AMQ International

Strategic Asset Management

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New Series!

SELECTING THE RIGHT TOOL FOR THE JOB

A spade is a spade is a spade! Right? Not if you need a shovel.

See our new series starting this issue —–>

Every technician knows that a BSE won't do if you need a metric spanner and every finance person knows that you write in black, sign in blue, correct in red, and audit in green and that 'being in the black' is definitely not the same as 'being in the red'.

We *know* these things are not interchangeable and that we need a different tool to serve each different purpose. So why do we persist in the notion that *one* valuation, *one* depreciation figure, *one* discount rate will serve all purposes?

It is no more reasonable to use a market valuation for replacement planning or straight-line depreciation for asset management than it is to attempt to use a Phillips Head when you really need a straight screwdriver.

So why do we do it? The answer, in short, is "ignorance and delayed and diffused feedback". Use the wrong spanner, the wrong ink, the wrong screwdriver and your error is immediately obvious – or very quickly pointed out to you!

But use the wrong valuation, depreciation or discount rate and while the errors can create multi-million dollar wrong decisions, because the losses are of the "missed opportunity" kind, only careful audit and some analytical disentangling reveals the cause of the losses.

This doesn't make the errors and their consequences for your organisation any the less real.

Over the next several issues we will be looking how you select the right tool—the right discount rate, the right valuation, the right depreciation—for the job in hand. One size does not fill all. See over for the first in our new series.

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Selecting the Right Tool for the Job! Part One:

Discount Rates For the Maintain/Renew Trade Off Decision

In Issue 53 (Jan 12, 2001) "Does it REALLY pay to defer maintenance?" we carried out an NPV analysis to compare the maintain/replace options—but we deferred answering the question "What should be the discount rate?"

In the exercise given, readers were simply advised that they should use an 8% discount rate in order to carry out the calculations. We deferred to this issue, consideration of what the rate should really be. Issues to be considered include:

Hurdle rate

Risk level
Real / nominal

The Hurdle Rate

Many organizations have a minimum rate that all proposals should clear in order to be accepted. This may be the CAPM method (which we will talk about in a later issue) or it may be some other figure handed down from Head Office or Treasury.

This rate, called a 'hurdle rate' because it sets a hurdle that all new proposals need to clear in order to be accepted, is not the same as the average rate of return on existing projects.

It will generally be higher than the average for two reasons:

(1) The average return on existing assets covers those projects that worked well and those that did not work so well. The hurdle rate includes a risk premium which attempts to protect the agency's average return from decline from projects that do not turn out as well as hoped for. (Some may bring more than expected returns but that is rather rare.)

(2) The hurdle rate may also be set high to screen out lower rating projects in order to increase the average return over time.

The Hurdle Rate is too high for the maintain/renew decision

Why include a risk premium appropriate to a chancy new project for a project that has already proved its worth—so much so that it is now a core asset, one that you are not considering to dispose of, but one for which the only decision is HOW to continue its service?

If your current hurdle rate is, say 9% nominal, you would probably find that your average rate of return on existing assets is around 7 to 7.5% nominal.

But is the average the correct figure?

Risk Level

Logic says that there is a variety of risks attached to the various existing projects, but an asset that is so central to the supply of service that the only question mark is around HOW it is to be renewed is obviously at the low end of the risk spectrum.

So even your agency's average return rate could be too high. Depending on the spread of returns, assuming you can calculate them, the risk associated with the maintain/renew proposal is low and should be reflected in the discount rate used.

As an example, if the average is 7—7.5% nominal, then perhaps the appropriate rate is closer to 6.5% nominal.

Real or Nominal?

Finally, if the exercise is being carried out in real terms (that is, no allowance has been made to increase future costs by the estimated inflation rate, but rather – as we did in our exercise, real today's dollars are used) then the discount rate must also be in real terms.

A nominal rate of 6.5% with inflation around 1.5% is approximately 5% real.

