Applying the Government Accounting Standards Board Statement 34: Lessons From the Field

Anthony J. Kadlec
Vice President of Operations
Goodpointe Technology
3940 27th Avenue South
Minneapolis MN 55406
Telephone: 612 729 5555 x202
Fax: 877 897 7855
Email: tkadlec@goodpointe.com

Sue McNeil[1]
Director, Urban Transportation Center
University of Illinois at Chicago (C 357)
412 South Peoria Street, Suite 340
Chicago, IL 60607-7036
Telephone: 312 996 9818
Fax: 312 413 0006
Email: mcneil@uic.edu

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[1] Corresponding Author

Abstract

In June 1999, the Government Accounting Standards Bureau (GASB) issued a reporting requirement that state and local governments show the value of the infrastructure assets that they own. The use of these guidelines is very controversial. However, it is mandated in most state statutes for state and local agencies to follow the guidelines. In this paper we show that the application of GASB Statement 34 is consistent with principles of good asset management. We use data and procedures from the pavement management system for the City of Hopkins, Minnesota to illustrate the application of the GASB requirements.

INTRODUCTION

In June 1999, the Government Accounting Standards Bureau (GASB) issued a reporting requirement that state and local governments show the value of the infrastructure assets that they own. Historically, public sector agencies have used revenue and expense reports and have not reported the value of their investments or assets. However, consistent with other business principles, there is considerable interest in moving to a balance sheet that includes assets and enhances public accountability. Also, asset valuation is a key element for evaluating success within organizations (1).

The GASB reporting guidelines are controversial. At the July 1999 meeting of the National Association of County Engineers (NACE), the Board and Executive Committee passed a resolution to recommend that GASB reconsider and rescind the infrastructure reporting requirements (www.naco.org/affo;s/nace/leg/GASBres.htm, www.naco.org/affils/nace/news/AugNews/html#Pres). The Washington Financial Officers Association initially recommended that state and local agencies not implement the guidelines if significant costs will be incurred but has since deemed the regulations "appropriate." (www.wfoa.org/GASB.htm).

During the fifteen years that the GASB requirements have been under discussion, interest in asset management has also independently generated considerable activity in professional organizations (such as the American Association of State Highway and Transportation Officials, and the American Public Works Association), agencies and supporting organizations. This paper develops the relationships among the existing work on asset management, ongoing efforts on asset valuation and the GASB requirements. We also show how the guidelines are applied using data from the City of Hopkins, Minnesota.

GASB STATEMENT 34

GASB is a private non-profit organization that determines commonly accepted practices for government financial reporting. Reporting of infrastructure assets has been an option since 1974 but less than 1% of agencies actually report and fewer actually depreciate assets. The intent of the new requirements, known as Statement No. 34, is to make annual financial reports more useful to legislators, investors and creditors (1) and support assessment of whether costs are being shifted to future generations, and the relative change in the agency's financial position. Statement No. 34 requires government financial managers to provide a narrative, known as management's discussion and analysis (MDA), summarizing the overall financial position and contrasting it with the previous year's situation. Revised financial statements based on full accrual accounting for all government activities, specifically physical assets, will support the MDA. Examples are presented in (2).

While the GASB does not have any mechanism for enforcing the reporting requirements, state statutes commonly require states and local agencies to follow generally accepted practices; in other words, the GASB requirements. For example, in Minnesota state statutes require local governments to follow "generally accepted accounting principles."

No matter what approach is taken, Madeleine Bloom, the director of FHWA's Office of Asset Management, summed up the issues in a report to the AASHTO Asset Management Task Force (3):

Adding highway infrastructure to the balance sheets of states will heighten the importance of these assets and draw attention to the need to maintain their condition, which is positive.

VALUING ASSETS

Like asset management, valuing assets can be interpreted in many different ways. The value of an asset depends on whether you are interested in the financial or the economic value. There are also many different methods for determining the value of an asset including (4):

- Book value - current value based on historical cost adjusted for depreciation,
- Written down replacement cost - current value based on replacement cost depreciated to current condition,
- Market value - price buyer is willing to pay,
- equivalent present worth in place - historic cost adjusted for inflation and wear,
- Productivity realized value - net present value of benefit stream for remaining service life.

