of its manufacturing facility, creating a digital model that ranked hazards, priorities, and proposed remedies – with their costs – together with options for facility optimization. Work packages could then be developed to prioritize near-term improvements to maximize the return on investment against those metrics of concern.

## RE-PURPOSE, RENEW OR MOVE OUT?

For many large industrial companies, they will be facing additional challenges around the re-purposing of older assets, many of which are no longer fit-for-purpose for today's production lines, or have a minimal residual value after they've been fully-exhausted from an older industrial or production process.

Clients tell us privately that some of their biggest pain-points revolve around how to reconfigure an asset to make it viable, or to sell it. Most manufacturing and processing companies have significantly impaired assets which require major environmental health and safety interventions in order to avoid liability risks in the future. Often, it's considerably more expensive to retrofit to fit today's production processes, than to buy a new asset and move.

Unfortunately, the driving force behind the decision to re-purpose, renew or dispose of the most challenging assets is the cost to carry them, and this is where the annualized capital planning process has a significant impact too.

On an annual basis, the cost of holding on to challenging or aging assets may look manageable, but a life-time cost approach would lead to a very different decision-making process. By avoiding a cumulative view of the true cost of an asset, many companies are holding on to assets about which they don't know what to do.







## Brownfield site optimization

Arcadis has worked closely with a major global industrial conglomerate for more than a decade to manage an average of 20 sites each year within the client's brownfields portfolio. With the goal of re-purposing assets or preparing them for sale, services include general building and grounds condition assessments, facility decommissioning, equipment assessment, and/or facility deconstruction.



*Common data environments – available anywhere at any time – provide a single source of ‘truth’ which can greatly improve optimization and decision-making.*



### DIGITAL TOOLS

This is where digital tools can help to prioritize what to do, and help understand what it will take to refurbish, retrofit or demolish. Common data environments – available anywhere at any time – provide a single source of ‘truth’ which can greatly improve optimization and decision-making. Digital tools also help drive standardization, automation and productization.

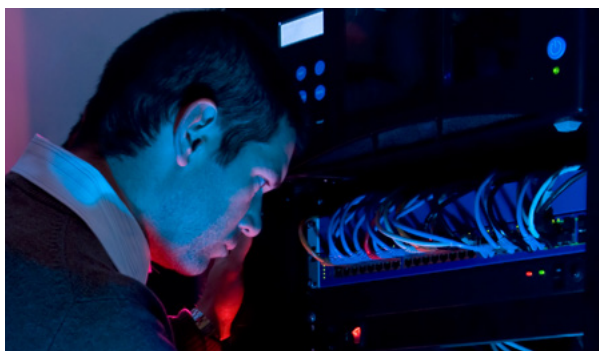
The coronavirus pandemic has created a period of time within which it is necessary for organizations to look long and hard at their business processes and optimize their assets. Can a facility be cleansed of its chemical and physical impairments? Can the structure be saved, or does it need to be demolished? Can we program in a prescriptive maintenance approach, rather than repairing when something breaks – an approach which experience shows can be up to four times more costly. Data-driven decision-making helps to create safer, more efficient work environments, making sense of the complex issues of cost, safety, risks, performance, sustainability, time and capacity.





## How the public sector can keep societies flourishing

The challenges facing public sector organizations who own and operate aging infrastructure are becoming ever-more complex in the light of the global pandemic. As well as the common challenges that they share with the private sector – knowledge gaps in the state and condition of aging assets, resource constraints, optimization challenges, future-proofing and sustainability and resilience – public bodies have also had to do this against a backdrop of changing demographics, consumption patterns and climate volatility.



*Without making good use of data and information, many organizations default to an age-based replacement program.*





## DIGITAL DECISION-MAKING

As can be seen in the private sector, digital tools are helping to make sense of the complexity organizations face, and digital analytics can help to prepare for some of the future challenges. But many public sector clients are playing catch-up when it comes to collecting data, particularly on older assets. In the US, for example, the water sector is last only to the agriculture and hunting sectors for the adoption of digital technology, according to Bluefield Research.

In part this is because the age of those assets makes it difficult – or prohibitively expensive – to capture data. But where data does exist, it’s often not of good quality. Furthermore, many organizations don’t have the resources or the organizational desire to consolidate information into a central digital asset management system.

This challenge is leading to even greater problems when it comes to prioritizing the repair, renewal and rebuilding of assets within the public sector. Without making good use of data and information, many organizations default to an age-based replacement program. For the water industry, 20% of failure modes are ascribed to age, with the remaining 80% due to random failure. This means that a significant amount of infrastructure will be replaced that simply doesn’t need to be updated. Making sense of asset data is therefore crucial in an era of major constraints on resources.

Organizations are now under increasing strain, with many infrastructure and water assets performing beyond the limitations of their original design, with major resource constraints ahead. Bluefield Research, for example, estimates that underinvestment is leading to between 25-50% of assets operating beyond their design life, which will give rise to hotspots of failure and reactive maintenance regimes, which are more costly to organizations than planned or proactive maintenance.

Consequently, there needs to be a focus on how to optimize assets while reducing cost and maintaining performance levels, all the while without increasing risk.

There are a number of specific opportunities that public sector organizations can embrace to take asset-management forward:

- increasing use of data in decision-making;
- a focus on organizational culture to bring institutional knowledge into the digital era;
- engaging with the public sector supply chain to fill in skills and resource gaps, to further speed the adoption of digital asset management and stimulate innovation by using the strengths of the market.