In the exercise used in Issue 53 you were told to assume an 8% discount rate. Was it real or nominal? Well, no attempt was made to scale up the future maintenance or renewal figures to reflect estimates of future prices so the appropriate discount rate to use was a real rate.

(No attempt was made to consider pre tax or post tax figures but if you are working within a tax regime then if the returns are calculated post tax, then the discount rate must also be a post tax rate, and conversely.)

How does the 8% discount rate used in the Snowy Mountains pipe exercise look in the light of the above analysis? Well, the answer is rather high! I had deliberately chosen a rate that made the difference between the two slight to highlight the risk issue.

This argument favours maintenance now and the postponement of renewal.

The impact of the bringing forward of the high replacement cost would weigh more heavily with the lower discount rate.

A common rate applicable to all decisions?

For a number of years now we have lived with the notion that we must have a common discount rate applicable to all project decisions or else "how can we sensibly choose between them?"

The answer is that we choose on the basis on NPV or IRR or whatever aggregate benefit measure that we use now—we simply apply the correct discount rate to the task at hand. It is a nonsense to assume that very different projects should attract the same discount rate—ie have the same risk profile.

This assumption of common rates is reducing agency's attention to maintenance and increasing costs to the community.

Comment to Penny Burns, <penny@amqi.com>

But, you argue,

A high hurdle rate will help to improve the rate of return?

About a decade ago, Professor Ken Wright, Professor of Commerce at the University of Melbourne, drew my attention to the following tale.

He said that sometimes managers seem to be under the illusion that the profitability of their company can be raised by increasing the hurdle rate.

The absurdity of this view, he says, was brilliantly exposed some thirty years previously in George Terborgh's tale.

"The Profits of Procrastination"

Two managers are discussing equipment replacement policy, and the following conversation takes place:

"If a machine doesn't show enough savings today, we wait a few years and get more. You'd be surprised how they increase as time goes on. Eventually we get the profit from replacement that we want."

"But how much do you want?"

"That's determined by the head office. We take their figure".

"Well, I don't see why you should ever stop waiting. If it is a good thing to make 20% profit on the replacement investment, why isn't 50% better and 100% better yet? You can get anything you want if you wait long enough. The sky's the limit."

George Terborgh, Business Investment Policy Machinery and Allied Products Institute, Washington, DC, 1958, p. 43

For those of you who are technically minded, Chris Adam provides the following technical supplement on discount rates.

"The hurdle rate is typically calculated a the sum of the time value of money (or risk free rate) and a risk premium, ie

Hurdle Rate (Rh) = (Risk Free Rate (Rf) + Risk Premium (Rp)

The risk free rate (Rf) includes an allowance for inflation and reflects a preference for money now rather than money later. Typically, Rf is taken to be the rate applied to government bonds. As these bonds have a return guaranteed by the government, the risk on these investments is taken to be nil.

The risk premium is harder to determine. The rate of return for a rental property is less than that for an investment in an IT start-up company, but the question is how much less? The risk of an investment is calculated as a function of volatility of the expected returns.

Renewal is an Opportunity to Change Direction at Minimum Cost.

This can perhaps best be explained by a small domestic example:

> Imagine you have an ageing electric water heater that you plan to change to gas when it needs renewing in order to obtain the benefits of instant, plentiful hot water at reduced costs. However your house is not currently connected to the gas supply.
>
> One winter morning the shower water is stone cold, the heater non-repairable - and you find you cannot get gas connected for three weeks! Reluctantly you turn to the only option open to you if you don't want to suffer three weeks of cold showers, and that is to forgo your desire for a gas water heater and replace the old heater with a new electric one.

What has happened here?

By failing to plan ahead you have missed the 'opportunity to change direction at minimum cost'.

The same thing can happen in your agency.

For example, an ageing road needs repair, but it could also do with re-alignment. Suddenly, grant money becomes available for roads but to take advantage of it you need to spend quickly. You have not done the planning necessary for re-alignment, so the road is simply replaced as is. An opportunity missed.

