



MACQUARIE



Global Infrastructure Hub Conference

Sweating the asset

Macquarie Projects

February 2016



Use of computerised asset management systems

provides active asset managers with the right tools to manage the trade-off between performance of an asset and lifecycle expenditure.

Well programmed maintenance will extend the life of an asset.



'Sweating the asset'

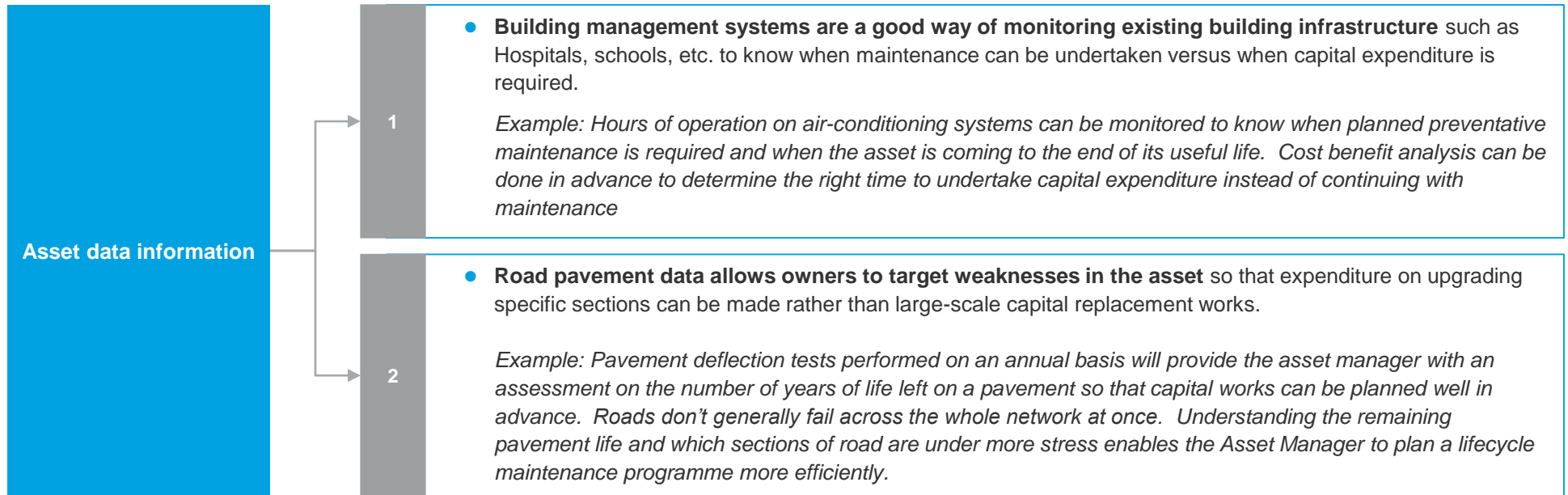
to maximise its performance is an art-form based in both science and management.

Through the design process redundancies in capacity are inherent.

These redundancies can be actively managed to get the most out of existing assets in a cost effective and efficient way without compromising performance standards, thus maximise performance and return on investment.

Asset data information

Asset data information on operating assets is key in determining how to extend the life of an asset in a cost efficient manner.



Planned preventative maintenance

Planned preventative maintenance: is required to gain the longest life out of an asset. Maintenance is key and is a smaller cost over the longer term to extend the life of operating assets

Performance can be maintained and enhanced by strong maintenance programmes

1

- **Daily, weekly and monthly operational maintenance**

Example: In the same way that we 'service' cars regularly to maintain optimum performance, so to should mechanical equipment be maintained

2

- **Life cycle maintenance**

Example: capital work expenditure to replace key parts of assets can often be pushed back a number of years if the operational maintenance has been performed well

- **Gaining an extra year or more before having to incur capital expenditure can have a big impact on investment returns**

Example: Replacing turbines in power plants beyond an expected life can lead to substantial savings

3

- **Using new technology to reduce maintenance** in certain areas is also a way of reducing operating costs provided operating performances are maintained.

