Facing the Renewal Challenge

Victorian Local Government Infrastructure Study

A report prepared for the

Office of Local Government
Department of Infrastructure

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1. EXECUTIVE OVERVIEW

Expenditure Projections
This study examined the renewal requirements of 78 Victorian Councils under a range of default assumptions. The projections made are *not* forecasts of future *actual* spending, *nor* are they forecasts of future *desired* spending. They reflect expenditure that would be required if no rationalisation of asset portfolios or other improved asset management were to take place. If the projections "hold true", Councils have failed to heed the messages contained in these pages. The size of the problem, however, is such that even with rationalisation and management improvement, increased expenditure *will* be necessary.

The Projections Provide Information for Councils
The expenditure projections and their relation to current spending levels, given in the "sustainability" indices, indicate the management task ahead for Councils. *A Council's current position is largely a function of its past patterns of growth.* The sustainability indices provide sets of information useful for future planning by individual Councils. They are *not* performance measures. Still less are they benchmarks or "league tables". Uninformed use in this way could detract from their useful for management in addressing the future renewal challenge.

Ageing Assets
Councils all over Australia are now facing the problem of ageing assets in need of renewal. Many of these assets were never funded by the Councils in the first place but came by way of grant (from State or Commonwealth), from developer contributions or from a shift of responsibilities for previously State owned assets to local government. Had Councils been responsible for funding all of their infrastructure, it is highly likely that they would have acquired less. Moreover their rate levels would have been increased to meet the needs of asset acquisition and some of this higher level of rate revenue may have continued on to be available for renewal. As it is, Councils now have to prepare for increased funding to meet the needs of asset renewal.

The Task
Infrastructure in Victorian Councils is worth around $23.3 billion in current replacement terms, or approximately $13,000 per household. Managing these assets on behalf of the community is a big responsibility and good management requires good information. Councils know that some of these assets are now in need of renewal - but how many assets? How much will it cost to renew them? When will resources be required to be spent, or other management action taken, to avoid asset deterioration and loss of service?

The objectives of this study are to:
1. determine the ability of Councils to meet long term investment needs in the renewal and acquisition of infrastructure assets;
2. develop a model for examining the challenges of the task; and

3. make recommendations to improve the management of Victorian local government infrastructure assets.

Default Assumptions

The asset renewal assumptions contained in this study are "default" projections. They indicate the size of the funding problem that would arise if nothing were done to change current asset levels, standards, utilisation, etc. The default projections used in this study are that:

- all existing assets are to be renewed when their time is up;
- they will be renewed with assets substantially the same as the assets already in existence - i.e. they will not be upgraded (or downgraded);
- the economic lives will remain as in the original estimates and not change over the forecast period;
- the real cost of renewal will not change over the forecast period;
- maintenance and management practices will remain as they are now; and
- technology will remain as it is now.

A Corporate Approach is Essential

Changes to the default assumptions will need to come from corporate management. Asset Management is a corporate responsibility and cannot be delegated solely to technicians. If the renewal challenge is to be met, it will be by senior management taking a corporate wide and service outcome focus. For this reason strategic and corporate wide information should be produced and assessed at a senior management level. This requires Councils to prepare long term financial plans rather than just an annual budget.

Time for Planning

Renewal spending is projected to increase considerably over the next 20 or so years, reflecting the growth of asset stocks in the past.

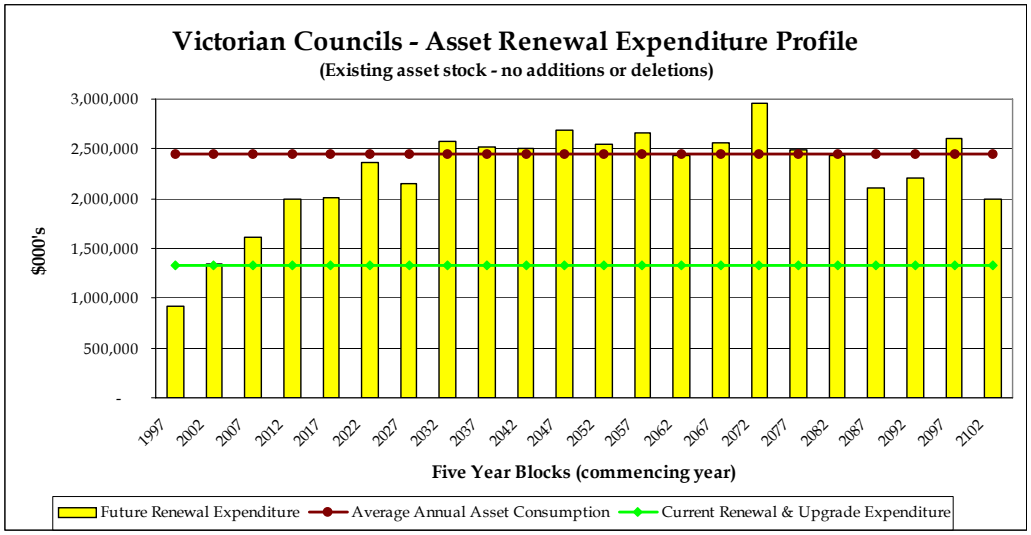


Figure 1.1

The lower horizontal line in Figure 1.1 above indicates the current level of spending on renewal and upgrade of assets. The bars indicate the forecast levels of renewal under the default assumptions for each five year period. The

upper horizontal line represents the long term average renewal requirement for current asset stocks.
Unless steps are taken to change the situation, within ten years the amount of required renewal alone will reach, then exceed, the current levels of renewal and upgrade combined. By the year 2012 required renewal will have more than doubled from current levels. This suggests that Councils have up to ten years of planning time to make necessary management adjustments to minimise required increases in renewal funding requirements. Councils who do not use this time wisely face a serious lowering of service standards generally because of a likely lack of funds to maintain assets at appropriate levels

This is an aggregate picture, some Councils will have more planning time - and some will have less.

Need for Improved Data
The quality of data varied between Councils and between assets. Road asset data was generally considerably better than that for other assets. During the survey site visits it was observed that technical data was of better quality than demand or utilisation data. Lack of good quality demand data limits the ability to match asset acquisition to service delivery requirements and without this, there is a tendency to acquire too many assets and at inappropriate standards.

It was found that, because the distinction is not required for external reporting, Councils were unable to distinguish capital spending designed to renew existing services, from that designed to improve existing services or to extend services to a greater number of ratepayers. This distinction is fundamental to informed strategic asset management and is a serious deficiency of existing data.

Managing Renewal Will Require Resource Re-Allocation
A corporate approach to asset management is essential because future renewal will not affect assets uniformly. Of the total amount of asset renewal required in the period 1997-2002, for example, roads account for 60% and buildings 27%, a 2.2:1 ratio. (Refer Figure 1.2)

Five years later, in 2002-2007 (see Figure 1.3) roads renewal requirements have increased from 60% to 64% and buildings renewal requirements have fallen to 20% of the total. This, however, does not tell the full story as total renewal requirements have also risen - from $918m to $1343m. This means that, in order to meet renewal, the budget of the roads sector *will need to increase by 58%* while the budget for the buildings sector will only need to *increase by 9.5%*.

However by the following five year period (2007-2012) the projected renewal requirements for buildings has actually fallen in real terms. The required change in the budget for buildings is *now -17.4%*. Roads, meanwhile, continues to absorb ever more of the renewal dollar. By this time roads renewal represents 73% of the increased total renewal, *increasing its budget by a further 38%*. In the space of ten years the ratio between the renewal budgets of roads and buildings has gone from 2.2:1 in favour of roads, to 5.8:1.

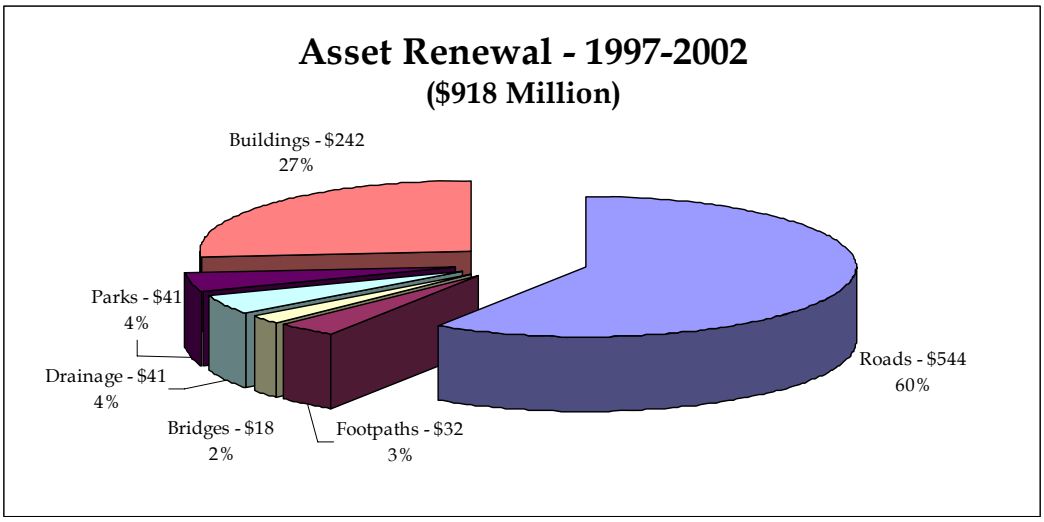


Figure 1.2

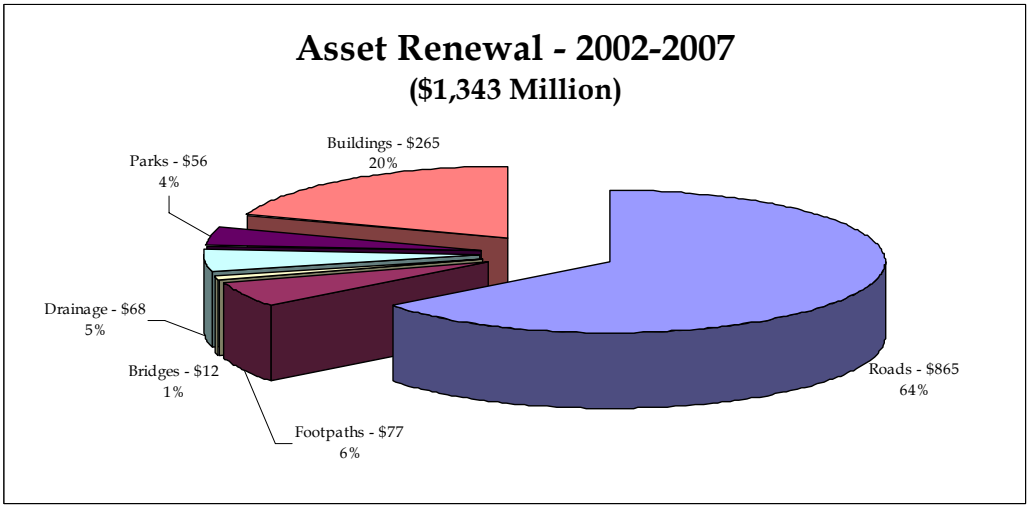


Figure 1.3

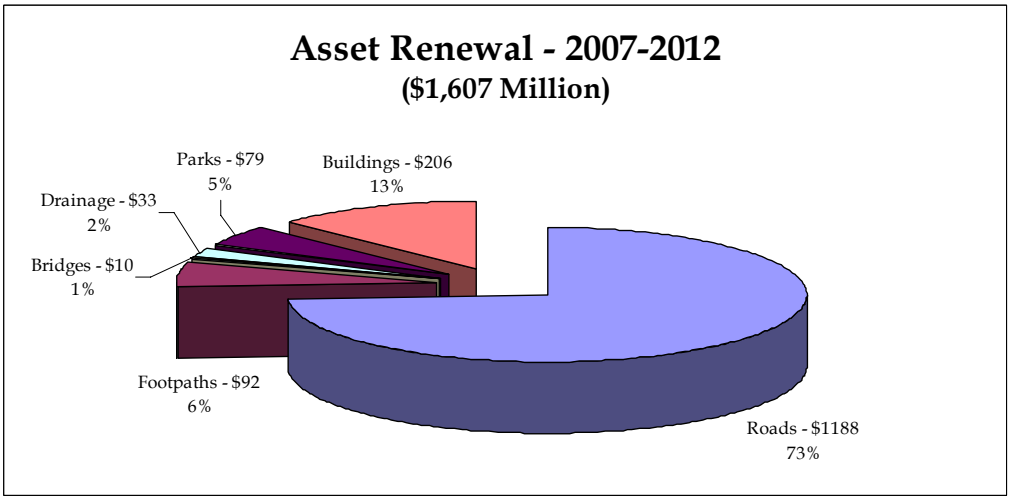


Figure 1.4

Such large swings in resourcing are very difficult to manage at both a resourcing *and* a human management level and need corporate direction and lots of planning time.

Strategic Asset Management Plans
Ratepayers need to know the renewal issues and how Councils are tackling them. It is recommended that strategic asset management plans be prepared and reported in the Corporate Plan along with performance targets and performance measures. Suggestions for suitable performance indicators are provided that can be incorporated in the Office of Local Government's performance monitoring program. Having identified their situation and analysed their options, Councils need to identify, in their corporate plans, what their future renewal problems are and what they are going to do about them. There should also be ongoing training available for Councils in strategic asset management at both middle and senior management levels.

Infrastructure Assets *are* Different
Ordinary assets wear out and are completely replaced with new. Infrastructure assets are complex systems, either networks or facilities, that are not replaced as a whole but rather continuously renewed by piecemeal replacement of component parts. This enables the entire asset system to continue almost indefinitely. Ordinary depreciation methods are not useful for assets which are effectively not replaced but renewed. It is recommended that the Office of Local Government explore the infrastructure option of Condition Based Depreciation which is more accurate and provides a better management tool.

Community Consultation
More community consultation is required and a greater degree of rigour in the analysis and presentation of asset options both for renewal and for new assets.

Rate Increases are not the only Option
The earliest reaction to the realisation of increased renewal was to seek an increase in rates. In fact an increase in rates is often seen as ***the*** solution to the problem of ageing assets. But, in fact, it is only one of a number of options available to Councils - and good corporate management would ensure that increases in rates are the option of last resort rather than the first approach. Many management options are reported in the Study, with illustrative examples.

Management Options
The difference between the projected renewal expenditures and the current level of renewal expenditures represents the gap that needs to be met by creative management effort. This includes, *amongst others*

- reducing costs by
- ✓ asset rationalisation and reviewing asset growth strategies
- ✓ more efficient utilisation, operations, maintenance
- ✓ choosing low cost over high cost asset strategies

- ✓ demand management
- changing the composition of capital spending from new to renewal

- making forward provision for renewal by
- ✓ reducing debt to create future borrowing capacity
- ✓ creating renewal reserves
- increasing revenues by user charges

Councils "in need"
Where projected near term renewal significantly exceeded current spending levels for Councils, they were identified as potentially "in need". To determine whether the gap reflected real need or was the result of poor data and inappropriate asset management, these Councils were examined according to a situational check list. The same list has been provided for the use of all Councils. It suggests ways to check the appropriateness of Council's self reported data, particularly with respect to age, economic life and condition.

Of the initial 14 Councils identified as "in need" in the draft report, 4 took the opportunity to refine their data according to the check list and are no longer "in need". For the 10 Councils remaining it was noted that the economic lives adopted were uniformly in the short to medium range, indicating the high end of service delivery aspirations, with very high levels of renewal unattended to ("backlog"). In the majority of cases the suggested "backlog" was inconsistent with reported asset condition. Better condition analysis is required by these Councils to determine their real position.

Backlog
Where assets are actually being renewed on cycles longer than considered optimal by asset managers, the extra funding needed to shorten the cycle is referred to as "backlog" or "catch up maintenance". An alternative way to view this situation is to recognise that it is the *actual* not the *desired* renewal cycle that defines the current service level being achieved. *Funding the backlog is equivalent to increasing service levels.*

The Study does not suggest that some increase in standards may not be desirable in certain cases. However *the focus of the Study was to project the cost of maintaining existing services and service levels over time*. Thus no allowance has been made in the model for funding backlogs. The decision to increase service levels will be made by Councils in the light of overall needs and funding ability. Service level increases and other growth capital requirements are additional to the renewal requirements forecast in this study.

Individual Council Information
Each Council is to be provided with information on its own assets with modelling capability to perform a variety of 'what if' scenario analyses.

Planning Time Should Not Be Frittered Away
When the Chairman of the South Australian Public Accounts Committee spoke to New York City Council officers he asked when they had first become aware of their burgeoning asset renewal problems. "When maintenance bills started

to accelerate" they replied. And then what did you do? "Well, we cut maintenance funding, we had to because of the budget". And then what happened? "All hell broke loose" was the exasperated answer "Things started breaking down, the problem got out of hand much more quickly than we imagined". It is a matter of public record that when painting was stopped on a major bridge in New York, it had so badly rusted within just three years that bits were literally falling off. The under-maintained roads became so bad that only buses designed for under-developed countries could manage the roughness.

New York did not have the benefit of knowing what was ahead of it in time to plan. Victorian Councils do.

This time should not be wasted.

Summary of Key Recommendations

Section 2 of this report provides 17 recommendations for improving the management of assets throughout Victorian Local Government. The thrust of those recommendations is:

- the recognition that asset management is a corporate, not a technical, responsibility;
- the need for good information;
- the need for comprehensive asset management planning;
- the need for community involvement in establishing service standards;
- the need for rigour in financial assessments; and
- the need for performance measurement of asset management.

Adoption of any of these management practices will help Councils avoid some of the increasing renewal costs projected in the model. Thus the model's projections are not prescriptive nor even necessarily descriptive. *The message is that the projected results can be avoided by changing the assumptions!* In this sense, the projections are not expected to "hold true". Were they to do so, it would mean that Councils had ignored the opportunity to learn from the information provided here.

Heavy Patching – Capital or Maintenance?

There are a number of terms used throughout this report that require definition. A glossary providing the definitions precedes Section 1.

2. ASSET MANAGEMENT ISSUES AND STRATEGIES FOR ACTION

2.1 Strategic Asset Management is a Corporate Issue

There is a tendency in Councils, no doubt for the sake of efficiency, to develop self contained units to manage different assets and their outsourced maintenance contracts. This often means that the unit looking at road management and the unit looking at drain management are two separate units. The unit considering new capital proposals may be entirely different from the unit considering maintenance. In both cases, valuable synergies are being lost.

Councils need to take a corporate approach that draws the various strands of asset management together and facilitates cross over between the services where appropriate. The corporate approach would also ensure that benefit-cost analyses for asset proposals are examined in the light of overall Council requirements rather than in the light of the needs of individual units alone. This would facilitate developing alternatives using the resources of other units. Thus a problem concerning roads may be alleviated by a solution involving drainage, or the need for a new asset problem may be avoided by a maintenance or operations solution.

A corporate approach to asset management is essential because future renewal will not affect assets uniformly. Of the total amount of asset renewal required in the period 1997-2002, for example, roads account for 60% and buildings 27%, a 2.2:1 ratio. (Refer Figure 2.1)

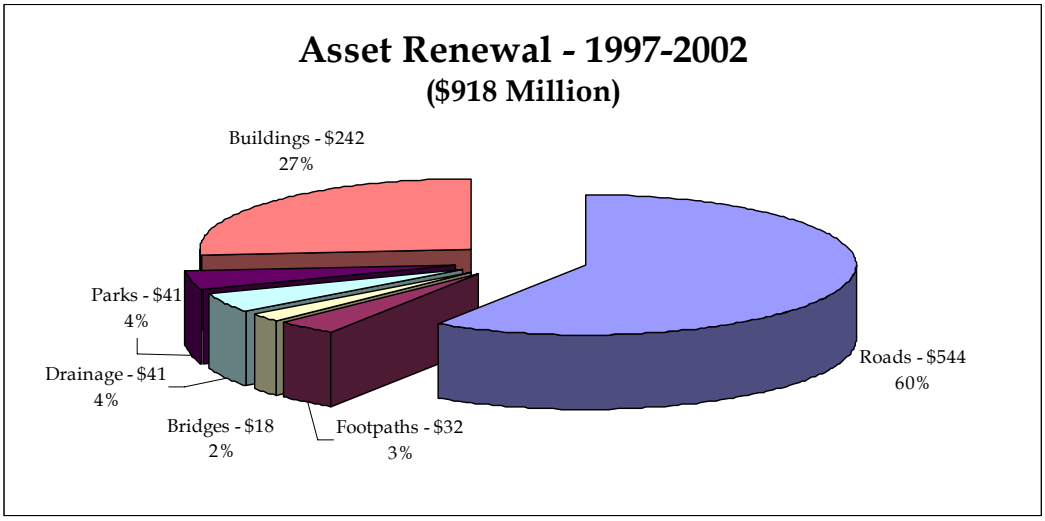
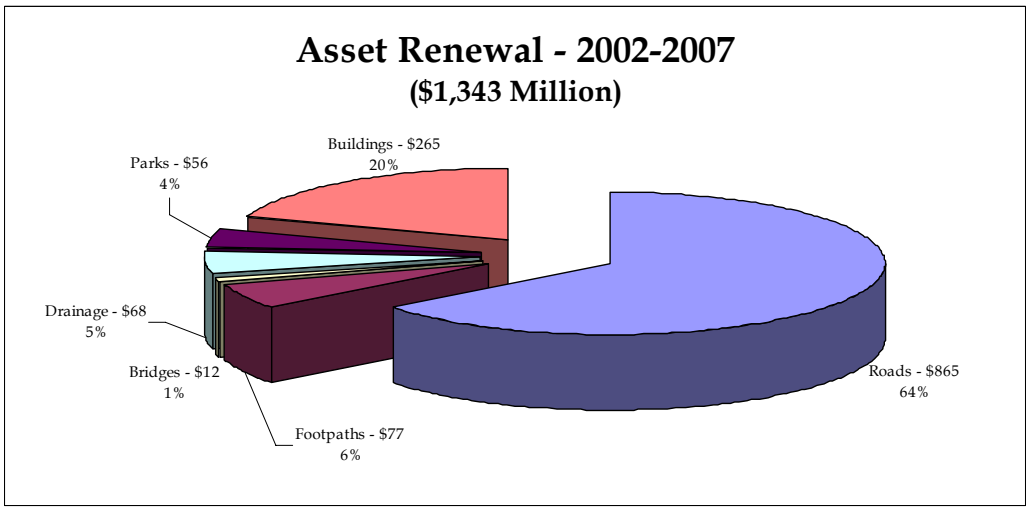


Figure 2.1

Five years later, in 2002-2007 (see Figure 2.2) roads renewal requirements have increased from 60% to 64% and buildings renewal requirements have fallen to 20% of the total. This, however, does not tell the full story as total renewal requirements have also risen - from $918m to $1343m. This means that, in order to meet renewal, the budget of the roads sector *will need to increase by 58%* while the budget for the buildings sector will only need to



increase by 9.5%.

Figure 2.2

However by the following five year period - 2007-2012 (Figure 2.3) the projected renewal requirements for buildings has actually fallen in real terms. The required change in the budget for buildings is *now -17.4%.* Roads, meanwhile, continues to absorb ever more of the renewal dollar. By this time roads renewal represents 73% of the increased total renewal, *increasing its budget by a further 38%.* In the space of ten years the ratio between the

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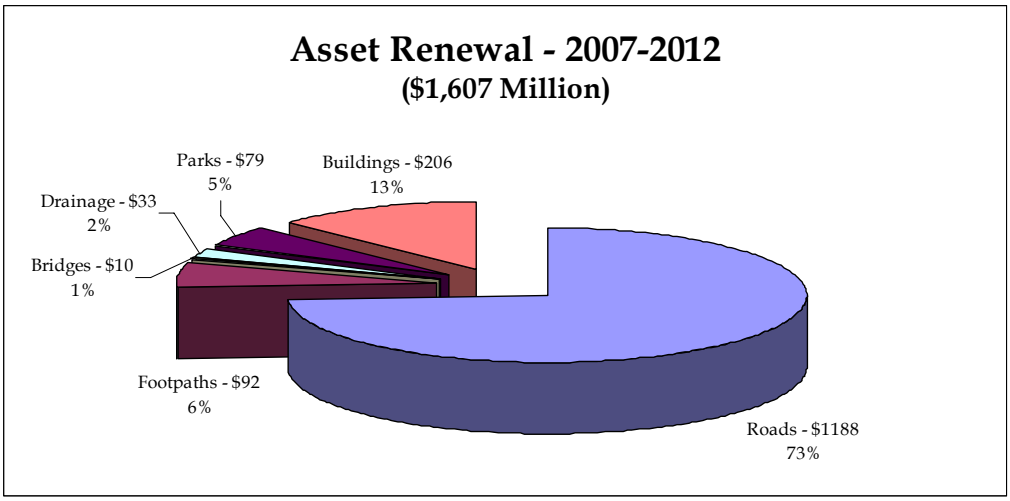


Figure 2.3

Such large swings in resourcing are very difficult to manage at both a resourcing *and* a human management level and need corporate direction and lots of planning time.

It is common to find that some of the budget funding that is increased in times of need remains long after the real need has disappeared. The result is that the asset area, that is now oversupplied with funds, is enhanced beyond the 'value for money' situation. This is why renewal requirements need to be included in the corporate and business plans of Councils and why there needs to be a clear asset management strategy to ensure that resources are correctly allocated. The longer the known lead time before a change is required, the easier it is to deal with it.

Recommendation 1.
That strategic asset management be recognised as a corporate responsibility and mechanisms be put in place to ensure that strategic and corporate wide information is produced and assessed at senior management level. This requires Councils to present asset requirements, together with other future requirements, in a long term financial plan rather than just the annual budget.

2.2 Information is the Key to Efficient Planning

2.2.1 Information Collection

A major asset management issue for Councils is the loss of information that has walked out of the door as Council workers have reached retirement age or left as a result of downsizing and amalgamation.