### Technology focus: sensor-driven automated monitoring

One of Europe’s national rail operators has implemented a fully automated bridge condition monitoring system using sensors. First, Arcadis modelled the bridge in 3D and used finite element analysis to gain insight into the expected deformations and dynamic responses the bridge would have. This output was then used as an input for the monitoring plan, which allowed the selection of the right sensor’s installation. A range of sensors is now installed and provide live data to a dashboard that can be directly viewed by the rail operator allowing data analysis to be done in real-time.



## A CULTURAL CONUNDRUM

For many organizations, these changes are occurring at a time when institutional knowledge is literally walking out of the door. In many public-sector bodies such as US water utilities, 10% of the workforce is set to retire each year (Bluefield Research), and similar trends are reflected in other regions. With this comes the challenge of safeguarding that institutional knowledge.

It’s unreasonable to assume that an accelerated knowledge capture program will help to stem the knowledge out-flow, but an increased focus on adopting digital asset management tools will help to rebuild institutional knowledge digitally.







### Maximizing resources to meet transformation goals

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A U.S. water utility approached Arcadis to help it transition from outdated legacy asset management software, to build a system that would allow them to further enhance their capability to prioritize water mains assets by consequence of failure rather than age. In building a new system, the team was able to identify new opportunities to collect insights in the field and identify valuable correlations between asset conditions and future main breaks. With improved resource allocation, the utility raised its water main replacement program's annual replacement target from two miles to ten miles of pipe – an achievement made all-the-more impressive against a backdrop of a declining workforce, as the organization had shrunk by 20% over a ten year period.

*The coronavirus experience has shown how existing digital tools can be used to great effect to keep organizations functioning remotely and safely.*

### PROMOTING PARTNERSHIPS

Another major barrier to adopting digital asset management within the public sector has been a collective bad memory of large-scale system implementations. Very few such systems have been successfully implemented, and the future for implementing digital asset management systems is likely to be more agile, more focused on achieving quick-wins and specific business-need goals than on implementing the 'all things to all people' approach. The coronavirus experience has shown how existing digital tools can be used to great effect to keep organizations functioning remotely and safely. A similar experience can perhaps be anticipated for digital asset management.

Crucial to this approach, however, will be agreement from all of the key stakeholders – finance, procurement, engineering, health and safety – on a digital strategy. Partnering with digital service providers can produce quick results, but ownership of systems, processes and data – and accountability – must sit within the business. This is crucial to installing a lasting digital culture.



### Investing in digitization is important for the safety and future of tunnels

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The Flemish Agency for Roads and Traffic in Belgium requested Arcadis to advise and support them in the modernization of the tunnel renovation and management of its tunnels. Much of the infrastructure was designed fifty to sixty years ago and was due for renovation work. Arcadis helped by advising on maintenance, research, control, helping with safety and renovation files, as well as the digitization of all tunnels plans with dynamic 3D BIM models.





## Six steps towards navigating the post-pandemic landscape

In exploring the topic of optimizing aging assets with clients and Arcadis subject matter experts, it's evident that there are some very clear steps that can be taken in the months ahead to enable organizations to emerge from the pandemic crisis and take back control of aging assets, and manage and mitigate any potential risks.





**STEP 01 FOCUS ON PEOPLE AND FOSTER A DIGITAL CULTURE**

Leaders need to embrace data-led decision making and introduce the necessary culture change within which a wholesale digital asset management system can thrive.

Engage and empower employees in the asset optimization journey. Simplify the message around what is important, why it is important, and be clear on the contribution that they can individually make to the successful outcome.

Break down silos that exist between the functional parts of your organization, so that there is proper integration between asset maintenance, new-build, renewal and enhancement, and investment/financial management. This will enable end-to-end asset lifecycle management to take place, helping to create a single unified approach to the digital optimization of assets.



**Using dashboards to bring data to life**

A major utility provider in the Western U.S. has partnered with Arcadis to make sense of the outputs from their SAP-based system to collect and manage data on their company-wide safety observation program. Arcadis developed a powerful, visually engaging, interactive tool to quickly extract data, insights, and connections from the nearly 70,000 data points, creating customized, interactive dashboards to clearly assess lagging indicators. It also allows the client to look forward by learning from observed behaviors and trends to proactively and strategically manage their health and safety processes and culture. The ability to bring tens of thousands of data points to life has allowed this utility to leverage their investment in the existing SAP tool and harness the power of their data to drive strategic decision making and engage with partners across all levels of the organization.

*The coronavirus experience has shown how existing digital tools can be used to great effect to keep organizations functioning remotely and safely.*

**STEP 02 USE DATA IN DECISION-MAKING**

Specifically articulate the business case of interventions on aging assets by using digital dashboards to show the interplay between various decision-making factors, such as cost, risk and performance, and showing how different variables can change the investment decisions.

Build a trusted data pipeline. Enhance your understanding of the risks you face by creating a common data structure and fill it with real-time information, gathered from sensors, drones and connected devices that your people use to make the critical decisions that matter.

Overcome short-term data management and data analysis skills shortages by engaging with existing supply chains to help bridge the knowledge and skills gap when building, for example, analytics dashboards that make sense of asset conditions using data analytics and visualization tools.





### STEP 03 EMBRACE DIGITAL INNOVATION

With the foundations in place, systems, artificial intelligence and machine learning unlock new potential to work assets harder and smarter for the good of your customers.

