Asset Management: The Proper Balance of Capital and Maintenance

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None of us would dream of buying a new house and expect to live in it for decades without needing to replace the roof and install a new air-conditioning unit sometime during its life span. But in a way, that's what we're asking many of our transportation leaders to do with the country's infrastructure. We've developed a cherished asset in the U.S. transportation network over the past 50 years. Now, we must be stewards of this treasure to ensure its continued existence for our children and grandchildren.

In today's environment of "doing more with less," asset management has been increasingly applied to the highway and transportation sector, and the concept is being adopted by more and more transportation agencies. The genesis of asset management provides a guide for how transportation agencies balance capital and operational expenses and offers perspective on what we can expect in the future. Indeed, as transportation agencies strive for the best long-term, whole-life strategies for optimizing asset value, the balance of capital and operational expenses will continue to take center stage.

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Maintenance versus Construction

The tremendous expansion in highway capacity during the past century resulted in an enormous inventory of highways requiring maintenance. The first half of the century saw the construction of tens of thousands of miles of concrete and asphalt pavement in an attempt to "get out of the mud." The latter half of the century saw the construction of the Interstate Highway System, one of the largest public-works projects in history.

During these large capital construction periods, federal funding played a major role (interstate highway funding was generally 90 percent federal and 10 percent state), and the policy was established early on that the states would be responsible for maintenance. At the same time that the capital construction program for the Interstate Highway System began to conclude, federal and state officials started to redefine operations more inclusively. Transportation facilities were no longer defined in terms of "design, construct, and maintain"; suddenly, they were seen as assets to be operated.

The ability to fund operations at an adequate level, however, remained a concern. Maintenance funding requirements grew as vehicle miles of travel increased, larger loads were allowed, and commercial traffic grew. The North American Free Trade Agreement (NAFTA), deregulation of the trucking industry, and just-in-time inventory all contributed to the need to ensure that these assets retained their value and engineering condition. Concurrently, demand for additional capacity in urban areas steadily increased and congestion grew on a nonlinear curve. Large sections of rural interstate highways had deteriorated to the point that major rehabilitation and reconstruction were necessary, but, overall, funding for transportation was inadequate.

Political considerations also factored in. After all, there's little political motivation to maintain existing facilities, as few ribbons are cut on maintenance projects. Deferring maintenance expenditures in favor of new capacity was a political temptation and sometimes a financial reality.

The emphasis on construction was a natural outcome of this political

dynamic. Consequently, maintenance was deferred on the interstate system in some states to such an extent that these states must now confront major reconstruction to return their assets to their original value. This created a mentality of "run to fail," where maintenance was increasingly put on the back burner so that funding matches could be met to build new highways. Emphasis on asset management shifted to a higher level when states didn't have to worry about having enough state money to match federal funds. Thus, the strategy for asset value was greatest when a state received all the federal construction funds it was due.

During the large capital construction eras of the 1980s and '90s, it was apparent that highway facilities weren't being maintained at optimum levels. As financial allocations shifted and construction programs were reduced, strategies for maintaining asset value were more often followed. The industry began to consider life-cycle costs to get the most out of highway funds in the long run. Funding levels that had been influenced by fund allocation decisions and the need to match available federal funding were allocated to operations and maintenance. Life-cycle costing served primarily to indicate the gap in maintenance funding, but nonetheless, providing sufficient funds to support full asset management remained an infrequent result.

Though toll agencies weren't affected by the need to match federal funds, they took an approach similar to that of state transportation departments with regard to maintenance. Toll agencies commonly used the

same maintenance methods as the state DOTs, and numerous individual contracts were awarded to accomplish single maintenance activities such as mowing, lighting, shoulder repair, and so on. The agencies did fund maintenance at a higher level than the state DOTs, to provide a smoother, more aesthetically pleasing, safer trip than nontoll roads, but their focus was on accomplishing maintenance work rather than obtaining optimum asset value. Further, toll agencies differed from general-purpose transportation agencies because of their use of tax-exempt debt wherein the investment public has a financial interest. As it would turn out, toll agencies would make the shift to asset-value strategies quite abruptly with the promulgation of new accounting standards in 1999.

Accounting Standards Come into Play

As these shifts in thinking began to occur, the financial community, through the Governmental Accounting Standards Board (GASB), was formulating accounting standards that would more fully reflect the financial status of public infrastructure agencies. The GASB, established in 1984, in 1999 voted to require that public infrastructure be depreciated on governmental financial statements. This proclamation, known as GASB 34, raised eyebrows, as the noncash

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depreciation of large infrastructure investments made heretofore "thriving" transportation agencies look less robust.

