BETTER STRATEGIC PROCUREMENT FOR MAINTAINING SCHOOLS: AN AUSTRALIAN CONTEXT

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ABSTRACT

At the end of 2005 a school buildings maintenance audit in the state of Victoria. This audit provided details of the condition of all building elements, many sub-elements, external works and services for all government schools, together with an assessment of any immediate future works that may be required to maintain the facilities in a serviceable condition to allow them to function effectively. The results highlighted the need to develop better models for organizing maintenance in the future to reduce the steadily increasing backlog starting to accumulate in all schools across the system.

This paper provides contemporary definitions and reviews of maintenance and procurement and identifies trends and benchmarks for maintenance in school buildings. The final key section of the paper considers a range of potential maintenance procurement strategies from low risk, little change to more radical approaches using a facilities whole life approach and public and private partnerships.

KEYWORDS: Maintenance; procurement; school buildings.

INTRODUCTION

Clients or practitioners involved in the care of buildings and facilities recognize that the organization and delivery of maintenance is important if it is to be carried out in an effective and timely manner. However, in many organizations it is deferred, ignored or just forgotten until it becomes an urgent matter where action is demanded due to failure or breakdown.

In common with many client organizations with a large portfolio of properties the Department of Education and Training in Victoria, Australia, is developing strategic models for better managing the maintenance in its schools. To gain an appreciation of the maintenance task it faces the Department has nearly 1,700 primary and secondary school campuses spread across the state and in the Melbourne metropolitan area, covering an area approximately the size of the UK. Identifying and organizing the maintenance of the buildings and the grounds on these schools is a large and complex task. At the end of 2005 a school buildings maintenance audit in the state of Victoria involved three principal contractors, 52 individual auditors inspecting 6.8 million square metres of floor space in 26,600 buildings. The maintenance audit was completed by mid-2006.

The results highlighted the need to develop better models for organizing maintenance in the future to reduce the steadily increasing backlog starting to accumulate in all schools across the system. This paper summarises the potential procurement strategies for managing maintenance in the whole range of its school buildings. It begins with the basic definitions and types of maintenance and then reviews the various approaches that a range of authors have suggested for this environment.
Benchmarks for Maintenance in Australian Schools

The National Public Works Council\(^1\) (NPWC) (1993) *Predicting Schools Maintenance Costs* is a study that suggests, ‘The conclusions from this study show that there is no “mythical” percentage which can be applied Australia wide to assess the level of funds required for the maintenance of schools. There is, however, a range of percentages, which reflect the differing design criteria, maintenance approaches, age and condition of school assets, geographical and environmental factors’.

A model was developed that, ‘… identified technical activities that have to be undertaken in order to keep a building adequately maintained over the long term (100 years), when they are needed, and what they should cost, given current expectations as to the levels of service provided’ (NPWC, 1993:3). Using the NPWC (1993) model the ‘…average estimated funding requirements for the period 1991 to 2010 ranged from 0.9% to 2.8% of the building replacement value. The results have been summarized in (the Report’s) Figure 1.

These statistics demonstrate the levels of expenditure that should be required to maintain the schools in each such environment’. So, for instance, Western Australia had the lowest requirement for maintenance to the building fabric at 1% of the replacement value of the school and Tasmania and South Australia as having the largest requirement for fabric maintenance at around 2.25%. The funding requirements for services maintenance is lowest in Victoria and Western Australia at around 0.25% with the Northern Territory with the highest need of around five times greater at around 1.25%. With Victoria being the focus of this work it is interesting to note that Victoria is shown as with an estimated annual maintenance requirement from 1991-2010 of 1.75% of replacement value for the fabric of the Buildings. That is, the second lowest of any states analysed.

The Report was realistic about gaining adequate funding for maintenance and also sounded an ominous warning if the states were unable to properly fund or neglect the maintenance needs of its school buildings (NPWC, 1993:2):

The implications of the funding that the results showed to be required in order to keep their schools facilities at the intended level of service should be reviewed by the Authorities. Judging by recent experience elsewhere, it is probable that the required levels of funding will prove to be higher than recent budget allocations. If so, the implications are:

- (a) an opportunity to present better cases for more appropriate funding, or
- (b) to accept:
  - a build-up of maintenance backlogs, adding to future funding needs;
  - a wastage of assets which, though not always brought to account is none the less real, and
  - a decline in the service provided by schools buildings.