Example: LED lighting has had a big impact in recent years due to much smaller power consumption, longer life of LED lights compared to older technology. Initial costs are traded off over time. The Asset Manager spends less time on planning, purchasing and replacing existing bulbs on shorter cycles.

Redundancy and servicing demand



Redundancy

Infrastructure assets are designed with redundant capacity. This provides active asset managers with a large degree of scope to 'sweat the asset' and push back capital expenditure.

Example: Sewerage network pipes come in set size pipe diameters. Engineers select the next largest size that their design calculation determine because pipes come in fixed diameters. This provides inherent additional capacity that can be used to extend the life of an asset and push back large capital expenditure programmes.

Servicing Demand

Over time, infrastructure usage generally increases, and having an active manager in place with the right level and standard of information on the asset allows them to safely manage the increase in demand balanced off against the inherent excess capacity, without leading to loss of service.



A good way of maximising asset investment.

'Right-sizing'
the asset to meet demand, through smart designs that allow the assets to be expanded as demand increase is often a way to maximise capital expenditure.

Capital Works expansion programmes are generally the most efficient way of providing additional infrastructure capacity.

Examples:

1

Roads being expanded with **additional lanes**

2

Sewerage treatment plants designed in modular form enable the **expansion of up to 5 times or more of the capacity** so that initial capital outlay is minimised and expansion capital outlay is triggered only when demand requires it



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Macquarie Projects

About Macquarie Projects

Macquarie Projects advises on project developments across Asia and the Middle East

- Macquarie Projects provides commercial project development advice to Clients regardless of funding arrangements
- As one of the world's largest owner / operators of infrastructure assets, Macquarie has developed a centre of excellence within Project structuring and implementation. Drawing on this experience as an owner allows Macquarie Projects to understand what it means to be responsible for the success or failure of a Project and what commercial arrangements are necessary to meet Client's requirements.
- The commercial expertise that Macquarie Projects applies to projects differentiates it from the rest of the market.

Combining knowledge and skills to anticipate and mitigate risk in the complete matrix of project and investment dynamics is neither natural nor widely available within engineering and construction advisers. Macquarie's corporate financing and investment background is unique amongst advisers.

Macquarie Capital's experienced project specialists based around Asia and the Middle East are dedicated solely to assisting clients with their project needs



Clients and Assets

Macquarie Projects provides commercial project development advice regardless of funding arrangements

Who Macquarie Projects can assist

Project owners
(Government / State Owned
Enterprises)

Developers
(Public and private)

Financiers
(Debt and equity providers)

Other stakeholders in the
procurement, delivery, investment,
execution or operation of a capital
expenditure project

Infrastructure



Water



Ports



Wastewater



Transport



Road



Air

Social



Schools



Healthcare



Power



Telecommunications

Macquarie Projects understands what it means to be an Owner of an Asset

Macquarie Projects advises on:



Feasibility

- Provide advice during development phase of projects e.g. Developing masterplans, design, feasibility studies, cost estimates, demand forecasting
- Assist client to engage advisers to complete deliverables – technical consultants, due diligence advisers, engineering firms, master planners, cost estimators
- Reviewing and commenting on findings / deliverables from Client's consultants and advisers to ensure that commercial aspects of project remain robust;



Documentation

- Understanding Client's expectations and required deliverables (delivery date, delivery price, aesthetics, revenue generation)
- Selecting the right procurement model for the project (BOT, PPP, DBFOM, D&C, etc.)
- Structuring commercial arrangements in project documents that will achieve the Client's required deliverables
- Making Client aware of their obligations and deliverables under the Project documents (eg. Authority approvals, payment processing)



Procurement

- Both Buy-side and Sell-side roles depending on Client requirements
- Structuring procurement arrangements with Client's legal and technical advisers to seek best available offer in the market
- Educating Bidders / running workshops with Client and their advisers on the procurement process, Client's objectives and required Project outcomes



Delivery

- Selection / procurement of suitable teams to manage delivery of the project during construction phases and operational phases;
- Commercial aspects of the project documentation as they are being implemented in the construction or operational phases, and what impact that has on the Client;
- In certain circumstances Macquarie Projects will step in and act as Owner's Representative during the Construction or Operational phase and manage the delivery teams;
- Managing reporting requirements;