

Recurrent cost financing: an overview

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This paper provides an overview of several of the conceptual issues related to the current assessment by the Australian Agency for International Development (AusAID) of recipient experience in the maintenance of project assets, with particular focus on problems of recurrent cost financing. These issues are primarily generic in character, and may be applicable in most, if not all, AusAID project circumstances. The country-specific references provided in this paper are intended to be illustrative, rather than seeking to highlight the extent of certain problems and issues in any specific countries.

Different asset types

It is possible to distinguish at least three asset classes which might attract recurrent cost financing

- physical infrastructure, such as roads and bridges (fixed assets)
- plant and equipment, such as motorised vehicles and machinery (movable assets)
- human capital and various forms of intellectual assets, such as technically qualified and experienced staff, as well as information and

management systems. Typically these are highly movable assets, frequently of an intangible nature.

Detailed consideration of maintenance issues will be somewhat different for each asset class. For example, physical infrastructure will typically have a relatively long design life span, with maintenance concerns revolving around adequate regular routine maintenance, and more substantial periodic replacement maintenance as required. For example, a sealed road requires regular routine maintenance (to repair potholes, clear drains, and so on) as well as significant periodic resurfacing (say each 10 years).

Plant and equipment assets will typically have a shorter life span compared to physical assets, due to the nature of their use as well as their being more susceptible to technological change. A particular case in point in this context is information technology equipment (that is, computers) which are subject to extremely rapid changes in technology. While the general concepts of routine and periodic maintenance still apply, proper maintenance planning for plant and equipment may include a sizeable component of preventative maintenance. For highly specialised and major equipment items (such as power

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generating equipment), detailed maintenance planning can include highly sophisticated risk analysis procedures, in particular to minimise the cost of inventory stocks of replacement parts.

With respect to human capital and various other forms of intellectual assets, concepts of 'maintenance' will be significantly different to those related to physical infrastructure, plant and equipment. Nevertheless, it is apparent that there are recurrent cost financing issues involved in 'maintaining' human capital (such as the need for ongoing training, 'update' courses, and the like).

Operations and maintenance expenditures

Typically, problems associated with recurrent cost financing and the longevity of AusAID-supplied project assets are linked with the perceived adequacy (or otherwise) of related operations and maintenance expenditures.

Operations expenditures typically refer to a broad range of financial outlays related to the normal provision of various services (such as education and health facilities). These expenditures can cover a wide range of categories, but frequently are dominated by payments for salaries (for example, to teachers). However, the potential range of items in operations expenditures might include

- personal emoluments (salaries, and so on)
- office materials and supplies
- operational materials and supplies
- travel and subsistence expenses
- utilities, transport and fuel
- rental of property, as well as various other administrative and operational expenses.

Typically, operations expenditure is related to a regular annual cycle, and might be considered to be reasonably predictable. Nevertheless, they may also be subject to peaks and troughs, such as occasioned by special events, public health epidemics, natural disasters, and so on.

It may also be noted that the concept of 'optimum' operations expenditures may be difficult to identify, or effectively non-existent. While it may be possible (at least in theory) to identify an optimum operations expenditure using marginal cost and benefit concepts, typically this is not a practical proposition. For example, in health expenditures, it is difficult to equate the marginal value of an extra life saved with the marginal operations expenditure of a health service.

In practical terms, typically there are certain minimum standards to provide a baseline for operations expenditures (such as maximum desired student-teacher ratios in education facilities, or desired minimum ratio of qualified medical staff to total population for health services). Equally there may exist certain goals for provision of services (such as target levels of service of various facilities, such as schools and health centres). In practice, there is typically considerable flexibility in these areas, and in some respects the demand for certain services may be virtually unlimited. That is, it is almost always possible to spend more money and provide enhanced services to the population of a country (such as in education and in health). Performance indicators are used to monitor the levels of service delivery in these sectors.

By contrast, maintenance expenditures are more difficult to predict than operations expenditures, as they include various 'emergency' maintenance needs from time to time

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(such as emergency repairs to roads after heavy rainfall). A typical categorisation of maintenance expenditures includes

- emergency repairs and maintenance
- routine regular maintenance and preventative maintenance
- cyclical major maintenance.

Replacement maintenance

In practice, it can be difficult to identify the actual levels of expenditure on maintenance, for a range of reasons. For example, some maintenance items may be considered recurrent expenditure, while others (such as cyclical major maintenance and replacement maintenance) may be classified as capital expenditure. Hence, they may be totally separate in accounting terms, possibly managed by different agencies, and difficult to reconcile and consolidate.