Within the digital space, embrace pilot programs or identify low-risk implementations including Digital Twins. If necessary, engage a trusted partner to help deliver solutions based upon business need, rather than the latest-and-greatest technological advance.



### UK high speed rail: Pushing the boundaries of digital asset management

One of the UK's high-speed rail networks engaged Arcadis to create an innovative strategic

asset management plan and a fit-for-purpose asset information management system. It is helping them to clearly prioritize the asset management capabilities required at each stage of their asset lifecycle, and has led to an improved understanding of the vulnerabilities of their Asset Information Management System, with practical recommendations to mitigate risks.

### STEP 04 MANAGE RISK

Use a common risk framework. This will drive focus and consistency, supporting every level of the organization and allow everyone to understand how risks are aggregating from the asset to the board room.

Following the Covid-19 pandemic, expect risk frameworks to rise up the business agenda, with procurement processes needing to adapt to the new reality of insecure supply chains, and suppliers who are less able to take on the same contract risks as before.

Where possible, take the opportunity to share or move the asset lifecycle risk onto others in operation and maintenance contracts, and performance-related contracts.

### Digitally improving frequency and reliability of travel across London

Arcadis Gen has entered into a ten-year strategic partnership with Transport for London (TfL) to deliver Digital Asset Management services. The first phase of the contract is to upgrade their existing asset and safety management system, introducing it across all nine London Underground lines and London Tramlink. Upon completion, for the first time in its 157-year history, London Underground will have a single system responsible for optimizing management of every single asset on the network. The project will support the continuous improvement of Underground services across London and enable TfL to manage increasing passenger numbers to accommodate London's rapidly growing population; improve reliability and frequency of services; and reduce whole-life asset management costs supporting further capital investment in the network







**STEP 05 DEAL WITH IMPAIRED ASSETS**

Industrial manufacturing organizations should surface and confront the lifetime costs of carrying impaired assets. Full visibility of the total costs of keeping impaired assets should enable better decision-making around their remediation and redeployment.

**STEP 06 MANAGE FOR THE LONG-TERM**

Organizations that have embraced a preventative approach to asset maintenance and refurbishment are reporting a reduction in maintenance spend of up to 50% over three years. They are using sensors and advanced data analytics to advanced data collection tools and technology, coupled with sophisticated data analytics to identify assets that need refurbishing before they fail.

Post-pandemic, the greater volatility and uncertainty in the marketplace will necessitate earlier engagement with sector/industry experts within supply chains.

Explore the creation of dedicated Program and Project Offices. If the biggest pain for public sector clients is knowing the state of assets and where the risks are, the next pain point is how to program and prioritize refurbishment of those assets.

Try to gain agreement from all key stakeholders about the benefits of a single enterprise-wide digital asset management system. Understand the opportunity cost of replacing legacy systems and inefficient processes, and the longer-term benefits of a true optimized digital asset management approach.

Be realistic about your enterprise goals. If the promise of an enterprise-wide, all assets in a single system, single-version-of-the-truth is too much of a stretch, consider Software As a Service models which use industry-specific best-practice templates to allow go-live with a minimum viable product in a short timescale.

### Maximizing returns with an effective analytics solution

Severn Trent Water (STW) needed to up their data game to make sure they were making the right investment choices for their three million assets. With Enterprise Decision Analytics solutions, they are now maximizing returns for shareholders and can say with confidence that their 4.3 million customers are getting value for money.

For over a decade, STW's decision-making roadmap has combined investment scenarios, risk and uncertainty, conducting thousands of optimizations each year. They needed a proven decision support tool that was capable of complex asset-level investment modelling, risk management and optimization. With Arcadis Gen's industry-leading Enterprise Decision Analytics (EDA) software, STW now manages all their asset and portfolio optimization needs in a single, web-based, platform. EDA's rich visualization dashboards enhance communications, and predictive analytics allow STW to plan for the future with confidence. This performance has placed them consistently in the upper quartile in industry rankings, and their record of significantly and consistently outperforming performance commitments to the regulator has resulted in record-breaking rewards of £50 million.





## Heralding the digital era

The coronavirus pandemic will by necessity cause many organizations to have to reset their operations and look afresh at what they do. Some have taken a head-start as a consequence of retooling production lines to manufacture much-needed PPE equipment, but future challenges to business processes and production lines – and supply chains – will need to be examined closely and quickly, and adaptable and flexible solutions will be needed.





Aging assets will also quickly rise up the business agenda after the pandemic is over, and companies everywhere will need to adapt to the 'new normal' in a very short timeframe. Despite large government investment stimulus, organizations will still need to 'do more with less' – perhaps 'even more with even less' – and the challenge will remain of understanding the condition of aging assets and how to prioritize their repair or renewal, their remediation or rebuilding. After all, any stimulus funding will need to be applied appropriately, and an asset management approach can help to prioritize that spending.

What's already clear, however, is that the 'new normal' includes a significant acceleration of the use of digital tools and digital asset management.



#### PROTECTING THE DATA ASSET

A best-practice approach recognizes that data is an asset in its own right, that should be invested in, be properly maintained, and have proper processes to manage its condition. If data is used to inform and justify decisions, it results in a much stronger data culture, in which everyone understands the role that data plays.