Public agencies are required to report the value of infrastructure assets such as roads, bridges, and tunnels (5). Although the requirements are effective June 1999, a transition period has been defined and the earliest implementation is June 2002. The value may be reported as an historical cost minus depreciation, or using a modified approach. Using the modified approach (1):

Infrastructure assets are not required to be depreciated if (1) the government manages those assets using an asset management system that has certain characteristics and (2) the government can document that the assets are being preserved approximately at (or above) a condition level established and disclosed by the government. Qualifying governments will make disclosures about infrastructure assets in required supplementary information (RSI), including the physical condition of the assets and the amounts spent to maintain and preserve them over time.

The asset management system must have an up-to-date inventory, include condition assessments and estimate the annual amount required each year to preserve these assets at some level of performance specified by the reporting agency.

Statement No 34 provides an example of asset value based on book value using an estimated historical cost and straight line depreciation as follows (1):

In 1998, a government has sixty-five lane miles of roads in a secondary road subsystem, and the current construction cost of similar roads I $1 million per lane-mile. The estimated total current replacement cost of the secondary road subsystem of a highway network, therefore, is $65 million. The roads have an estimated weighted average age of fifteen years. Therefore, 1983 is considered to be the acquisition year. Based on US Department of Transportation, Federal Highway Administration's "Price Trend Information for Federal Aid highway Construction for 1983 and 1998, 1983 constructions costs were 69.03 percent of 1998 costs. The estimated historical cost of the subsystem, therefore, is $44,869,500. In 1998, the government would have report the subsystem in it s financial statements to have an estimated cost of $44,869,500 less accumulated depreciation for fifteen years based on that deflated amount. …… assume that the road system had a total useful life of twenty-five years. Assuming no residual value at the end of the time the straight-line depreciation expense would be $1,794,780 per year, and accumulated depreciation in 1998 would be $26,921,700.

In deciding on a method, the availability of data, and what the results will be used for are critical factors. The value of the asset can be used for establishing accountability, decision making and decision support. It is important to recognize that the value of an asset should also include the question "to whom?" Answering this question requires knowledge of the users of the asset and consideration of time in the sense of whether or not the value of the asset should reflect its value for future generations. For example, an underutilized section of roadway may be in the same condition as a heavily traveled section. To the user they have very different values, but their value based on condition may be the same.

Tennessee's Experience

Using existing management systems data, Tennessee Department of Transportation has explored the effort required to value right of way, structures, pavement and buildings as required to meet GASB 34 (6). The exploratory analysis was based on the assumption that the modified method will be used with broad classes of infrastructure, for example, long span bridges being grouped together. It was determined that adequate supporting data already available to be able to meet the reporting requirements including the RSI.

Using Micro PAVER

As illustrated by Tennessee DOT's experience, much of the existing data to support the GASB Statement 34 requirements already resides in existing asset management systems. The Micro PAVER pavement management system (7) provides a simple tool that provides the data to meet the GASB requirements. Specifically, and like other pavement management systems, Mico PAVER includes inventory, condition assessment, and tools for estimating the investment required to meet a specified level of pavement performance. Micro PAVER also illustrates some of the differences between the GASB requirements and asset management. While Micro PAVER meets the GASB requirements and it is an asset management system for managing a particular type of asset, it is not asset management in the broader sense of the word. It encourages decision-makers to focus on traditional stovepipe decision-making and relies heavily on engineering judgement.

Another Role for the Highway Economic Requirements System (HERS)

One of the important concepts of asset management is that there is some value to looking at highway assets as a whole rather than in terms of specific types of assets such as pavements and bridges. FHWA is exploring the role the Highway Economic Requirements System (HERS) may play in this (8). HERS is an elaborate benefit costs analysis model used to make recommendations to congress regarding the federal highway budget and considers highway performance in terms of safety, pavement preservation and congestion. The calculation of residual value is particularly interesting but as it currently stands, represents an economic value of a particular segment, rather than a financial value. However, HERS clearly has raw building blocks that are appropriate for developing asset value and for providing supporting information so that agencies do not have to depreciate their assets.

USING DATA FROM A PAVEMENT MANAGEMENT SYSTEM TO MEET GASB REQUIREMENTS

Pavement management systems typically define homogeneous pavement segments. The segments are used grouped into functional classes. Within each functional class, segments have similar design standards and usage. Related to each segment are data on the pavement condition and age. This data can be used to calculate the value of the asset and then to devise a strategy to maintain condition at an acceptable level.