The final version of GASB 34 allows for expensing maintenance activities in lieu of depreciation as long as the condition of the facility demonstrates that maintenance expenditures are adequate. This lessened the sudden effect of large noncash depreciation expenditures, but GASB 34 amplified the shift to long-term asset-value strategies. Financial reporting was no longer focused on the inputs to highway maintenance—the dollars spent—but rather on the asset value remaining at the end of the financial period. The measure of how well a governmental transportation agency performed changed from dollars spent to asset value at the end of the reporting period. The financial decision to spend money for maintenance was now directly tied to the asset value and the performance of the agency.

Condition Ratings

As the concept of asset management develops, the existence of a consistent performance-measurement technique becomes all the more important. This requires a condition-rating program to ensure that the physical condition of the asset is maintained at an acceptable level. Fortunately, most state transportation departments have developed at least a minimal condition-rating system based on various physical measures and expert observation. In some states, these systems have been in operation for decades and are crucial for performance measurement that corroborates asset values reported on financial statements. Some states aren't as advanced but have recently begun to make great strides in perfecting their condition-rating programs.

The Federal Highway Administration has expressed interest in seeing more of a national standard developed to ensure uniform condition-rating standards throughout the U.S. The national Maintenance Quality Assurance (MQA) Peer Exchange has been working on this issue since 2004,

when the first meeting of the group was held. (An example of standards from several states may be found in the MQA document library, at www.mrutc.org/outreach/mqa.) Because condition ratings are indicative of asset value, they provide a baseline of data that can be tracked over time and offer historical evidence that proper investment decisions have been made. Whether the actual work is performed by the private sector or in-house, a well-developed condition-rating system provides a basis for measuring performance.

and historical transportation funding allocation processes that have sought to maximize the return of federal gasoline taxes to the states via federal construction funds. Nevertheless, life-cycle cost analyses demonstrate that it is less expensive to maintain an asset at near original condition than to allow it to deteriorate to a point that major rehabilitation or reconstruction is necessary.

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Misplaced Priorities

Any asset will naturally deteriorate with time, and generally in a nonlinear fashion. If maintenance of the asset is deferred, the asset's condition and value will decline at an accelerated rate. Once the deterioration of the asset begins to accelerate, increased routine maintenance is insufficient to return the asset to its original value. It then becomes necessary to rehabilitate the asset and perhaps even reconstruct it.

This nonlinear relationship has been in direct conflict with political

to limit major change. Thus, the shift in strategy from routine maintenance funding, activity contracting, and balanced capital spending to a balanced program of asset management is a major political and administrative change in policy.

Capital construction is supported by an enormous institutional infrastructure that provides support for maintaining construction expenditures even in a time of reduced transportation funding. Private enterprises engaged in planning, design, construction, right-of-way

acquisition, environmental assessment, legal services, surveying, construction inspection, and related businesses naturally have a vested interest in ensuring that capital construction continues.

While a strong case can be made for increased funding, the balance between asset management and capital construction should be decided based on analysis, not political agendas or restrictions in fund allocations.

Asset Management and the Private Sector

The convergence of data from existing maintenance-ratings systems and GASB 34 financial data has provided policymakers with better information with which to make transportation budget decisions. As the concept of asset management develops, agencies are more likely to fund programs that ensure that asset value is kept at an optimum level consistent with life-cycle costing. In this effort, it is important that efficient delivery remain a focus, an area in which the private sector can help.

An expanded use of the private sector for asset management is supported by several factors. For example, performance-based contracts used with private contractors depend heavily on consistent performance-measurement methods that must be acceptable to both contracting parties. The condition-rating process fulfills this need. Furthermore, subsets of condition ratings are typically established at minimum levels and can become part of the performance-measurement system. Typically this can be done by grouping together similar facility-type classifications (such as rural/urban and limited access/arterial). The facility types can then be further subdivided into elements (including pavement,

road side, traffic services, drainage, vegetation/aesthetics, and snow/ice). The elements can be further grouped according to features or characteristics shared by work activities (for example, traffic services may include pavement symbols, raised/recessed pavement markers, signs, light fixtures, and so on).

Once the main groups have been established, the desired level of service for each characteristic can be developed. For example, the agency may specify that in order to meet the criteria for raised/recessed pavement markers, "70 percent of the required markers should be reflective, with not more than 120 feet of continuous center line or lane line without a reflective marker." Similar levels of service for each routine maintenance activity can be expressed to represent the agency's requirements.