Very few public or private sector organizations are currently at the stage where they have a true enterprise-wide digital asset management system – providing a unified view of all assets in a single system, driving common ways of working and providing real-time holistic reporting of the state of a system, network or organization. But instead, there is a growing trend towards using a 'Software As a Service' approach in order to get to a minimum viable product within a much shorter space of time, rather than aiming for an 'all things to all people' system.

And while public sector organizations may not have the flexibility to reorganize or to bring new skillsets into the organization in order to fully exploit new digital tools, there are many existing suppliers and third-party organizations who can help with that transition, or take some of those roles on.



*A best-practice approach recognizes that data is an asset in its own right, that should be invested in, be properly maintained, and have proper processes to manage its condition.*

#### A PRAGMATIC APPROACH

The goal for many organizations is to integrate technology into their business processes, and where those technologies and skills can't be adopted, to make use of existing supply chains to bring those skills and services in-house. By doing so, organizations can ensure they have the knowledge needed to maintain a strong state-of-refurbishment program without having to reorganize their structure.

This will also require suppliers to be more pragmatic when working with public and private sector clients. Many organizations who were early adopters in the digital space are still cautious of being burned again by digital vendors who over-promised and under-delivered. There will therefore need to be a re-setting of the digital asset management marketplace, where pragmatism and a proven tried-and-tested approach is embraced by private and public sector organizations alike.

As we emerge from the coronavirus pandemic and organizations have overcome the short-term financial constraints and ensured the health and safety of their workforces, it's beholden on them to take the opportunity to rethink and reset their approach to aging assets.





# Coping in the changing world – asset management for the future

The global pandemic has changed Australia just like it has changed the rest of the world. Countless industries, companies and communities are affected by ‘the new normal’ and are now looking for ways to recover and prepare for the future.

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When it comes to the Asset Management, our private and public sectors are facing similar issues as their peers across the world. Global Asset Management topics like future proofing, resource management, data & technology utilisation and knowledge gaps, are all something that the Australian market needs to consider – and in many cases, with a very fast schedule in order to recover from the massive hit of the global pandemic.

But what should organisations be focusing on in the future? What will futureproof assets in the long run? Globally and in the Australian market, our research has highlighted that the key topics are the same:

- Increased service and service costs: How to manage increasing service costs of ageing assets and get return for your investment
- Customer focus: what does the customer or users of the assets need and want? How do we continue to serve them in the best possible way?
- Utilising technology in asset management: how to select and efficiently manage new technology, and ensure you have the right knowledge in your organisation.

- Data management: how to gather relevant data and govern it effectively to maximise the current and future performance of your assets. Can your data be analysed to predict the future?
- Organisation structure and collaboration: taking down organisation silos is critical for future success. Many organisations will need to adapt to new ways of working.
- Transparency in the heart of success: being able to show what is done and why, will support the organisation, its business and stakeholders.

To get more in-depth local insights, we interviewed some of the asset managers and owners of major Australian organisations. They shared their views, thoughts and best practices of asset management, the current situation and how their organisations are prepared to futureproof their assets.





## Spotlight on Aurizon: a case study

For Drew Hellyer, Acting Head of Network Asset Management at Aurizon, the key to future-proofing aged assets lies in better data. At Aurizon, better insights and working in partnership with the customer is leading to better outcomes.





## INCREASED UNPLANNED OUTAGES THE NUMBER ONE RISK FOR AGED ASSETS

The number one risk that Aurizon faces when it comes to aged assets is an increase of unplanned outages, says Hellyer. 'For assets that are at the end of their life cycle, there is an opportunity for them to fail more often in ways and locations that we haven't seen before.'

The vastness of the area that Aurizon's network spans also provides a challenge. 'Our assets aren't all in one location. To give perspective, our 'factory' is twice the size of Tasmania. So, if our assets fail, there is considerable time and effort to get to that location – it can take hours of driving.'

Other challenges Hellyer sees include:

- Increased servicing. 'We need to increase the amount of inspections and renewals activity for aged assets. The usage of aged assets is the same as newer assets, but the amount of servicing increased.'
- Managing computer-based vs systems-based assets. 'Assets continually evolve. And as our vendors move onto generation 'next', they aren't supporting the generation we are working with. If an aged asset breaks, it may have to be completely replaced because it doesn't work with our vendor's system.'
- Maintaining and holding inventory. 'Many of our assets have relatively long lives, and with a lot of variations. Maintaining and holding inventory for all these assets, as well as the technicians who have skill and knowledge in these assets, is a risk.'
- Asset stranding risks. 'We need to match the asset life with the life of the contract, otherwise we're left holding a significant bill at the end of a contract. If aged assets fail unexpectedly, it increases this risk.'



Maintaining current servicing levels isn't enough; customers are increasingly placing greater demands on the business. 'Our customers want that time to be lower. Majority of our assets have been established at the same time, and that means they all get older at the same time. So, we're transparent and communicative with our clients about our data, and what that's telling us.'