Amalgamation of Councils has also meant the amalgamation of different asset information systems and different quality data holdings. This has brought the issue of information collection and recording into sharper focus.

Information collection is costly and time consuming but there is no longer any option. The "seat of the pants" decision making which was common, and even practical in simpler past times, is, with the loss of experienced staff and the extended size of amalgamated Councils, no longer possible.

The Victorian Office of Local Government Infrastructure database has been compiled with extensive input and effort from Councils. Councils are concerned to make good use of the data and to this end, many have expressed a willingness to recast their internal accounting procedures if the database is to be regularly updated. This does not mean that all information need be collected on an annual basis. Some information, such as age profiles and condition data need be collected only periodically, but Councils should have the opportunity to revise their past data.

Infrastructure assets are not the only assets whose renewal needs to be managed by Councils. While the data collection in this study does not permit this to be examined, Grants Commission figures suggest that the composition of capital spending is shifting towards non- infrastructure items such as computer equipment.

Non-infrastructure assets have much shorter lives than infrastructure and therefore higher asset consumption and renewal costs per dollar of capital. If infrastructure assets are reduced and the revenues gained from their sale are spent on non-infrastructure items, the Councils' overall asset renewal position would worsen.

Non-infrastructure assets represent a much smaller proportion of the total asset holdings of Councils than infrastructure assets but their rate of consumption is much higher. Rationalisation of non-infrastructure assets is also a strategy that may be used to manage overall renewal.

Recommendation 2.
That the database provided by the Infrastructure Study be updated annually (at least in part) and that in future revisions and updates all renewable assets be included, infrastructure and non-infrastructure.

In the study, Councils were asked to distinguish between renewal, upgrade and expansion capital. This they found very difficult to do. But if Councils do not know how much of their capital spending is on renewal - i.e. is re-investment, and how much is on new or additional capital, - i.e. new investment, they will not know how to project future renewal or maintenance. Reinvestment (renewal) and new investment (upgrade and expansion) have very different implications for future renewal liability, maintenance, operations costs and service delivery. Councils and their ratepayers should be in a position to determine whether capital spending is for renewal of existing services or is increasing or enhancing services.

Recommendation 3.
That Councils be required to distinguish, in their corporate plans, those asset expenditures which represent the renewal of existing services and those which represent a growth in the asset base. This distinction needs to be made at the corporate or service level rather than at the technical or asset level. Distinction between the expansion or increase of services and the enhancement or upgrade of services is also recommended.

2.2.2 Information Presentation and Asset Management Plans

Few Councils have Asset Management Plans and fewer appear to be using them as a strategic management tool. Data on assets recorded in asset registers and presented in the form of lists is not a useful format for management.

An Asset Management Plan presents a forward cash flow forecast for the Council in terms of maintenance, operations, projected renewal and capital growth, where the contribution of each item to the total annual cost is identified and can be justified in terms of value for money to the organisation. With an asset management plan, scenario analysis can be carried out to determine the impact of increased maintenance on future renewal profiles, or the impact of asset growth on future maintenance and operations costs.

Strategic asset management plans are essential in managing future renewal. It is therefore important that Councils adopt them, but not out of compliance, rather with regard to the real benefits to be obtained. One way to highlight the benefits is to have Councils report key asset management indicators in their annual plans. A set of suggested indicators is included at the end of this section.

While each Council will choose its own strategic asset management planning process to suit its own needs and resources, it would be beneficial to have some industry training/information exchange workshops to assist Councils to develop their plans. The process used might be modelled on that used to develop Municipal Strategic Statements.

The strategic asset management plan needs to be seen as a living document that changes as needs and Council strategies change. To this end, and given the movement of personnel which ensures that those who were trained this year will be doing some other job next year, thought should be given to developing an ongoing training facility, perhaps with a “beginners” course and a “skill upgrade” course. These might be provided by the Local Government Professionals Organisation as part of its member training.

Strategic asset management planning is a corporate level responsibility. Training of middle management to produce the data on which decisions are to be made is necessary but not a substitute for knowledge and understanding at the top. Consideration should therefore be given to appropriate resources to support senior management appreciation of strategic asset management.

Recommendation 4
That strategic asset management plans be prepared and reported in the Corporate Plan, along with performance targets and performance measures.

Recommendation 5:
That the Office of Local Government should work with Councils to ensure that training in strategic asset management planning is available to both middle and senior levels of management.

2.2.3 Information and Analysis for New and Renewal Capital Projects

Economic appraisal is a systematic means of analysing the costs and benefits of the various ways a project objective can be met in order to determine the best use of scarce resources. It analyses the direct and indirect costs and benefits of a new asset (not as a stand-alone asset but as part of the Council's total asset holdings) compares options (including the do-nothing option) calculates rates of return and compares these against target rates.

Local Government Capital Evaluation Guidelines have been prepared and distributed to Councils to enable them to do cost benefit analysis. Many Councils indicated use of these guidelines, or a simplified version of them.

The Capital Evaluation Guidelines are focussed on new assets. Supplementary Guidelines to assist in the difficult issue of trade-offs between extending the life of an existing asset (with the issues of increased maintenance, expected life extension, increased risk) and the purchase of a new asset could be beneficial.

There tends to be a presumption that if an asset exists, its renewal is justified. This is frequently not true. Demands change, technologies change. It would be very strange if assets created 20, 30, even 60 years ago still met today's demands and are the best technological solution.

More effort needs to be applied to estimating demand and the willingness of ratepayers to pay. Demographic data, market analysis and examination of options are essential to the determination of benefits. Proposals may be well developed with respect to the technical requirements but benefits to the ratepayer are more assumed than tested.

Performance information means more than simply recording the condition of the asset, it also means examining the impact of the asset's condition on service levels, calculating the costs of correction and weighing this against the costs of deferral in terms of impact on service level.

Without this information, assets could be maintained at a level not justified by service delivery requirements or renewed when renewal was not needed.

Recommendation 6

That assessment of customer benefits and market analysis should be part of the strategic asset management plans.

2.2.4 A Situation Check List

If the renewal projections produced by the self-reported asset data suggest that Councils have an immediate renewal problem the following checks can be run.

1. Does imminent renewal seem reasonable in the light of maintenance reports and particularly in terms of customer complaints? If maintenance personnel are concerned but customers are not, it may be that the technically desired asset standards are in excess of customer requirements.

2. Check the age profile of each asset group. If knowledge of age profiles was scant and the default has been to distribute them evenly over time, this will almost certainly overstate the amount of aged assets that the Council has to renew in the near term. The solution is to undertake a condition analysis of its assets so that the Council has a better understanding of renewal timing.

3. Check the asset condition rating. If assets have been reported to be in generally good condition but the renewal profiles say otherwise, there is an inconsistency that needs to be checked.

4. Check the management score. Councils were asked to report their management practices on 11 questions against a 0-5 scale where higher numbered options represented improved practices. If Councils average their scores on these questions, an overall score of 3.5 or above indicates average to good management understanding and practices. The higher the score the more likely that the problem identified with near term renewal is a genuine problem. But the management quality of particular asset groupings may vary from the overall score and thus reasonable checks should be made.

A low score (say 1.5 or less) indicates that there is a chance that the renewal profiles may be in error and the problem may be a spurious one. In both cases the answer is to do a condition analysis. However, if the management score is high, the level of management expertise in Council should be possible to enable it to identify the assets in need of analysis and to do an in-depth study on them. If the management score is low, the best option is a general condition analysis of all assets to determine which ones require further detailed study.

5. Check the economic lives relative to the general distribution for all Councils for each of the asset groups. (If it is possible with the information available to be sure which asset category is the one in most immediate need of renewal then the study may be confined to that class of assets.) If the asset lives are toward the short end of the spectrum, the Council should review its service delivery objectives to see (a) whether they are aligned with community wishes and (b) whether they are higher than can be economically sustained. Reducing service delivery levels extends economic lives, postpones renewal, and provides more planning time with often little impact on customer perceptions of quality.

Completing the situation check list may itself reveal areas where greater skills, knowledge and experience are required.

Recommendation 7
That every Council undertakes the situation check list to determine whether the data it has provided, and which underpins the future renewal profile, is reasonable.

2.3 Strategies for Action

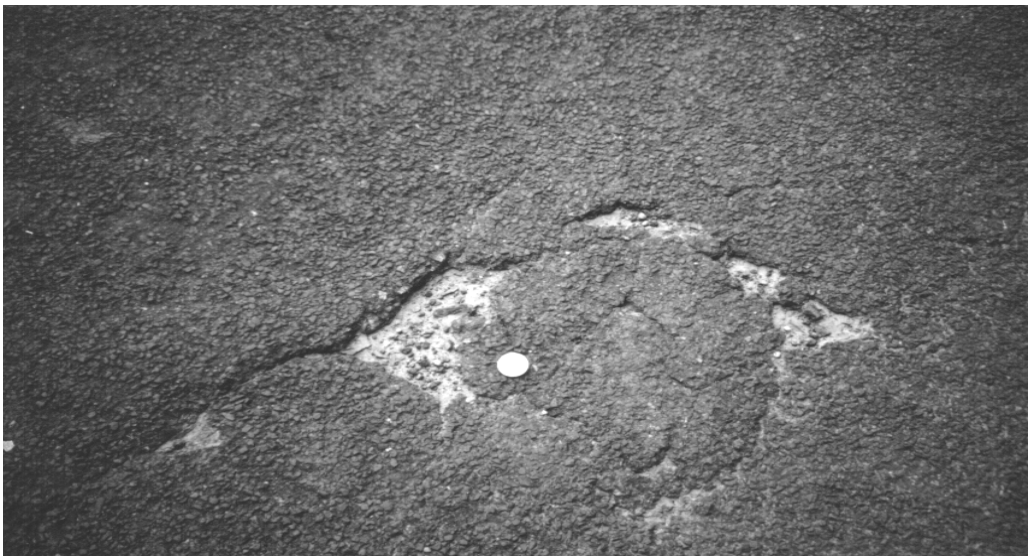
There are five broad areas that Councils can address to reduce the costs or the impact of future renewal, namely:

(1) Reducing Capital Renewal Costs of Existing Assets
(2) Reducing Capital Costs of Future Assets
(3) Achieving Greater Output with less Capital
(4) Increasing Revenues
(5) Cash and Debt Management

2.3.1 Reducing Renewal and Maintenance Costs of Existing Assets

More Maintenance A "stitch in time" is still a sound concept for extending economic lives and reducing renewal and life cycle costs. But benefits of increased maintenance need to be tested rather than assumed. Asset management plans provide the framework within which this analysis can be carried out. Appropriate and timely application of maintenance can greatly reduce costs of renewal, particularly in roads. (See the following photographs.)

In the examples given in Pictures 2.1 and 2.2 sealed road pavements are at risk of further - and potentially rapid - deterioration if the road seals are not attended to. Council has to determine whether the most beneficial route in this case is road re-sealing or heavy patching. Information on road degradation life cycles is available from the Australian Road Research Board and the Australian Local Government Association is conducting an ongoing survey and collecting and disseminating data from participating Councils.



This sealed road pavement will have its life reduced by 50% if the seal is not repaired before extended rain.
Picture 2.1

This sealed road pavement will have its life reduced by 80% if the seal is not repaired before extended rain.
Picture 2. 2

Condition Based Depreciation (CBD) - Depreciation that takes maintenance into account. Engineers know that insufficient maintenance can drastically reduce the life of an asset and that, conversely, good maintenance can ensure that service life potential is extended as far as possible before renewal is needed. Yet maintenance is often the first item to be cut when budgets are stressed. This is because it shows up in the accounts as a "saving". The corresponding "cost" of asset degradation is not reflected in the run down in asset service potential ("asset value") because accounting depreciation is based on a standard formula and does not take year to year variations in maintenance into account.

For short lived ordinary assets, such as plant and machinery, vehicles or furniture and fittings, this may not be critical but it *is* critical for longer-lived infrastructure assets. Here failure to account for the lost service potential of under maintaining an asset can cost Councils large amounts in unnecessarily early renewal.

There is now a method of depreciation for infrastructure assets that does take maintenance into account. It is called "condition based depreciation (CBD)"[1]

[1] Dr Penny Burns. "Condition Based Depreciation". Paper presented to the National Accountants in Government Conference in Hobart in May 1993 and published by the ASCPA's Public Sector Accounting Centre of Excellence in its collected volume for 1992-93. Dr Penny Burns, David Hope, and others. Seminar on Condition Based Depreciation. In

or "renewals annuities". (Because the method of calculating depreciation is by taking an annuity over the renewal profile.)

Condition based depreciation (CBD) is applied only to infrastructure assets, those assets whose service delivery is continually renewed by the replacement or repair of worn out components, such as road networks and complex facilities.

The basic premise behind CBD is that assets are a store of future service potential and the value of the asset is thus the value of that service potential. As the service potential is used up, the value falls. It is this fall in value that is depreciation and it is best measured by the cost of restoring the potential. CBD measures the annual cost of periodically replacing the loss of service potential of such a network by calculating an annuity over a forward renewal cash flow. It is based on actual activity needed to renew the system (as justified by an auditable asset management plan) and not on a percentage of asset value and is thus independent of the method of valuation used.

The annuity method of calculating CBD should not be confused with the method of adjusting depreciation percentages for residual life, also sometimes called condition based depreciation. This residual life method is certainly more accurate than standard depreciation methods based on average lives, but it lacks the ability of CBD to provide a forward management tool, together with a clear justification of need, in the form of the cash flow projection.

The Road Traffic Authority in NSW uses CBD for its roads. Because it carries out an asset condition analysis on an annual basis it is able to directly measure the difference in portfolio condition between the beginning and end of year. Any overall decline in condition is depreciation. If, on the other hand, increased maintenance has led to an increase in condition, the difference is appreciation. Only CBD is able to show the impact of improved maintenance in the balance sheet results.

CBD, based on an asset management plan and renewals annuities, is used by the Victorian Irrigation Industry for management purposes and it is now being considered by COAG for use by all water authorities in Australia. In New Zealand, a renewals approach is used by Councils for all of their infrastructure assets. New Zealand adopts a ten year planning and financial forecasting period. This is a good time frame as it is long enough to avoid large year to year variation but short enough to use condition assessments and short term modelling rather than long term guess work.

Engineers like this approach which provides useful management information. Many accountants also favour it. Auditors and regulators find that they can

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Proceedings of the National Committee for Rationalised Buildings, FM-95. Dr Penny Burns "Managing for Asset Maintenance and Renewal" Proceedings of International Conference of Maintenance Societies, Melbourne, May 1996. Dr Penny Burns and David Hope, Forthcoming series on Condition Based Depreciation in *The Australian CPA.*

track whether agencies are doing what they said they were going to do - and if not, why not.

Unfortunately, accounting standards have not been designed for infrastructure assets and this method of depreciation has yet to be accepted by the standards boards. CBD is not yet acceptable for financial reporting purposes, but the Public Sector Accounting Standards Board is considering it.

It is suggested that CBD be considered for internal or management accounting *at this stage*. This has been the approach taken by the Victorian Irrigation industry, which has used this method for management and pricing for a number of years. They find that they are able to keep their prices down without compromising efficiency and effectiveness, for CBD avoids the over-recovery that occurs when accounting formula depreciation is applied to pricing decisions. This is also the reason why it is now being promoted for use Australia wide in the water industry.

Application of CBD in Victorian Councils would enable Councils to accurately plan for renewal, reflect the correct level of costs in charges, and to provide information in a form useful for management.

CBD is an essential element and outcome from a Strategic Asset Management Plan and can also be used as a performance measure.

Recommendation 8
That CBD be considered for use in Councils for all management accounting purposes - costing, pricing, management, planning, and that the Office of Local Government, together with Councils, examine how it may be implemented.

Rationalisation Rationalisation is a direct way of reducing renewal requirements. Assets that served the needs of the community twenty or more years ago may no longer be providing value for money. They may still be providing a valuable service but not one that exceeds the costs of provision. These assets need to be identified and either reconfigured so that they do provide value for money or the Council should dispose of the asset. Even if disposing of the asset returns little by way of revenue, the Council will save in maintenance, operations, cleaning, lighting, security etc and it will save in the costs of renewal.

It will frequently pay to give away assets that have become liabilities, for example, rural roads that serve only one or two farm properties or to have the community take a more direct management role. The Shire of West Wimmera's parks and gardens are created and maintained by local service clubs. Council contributes to upgrade costs. (Refer Section 8.1.2 of this report and Pictures 2.3 and 2.4)

Giving the assets to the users to maintain does not deprive them of the service but frees up Council resources that can be deployed in better maintaining other Council assets, reducing *their* need for renewal.

Irrigation and Lighting – High Maintenance
Picture 2.3

Parks Equipment and Hardworks – High maintenance and high risk
Picture 2.4

Life Extension Extending asset lives by repair and rehabilitation strategies reduces the average annual consumption cost and renewal rates and postpones the need to renew. Asset lives can also be extended by changing the required service delivery levels where they are higher than the demand for the services warrants. Lower service level equals lower cost as the following picture illustrates. (Refer Picture 2.5 below)

Picture 2.5

Simply changing management understanding and information can extend economic lives for infrastructure where assets are being renewed before their life is up. Consider the timber decking on the bridge in Picture 2.6 Does the bridge in the next picture need renewal?

Appears at the end of its life!
Picture 2.6

Or can its life be extended? (Refer Picture 2.7)

Same timber bridge – with life extension
Picture 2.7

2.3.2 Reducing Capital Costs of Future Assets

The right asset for the job. Getting the appropriate asset for the job is a major part of reducing the costs of maintaining future assets. For example, the following picture shows a gravel road subject to deterioration in heavy storms. Gravel roads may be an appropriate service level in many circumstances but if storm damage results in immediate repair needs the chances are that the road was not the right asset for the job. Conversely, a good gravel road is probably better than a pot-holed sealed road any day. In the past, road seal programs have been seen as a sign of progress. Now, they need to be questioned as to appropriateness. The objective is to determine the most cost effective solution.

One heavy storm can shorten the life of a gravel road
Picture 2.8

Benefit Cost Analysis and Project Evaluation The largest gains, and the quickest, come from avoiding those capital decisions that do not provide value for money. This comes through better application of existing benefit cost analyses and particularly from better application of demand analysis (knowing what the community really wants and is willing to pay for) and demand management (ensuring that the community really does understand the costs of the services they are demanding). Guidelines for Evaluating Local Government Capital Projects are available to all Councils and training in their use and the presentation of proposals would enable Councils to avoid investing in projects that have benefits but are not value for money propositions.

Customer Surveys Establishing what the ratepayers value most highly is an important key to managing investment and re-investment. Christchurch Council in New Zealand was about to embark on a costly program of footpath repair until it found, through its new asset management planning process, that ratepayers were less concerned with the condition of the footpaths than they were with street lighting. With better street lighting ratepayers not only felt safer, but they could see to avoid footpath problems.

There are now well established techniques for establishing customer needs on a relative basis - i.e. in terms of "more of this and less of that" so that customers do not simply demand more of everything without regard to cost. These techniques allow Councils to allocate their capital budgets according to customer preferences.

Councils could also be well served by an attitude that assets are like overheads - they may be necessary for service provision but costs should be contained - rather than as wealth to be maximised.

Under-Utilisation as an Opportunity Asset under-utilisation should be seen as an opportunity to avoid unnecessary capital growth. Where there is increasing demand for services, increasing the output from existing assets is an alternative to creating new assets. This may be achieved by way of appropriate repair and maintenance or by reconfiguration. One Council greatly increased the usage of an existing hall simply by adding a verandah. Once the reasons for under-utilisation have been identified, it can be determined whether modification is cost beneficial. Sharing the resource with others (either other Councils or with private institutions) is a revenue raising possibility. Where under-utilisation is recognised, reducing the total stock of that kind of asset will increase the utilisation of the remaining stock as well as reducing security and lighting etc on the elements removed.

2.3.3 Achieving Greater Output with less Capital

Resource sharing This includes increasing utilisation as above, joint capital sharing ventures with schools, institutions and private companies. (Refer examples in 8.2.1) In the United Kingdom, "Best Value" contracting is being piloted and it is likely it will replace Compulsory Competitive Tendering for

local government. Its focus is on private-public partnerships to produce innovative solutions to the problem of increasing customer satisfaction.

Non Asset Solutions It also includes recognising that providing services does not always mean that Council needs to own its own assets. Renting or leasing may be more cost effective. It also includes consideration of non-asset solutions to service delivery. Birmingham City Council, for example, the largest Council in the UK, is looking at ways of reducing the need for CBD space by such means as working from home, "hot desking" (i.e. sharing of facilities by officers such as regional inspectors who are mostly out in the field) and satellite offices (computer installations that can be used for communication purposes by home workers).

Changing the Asset Mix In terms of roads, this may mean upgrading one road which can then take most of the traffic, allowing the downgrading of others.

For drains, the required drainage capacity can either be achieved by building more drains and drainage pits as the community expands - or by more regularly cleaning out the drains and pits that already exist and keeping them in good repair so that they are able to cope with higher flow rates. The technology exists for determining condition. Economic analysis will indicate where capital savings can be made.

2.3.4 Increasing Revenues

Increasing rate levels is not the only means of increasing revenues. Many Councils can make much more use of user charges. This includes charging directly where costs are incurred, such as damage to road structures by log trucks and milk trucks. A proper benefit cost analysis would indicate where it would be profitable for trucks damaging the road surface to contribute to the Council for constructing a better quality surface not so easily damaged. Levies on quarry vehicles and others involved in construction work are being used in some places. These are all forms of direct user charging.

Councils may also wish to examine their rate base to see whether the burden of rates is being well distributed.

2.3.5 Cash and Debt Management.

Cash management can be used to provide future borrowing capacity. Where current renewal is less than the long term sustainable level, current ratepayers are not paying their way. Raising the level of rate revenues to address the inter-generational inequity issue is of little benefit if the additional revenue is then spent on new assets. This only exacerbates future renewal problems. Councils may, however, adopt a debt redemption policy that enables them to increase their future borrowing capacity at a time when renewal is due. Applying resources to a financial investment program is another alternative.

Provision for future renewal could be made by way of insuring against future renewal costs but like all insurance this is likely to increase the overall cost as

those insured take less care to extend lives. This course of cash management is thus not recommended.

2.3.6 Improving Strategic Planning - Zero based renewal

Understanding current and future demand has already been referred to above. Demographic projections and customer surveys need to supplement supply based data. It is unwise to assume that just because an asset exists and is in a run-down state that therefore it needs renewing. All renewal proposals should be treated as rigorously as new asset proposals. In fact, more rigorously, to overcome the natural tendency to assume that the benefits outweigh the costs if the asset is in existence. As in zero based budgeting, with renewal there is the opportunity to start afresh - and do something different. Ratepayers should be advised of the reasons for withdrawal of existing services and this will need astute and positive marketing backed up with highly credible asset management analysis if the full benefits are to be achieved.

All of the issues raised above should be considered in the development of the strategic asset management as options for dealing with future renewal.

Recommendation 9

That Councils should, having assessed their situation considering a full range of options, report in their Annual Management Plan, the extent to which they expect difficulties in renewal - and what they are going to do about it.

2.4 Involving the Community

2.4.1 Rate Increases

A Council that wishes to increase rates to provide for asset renewal should be prepared to demonstrate, in its corporate plan, the range of options it has considered in its strategic asset management plan and to say why a rate increase is considered appropriate. The range of options should include at least those presented in the Infrastructure Study Report and illustrated above, namely:

- Ways in which capital renewal costs can be reduced (including the substitution of maintenance, proper planning with good Condition Based Depreciation data, rationalisation of assets and life extension)
- Ways in which future capital costs can be minimised (by choosing the right asset, rethinking the appropriateness of capital projects, better cost benefit analysis, increased market analysis to test need and willingness to pay, etc)
- Ways of achieving greater output with less capital (by use of demand management, resource sharing, private-public partnerships, outsourcing, etc)
- Alternative ways of increasing revenues (such as user pays charges)
- Ways of planning to finance renewal by cash and debt management strategies and review of the capital expenditure mix.

Recommendation 10
That Councils considering a rate increase to manage their future renewal should demonstrate the need for such an increase in their corporate plan, having examined all possible options and other Council priorities.

2.4.2 Community Consultation and Peer Review

Market analysis and community willingness to pay are areas that do not appear to be well developed with respect to asset acquisition or renewal. Councils are developing data bases recording the condition of their assets but not the impact of that condition on services or customers' perceived satisfaction.

With the development of performance indicators of community satisfaction, in terms of performance overall and in key services, it is now possible to tailor the asset management strategy more closely to the needs and wishes of the community. This will be assisted by special community consultation on large scale, complicated, or expensive renewal or asset acquisition projects.

New Zealand Councils have been in the forefront of strategic asset management planning at the local government level. For example, Dunedin City Council in New Zealand, when examining options for renovating its water supply system, separated the technical options and the funding methods and produced two reports for community comment thus avoiding the confusion (both for the public and within Council) that often occurs when the technical and financial issues are intermingled.

The papers were submitted to a peer review by a local firm of consultants to ensure that all issues had been identified, that they had been logically evaluated avoiding prejudicial views and that the issues had been appropriately dealt with. The review also considered the structure of the report with a view to incorporating explanations that may be helpful to the reader and in defining the elements which comprised the estimates.

Dunedin also released the financial report in two stages; the first covered all the possible ways/methods of funding. The second was released during the formal "public consultation" period and was far more detailed in its modelling, drawing the public and others to the conclusion that of all the various methods only three were probably economically viable. The final recommendation of the review team was then critically evaluated by a firm of Chartered Accountants.

Such a rigorous process may not always be necessary but for large or novel applications, it provides assurance to ratepayers that all bases have been covered and increases the Council's credibility.

Dunedin is an example of "best practice" in this area of public consultation and strategic asset management.