Private companies interested in proposing on asset-management projects can find information on the existing condition rating and the minimum condition rating required in the contract. They can also perform their own extensive condition assessments before projects are bid. A comprehensive work plan is then developed to maintain the asset at the prescribed levels through the term of the contract.

The emphasis here is on managing the asset, not managing the in-house labor force or complement of equipment. Asset-management contractors are at liberty to subcontract activities to local firms based on the latter's ability to perform and the desire of the public agency involved to achieve various public policy agendas. For example, experience has shown that asset-management contractors can be very helpful in supporting small and minority-owned local companies and that they have demonstrated a willingness to mentor and help these companies grow their businesses.

While multiyear asset-management contracts are commonly bid below the maintenance expenditures of public agencies, it is not necessarily true that the private sector is inherently more efficient than the public sector. However, the rules by which the public

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sector procures and administers are clearly more burdensome than those of the private sector. Similarly, the ability to manage personnel is less restricted in, and the ability to provide bonuses and other financial incentives more available to, the private sector.

The maintenance of an asset is a process that involves large quantities of human resources, equipment, and materials and is therefore highly dependent on procurement and management practices. To the extent the private sector is afforded more freedom in these activities than the public sector, greater efficiency should be expected.

Focusing on Outcome

The single change of procuring private-sector services through multiyear versus annual contracts creates tremendous alignment between the agency and the contractor. When 5- to 10-year contracts are procured, the asset-management contractor has an incentive to consistently provide a high level of service throughout the term, thus avoiding the current "patch it" mentality that exists inherently with short-term contracts. This incentive creates a life-cycle cost approach that is aligned with true asset management.

Private-sector asset-management contractors focus on overall maintenance-rating goals and specific maintenance ratings for various activities. No longer is it a question of how much should be spent on maintenance on an annual basis; rather, the emphasis is on outcome, and the private sector is at liberty to use best practices to attain the goal of maintaining asset value. The asset-management company's financials are directly affected when the facility's performance falls below the agreed-to condition ratings. Thus, the outcome, not the input, becomes the focus.

Shared Need, Different Approaches

While toll agencies and departments of transportation have unique policies, procedures, and legal frameworks, they share a need for a balanced transportation financial strategy.

The classical sequence of budgeting for toll agencies is to fund administration and the collection of revenue as a first priority. Under these circumstances, the temptation to fund engineering and preparatory right-of-way activities for new capital construction can be considerable, resulting in deferred maintenance. Maintenance can subsequently be relegated to a minor role unless bond covenants prescribe specific maintenance standards or the agency board sets a policy designating a minimum standard.

For state transportation departments, the budgetary process depends on the need to match federal grants for capital construction. Failure to match such funds can result in revenue from federal fuel taxes being distributed to other states, an outcome that would be politically devastating. In recent years, however, federal capital funds for construction have decreased, requiring fewer state funds to match them. The number of categories in which the funds are allocated has also decreased. This has provided state transportation departments with greater budgetary flexibility and has minimized conflicts with maintenance.

Thus, transportation departments must be concerned with federal fund allocations as a balancing factor for asset management. Toll agencies, meanwhile, aim to maintain the asset at a high value for their investors as well as their customers, giving them an incentive to emphasize long-term maintenance programs.

In addition to their funding and budgeting differences, state transportation departments and toll agencies differ from one another in how they deliver maintenance services. Historically, state DOTs have conducted maintenance activities using in-house crews, equipment, and stockpiled material. This is especially the case in states that tend to balance the need for snow removal with maintenance activities in other seasons to support the emergency nature of winter services. The management of a

large pool of human resources, the procurement of complex maintenance equipment to exacting specifications, and the procurement and storage of materials make it difficult for a public agency to be efficient. Moreover, accounting for these expenditures makes it difficult to determine relative efficiency.

Increasingly, toll agencies have begun to contract with the private sector on a performance basis for asset management, as have state transportation departments, especially for arterial and interstate highway systems. With the growing focus on output rather than input in the asset-management process, there is a greater likelihood that life-cycle costing analyses will form the basis of transportation budget decisions in the future.

Life-cycle costing is a sound financial and policy strategy and is being adopted more frequently by transportation departments and toll agencies. Partially a result of changed financial reporting and shifting capital funding availability, asset management is benefiting transportation policy in a way that will ensure that the great transportation investments of the past will serve the next generation of customers. Asset management will prevent the huge costs of rehabilitation and reconstruction that have become necessary in some states and will serve to bring private-sector efficiency to a crucial public policy agenda: the preservation of our national transportation facilities.

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