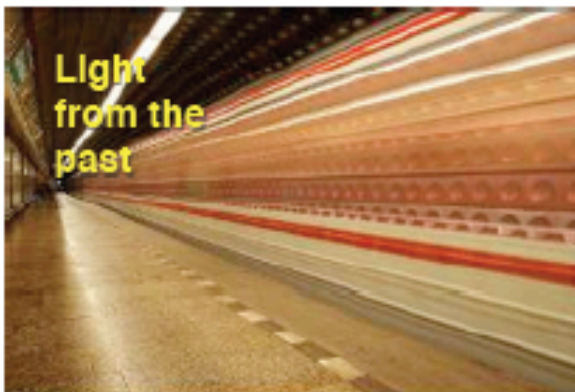


AMQ  
International's

# STRATEGIC # 325 ASSET MANAGEMENT



September 19th 2011

## Utilisation

An asset may be well maintained, functioning well and running as cheaply as can be managed and yet it may still not be 'pulling its weight' and so fail to give back in benefits more than it is costing in resources. This may be the case if it is heavily under-

utilised. It is for this reason that Treasuries and Head Offices are interested in measures of utilisation: it gives them strategic insight into the existing (and desired) shape of their portfolios. Under-utilisation is often thought to arise simply through changes in demand over time -and that, consequently, there is not much that can be done about it. However, this is not true.

Under-utilisation can result from poor design or poor planning. It can be provoked by poor decision making. Frequently it continues because management is unaware that it exists, or if aware, unaware that something can often be done about it.

When resources are scarce, as they are now, the ability to address under-utilisation is a valuable AM skill. (The ability to communicate the benefits to management is another one!)

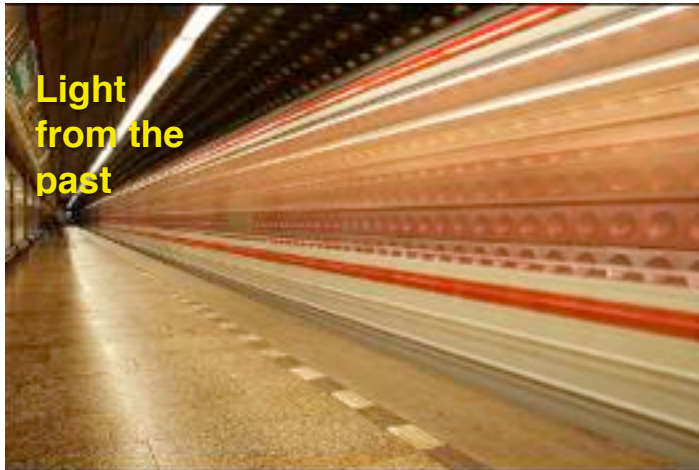
In this issue I have gathered together a number of articles that were written some years ago when this topic was being seriously addressed. It never fails to amaze me how many of the good ideas we were looking at in earlier times are still valuable today. But perhaps I shouldn't be amazed, after all whilst asset management has become broader and more encompassing, the fundamentals haven't changed.

Consider - and enjoy!  
Penny

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## Thoughts on Utilisation

a collection of writings from 1994!



All of the Strategic Asset Management issues from January 1999 are available to subscribers on our website, [www.amqi.com](http://www.amqi.com) But we started writing on asset management in 1994 and some of the ideas that arose then, and the issues that were of concern then, are still important today.

Yes, some of the ideas in this issue may have been rendered obsolete simply by the passage of time. They were, after all, written 15 years ago. But many reflect ideas and issues that were current at the time but have since been forgotten in the press of other activities. *You may find that many are worth re-thinking in your current circumstances.*

Some of the articles present solutions, some simply clarify the issues. Often you may find that the clarification of issues is the more valuable, since new solutions will, in many cases, now be available - once we know what we are looking for! And not only that, but that the process that these early asset managers went through to tease out the dimensions of their problems, may well inspire you to explore not only this but other problems that you face.

On the next page there is an interesting article on the use of life cycle modelling to analyse the impact of demand growth.

Another aspect on the use of life cycles for thinking through the future utilisation of assets (or for understanding the current levels of utilisation) is to look not only at the supply side, or the traditional life cycle *cost* models but also to consider the life cycles of the products or services that the assets supply. Mike Smart looks at this with respect to rail in Strategic Asset Management, Issue 8, April 23, p. 62 available in the archives.