\(^1\) The National Public Works Council (NPWC) was founded in 1967 and became the Australian Procurement and Construction Council Inc (APCC) in the mid-1990s. The APCC has established itself as a national reference point for both government and industry on best practices, principles and emerging issues in procurement, construction and asset management disciplines.
In the UK, Spedding (1992) is one of the few authors to document maintenance and capital costs of schools. In his research paper, he notes that when comparing maintenance costs, ‘Changes in intensity of use and long term under funding of maintenance in many counties means that the consequences for maintenance and running costs are significant. The fact is that buildings built for, say, 240 pupils frequently had to accommodate many more pupils at the height of the boom, thus increasing wear and tear at that time, and buildings intended for at least double that number may have less than half. Therefore, the expression of maintenance costs, as costs per pupil cannot, in many schools, be considered as a simple relationship. Similarly, the expression of cost related to area is likely to be flawed’ (Spedding, 1992:5).

Table 1 shows the cost of a 5-year program of building maintenance averaged to 1980 prices per annum for 60 typical schools, sampled in proportion to their relative numbers in a county council’s stock of buildings.

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<tr>
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<th>Average cost per annum £ (1980 Prices)</th>
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<td></td>
<td>Per School</td>
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<tr>
<td>Primary Schools</td>
<td>50</td>
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<td>Secondary Schools</td>
<td>10</td>
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Note: Exchange rate of 1£ = A$ 2.40 used.

Spedding commented on the wide gap between the maintenance costs per annum per school with, ‘… the maintenance cost expressed as per school shows that primaries cost, on average,
one-seventh of secondaries. The figures show less variation between costs per pupil in that primaries cost over three-quarters of the secondaries’

However, for the other unit comparisons the range was not so large. For instance, in 1980 prices the schools’ authorities maintenance unit spending per square metre was around £2.60 to £3.10 per square metre per annum for primary and secondary schools (= A$6.20 to A$7.40 per square metre). The building cost indices in the UK have risen +150% for the period 1980 to 2006 and in Australia by +340% in the same period. Taking the lower percentage (+150%) these costs per square metre on present date prices would be in the region of £6.50 to £7.75 (= A$15.50 to A$18.50) per square metre per annum.

The Scale of Schools’ Maintenance in Victoria

A critical factor in assessing the type and extent of maintenance on each school property is the management and updating of the Department’s schools property database, Schools Maintenance System (SMS). The assessment of the condition of schools is carried out by the updating of this database by periodic audits. Audits were completed in 1997/98, 2000/01 and most recently at the end of 2005. These audits provide details of the condition of all building elements and external works for all government schools, together with an assessment of any immediate future works that may be required to maintain the facilities in a serviceable condition to allow them to function effectively.

An independent experienced inspector familiar with maintenance work and activities carries out the audit. The auditor works closely with the regional offices and schools, but the assessment is an independent one where they are required to identify works and priorities in accordance guidelines published by the Department in its Schools Maintenance System (SMS): Maintenance Assessment Guidelines (August 2005), prepared by Sinclair Knight Merz Pty Ltd.

The costs for maintenance work identified by the audit are automatically costed by the Physical Resource Management System (PRMS). A schedule of rates assesses the costs of repair, rectification or replacement works for all the common maintenance items. These costs have been assessed on a consistent basis by a firm of professional quantity surveyors and these estimates are integrated into the software to automatically price or cost each maintenance item on the database.

Thus, at the end of the audit the system can provide detailed costings of each maintenance item within a school and integrated costings for a region and the whole state broken down into elements and condition, priority classifications and other categories, if necessary.