Or a major shopping centre car park now stands where once there was an inner urban residential area. Underneath the car park are a myriad of small diameter water and sewer pipes that once connected that residential area to the main supply and treatment works. There is now the scope for simplifying the spaghetti of pipes into several large collectors, much cheaper to replace and maintain.

But, unless this is planned what happens is there is a pipe break and it is replaced, then another and another and before you know it, you have replaced half of the area and now it hardly seems worthwhile to simplify the network. An opportunity missed!

Renewal Projections Provide Planning Time

Oftentimes agencies will object to doing renewal projections on the grounds that "What's the use, we can't afford to do it all!"

But THAT is precisely the point!

The community is now not rich enough—or willing enough—to replace the current infrastructure system 'as is'. Nor should it do so. Better things are now possible. But only possible if they are planned ahead of the need for urgent breakdown action.

Renewal Forecasts Provide Options—They Don't Dictate Actions!

This is what the renewal projections are intended to do; they are not prescriptions, but guidance to provide an indication of renewal opportunities in time to give agencies the chance to consider options and choose the most appropriate path.

For all of these reasons, the renewal projections are not 'set in concrete'. Far from it. They are a guide to action. In this way they are meant to be changed!

To use the projections simply as a plea for more resources is to fail to manage—or to manage to fail.

Special for Councils

'Roads to Recovery' or Roads to Purgatory?

How will you spend your Federal Transport grants?

The Federal Government recently announced a 4 year program of road grants to local government of $1.2 billion. The grants are designed to cope with the backlog of maintenance work that has built up over past years, particularly with respect to rural areas.

Jeff Roorda (JRA, Jeff Roorda and Associates) has been gathering data on the costs of maintaining and renewing both gravel and sealed roads as part of an ALGA led study. Jeff joins me in explaining why the new road grants may be a blessing- or a curse- to local government, depending on how they choose to spend the funds. A modified form of this article is to be published in Public Works Engineering Jan/Feb 2001.

It is tempting to use the new funds to seal gravel roads

1. Councils using grants to seal gravel roads will save themselves the ongoing costs of maintenance grading and re-sheeting. The studies done show that this is a saving of about $1400 per km per year on average (see Fig 1, p. 23).
2. The more kilometres sealed the greater the savings — so not only can roads be maintained and service levels increased but funds are freed up to spend on other items as well!

But should you succumb?

Average annual unit cost for gravel roads approx. $1,400 /km/yr

What are the costs that will be incurred when roads are sealed?

Average annual unit cost for sealed roads approx. $5,500 /km/yr

Sealed roads have to be patched, repaired and re-sealed at some point. The results of the studies show that over its lifetime the average cost of maintaining and renewing a sealed road is about $5,500/km/yr . (Fig 2, p. 23)

Net Cost of Changeover is average $4,100 per km

Although councils are saving about $1400 by not having a gravel road to maintain they are paying about $5,500 to maintain the sealed road that has taken its place – resulting in a net increase in funding requirements of $4,1000.

So sealing roads provides some short-term breathing space, but it does so at a very large cost.

Plus Extra risk and liability if the new seal is not maintained

In addition to the extra expenditure needed, neglecting to maintain a sealed road carries more liability for council than neglecting to maintain a gravel road — pot-holes are dangerous whereas a lack of gravel just results in uncomfortable driving.

Who will meet the increased costs?

Will the federal government increase the size of the annual road grants to meet the higher service levels? Will councils be required to meet the needs out of their own funding and possibly higher ratepayer contributions?

Where it pays to seal

Where upgrading will generate council revenues (or generate maintenance and re-sheeting savings) sufficient to cover the extra costs there is no problem.

Example 1: Increased revenues, savings

For example, some coastal tourist roads are difficult, and costly, to maintain because of high usage and scarce, low quality, road making materials. There is a high demand in peak tourist seasons which is reducing the maximum life to only 6-7 before a total gravel resurfacing is required. Extensive and regular grading is required with water tanks and rollers to maintain the surface in between resurfacing.