Demand growth is relatively smooth but the most efficient way to construct infrastructure assets is in large lumps. This means that there is an inherent tendency to under-utilisation simply because of the nature of infrastructure.

Robert Hood looks at this problem and suggests the use of life cycle analysis to explore the growth in demand, instead of just the decline of the asset!



## Capacity Utilisation Life Cycle Modelling

### Modelling the period of time between construction and full utilisation.

Life cycle analysis traditionally looks at the period between the acquisition of an asset, or a component of an asset, and the need to replace it or to carry out some major refurbishment activity.

But for large and lumpy infrastructure assets such as dams, sewerage and filtration stations, etc. which need to be constructed ahead of full demand, life cycle thinking may be used to model the period of time between construction and full utilisation.

### Changes in design can affect utilisation

Utilisation life cycles are important for asset managers who need to plan for increased capacity, or to decide whether to refurbish an existing plant (thus taking it out of operation for a period) as against build anew. Even simple changes in design may affect utilisation as can easily be seen in the impacts on the utilisation and, therefore, efficiency of an air conditioning system if internal walls are added or removed.

### Different components not only age at different rates but reach their full capacity utilisation at different rates.

Where an asset system consists of multiple layers such as a water supply system with headworks, watershed supply level assets and zone level assets, the integration of the different utilisation patterns can be complicated. This is especially so, if the rate of utilisation for the different levels is driven by different factors.

A similar pattern of layering could be seen in, say, a hospital with the utilisation rates of office space, ward space, surgical space, corridor space and plant room space growing at differential rate and driven by different factors.

These are problems that need to be addressed in the construction of a long run marginal costing model, but the issues are broader than costing alone.

The type of asset layering chosen has implications for the period over which capital expenditure and cost data needs to be collected and evaluated.

For example, water zones operate with a 10 year capital expenditure program which is considered a reasonable period in which to detect growth expenditures and relate these to increments in demand.

Watersheds, however, with their different asset types are considered likely to have longer life cycle before growth expenditure occurs and for that reason, a period of 30 years is more reasonable for marginal cost calculations.

System assets, like major reservoirs have even longer cycles before capacity would require expansion so the period chosen for the top system supply level is more appropriately 50 years.

### **Modelling not the using up of the asset - but rather using up its capacity to meet further demands without expansion.**

These periods do not relate to the period in which the capital is likely to be 'used up' and need replacement, but rather to the period in which it is likely to go from severely under-utilised to full capacity use. Clearly these periods will be dictated by whether demand is growing quickly (as may be the case in new suburbs) or is growing more slowly.

The level of utilisation is an important cost factor and the development of such utilisation life cycle models could be very useful for financial asset management.

#### **Questions:**

**1. Should we build ahead of demand? (and face years of under-utilisation) Or should we build behind demand (and experience a period of customer rationing)?**

**The answer can only be determined by considering the severity of the consequences and what options are available to mitigate the consequences of the choices made.**

**2. When do we come to the end of economic life, when the asset or component needs renewal or when it has insufficient capacity to do the job?**

**Answer: whichever comes first! Thus minimising the LCC requires attention to growth as well as decay factors.**



One of the reasons why Treasuries and Head Offices were most concerned about the issues of wasteful under-utilisation is that they felt that their departments were not sufficiently aware of the issue or able to deal with it.

This inspired these thoughts from Alan White.

### **Where are the “Red Flags”, the “Action Triggers”?**

If the right AM actions are not happening in your agency, ask yourself “Where are the triggers?”

It is not enough that an asset management action produce benefits, we have to be able to recognise these benefits *when the opportunity arises*. Since there will always be many things fighting for our attention at any one time, we need built-in ways of bringing these opportunities to our attention in ways that make it difficult for us to ignore them.

If someone wants a new asset, they will generally keep up the pressure on you until some action occurs. This is a very effective ‘action trigger’. If a vital asset has broken down and needs repair or renewal, there will be similar pressure.

But what if an asset is being under-utilised, over-maintained, under-maintained, or is surplus to requirements. Where then is the pressure for action?

Your organisation structure (and information system) may require some re-engineering to ensure that

- (a) there is some signal that there is a need for action, and
- (b) the signal has the strength to compete with other demands on your time and the time of your staff - and the attention of your CEO.