Recommendation 11:
That large, complex or expensive infrastructure renewal and acquisition projects be subject to a rigorous community consultation process and professional review.

2.4.3 "Paying Our Way" - Avoiding Intergenerational Inequity

Average annual asset consumption (AAAC) is estimated at $488m but renewal, even including upgrade, is estimated to be only just over half of this, for a total of $266m. Admittedly, Councils are also contributing to loan redemption and some investment is taking place that will have been charged to ratepayers and these two elements will lessen the shortfall between the amount of current asset consumption and current cost contribution. However, calculation of the average annual asset consumption did not include renewal of non-infrastructure assets and it refers only to existing asset levels, so that there has been no provision in AAAC nor for those increases in future renewal made necessary by current levels of asset growth.

The gap between the current level of asset consumption and the amount contributed to its cost, when all of the above elements have been taken into account, is likely to be far too large to be eliminated by cost efficiencies alone. If current ratepayers do not pay for their usage of assets, the burden falls upon future ratepayers. This is the inter-generational inequity problem.

Mechanisms that can be used to ensure that current ratepayers fairly contribute to the costs they incur include redemption of existing debt (which also provides greater future borrowing capacity) and contribution to a renewal fund. Safeguards would be needed to ensure that such a fund was used for the purpose for which it was created and not employed to increase the asset stock and thus exacerbate future renewal problems, rather than solve them. The use of an asset management plan that maps out future renewal requirements is a mechanism by which renewal funds can be kept on track.

Recommendation 12
That as current ratepayers are paying less than their full asset usage, Councils should consider, amongst other measures, the use of a renewal fund based on justified asset management plans, to ensure that each generation contributes fairly to asset costs.

2.4.4 Integrating Infrastructure Asset Management Strategies

Local government infrastructure assets are an integral part of wider regional and national networks. A large proportion of local infrastructure has been inherited as a result of regional and national strategies, i.e., *either*

(i) infrastructure transferred from private developers resulting from State and Commonwealth assisted growth (national strategies of growth, immigration, etc); *or*

(ii) infrastructure enhancement of transport networks associated with Commonwealth Grant funding.

The burden of maintaining infrastructure has led to a lot of downward shifting of responsibility and local communities may now be unilaterally forced to abandon this infrastructure development funded by other levels of government.

Unless State and Commonwealth Governments take a leading role, fragmented decisions by different government agencies *at all levels*, in response to their own financial pressures, can frustrate regional and national strategies such as the improvement of road transport to regional areas for safety, or for export markets. Forestry and dairying are good examples where regional economic development would benefit from a State asset management plan.

As Councils develop their own strategic asset management plans, they would be greatly aided by the guidance that a State or Regional asset management plan could provide. The Regional Plan would also provide much needed guidance to funding or resource allocation bodies.

Recommendation 13
That the Department of Infrastructure work with local government to develop state and regional infrastructure strategies that promote the co-ordination of regional transport, drainage and flooding, building and recreation objectives and link with national infrastructure strategies.

2.4.5 Grants Commission Grants and Integrated Strategies

It is not appropriate for this Study to determine the road funding strategy to be adopted by the Grants Commission. However, the funds allocation process has the potential to encourage or discourage good asset management practice and incentives to good practice should be seriously considered in any revision of the allocation process. A number of relevant issues for consideration in any future revision are addressed below.

Consistent with Recommendation 13, Councils need to consider their road strategies in a wider local government and state government infrastructure context. Road funding based on regional and national road strategies may be helpful. If the strategy, say, is for local roads to be downgraded with respect to state and national arterials, this needs to be reflected in the funding strategy. To encourage desirable rationalisation, such a strategy could include transition funding to enable Councils to either transfer roads to a private user basis where appropriate or to close and resume roads, or to downgrade them from sealed to unsealed where this was cost effective for low use roads. This funding would be effective in that it would reduce future funding needs, whilst funding on the basis of road length encourages expansion and increases future funding needs.

The road strategy may include an element of support for local roads in those cases where the ratebase is not sufficient to maintain roads of the quality

desired at the regional or national level. In this case, specific road links would need to be identified which must meet the higher level strategy needs and these should be the ones that receive funding - in return for an agreement to maintain the roads to a nationally or regionally required basis. These links might be roads that support industry development (e.g. forestry and dairying) and which would receive some funding to reflect the benefits received at the regional and national level - as distinct from the local level. The cost benefit analysis of the renewal of such roads should separately identify local, state and national benefits.

Where funds are allocated on the basis of road length, this encourages communities to retain roads that are little used so as to avoid a reduction in their grant allocation. The funds then need to be spread over the larger asset base with a consequently lower overall quality being achieved.

An alternative is the funding of roads on the basis of "need", with poor condition roads receiving additional funding. This would lead to an overall improvement in infrastructure, but has the downside of penalising those Councils that have managed their road networks well.

Recognising that "poor" roads do not develop overnight and that solutions can seldom be delivered in a short time frame, it may be appropriate to adopt a "phased" scheme. In such a scheme, funding on the basis of need could be adopted but gradually phased out, giving Councils assistance where the problem has arisen as a result of past administrations but encouraging current administrations to better manage their road assets.

A revision of the grants process will obviously consider a range of issues. Encouragement to good asset management needs to be one of them.

Recommendation 14
That in any revision of grant formulas, the Grants Commission considers the need to encourage good asset management practice.

2.5 Performing Well and Knowing It

The aim of good asset management is to meet ratepayers needs at minimum cost, that is the lowest possible costs for maintenance and capital renewal combined.

Many Councils, in the past, have reduced maintenance spending in times of budget stress. This is a "short term fix". It improves the current budget but at the expense of having to renew assets sooner than would otherwise be needed, thus increasing capital costs. Unfortunately the standard accounting treatment of infrastructure assets does not adjust the level of recorded depreciation to account for this more rapid deterioration of assets when maintenance is reduced so that reducing maintenance looks as if Councils are improving their budgets when the reverse may actually be the case.

Ideally, Councils should trade off increased maintenance now against lower capital costs in the future until an optimum position is reached, but the depreciation measures applied do not encourage this good performance. This is the purpose of Condition Based Depreciation (CBD), a depreciation method designed for infrastructure assets, i.e. those long living assets that are renewed rather than replaced. If Councils were to adopt this depreciation method, as recommended earlier in this section, they would be required to plan ahead in terms of lowest life cycle costs. The resulting renewal cost profile over the planning period would be the basis of an annuity representing the cost of restoring lost service potential - i.e. depreciation. New Zealand Councils are adopting a ten year forward financial planning period. The task for Councils would be to so configure their asset base and their maintenance and renewal practices as to minimise the life cycle costs over the planning period. Although there would be some fluctuations that can be accounted for by condition and age profiles, Councils could be compared, not so much with each other, as on their ability to reduce their overall costs as reflected in the CBD measure.

In the absence of such a measure, however, other indicators may be adopted and applied to the data already available.

With the proviso that the ratepayer satisfaction levels are maintained or increased, reductions in the sustainability costs of assets would be an indication of improved Council performance.

Recording both the total sustainability costs and the capital component of these costs provides extra information to assist Councils in improving the balance between capital renewal and maintenance.

For the purposes of year to year comparisons within Councils and for Council-to-Council comparisons, it is necessary to standardise sustainability and capital renewal costs in some way. Three obvious possibilities are:

(1) Current Replacement Cost of Assets (CRV);
(2) Capital Improved Value (CIV); and
(3) Population (or number of assessments).

The different methods of standardisation illustrate different aspects of Councils' asset management performance.

For example, a reduction in a performance measure that expressed average annual asset consumption as a percentage of the current replacement cost (AAAC/CRC) would indicate *either:*

- that a desirable change had been made in the asset composition increasing the proportion of longer lived assets which have a lower average annual cost per dollar of capital; *or*
- that existing asset lives had been extended representing an efficiency change.

Both of these are positive improvements.

If average annual asset consumption was expressed in terms of dollars per head of population (AAAC/Population), a fall in the measure would reflect either economies of scale achieved through more extensive use of existing assets or greater efficiency through rationalisation of the asset base. Again, both are improvements.

Or if average annual asset consumption was expressed as a percentage of capital improved value (AAAC/CIV), a reduction would enable Councils to show the effectiveness of their asset management in so far as better management of the asset stock leads to an increase in capital improved value. If capital improved value increases faster than the asset base, the measure declines.

In each case a decline in the AAAC ratio represents an improvement always provided that customer satisfaction is maintained (or enhanced).

Sustainability (average annual asset consumption plus maintenance) can be treated in the same way. The benefit of adding this broader measure is that it avoids the danger of encouraging too great a reduction in capital costs at the expense of increased maintenance costs.

Recommendation 15
That the following measures be adopted in the set of performance indicators reported by Councils as better, more rounded, interpretations of performance are possible from a set of indicators rather than just one or two.

1. **AAAC/CRC**
2. **AAAC/Population**
3. **AAAC/CIV**
4. **AAAC + Maintenance/ CRC**
5. **AAAC + Maintenance/ Population**
6. **AAAC + Maintenance/ CIV**

2.6 Financial Management

Private Sector funding is now being examined by Councils as well as other levels of government. In considering which areas are suitable for co-operative ventures or other forms of private sector funding, it is necessary to keep in mind the balance that needs to be struck between the renewal of existing infrastructure and the creation of new infrastructure. Unless private funding can be found for renewal projects (perhaps using marketable capacity rights) then there is a tendency to do more new (i.e. additional) asset activity than renewal. If private funding is to be used, Councils may need to consider switching more of their own funds into renewal in order to maintain the appropriate balance. This balance should be swinging towards more renewal as the asset portfolio passes its major growth phase and starts to age.

Recommendation 16

That in considering the use of private sector funds for infrastructure funding due care be paid to ensuring that the appropriate balance between new asset acquisition and renewal is achieved. A greater proportion of total capital needs to be spent on renewal as the asset portfolio ages.

2.7 Communication

The default projections in this Study are for the use of Councils in understanding the adjustments that they will need to make from their current position to a long term sustainable position with respect to infrastructure assets. The sustainability indices should not be interpreted as Council "rankings", they are nothing of the sort. They simply provide a guide to the potential change required from current spending levels towards the long term average renewal expenditure, if no changes are made to asset management practices.

A Council's current position with respect to asset renewal is a function of the current age and composition of its assets, itself reflecting past growth in the community. It is not a reflection of current management, good or bad. The quality of Council management is revealed, not in the current renewal situation but rather in how Councils deal with the situation. Interpretation of the sustainability indices as "league tables" or "benchmarks" or "performance indicators" is entirely incorrect.

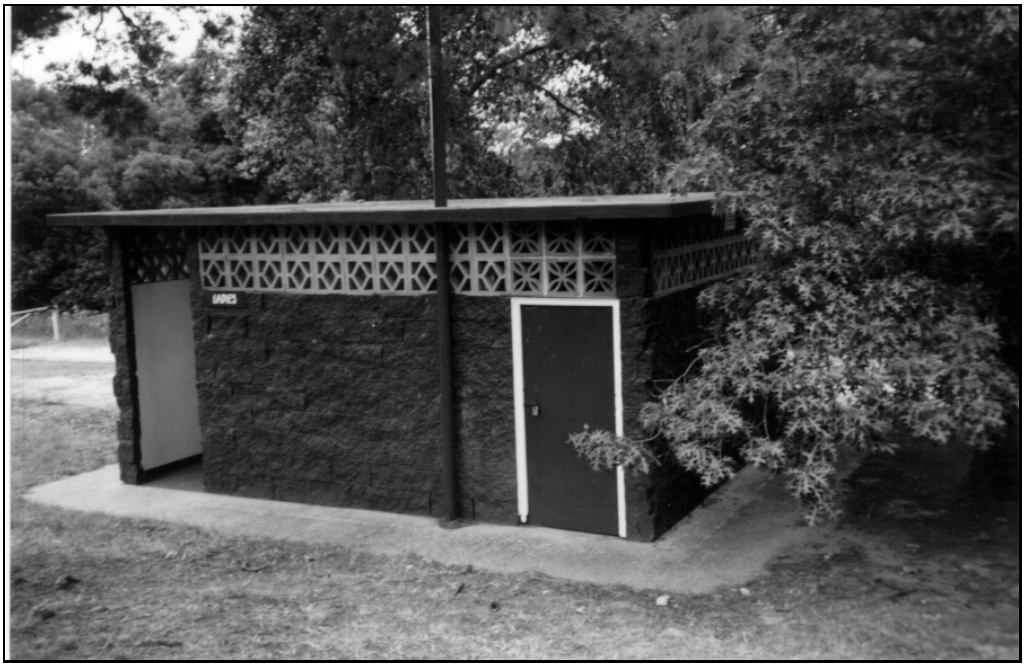
Such uninformed comparison of unlike situations is not likely to be helpful. Asset management staff are therefore encouraged to understand the true use of the sustainability indices as information for management decision making at a corporate level and to ensure that this is also understood by those who will be making asset decisions - including Councillors and, where necessary, ratepayer groups.

The Infrastructure Study has already produced a greater interest and willingness to take asset management seriously, with Councils adopting five year forward capital programs and reviewing economic lives. Better asset management will be expected to change the data in the sustainability indices. In the next few years changes may be expected from

- Better understanding by Councils
- More accurate and relevant data
- Adoption of improved planning tools
- Use of CBD where possible

Council's asset management performance will be indicated by the changes it can make in its own sustainability figures (and not, as explained above, by comparison or ranking with the figures of others).

Recommendation 17
That Council staff ensure that they are familiar with the rationale for the sustainability indices and projections in the Infrastructure Study and can communicate this to decision-makers.



Buildings – some not very glamorous, but lots of them and important to the community – long life but high maintenance

3. BACKGROUND, TERMS OF REFERENCE AND APPROACH

3.1 Objectives

The objectives of this study are to:

1. determine the ability of Councils to meet long term investment needs in the renewal and acquisition of infrastructure assets;
2. develop a model for examining the challenges of the task; and
3. make recommendations to improve the management of Victorian local government infrastructure assets.

3.1.1 Ageing Assets

Councils all over Australia are now facing the problem of ageing assets in need of renewal. Many of these assets were never funded by the Councils in the first place but came by way of grant (State or Commonwealth), from developer contributions or from a shift of responsibilities for previously State owned assets to local government. It has been suggested that had Councils been responsible for funding all of their infrastructure, it is highly likely that they would have acquired less. Moreover their rate levels would have been increased to meet the needs of asset acquisition and some of this higher level of rate revenue may have continued on to be available for renewal. As it is, Councils now have to prepare for increased funding to meet the needs of asset renewal.

3.1.2 Planning and Funding

Thus asset renewal creates two separate, but related, problems for Councils:

- planning; and
- funding

Following amalgamations, rates were reduced and capped at CPI less 1%. Although efficiency gains were made through the introduction of compulsory competitive tendering, it was not known whether the degree of savings achieved and achievable would be sufficient, with the reduced rate levels, to sustain Councils infrastructure assets as the time for renewal approached.

Rates are only one means of revenue raising but they are the major means. Increased use of user-pays charging can be used to improve revenues, and the appropriateness of grant levels can be reviewed. However, it is clear that if there is a need for a large increase in funding for infrastructure asset renewal, the major part may need to come by way of rate increases.

3.1.3 Focus on Expenditure Projections

Initially it was considered that the renewal problem would be examined by focussing on revenues: whether the revenue/charges split was appropriate, whether the rate base was appropriate, whether the rate burden on ratepayers was appropriate. This is reflected in the Terms of Reference attached as Appendix 1.

However, as the problem was examined further, it was apparent that little was known on the expenditure side and that measuring the gap between required future asset renewal expenditures and current revenue would need the focus to be placed on estimating the expenditures in the first instance.

Clearly if there is an imbalance between expenditures and revenues as asset renewal increases, Councils not only have the option, they have the requirement, to reconsider all sources of revenue and all types of expenditure. However, choices of what is to be foregone must lie with an individual Council and it would be inappropriate for this study to assume that one type of expenditure took preference over another.

Quite early in discussions with the Steering Committee it was established that the adequacy of existing budgets to fund a higher level of renewal would depend on the willingness and the capability of Councils to restructure their budgets. It was recognised, however, that it was beyond the brief of this study to deal with this restructuring, other than by suggesting ways in which capital expenditures themselves could be restructured.

3.1.4 Modelling Renewal Requirements

In order to model future renewal requirements, certain assumptions needed to be made, namely that all existing assets (unless already tagged for disposal) would be replaced, that maintenance and management practices would remain as they are now, and that the real replacement costs would be constant.

With these assumptions it was possible to project the cost and timing of renewal of Council infrastructure. As with all projections based on default assumptions, the opportunity always remains to change the assumptions if the outcomes projected are undesirable.

Thus, depending on the outcomes, Councils may wish to rationalise their asset stocks, change their maintenance and management practices and look for more cost effective ways of replacing assets.

Similarly on the revenues side. The model assumes existing debt levels, debt redemption policies and funding practices. However, outcomes may be improved by operating on debt levels, debt redemption and funding practices.

3.1.5 Making Optimum Use of Limited Data

It was recognised from the start that the data held by Councils was extremely limited. The Office of Local Government estimates that only about one third of Councils have 5 year forward forecasts of their capital requirements. Infrastructure assets are now required to be reported in balance sheets but a number of Councils only report those infrastructure assets acquired in recent years and there has been no attempt to adjust the acquisition cost for subsequent inflation. Distinctions between maintenance and asset renewal for infrastructure assets varied between Councils as did capitalisation practices.

The approach taken was to devise a survey, with input from Councils, to collect basic data needed to forecast renewal. Initially it was intended to collect information on a sample basis. The Office of Local Government decided that every Council should be visited and this turned out to be extremely beneficial and produced a stronger result.

Analysis of financial measures has been limited to rate revenues with other measures, e.g. debt levels, incorporated as one of the mechanisms by which Councils may choose to manage their situation.

Renewal profiles were analysed against local government classifications to determine whether the growth rates and other features of Councils reflected in these classifications provided any guide to future problems, i.e. to determine whether there were any identifiable “cost drivers”.

3.2 Deliverables

The deliverables from the study were:

- The Survey Form which can be used to update information and ensure the continued usefulness of the database;
- A complete database containing asset profiles, economic lives, and replacement costs for major asset groupings;
- This report, with analysis and recommendations; and
- A formal presentation of the results to a meeting of CEOs.

3.3 Approach

To achieve these results, the Consultants

- Designed a survey form;
- Accepted input from two Reference Groups established by the Office of Local Government, one on roads, and the other on parks and recreation and culture;
- Pilot tested the survey on ten Councils;
- Explained the process and intended outcomes to two meetings of CEOs, one in Melbourne and one in Shepparton;
- Conducted five regional meetings in which the survey forms were explained to both technical and financial staff who were to complete the surveys;
- Visited every Council, discussing problems and survey outcomes;
- Verified and validated the information;
- Returned the cleaned up data to CEOs for checking and confirmation;
- Analysed the data: and
- Produced this report.

A full discussion of the methodology applied will be found in the next chapter, Chapter 4. The analysis is in Chapter 5

3.4 Acknowledgements

Many people have contributed to this report.

Officers at every Council have spent a great deal of time finding, categorising and providing information about their infrastructure assets and asset management practices. Without their assistance and knowledge this report would not have been possible and that help is greatly appreciated. Additionally, about thirty Councils, along with VicRoads and the RACV, made comments on the draft report, many of which are reflected in this final document.

The Steering Committee, the Reference Groups and the Pilot Councils have been particularly helpful in shaping the direction of the study and providing valuable feedback during discussions and meetings.

The Office of Local Government has provided helpful staff, office accommodation and other office services to facilitate the data-gathering and reporting.

Data quality remains with Councils. The authors accept responsibility for the conclusions and recommendations of this report.

Typical drainage assets – much less volatile than roads, but harder to measure

4 STUDY METHODOLOGY

4.1 Data collection

4.1.1 Survey Form

A comprehensive survey form was developed to gather data on a consistent basis. The survey form was developed with the help of:

- A Roads Reference Group;
- A Recreation and Culture Reference Group; and
- Ten Pilot Councils. (Refer Appendix 2 for the composition of the groups.)

The Reference Groups and Pilot Councils were instrumental in determining:

- The scope of the data collection;
- The level and aggregation of the data collected;
- Advising on data availability; and
- Ensuring that the terminology used was understandable to local government.

The survey form was developed in Microsoft Excel and was made available to councils, on disk, in the Office 97 version and in the previous version, 5.0. A feature of the Office 97 version was the use of 'drop-down' list boxes which were used to obtain consistent responses to a number of the questions in the survey. A copy of the survey form is attached as Appendix 3.

Accompanying the survey form was a detailed instruction manual for its completion. A copy of the instruction manual is attached at Appendix 4. The

instruction manual provided a clear set of guidelines for completing every field of the survey form. For councils using the previous version of Microsoft Excel, the content of each of the 'drop-down' list boxes was displayed to maintain the consistency in responses.

Five regional meetings were held across the State. Technical and financial people responsible for completing the survey form attended the meetings, from 71 of the 78 councils. There was a detailed briefing on the nature and purpose of the data collection and each field (or set of fields) of the survey form was discussed. There was a high degree of interaction at each meeting and many of the questions that were asked helped the council staff to gain a better understanding of the purposes of the survey and the requirements of the data collection.

The survey forms and the instruction manual were released at the meetings. Those councils who did not attend the regional meetings received their forms through the post, with six of the seven councils requesting a briefing on the survey.

4.1.2 Council Visits

Every council in the state was visited to retrieve the information requested in the survey form. The visits provided an opportunity for both the council and the consultants to clarify the data collection. An initial validation of the data was achieved by checking and comparing completed parts of the survey form, e.g. estimated annualised life cycle cost approximates total maintenance plus depreciation; current replacement cost is greater than written down current cost. A checklist was used by the consultants to prompt the councils for other information and clarification of the data provided. A copy of the checklist is attached as Appendix 5. Part of the checklist was a pro forma to assist councils to tell the 'good news' stories about the 'best practice' approaches being taken to provide council services.

In many cases, the completed disk was retained by the council for modification of the data.

As well as assisting in ensuring a 'good' data collection and helping the consultants to view the local area of each council, a number of councils expressed their pleasure at being visited in their own environment. There were a number of comments on the perceived benefits of the visits and the following list provides a summation of those comments:

i. Technical and financial people working together to obtain the data.
ii. A solid understanding of the project aims and objectives.
iii. A new way of looking at asset management.
iv. The realisation that some of the data is not available and yet it is important data in the strategic and management contexts.
v. The knowledge that other councils are doing similar things.
vi. The knowledge that other councils face similar problems – 'we are not alone'.
vii. The knowledge that they are doing some things that are 'best practice' (the 'best practice' stories).

viii. A raised awareness about the importance of strategic planning.
ix. An understanding that there is no best (or one) way to do things, but that each council has unique problems as well as common problems on some basis.
x. A raised awareness about asset management issues.
xi. Networking – other people to talk to and discuss issues - see also v. above. (This was a major benefit of the regional meetings, with people saying that they got an opportunity to meet their counterparts in neighbouring councils.)
xii. Seeing the big picture by getting out of the detail.
xiii. Suggesting strategies to overcome the problems – further amalgamations, asset rationalisation, changed asset ownership, using the local community.
xiv. Understanding and articulating the political dimension of the problem.
xv. The need for a continuing data collection.

The survey form was generally forwarded a few days after the site visit. In most cases the form was sent via email, demonstrating local governments ability to adopt new technology quickly.

4.1.3 Follow Up With Councils

In some instances, further clarification of the data supplied was required. This was generally achieved through either a telephone call or a fax. Responses took the form of a fax, if there was only a small amount of information being transmitted. Data clarification requests resulting in significant changes to the survey form usually were handled through email.

4.1.4 CEO's Sign-off

At a late stage in the study it became apparent that, despite efforts to clarify data discrepancies, there were some survey returns that contained poor quality data. After discussion with the Office of Local Government it was decided to return completed survey forms, with any amendments included, to every council for the CEO to sign-off on the reasonableness of the data. This exercise resulted in 45 of the 78 councils making changes to the supplied data. A brief summary of the changes is contained in Appendix 6.

Typically, the changes made included:

- Revised economic lives for some assets (generally extended);
- Changes in the categorisation of capital expenditure; and
- Changes in the age profile of assets.

4.1.5 Draft Report – Feedback

A draft report was prepared and issued to all councils, inviting feedback on the contents of the report. A number of councils (about 10) took the opportunity to further revise the data they had supplied. The changes were mainly in relation to economic lives and some budget information.

4.1.6 Other Data Sources Used

At the outset of the project, councils were advised that the amount of data they would have to supply would be kept to a minimum. In particular, where the data was available from another source, that source would be used. The following data sources were used to collect information relevant to the study:

- Victoria Grants Commission
  - ™1995/96 and 1996/97 broad revenue and expenditure information;
  - ™1995/96 and 1996/97 rates information; and
  - ™disability factors used in assessing councils for financial assistance grants.
- Department of Infrastructure – Research Unit
  - ™Population and household statistics
  - ™Dwelling composition
- Australian Bureau of Statistics
  - ™Household income information from the 1996 census.

4.2 Data Analysis

4.2.1 Definitions

The Instruction Manual which accompanied the survey form provided a number of definitions (refer to Appendix 4.) It is known that a number of councils have used their own definitions of maintenance and capital. This reflects the lack of uniformity of treatment of infrastructure asset expenditure by councils. It should be noted that there are a number of viewpoints on what is maintenance and what is renewal, causing genuine misunderstanding. In terms of this study, the differing interpretations only affect the data analysis when it is conducted at a disaggregated level. It does not affect big picture analysis.

However, it would be useful in any future data gathering exercise if common definitions were developed and used by all councils.

A glossary of a number of terms used in this report precedes Section 1 of the report.