## THE KEY IS IN PREDICTING THE FUTURE

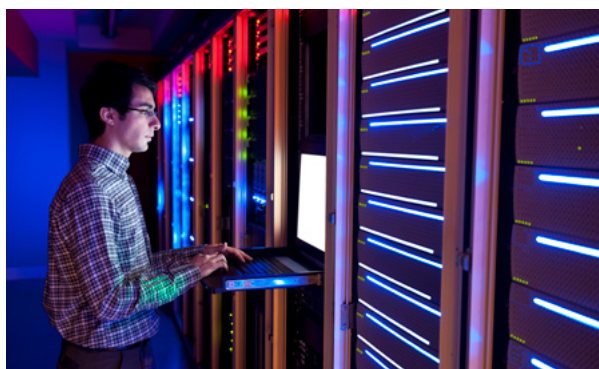
Data management is the key to Aurizon's future-proofing, says Hellyer. 'Our asset management approach is about predicting the future. It's easy to report on things that have happened in the past. But we want to know what is going to happen at any given time. We use predictive modelling to protect our asset ahead of it failing. We are continually developing an increased ability to understand what is going to happen.'

It's about being proactive, not reactive. 'Then we can intervene before the asset fails.'

However, it's a long path, he says. 'For some assets, we are well on our way with that journey, while for others we are just starting. We want to make our standards more risk adverse and understand the best point to intervene.'

But age is not a factor, according to Hellyer, as every asset is somewhere on its lifecycle and every asset has the same life cycle.

'You acquire it, you maintain it, and you dispose of it. Regardless of its location and use, it will be on that life cycle. We want to understand exactly what point of its lifecycle each asset is on. Our job is to maintain the master data suite to understand the true cost of that asset through its life cycle.'



## TIME MEANS MONEY

At Aurizon, time, in the form of a path for a train to take is a commodity, and time taken for renewal, maintenance or recovery assets means less time for train services. 'We effectively sell time, and when you have unplanned outages, you introduce delays and confusion,' Hellyer says.

'Currently, we are on track 13% of the time, and trains run 87% of the time. If there is an unplanned outage, there is a reduction in our capacity to service our clients.'





## WEAR AND FAILURE RATES ARE SCRUTINISED

A variety of data management tools – and the experience of their people – keeps Aurizon on track.

‘We are interested in understanding how our asset is performing,’ says Hellyer. ‘We measure the wear rates to understand when they will reach a point where they need to be renewed.’

‘We also want to understand failure rates. We have assets that are electrical based, and they will suddenly break. We need to follow the trend of the failures to learn the failure point.’

## REMOVING SILOES IS CRITICAL TO SUCCESS

Prior to 2015, Aurizon had disparate systems, with people and processes working in siloes. In 2015, all that changed, says Hellyer.

‘In 2015, we implemented the Network Asset Management System (NAMS), and that project is continuing today. Its job is to bring all of our systems together. Previously, our systems were siloed, and our people were siloed. Everyone was doing a really good job within their silo, but there was no efficiency, visibility or synergy.’

‘Now, we’re aiming for total visibility – we can understand all costs and maintenance requirements on any asset. Every item of work goes through the same stages – scoping, scheduling, execution and close out. A consistent, transparent approach, with greater efficiency.’

## A PARADIGM SHIFT TOWARDS TRANSPARENCY

While previously, there was an economic regulator ‘all about cost pressure, and how to provide the service for the lowest cost,’ there is now a much lighter regulatory regime – in exchange for transparency, says Hellyer.

‘Customers now want complete transparency. They want to understand the decisions being made, and they want you to give them options. They don’t just want to know what or how we are going to deliver something, they want to know what the options are, and the process we went through to get to the options.’

They also want a higher capacity, and that can come at a greater financial cost. ‘It’s an interesting paradigm shift,’ reflects Hellyer. ‘All of a sudden customers are open to acquiring new machines to do work instead of sweating them. They are keen for us to look at the problem and find out what the solution is.’

‘Ultimately, the questions we’re asking have been redefined. It’s not ‘what is the lowest cost?’. It’s ‘What does the customer want?’



## WORKING IN PARTNERSHIP IS CRITICAL TO SUSTAINABILITY

Sustainability is another priority – but this requires partnership from the customer. ‘Sustainability is important to us,’ says Hellyer. ‘We are a publicly listed company, and we have a responsibility towards reducing climate change, and focusing on sustainability.’

But this can be challenging as customers vary in their prioritization of sustainability. As Hellyer explains, some are interested in the long term, like the customers who ‘wanted to know what we were doing to make sure we were sustainable for the future’ after a post-cyclone landslide closed a Black Mountain track for five weeks in 2017. Others ‘may want a bridge that only lasts 25 years’.

For Aurizon, education around sustainability is key. ‘You can run a train two ways. You can draw electricity from overhead or run a diesel train. It’s currently cheaper to run a diesel train when compared with the cost of electricity. In addition, there is also an asset stranding risk with electric trains. So if our clients are cost sensitive, they will choose diesel. We’re trying to help our customers understand the benefits of electric, in particular the climate offsets, and emissions offsets.’

## TRANSPARENCY, DATA AND PARTNERSHIPS IN ACTION

Aurizon is witnessing increasing customer transparency and interaction. ‘When the regulator was in the middle, we couldn’t talk,’ explains Hellyer. ‘We can now share what is going on.’

Decisions informed by data is another key trend. ‘We see more decisions made on data, not opinion. Expertise is highly valued, but those people won’t always be there, so we need to get the information out of their heads to inform data systems.’

Finally, there is a growing trend towards working in partnership with the customer to determine outcomes. Says Hellyer: ‘Now, we share not just what the problem is, but the different ways to solve that problem, and insights around the time, throughput, and cost trade-offs.’





# Spotlight on the Australian Rail Track Corporation's Asset optimisation

For Phillip Campbell OAM, General Manager Technical Standards, Australian Rail Track Corporation, asset management is about more than infrastructure. Customer satisfaction and maintaining the brand reputation of the organisation are top of mind.





