

The Relationship Between Asset Management and Performance Management

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The Relationship Between Asset Management and Performance Management

This discussion paper was prepared at AASHTO's request to clarify the relationship between asset management and performance management and to help ensure that efforts to advance these related concepts are coordinated.

Introduction

The best way to define the relationship between asset management and performance management is to recognize that a transportation system's performance, how well the system provides for the safe, efficient, and environmentally responsible movement of people and goods, depends on many factors including usage and demand, capacity, system operations, user behavior and many other factors in addition to the physical condition of facilities. Performance management is a strategic activity that focuses on how policies, resource allocation and other decisions affect all aspects of system performance including safety, operations, environmental stewardship and infrastructure condition. The basic principles of performance management can be applied to all aspects of transportation system performance and to the performance of transportation agencies as well.

Asset management refers to applying performance management principles to the management of transportation physical assets and provides a strategic approach for the preservation, rehabilitation and maintenance of these assets. Asset management is one of the most advanced examples of the application of performance management principles in the transportation industry. In fact, much of the initial work on defining the core principles of what now is called performance management grew out of AASHTO and FHWA efforts to promote a strategic approach to asset management. The analytic tools, data, and experience in applying performance management principles are more advanced in asset management than in many other aspects of transportation.

Because most transportation facilities have long service lives, asset management must have a long-term focus. Many asset management programs focus primarily on pavement and bridge condition using performance measures that reflect all the key metrics related to the physical health of these facilities. However, there are other physical assets, that support a range of performance goals, that need to be incorporated into a comprehensive asset management program. These other performance goals include safety (lighting, signing, guard rail, median cables, rest areas, etc.), operations (traffic signals, traffic management centers, incident response equipment, etc), traveler information (call boxes, variable message signs, 511 systems, etc.) as well as other support facilities and equipment.

Over the past few years, much progress has been made in applying performance management principles to many aspects of performance, beyond the physical condition of assets, including operations, safety, congestion relief, system reliability, environmental concerns as well as key elements of organizational performance such as project delivery and customer service. In these cases, performance measures would vary widely from travel time and delay for system operations to fatalities for safety and on-time/on-

budget delivery for projects depending on the focus of the performance management effort. While some of these broader aspects of performance management (e.g., congestion relief) might also be long term in nature, other aspects, including system operations (e.g., incident response, real time system management, etc.) may be more short-term oriented.

In summary, the core principles of performance management apply to all aspects of transportation system performance. Asset management refers to applying these principles to the physical condition of infrastructure, vehicles, and all other facilities and equipment used to operate and manage the system. The specific application of performance management principles to different aspects of transportation system performance will vary in terms of the appropriate performance measures, short-term versus long-term focus, the appropriate strategies for improving performance and the timeframe for being able to observe performance changes.

Principles of Performance Management and Asset Management

Figure 1 shows the basic elements of performance management. At the broadest level, performance management is about linking agency goals and objectives with resources and results. Asset management represents the application of the core principles of performance management to the physical condition of transportation infrastructure, facilities and equipment.