4.2.2 Assumptions

Some assumptions have been made to provide a basis for analysing the data. While the assumptions may not be completely correct it is important to make them to assist data analysis. The assumptions may not always hold at the individual council level, but they will generally hold at the aggregate level because of the 'swings and roundabouts' effect of the data collection.

i. *Economic Lives*. Councils have used a range of economic lives for the same type of asset. There are valid reasons (e.g. topography, climate, quality of construction materials) why this should be the case. It has been assumed that the economic lives used by individual councils are a genuine reflection of the factors which differentiate between councils and the level of maintenance applied to the assets by the council.

ii. *Maintenance Costs*. It is not possible, given the nature of the study, to analyse the maintenance effort of individual councils. This is particularly the case with longer lived or buried assets, which may

require little or no maintenance expenditure for considerable periods of time. Nor would it be correct to say that maintenance expenditures are a certain percentage of current replacement costs of a council's assets. It is assumed that the current level of maintenance expenditure is appropriate.

iii. *Asset Renewal Profile.* In the absence of a clear policy direction to the contrary it has been assumed that the current asset base of each council will be maintained for the purposes of determining the future liability for renewal of assets.

iv. *Age Profile of Assets*. The age profile of a council's assets may be based on the age of the assets, some surrogacy for the exact age such as the date of construction of surrounding assets or the condition of the assets. In the absence of any other data the age profile provided by councils has been accepted.

v. *Current Costs*. The data was supplied using current costs, i.e. no allowance was made for the effect of future cost increases or inflation. This provides for a substantial level of consistency in the data.

vi. *Current Management Practices.* Although each council may well deal with its assets differently from its neighbours it has been assumed that the management practices are appropriate to the council and no attempt has been made to adjust figures to 'standardise' for those different practices. Further comment on management practices is made in Section 5.12 of this report.

vii. *Backlog Maintenance ("Past Due").* Nearly every council has assets that are shown as being past their economic life. This is to be expected as the concept of economic life is the average age at which the assets will no longer provide a useful service. Some assets will fail early and some later. However, a number of councils have reported a substantial number of assets as being "past due" for replacement. In generating the future renewal profile for each council assets past due have been scheduled for replacement at the next cycle. For example, a road asset with an economic life of 50 years which is now 75 years old has been scheduled for replacement at 100 years.

4.2.3 Data Constraints

The data survey collected a broad range of data about each council. There are a number of constraints which apply to the data, its use and the analysis of the data. They are:

i. *Nature of the Study.* This is a high level study of some macro areas of asset management. It provides a 'helicopter' view of the challenges faced by Victorian local governments. It is not intended to provide for a detailed analysis or understanding of individual councils asset management practices or data.

ii. *Economic Lives.* Councils were asked to provide a single economic life for each sub-category of assets. This necessarily adds an 'averaging' aspect to the data as some assets will be subject to further sub-categorisation (e.g. arterial roads, collector roads, local roads) which have differing economic lives.

iii. *Use of the Data*. The data was collected purely for the purposes of the Infrastructure Study. It was not collected for cost comparison or benchmarking purposes and the specification and rigour that is associated with such data collections has not been applied to this data collection. Tables of councils with varying percentages or other measures are not rankings – they are simply sets of information which may be useful to provide an indication of areas for further study. **It is dangerous, and indeed inappropriate, to use the data for purposes other than the Infrastructure Study.**

iv. *Time*. The Infrastructure Study has a tight timeframe for its completion. This impinged on the data as it was not possible for councils with poor data to spend significant amounts of time improving the data.

v. *Interpretation of Requirements.* The briefings on the study and the site visits to councils have gone a long way to ensuring that a uniform interpretation of requirements has been made. However, there may be some inconsistencies in the way in which the requirements have been interpreted. This needs to be taken into account in relying on the data.

vi. *Errors.* The size of the data collection and the number of fields to be completed tend to increase the chances of incorrect or missing data.

vii. *Nature of Council Data Holdings.* The data held by councils is not homogeneous. Council amalgamations have resulted in the combination of disparate systems, which may or may not result in some loss of data integrity or a blurring of the system controls on data entry and update. Data has been collected using different assessors and staff and it is likely that dissimilar standards have been used.

4.2.4 Data Validation Issues

In any data collection it is useful to take steps to validate the data received. The outcome of the study is enhanced if valid data is analysed. There were three data validation stage in this project – the site visits, data entry and CEO sign-off. **Despite these validation steps it is unrealistic to believe that all the data is validated – this is not the case.** Data validation has been possible to the following extent:

i. *Internal Comparison Checks*. A number of comparison checks were made of the data, e.g. Was the total replacement cost of the age distribution of the assets consistent with the current replacement cost? Was the depreciation charge consistent with the stated economic life of the asset? Was the annualised estimated life cycle cost equivalent to the sum of depreciation and maintenance? Fax and/or telephone follow-up with councils, as necessary, was made to clarify any significant variations.

ii. *External Comparison Checks*. Where data was available from another source, e.g. Victoria Grants Commission; Australian Bureau of Statistics; Department of Infrastructure, a comparison of the data sources was made.

iii. *Reasonableness Checks.* Each survey form has been reviewed for reasonableness, on more than one occasion. Typically, the questions posed were: Are the survey answers or figures consistent or reasonable for a council of this size or nature? Is the maintenance figure consistent with the asset base? Are the economic lives consistent with the age profile of the assets? Is the data consistent with data from other sources? Again, telephone and fax contact was made with councils to clarify potential anomalies.

iv. *Correct Additions.* Where additions were required the survey form was designed to total the individual amounts automatically.

v. *Data Magnitude.* Dollar amounts were required to be entered in thousands, but there was a lack of consistency applied by councils in observing this rule and a careful analysis of all dollar amounts was undertaken to ensure that the correct magnitude was observed. Errors of this type became more apparent when the data was converted into table format. Incorrect data was readily converted to the correct magnitude, with little reference to councils.

vi. *Percentage Amounts.* The survey form was not sufficiently stringent in accepting percentages. A careful review of percentages, again using data tables, was required to ensure that the correct magnitude was applied.

4.2.5 Environmental Factors

Victoria is a compact state compared to the other Australian states. Despite its compactness there is a significant amount of variation across the state. While there are many similarities between councils, there are many differences. The Australian Classification of Local Governments (ACLG) acknowledges the differences by providing twenty-two different classifications. The classifications relate to land use (urban or rural), population density and remoteness, with a separate classification for capital cities. Victorian councils are represented in fifteen of the twenty-two classifications.

As well as the distinctions identified in the ACLG system there are a number of other factors which distinguish councils, both natural and man-made. They include:

i. *Topography.* The physical characteristics of the council area, e.g. hilly terrain, open plains, coastal areas, natural forests, rivers and watercourses. The predominance of particular physical characteristics will affect the councils cost structure. For instance, numerous watercourses increase the cost of building and maintaining roads because of the increased need for bridges and culverts and the degradation of road pavements from water in flood-prone areas.

ii. *Climate.* There are potentially four climates experienced by Victorian councils. Temperate (mild winters, warm summers, moderate rainfall), arid (cold to mild winters, hot summers, low rainfall), wet temperate (mild winters, warm summers, high rainfall) and alpine (cold winters, warm summers, significant snowfalls). Each of those climatic conditions has different effects on infrastructure assets, in terms of economic lives and maintenance costs.

iii. *Built Environment.* The extent of the built environment, particularly transport and drainage infrastructure, and its age have a significant effect on maintenance and renewal expenditure levels of councils.

iv. *Distance between Urban Centres.* A council with a large geographical area will have more difficulties, and probably increased costs, in delivering services to its de-centralised community compared to a compact metropolitan council. This is likely to be offset to some extent by the provision of fewer services and the self-reliability of rural communities.

The effect of these environmental factors differs for each council and contributes to the differences between councils both in terms of the demand for services and the capacity, and extent, of service delivery.

4.2.6 Summary

While councils have made a significant effort to provide good quality data it must be kept in mind that the data is:

- Largely unaudited;
- Subject to a set of assumptions which may not always hold true;
- Subject to varying interpretations;
- Subject to some inconsistency;
- Useful as a guide and a 'first cut' for aggregate analysis; and
- Gathered for the purposes of this study and not other purposes which might require a more rigorous approach – e.g. unit cost analysis, benchmarking.

Despite the limitations and constraints of the data it is of sufficient accuracy to provide the 'helicopter' view.

5. THE RENEWAL CHALLENGE:

Findings from the Study and their Implications for Councils

5.1 The Information Base

5.1.1 Balance Sheet Data is Not Enough

Infrastructure in Victorian Councils is worth around $23.3 billion in current replacement terms, or approximately $13,000 per household. Managing these assets on behalf of the community is a big responsibility and good management requires good information. Councils know that some of these assets are now in need of renewal - but how many assets? How much will it cost to renew them? When will resources be required to be spent, or other management action taken, to avoid asset deterioration and loss of service?

Until now, the information necessary to answer these questions has not been available. Only in recent years have Councils have adopted accrual accounting with recognition of infrastructure assets in their balance sheets and for many this information is still imperfect. But even if this information was perfect, it would still be insufficient. The balance sheet can only estimate the overall loss of service potential through wear and tear and obsolescence, it cannot predict the timing of needed renewal. More than balance sheet information is required.

5.1.2 Asset Planning Data

This study has collected asset planning data base to supplement information available from the financial accounts and maintenance systems. Forecasting asset renewal requires knowledge of the age of assets, the cost of renewal and

their economic lives (or how long they are expected to last before a combination of wear and tear, and technical and demand obsolescence makes their replacement or renewal the most cost effective option).

Some Councils knew when their assets had been constructed or acquired; most did not. Where they did not, Councils were asked to estimate age. This was done by assessing condition and residual life and working backwards from an understanding of the general economic life of the asset class, or by estimating age from a knowledge of Council's development and growth patterns.

5.1.3 Economic Life

Economic life has been defined for this study as the period between the acquisition of an asset and its renewal. Councils were asked to estimate this period *based on their current knowledge and practices*. It is not the design life, which is, in general, far shorter. Nor is it the physical life, the time at which the asset completely fails, which is, in general, far longer. It is that period of time during which retaining the asset is more economic than replacing it, after taking into account the higher reliability and lower maintenance costs of a new asset but also the extra interest costs incurred. The economic life of any asset is a function of the service standard required from that asset. The lower the service standard that is acceptable, the greater can be the economic life.

Economic lives are also referred to as "useful lives". The lives used in the financial accounts for purposes of depreciation may bear no resemblance to any of the above lives. Councils were asked to disregard financial accounting lives and engineering design lives and to estimate the period that the asset would actually be held.

Economic lives vary between Councils for three reasons:

1. genuine differences in economic lives resulting from differences in the terrain, climate, conditions of use, etc.; and
2. genuine differences in economic lives resulting from different service level policies adopted by Councils.

(It would be quite wrong to attempt to standardise for these genuine differences and the study has not attempted this.)

The third reason however is:

3. differences in estimates of economic lives resulting from poor information or lack of understanding.

To eliminate as much as possible differences occurring for this third reason, frequency distributions of Councils' economic lives were prepared for each of the major asset classes and distributed to individual Councils during the final checking and verification process. The distributions presented in Appendix 7 to this study are the revised distributions after Councils re-assessed their estimates with those of their peers in other Councils. The effect of revision was to reduce the range of variation in Council estimates but not to remove it. This study has not attempted to impose any common policy standard on

Councils. It is Councils' right and prerogative to choose their own level of service delivery as reflected in their asset conditions.

5.1.4 Backlog

Where assets are actually being renewed on cycles longer than considered optimal by asset managers, the extra funding needed to shorten the cycle is often referred to as a backlog or "catch up maintenance". An alternative way to view this situation is to recognise that it is the *actual* not the *desired* renewal cycle that defines the current service level being achieved. *Funding the backlog is thus equivalent to increasing service levels.*

The purpose of the projections is to estimate renewal requirements *based on current service levels.* Accordingly, no attempt has been made to factor in any "catch up " maintenance or backlog in the projections. This has met with criticism from some Councils whose aspirations for higher service levels have not been supported by their budget levels.

5.1.5 The Projections and the Default Assumptions

The asset renewal projections contained in this study are "default" projections. They indicate the size of the funding problem that would arise if nothing were done to change current asset levels, standards, utilisation, etc. The default projections used in this study are:

- that all existing assets are to be renewed when their time is up
- that they will be renewed with assets substantially the same as the assets already in existence - i.e. they will not be upgraded (or downgraded)
- that the economic lives will remain as in the original estimates and not change over the forecast period
- that the real cost of renewal will not change over the forecast period
- that maintenance and management practices will remain as they are now
- that technology will remain as it is now

The default assumptions represent the status quo. Deliberate decisions will be required on the part of Councils to change the default assumptions, but it is changes in these default assumptions that will lead to improved outcomes.

In practice, it is likely that none of these assumptions will hold, or at least not hold completely. Indeed, the very projections themselves and Councils reactions to them will provoke changes, this is how management improvement is achieved.

Councils may decide to rationalise non-core assets; they may decide to change their maintenance and/or operating practices, or conditions of use, so that the assets' lives can be extended. Where assets, particularly roads, are currently set at inappropriately high and costly levels, Councils may decide to review their service levels to ensure cost effectiveness. Councils may investigate cheaper ways of managing renewal costs.

Adoption of any of these management practices will help Councils avoid some of the increasing renewal costs projected in the model. Thus the model's projections are not prescriptive nor even necessarily descriptive. *The message is that the projected results can be avoided by changing the assumptions!* In

this sense, the projections are not expected to "hold true". Were they to do so, it would mean that Councils had ignored the opportunity to learn from the information provided here.
The projections here cannot be used to support an increased call for funds. Increased funding is not a solution until and unless Council's assumptions of economic life, renewal cost, age of asset, service level standard and maintenance practice can be shown to have been checked and to be demonstrably optimal for Council and its ratepayers.

5.1.6 Data Quality

The information analysed in this section is not perfect. This is the first time that Councils have had to provide this type of data and for many it was difficult and it is to be expected that, despite all of the assistance provided and the verification checks that have been carried out (see Section 4) some errors will remain. Residual errors, however, are not expected to impact on the general thrust of the study, its findings, implications and recommendations.

The information is relevant and a great improvement on the information that has been available in the past; it is more extensive, has greater scope, and for the first time there is an asset planning database that covers the entire state on a reasonably consistent basis. Councils now have the base data on which to start planning for the future. Some will wish to refine the data they have provided. Others will need help to do so.

With refinement and continued use through the modelling capability provided to Councils as part of the Infrastructure Study and through regular annual statewide updates of the database, it will get even better.

To summarise: Renewal forecasting has required a major data collection exercise - much of it for the first time. Care needs to be exercised, but the data is a valuable contribution to Strategic Asset Management in Victoria.

5.2 The Size of the Challenge

5.2.1 The Infrastructure Asset Base

This is the first time that Victoria has had an overall picture of the size, condition and value of its local Council infrastructure - its roads, bridges, footpaths, drains, parks and recreation and public buildings. No similar study of local government infrastructure has been found anywhere in the world.

The Victorian local government infrastructure asset base is worth around $23.3b in current replacement values (exclusive of land holdings.) 64% of this is in transport - roads, bridges and footpaths. Drainage constitutes 15%, Buildings 19% and Parks, despite covering a large landmass, represent only about 2% of replaceable infrastructure assets (refer Figure 5.1).

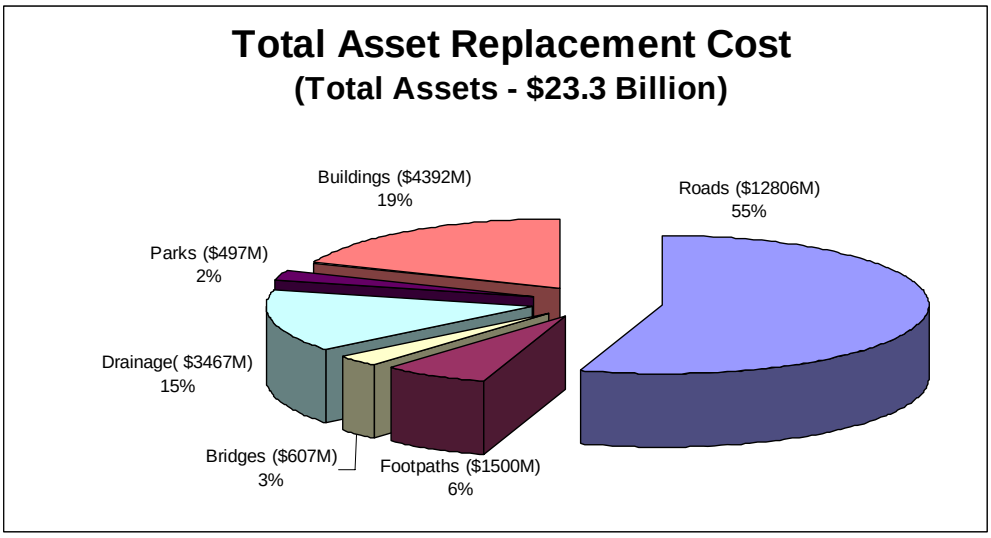


Figure 5.1

Because transport is such a significant component of the total, the following piechart (refer Figure 5.2) shows the breakdown of transport into its finer components, e.g. road pavement and seal, concrete and timber bridges.

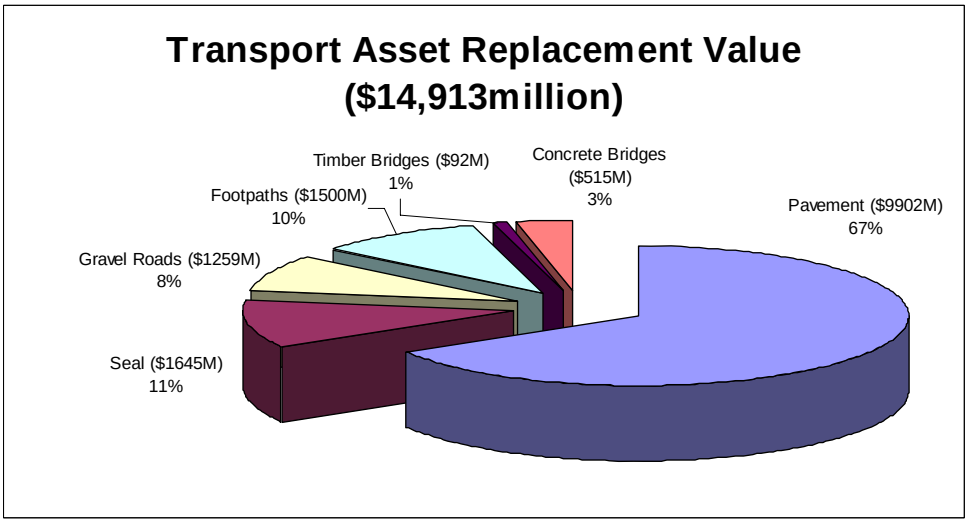


Figure 5.2

5.2.2 Annual Consumption of Infrastructure Assets

On an annual asset consumption basis (refer Figure 5.3), transport accounts for an even larger percentage. Roads, which are only 55% of total infrastructure assets, account for 62% of the annual asset consumption, footpaths which account for 6% of the total replacement value, account for 7% of the asset consumption. Parks doubles its significance with 4% of asset consumption versus 2% of replacement value but buildings and drains decline in proportion. For drains, much of the work that needs to be done is cleaning and dragging - maintenance items. If these are done regularly, drains have a long life and this is reflected in the asset consumption figures.

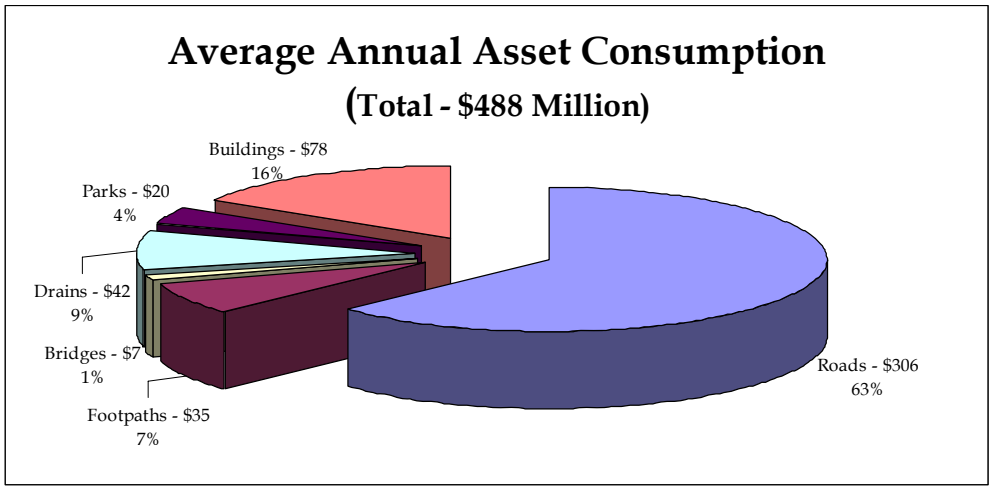


Figure 5.3

Buildings also decline as a proportion of asset consumption as the building structure has a long life and the shorter living elements of buildings, the electricals and mechanicals, are a relatively small proportion of the total building value. This picture however does not include furniture and fitouts, although they are associated with buildings because they are not infrastructure assets. Their replacement could however be significant for Councils.

5.2.3 The Key Infrastructure Questions

With respect to this infrastructure, the study has focussed on three key questions:

1. How much does it cost ratepayers to retain the current infrastructure portfolio of Councils? (i.e. what is the long term average cost of renewal plus maintenance?)
2. How much will need to be spent in the near term (i.e. within the next ten years) relative to the renewal levels experienced in the recent past and how quickly will renewal mount after this ten year period? That is, how much more management effort (financial or creative input) will be required of Councils as their assets age?
3. How many Councils - and which ones - are in immediate need, and how many have the luxury of planning time to cope with their renewal problems?

5.3 Capital Expenditure on Infrastructure

To answer the three key infrastructure questions it is necessary to make a distinction between the types of capital expenditure on infrastructure assets.

5.3.1 Capital Expenditure Categories

There are three distinct capital expenditure categories:

Renewal - where the purpose of the capital spending is to retain an existing service.

Expansion - where the purpose of the capital spending is to extend services to newly developing areas of Council where there are new ratepayers.

Upgrade - where the purpose of the capital spending is to increase the quality of services provided to existing ratepayers or to provide entirely new services.

The impact of any amount of capital spending on Council's future renewal liability, maintenance, operations, and revenues depends on how capital spending is allocated between these three categories.

The Infrastructure Study accordingly required Councils to allocate their capital spending for the two historic years, the current budget year and the two forward planning years, according to these three categories.

This caused considerable difficulty for Councils, for the accounting records have not traditionally made these distinctions. Although the classifications are clear - and detailed descriptions were provided in the guidelines - in practice separating the three categories was not easy.

The reason for the difficulty is that the distinction is one that needs to be made at the corporate level in Council, rather than at a middle management or technical level. The logic underpinning the classification is the relationship of the capital spending to the Councils' service strategies.

From a technical point of view, the construction of an asset may look much the same whether it is a renewal of existing service ("renewal"), an increased service level provided to existing ratepayers ("upgrade"), or an extension of the basic service level to growth areas of Council ("expansion"). It is the purpose that counts and that can only be decided at a corporate level.

To give an example. A new swimming pool, if it replaces an old one at the same service level (i.e. same number and type of pools, same size of pools, etc) is RENEWAL of services. However, if there had previously been no pool at all and it serves the existing ratepayer base, the swimming pool represents an increased service level and it is UPGRADE of services. If it is a new pool but there already exists one (or more) that serves the needs of the existing ratepayer base but this pool is being constructed in a developing ward to serve the needs of a growing ratepayer base, then it is EXPANSION of services.

All terms have to be interpreted in terms of service rather than the asset that provides the service. This is why the distinction needs to be made at the corporate service level rather than at the technical level.

Another example would be roads. A reseal is RENEWAL of services. But if the road is being widened at the same time then the portion of the seal that covers the widened section of road is UPGRADE of services even if it is carried out at the same time. The seal on a new road linking a new subdivision to the rest of the Council area, and paid for by Council, is EXPANSION of services.

5.3.2 Capital Expenditure Allocation Accuracy

The key to the difficulty experienced by Councils in categorising asset expenditure is that it is not the expenditure on the asset that determines the classification, it is the purpose for which the asset expenditure is carried out.

Councils have generally not developed a corporate level asset management strategy for which these capital distinctions are important. Because (1) the allocation task was new for Councils, (2) the task was mostly given to technicians to accomplish whereas it should have been carried out at the corporate level and (3) for the two historic years in the Study, the allocations had to be made after the event, the accuracy of this allocation needs to be carefully examined.

Councils reported that, in aggregate their capital spending was allocated as follows:

Renewal Capital	$150m per annum
Upgrade Capital	$116m per annum
Expansion Capital	$ 95m per annum

Forecast Renewal Capital for the period 1997-2002 was $918 million (or an average of about $184m per year over the period). This suggests an increase in renewal spending in the near term over existing renewal capital levels.

The reported asset condition (which was included in the study data as a reference check on the accuracy of supplied cost data) when taken together with the reported age profiles, is more consistent with there being a higher level of renewal than the level actually reported as renewal.

One possibility is that a number of Councils could be renewing services but calling the expenditure "upgrade". This is because they were being influenced by the new asset relative to the old, worn-out asset, when what they should have been looking at was whether the new asset was providing a higher degree of service or just replacing the old service.

Renewal could also be reported on the low side if Councils considered an expenditure item to be maintenance rather than renewal. Reseals are an obvious case where Councils differ in treatment, some regarding reseals as maintenance and some as capital. There is no right and wrong to this question, but for the purposes of forecasting future expenditure, it is more useful to consider the reseal issue as capital renewal. This is what Councils were required to do. However, again, because this required Council officers to do something with which they were not familiar, errors may have occurred.