**Ed: Make it personal! An idea.**

**One of the problems - both with the desire of councillors to acquire new assets, and their unwillingness to get rid of old ones - is that they don't have a personal stake in the actual choice. What if they were each to get a share of the total capital budget which they could vote to the project of their choice - and any capital recovered from sales was shared between them for the same purpose?**

Under-utilisation can be seen as a 'problem' to be solved - or it can be seen as an opportunity.

In our very first issue, back in March 1994, we published the work of Network SouthEast, British Rail, who came up with these very good ideas (and were extremely successful when they put them into action).



## **Five Golden Rules for Increasing Asset Productivity.**

### **1. Any Asset not sponsored by a business must be scrapped!**

Every single asset should be pinned down to a single business owner and then down again to a single owner within a business. Common assets 'held centrally' are a recipe for waste. Application of this principle reduced the locomotive fleet by 17% and wagons by 25%. saving over \$A200 Million (and this was back in 1994!)

*Ed: This idea is not only for businesses that have an income return. If your business sections could retain their maintenance resources but could dispense with low productivity assets and so spread these resources over a smaller portfolio, how many would then opt to retain all the assets that they have?*

### **2. If in doubt, cut the asset base down**

The trick is to live mean at periods of peak demand. Only two thirds of the train assets and half the infrastructure and station capacity is needed off-peak. NSE has been able to handle a 20% increase in commuting with a reduction in coaches - and still reduce over-crowding! Timetables are rewritten at least twice a year to matching changing demand patterns and no trains are scheduled for maintenance or cleaning in the peak. A 5% reduction in assets is worth \$A26M (1994 prices) to NSE in reduced depreciation.

*Ed: While I was in Kuala Lumpur I noticed that the alleyway across the road from my hotel was a parking lot by day but early in the morning and in the evening it was filled with tables and chairs and portable cooking facilities. How many of your spaces could do 'double duty'?*

### 3. Sweat those Assets

Fenwick Street station is a lean asset with only four platforms serving a daily throughput equal to Gatwick airport. It commands a huge station trading potential and new shops, pubs and buffets now yield a second and growing profit. Situated in the heart of the city, in an ultra expensive area of land, the sale of the airspace above the station has been exploited to the ultimate. Two rival office developments were built across the top of the station- yielding even more profit to the shops underneath. In another case, falling traffic led to the closure of a station, redirection of the route, and the station closed and made way for office development.

*It is now earning 30 times as much as before.*

### 4. Asset Synergy or Lateral Thinking

Encourage lateral thinking between groups of assets: two plus two equal a profitable five! A good example lies in fill-in electrification schemes such as South Hampshire where a pocket of old diesel trains operate in a largely electrified network. The traction function's problem was to make a financial case for new diesel trains but the solution came from the infrastructure group with a proposal to electrify the route instead for the same capital cost as the diesel trains. The operations function then demonstrated that they could 'sweat' the surrounding electric fleets avoiding purchase of any new electric trains.

*Ed: Many road and other organisations have separate divisions for new works and for asset management. Maybe there are opportunities for gain and greater productivity by involving both groups in new works proposals?*

### 5. Think Smart!

Low cost ingenuity can save millions of dollars of new assets. One division with a major communications problem but no hope of getting the \$A11 million capital investment from NSE determined to solve its problems and finally hit on a short term solution of pocket 'paggers' for all staff. For set-up costs of \$A30,000 and running costs of just \$A33,000 per annum, the control office can bleep every member of staff whether on train, stations or trackside and send a 40 word consistent message detailing a cancellation, an emergency service or the business results of the day.

*Ed: Note: this was 1994! Just think of the opportunities available to you today!*

**Under-utilisation is endemic in schools and the education sector generally. Whilst much may be accounted for by political tendencies to build new schools in politically marginal areas and the political difficulty of closing schools, nevertheless much can be done to avoid wasteful excess space by careful design. Richard Davoren and the Tasmanian Education Department contributed the following ideas in September 1994.**



## **Good Utilisation is a matter of design**

Under-utilised space and equipment wastes capital and creates excessive maintenance, how do you ensure that your design does not build in more capacity than you require?