Results of the 2005 Maintenance Audit

After the audit was completed in late 2005 the Department was able to use the audit results in the Department (DEET, 2005) in its Schools Maintenance System (SMS), which was integrated with School Asset Management System (SAMS). The standard costings provide data, statistics and detailed cost analyses based on the following major variables or criteria:

- All Building elements
- Condition (Poor, Worn, Fair) and priority (A, B, C, D)
- Planned work and Unplanned/Ineligible work
- Specialist work
The audit data has allowed various and detailed analyses to be carried out, but these cannot be included in this paper. The total of all three categories of maintenance (Poor, Worn, Fair) under the four condition categories (A, B, C and D) were evaluated in the 2005 audit (with an early 2006) review update of $250 million.

Managing Maintenance in the Future

To overcome this maintenance backlog requires an approach that will address the problem whilst delivering a good value technical and financial solution. Aggregating the maintenance items that need attention, using the data collected by the maintenance audit and placing them in appropriate packages of work that will attract keen competition and innovation is the challenge facing the Department or any other organization with a similar problem. There is a need to develop an approach that will reduce the present level of maintenance and to ensure that future levels of funding and procurement do not allow the maintenance situation to deteriorate to the levels we presently see in the system.

Grouping of work rather than tackling each individual item of work should bring benefits of continuity of work, economies of scale and gaining the skills of a better organized maintenance contractor. Nevertheless, organizing and managing maintenance on this scale is difficult task. Wood (2003:71) has recognised the problems of maintenance procurement, ‘… because of its inherent uncertainties in terms of scope and scale of work, the unpredictability of when emergency work may arise and complications of access, often involving disruption to occupants and their operations, contract arrangements have often been looser.’

Maintenance Management Models

The present system of maintenance in schools in Victorian schools has been manifestly under-funded and has resulted in a massive backlog of poor condition maintenance items as demonstrated by the audit survey conducted in late 2005. School maintenance in Victoria has all the characteristics of deferred maintenance, where insufficient funds are made available.

In common with many organizations the Department must make inroads into the maintenance backlog that has now been identified by considering new funding and organizational maintenance models that will prevent this situation arising again. However, there must be an injection of funds into schools maintenance to overcome the backlog that has developed over decades. In the immediate future, there will also be a need for greater funding than the present model to at least keep pace with the accruing maintenance in all schools. In addition to this commitment it would be necessary to review the methods and arrangements used to deliver maintenance and related services to schools. That is, rather than consider it purely as a maintenance function, the Department should be organizing maintenance as a facilities management service more aligned to the type of integrated service described earlier.

Following the guidance given in the NPWC (1993) Predicting Schools Maintenance Costs Report given earlier to demonstrate the levels of annual expenditure that should be required to maintain the schools then a percentage of 1.75% of the replacement value should be applied Victoria. With an estimated buildings replacement value from the Department of around $10,000,000,000 ($10 billion) then an annual figure of $175 million ought to be spent on maintenance. On present maintenance assessment values from the 2005 audit such a figure would clear all Poor and Worn condition maintenance items from all schools ($115 million)
and still have $35 million to make considerable inroads into the third level of maintenance items in the ‘Fair’ category of maintenance. To clear all these items of maintenance would place schools and the Department in a good position to develop a better strategic approach to ensuring such a backlog of maintenance did not occur again.

**Making Progress Towards Better Strategic Models of Maintenance in Victoria**

The message from the material presented is that with present levels of funding the Department is not clearing its maintenance backlog through its corrective (unplanned) maintenance approach. In fact, with present levels of funding maintenance levels will continue to increase as the existing school building stock ages and new schools are added to the stock. In addition, new school buildings are being added to the building stock, but the Department is not replacing existing schools (particularly those in poor condition) quickly enough. The value of all maintenance will continue to grow and more items will be added to the ‘Poor’ category as the ‘Fair’ and ‘Worn’ Categories deteriorate through lack of attention. Therefore, the present method of funding maintenance is unsustainable and maintenance will have a negative impact on the function and performance of activities within Victorian schools.

