

**CIP PLANNER**

# **Capital Maintenance and Replacement Three Part Series**

## **Capital Program Management: the CIP Revolution**

**CIPPlanner Corporation**

<http://www.cipplanner.com>



# Three Part Series

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## Capital Maintenance and Replacement – Commentary on the GFOA Best Practices Part I

### Part 1: Inventory and Condition Assessment

This is the first of a three (3) part series on the GFOA's recommended practices on Capital Maintenance and Replacement.

CIPPlanner Corporation seeks to serve as a resource for our clients and colleagues in expanding the understanding of Capital Program Management (CPM). As we reviewed the GFOA recommended practice released last October, we were excited to learn that the GFOA is making concrete strides in articulating point by point the multiple dimensions of the various perspectives of Capital Program Management. Our perspective gained by working closely with local governments and agencies during the implementation of our software, puts us into day to day contact with the subtle issues that often become the tips and tricks in implementing the GFOA's recommended practices. This series seeks to analyze the recommended practice and offer up our tips, tricks and recommendations about how to get the most out of those practices.

#### **Capital Maintenance and Replacement (October 2007) (CEDCP)**

***“Background.** Capital assets comprise major government facilities, infrastructure, equipment and networks enabling the delivery of public sector services. The quality and continued utilization of these capital assets are essential to the health, safety, economic development and quality of life of those utilizing such assets.*

*Budgetary pressures may impede capital program investments for maintenance and replacement purposes, making it increasingly difficult to sustain existing capital asset condition and avoid functional obsolescence. Yet deferring such essential reinvestments reduces vital public services and may even endanger public safety. The financial result is increased cost as the physical condition of these assets declines. Government entities should therefore establish capital planning, budgeting and reporting practices to encourage adequate capital spending levels. A government's financial and capital improvement plans should address the continuing investment necessary to properly maintain its capital assets. Such practices should include proactive steps to promote adequate capital maintenance and reinvestment in existing public capital assets.*

***Recommendation.** The Government Finance Officers Association (GFOA) recommends that local and state governments establish a system for planning, budgeting and periodic assessment of their capital maintenance/replacement needs. The following actions should be considered:*

- 1. Develop and maintain a complete inventory of all capital assets. This inventory should contain essential information including engineering description, location, physical dimensions and condition, "as-built" documents, warranties, maintenance history, book value and replacement cost. Operating cost information could also be included. Database and geographic information technologies should be employed to assist in this task.*
- 2. Develop a policy to require periodic measurement of the physical condition of all existing capital assets. Document the established methods of condition assessment. Periodically evaluate the capital program using data driven analysis of asset condition as well as past expenditure levels.*

3. *Establish condition/functional performance standards to be maintained for each component of capital assets. Such standards may be dictated by mandated safety requirements, federal or state funding requirements or applicable professional standards. Use these standards and a current condition assessment as a basis for multi-year capital planning and annual budget funding allocations for capital asset maintenance and replacement."*

First we would like to offer a comment on where we currently see the state of this practice.

We have discovered that many single purpose agencies like airports and expressway or toll authorities often have the most developed and complete inventories of all their asset classes used in the capital planning process. The inventories are the result of either a master planning effort or of a condition survey. Both of which are performed independently of the standard asset inventories that are maintained in compliance with GASB 34. These condition inventories can be the basis of long term capital planning because they contain the essential information of when the asset should be replaced, and an estimated replacement cost.

Governmental entities tend to have a variety of management practices depending on the asset class. Being that GASB 34 has been in place for some time now, and most local governments have a good understanding of their asset inventory from a financial perspective of book value and depreciation, we have found that often this information is not used in the Capital Planning process. The effort made in developing the asset inventories is often done mainly for the purpose of meeting the GASB 34 compliance. We feel that the GASB 34 requirements should also be about the demonstration of the management of those fixed assets.

We have not encountered a unified approach to condition assessment and capital planning, so we consulted with our technology partners for some input on this topic and analysis. We discovered that this concept has great promise as outlined in the "modified approach" in GASB 34, but is not widely utilized because of the expense of the three year assessment cycle.