Calculating the Value of Assets

For each pavement segment constructed or reconstructed since 1980:

1. Compute replacement cost ($Cost_{repl}$)
2. Convert to historical ($Cost_{hist}$)
   $Cost_{hist} = Cost_{repl} * CCI_{yr\_const} / CCI_{2000}$
   CCI_{2000} = construction cost index in year 2000
   CCI_{yr_const} = construction cost index in year pavement was constructed
   Several different construction cost indices (CCI) are available. For example, *Engineering News Record* (ENR) publishes a monthly index for various cities. Perhaps the most logical cost index is the highway construction cost index that tracks price trends for highway construction. This is available on

the Bureau of Transportation Statistics website (www.bts.gov) under *Highway Statistics*. However, this data is undergoing a transition and the most recent data is for 1997.

3. Convert to book value ($Cost_{book}$)
   $Cost_{book} = Cost_{hist} * (life - age)/ life$
   Life = life of the pavement
   Age = age of the pavement

Example

To illustrate the application of this procedure, consider the example from GASB:

- Replacement cost for a highway - $1m/mile
- Historical cost
  - 15 year old highway
  - CCI 1983 / CCI 1998 = 0.6903
  - $Cost_{hist}$ = $0.69 m/mile
- Book value
  - Expected life 25 years
  - Depreciation = 60% (straight line)
  - $Cost_{book}$ = $0.27m/mile

Demonstrating that Pavement is Adequately Maintained

To demonstrate that the pavement is adequately maintained and therefore, the value does not have to be depreciated, set minimum average acceptable condition (PCI) for each functional class (local and collector). Setting the minimum acceptable level of condition requires expert judgement and a consensus on what is appropriate for a specific functional class and a specific location. The pavement management system is then used with typical scenarios to demonstrate that this condition is maintained over say a 10-year period and generate required budgets to maintain condition. Some iteration will be required to find the appropriate condition and expenditure levels.

The state of local government will have to demonstrate in the narrative that is attached to the typical financial reports that:

- The recommended levels of funding to maintain the system have actually been spent, and
- Condition inspections show that on the average the minimum acceptable level of condition has been maintained.

A CASE STUDY: PAVEMENTS IN THE CITY OF HOPKINS, MINNESOTA

The following case study is offered to illustrate how a local government agency, the City of Hopkins, Minnesota is working to apply the “modified” approach of GASB Statement No. 34 using its pavement management system (PMS).

Although Hopkins, which is located a few miles west of Minneapolis, has an accurate inventory of infrastructure assets, which resides in a PMS relational database management system and a fully integrated Geographic Information System (GIS), it does not have a readily accessible record of historical cost data. Hopkins currently has an AA bond rating.

The first settlers of Hopkins arrived in 1854; roots of the town began in 1887. In 1893, the area was incorporated as the village of West Minneapolis and in 1928; the name of the village was changed to Hopkins. The population at the time of its incorporation was 1,105; today it is 16,500. The average age of its residents is 31.

Infrastructure Network

The original village was comprised of three square miles, and it has been enlarged by annexation to its present size of about four square miles. Table 1 describes the City's pavement network.

TABLE 1. PAVEMENT NETWORK, CITY OF HOPKINS

Functional Class	**Number of Sections (Street Blocks)**	**Centerline Mileage**
Local	384	41.8
Collector	95	9.5
Total	**479**	**51.3**

The city of Hopkins is about 98 percent developed with little remaining vacant land. It has been in a redevelopment mode for a number of years, and that will continue as city leaders look for ways to maintain, preserve and improve this historic community.

Preserving the Infrastructure Assets of Hopkins

In 1994, the city of Hopkins implemented the Infrastructure CONsultant (ICON) infrastructure asset management system developed by GoodPointe Technology Corporation (www.goodpointe.com) of Minneapolis, Minnesota. The ICON software program is currently used to maintain the pavement inventory and surface condition data, as well as perform multi-year budget scenario projections for the 51-centerline-mile pavement network.

Consistent with GASB recommendations, the surface condition of the City pavement network has been re-evaluated on a three year cycle (1994, 1997, 2000, etc.) using the Pavement Condition Index (PCI) methodology (8). The PCI is based on a numeric rating system ranging from 100 for a newly surfaced pavement to 0 for a failed pavement. Table 2 shows the latest set of pavement condition survey information collected in 2000.

TABLE 2. PAVEMENT CONDITION, CITY OF HOPKINS

Functional Class	**Number of Sections (Street Blocks)**	**Centerline Mileage**	**Year 2000 Average Pavement Condition Index (PCI)**
Local	384	41.8	72.1
Collector	95	9.5	78.9
Total	**479**	**51.3**	**Overall Network Average 73.4**

What are these assets worth? What level of funding does Hopkins need to invest to maintain the network condition (measured in terms of PCI) at or above the proposed GASB benchmark PCI? These are questions that can be answered with the city PMS.