## STRUCTURAL FAILURE IS THE ULTIMATE RISK

Assets always need to be fit for purpose. At the Australian Rail Track Corporation (ARTC), performance and integrity are critical, says Campbell. 'The structural failure of the bridges and track infrastructure of the railway of the assets is the greatest risk.'

### OTHER RISKS CAMPBELL SEES INCLUDE:

- Underperformance. An asset performance risk that affects customer is always a concern. Campbell explains: 'The degradation of the asset places limits on the network, affects the safety and creates delays for our customers. The quality of the ride can also be affected, which means the patrons have an uncomfortable journey.'
- Maintenance costs. 'Aging assets mean increasing maintenance bills.'
- Large capital costs. 'If an asset requires replacing, it can cost hundreds of millions of dollars of capital. If that's unexpected, that's a huge disruption to capital requirements. We want to avoid surprises; we want to deal with aged assets in a planned manner.'
- Reputational risk. Aging assets have the potential to damage a business's brand. 'The perception that our customers, shareholders and stakeholders will have of us – that may mean damage to the company's reputation.'



But it's not always the case. 'Some structures can be difficult to replace. We've seen tracks washed away on the Nullarbor after flash storms. In order to do the repairs, we sometimes have to build a road. Repairs are costly and time-consuming.'

'The long-term consequence is the negative publicity – it makes the railway system less reliable when compared with other forms of transport, like roads.'

Monitoring and proactive continuous improvement the key to managing risks

Active steps can be taken to remedy these risks. For the ARTC, the focus is on implementing monitoring systems and continuous improvement.

According to Campbell, specific activities include:

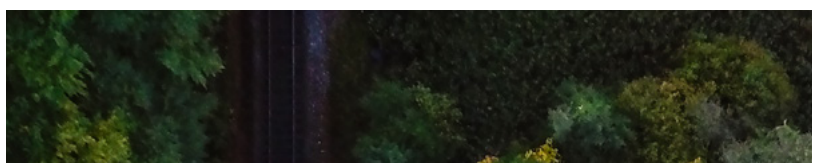
- Focusing on the resistance of the track to buckling on approaches and being proactive in wintertime ahead of summertime challenges. 'We've seen the number of track buckles drop markedly since we shifted our focus to this seasonal approach.'
- Implementing monitoring systems to look at the load and stresses on bridges, and the overall health of the structure.
- Re-railing tracks, including in specific areas between Goulburn and Sydney, and 600kms of track between Adelaide and Tarcoola.
- Undertaking the ongoing replacement of bridges in a planned way.
- Tracking geometry improvements to improve customer perception and ride quality.



### RISKS CAN HAVE FAR-REACHING CONSEQUENCES

For ARTC, the effects of risk can be significant and ongoing, and one risk can lead to another. And even after an issue is resolved, it can continue to have an adverse impact.

Explains Campbell: 'In New South Wales in 2012, a bridge was destroyed because a track buckled on approach to the bridge. Luckily, there was no loss of life but it in that instance, our customers and their transportation of their bulk produce were completely cut off.' In this situation, 'we were able to repair the bridge very quickly, in just three weeks'.



## MAINTENANCE FOCUSED ON RELIABILITY

When it comes to asset maintenance, ARTC is planning for shifting from a time-based to a reliability-based approach.

‘We are incorporating monitoring systems to gather sufficient data to make decisions on when you should intervene based on the reliability. This reduces the burden of maintenance because we can intervene at the right time to extend the life of the asset,’ Campbell says.

‘We are also replacing low reliability items with high reliability items, so that the overall reliability can be improved.’

This approach includes managing assets differently based on age, as preferred construction materials and technology have changed over time.

New assets typically have much better performance. ‘For example, the sleepers used to be timber, and now they are made of steel reinforced concrete. There is better track buckling resistance with the concrete.’

Aging assets tend to require greater investment and monitoring. ‘For old assets, we look at a number of things, like measuring systems on the train to see how it’s responding as it goes along the track,’ Campbell says. ‘In the case of track and static structures, we have installed strain and stress monitoring equipment. We’ve also installed wayside equipment – we measure the noise of the passing train so we can listen for bearings that approach the end of their lives.’

## A DATA-BASED APPROACH TO AGING ASSETS

To inform their reliability-centred maintenance approach, Campbell says ARTC is also improving their data capabilities. ‘We’re implementing supporting tools to gather data, like drone inspections to cover large bridges and tall towers.’

With accurate and wide-ranging data critical to their operations, ARTC maintains an extensive list of systems, including asset condition, performance, structural integrity and acoustic data.

‘We’re also focusing on data handling – how we collect, display, analyse and interpret that huge volume of data from train-born and wayside monitoring.’

And they’re supporting their team to get the most out of the data. Explains Campbell: ‘We’re focusing on upskilling, and helping our people make informed decisions based on the information that they have at hand and equipping them with the tools to trawl through that large set of data.’

## GROWING SHIFT TOWARDS SUSTAINABILITY

‘Sustainability is becoming a priority,’ Campbell says. ‘Some clients are asking for sustainability



management plans, covering energy management use, water use and control of top waste streams, as well as asset sustainability.’

For ARTC, legislation is also driving a focus on sustainability, such as carbon requirements. ‘It’s seen as an evolving requirement – senior management understand the importance of it.’

