

ASSET MANAGEMENT FOR WATER RESOURCES INFRASTRUCTURE

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Abstract. This paper addresses the emerging common movement toward proactive asset management for the nation's infrastructure, in particular the water resources infrastructure (water, wastewater, and storm water treatment facilities, collection and distribution systems). Following decades of original capital investment, we now face a mounting financial burden to sustain that infrastructure. Appropriate renewal of assets *before reaching "dire-need"* is the objective of proactive asset management. Failure to renew the infrastructure will lead to greater violations of water quality standards and greater costs for appropriate mitigation.

The job must begin now if the water resources infrastructure is to be sustained or improved to an appropriate level of quality. But, specifically what is to be done, in what order, by whom, and who pays for it? While many managers take the position that they must wait until circumstances are more favorable, the fact is that circumstances might not improve significantly. So, what to do?

INTRODUCTION

Proactive intervention in the typical asset condition degradation process to improve conditions before reaching "dire-need" is the specific objective of asset management. Asset management is being called for through several initiatives, primarily

- judicial consent decrees specifying asset management as a remedy,
- the EPA's CMOM initiative, and
- the "modified approach" (asset management) alternative of GASB 34.

This impetus has left mixed and conflicted considerations to manage.

Among many utility managers, hopes and expectations have risen for doing business in a manner more like private enterprise. However, along with the raised hopes and expectations is the perception that implementation cost will be very high. That perceived high cost is in terms of data acquisition, information systems, process improvement, and more human resources – the "up front" outlays. In addition, a less tangible, yet significant, cost is perceived in terms of changes in

organizational paradigms – the behavioral changes that must come with new ways of doing business. Most benefits from these up-front outlays and changes will accrue down the road, most likely to the successors of current managers and their current constituents.

MEASURES OF THE PROBLEM

The aged and deteriorated condition of the nation's infrastructure has been the subject of many studies over the past few years, in particular the water and wastewater infrastructure. The sources of studies have ranged from professional associations (e.g., American Water Works Association)⁽¹⁾, to the U. S. Congressional Budget Office⁽²⁾ to the U. S Environmental Protection Agency⁽³⁾. By all accounts, the needed fixes will take decades to accomplish, even with an immediate start, and the costs are measured in the billions at some local levels and more than a trillion dollars nationwide.

In the most recent example, the American Society of Civil Engineers' 2005 Report Card on America's Infrastructure⁽⁴⁾ indicates that the trend across all categories of infrastructure is declining compared to the original 2001 Grade Point. For drinking water and wastewater, the 2001 GPA for both was a "D" whereas the 2005 GPA for both is "D-."

Going beyond the declining overall trend in condition, the 2005 Report Card shows the inevitable competition for the limited resources among advocates for the various infrastructure categories. The estimated nationwide shortfall for needed replacement and rehabilitation *over the next five-year period* is \$1.6 trillion to cover all categories. In the drinking water and wastewater categories alone, the need is estimated at \$23 billion *annually*, about evenly split between the two categories. Given this situation, it is little wonder that utility managers have mixed perspectives and motivations.

In addition to the general aged and deteriorated physical condition of the infrastructure studied by various interests, EPA has studied the water contamination events associated with sewer systems as a basis for prospective regulation. The incidence of combined sewer overflows (CSO) and sanitary sewer overflows (SSO) are recapped as follows⁽⁵⁾:

- 836 NPDES permits currently authorize discharge from 9,501 CSO outfalls in 32 states
- 850 billion gallons of CSO discharges annually
- 25,000 to 86,000 SSO events nationwide annually
- 3.0 billion to 10.6 billion gallons of SSO discharges annually

CONSENT DECREES

What A Consent Decree Is. Consent decrees result from lawsuits brought by offended parties (e.g., private citizens, environmental advocacy organizations) and regulators (e.g., U.S. EPA, state environmental protection agencies) against chronic violators (typically local governments) of environmental standards (typically the Clean Water Act). Leading up to the legal action is always a long record of missed opportunities to manage the problems. In many cases, millions of dollars have been paid in fines rather than spending on solutions to address the problems at the heart of the lawsuits.

A consent decree is the mutually-agreed, legally-binding action plan, articulated by a judge, by which the plaintiffs and defendants will address the pollution problems going forward. Regardless of the manner of presentation, consent decrees generally cite violations of the Clean Water Act as the basis for action, frequently, specific violations of the National Pollutant Discharge Elimination System (NPDES) permits. Often, remedies stated in consent decrees are replete with elements of the EPA's Capacity, Management, Operations, and Maintenance (CMOM) initiative, though not specifically identified as EPA CMOM. In effect, these decrees prescribe elements of proactive asset management.

Consent Decree Contents. The prescriptions stipulated in consent decrees give the appearance that a combination of proactive commitment, funding, and common sense would have avoided the need for legal action in the first place. Review of specific language shows that none of the remedies require the development of new technologies, the introduction of high-risk actions, or revolutionary approaches to management. On the contrary, most consent decrees stipulate the application of proven technologies, low-risk actions, and generally accepted management approaches.