Valuing Assets

The first step in applying the methodology presented in GASB 34 is to value the assets. If we simply consider pavement in the City of Hopkins and use a replacement cost of $2.15 per square foot for local streets and collectors, the pavements are valued at $20.823m ($16.444 m for locals and $4.379 for collectors). This is a replacement cost. While this value is meaningful to engineers (and most likely the general public), general accepted accounting practices require the use of the depreciated value.

GASB also requires assets obtained after 1980 to be valued. Reliable data on the age of pavements is only available for pavement constructed, reconstructed or overlaid since 1990. Where no data is available we will assume these pavements were upgraded prior to 1980. This is a reasonable assumption in the case of the City of Hopkins as little renewal of infrastructure was undertaken in the 1980s. However, it excludes 76% of the network. The calculation of the replacement cost for the network constructed or overlaid after 1980 is based on:

- Overlay unit cost of $0.70
- Reconstruction cost of $2.70 per square foot
- Overlay life of 23 years
- Reconstruction life of 29 years.

To the engineering community, the more consistent way to calculate the value of the assets is to use constant dollars. That is the construction cost index is not used in the calculation of the depreciated value. Alternatively, converting depreciating and converting to current dollars provides the value consistent with the examples provided in Statement 34. However, it appears that this is not a useful value. It certainly should not be used for absolute comparisons between communities and is of limited value when comparing the value of assets for year to year. The three different methods for valuing pavement assets for Hopkins are summarized in Table 3. As pavements in the City of Hopkins are either relatively new or built prior to 1980, the depreciated values in constant and current dollars are fairly close to each other.

TABLE 3. VALUE OF PAVEMENT ASSETS, CITY OF HOPKINS

Method	Value of Collectors 000's $	Value of Locals 000's $	Total Value 000's $
Replacement Cost (entire network)	$16,445	$4,380	$20,825
Replacement Cost (post 1980)	$752	$6,156	$6,908
Depreciated Value Constant (1999 $)	$663	$5,650	$6,313
Depreciated Value Current $	$591	$5,246	$5,837

Budget Scenario Analysis Using the Modified Approach

It is important to note that the guidelines of the modified approach of GASB statement 34 allow the reporting agency to determine their own benchmark standards for each respective infrastructure network level. In other words, the agency has the autonomy to adjust the benchmark standards as high or as low as the needs of each respective infrastructure network level allows. The caveat is that the agency must publicly disclose the benchmark standards to its constituents; therefore some careful thought must be put into the development and disclosure of the benchmark standards.

The City of Hopkins has designated two separate functional classes of roadways in its street network, *local roadways* and *collector roadways*. The City elected to determine their own benchmark standards of pavement condition (expressed in terms of PCI) for each of these two functional classes. For the City of Hopkins, the process of determining the GASB benchmark standards was a familiar one; it was the same budget scenario analysis process it had employed on a regular basis over the past six years.

The benchmark standard PCI were determined by the City of Hopkins Public Works Department and are listed in Table 4.

TABLE 4. PAVEMENT BENCHMARKS

Functional Class	**Year 2000 Average Pavement Condition Index (PCI)**	**Proposed GASB Benchmark Standard PCI For Functional Class**
Local	72.1	65
Collector	78.9	70

With the above benchmark standards in place, the ICON PMS was used to run multiple budget analysis scenarios taking into account the available historical project-related data to predict future trends in network pavement surface condition. For a particular pavement maintenance or rehabilitation strategy (such as sealcoats, overlays, and reconstructs) the City specified:

1. The Pavement Condition Index (PCI) score range for which the strategy will be considered.
2. The maximum number of applications the strategy can be applied successively before a new strategy must be recommended.
3. The time interval (in years) between successive applications of the strategy.
4. The unit cost of the applying strategy, including the necessary prep work.

At the start of a budget scenario, the ICON program loads the most recent condition survey data or project related information and deteriorates the PCI from that historical date to the date of the analysis. The ICON program then filters through the historical project information to determine how many times each particular strategy has been applied successively and what the time interval has been since the last strategy. Given this historical information, ICON performs the life cycle cost analysis to determine the optimum way to spend the budget in the future analysis years given the practical constraints of how the applicable strategies need to be programmed.