We have found the following condition assessment cycles to be most common:

- Water/Wastewater and Storm water
  - 3 to 5 years with mission critical assets that could not tolerate failure on an annual cycle.
- Roads and Bridges
  - Annually
  - The Pavement Condition Index developed by the Corp of Engineers has been widely adopted to determine when pavement will fail.
- Facilities
  - Condition assessment for facilities has not developed to the same level as the other asset classes. The work that has been done has centered on energy systems such as HVAC, and windows and doors.

Consider the value of periodic assessments relative to their contribution to the accuracy and optimization of the Capital Plan, and by extension the optimization of the resources, minimization of cost, and adherence to schedule. The conduct of periodic assessments will provide visibility into the "real" maintenance and repair needs within specific windows of time. Utilizing engineering models/predictive models, enable determinations to be made relative to the probabilistic time of failure of these assets. Couple this with forecasted cost estimates that

can be generated with consideration given to resource availability, material costs, inflation factors, rate degradation, etc. Suddenly, we have the means to conduct a 'trade-off' analysis to determine the impact of implementing a repair or maintenance function on a particular stretch of roadway or pipeline against various timetables. Integrate this analysis with consideration of funding constraints, level of importance, (you name the set of criteria) comparatively with other Capital Projects under consideration in a CIP horizon, and you now have the means to provide a optimized plan with selection of projects based upon real data and models. This offers a municipality or agency the means by which to conduct a comprehensive, integrated planning process.

Consider the idea of utilizing these condition assessments and predictive modeling techniques in conjunction with the strategic planning and comprehensive planning function. What is the value of understanding the condition of the assets as they relate to population shift (growth, shrinkage, redistribution), or economic development? Is there a connection here? By extension does this not support the notion that there is indeed a convergence of long term planning with that of near term CIP planning? We believe it does!

The key "takeaways" here are the following:

- The GFOA Best Practice for Capital Maintenance and Replacement is really driving toward the recognition that Total Cost of Ownership of the Capital Assets is directly related to the level and nature of the planning (near term and long term) that is performed.
- The level of capability to execute on those plans and the continual management of those assets over their lifecycle and
- There are several existing management tools/systems available, such as Financial and Asset Management software systems that can be utilized in this effort. But there is the recognition that these systems as standalone solutions are inadequate to meet the objectives set forth in these Best Practices.
- There is indeed the convergence of long term strategic and comprehensive planning with that of near term CIP planning.

## Capital Maintenance and Replacement – Commentary on the GFOA Best Practices Part II

### Part 2: Financing Policies

This is the second of a three (3) part series on the GFOA's recommended practices on Capital Maintenance and Replacement.

#### **Capital Maintenance and Replacement (October 2007) (CEDCP)**

"4. Develop financing policies for capital maintenance/replacement which encourage a high priority for those capital programs whose goal is maintaining the quality of existing assets. Consider earmarking fees or other revenue sources to help achieve this goal.

5. Allocate sufficient funds in the multi-year capital plan and annual operations budget for routine maintenance, repair and replacement of capital assets in order to extend the useful life of these assets and promote a high level of performance throughout the target period."

Our [first article](#) emphasized our perception that most jurisdictions are not leveraging their asset information for the larger purpose of Capital Program Management. Our benchmark of the two subset goals listed above is that technology and practice are relatively wide spread. Our basis for this assertion is our assessment that approximately 80% of jurisdictions with populations of over 100,000 have implemented an asset management solution. In fact many jurisdictions with over 100,000 in population are on their second generation of asset management. We believe that better than half of the jurisdictions with populations between 50,000 and 100,000 have also adopted an asset management solution. The adoption of these technologies allows the jurisdictions to execute these recommended practices to the extent of the assets that are tracked in the systems. We have found that not all assets are tracked in asset management systems but rather those that require a high level of maintenance.

#### ***Unfunded/Funding to be determined***

The first impact we see arising out the adoption of asset management systems and the use of long term predictive models is the identification of the really big number associated with the maintenance and replacement of the existing asset base. We believe that the maintenance has an impact primarily on the operating side of the budget and will treat the implications of that under total cost of ownership. On the replacement side we see the extension of planning horizons to 20 and 30 years to accommodate the replacement cycles of assets. This creates a problem on the funding side in that when planning looks that far out it inevitably changes and at times the funding sources are not know.