PROACTIVE ASSET MANAGEMENT

To make clear the connection of proactive infrastructure asset management and water resources, consider the following: water, wastewater, and storm water are handled in physically closed systems such that contaminated water and clean water remain segregated.

When these systems (assets) are new, a high degree of structural integrity exists. As the assets deteriorate and break down over time (typically decades for infrastructure assets), the structural integrity declines. For example, wastewater can escape closed systems; storm water can inflow or infiltrate leading to capacity being exceeded (overflows).

To mitigate violations of water quality standards, more and more operations and maintenance costs are required, even as performance declines, until the assets have to be replaced. Rather than allowing the assets to degrade severely, planned intervention with scheduled rehabilitation programs can be used to extend asset service life and maintain the asset physical condition at a level needed to comply with water quality standards. Finding the optimum combination of repair, rehabilitation/renewal, and replacement is the essence of proactive asset management.

With all the new initiatives involving proactive asset management in recent years, the term "asset management" has become an overused buzzword. Software packages that once were maintenance management systems are now asset management systems; sewer system evaluation surveys are now asset management implementations; fixed asset accounting processes are now asset management processes. To add to the confusion: asset management has long described the handling of investment portfolios.

Therefore, to focus communications with clients, the author employs the following working definition of "proactive asset management:"

- Knowing what you have (a systematic inventory of assets)
- Knowing what condition it is in (evaluated periodically on a consistent measurement scale or ranking system)
- Knowing what the financial burden will be to sustain the assets (at a targeted condition on the measurement scale or ranking system)

This knowledge enables a systematic approach to setting objectives, managing capital investment and operations and maintenance costs, and providing the necessary information management to support those activities.

Whether a wastewater collection and treatment utility, a drinking water treatment and distribution utility, or a capital-intensive private manufacturing business (with multiple plants, sources of supplies, and distribution channels), the same basic needs must be met through the three elements listed above. The basic difference between the utilities and the manufacturer is that the manufacturer may go out of business if unable to find the optimal balance that will keep him competitive. The utilities can continue to exist even without balanced performance, although their path forward may be rough.

This contrast between the public entities and private enterprises has given rise to the push to make the public entities “more like private business” in their operations. Given the well-documented problems with the nation’s infrastructure, this push has been especially strong in that realm. The balance of this paper discusses the current state of developments in two arenas: the CMOM initiative and Governmental Accounting Standards Board Statement No. 34 (GASB 34). Both have received much attention for their potential influence on asset management implementation, and consequently their impact on operation of water resources infrastructure. Yet, both are faltering a bit in fulfilling that potential.

CMOM

What CMOM Is. The EPA’s CMOM initiative was developed in EPA Region 4 (Southeastern USA) in the late 1990’s as a test approach to compliance with the Clean Water Act. CMOM is simply a specific case of proactive asset management applied to sewer overflow problems. The concept is to provide adequate infrastructure (capacity) to handle base and peak flows with appropriate foresight (management), with the system being kept in good repair physically and financially (operation and maintenance).

EPA’s CMOM was intended to enable utilities to analyze their own problems, generate their own solution alternatives, and confirm their implementation through a self-audit program, subject to EPA overview. The self-regulatory aspect would mean that well-managed utilities could find the most cost-effective alternatives for their individual circumstances, as long as the ultimate objectives for water quality are achieved. EPA set out to promulgate regulations nationwide by 2003. However, at this writing in April 2005, EPA has not achieved the nationwide implementation for a variety of reasons.

Current Situation. With the long delay in achieving consistent, nationwide implementation of CMOM regulations, the trend now is for the individual States to implement their own approaches, sometimes within the context of whatever EPA region they are in. At the local level, a number of individual utilities have voluntarily undertaken EPA CMOM self-audit initiatives with very positive results to report. EPA maintains a website providing detailed case studies at this website: http://cfpub.epa.gov/npdes/sso/featuredinfo.cfm?program_id=4. These utilities have not waited for nationwide regulations to give them the go-ahead. They are positive proof that proactive commitment can produce good results, and that the hammer of regulation is not necessary in a proactive atmosphere.

What GASB 34 Is. In addition to the EPA CMOM initiative, the other great stimulus of discussion of proactive asset management has been GASB 34. Essentially, GASB 34 is a redefinition of the generally accepted accounting principles that guide State and local government accounting processes and the preparation of their periodic financial statements. (The Governmental Accounting Standards Board is not a government agency – it is a professional standards board. GASB 34 is neither a law nor a government regulation – it is a body of professional standards.)

On the surface there would seem to be little connection between generally accepted accounting principles and infrastructure asset management. The connection has to do with the historical accounting standards for State and local governments. Until GASB 34, unless infrastructure assets were part of an enterprise operation (e.g., a utility which charges fees to generate its own revenue for operations), no requirement existed for accounting for and reporting on infrastructure assets. This is the main reason that many utilities do not have current or complete information on infrastructure asset inventories and conditions, as mentioned previously: they were never required to have it.