After each of the desired scenarios was evaluated, the predicted total average pavement condition, total backlog and annual funding were used to determine the relative merits of each scenario for each of the two functional classes. In general, the scenario that maintains or increases the pavement condition the most, while reducing the rehabilitation backlog the most, provides the greatest benefit from an asset management perspective. The goal of the budget analysis was to determine the investment level required to maintain the average PCI above the stated benchmark PCI for each of the two functional classes.

Figure 1 from the ICON program is presented to show the budget scenario projection results for the local functional class of the City of Hopkins.

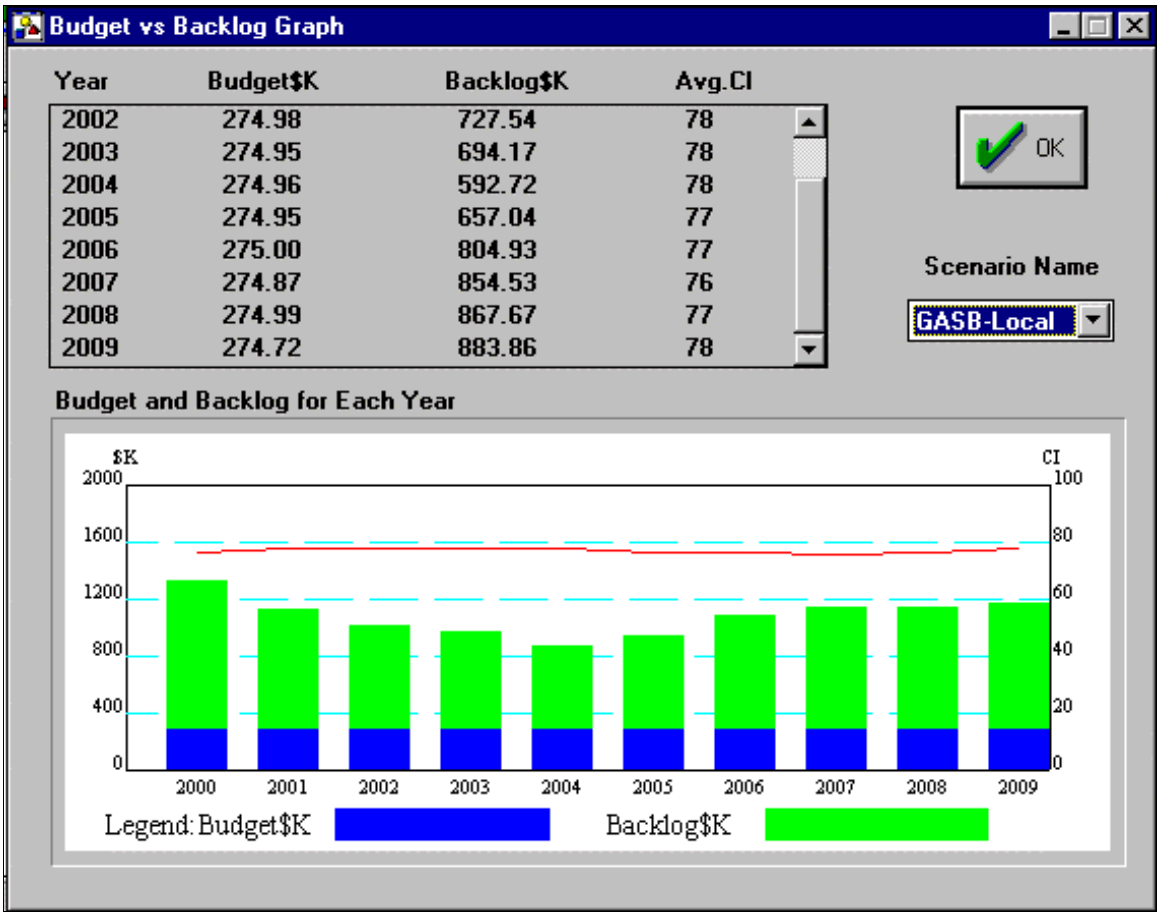

FIGURE 1. ICON RESULTS FOR LOCAL PAVEMENTS IN HOPKINS

Using this methodology, the City used ICON as a tool to determine that an annual budget of approximately $275,000 will need to be invested in the local functional class over the next ten years to maintain the average PCI above the benchmark PCI of 65. The same process was used to determine that an additional $100,000 would be required for the collector functional class, in order to maintain these pavements over the benchmark PCI of 70 for the next ten years. These results are consistent with what the city has been spending and expects to spend to maintain its assets.