### **In the Tasmanian Education Department the problem was this:**

Establishing square metre per student space requirements can lead to excessive space provision if attention is not paid to the level of utilisation of the space provided. Where new uses and technology require increased space for student, space requirements increase, yet there seems to be little corresponding tendency for decrease in those areas where changes in technology and use result in lower space requirements. The result is an upward spiral and under-utilised resources.

Another factor is the increasing number of specialised courses requiring specialised spaces. Greater choice means fewer students per course. Designing a specialist room with space for five students hardly seems reasonable, yet in some specialist courses this may well be the limit of need, even after some years of growth. Specialisation is resulting in rooms being oversized for need, and unoccupied for much of the time (or else used by non-specialist users who could quite easily use far less expensive space.)

## **Towards a Solution**

### ***How are target utilisation rates to be developed?***

It seems sensible to establish some benchmarks by reference to 'best practice' utilisation rates achieved in other places. An alternative is to set the utilisation rate by what can be afforded.

### ***Utilisation as percentage of what?***

How should we measure utilisation? This is a problem for everyone, not only managers of schools. The options for schools are many: as a percentage of 'normal' school hours, or a percentage of total available hours (theoretically 365 days x 24 hours). While the total hours approach is the most objective and was recommended in the National Board of Employment, Education and Training's Report 31 on "Developing Indicators of Infrastructure Needs in Secondary Schools" (August 1994), the use of a restricted base, say 8 hours per day for the school year, could provide better managerial incentive.

### ***How do we define spaces? (e.g. rooms, ovals, walkways, plant rooms, sheds?)***

Space requirements per person made sense in the days of generalist classrooms, which were fully utilised for the school or college day. Now the same application of space requirements per person, when that person may be occupying 5 or 6 spaces at different times during the day (general class, library, specialist classes, travel (e.g. corridors) cafeteria, etc.) can, and does, lead to large increases in overall space requirements - at consequent cost. Space requirements per person need to be modified by the percentage of time that the person is likely to spend in each space.

Recognising that many staff members are not in their offices during the day but out on the job, led space management specialists, such as Frank Duffy, to rethink the need for space in office accommodation. Agencies adopting a Duffy-type approach have reduced their office accommodation needs in some areas by up to 75%. Can similar thinking help contain costs in education and other areas whilst maintaining, or increasing services?

### ***How do we define utilisation?***

Number of hours of utilisation, or the intensity of use during these hours? E.g. if a laboratory is designed for and capable of handling 30 students and two students occupy it for a few hours doing a special project, what is the utilisation - 2 hours x 2 or 2 hours x 2/30? (The NBEET study differentiates between 'use' and 'intensity of use' and you may wish to do so also to get a good understanding of the level of utilisation you are facing - and thus the problems AND the opportunities you have.)

How do we aggregate different utilisation rates across different spaces to get an overall measure, a measure that will present incentives to design economically as well as to manage economically? E.g. do we weight by space measurement? or by capital cost of space provided.

### ***Questions:***

- 1. What new options does the innovative use of technology provide you today for getting better use of existing space? And how may these be used to avoid wasteful excess space in future designs?***
- 2. How can you choose target benchmarks - survey, samples, what you can afford?***



Finally, utilisation - or any other one aspect of asset management alone - should never be our focus. Crazy things can happen when we allow ourselves to be guided by just one indicator of performance. Some of this craziness is captured in my following light hearted editorial of March 1995.

### **The Tao (the path) of Utilisation**

In a certain country, the road planners said that their extensive country roads were heavily under-utilised. "This is bad" said the Treasury. *"How do you know?" said the Asset Manager.*

The planners sought to meet the Treasury's demand for greater utilisation by encouraging greater traffic flows and they were successful. "This is good" said the Treasury. *"How do you know?" said the Asset Manager.*

The greater traffic flows led to increased pollution, accidents and congestion. "This is bad" said the EPA, the Road Users Association, and the Road Accidents Board. *"How do you know?" said the Asset Manager.*

The road planners put in bypasses to move traffic away from country towns. This improved traffic flows and reduced accidents and congestion in the townships. "This is good" said the road planners. *"How do you know?" said the Asset Manager.*

The traffic flow away from the country towns reduced trade in the townships, businesses became non-viable and closed down and so local people had to travel further afield for employment and purchases. *"How...*

..... Well, you get the picture!

**Focusing on one indicator alone, whether it be utilisation, safety, economic development or anything else, is no way to manage assets. In fact, it is no way to manage, period!**