It should also be noted that a reasonable proportion of the capital works, especially that part providing renovations, extensions and upgrading of existing schools in effect is removing many maintenance items from the schools receiving these capital works. The Schools Resources Division assess the proportion of capital works that goes into rectification and maintenance works of this kind as in the region of 15-20% of the capital works budget. To accurately calculate this figure a study is needed that investigates and analyses a sample of these types of renovations and extension works to existing schools to verify the type and extent of maintenance work in such projects.

**Conclusion**

Victoria has investigated new maintenance approaches and anticipates its program as an integrated facilities management service providing building care on the model espoused by Wood (2003) with his JIT approach to maintenance and customer service. Whilst Wood envisaged his model to be more likely to be adopted by the corporate sector, authorities such as Victoria included it as a strategy for its schools sector, adopting world’s best practice.

Progress toward this model will probably have to be achieved in stages, with the most critical stage being the clearing of all significant maintenance items under the Poor Condition category and many of the Worn category as well. This then provides a new base for the development proposed in Figure 2. This Figure shows the spectrum of development from the existing status quo situation, to overcoming the backlog of maintenance with an injection of new and significant funding. Then the schools system has the ability to proceed to the next stage, regional organizations for maintenance and possibly a broader inclusion of facilities management. Progress towards Wood’s JIT Building Care model then becomes feasible where maintenance is seen in the broader perspective of customer or community service, probably still based on the regional model it supplants. Finally, the strategic partnering for new schools and their care is at the upper end of the model and these building would become the responsibility of the regional or building care models as appropriate.

**REFERENCES**


Figure 2  PROGRESSION TOWARDS BETTER MODELS OF MAINTENANCE AND FACILITIES MANAGEMENT

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<th>SPECTRUM OF POTENTIAL MODELS</th>
<th>LESS CHANGE</th>
<th>MORE CHANGE</th>
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**Status Quo**
- Focused on Corrective Maintenance
- Injection of funds to overcome backlog of Poor Condition Maintenance Items
- Places schools maintenance on a sound basis for continuation and improvement
- Move towards sound levels of annual maintenance funding aiming closer to the 1.5% of replacement value per annum
- Deferred maintenance environment
- Limited expenditure on Maintenance at $13.5m pa
- Backlog of 'Poor Condition' Maintenance items
- Expanding list of unattended maintenance items
- Surplus space limiting best use of maintenance funds.

**Increased expenditure with minor organizational change**
- Focused on Maintenance Funding to Schools
- Option 1 (NSW)
- Principal directs maintenance

**Clustering Schools for Maintenance**
- Direct Funding to Schools Potential for Facilities Management
- Option 2 (NSW)
- Regional Asset Management Unit (AMU) supports aggregated regional groupings
- Principal directs maintenance
- Group contract arrangements
- Maintenance performance benchmarking
- Regional maintenance & FM skills developed.
- Maintenance & FM partnerships can develop
- Encouragement of consortia with non-building providers
- Schools deeply involved in process.

**New Approaches: Just-in Time Building Care**
- Department Directed Condition Based Maintenance
- Option 3 (NSW): Preferred option
- Regional Asset Management Units (AMU)
- Principals to direct priorities
- Aggregated clustered and regional groupings
- Customer focused
- Intelligent use of technology
- ‘light touch’ management
- Responsiveness
- Control down to individual level
- Compatible with corporate strategic directions
- Quality & Continuity
- Revolutionary change in attitude required by client and contractors

**Public, Strategic and Private Partnerships**
- School Core Business (Facilities Management With Building Care)
- Option 3 (NSW): Preferred option
- Regional Asset Management Units (AMU)
- Principals to direct priorities
- Aggregated clustered and regional groupings
- Customer focused
- Intelligent use of technology
- ‘light touch’ management
- Responsiveness
- Control down to individual level
- Compatible with corporate strategic directions
- Quality & Continuity
- Revolutionary change in attitude required by client and contractors

- Adopt a whole life approach to managing schools
- Consistent approach to resource allocation
- Benchmarking and performance measurement
- Commitment to reactive and preventative maintenance
- Considerable specialist skills to negotiate with partners to manage performance and relationships

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