The accuracy of this reporting will increase as Councils develop their strategic asset management plans and take a more corporate view of asset management and capital expenditure. However, for this study, it is necessary to recognise the reporting limitations in this instance.

To avoid overstating the case for future renewal increases, the basic analysis has combined the reported figures for renewal and upgrade into the one

"possible renewal" figure to use as the base from which future increases in renewal costs are taken.

However, to allow maximum information for Councils, all categories are presented in the tables and the sustainability and management effort tables have compared forecast figures for renewal with all categories of capital spending.
This is:

1. To allow for possible mis-allocation between categories, and
2. Because switching capital spending between the different categories is a viable strategic asset management strategy.

To summarise:
Councils were asked to allocate capital spending to three categories on the basis of its impact on services. This represented a cultural shift and mindset change for many Councils and it is suspected that renewal has been under-reported. Allowance has been made by considering the composite category "renewal plus upgrade" as the possible level of real renewal.

5.3.3 Why the Distinction between Capital Categories is Essential for Developing Corporate Asset Management Strategies.

Despite the difficulty that Councils are currently experiencing in making these capital distinctions, not to do so puts them at a great disadvantage in future planning and in coping with the renewal problem. All capital is not alike and it is a mistake to treat it so. For example:

Renewal Capital usually results in a *reduction* in maintenance since it is replacing an older, usually more maintenance intensive, asset with a newer, efficient one. But expenditure on renewal is *not matched by any natural increase in revenues.*

Upgrade Capital, i.e., capital spent on *upgrading services* is similar to renewal in that it is generally *not matched with an increase in revenues* (unless, of course, it is providing a service subject to a user pays charge) but unlike renewal it will generally *increase the total maintenance requirements* because it is increasing the total asset base.

Expansion Capital increases the total asset base *and increases maintenance expenditures* but it is associated with an *increase in rate revenues from new ratepayers. (Note, a large amount of expansion capital which will affect future renewal will not show up in the capital expenditures of Councils because it has been funded by developer contributions. See Section 5.9 on Infrastructure Asset Growth.)*

Capital spent on additional assets, "growth" (upgrade and expansion) increases both maintenance and the average annual level of asset consumption (AAAC). That is, growth increases sustainment costs. Renewal does not.

As a rough rule of thumb, given the average economic life, the average annual consumption costs increase by about 2% of every capital dollar spent on growth. Whereas the capital growth is a "once off" cost, the extra asset consumption (AAAC) is added to costs *every year*. The same is true of maintenance. On average, every dollar of capital spent will also add about 2% to the annual maintenance budget.

In most cases new capital (upgrade and expansion) will also be associated with increased operating, security, and cleaning costs, whereas renewal capital will not. The Victorian Audit Commission reported that for every $100 spent (once-off) on new capital, between $4.50 and $8.00 was added to the (annual) recurrent budget for such things as maintenance, repair, energy, cleaning, and security). In addition, if the assets were in health, transport or schools, up to $18 per $100 of capital spending could be added to the recurrent budget.

To summarise:
Unless capital is properly distinguished, future recurrent and renewal planning is very much a hit and miss affair. Table 5.1 below summarises the essential distinctions.

Likely Impact of Capital Expenditures on Maintenance, Operations, Revenue and Renewal

Capital/ Impact	Maintenance Impact	Operations Impact	Revenue Impact	Renewal Impact
Renewal	decrease	may decrease	Nil	nil
Upgrade	increase	increase/ decrease	Nil	increase
Expansion	increase	Increase	Increase	increase

Table 5.1

Note: "Operations" refers to the impact on the recurrent budget apart from maintenance expenditure, e.g. fuel, lighting etc.

5.4 How Much is the Existing Infrastructure Portfolio Costing?

The first of the three key questions was:

1. How much is the current infrastructure portfolio of Councils costing ratepayers in terms of its upkeep? (long term average rates of renewal plus maintenance)

This question is answered by a measurement the Study has developed called "sustainment". This measures combines day to day maintenance with the costs of periodic renewal

5.4.1 Maintenance

Maintenance, on an aggregate level, is currently $225m.[1] Many argue that this is not sufficient, but in doing so, they frequently fail to make the distinction between day to day maintenance and periodic renewal. Others argue that the maintenance dollar is ill-spent, with as much as one quarter to one third being wasted[2]. The problem is often not how much is being spent but rather *where and how* it is being spent. In the absence of better information, it has been assumed in this Study that the general level of maintenance expenditure is probably about right but that does not preclude the possibility of it being deployed more efficiently.

5.4.2 Renewal

Infrastructure assets are renewed rather than replaced. Ordinary assets, such as most plant items and furniture, are used up and completely replaced with a new item, but infrastructure assets such as roads and most buildings have an indefinite life which is "renewed" by the periodic replacement of individual components.

Infrastructure assets consist of an aggregate of components, each with a different lifespan. As each component comes to the end of its life, it is replaced, thus keeping the infrastructure asset system itself continuing almost indefinitely. Thus a road network remains an integral road network because of periodic replacement of sections of the substructure, sections of the seal, and sections of complete reconstruction. Similarly buildings, once constructed, tend to last as long as they are functionally required, by virtue of being, periodically, rewired, re-roofed, re-painted, re-furbished and rehabilitated.

The annualised renewal cost for each Council has been calculated from renewal profiles that project the cost and timing of major renewal activities for each asset class.

Ideally, Councils would develop detailed renewal schedules for major assets showing the timing and cost of replacing individual components. In the current study, however, only roads have been broken down into their major components of substructure and seal for the purpose of estimating future renewal costs. Other assets have been treated in a more global fashion. Developing more detailed renewal schedules for their buildings, parks, bridges and drainage assets based on economic lives of individual components would enable Councils to refine the figures provided in this study and assist them in overall management.

Councils have been asked to estimate the actual length of time between successive reseals or major substructure renewal, defined as the "economic life" of the asset. This is a technical estimate based on knowledge of the

[1] For Councils as a whole, maintenance figures were recorded at $ 323 m a year. However, of this, approximately $98m is estimated as being attributable to watering, coring and cutting of grassed areas in parks and gardens and they have been omitted from the aggregate sustainment figures. In future studies these costs will be omitted from the maintenance recording as they are more appropriately regarded as "operations".

[2] Anecdotal evidence from consultants specialising in this area. The absence of performance measures makes this is a difficult area to test.

asset, the way it is being used and the climatic and other conditions that give rise to decay and obsolescence.

5.4.3 Average Annual Asset Consumption (AAAC)

The key measure of the annualised cost of renewal is the "average annual asset consumption (AAAC)"

This is calculated, for each asset class and subclass separately, by dividing the total replacement cost by the class economic life.
Applying the economic lives provided by Councils for each of the main asset categories individually and aggregating individual asset consumption costs gives an aggregate annual asset consumption for Victorian Councils as a whole of $488m. This is on an infrastructure asset base of $23.3b. This represents an annual usage of assets of about 2%.

This is the amount that Victorians, on average need to spend a year to renew their infrastructure assets. But this is not the entire cost of *sustaining* the current asset base. Maintenance costs of $225m need to be added making the total average annual infrastructure cost $713m. (Sustainment costs have been calculated for each Council separately and are used in the analysis that follows this section.)

To summarise: "Sustainment" is a measure of the costs of retaining the existing infrastructure portfolio. It consists of maintenance and average renewal. The average renewal is measured by the "average annual asset consumption" cost or AAAC. The AAAC for Victorian Councils is $488m. The current average annual maintenance expenditure is $225m. The average annual sustainment cost is, therefore, $713m.

5.4.4 Current Level of Possible Renewal

The possible level of renewal is the amount that Councils could be currently spending on renewal as discussed in Section 5.3.2. Councils had difficulty separating their capital expenditure into the relevant categories. They reported current renewal costs are $150m per annum and reported capital upgrade $116m per annum.

For reasons previously discussed, these two categories have been amalgamated into one category of "possible renewal" on the understanding that (a) they could have spent the money on renewal and misclassified into upgrade and (b) it is possible to switch current spending on upgrade into renewal in many cases. Thus Councils could be spending as much as $266m per annum on renewal.

5.4.5 How Much are Councils Paying for the Existing Asset Portfolio?

Expenditure of $266m as possible renewal is a long way short of the long term average annual asset consumption and average future renewal. It represents only 55% of the AAAC amount of $488m. When maintenance costs of $225m are added, current expenditure equals 69% of required expenditure to sustain the existing asset portfolio.

This does *not* mean that Councils are currently underspending on asset sustainment because this is a "long term average" figure and the amount of assets falling due for renewal is increasing over time reflecting past growth in asset stocks.

In the absence of any rationalisation of infrastructure assets, the infrastructure asset portfolio is continually growing. The actual annual renewal costs are also growing but they lag behind the growth in the asset portfolio by the period of the economic lives of the assets. Thus the increase in renewal costs lags behind the growth in the asset portfolio by between 20-100 years depending on the composition of the asset growth.

The result is that today's ratepayers are paying only about 69% of the asset sustainment costs that are being incurred now. This means that the difference will be paid by future generations (either by way of higher costs for renewal or by way of service deterioration if the costs cannot be afforded). This is the basis of what is often referred to as 'inter-generational inequity', that is, today's ratepayers use up the asset stock but it is tomorrow's generation that picks up the renewal tab. Today's ratepayers are picking up the (much smaller) tab for yesterday's asset usage.

The average annual asset consumption is a measure of the asset consumption costs being incurred today. To the extent that they are not funded by today's ratepayers the problem becomes one for future generations.

5.5 Sustainability Index for Individual Councils

5.5.1 How to Interpret the Sustainability Index

The sustainability index indicates the extent of the gap between a Council's current position - determined largely by historical factors - and the long term sustainable level of costs for its existing asset portfolio. It is a measure of the future management requirements of Council.

- **Not a rank ordering or performance indicator**

It is *not* a measure of past performance. It is *not* a rank order. No Council should pride itself on its position in the index, nor should it berate itself. The current position has little to do with current management and everything to do with past growth patterns. A Council's current sustainment index is thus very much a matter of the "luck of the draw". It is what a Council does to reduce its gap that constitutes management and on which a Council can and may be evaluated, not on the currently existing position.

- **Most Councils Should be Spending Less than the Long Term Sustainable Level**

The sustainability index indicates the difference between the long term average sustainability rate for today's asset portfolio and the current rate of maintenance and renewal expenditure. For the reason given above, the current rate should fall short of the long term rate, for Councils in aggregate, since the

current rate reflects the renewal of past, smaller, asset stocks rather than today's level of asset holdings. However, for individual Councils this may not be the case. Some Councils may have had a large lump of asset acquisition in the past which is now due for renewal. In this case their actual maintenance and capital renewal expenditure could be greater than their long term average.

- **Illustrative Example**

To see how this may affect Councils, consider the mythical Council of Wingara that, 30 years ago, experienced very rapid growth, with its population increasing by 20% in just five years. As the new population of Wingara settled on the fringe of the then developed Council area new roads had to be constructed to link the developing regions with the city core. The total length of roads managed by Wingara doubled in a short space of just five years.

Over the past 30 years, the Council has been gradually replacing its pre-growth spurt roads (one half of its total stock). However now, 30 years later, it suddenly faces replacement of the remaining half all at once - because the growth spurt roads have now reached the end of their economic lives. Wingara Council finds its road replacement has leapt up five or six fold! The average asset consumption for roads is only $1/30^{th}$ a year or $1/6^{th}$ in a five year period, but now renewal costs are half of the stock in a five year period. Since roads are generally about 60% of Council assets the increase is very substantial indeed.

Victorian Councils that find themselves in Wingara's position would be found at Position (1) on the renewal profile in Figure 5.4 , when it has suddenly to spend much more than the long term average in order to cope with renewal.

When comparing current with future sustainability, the assumption has been made that maintenance will remain constant for this level of assets; the maintenance element is common to both figures. Differences in the sustainability measures are therefore solely due to differences in the renewal (or capital expenditure) element which is why the argument here revolves around the renewal profiles alone.

The following schematic illustrates the possible positions for Councils viz a viz their long term sustainable level depending on their current level of renewal.. The renewal profile for a Council is not smooth, it consists of ups and downs reflecting past acquisitions and their economic lives. A typical renewal profile may look like the one in Figure 5.4 below :

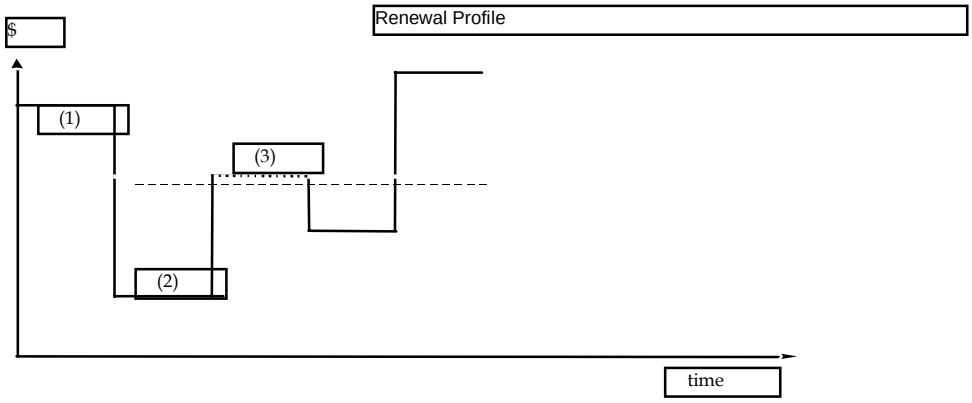


Figure 5.4

A Council could be at position (1) as illustrated in the example, above the dotted long run average sustainable level, or it could be below at position (2). It could even be, temporarily, exactly at the long run level (3). This is mostly an "accident of developmental history" - where Councils are now on the renewal profile depends on where they were on the growth profile many years ago.
The important thing to note is that where a Council is, relative to the long run sustainable level, is largely a matter of chance. It does not reflect good or bad management. However it will take good management to ensure that services continue no matter what the current position on the renewal profile.

The reason for the index is to indicate what level of management effort will need to be made, from where the Council is now, to meet the future lumps and bumps. It is always easier to maintain revenue and costs than to attempt to change them. "Management effort" includes creative means of reducing costs including demand management, ways of making provisions for future increases in renewal costs, and innovative funding techniques (including paying off loans now to increase future borrowing capacity).

The sustainability (renewal only) index does two things:
1. it gives an indication of the extent to which current ratepayers are contributing to the assets that they are now consuming (the intergenerational inequity issue), and
2. it indicates how much more (or less) will be required in the future - over the long haul.

To summarise: Ratepayers are currently paying for assets acquired some time in the past which are now falling due for renewal. The assets they are currently consuming (measured by AAAC) will not be due for renewal possibly for many years to come. The general level of assets falling due for renewal is increasing.

5.5.2 How to Use the Sustainability Indices

The sustainability indices are provided in Tables 5.2, 5.3 and 5.4.

Table 5.2 shows the ratio of current spending on renewal (defined above as renewal plus upgrade expenditure) to the long term Average Rate Of Asset Consumption (AAAC).

Table 5.3 shows the ratio of current renewal spending plus maintenance (i.e. the full sustainability measure) to AAAC + Maintenance. This shows a lower percentage gap between what is spent now and what will need to be spent later but the base is also higher. This is considered to be the appropriate table and measure to use for determining sustainment.

Table 5.4 is a measure of Total Capital Expenditure plus Maintenance to AAAC + Maintenance. While it gives the best ratios it is not the best measure as expenditure on capital expansion is unlikely to be readily transferable to renewal.

The purpose of the tables is to give Councils an indication of the adjustments that they will have to make to adjust to a long term sustainable position. By themselves they say nothing about the time period over which this adjustment has to be made. This is dealt with in the Management Effort Tables in Section 5.8.

Council Sustainability - Renewal plus Upgrade
Potential Renewal Capital Expenditure (based on current asset stock)
as a percentage of Average Annual Asset Consumption

Melton (S)	8%	La Trobe (S)	48%
Delatite (S)	14%	Loddon (S)	50%
Moira (S)	18%	Cardinia	51%
Central Goldfields (S)	18%	Greater Shepparton (C)	52%
Yarriambiack (S)	19%	Campaspe (C)	56%
Wodonga (RC)	20%	Yarra Ranges (S)	56%
Greater Dandenong (C)	21%	Monash (C)	56%
Macedon Ranges (S)	22%	Wyndham (C)	58%
East Gippsland (S)	23%	Mount Alexander (S)	58%
Horsham (RC)	26%	South Gippsland (S)	59%
Moorabool (S)	28%	Swan Hill (RC)	60%
Surf Coast (S)	28%	Moyne (S)	64%
Greater Geelong (C)	29%	Frankston (C)	64%
Gannawarra (S)	29%	Port Phillip (C)	65%
Bass Coast (S)	29%	Mornington Peninsula (S)	66%
Brimbank (C)	30%	Maribyrnong (C)	66%
Wellington (S)	30%	Southern Grampians (S)	67%
Colac-Otway (S)	32%	Ararat (RC)	68%
Queenscliffe (B)	33%	Baw Baw (S)	68%
Towong (S)	33%	Whittlesea (C)	69%
Hume (C)	33%	Northern Grampians (S)	70%
Hobson's Bay (C)	34%	Darebin (C)	70%
Wangaratta (RC)	34%	Glen Eira (C)	72%
Mitchell (S)	35%	Bayside (C)	77%
Ballarat (C)	36%	West Wimmera (S)	79%
Glenelg (S)	36%	Knox (C)	80%
Indigo (S)	37%	Yarra (C)	81%
Pyrenees (S)	38%	Nillumbik (S)	84%
Alpine (S)	41%	Murrindindi (S)	85%

Moonee Valley (C)	41%	Greater Bendigo (C)	90%
Strathbogie (S)	42%	Whitehorse (C)	95%
Banyule (C)	42%	Hindmarsh (S)	96%
Maroondah (C)	44%	Warrnambool (C)	96%
Kingston (C)	45%	Boroondara	112%
Golden Plains (S)	46%	Stonnington (C)	116%
Moreland (C)	46%	Mildura (RC)	117%
Casey (C)	47%	Melbourne (C)	118%
Buloke (S)	47%	Manningham (C)	170%
Corangamite (S)	48%	Hepburn (S)	274%

Table 5.2

In Table 5.2**,** Councils are ranked according to their revised renewal spending (renewal plus upgrade) relative to their long term renewal spending position. Those Councils at the 70% mark are currently spending about 70% of what they will need to spend, in the absence of other managerial changes, to renew all of their assets as they fall due.

Council Sustainability - Renewal plus Upgrade plus Maintenance
Potential Renewal Capital Expenditure (based on current asset stock)
as a percentage of Average Annual Asset Consumption and Maintenance

Melton (S)	29%	Mount Alexander (S)	68%
Greater Dandenong (C)	31%	Casey (C)	68%
Central Goldfields (S)	33%	Greater Shepparton (C)	68%
Moira (S)	38%	Cardinia	70%
Wodonga (RC)	39%	Loddon (S)	71%
Horsham (RC)	39%	Campaspe (C)	71%
Brimbank (C)	44%	Yarra Ranges (S)	72%
Macedon Ranges (S)	44%	Swan Hill (RC)	73%
Hume (C)	46%	Frankston (C)	73%
East Gippsland (S)	46%	Maribyrnong (C)	74%
Glenelg (S)	48%	South Gippsland (S)	74%
Moonee Valley (C)	49%	Buloke (S)	75%
Yarriambiack (S)	49%	Mornington Peninsula (S)	75%
Gannawarra (S)	49%	Moyne (S)	76%
Ballarat (C)	49%	Port Phillip (C)	76%
Moorabool (S)	50%	Wyndham (C)	76%
Wellington (S)	51%	Whittlesea (C)	76%
Pyrenees (S)	53%	Darebin (C)	77%
Bass Coast (S)	57%	Southern Grampians (S)	80%
Greater Geelong (C)	57%	Baw Baw (S)	80%
Maroondah (C)	58%	Ararat (RC)	80%
Colac-Otway (S)	58%	Northern Grampians (S)	81%
Indigo (S)	59%	Bayside (C)	84%
Delatite (S)	59%	Glen Eira (C)	85%
Mitchell (S)	59%	Knox (C)	85%
Queenscliffe (B)	60%	Yarra (C)	86%
Wangaratta (RC)	61%	West Wimmera (S)	89%
Hobson's Bay (C)	61%	Murrindindi (S)	91%
Corangamite (S)	61%	Nillumbik (S)	92%

Moreland (C)	61%	Greater Bendigo (C)	94%
Strathbogie (S)	62%	Whitehorse (C)	97%
Golden Plains (S)	62%	Warrnambool (C)	97%
Banyule (C)	62%	Hindmarsh (S)	98%
La Trobe (S)	63%	Boroondara	107%
Kingston (C)	64%	Mildura (RC)	109%
Monash (C)	65%	Melbourne (C)	111%
Surf Coast (S)	67%	Stonnington (C)	111%
Towong (S)	68%	Hepburn (S)	132%
Alpine (S)	68%	Manningham (C)	147%

Table 5.3

Table 5.3 ranks Councils on the basis of their revised renewal expenditure (renewal plus upgrade) plus maintenance expenditure relative to their long-term renewal and maintenance expenditures. This table is considered to give the best guide to sustainability as the renewal, upgrade and maintenance mix should be capable of being readily adjusted to meet future needs.

Council Sustainability - Total Capital plus Maintenance
Potential Renewal Capital Expenditure (based on current asset stock)
as a percentage of Average Annual Asset Consumption and Maintenance

Melton (S)	32%	Buloke (S)	78%
Greater Dandenong (C)	39%	Hume (C)	79%
Horsham (RC)	43%	Mornington Peninsula (S)	80%
Moira (S)	45%	Port Phillip (C)	80%
Moorabool (S)	50%	Alpine (S)	81%
Yarriambiack (S)	52%	Ararat (RC)	84%
Central Goldfields (S)	52%	Baw Baw (S)	85%
Wellington (S)	52%	Moyne (S)	85%
Gannawarra (S)	52%	Greater Geelong (C)	86%
Wodonga (RC)	53%	Southern Grampians (S)	86%
Moonee Valley (C)	54%	South Gippsland (S)	87%
Pyrenees (S)	54%	Bayside (C)	87%
East Gippsland (S)	56%	Yarra (C)	88%
Ballarat (C)	56%	Bass Coast (S)	88%
Brimbank (C)	60%	Glen Eira (C)	90%
Strathbogie (S)	62%	Northern Grampians (S)	91%
Corangamite (S)	64%	Indigo (S)	91%
Macedon Ranges (S)	65%	Nillumbik (S)	93%
Wangaratta (RC)	66%	West Wimmera (S)	94%
Banyule (C)	67%	Greater Shepparton (C)	96%
La Trobe (S)	67%	Murrindindi (S)	96%
Mount Alexander (S)	69%	Swan Hill (RC)	96%
Colac-Otway (S)	69%	Whitehorse (C)	97%
Moreland (C)	71%	Casey (C)	98%
Golden Plains (S)	71%	Frankston (C)	98%
Towong (S)	71%	Darebin (C)	101%
Hobson's Bay (C)	71%	Maribyrnong (C)	102%
Glenelg (S)	71%	Hindmarsh (S)	103%
Mitchell (S)	72%	Warrnambool (C)	107%

Cardinia	72%	Boroondara	109%
Queenscliffe (B)	73%	Melbourne (C)	111%
Maroondah (C)	74%	Mildura (RC)	119%
Delatite (S)	75%	Knox (C)	121%
Kingston (C)	75%	Wyndham (C)	121%
Monash (C)	76%	Greater Bendigo (C)	124%
Loddon (S)	77%	Whittlesea (C)	124%
Campaspe (C)	77%	Stonnington (C)	130%
Surf Coast (S)	78%	Hepburn (S)	155%
Yarra Ranges (S)	78%	Manningham (C)	179%

Table 5.4

5.5.3 The Significance of the Sustainability Figures.

Some Councils will currently be spending more than they will have to on a long term sustainable basis. How can this be? Very simply they could be facing a lot of renewal now because of a peak in asset spending at some time in the past, with those assets now falling due for renewal. If this peak of acquisition is more than the long term average rate of acquisition, they will currently be spending above their long term rate. Others, for similar reasons will be spending at their long term average. This is what was shown in the schematic in Figure 5.4 above.

Councils currently renewing at a high level relative to the long term average may not know it, but they are in a good position. They are now "geared up" for renewal spending and it is always easier to stay where you are in revenue raising or spending than it is to increase revenues or to cut costs.

It can be seen, however, that most Councils are not spending at or above their sustainable level but are below that level. That would have been expected from the aggregate figures that show that Councils, in aggregate, are spending only half as much as the long term renewal level.

It would also be expected from the information provided on the overall condition of Council's assets. They are generally reported as quite good.

The sustainability charts provide an overall indication of how many Councils will need to apply extra effort to reduce or otherwise manage their future renewal costs. However, the sustainability index tables only indicate the SIZE of the problem. They say nothing about TIMING, or when a Council will need to make effort. For some Councils, the major renewal problem may be 20 years off, so that they have leeway for management and careful planning. For other Councils the problem may be tomorrow, or, in any case within the next few years, in which case, the problem is of a different order altogether.

Caution!

It would be wrong to assume from the sustainability chart that Councils who are below the long term sustainability level need to lift their spending NOW. They do not. It is neither efficient, or desirable, to renew assets before they are due. And if the sustainable level of capital IS spent, but is not spent on assets needing renewing, then it is likely to be

spent on additional assets - which will only widen the gap. No, the answer, in most cases, is not to spend more now, the answer is to make management adjustments.

In some cases, the need will be sooner rather than later. Some Councils will be facing large increases in renewal falling due within the next ten years.

To answer the timing question, to see WHEN the effort will be needed (i.e. when the bumps are likely to occur) requires the "management effort" indices.