However, when looking at the environmental waste minimisation dimension, Campbell says it needs to be balanced with financial sustainability. ‘When we’re looking at the preservation of an aged asset, at some point the risk becomes unacceptable and you can’t control the risk.’

## MEETING EXPECTATIONS IN THE FUTURE

Moving forward, Campbell anticipates even greater asset monitoring and data collection. ‘This is encouraged by monitoring systems being increasingly cost effective.’

Meanwhile, he is conscious of a continuing trend for customers demanding higher axle loads and higher speeds, which impacts on the assets. ‘The customers want higher speeds in high traffic density areas. You can’t just allow it without understanding the impacts and implications, but we have to be competitive.’

ARTC are continually improving their quality assurances and processes. The ideal is ‘good assurance and good feedback to give people confidence’.

Improving aging assets ultimately comes down to delivering the service the customers expect. Says Campbell: ‘It’s about being responsive to our customers. For example, our customers want increased capacity – heavier trains, faster trains. We need to make sure the network can cope with that.’





## An asset's life: a case study

David Sutherland, a consulting engineer, draws on over 40 years' experience in alumina, mining and industrial chemicals industries. For Sutherland, insight-based planning is the key to maximising the lifespan of an aging asset and offers a competitive advantage for Australian organisations.



## COST TO REPAIR THE BIGGEST RISK FOR AGING ASSETS

With an increasing sustaining capital and maintenance spend along with deteriorating performance as an asset reaches maturity, Sutherland sees the increasing burden on operational costs as the biggest risk to an organisation.

‘You have a dilemma,’ he says. ‘Either keep spending immediate cash flow to repair the asset or invest capital to replace it.’

Other risks identified by Sutherland include:

- **Frequency of downtime/unplanned loss.** All process plant equipment has an effective operating life and typically experience decreasing utilisation and higher maintenance as they age. Most major assets such as boilers, grinding mills and pressure vessels have a finite life and when reached progressively increasing downtime and maintenance cost will dictate replacement. Typically, large equipment may benefit from a half-life overhaul however, there comes a point where any further overhaul becomes so extensive that it effectively becomes a replacement.
- **Availability of spares.** As assets age, the availability of spares typically decreases, especially for bespoke pieces of equipment. As technology improves, you will very rarely get like for like and you can end up needing to replace the whole asset or reconfiguring new parts to suit the older assets. This can be very expensive.
- **Lack of expertise to maintain.** Some equipment requires specialised tradespeople to work on it. Long term assets can be built to last beyond the lifecycle of people’s working life. The expertise required to maintain an aged asset or component can be lost.
- **Aging asset no longer conforms to EH&S best practice or statutory regulations and requirements.** Industry drive to improve EH&S performance including process and machine safety may mandate upgrade or replacement of equipment. ‘Where equipment no longer meets expected standards, we would then need to modify or replace with the modern equivalent.’

## REPLACEMENT COSTS CAN BE EVEN GREATER WITHOUT IMPROVEMENT

The cost of maintaining an aging asset can be significant, but it can be an even greater cost to replace it, unless efficiency can be simultaneously increased.

‘There is normally an increasingly high sustaining capital demand for an aging asset,’ Sutherland says, but ‘there’s only so much cash flow that a business generates.’



‘High maintenance expenditure may constrain expenditure in other areas to improve the business and may end up spending available cash but not improving competitiveness. For a business to be sustainable, it needs to progressively improve. If it can’t be resolved, this asset has now reached the end of its economic life.’

Because the cost to replace an asset can be prohibitive, it can threaten the viability of the business. ‘You can end up with a decision to make: how can we replace the asset and improve our overall cost position, or do we consider closure?’

## MAXIMISING AN ASSET’S PRODUCTIVE LIFE

Careful planning can improve the lifespan of an asset, says Sutherland.

‘You need to operate the asset to maximise its productive life. All businesses need a maintenance and operability program. Typically, this would include an operating strategy coupled with a preventative maintenance plan and a life cycle analysis.’

‘There would also be regular asset integrity assessments to ensure the site operations aren’t over-stressing or under-maintaining the asset to meet short-term productivity goals. Governance systems are typically applied to ensure a system is maintained,’ Sutherland explains.

A long-term maintenance plan and associated expenditure is also needed to support budgeting at a corporate level, ‘especially for capital-intensive assets’ he says. This helps businesses forecast and plan ahead for significant variations in spending.

Assets also need to be supported by competent site operations and maintenance teams. Historically sites would be largely self-sufficient, however, with increasing equipment complexity and specialisation it is increasingly common to use specialist contractors who can often more effectively undertake both routine and major maintenance.

‘Most companies still retain a level of in-house expertise where the equipment is unique to their industry – specialists to maintain and operate the equipment.’

‘When more complex or persistent maintenance problems arise, businesses often seek external support from subject matter experts,’ he says, especially if productivity is being affected.





## ASSET PURCHASING IS A LIFE CYCLE DECISION

For Sutherland, future-proofing an asset starts before it is even purchased. Operations need to consider the life cycle of the operations and purchase equipment best suited for that purpose, even if it's a greater expense up front.

He explains: 'You buy according to your long-term need. A large organisation with long life cycle operation may invest in more expensive equipment up front with a higher duty. If you're an operation with an expected 10-year life cycle, you can often buy less expensive equipment.'