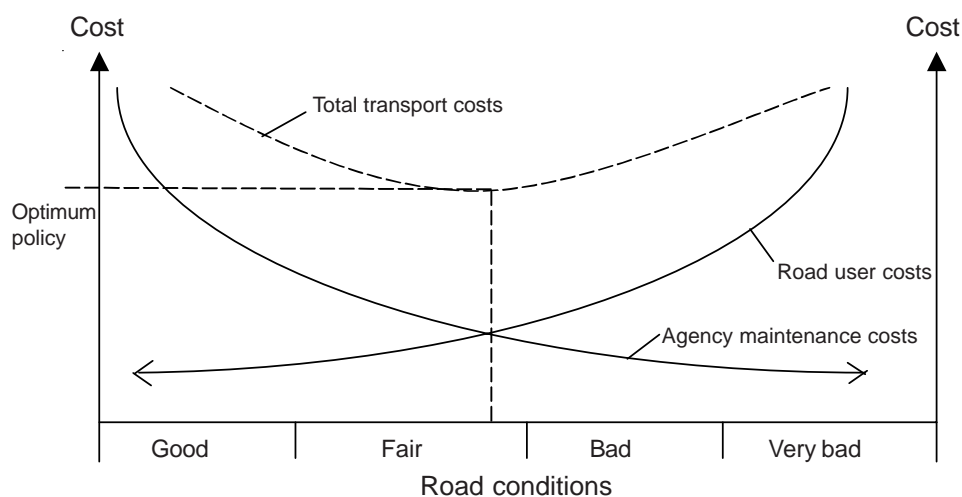
Second, practical estimates for routine regular maintenance may not include all costs incurred in this category. For example, staffing for overhead management and even for some day-to-day

activities may be accounted for separately. Similarly, some operational materials and supplies and other similar expenditures related to routine maintenance may be accounted for separately. A third difficulty in practice can be the dispersion of financial responsibility for maintenance between different levels of government. For example, maintenance of roads in Papua New Guinea is undertaken by the National Government, as well as a large number of provincial and local-level governments.

In addition to the broad classifications of maintenance expenditures outlined above, different agencies have a range of internal classifications for maintenance expenditures. For example, the National Government Department of Transport and Works in Papua New Guinea uses seven categories of road maintenance expenditure for internal planning and budgeting purposes (see Box).

As for operations expenditures, varying expenditures on maintenance can deliver different levels of service to users. For example, in the case of unsealed roads,

Figure 1 Relationship between road user costs, agency costs and road conditions



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a quarterly regrading program will be less expensive than a monthly regrading program, but may be expected to impose higher costs on road users. Conceptually, it is possible to identify 'optimum' levels of maintenance expenditures. As illustrated on the diagram in the case of roads, an 'optimum' road maintenance expenditure policy is achieved when total transport costs are minimised (being the sum of road user costs and agency maintenance costs).

It is often difficult (if not impossible) to define 'optimum' maintenance conditions,

due to a combination of lack of information and budget constraints. Clearly however, the concept of 'over maintenance' is possible. In practice, this is an unlikely distraction in most countries. Rather, it is apparent that lack of information and budget constraints contribute to significant 'undermaintenance'. Furthermore, as has been demonstrated frequently in the case of roads, the consequences of long-term under-maintenance can be extremely severe (and occasionally catastrophic). Inadequate road maintenance leading to

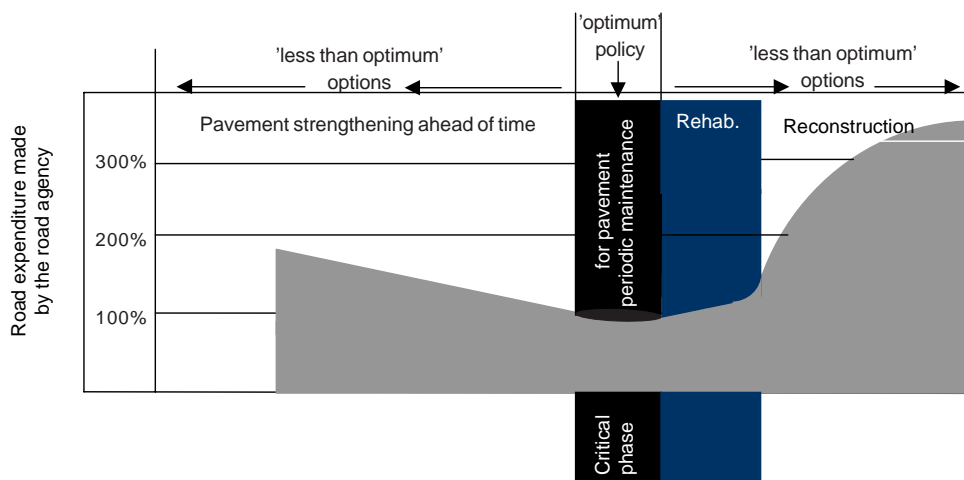
Papua New Guinea

Classification of road maintenance expenditure used by Department of Transport and Works