5.6 What Increase in Renewal Expenditure will be Necessary to Cope with Rising Levels of Renewal?

In the absence of other strategies, how much will Councils need to spend in the near future to pay for past capital consumption? This is the basis of the second of our three "key" questions, namely

> "How much will need to be spent in the near term (i.e. within the next ten years) *relative to the renewal expenditure levels experienced in the recent past* and how will renewal expenditures increase beyond this ten year period?

And, realising that both spending and non-spending options are available, this translates into "How much more strategic and creative management effort will be required of Councils as their assets age?"

5.6.1 The Big Picture

- **Rate Increases Are Not The Only Option**

Increases in rates is often seen as ***the*** solution to the problem of ageing assets. In fact, it is only one of a number of options available to Councils - and good corporate management would ensure that increases in rates are the option of last resort rather than the first approach.

The difference between the "default" renewal expenditure projections and the current level of renewal expenditures represents the infrastructure spending gap that needs to be met by creative management effort.

This includes, *amongst others*

- reducing costs by
  - ✓ asset rationalisation and reviewing asset growth strategies
  - ✓ more efficient utilisation, operations, maintenance
  - ✓ choosing low cost over high cost asset strategies
  - ✓ demand management
- changing the composition of capital spending from new to renewal
- making forward provision for renewal by
  - ✓ reducing debt to create future borrowing capacity

- ✓ creating renewal reserves
- increasing revenues by user charges

Using the age profiles, economic life and replacement cost data provided by each of the Councils, the following aggregate asset renewal chart has been prepared.

- **Renewal Spending Projected to Increase for Next 20 Years**

Renewal spending is projected to increase considerably over the next 20 or so years, reflecting the growth of asset stocks in the past. The lower horizontal line in the following bar chart indicates the current level of spending on renewal and upgrade of services. The bars indicate the forecast level of renewal under the default assumptions for each five year period. The upper horizontal line represents the long term average renewal for the existing asset stock.

- **Up to Ten Years of Planning Time**

Unless steps are taken to change the situation, within ten years the amount of required renewal will reach, and then exceed, the current level of renewal including upgrade of asset services. *This suggests that Councils have up to ten years of planning time to change their asset management to avoid large increases in renewal funding requirements, or lowering of service standards.*

- **Projections Only Consider Renewal of *Existing* Assets**

When studying this future renewal picture it is important to bear in mind that this considers only the renewal of assets in the existing asset portfolio (as of June 1997) Any net additions to the portfolio over time will increase the AAAC and increase the level of future renewal. On average, every dollar of asset growth adds 2% for asset renewal and another 2% for maintenance to the recurrent budget every year thereafter.

Note: The following table excludes maintenance expenditure and any capital expenditure that may have been mis-classified as maintenance.

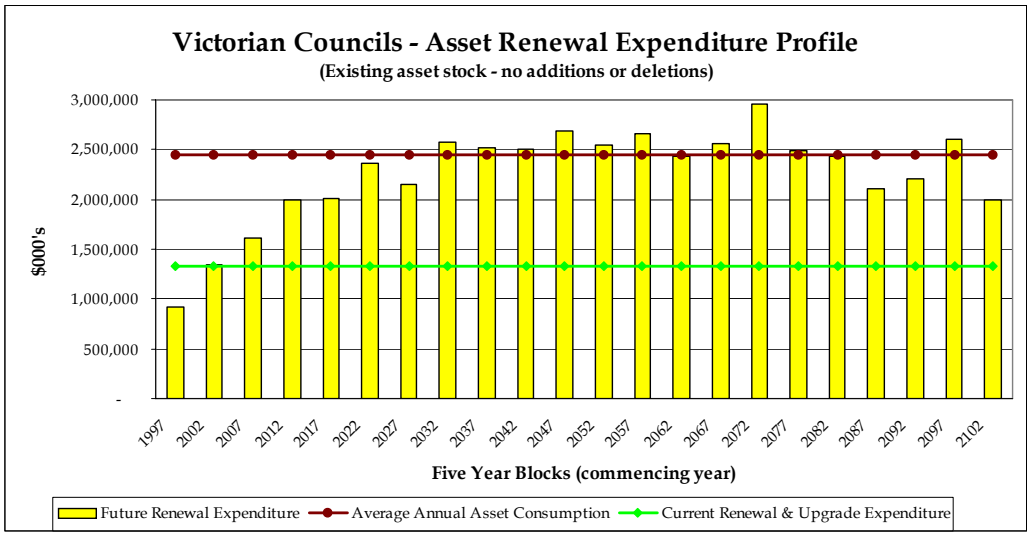


Figure 5.5

5.6.2 Individual Councils

Each Council will be provided with a computer disc recording its own individual asset renewal profile. It has a built in capacity for "what if" analysis so that Councils may change their assumptions about age, economic life, etc and see what impact this has on future renewal costs. They can see what impact a certain level of rationalisation might have, or the impact of extending the lives of assets by changing management practices or better maintenance.

Most Councils will have some planning time to make the necessary adjustments and develop a corporate wide strategic asset management plan. Some will have rather shorter term adjustment problems. The following tables indicate the number of Councils that will experience small and large scale adjustments from their current levels of spending in order to manage future renewal. The adjustments will take many forms and that is why the gaps between renewal costs now and renewal costs later are described in terms of the "management effort" that they will require.

5.6.3 How many Councils - and which - are in short-term renewal need?

How many Councils will be facing serious adjustment problems in the near future? That is the subject of the third "key" question:

> "How many Councils - and which ones - are in immediate need, and how many have the luxury of planning time to cope with their renewal problems?"

So far the analysis has been at the aggregate level - all Councils combined. It is now time to look at the disaggregated picture.

How many Councils will need to increase their capital spending on renewal in order to meet their renewal falling due over the next five years? What if

upgrade spending is diverted to renewal? Or indeed, if all capital is diverted to renewal, how many Councils, under these circumstances will still need to increase overall capital spending over the *next five years* - or take other managerial action? *Over the next ten years? Over the next 15 years?* This is measured in Table 5.5.

Management Effort Required for Renewal - 1997-2012

Councils experiencing an increase in RENEWAL expenditure in the forecast period:	Over current levels of :		
	RENEWAL expenditure	RENEWAL + UPGRADE expenditure	TOTAL CAPITAL expenditure
1997 to 2002			
< 10%	45	63	68
between 10% and 25%	6	3	0
between 25% and 50%	5	3	2
over 50%	22	9	8
2002 to 2007			
< 10%	20	47	58
between 10% and 25%	6	4	5
between 25% and 50%	10	7	3
over 50%	42	20	12
2007 to 2012			
< 10%	20	36	46
between 10% and 25%	3	3	6
between 25% and 50%	5	10	10
over 50%	50	29	16

Table 5.5

- **Most Councils Will Experience Only Small Increases in Renewal Requirements in the Next 5 Years.**

Table 5.5 indicates that out of 78 Councils, 45 will experience increases in forecast renewal of less than 10%. 22, however, will experience increases of over 50% and these are the Councils that will need to review the quality of their data and, if necessary, consider what rationalisation they can quickly manage and carry out a condition analysis on their remaining assets to prioritise need. About half of these Councils could switch funding from upgrading services to renewal of services as a management strategy. For the remainder, even this would be insufficient and more serious remedies will need to be sought.

- **Most Councils Will Experience Large Increases in Renewal Requirements in the Next 10-15 Years.**

This is consistent with the aggregate chart (fig 5.5) which indicates about a ten year planning horizon before large scale renewal increases become evident. This is, however, not necessarily a funding problem. It is much more a management problem. Chapter 2 suggested a range of options that could be individually and collectively applied to reduce the impact of renewal on Council budgets.

- **Capital Switching (From Additional to Renewal Assets) is an Option for Most Councils**

Of the 78 Councils, 68 will need to make less than a 10% adjustment to their total capital spending to manage renewal over the next five years. Looking out ten years, the number of Councils that need to make a less than 10% adjustment overall is still a healthy 58, but by the time the third five year period is reached, this has fallen to 46.

On the other hand, those Councils who need to manage a greater than 50% increase in renewal falling due over their present levels of TOTAL capital spending increases from 8 in the periods 1997-2002 and 2002-2007 to 16 in the period 2007-2012.

- **Identifying Councils Potentially "in need"**

There are 8 Councils who, even if they diverted all of their present capital spending towards renewal would still need to increase capital spending by over 50% or make other equivalent management adjustments to meet their renewal falling due in the first five year period. These are the Councils who are considered potentially in the greatest need. There are also 2 Councils who would need to increase their total capital spending by between 10% and 50% and switch it all to renewal to meet the demands of the next five year period. These 10 Councils are examined further in Section 5.12.

5.7 There is Time to Plan for Renewal

What is most noticeable from Table 5.5 is the number of Councils that do, in fact, have considerable planning time to make the adjustments that will later be necessary.

Even on the most stringent interpretation of management effort, i.e. on considering only reported renewal capital, 45 Councils would be in the less than 10% extra effort category in the first five year period, 20 in the five years after that and 20 in the final 5 years. Looking at a baseline of both renewal and upgrade capital, 63 Councils need to make less than a 10% adjustment in the next five years, 47 in the following five years and 36 in the last 5 years of the period.

These figures do not suggest a crisis of massive proportions. *They do, however, indicate a need for planning NOW.*

Experience in the United States suggests that when the need for major renewal was first noted the temptation was to defer. ***Deferral of replacement*** is a management strategy and one that is often resorted to in times of budgetary stress. If the situation is one of a temporary 'hump' in expenditures, this may well be the most rational solution. If, however, the near term replacement expenditure increases are part of a longer term increase, deferral only exacerbates the overall problem. Councils therefore need to examine their own renewal profiles to determine where the increased need is temporary and where it is the forerunner of major ongoing adjustments.

To Summarise: 8 Councils will according to the model forecasts, need to increase their TOTAL capital spending by more than 50% just to cope with renewal falling due in the next five years. 2 more face increases between 10-50%. However, it is important to examine the accuracy of the self reporting of the data that underpins these forecasts and that is done in Section 5.12.

5.8 Management Effort - Making More Use of Maintenance

The Management Effort indices above have concentrated on the change in the level of required capital expenditure. However the costs of sustainment, as shown earlier, include the costs of maintenance.

For complex infrastructure assets, such as roads and bridges and public buildings, the dividing lines between major maintenance and renewal can sometimes be blurred. It is possible that some Councils have called activities "maintenance" whilst others have called the same activities "renewal". In any case, timely maintenance at an appropriate level can extend the life of an asset and defer the necessity for renewal.

The amount of maintenance carried out in Councils is extensive and the cost is generally much larger than the cost of renewal capital. Taken together, renewal capital and recurrent maintenance can be considered to be the costs required to sustain the services of the assets that Councils employ. These are **asset sustainment** costs.

When considering the total increase in asset sustainment costs required to cope with ageing assets over the next ten years the picture would appear to be a more manageable one. The percentage increases are reduced, but it is important to note that they are percentage increases on a much larger base!

An increase in maintenance efficiency and effectiveness is one of the more immediate management strategies for Councils in coping with future replacement requirements and it is worth considering the renewal management situation from a perspective that includes maintenance.

For this study it has been assumed that maintenance costs for existing assets will remain constant. This allows for some assets to age and require more maintenance but some of the more maintenance intensive assets near the end of their lives to be replaced and therefore reduce the maintenance burden.

Management Effort Required for Renewal (including Maintenance expenditure) - 1997-2012

Councils experiencing an increase in RENEWAL plus MAINTENANCE expenditure in the forecast period:	Over current levels of :		
	RENEWAL + MAINTENANCE expenditure	RENEWAL + UPGRADE + MAINTENANCE expenditure	TOTAL CAPITAL + MAINTENANCE expenditure
1997 to 2002			
< 10%	69	72	76
between 10% and 25%	1	3	0
between 25% and 50%	3	0	1
over 50%	5	3	1
2002 to 2007			
< 10%	65	71	73
between 10% and 25%	5	2	3
between 25% and 50%	2	2	0
over 50%	6	3	2
2007 to 2012			
< 10%	56	66	70
between 10% and 25%	7	4	3
between 25% and 50%	3	5	2
over 50%	12	3	3

Table 5.6

Table 5.6 shows that when maintenance is included all but two Councils fall within the less than ten percent extra effort required category taking all capital expenditure into account, largely because of the greater base. This picture does not change much if we take the following period 2002 -2007.

Even by the period 2007-2012, 70 are still in this relatively low effort category if all capital expenditure is taken as the base. On the more stringent definition of the base year's spending as just declared renewal capital plus maintenance, the respective figures are 69, 66 and 56 for Councils who need to make less than a 10% adjustment for the three five year periods.

On the other hand, those who need to make more than a 50% adjustment over the base amount when that base is taken as just renewal capital plus maintenance is 5 in the first five year period and 6 and 12 in the next two five year periods.

5.9 Infrastructure Asset Growth

- **Existing Assets Only Have Been Modelled for Renewal**

Throughout this analysis, the emphasis has been on the renewal of existing assets only. But the future renewal picture will be affected by the extra assets that Councils are annually adding to their stock.

- **More may be Spent on Additional Services than on Renewal**

According to the information reported by Councils, on average more money is being spent on new infrastructure assets (upgrade and expansion) than is being spent on renewal The ratio is about 3:2. But for some Councils the ratio is as high as 8:1. In terms of percentage increase in asset holdings, the aggregate growth rate for Victorian Councils is about 1% Only one Council had a growth rate in excess of 3%.

- **Council Capital Expenditure Understates True Asset Growth**

Some growth in Council areas is funded by developers. These capital expenditures do not register as growth capital but they are. And they contribute greatly to future renewal as well as to future maintenance.

- **Most Asset Growth is in Areas of Population or Industry Growth**

An analysis of growth by Council classification shows, as expected, that most of the extension growth is in Councils experiencing population or industry growth.

- **But not all**

However a lot of the growth described by Councils as upgrade, i.e. providing an improvement of service to existing ratepayers, was not necessarily highly correlated with growth. Reported upgrade asset growth was almost 20% higher than extension growth. Some upgrade asset expenditure might be designed to bring sections of amalgamated Councils up to the level experienced by other sections and thus could be a natural outcome of the amalgamation process or it could be a misrecording of renewal capital. Another possibility is that it represents new services to the existing ratepayer base.

- **Upgrade Capital Projects Should Attract Rigorous Evaluation**

Capital expenditure for upgrade (improvement, new services) should attract the most rigorous analysis. Benefits to ratepayers and willingness to pay needs to be very carefully checked. Upgrade is like renewal in one way, in that it generally attracts no new revenue. However, unlike renewal, it does not reflect a service that ratepayers have become accustomed to - yet! Avoiding upgrade is thus likely to meet with less ratepayer resistance than avoiding renewal.

- **Extension Capital Projects May Attract Revenue and thus be More Viable**

Extension asset expenditure, on the other hand, is usually associated with increased revenues from the extra ratepayers that it serves. Upgrade and renewal are competitors for the existing rate revenues and it is here that there is the greatest opportunity for expenditure switching in order to cope with increased replacement.

Appendix 8 shows the relationship between upgrade, expansion and renewal capital by category of local government.

5.10 Extrapolations from Figures in this Study

Projections are only as good as the information and assumptions that go into them. . In this report all inferences and conclusions have been cross checked with questions written into the survey for this purpose. Only summary data has been presented here and not the more extensive secondary data for checking purposes. Caution is therefore urged in drawing any inferences from the data which are not provided in the report itself.

It cannot be assumed, for example, on the basis of the information provided here, whether Councils are currently overspending or underspending. Conclusions of this nature require a much more detailed analysis of Council management and asset holdings than has been undertaken here. It would, for example, require an independent assessment of each Council's asset valuation, condition assessments, economic life estimates and the service level standards adopted. The current study has accepted the Councils' own estimates in all of these cases.

Only in two places did the study impose extra information on the data that Councils supplied: economic lives and the treatment of earthworks.

- **Economic lives**

Where Councils supplied no information on appropriate economic lives, it was the judgement of the reference groups that the median life of the remaining Councils should be adopted as the default.

- **Earthworks in Road Pavements**

Earthworks were included in the age profile data supplied by a number of the Councils. As earthworks are not renewable, their inclusion would overstate future renewal requirements. The proportion of earthworks in the values supplied was estimated by reference to more detailed work on roads and earthworks in a separate Council infrastructure study being conducted by one of the consultants. Using this data, the sealed road pavement age profile figures, supplied by those Councils which had included earthworks, was reduced by 15%. For sealed roads, information on the seal was reported separately. For unsealed gravel roads, the value of the road pavement and the

gravel overlay was combined. The age profile data for unsealed gravel roads where earthworks were included were reduced by 10%.

Maintenance figures for parks were reduced as outlined earlier in this section. The reduction for what is considered operational expenditure is a logical one as the renewal profiles do not include estimates of the renewal costs of parks softworks – garden beds, ovals etc.

(For a detailed study of the methodology employed see Section 4.)

5.11 Quality of Data

With these exceptions, data is as supplied by Councils. The quality of this data has been variable. While some Councils had a great deal of understanding about their asset problems, had good asset registers and supplied detailed working papers to back up the data supplied, most did not. There was, nevertheless, a great deal of enthusiasm for the task with a lot of effort expended. A major contribution of the current study has been in raising the level of awareness of Councils and helping them to improve their existing data.

Despite detailed regional briefings, on site visitation and a comprehensive handbook accompanying the data discs, it is evident that some Councils completed the survey in a less than rigorous manner. In a number of cases, the task was assigned to officers who had not been exposed to any of the preliminary information or documentation provided. Some Councils took the opportunity to revise data at the stage of CEO sign off. But some of the data provided is still open to question and the Councils involved will need to do some serious work to develop their data to a level where it can be used with reasonable assurance at the corporate level.

In every case, the value to Councils of the modelling work and individual data discs returned to Councils for "what if" scenario analysis is in direct proportion to the effort and quality of their own input.

(A more detailed analysis of data constraints is provided in Section 4.)

- **Assumptions**

The assumptions made in this study have been of two types: those required to overcome data deficiencies; and those required to interpret the individual and aggregate data.

- **Data Deficiency**

The data deficiency issues with respect to missing economic life estimates and the inclusion of non-renewable earthworks in the road renewal profiles has already been referred to. These were general problems. Assumptions have been used to refine the data.

For individual inconsistencies between condition studies and economic life estimates, where Councils have not elected to revise their figures or estimates, the information has been left as provided by Councils. In interpreting the future assistance needs of Councils with respect to renewal, these inconsistencies have been taken into account.

- **Inconsistency**

For example, one Council had undergone a good reseal program over the last ten years with the result that only 15% of the network was estimated to be less than satisfactory, and only 4% was claimed to be actually failed. Yet an analysis of the age profile, given their reported economic life of 15 years for reseals showed that 70% of their road surfaces had passed their stated economic life of 15 year and 20% were 40 years and more. had reported an economic life for reseal of 15 years, which is within the normal range. This age profile was inconsistent with the condition data. It is probably indicating that while 15 years for reseals is the standard for some roads, the ones with greater utilisation; there are others which may go out to 35 years and more with no serious consequences where traffic is reasonably light. Renewal profiles based on the 15 year estimate thus overstate the real road requirements of this Council.

- **Individual and Aggregate Data**

This is an example of the care that needs to be taken when interpreting individual data. For aggregate analysis, individual variations can occur that increase and decrease the total. Unless they represented large aberrations, individual variations have not been regarded as material and significant for the total analysis.

5.12 Councils That May Face Renewal Difficulties

5.12.1 Reasons for Renewal Difficulties

Some Councils may have difficulties in funding replacement falling due in the next five years. There are a number of reasons why this may be so:

(1) Councils may have experienced a sharp spurt of growth at some past time and the assets acquired at that time may now be falling due for renewal causing a sharp lift in renewal funding - an “echo” of the previous growth.

(2) Councils may have been granted or donated assets which they do not have the financial capacity to renew. This may particularly be the case where perceived disadvantage was the reason for the original assistance in acquiring the assets. If this disadvantage persists, assistance may also be required with renewal. However the rationale for the initial grant may have been to overcome disadvantage and thus further assistance cannot be assumed.

(3) Councils may have poor planning or lack financial prudence.

5.12.2 Councils Projected to Require an Increase in Total Capital Funding of more than 10%

The Infrastructure Study permits forecasts of renewals for each Council to be weighed against current levels of renewal and capital spending. Examination of the figures indicates that 8 Councils are projected to have renewal falling due in the next five years which represents a 50% or more increase on current levels of TOTAL capital spending.

If accurate, this is a very serious problem. The 50% level is the "first filter" that has been applied.

The "second filter" is those Councils that would experience an increase of between 10% and 50%. This brings another 2 Councils into the serious need category. Other filters could be applied bringing in more Councils with lower levels of projected renewal requirements. The number of first and second filter Councils in each of the regional categories is given in Table 5.7 below.

Councils in the "Critical, Urgent" (First Filter) and "Serious, Urgent" (Second Filter) Categories

Classification	# of Councils 1st Filter	# of Councils 2nd Filter
Inner	1	-
Outer	-	-
Regional	1	-
Large Shire	4	1
Small Shire	2	1

Table 5.7

It is noted that the Councils involved are predominantly rural shire Councils.

5.12.3 Checking the Credibility of the Extreme Forecasts

Given the reasons above for serious renewal funding need, the figures in table 5.7 need to be examined for credibility. That is the issue examined in this section.

It needs to be noted, for example, that in every single case the Councils that, on their own figures, will be requiring an extremely large increase in renewal funding are still allocating capital to growth spending.

Furthermore, none of the Councils concerned forecast an increase in their future budgets for renewal spending of anything like the order required by the projections. The question needs to be asked whether this is because the need was recognised but the officers concerned judged that there would be no budget to attend to the problem, or because the need was not recognised.

- **Economic Lives and "Past Due"**

Councils were asked to report their actual economic lives, and thus their actual asset standards. It is suspected that, contrary to instructions, *some Councils may have returned figures for economic lives that were much shorter than the lives actually being applied*, i.e. the economic lives claimed to be in place represented a higher standard than was actually being achieved. This would show up in such Councils having a large amount of renewal that had fallen due in past years but not been attended to. This was indeed the case for the Councils in the two categories examined.

In Table 5.8, this overdue renewal is expressed in terms of each Council's average annual total capital spending. The results for each Council is given in brackets for the category concerned. All Councils showed large amounts of overdue renewal. In one case it would take 37 years to clear the backlog even if total capital spending were to be doubled and all of the increase were spent on renewal!

Ratio of "Past Due" Renewal to Spending in Terms of Number of Years of Capital Spending the Past Due Represents.

Classification	# of Councils 1st Filter ("Past due" : Total Capital Spending)	# of Councils 2nd Filter ("Past due" : Total Capital Spending)
Inner	1 (30)	-
Outer	-	-
Regional	1 (23)	-
Large Shire	4 (37,30,28,10)	1 (33)
Small Shire	2 (25,15)	1 (12)

Table 5.8

The figures in table 5.8, if accurate, either paint a picture of assets in very poor condition or the age profiles are not very accurate, or both. It is thus necessary to check the means by which the age profiles were compiled and the condition assessments reported by these Councils.

- **Quality of Age Data**

One of the checks built into the study was the source of the age data for assets. The most accurate reporting was considered to be that based on actual records of acquisition. This is called Grade A data. The next most accurate is age data interpreted from a condition study of assets. This is Grade B data. The least accurate is where neither of these applies and the figures have been estimated from the best knowledge available to Councils. This is Grade C data. The level of data accuracy for the Councils being considered here is given in Table 5.9.

Quality of Age Data

Classification	# of Councils 1st Filter Grade of Age Profile Data	# of Councils 2nd Filter Grade of Age Profile Data
Inner	1 (C)	-
Outer	-	-

Regional	1 (A)	-
Large Shire	4 (C,C,C,B)	1 (C)
Small Shire	2 (B,B)	1 (B)

Table 5.9

As can be seen from Table 5.9, only one Council had Grade A age data. Four Councils had Grade B data and 5 had the poorest data level, Grade C.

Poor data does not mean that a serious asset renewal problem does not exist, but it throws doubt on the size of the problem and it presents a difficulty for Councils in dealing with it.

Even where age data is good (and more so if it is not) the economic life assumptions that result in statements of overdue renewal of the order of 20 or more years worth of current renewal activity, need to be checked against Council's own condition assessments.

- **Condition Assessments and Consistency with "Past Due" Renewal**

One of the checks built into the survey was a question on the assessed condition of the Councils' assets. The response to this question was checked to see if it was consistent (C) or inconsistent (I) with the level of past due renewal reported. As can be seen in Table 5.10 of the 10 Councils being considered, the information provided on condition was inconsistent with the "past due" renewal amounts in all but two cases. This means that although the projections are showing large amounts of overdue renewal, based on the economic lives supplied by the Councils, this is not reflected in the self assessment of condition.

Asset Condition Ratings

Classification	# of Councils 1st Filter Consistency of asset condition reports	# of Councils 2nd Filter Consistency of asset condition reports
Inner	1 (I)	-
Outer	-	-
Regional	I (C)	-
Large Shire	4 (I,I,I,I)	1(I)
Small Shire	2 (I, I)	1(C)

Table 5.10

- **Asset Management Ability**

Two further checks were considered. One of these was the level of asset management achieved in the Council which was reported in the Survey. A number of questions were asked about the asset management activity undertaken by Council and, for each of these, Councils were asked to report the level currently achieved. This information was analysed and where the level of reported activity was at or above average the Council was rated as having good asset management ability (G). Where the reported activity was less than average, the Council was rated as (L) for a low level of asset management ability. These figures are reported in Table 5.11.