The time after purchasing is critical to an asset's life, Sutherland says. 'It's important to have an asset integrity program implemented from the start. And you need to take care commissioning equipment – in that early phase the equipment has a greater potential to be damaged because it may not be adapted for the purpose, or the operating team might not know how to operate it without damaging it.'

## MONITORING MORE IMPORTANT THAN EVER

Sutherland sees that the biggest change in asset management is the increased level of equipment monitoring technology that is available.

'There's a whole new world of improved or enhanced tools that now enable more proactive maintenance which enables lower total operating cost. There's a lot more maintenance and equipment operating parameter recording done now and increased traceability/service history of parts,' he says

'For example, there's an online visibility of equipment performance such as load or vibration metrics that weren't readily available before. It means you're more easily able to proactively maintain equipment. This early detection prevents running to failure and minimises the cost of maintenance.'

Adjusting maintenance strategies for specific operational conditions can also help minimise maintenance costs. Keeping these costs down is critically important for Australian industries threatened by shifting global economics.

'For large maintenance is a very significant operating cost component. With greater cost pressure on large manufacturing sites in developed countries, high operating efficiency is critical otherwise we see a migration of these industries to lower cost countries,' Sutherland says.



## A SUSTAINABLE FUTURE THROUGH DIGITAL SOLUTIONS

Australian organisations are increasingly reliant on digital systems, including data recording capabilities, to improve operations and optimise asset life and maintenance spend. They are vital for Australian businesses looking to compete in the global market, Sutherland says, as they increase efficiency and decrease costs.

'To be sustainable in business in an Australian operation, you have to have very high utilisation of an asset,' Sutherland explains

'Operations can now have a highly detailed digital record of the operating life of each equipment item. The record can include everything that's happened to it in terms of maintenance. The service history of individual components can also be tracked. In terms of operations, online data systems record important performance metrics as well. A comprehensive maintenance and performance records allow both troubleshooting and life cycle optimisation.'

This data can be shared and used widely. Says Sutherland: 'At a site level the appropriate maintenance engineer or operations engineer can analyse the data. It can also be monitored, in real time, at a corporate level. Corporate teams can use the data to support site maintenance, and data can also be shared around globally to bring the support from experts in other parts of the business.'

It is also important to look at the total operating cost of an asset over its life cycle. Buying an asset with a higher efficiency or longer life can be more cost effective, even if it is initially at a higher cost.

'If you're taking a longer-term view, which is synonymous with sustainability, you often pick the higher-efficiency piece of equipment,' Sutherland explains. 'With very lean profit margins, many operations are looking at the lowest operating cost. Any long-life asset becomes a priority for both lifespans for the asset and the life cycle consumption of resources. They're more efficient over the longer term, which keeps costs down.'

Says Sutherland: 'The only way to compete is to be highly efficient and continuously improve.'





# Summary – What will the future look like?

As the pandemic situation in Australia continues to develop, asset managers and owners are facing some challenging times. As assets age, maintaining fitness for purpose becomes more demanding, as reliability decreases, and obsolescence risks increase as systems and components may no longer be supported. Throughout the world, asset owners are sharing the same challenge: how to maintain customer serviceability requirements and production capability on aging asset portfolios, whilst maintaining value for money and preserving the integrity of the assets.

But there are some great insights and signs that we are already seeing. Arcadis has helped many organisations to introduce initiatives to improve reliability and maintain serviceability requirements such as criticality assessments, risk-based inspections, and reliability-centred maintenance to support our clients on their journey towards healthier and more resilient future asset management.

We have seen the sector take some great steps forward with regard to asset data maturity. We are currently developing and implementing AIP solutions across the globe to support our clients on the journey towards increased data maturity and competent asset management in relation to integrity, reliability and sustainability.

However, talking to asset managers around the world has highlighted that the assurance of asset integrity and optimisation is reliant on informed evidence-based decision making.

Data assets, similar to infrastructure assets, must be understood, governed and managed to maintain its integrity and the accuracy of the models. The risk is, that post-pandemic downturn results in resources and investment drying up, arising in cuts to inspection routines, decreased routine maintenance and data collection. As this temptation prevails to switch back to reactive models, asset managers will experience revenue losses, increased failure rates and downtimes and subsequent increased capital costs and unsatisfied customers.

Arcadis is helping large infrastructure organisations to manage these aging assets through the application of engineering and digital processes, policies, and strategies. We utilise AIP and data analytics to support informed portfolio decisions that enable our clients to deliver the best service to their customers against increasing funding pressures and demanding stakeholder and productivity expectations. Increased investment in asset performance, reliability and sustainability are required to see critical assets through the downturn in the most efficient way so that you can manage risk effectively yet achieve the commercial goals of your business.

Lastly, we need to learn the lessons from the GFC and avoid taking opex cuts as a means of being more price competitive. As we heard from our clients, investment levels never recovered, therefore, we cannot afford to set a new lower baseline for opex spend without first ensuring that decisions are being made on sound data and accurate asset condition.

Changes will be inevitable, but it is not always the end. Even the most challenging times can show and teach us new ways of working and help to cope with the changes as we future proof the assets of tomorrow.





# About Arcadis

Arcadis is the leading global Design & Consultancy firm for natural and built assets. Applying our deep market sector insights and collective design, consultancy, engineering, project and management services we work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets. We are 27,000 people, active in over 70 countries that generate €3.3 billion in revenues. We support UN-Habitat with knowledge and expertise to improve the quality of life in rapidly growing cities around the world.

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