New Requirements. GASB 34 required that, according to the implementation schedule which is spread out over several years beginning in 2002, *all* infrastructure assets had to be accounted for and reported on in financial statements. This meant developing an inventory of current assets, developing a cost basis retroactive to 1980, and implementing depreciation accounting covering all those assets.

For many State and local governments, the retroactive recapture of asset inventories and cost could present an onerous burden. In recognition of this prospect, an alternative (the “modified approach”) was provided. The “modified approach” allowed implementation of a “qualified asset management system” in lieu of the traditional depreciation accounting approach. GASB 34 represented a golden opportunity for the implementation of asset management in circumstances for which it could actually be the best alternative. However, responsibility for compliance with GASB 34 rests with the financial officers, not the managers of the water resources utilities.

Multiple Perspectives. Government financial officers are typically from the accounting profession. Generally, they have a deep experience base in fixed asset accounting issues, with shallow (if any) experience in utility operations or infrastructure asset management. Therefore, under the pressure to implement massive new

requirements under a strict compliance deadline, the expected natural behavior is that they will stick with what they already have mastered. The traditional depreciation accounting process for their fixed assets has already been mastered and practiced for years; asset management is something new.

For most government financial officers, sticking with traditional fixed asset depreciation accounting meant no added investment in staff education, no new systems to support asset management, and no new paradigms to be contemplated for day-to-day operations. (This does not infer that they faced no additional cost; in fact, the work volume for most did increase, but not in the “new” areas mentioned above.) To embrace asset management would mean higher short-term costs in several areas: this at a time when government revenues were severely repressed in many locales. The hypothetical arguments favoring the long-term benefits do not hold much weight under such short-term considerations.

On the other hand, GASB 34 represented a rare opportunity for those utility managers who already had an interest in implementing asset management. For them, the “modified approach” was a supporting element in the mix of arguments for implementing asset management. They could use GASB 34 compliance as a motive for investing in new systems, staff education, and different paradigms for doing day-to-day business.

Both the financial officers and the utility managers have to work within a political environment that is short-term oriented, averse to risky initiatives where benefits are not tangible, and heavily influenced by public relations. In financially tight times, as has been the case for local governments in recent years, pressure mounts on government managers to take it easy on taxpayers and ratepayers. This is compounded by the fact that elected officials do not necessarily come into office with the needed knowledge base or the will to seek new horizons. Thus, a natural conflict has been set up between the traditional accounting types, typified by financial officers, and the advocates for proactive asset management, typified by innovative utility managers.

CONCLUSION

We can see that proactive asset management has a common denominator in several initiatives, in particular, CMOM and the adoption of GASB 34. We can also see some of the forces working against rapid deployment, in particular, the lag in promulgating CMOM regulations and the short-term financial considerations of GASB 34.

In the face of continuing deterioration in infrastructure condition, the increasing costs to fix infrastructure problems, and the inevitable competition for limited

resources among competing needs, what should a progressive manager of a water resources utility do?

First, don't wait for all the conditions and regulatory guidance to be in place. Most utilities have some means for collecting information on which to make current decisions on capital investment and operations and maintenance spending; most do not have ideal information or systems. Yet, decisions are made on the required schedule, ready or not.

Second, advocate improvement of processes, practices, and paradigms to support the obvious needs. For all the initiatives currently facing decision-makers, someone someplace had to be the first proponent and others rallied to the cause. Those who hold back hoping for someone else to lead the charge more strongly, or to articulate the position more clearly, will finish back in the pack, if they finish at all.

Third, don't ignore the possible while expending energy on the impossible. In most management situations, a list of do-able action items can be developed readily; usually the reason they have not yet been done is that no one yet has made the needed commitment.

REFERENCES

- 1) American Water Works Association, 2001, *Reinvesting in Drinking Water Infrastructure: Dawn of the Replacement Era*, Online: <http://www.awwa.org/Advocacy/govt-aff/infrastructure.pdf>.
- 2) Congressional Budget Office, November 2002, *Report to Congress: Future Investment in Drinking Water and Wastewater Infrastructure*, Online: <http://www.cbo.gov/showdoc.cfm?index=3983&sequence=0>.
- 3) U. S. Environmental Protection Agency, September 2002, *The Clean Water and Drinking Water Infrastructure Gap Analysis*. EPA-816-R-02-020. Online: <http://epa.gov/safewater/gapreport.pdf>.
- 4) American Society of Civil Engineers, 1998 (updated in 2001, 2003, and 2005) *Report Card for America's Infrastructure*, Online: <http://www.asce.org/reportcard>.
- 5) WEFTEC, New Orleans, October 2004, *U. S. EPA's Report to Congress on the Impacts and Control of Combined Sewer Overflows and Sanitary Sewer Overflows*, Kevin M. DeBell.