Management Score

Classification	# of Councils 1st Filter Management Rating	# of Councils 2nd Filter Management Rating
Inner	1 (G)	-
Outer	-	-
Regional	1 (L)	-
Large Shire	4 (G,L,L,L)	1 (L)
Small Shire	2 (L, L)	1 (L)

Table 5.11

Table 5.11 shows that of the ten Councils, only two have reported asset management practices that are good (i.e. average or better based on the practices of all Councils.) Other things equal, one would have more confidence that a genuine problem exists if the Council can demonstrate that it has assessed this problem with good management techniques.

- **Economic Lives Related to Overall Distribution**

So far the analysis above has suggested that of the 10 Councils in the first and second filter category representing a forecast need to spend considerably increased more on their renewal in the next five years, all have very high levels of reported past due renewal. Of these 8 have reported asset condition assessments that seem to be inconsistent with such large levels of past due renewal, this included the one Council that was rated as having good age data.

The inconsistency of the asset condition reporting with the data used in the forecasts suggests that the economic lives reported may not be accurate. The final check was to consider the reported economic lives against the standard range of lives reported by all Councils. This is reported in Table 5.12.

Economic Lives of Councils Compared with the Standard Range of Economic Lives.

Classification	# of Councils 1st Filter Economic Lives	# of Councils 2nd Filter Economic Lives
Inner	1 (M)	-
Outer	-	-
Regional	1 (S)	-
Large Shire	4 (S,S,M,S)	1 (S)
Small Shire	2 (S,M)	1 (S)

Table 5.12

In table 5.12 Councils are rated S if they are at the short end of the distribution of economic lives, M if they are in the middle, and L if they are at the long end of the distribution.

As can be seen, all Councils reported lives in the short to medium range. Special physical conditions may apply that decrease the life of assets in these Councils. For example damage caused by milk trucks or log trucks. This would not apply to all roads, but in the limited scope for disaggregation posed in the Survey, the shorter lives applying to these roads may have been applied to all. If so, this is a case for a refinement of the data. Another possibility is that the lives reported may be "desired" lives rather than "actual" lives. Given the general inconsistency with condition assessments, even "desired" lives may not be yielding any improvement in service quality.

- **Conclusion.**

Ten Councils are forecast to have renewal needs in the next five years which represent an increase on their *total capital spending* of more than 10%. However none of these Councils reported an intention in the two forecast budget years to greatly increase renewal, despite the fact that capital was still being budgeted for expansion and upgrade.

Nor did they indicate a large percentage increase in this category in later years that would be consistent with the forecast figures. This could reflect either a level of resignation that the resources, although needed, would not be forthcoming, or it could mean that those reporting in the Survey did not see a large future need. This does not mean that the need is not there. But it does mean that each Council needs to check the forecasts against its own economic life and age reporting before assuming large scale, near term, future need.

One check that Councils need to apply is to check the forecast level of renewal - and thus the implied condition of assets - against the perceptions of ratepayers and ratepayer satisfaction with Council service provision. It may be that the standards applied by Councils are higher than the ratepayers require.

This section has examined the forecast renewal need and thrown some doubt on the severity of renewal by the 10 Councils in the most serious need categories. It has shown that there may be scope for the great majority of these Councils to reduce their immediate “need” by revising their reported economic lives and bringing them into line with actual economic lives.

68 of the 78 Councils face increases of less than 10% of their current total capital spending. Some do not face increases at all in the next five years, and some do not even in the next ten years.

- **Justification for Additional Funding?**

The level of inconsistencies in information supplied by the ten "in need" Councils does not enable the large reported renewal requirements to be

translated into recommendations for additional funding. The need is rather to re-consider the asset standards actually in use and required and to improve the level of knowledge about the condition of assets and the real need for renewal.

- **Individual Re-Assessments**

Each Council will be provided with the final information supplied to the Survey on a disc that will include a "what if" modelling capability. This will enable those Councils who are projected to need a large amount of extra renewal funding (as well as others) to examine the options for extending lives and rationalising their asset base. The final figures will then need to be checked against available funding, cash reserves, borrowing capability, and other revenue raising sources to establish a prima facie case, where necessary, for rate increases.

Typical Timber Bridge

6. FINANCIAL AND MANAGEMENT REPORTING

6.1 Asset Valuation

6.1.1 Role of Asset Valuation

The introduction of an accounting standard specifically for local government (AAS27 – Financial Reporting for Local Government) required councils to provide information about a broad range of assets that had not been previously reported. While past council financial statements had included information on vehicles and plant, office equipment and computers and, in some cases, buildings, the great bulk of council assets had gone unreported. In most cases, the unreported assets were not specifically recorded in an asset register. The effect of both non-reporting and non-recording was that those assets were not generally considered in a strategic context. The natural consequence of the lack of a strategic framework within which to consider assets is poor (or no) planning for their required maintenance and eventual replacement, with maintenance and renewal being a reaction to crisis rather than an effective, efficient and well-planned management process. The subsequent valuation of those assets has highlighted their financial significance.

The accounting standard requires that councils report or disclose the following information:

- The nature and type of assets (asset categorisation, e.g. land, buildings, infrastructure – broader groupings);
- The replacement (renewal) value of all assets (current replacement cost);
- The current value of all assets (written down current replacement cost);

- The amount of depreciation of all assets (the service potential used up);
- The cost and valuation bases used for assets; and
- Accounting policies relating to assets (e.g. valuation methodologies, depreciation rates, economic lives of assets) and any changes from the previous year, with an outline of the effects of the policy changes.

6.1.2 Variations in Valuations

Assets are generally valued at their renewal cost. They are "carried' in the accounts at their renewal cost, less any depreciation. A number of valuation methodologies have been used by councils. They include:

Historic Cost. The original cost of the asset. In some instances, this cost has been used due to a lack of better information. The older the asset, the less relevant this cost will be . This valuation methodology will understate the replacement cost of the assets and understate the renewal profile of the assets.

Current Replacement Cost. This is the cost to replace the asset in new condition. In some cases, council officers have used unit rates of construction to obtain this cost. This is a particularly useful and relatively inexpensive methodology, well-suited to infrastructure assets such as roads, footpaths and drainage, and the practice should be encouraged provided that current unit costs are readily available and that the process be systematised to allow for regular revaluation of such assets. Such a basis is generally not as suitable for more complex infrastructure assets which have an element of 'one-off' costs built into them, such as buildings, bridges (excluding culverts) and some parks assets. The use of a qualified valuer or quantity surveyor to determine the replacement cost is more appropriate for complex assets. This valuation methodology is generally considered to provide the most accurate replacement cost and therefore the most accurate renewal profile.

Market Value. Some councils are using market value for some of their assets. While market value is useful for assets that are held for resale or assets used to generate revenue (the return on investment test). However, it is not an appropriate methodology for long-lived assets that are not used to generate revenue. Firstly, it is not a useful measure to determine depreciation, or the amount of the asset being used up. This means that only one value will be held in the accounts, the written down cost, for which market value is a surrogate. Using market value as a surrogate for current replacement cost will generally understate the asset value (but not always) and understate the future renewal profile.

6.1.3 Keeping Valuations Current

The relevant accounting standard requires that the value of assets be subjected to periodic review. This is particularly important where assets are subject to periodic price changes, either through technological advances, material scarcity or inflation. The more current the valuations the more accurate the future renewal profile.

6.1.4 Overcoming Shortcomings in Asset Valuations

At the individual council level there are a number of things that councils can do to make up for anomalous asset valuations. They relate to using the technical information that councils have, or can gather, on their assets to provide information to effectively manage the large asset stock. Many councils are using these techniques. The techniques include:

Condition Assessment. The use of professionals, either council staff or consultants, to regularly assess the condition of the asset network and provide information which is useful in determining optimum maintenance levels and the timing of asset renewal. In the case of roads they include such measures as roughness indicators and pavement deflection testing.

Asset Registers. The use of an asset register which contains details about the construction, maintenance, rehabilitation and re-construction of components of the asset network provides the capacity to analyse the infrastructure network and determine maintenance and renewal costs and timings, based on the recorded information.

Asset Management Systems. The use of computer-based packages such as pavement management and asset life cycle systems, provides a further level of sophistication in managing assets. Such systems are usually predictive in nature and can be used to optimise maintenance and renewal costs. In particular, they can be used to assist in ensuring that limited resources are deployed to the best advantage to maintain service levels of infrastructure assets.

Technical Data Bases and Information. Many councils have data bases which contain technical information about the councils assets. In addition, there are a range of technical data bases which can be accessed by councils to provide information about the maintenance of infrastructure assets, e.g. Australian Road Research Board library, CSIRO, other university and research facilities. Much of the technical information is available through the internet. Accessing the latest data on asset management and new technologies for maintaining and renewing assets can provide councils with opportunities to minimise financial costs and maximise the services provided by infrastructure assets.

6.2 Why Councils Have Been Slow to Capitalise on Information.

To a large extent the reason why councils are slow to capitalise on the benefits of good information or asset management is that they are going about it the wrong way.

To understand this, it is useful to think of Asset Management as the interlinking of three elements.

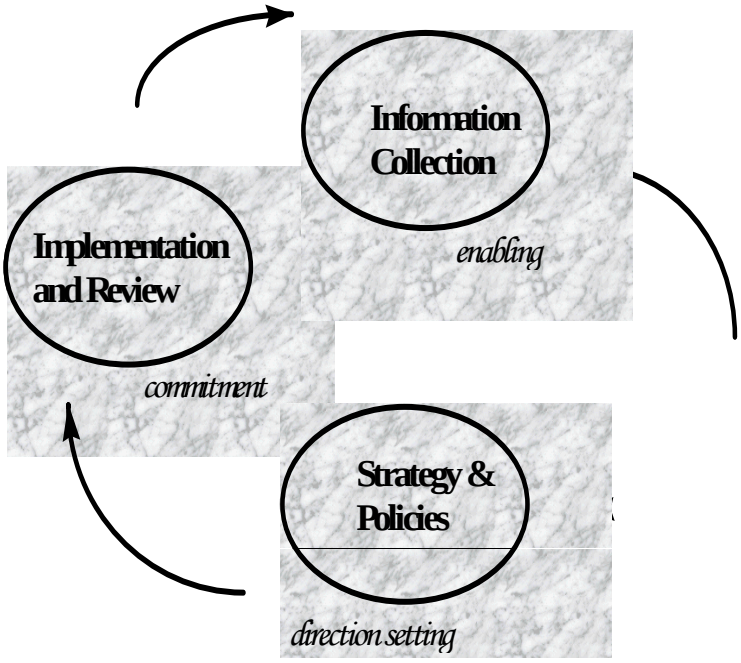


Figure 6.1

Information Collection – This may be termed the "arms and legs" of asset management. Councils sometimes confuse data collection with knowledge (as in "knowledge is power", implying the more data collected the better). But data must be analysed to become information, and that information must be related to prior information and understanding to become knowledge. Even with this analysis and understanding - which is generally not taking place! - information or knowledge is still only an enabler, it makes better asset management possible but it doesn't make it happen.

Strategy and Policy – This may be thought of as the "brain, or the mind" of asset management. Strategy sets general directions while policy guidelines determine how things must be done in order to comply. Compliance with strategy ensures that IF something is done it is generally the right, or effective thing, but it does not make it happen.

Implementation and Review - It is commitment to action that actually produces outcomes. This is the true "heart" of asset management. Implementation makes *it happen.*

Local governments are currently approaching asset management from the *information collection* perspective, using a "bottom-up" approach driven by technicians.

State Governments tend to approach asset management from the perspective of *strategy and policy*, a "top-down" approach, driven by policy analysts external to the operating agency and with no responsibility for the ultimate outcome.

Real success in asset management today is going to those who take the *implementation and review* perspective. This is neither bottom-up nor top-down, or rather it is both, but in an *integrated* manner.

The *implementation and review* perspective starts with an objective, it uses data collection, but selectively, *it analyses the information to solve the problems set by the objective*, sets directions for the achievement *of that outcome,* takes action - and reviews the consequence!

It is a very practical and pragmatic approach and one which councils would be very comfortable with were it not that they are feeling the pressure to conform to the data collection 'fad' that is currently seizing many asset managers. A good example of best practice in the 'Implementation and Review' approach is Ballarat City Council, the winner in the recent Australia and New Zealand Asset Management Competitions. It is a good example of outcomes resulting from a commitment to action which drove the information collection and analysis.

Ballarat City *started with an outcome objective*: to answer the question "What should we spend on our roads?" and "Is the current expenditure adequate". This is a top-down, strategic issue. The problem was analysed and defined - and *then* information was collected and analysed to find an answer to the question, i.e. the information collection and research was itself outcome focussed. This was the technical, bottom-up perspective. The answers to the research were then adopted as its strategic approach to road management by Council - generating the outcome. Review has already determined that the information needs to be refined which will occur once the Council's pavement management system is fully operational.

The solution required the integration of financial modelling, considering the sources of income, as well as technical decay modelling. It is unusual to find a holistic approach like this in councils (or in other levels of government either) where the financial and technical functions tend to remain as separate silos.

The Ballarat example above is an excellent example of detailed analysis of information. The trouble with the more traditional collection approach is that it tends to become an end in itself. "Better" *information* is the aim. With the

strategic or policy approach, the aim becomes "better" *decision making*. There is nothing inherently wrong in either of these positions, it is just that what is "better" cannot be defined in the absence of defined outcomes and until there is implementation, there are no outcomes! With the implementation and review approach, "better" *means* "better outcomes".

It may seem "logical" to first collect the data, then develop the strategies and finally implement the process and then review, but there is good reason for suggesting that councils would do better to reverse this process, that is to start with reviewing the success of current practice in achieving a defined objective.

6.3 Asset Accounting

There are many issues related to the effectiveness of asset accounting for asset management. One is the lack of an accounting framework that supports asset management. East Gippsland is an exception for it has an accounting framework based on life cycle costing.

Accounting Systems that Aid Asset Management

East Gippsland Shire Council has developed a chart of accounts that focuses on asset life cycle costing and integrates within a single asset sub-system to provide asset accounting and asset management information.

Assets accounts provide information on the asset life cycle from acquisition, operation, maintenance, upgrade/replacement and disposal. Assets are also classified by function for Grants Commission reporting. The Chart of Accounts defines activities relevant to each phase in the asset life cycle and also defines activities for non asset related service delivery.

Activities are divided into four categories:

- Service Provision (non asset related) expenditure incurred by service groups
- Operating expenditure of a recurrent nature required in the day to day operation of an asset, e.g. mowing, cleaning, utility costs
- Maintenance expenditure required to achieve an assets planned useful life, e.g. resheeting gravel roads, redecking bridges, patching road seal
- Capital Expenditure required to create, extend the life of, or replace an asset

6.3.1 Traditional Accounting is not designed for Infrastructure Assets

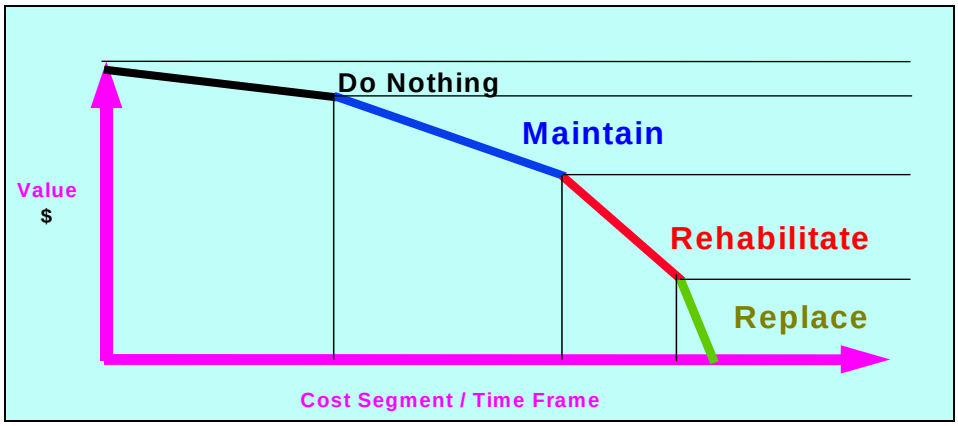
Another issue is the failure of traditional accounting models to deal with the nature of infrastructure assets. This traditional depreciation model reflects the book value treatment that an asset will receive in a chart of accounts under an accrual arrangement. At a pre-determined point in time the asset reaches a zero book value and its full cost has been written off against the business. This is a strict financial interpretation of the impact of asset ownership but it does not reflect the actual situation that Council finds itself in as the owner of substantial infrastructure. The American and Canadian Accounting Standards adopted for government business do not record or depreciate infrastructure assets as it is agreed that the information generated does not reflect the true

health of the business. Australia has followed the British and EEC model. What is clear is that neither Accounting Standard is useful in portraying the true situation of the business. The North American model understates the true infrastructure asset costs by not allowing for the inevitable run-down in service potential which has to be restored and the European model overstates by assuming complete run-down and replacement.

Applying a more appropriate depreciation model based on asset condition led to Ballarat being able to plan better and make better use of their limited funds.

The following model produced by Ballarat Council makes the point.

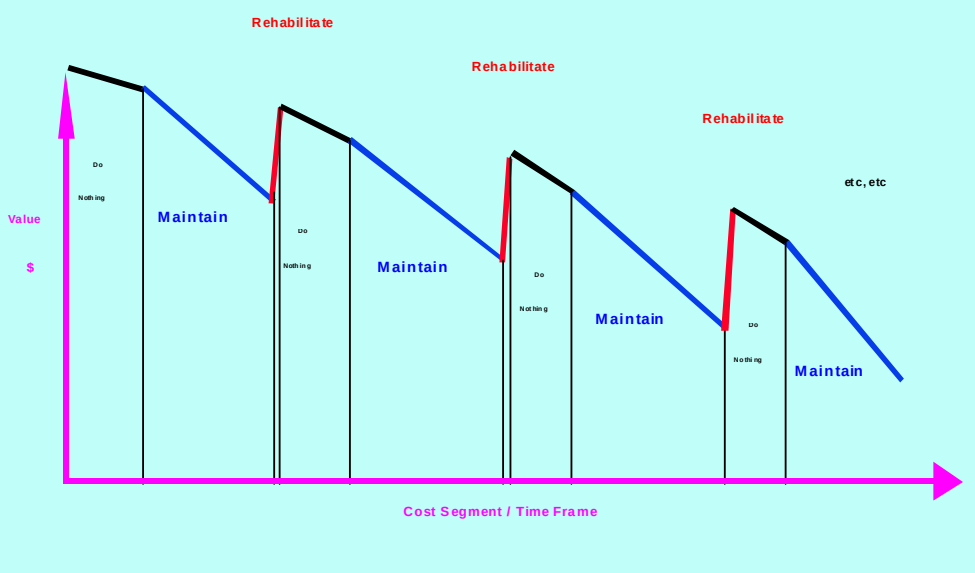
Traditional Asset Accounting – European Model



As Ballarat recognises the model above may only have some relevance if the description of the cost segments are changed to:

- Should **Maintain** But Didn't!
- Should Have **Rehabilitated** But Didn't!
- Have To **Replace**!

The realistic depreciation model for major infrastructure assets the City of Ballarat believe is more useful is shown below.



This generic depreciation model better describes the actual management approach applied to infrastructure assets. The declining value of the asset at each rehabilitation indicates that there is a limit to the application of rehabilitation as a management solution, but the real 'Economic Life' in virtually all situations is much longer than current lives suggested in accounting manuals and guidelines.

This model underpins the "Condition Based Depreciation" approach discussed in Section 2 – "Strategies For Action".

In the absence of detailed condition information from councils, the model used in this Infrastructure Study has projected major road component replacement. That is, it has projected road sealing separately from pavement reconstruction.

A number of councils have reported that they would consider changing their accounting framework to provide the information required by the Infrastructure Study and the "what if" scenario modelling framework to be provided as part of the study, if there was an ongoing State requirement for the information.

6.4 Lack of Integration across Functional Silos

It was apparent during the site visits that there was often little integration between different sections of council responsible for assets; for example, the accountants would use different assumptions about life expectancy from the engineer, and the road engineer and the drainage engineer would frequently not combine engineering and management.

6.5 Emphasis on Technical Issues of Supply not matched by an Equal Emphasis on Demand and Outcome Measurement

The vast improvement that has been experienced in recent years in the techniques of information collection and recording - GIS, video condition

monitoring, etc - have led to a situation where councils are often well resourced in the supply of technical data. This data is often heavily under-utilised, contributing only to filling out the asset register but not being used to determine the cost effectiveness of different maintenance/replacement options and their impact on service delivery. In terms of asset management these new techniques are not reaching their full potential.

6.6 Current Asset Management Practices

In order to establish a feel for data accuracy in the validation process, the survey collected information on the current level of asset management in councils. Answers to questions were the assessment of respondents rather than an independent view, nevertheless the information is indicative of the current state of asset management in councils. That councils tended to err on the side of caution when estimating their own asset management ability is the view of the consultants who visited councils on site and observed some of their practices to be better than councils had reported. However, it was clear that whatever the council wide answer to an asset management category, actual performance varied considerably between asset categories.

The data collected by the survey related to council effort in:

- Strategic Planning
- Asset Accounting
- Customer Satisfaction
- Asset Utilisation
- Demand Management
- Joint Use of Facilities
- Capital Evaluation
- Analysis of Service Gaps and Duplication
- Risk Analysis
- Data Warehousing
- Analysis of Future Trends

Practices by councils varied widely, but it was encouraging to see that a number of councils were using a range of techniques and practices to determine customer demand and satisfaction, asset utilisation and service gaps.

6.7 Service Levels/Standards and links with management plans

6.7.1 Service Levels Linked with Asset Lives

An understanding of an asset's performance - in the light of what the community requires - is the key to estimating its economic life and the likely time of its replacement. Thus defining asset performance requirements such as standards of service provision and levels of utilisation assist in better management and investment decision-making.

Service levels and economic lives are inextricably linked. This is easy to see for roads where the higher the level of road roughness that the community will tolerate, the longer the life of the road. But it also applies to traffic congestion and the demand for new roads. The existing network will be sufficient if the community is prepared to accept a higher level of congestion than if it demands a lower level.

The importance of educating the community about the service level - cost of service link is thus vital.

6.7.2 Service Strategy

A 'service strategy' defines what services, for whom, where, when, for how long, at what level and what cost and price, an asset is needed. Service strategies are defined in terms of service outcomes rather than in terms of specific asset solutions. This is essential if certain tools of asset management such as demand management and option analysis are to be taken advantage of.

Unfortunately few councils have the well developed service strategies needed to underpin an asset management plan.

6.8 Demand Management

Demand management is the active intervention in the market to influence the demand for services and assets. The management of demand for council services can be influenced by such measures as community education and pricing policies and can dramatically reduce or defer asset requirements.

Councils are making some use of user-pays pricing systems but could do more. User pays pricing would be of assistance where one ward has a facility which is not available in other wards of an amalgamated council. If such a facility (e.g. child care facility) is paid for, or subsidised from rate revenue, there is a tendency for all wards to demand the same treatment. A user pays pricing system establishes the real demand (i.e. willingness to pay) for the facility, as well as providing funds for its establishment.

6.9 Life Cycle Asset Management

Life cycle costing focuses on all asset costs, not simply the initial acquisition cost. Indeed, it places particular emphasis on costs incurred following acquisition, such as operations, maintenance, repair, replacement, and disposal.

The recurrent costs of power, cleaning, security, maintenance and property holding, as well as the labour and finance charges attributable to the asset, are frequently neglected in the process of capital budget decision making.

It is tempting to focus on a financing option which promises initial "savings" but ignores the longer term costs.

Life cycle analysis requires a good information base. Maroondah Shire Council used the requirement to report assets under AAS27 to establish the data required for life cycle costing. Their work won them the Worley-GHD Award for Asset Management Excellence in the 1997-1998 Australia and New Zealand Asset Management Competitions.

Life cycle asset management requires that the life cycle costs be recorded for existing assets, to act as an aid in projecting them for new assets. Few councils have the facility to easily derive life cycle costs. An exception is East Gippsland, as mentioned above, who argue that financial accountants need to focus attention on developing accounting systems to support asset management. This is, indeed, a high priority. The Chart of Accounts used by East Gippsland is ideally situated to ongoing analysis and asset planning and requires only that Capital Expenditure be further broken down into replacement capital and new capital (upgrade and extension) in order to meet with the continuing information needs of the Infrastructure Study reporting and with councils' individual needs for "what if" analysis using the model framework provided.

7.0 ISSUES AND CONSTRAINTS FOR LOCAL GOVERNMENT REVENUE

7.1 Current Revenues

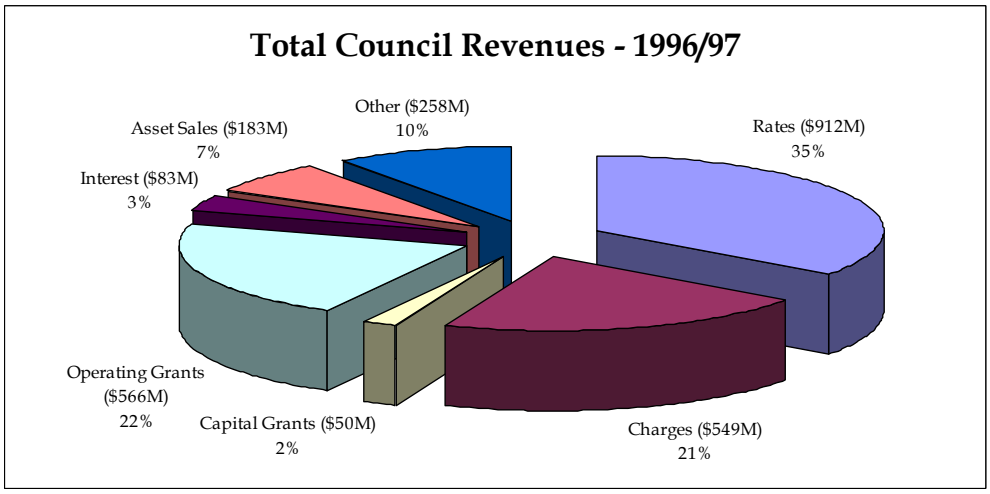


Figure 7.1

7.1.1 Restricted Tax Base

Local government has a single tax base, a property tax based on the capital value, the site value or the net annual value of a piece of land. Councils may raise:

- general rates (which may include a municipal charge which may not raise more than 20% of the total rate revenue), which may be differentiated between different classes of land if the capital value system of valuing property is adopted;
- service rates and charges (for specific purposes, e.g. refuse disposal, sewage services);
- special rates and charges, in relation to specific areas of the council (for specific projects, e.g. drain construction, CBD levies);

7.1.2 Other Revenues

Councils raise or receive revenues from other sources. These include:

- grants and subsidies from other levels of government;
- user charges for goods and services provided, including profits on service delivery contracts for other councils;
- regulatory fines and fees;
- reimbursements for work done on behalf of other agencies;
- interest on investments; and
- contributions and donations.