As availability of high quality material reduces and level of service requirement increases unit maintenance costs increase. In the example above road materials need water and rolling because of the quality of available material. This can double the historical unit rates of maintenance grading.

These are circumstances where

1. There is the potential for revenue increase through tourist traffic into the area, and
2. There is the potential for cost savings because of the higher than average cost of maintaining the existing gravel road.

Example 2: Benefits exceed Costs, but they are not translated into extra revenues.

For example, the second picture shows the challenge of maintaining rural roads in remote areas. Without regular grading the gravel surface rapidly deteriorates. As the gravel layer deteriorates maintenance costs increase to sustain an all weather surface needed for rapid transport of goods by road trains.

It might be the case that the benefits to the national road network is worth the costs of upgrade, although they will not generate sufficient extra revenue or cost savings to the council to justify taking sealing action.

Where upgrading will generate benefits greater than the extra costs but these do not translate into extra council revenues, there may therefore be an argument for subsidy at a regional, state or national level. *But value for money at the national or regional level needs to be demonstrated.*

Where it doesn't pay to seal

No matter if the temporary ability to seal applies, or if the council wants to satisfy the many demands for better roads that are placed on it, or simply to look 'progressive' - If neither of the above applies, that if sealing neither generates its own cost savings or extra revenues, nor generates extra support from other levels, then

Councils that use the road funds to upgrade rather than maintain their roads are digging a very large financial hole for themselves. Their situation can only get worse.

What to do

Councils need to prioritise and demonstrate value for money from each project. This protects individual councils from spending unwisely. Treating the extra road grants as if they were lottery winnings could see councils worse rather than better off.

What Should Be the Total Level of Road Grants?

The present grants have been positioned as 'catch-up grants'. Over the years there has been much debate about how grants should be distributed but almost none about what the total level of those grants should be. This has been due to a lack of understanding of the principles of grant funding and a lack of information on a council's real costs. Current studies by the ALGA and Victorian and South Australian councils are helping to tackle this information issue.

Monitoring of Grants

The Commonwealth has stated that it will monitor the spending of the grants to ensure that they are used wisely. This could provide an opportunity to extend the 'catch-up' grants into something more permanent if councils can demonstrate that they are spending wisely and that their needs are real.

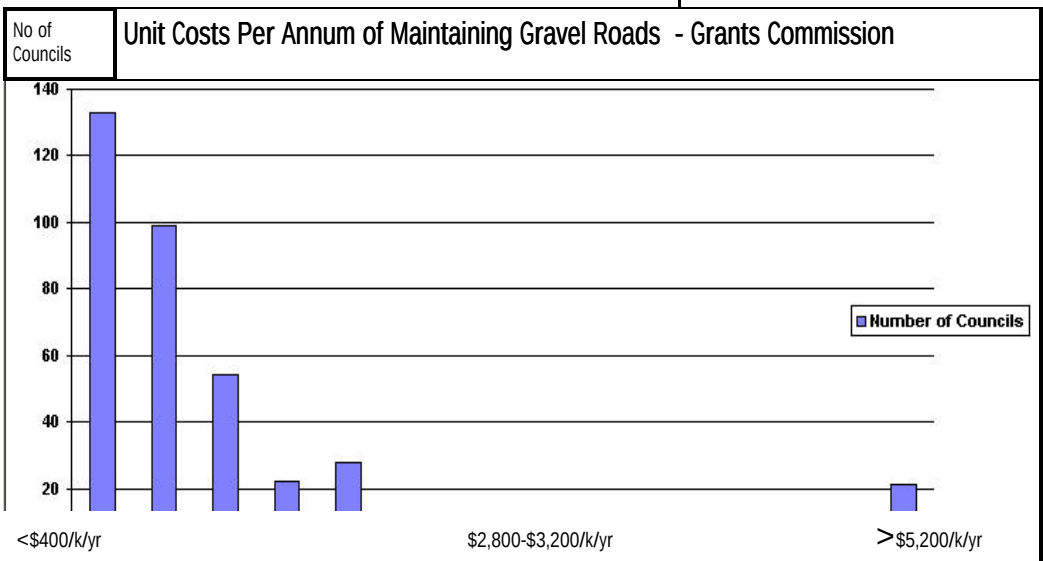

Fig 1.