To follow through under the guidelines of GASB 34, the City will need to document the pavement maintenance and rehabilitation projects that are actually performed in each functional class and to subtotal the costs of these projects in both functional classes to track and compare the actual level of investment versus the results from the budget analysis scenarios. The City of Hopkins will continue to track the projected condition of the pavements in the street network against the pavement condition survey information collected every three years to ensure that these infrastructure assets are being maintained under the guidelines of the GASB modified approach. In the event that projected or measured condition of the pavements in a given functional class start approaching the benchmark PCI for the given functional class, the City could adjust their pavement maintenance and rehabilitation policies to better meet the needs of this functional class.

Other Assets in Hopkins

Although this case study covered the evaluation of the 51 centerline-mile pavement network, it is noted that the City of Hopkins owns and manages additional infrastructure assets that are favorable candidates

for evaluation under the modified approach of GASB Statement 34. These infrastructure assets, which are not currently being managed in long-term asset accounts by the City Finance Department include: alleyways, sidewalks, and street signs. The City is currently in the process of determining the most advantageous method of evaluating these assets under the GASB 34 guidelines.

ISSUES AND LESSONS FROM THE FIELD

Perhaps the most interesting lesson learned from this case study is that, although many questions on GASB were answered, many additional questions or implementation issues still remain to be solved. The following issues and lessons were documented in the course of the case study with the City of Hopkins.

At the writing of this paper, there is still widespread speculation among public agencies across the United States as to "what does GASB really mean to my agency?" Since the scope of GASB 34 is broad and spans the interest of many departments within a given agency (Public Works, Finance, etc.) earnest inter-departmental cooperation will likely be required to gain a comprehensive understanding of the short-term and long-term implications of GASB 34. The finance officer may need to educate the engineers on the finer points of asset depreciation schedules and the engineers may need to explain to the finance officer how long the infrastructure assets (above ground and underground) are remaining serviceable given the local conditions of the agency.

GASB requires reporting every year but inspection of pavements is required only every three years. Every year, Hopkins must demonstrate that they have spent the amount specified in (3) above on pavements and that the inspection results indicate that on average they have achieved their specified level of condition, otherwise they will have to depreciate the value of their pavements.

There are several alternative approaches that merit consideration:

– While GASB only requires reporting of asset constructed (or reconstructed) after 1980 Hopkins may want to consider doing all the pavement sections for locals and collectors.

– The computation of book value is based on any acceptable but consistent method. If Hopkins believes that their book value is not adequately represented by the straight-line depreciation method used here, they may choose some other method.

If your agency is currently using an infrastructure management system that has built in condition-projection models and/or a budget analysis module, then you are most likely able to engage the "modified approach" under GASB 34 without needing to purchase additional software. Furthermore, with some basic GASB 34 information and guidance, your staff can likely generate supporting documentation and/or reporting schedules with little additional labor effort.

For the infrastructure asset category of City Streets, the City of Hopkins is maintaining a long-term asset account for street improvement projects such as overlays and pavement reconstruction, but not for preventive maintenance projects such as sealcoats and routine maintenance activity such as patching, crack-sealing, and pothole filling. The Hopkins Public Works Department recognizes the importance of sustaining the preventive and routine maintenance activity and tracking this information because it promotes the overall preservation of the City street network. In other words, just because the accounting department elects not to record preventive and routine maintenance as a long-term asset on the books, it doesn't mean that this activity is unjustified. It should not be seen as a "vote against" this activity and it should not significantly offend the professional sensibilities of the engineers.

In conclusion, the following recommendations are offered for public works managers:

- If you do have an infrastructure management system in place, it is advisable to make your Finance Officer/Manager aware of the infrastructure elements or categories that are being managed in the system.

- Perform an audit of each category (e.g. sidewalk pavements) of your infrastructure assets to determine:

  Is your agency managing the inventory and condition information of this category in an infrastructure management system? How complete is the inventory and in what format is the data? How up-to-date is the condition assessment of this category? Based on the total annual revenue of your agency, when will the GASB 34 reporting requirements apply? Is this the financial value of this category also being accounted for entirely or partially in a long-term asset account in the finance department of your agency? Is this category best managed in a long-term asset account in the finance department or in the infrastructure management system or a combination of the both? What are the information flows between the Public Works department and the Finance Department? How can these information flows be improved to benefit all parties involved?

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