7.1.3 Rating Effort and Capacity

There are a number of papers available that discuss rating effort. They are generally highly mathematical in nature and difficult for the ordinary citizen to understand. A table will be provided, in a collection of comparative tables and averages, of rating information for all Victorian councils, based on the 1996/97

financial year and 1996 census information. The information provided will include for each council:

- total capital value (Note: Capital Value is used as a standard, not as a comment on the most appropriate valuation methodology);
- total rates (Note: In 1996/97 rates were raised for only 9 months of the year to bring the rating year into line with the financial year);
- total assessments;
- median income;
- average capital value per assessment;
- average rates per assessment;
- capital value required to raise $1 of rates; and
- rate as a percentage of median income.

A selection of this information is presented in Table 7.1 below, with some comments on its usefulness.

Council	***Average Rates per Assessment $***	***CIV to raise $1 of rates $***	***Average Rates as % Median Income***
Inner Melbourne			
Monash (C)	560	297	1.41%
Bayside (C)	622	356	1.47%
Banyule (C)	505	314	1.29%
Boroondara	673	354	1.49%
Darebin (C)	623	217	2.19%
Glen Eira (C)	439	391	1.27%
Hobson's Bay (C)	596	232	1.76%
Kingston (C)	397	407	1.18%
Manningham (C)	736	277	1.57%
Maribyrnong (C)	847	143	3.30%
Maroondah (C)	473	306	1.23%
Melbourne (C)	3,560	138	9.68%
Moonee Valley (C)	568	273	1.62%
Moreland (C)	549	244	1.87%
Port Phillip (C)	766	260	2.28%
Stonnington (C)	500	462	1.22%
Whitehorse (C)	505	330	1.33%
Yarra (C)	840	203	2.40%
Group Average	670	271	1.84%
Outer Melbourne			
Mornington Peninsula (S)	450	341	1.59%
Brimbank (C)	488	254	1.40%
Cardinia	544	302	1.53%
Casey (C)	521	251	1.31%
Frankston (C)	396	654	1.19%
Hume (C)	587	245	1.55%
Knox (C)	523	289	1.24%
Greater Dandenong (C)	480	309	1.57%
Melton (S)	658	179	1.72%
Nillumbik (S)	772	237	1.52%
Whittlesea (C)	678	208	1.78%
Wyndham (C)	819	168	1.99%
Yarra Ranges (S)	586	241	1.59%
Group Average	545	281	1.45%

Council	***Average Rates per Assessment $***	***CIV to raise $1 of rates $***	***Average Rates as % Median Income***
Regional Councils			
Swan Hill (RC)	636	141	2.50%
Ballarat (C)	534	185	1.96%
Greater Bendigo (C)	584	166	2.17%
Greater Geelong (C)	474	244	1.63%
Horsham (RC)	526	196	1.96%
Mildura (RC)	555	192	2.15%
Greater Shepparton (C)	616	206	2.13%
Wangaratta (RC)	404	307	1.43%
Warrnambool (C)	563	207	2.11%
Wodonga (RC)	579	210	1.79%
La Trobe (S)	588	140	2.17%
Group Average	538	199	1.94%
Large Shires			
Moyne (S)	508	332	1.87%
Murrindindi (S)	468	284	1.76%
Colac-Otway (S)	513	195	2.02%
Baw Baw (S)	593	221	2.08%
Campaspe (C)	472	267	1.75%
Corangamite (S)	620	256	2.40%
Delatite (S)	407	266	1.60%
East Gippsland (S)	459	229	2.03%
Glenelg (S)	630	236	2.28%
Macedon Ranges (S)	592	222	1.62%
Mitchell (S)	564	209	1.71%
Moira (S)	481	251	1.90%
Moorabool (S)	572	201	1.73%
Southern Grampians (S)	673	199	2.70%
South Gippsland (S)	487	260	1.88%
Wellington (S)	478	180	1.80%
Surf Coast (S)	491	259	1.64%
Group Average	520	233	1.88%
Small Shires			
Pyrenees (S)	439	203	2.06%
Ararat (RC)	551	175	2.16%
Bass Coast (S)	334	249	1.58%
Central Goldfields (S)	394	176	1.86%
Hepburn (S)	334	219	1.46%
Queenscliffe (B)	556	273	2.16%
Alpine (S)	603	169	2.39%
Buloke (S)	636	111	2.68%
Gannawarra (S)	436	239	1.79%
Golden Plains (S)	352	303	1.14%
Hindmarsh (S)	477	151	2.03%
Indigo (S)	411	264	1.37%
Loddon (S)	530	168	2.48%
Mount Alexander (S)	451	200	1.98%
Northern Grampians (S)	406	192	1.60%
Strathbogie (S)	458	267	2.09%
Towong (S)	436	283	1.68%
West Wimmera (S)	516	208	2.26%
Yarriambiack (S)	416	-	1.69%
Group Average	438	199	1.81%

Average - All Councils	584	256	1.91%

Table 7.1

The simple averages provide the following indications:

Capacity to Pay. The median household income provides an indication of the capacity of the community to pay rates, an important consideration in taxation. In a relative sense, if an individual council's rates as a percentage of median household income is lower than the average then there is the potential for further rate revenue to be paid by that community. Note that the number of commercial or rural properties in a particular council area will be a factor that distorts the index comparison.

Capacity to Raise Revenue. The higher the total valuation the greater the potential for rate revenue. In a relative sense, if an individual council's average rate is lower than the average rate for the council grouping then there is the potential for more rate revenue to be raised to support the expenditures.

Cautionary Note: These are simple averages and measures and really do no more than indicate an avenue for further research.

7.2 Potential Revenue Sources

7. 2.1. Rates versus User Charges

It will be noted from Figure 7.1 that user charges are a significant component of total council revenues. User charges include the application of regulatory fees and fines. There is a sound economic argument to suggest that where the provision of a good or service can be attributed to an individual that the individual should pay a fee for the good or service. The corollary is that rate revenue should only be raised for:

- those goods and services that are unable to be specifically charged to individuals (the *allocative* role of government); and
- equity and social justice programs (the *distributive* role of government).

Some commentators argue that user charges are a back door method to increase rates. User charges are a more equitable arrangement for distributing the cost of service provision to those who benefit from the service (an important principle of taxation). The introduction of user charges could be accompanied by a consequential reduction in rates.

Clearly, the more revenue that can be raised through user charges the less call on rate revenue. Rate revenue can then be reduced (through lower rates) or re-directed to provide services to benefit the community (such as effective maintenance and renewal of infrastructure assets). Care needs to be taken to ensure that user charges recover only the cost of providing the benefits to the individual. For instance, it would be inappropriate to recover the total cost of providing town planning services from developers. Some of the cost of town planning is directed to providing benefits to the community as a whole, which should be a charge against the general rate revenue. Similarly, where user

charges are applied for a particular service and concessional arrangements are made for disadvantaged users, the cost of the concessional arrangements should be a charge against the general rate revenue, not the other users of the service.

A question to ponder is the extent, if any, to which local government will be embroiled in the current tax reform process.

7.2.2 Grant Revenues

Another significant component of local government revenues is grants from other levels of government. These grants are predominantly from the Commonwealth government, through the financial assistance arrangements made to provide some redistribution of the Commonwealth's surplus from vertical fiscal imbalance to local government, by tied and untied grants. Because local government has a single tax base, there is an argument that could be mounted that local government should receive a larger share of Commonwealth (and State) taxes. The devolution, either deliberately or by other levels of government no longer providing them, of a number of services by other levels of government has placed a strain on local government resources. It is a sad fact of life that large ticket items such as road maintenance and asset renewal programs provide a soft target for cuts in budgets when resources are stretched.

The potential to achieve a greater share of grant revenue should be explored, and the maintenance or renewal of assets provided directly or indirectly by other levels of government should be a point of leverage in the explorations.

7.3 Cash Management Issues

Appendix 10 contains some useful information about financial management issues, with specific reference to borrowings, debt redemption and cash reserves and investment.

Councils have significant cash reserves, which vary according to the cyclical cash inflows and outflows for each council. The more effectively cash is managed the greater the potential to earn good investment income and minimise interest charges on borrowings. This will provide further funds for the provision of council services, including the maintenance, renewal and upgrade of infrastructure.

Strategies for sound financial management should include:

- short, medium and long term financial management plans as part of the strategic focus of the council;
- maximising the return from cash surpluses;
- the use of cash advance facilities which can be readily repaid to minimise interest costs on borrowings;
- timing of the acquisition of and payment for major purchases to minimise the use of overdraft and similar facilities.

Cash Flow Management

Finance staff at the Rural City of Ararat monitor cash receipts and disbursements on a weekly basis. Major capital expenditure items are then scheduled to be paid for when sufficient surplus cash is available, where this is appropriate.

Plant purchases, etc, are programmed to suit the Council's available cash. Council does not expect to have to use its overdraft this year, thus saving the budget allocation for interest on overdraft, which then becomes available for additional service provision in other areas.

By synchronising major capital expenditure with cash inflows, Council can maximise its interest on investment and minimise overdraft usage.

It may be a trite statement that every dollar saved in interest costs can be used to fund services and infrastructure, but it is true.

7.4 Private Sector Investment

A few councils indicated in discussions that they were considering involving the private sector in the provision of infrastructure. The Victorian Government has provided a lead to councils on how this can be done to overcome funding gaps. Other governments around the world are also pursuing private sector investment in public infrastructure.

However, Councils need to consider whether they want to end up owning the asset, and therefore have a future liability to replace the asset, or simply arrange for the asset to be built, owned and operated by the private sector.

It is considered that this is an appropriate mechanism for councils to pursue within the context of current low revenue growth, high community expectations for infrastructure and the strategic framework for council operations.

8. ISSUES AND CONSTRAINTS FOR LOCAL GOVERNMENT EXPENDITURE

8.1 Non-Asset Expenditures

8.1.1 Scope of Expenditures

Expenditures on the maintenance and renewal of infrastructure assets are significant, but only part of the total outlays for councils. The following piechart, based on the 1997/98 budgeted outlays provides a pictorial representation of the non-asset expenditures of councils.

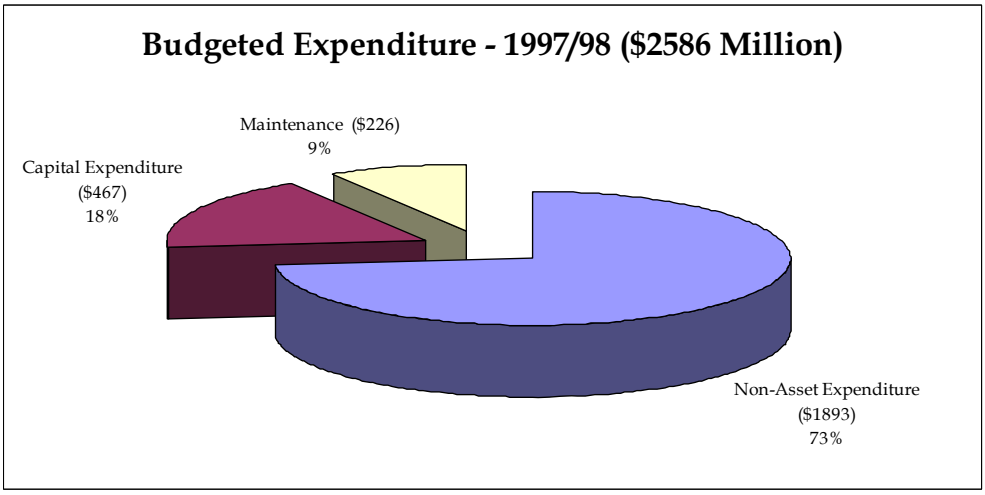


Figure 8.1

8.1.2 Discretionary and Non-discretionary Expenditures

Many of the expenditures that councils incur are, in the short-term, non-discretionary. (Some ratepayers view all council expenditures as non-discretionary!) Non-discretionary expenditures relate to the carrying out of functions imposed by statute, legal liabilities, contractual obligations, governance and public order and safety. In framing a council's budget, the major constraint is the level of non-discretionary expenditure. Sometimes, the amount of non-discretionary expenditure can be reduced by changing the method of service delivery to reduce costs.

To a large extent, expenditure related to assets is viewed as non-discretionary yet there are opportunities to reduce or eliminate such expenditure. A number of councils are involving their communities more fully in the maintenance of assets, as the following examples show.

Service Clubs – Serving the Community

Parks and gardens in the Shire of West Wimmera are created and maintained by local service clubs. The efforts of those clubs enhances the quality of life of rural communities and allows the council to use scarce resources in other areas.

Community Involvement

All of the rural recreation facilities of the Rural City of Ararat are managed by Committees of Management who are responsible for the day-to-day operation and maintenance of the facilities under their control. Council contributes to major upgrading works at these facilities.

Community facilities are maintained by the users for the users to the standard required by the users. This system generates a feeling of equity in the facility for the users, and consequently the facilities are kept in excellent condition at very little cost to Council.

Non-discretionary expenditures can be reduced by a careful examination of all aspects of service delivery and the elimination or reduction of non-essential parts of the service.

8.2 Reducing Expenditure Constraints

8.2.1 Resource Sharing/Joint use of Facilities

The functions undertaken and the similarity of services provided by local governments give rise to opportunities for councils to join together to arrange for the provision of those services within their council areas at a reduced cost. Such arrangements include joint purchasing activities to obtain better discounts through economies of scale to the creation of regional authorities to undertake or facilitate service delivery.

Two Councils Share Software Development Costs

The Manningham City Council has developed an Integrated Project Management package in association with the City of Knox which links the current years Capital Allocation to a time and cost monitoring process. The project managers use the application to manage the day to day aspects of Projects, single data entry, automatic extraction of financial information and preparation of Management Summary Reports. The System will allow for highlighting exceptions to designated performance tolerance standards.

The features of the system are:

- single entry of data;
- linkage to ledger for financial data;
- preparation of standard letters and tender schedules automatically;
- summary reports to management without loss of Contractor's Service Unit cost information; and
- it is based on readily available off the shelf, office standard computer software platform.

Resource sharing can be between local government and other bodies, as the following story illustrates.

R& D - Road Pavement Construction System with Swinburne University

Horsham City is situated on unique, highly expansive clays which, as a result of moisture variation due to seasonal and water activity, contribute to movement of subgrades. As a result, the local roads system has a much reduced serviceable life.

The localised effect of tree root activity and services within the road reserve also aggravates the deterioration process on Council road assets. In general road construction has traditionally been similar to other Municipalities.

Currently, with the objective of establishing procedures and standards that are special to Horsham unique subgrades, Council has joined with Swinburne University Research Staff to fund trials into the effectiveness of MOISTURE BARRIERS IN URBAN ROADS, to increase the useful life of future road construction and reconstruction.

The joining of Local Government and the Research and Development Resources of the University to solve a local problem, together with the allocation by Council of $25,000 for Research and Development is a unique feature of this research.

8.2.2 Adoption of Improved or New Technology

The adoption of improved or new technology can assist councils to save costs and extend the useful lives of existing assets. Councils are doing this as the following examples show.

The introduction of life cycle costing at Maroondah City Council

Methodology used to maximise benefits

To implement the total life cycle asset management program, a need was determined to structure it from the top down. Corporate ownership of the function is deemed a necessity at Maroondah to ensure continuous improvement of the system.

The implementation program involves the following processes:

- Formulation of an overseeing asset management steering committee for development and implementation (the committee is multi-disciplined and representative of the major functions of the council).
- Education for organisational functions on the philosophies of total life cycle asset management.
- Developed total life cycle asset management policies and strategies to sit corporately over the entire asset management program.
- Developed asset management plans.
- Implemented data collection requirements of the total life cycle asset management system.
- Recorded all information on electronic recording system.

- Benchmarked asset management activities against best practices and implementation against industry best practice.

Highlights of benefits achieved

The immediate benefit being seen from the implementation of a total life cycle asset management approach to managing council's asset portfolio include:

- Knowledge of the totality of the asset base and its value
- An understanding of the condition of all assets
- The life cycle positioning of each asset
- Knowledge of the maintenance requirements of each asset
- Knowledge of the likely assets at risk of failure.
- An understanding of ongoing costs of keeping the assets at the present level of service delivery capabilities.
- The ability to conduct "what if" scenarios including the reduction of service provision standards.
- The ability to optimise the maintenance expenditure on a network basis and remove the squeaky wheel approach to maintenance activities.
- Ability to predict and therefore program maintenance activities, and associated down time to convenient and appropriate time frames.

The longer term benefits which will follow from this approach to the management of assets include:

- Extension of useful life of assets
- Minimisation of an asset's risk of failure
- Reduction in the costs of providing services
- Better accountability for an asset's performance and longevity.

Extending Road Pavement Life

The Baw Baw Shire is located in West Gippsland and experiences high rainfall, poor subgrades, increasing vehicular loads associated with milk, timber and quarry product cartage, all of which add to the problems experienced by an ageing road network. It is not surprising therefore that pavement rehabilitation funding in Council's annual road maintenance budget makes up a significant portion of that budget.

Baw Baw Shire uses a stabilisation technique to extend road pavement life. This commenced in earnest in 1986 in the Buln Buln Shire (now incorporated with Baw Baw Shire) and the experience over the last ten years has proven the value of the process.

Variations to the process can depend on the condition of the pavement, composition of the pavement material, traffic volumes and loads carted over the road. The treatment also sometimes requires initial treatment with lime where it is shown that the PI level of the pavement material is too high.

While costs can vary with each individual project, significant savings of up to 40% over the cost of total reconstruction are being achieved.

Before any decision is made to reconstruct a road, whether it be a rural road or urban street, it is strongly recommended that a cement stabilised pavement rehabilitation process be considered.

Microwave Towers

Due to the remote sites involved in the Communications Network for Moira Shire, microwave linking of service centre voice and data was chosen. The traditional connection via ISDN was not practical as it does not currently run to Tungamah or Nathalia. The yearly rental cost of a leased line is also expensive. Council chose to install the Microwave network that would run its voice and data to save money on phone calls as well. Internal calls between Service Centres are not chargeable with the current system. Council also receives a yearly income from rental of space on the towers, including Optus Telecommunicatons. The microwave network has achieved a high level of reliability when the amount of traffic running its bandwidth is taken into consideration.

Road Stabilisation and Re-Use

Due to the high cost and limited availability of road making materials, the Horsham Rural City Council projects are increasingly using STABILISATION of existing materials by various techniques. The costs of $7-9/m3 on selected materials compares with $15-20/m3 for new materials.

Particularly for reconstruction, the re-use and recycling of existing materials is proving a financially effective method of achieving a limited road reconstruction program.

Extending the Life of Rural Rods, Bitumen Reseals - Emulsion Enrichment

Due to the limitation of funding for resealing of local roads network on a needs basis at the Horsham Rural City Council, selected pavements have been programmed for EMULSION ENRICHMENT SEALS at HALF LIFE to preserve the asset.

Emulsion sprayed under controlled conditions to pavement where AGGREGATE IS STILL SERVICEABLE but bitumen is depleted will extend the life of low traffic rural roads by 5-7 years.

This freed up available funds for pavements requiring full reseals and ensured a maximum length of reseal per financial year.

The cost of emulsion enrichment is approximately 40c/m2
The cost of 10mm Reseal is approximately $1.40/m2

Emulsion reseals have generally not been favoured owing to SHORT LIFE and problems of ACCESS immediately after seal. Funding limitations have caused a rethink until higher levels of funding can be restored.

Moral 1. With interest rates at 10% the reseal would need to produce a life of 'x' years before the emulsion enrichment treatment becomes not cost effective.

Moral 2. Even if the treatment is not cost effective when funding is available to choose between the two methods, it may be preferred as it provides a better DISTRIBUTION of benefits to ratepayers.

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Glossary

Accounting Lives - the period over which the cost of an asset is allocated for the purpose of calculating depreciation. *See also* “Economic Lives”.

Asset - A store of future service potential controlled by the entity as a result of a past transaction or other past events (Australian Accounting Standard 27 para. 12). Infrastructure is a subset of asset, *see* “infrastructure”.

Asset System - A complex asset such as a facility or a network which consists of a number of essential but separable components which may be separately replaced to maintain the function of the system. The smallest aggregate of components that provides a distinct service outcome. Infrastructure assets are asset systems.

Capital Expansion - Investment in new assets designed to extend the same standard and type of service currently provided to ratepayers to a greater number of ratepayers, e.g. extending a drainage or a road network, or the provision of standard facilities in a new suburb. Extension is a function of population growth.

Capital Renewal - - Extending the functionality of an infrastructure asset by piecemeal replacement of individual components as they age or become obsolete. Ensuring that ratepayers continue to receive the benefits of existing infrastructure assets. Capital investment in renewal extends the period of service potential but does not change the total capital replacement value, thus it does not increase the size of the infrastructure asset portfolio. (*see* “component”; “infrastructure asset”).

Capital Upgrade. Investment in new assets designed to improve the type of service provided to existing ratepayers. For example, widening the pavement and sealed area of an existing road, replacing drainage pipes with higher capacity pipes to provide a better service, building a grandstand at a sporting facility, or the provision of any new service to existing ratepayers.

Component - An essential part of an asset which may be separately removed and replaced to extend the life of the asset. (e.g. road seal as a component of a road asset; or a roof as a component of a building asset).

Condition Based Depreciation - A method of estimating the depreciation or run down in service potential of an infrastructure asset (its change in condition) by the amount it costs to restore that service potential. This is calculated as an annuity over a forward renewal cash flow, hence it is also referred to as the “renewal annuity” method.

Current Replacement Cost (CRC) - The cost, in today’s dollars, of replacing the assets concerned. *See also* “Written down current replacement cost”.

Current Replacement Value (CRV) - *see* “Current Replacement Cost”.

Depreciation - Loss of service potential through wear and tear and/or general obsolescence. Estimated in the balance sheets by application of a formula involving the Current Replacement Cost and the assumed Accounting Lives. But *see also* "Condition Based Depreciation".

Design Life - Period during which an asset can be expected to remain of acceptable physical quality and perform its intended function without repair.

Economic Life - The period from the acquisition of an asset to the time when the asset, while it may be still physically capable of providing a service, ceases to be the lowest cost alternative to satisfy a particular need. The economic life, at a maximum, is equal to the physical life; however obsolescence will often ensure that the economic life is less than the physical life. *See also* "design life".

Effort - *see* "Management Effort"

Expansion - *see* "Capital Expansion".

Growth Assets- Investment in assets that increases the size of the asset portfolio. Growth includes "extension" related to population growth (*see* "extension") and "upgrade", an increase in service levels (*see* "upgrade"). *Cf* "reinvestment".

Infrastructure Assets - Assets that are not replaced as a whole, but rather renewed piecemeal by the replacement of individual components whilst maintaining the function of the asset as a whole. Infrastructure assets have indefinite lives. Economic lives are assigned to components of an infrastructure asset. (*see* "economic lives"; "component")

Infrastructure Spending Gap - The difference between the "default" renewal expenditure projections and the current level of renewal expenditures.

Maintenance - General definitions such as those in Standards Australia "Glossary of Building Terms" include all actions necessary to retain the intended function of the asset (including restoration).

This study has defined maintenance in an activity sense as "Expenditure on an asset which maintains the asset in use but does not increase its service potential or life, e.g. repairing a pothole in a road, repairing the decking on a timber bridge, repairing a single pipe in a drainage network, repairing the fencing in a park, repair work to prevent early failure of an aset or a portion of an infrastructure network".

In practice, this is close to the accounting treatment of maintenance as "all of those actions to preserve the use of the asset that are deemed to be expendable within the accounting period". This, however, varies between councils.

Management Effort - Although measured in terms of the gap between current and future levels of capital spending (mostly that required for renewal), management effort represents all of the management avenues for closing the gap, i.e. reducing costs through greater efficiency, rationalisation, demand management, etc, making future provisions, and innovative funding.

Reinvestment - Capital investment in renewal of infrastructure assets or replacement of non-infrastructure assets. Re-investment does not increase the size of the asset portfolio. (see "replacement"; "renewal") *See* "Growth Assets".

Renewal see "Capital Renewal".

Replacement - the complete removal of an asset or a component of an asset and the use of another in its place. (*see* "component").

Service Delivery - the purpose for which an asset is held, measured in terms of service outputs or outcomes, e.g. road access, travel time, hours of library access, etc.

Strategic Asset Management Plan - A plan showing future changes to the asset portfolio (renewal, acquisition, disposal) to ensure that the asset portfolio stays aligned with the Corporate Strategy. It is supported by a full analysis of options, justified in terms of outputs/outcomes.

Sustainment - the cost of maintaining the function of an infrastructure asset portfolio by day to day maintenance and periodic replacement of components ("renewal"). (*see* "infrastructure asset", "maintenance", "replacement", "components").

Upgrade Assets - *see* "Capital Upgrade".

Written Down Current Replacement Cost - The Current Replacement Cost less Accumulated Depreciation calculated on the basis of accounting lives.