We see two approaches to this problem. First we see the big bucket of unfunded projects. Asset replacement projects that have been identified but for which no funding has been determined. This is an important number for all to be aware of because it can be an indication of several important considerations. If the unfunded number is low compared to the funded projects. Then the jurisdiction is either exceedingly wealthy or has done well. If the number is so high as to be overwhelming that the plans have become the captive to the planning departments and are not part of true long term planning. A balance must be struck.

Our key take a ways for unfunded projects are:



- You need them as a threshold for last minute newly proposed projects. If jurisdictions are finding last minute projects on a consistent basis then executive pressure need to be brought to bear of emphasize the importance of the long term planning effort. In other words the board must inflict enough pain to improve the predictability of the long term Capital Plan.
- The public need to understand what is not getting done as well to understand the basis for the funding levels that are being established.

A refinement to the unfunded concept that one of our clients uses is the funding to be determined classification. The map out all the identified unfunded projects and then promote from this large bucket the smaller high priority projects that are first in line when funding is determined. This clearly defines the next step for all stake holders and helps define the direction of the capital plan.

### ***Total Cost of Ownership***

We believe that the concept of total cost of ownership of assets is one the most underutilized management techniques in Capital Program Management Adoption of asset management technologies. The area of pulling together the cost of maintenance of capital assets is actually good in most jurisdictions. But we do not see this information applied in two key areas: in the cost estimates for new projects and as an offset for the implementation of new projects.

If a jurisdiction has a long standing an asset management system it has at its disposal the cost of maintenance of these assets over times. This long term data can be normalized and applied to the cost of newly proposed projects. This of course is especially important in assets that extend service areas. For jurisdictions that are more focused on replacement of existing infrastructure e this type of information can be used as an offset to current maintenance costs, assuming that the maintenance costs of new assets are lower than the cost of older assets. This offset can be applied to the cost of the project but we suggest that the better earmark for these savings is in the debt service thresholds that are used to fund the projects in the first place. This is routinely done for revenue producing projects but not generally for other types of projects despite the fact that the justification is functionally the same.

## Capital Maintenance and Replacement – Commentary on the GFOA Best Practices Part III

### Part 3: Reporting and Assessment

This is the final part of a three (3) part series on the GFOA's recommended practices on Capital Maintenance and Replacement.

#### Capital Maintenance and Replacement (October 2007) (CEDCP)

6. *At least annually, report on capital infrastructure, including:*
  - a. *Condition ratings jurisdiction-wide*
  - b. *Condition ratings by geographical area, asset class, and other relevant factors*
  - c. *Indirect condition data (e.g., water main breaks, sewer back-up complaints)*
  - d. *Replacement life cycle(s) by infrastructure type*
  - e. *Year-to-Year changes in net infrastructure asset value*
  - f. *Actual expenditures and performance data on capital maintenance compared to budgeted expenditures performance data (e.g., budgeted street miles reconstructed compared to actual)*

7. *Report trends in infrastructure spending and accomplishments in the jurisdiction's Capital Improvements Program including trends in spending, replacement cycle, and other important factors for each major infrastructure category.*

Over the past year we've been discussing the need and value of optimizing the Capital Program. We've discussed it in terms of the convergence of Master and CIP planning functions (long term with near term planning), predictive modeling, and the integration of multiple projects in order to leverage resources. Rather than presenting yet another discussion on these issues in the context of Capital Maintenance and Replacement we thought that a great deal of benefit could be derived from viewing a Power Point presentation that has been put together by RJN Group (one of our partners). The Power Point presentation addresses the benefits to be realized by utilizing predictive maintenance and repair modeling as an integral part of the master and CIP planning processes. The story is quite compelling. Addressing the issues surrounding Capital Maintenance and Replacement in the context of assessing the risks and costs of various levels of investments should prove to be quite informative.

RJN (<http://www.rjn.com/>) is a consulting firm providing engineering services and information technology services for infrastructure planning, design, construction, maintenance, and management for the public sector.

<http://www.ciplanner.com/assessingriskandcostofinvestment.ppt>

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