Head 1 GRM	General Road Maintenance is the main source of funds for road maintenance activities carried out at regular intervals throughout the year, as a planned response to the continuing deterioration of the road (such as filling potholes, edge and shoulder maintenance, clearing drains, vegetation control, repair seal and bridge maintenance)
Head 2 SRM	Specific Road Maintenance provides supplementary funds to enable target maintenance cycles to be achieved where unusual circumstances have made GRM fund inadequate (such as major road patching, river training, disaster relief)
Head 3 MER	Minor Emergency Repair is a supplementary source of funds to address <i>ad hoc</i> deterioration which may close the road or endanger traffic and which cannot wait for the next cycle of GRM to be repaired
Head 4 RMO	Routine Maintenance Overhead covers to the distribution of charges for Provincial and Regional Offices
Head 5 GPM	General Periodic Maintenance fund cover cyclical maintenance that occurs at regular intervals (such as re-gravelling, resealing, carriageway markings, bridge painting and bridge deck replacement)
Head 6 SPM	Specific Periodic Maintenance funds are to cover works that reduce the recurrent network (such as reinstating and rehabilitating severely damaged roads, preventative maintenance, improved road safety, environmental enhancement)
Head 7 HER	Heavy Emergency Repair covers special projects that allow the road network to be opened (where there has been such severe damage that the road has become closed to traffic)

Note

Figure 2 Impact of timing on periodic maintenance costs



Note: 100% = cost of 'optimum' or best policy.

the need to completely reconstruct a road is considerably more expensive in total than over-maintenance (such as pavement strengthening ahead of optimum time) (Figure 2).

Shortfalls in operations and maintenance funding

It is not only difficult to identify the precise quantum of financial resources devoted to operations and maintenance, but it may also be difficult to identify the desired 'optimum' expenditure in any specific context.

A further practical difficulty in this context is the phenomenon of 'abandoned' projects, plant and equipment and so on. In many of these circumstances, an apparent inference could be that these projects have 'failed' due to inadequate recipient expenditure on project operations and

maintenance. However, it is not infrequently the case that such projects have actually failed for some other reason (such as a technical design fault) and that further expenditure has consequently not been forthcoming.

It should also be noted that the preceding scenario should not be confused with the 'moral hazard' problem. That is, there is a respectable argument that the international development assistance process has an inbuilt 'capital aid bias'. As a consequence, it is argued that some aid recipients may choose (rationally) not to incur appropriate operations and maintenance expenditures, but rather allow capital goods to deteriorate in the expectation that further international donor aid will be forthcoming to substitute for the diminished assets. The real significance of the problem in practice, at least in this extended version, appears to be largely untested by empirical inquiry.

Addressing recurrent cost financing shortfalls

Where shortfalls in operations and maintenance funding are perceived to exist, it is possible to identify three broad avenues for addressing the issue

- financial shortfalls
- institutional arrangements
- technical considerations.

With respect to financial shortfalls, it is apparent that budget pressures are a global phenomenon, and there are universal concerns regarding the capacity of governments to assemble adequate fiscal resources. Various measures applicable to developing economies include

- increasing tax take, by better collection procedures and higher taxes
- mobilising international donors to contribute to the recurrent budget
- designing donor contributions to the development budget so as to 'capitalise' traditional operations and maintenance expenditures (as has recently occurred in Papua New Guinea, where road maintenance expenditure by the national government has been moved from the recurrent budget to the development budget)
- reallocation of priorities within given budgets to shift attention to ongoing operations and maintenance expenditure rather than new capital investment and/or deletion of some established expenditures (such as on defence). 'Investment' in maintenance expenditures can be shown to yield high economic rates of return.

There are numerous institutional arrangements which might be adopted to address recurrent cost financing shortfalls.

- Improved cash flow management to strengthen the planning capacity of agencies. For example, in Papua New Guinea an environment of uncertainty exists for public sector agencies with respect to receipt of funds. This creates major problems for orderly expenditure planning, and encourages erratic behaviour.
- Clarification of institutional overlaps which generate uncertainty as to precise responsibilities for operations and maintenance issues, such as currently experienced in Papua New Guinea by the ongoing provincial and local level government 'reform' process. Other administrative and management reforms can improve the overall delivery of government services.
- Hypothecation of public revenues to ensure dedicated financial resources in key sectors (such as fuel tax revenue being solely applied to maintenance of the transport network).
- Development of user-pays arrangements, and commercialisation, corporatisation and privatisation of public sector activities to remove the funding responsibilities for operations and maintenance from government receipts (and enhance incentives to maintain properly facilities held in private ownership). Similarly, 'outsourcing' of appropriate operations and maintenance activities can improve the effectiveness of expenditures in these fields. New projects might be of a build-own-operate character, or build-operate-transfer, or both.

Concerning technical considerations, there is undoubtedly scope to increase the efficiency of operations and maintenance expenditures by various means.

- Technical maintenance planning can require sophisticated techniques

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to optimise performance (and minimise outlays on operations and maintenance) including detailed risk analysis where appropriate.

- Attention can be given to relevant technical issues in the design of project investments, to lessen ongoing operations and maintenance requirements.
- Maintenance arrangements can be built in to capital expenditures, such as by extended warranty periods for major equipment, and contracts for major capital works to have ongoing maintenance components.

Conclusion

It is evident that there is no single recurrent cost financing problem. Rather, in assessing recipient experience in the maintenance of AusAID project assets, there are likely to be many different types of experience with different asset types. Similarly, the perceived problem of shortfalls in operations and maintenance expenditures has many facets, and 'optimum' expenditure levels in this context may be difficult to define. However, there exist three broad areas of recurrent cost financing shortfalls—financial, institutional and technical—providing a broad framework for analysing shortcomings in project planning and financing.