Average Cost $1361/k/yr

No of Councils

NSW 139
SA 58
Vic 72
WA 125

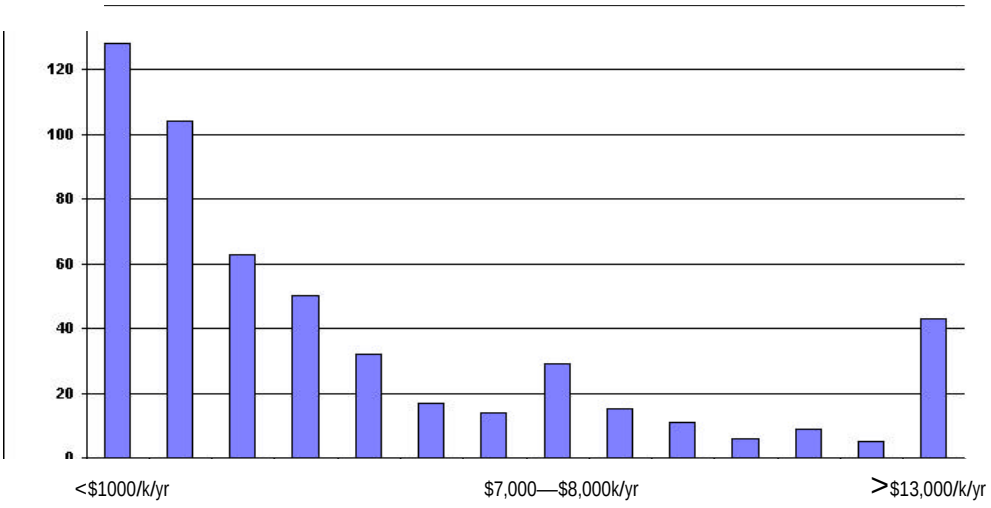

Fig 2

Average Cost $5,490

No of Councils

NSW 170
Qld 69
SA 68
Vic 78
WA 141

Avoidable Costs

In the previous diagrams, the spread of costs is noticeably wide for both gravel and sealed roads. Reasons include:

- The cost of re-metalling or re-sheeting may vary (if there is a local quarry the cost of re-metalling may be quite low, whereas for roads in national parks, where councils may need to truck in metal long distances, the cost can be very much higher).
- The life may vary (for reasons of usage, desired standards, climatic variations, or operating conditions (eg the road may be next to an irrigated area and be affected by the overflow or runoff))
- There may be variations in the type and cost of maintenance done to prolong the period between re-sheets or re-metalling to suit the local situation.

These are all *avoidable costs* in the sense that if the road were not there, the costs would cease.

Overhead Costs

In addition to these there are the *overhead costs*. Overheads include administrative costs, on-costs, perhaps a share of the CEOs time, etc. These are valid costs to include in overall costs.

But if the road were to be decommissioned these overhead costs would continue to exist – they would simply have to be shifted to other assets.

So in making a decision to switch from a gravel road to a sealed road (or vice versa) only the avoidable costs should be used in the decision-making, not the overheads. That is, only the direct costs.

Note: Council practices in what should be included in overheads and how those overheads are to be allocated to different assets and services varies very widely between councils.

Coming Up in Issue 56

REAL PROPERTY

The United States Federal Real Property Asset Management Principles have now been in place for just over 4 years. In the next issue we bring you the principles as they were enunciated. I am sure you will find them interesting and want to know how they have worked out in practice. So I am inviting you to send me your questions and I will endeavour to find out the answers.