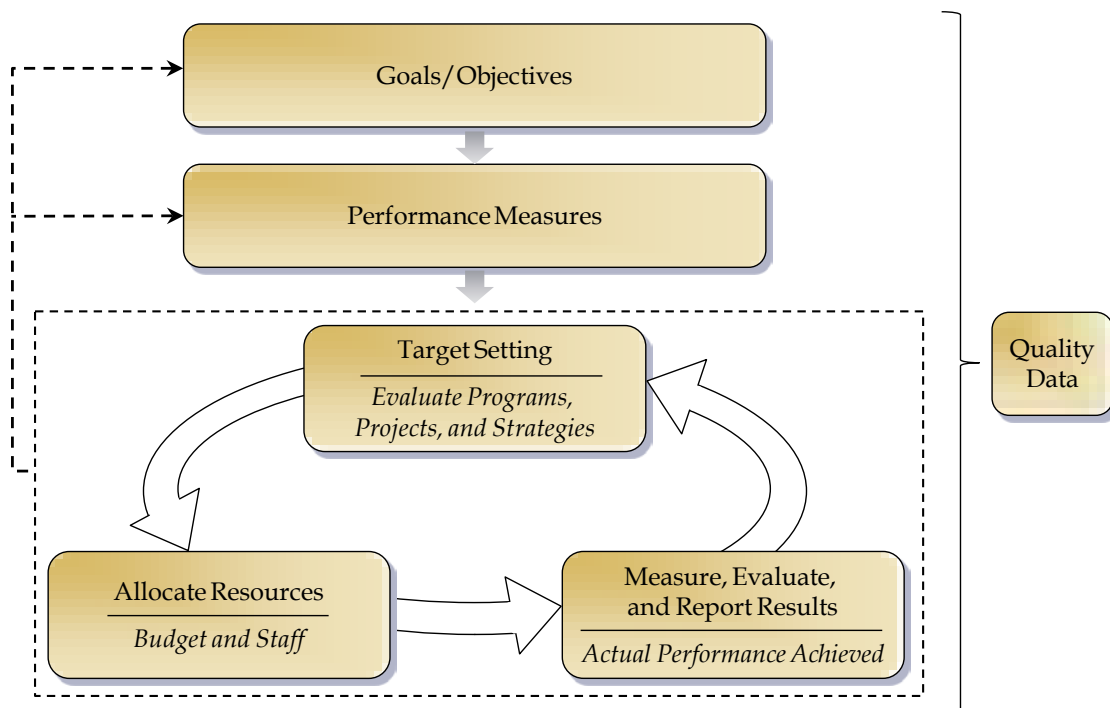


Figure 1. Performance Management Framework
Linking Goals/Objectives to Resource and Results

Each of these performance management elements apply to asset management and the other aspects of transportation system performance as discussed below:

- **Goals/Objectives** – Resource allocation and other decisions are based on a well-defined and explicitly stated set of policy goals and objectives. In the case of asset management, these goals focus on the desired long-term condition of pavements, bridges, and other physical assets. For other aspects of system performance, goals focus on safety, operations, other performance areas, as well as agency performance such as project delivery.
- **Performance Measures** – Policy objectives are translated into performance measures that are used for both day-to-day and strategic management. In the case of asset management, measures would reflect the desired condition or health of physical assets such as pavements and bridges. Broader performance management measures might include travel time and delay, fatalities and serious injuries, as well as measure of agency performance such as on-time and on-budget project delivery.
- **Forecasting Performance and Target Setting** – Decisions on how to allocate resources within and across different types of investments are based on an analysis of how different allocations will impact achievement of policy objectives and performance goals. For some goals, this may include forecasting the likely performance impacts of different strategies and setting performance targets. The limitations posed by realistic funding constraints must be reflected in the range of options and tradeoffs considered. For asset management a key issue is always the mix and timing of the appropriate set of preservation strategies given the available funding. For congestion relief the issue might be the right mix of capital expansion and operations strategies to address bottlenecks given the funding available.
- **Resource Allocation Decisions Based on Quality Information** – The merits of different options with respect to an agency’s policy goals are evaluated using credible and current data. In the case of asset management, decision support tools, such as bridge and pavement management systems, are used to track system conditions and forecast performance in the future. For some other performance areas such as congestion relief and system reliability, data and tools are also available to evaluate likely performance results. However, for many aspects of performance there are gaps in both the data and the tools available.
- **Measuring, Evaluating and Reporting Performance Results** – The actual performance impact of programs and projects are tracked over time and provide the basis for evaluating the most effective strategies to achieve desired goals. Recognizing realistic timeframes for observing performance results and understanding that these timeframes will vary by performance area is important. For example, for many key performance measures supporting asset management, changes in system performance will only be observable over a number of years. For some aspects of system operations or agency performance, changes can be tracked on a monthly or even daily basis.

The original AASHTO Asset Management Guide recognized that these core principles apply to all aspects of the transportation system. However, most agencies use the term “asset management” to refer

to the application of performance management principles to the maintenance and preservation of physical assets. Adopting this definition and focus for asset management and using the term “performance management” to refer to the broader application of performance management principles to all aspects of the system, including those covered by a good asset management program, will help to clarify the relationship between the two concepts.

Strategic Resource Allocation Process

Understanding the strategic resource allocation process that agencies use to evaluate performance tradeoffs across all goal areas helps to clarify the two concepts of performance management and asset management. Figure 2 illustrates the strategic resource allocation process. The performance areas (preservation, safety, etc.) shown are illustrative and may vary from agency to agency to some extent.

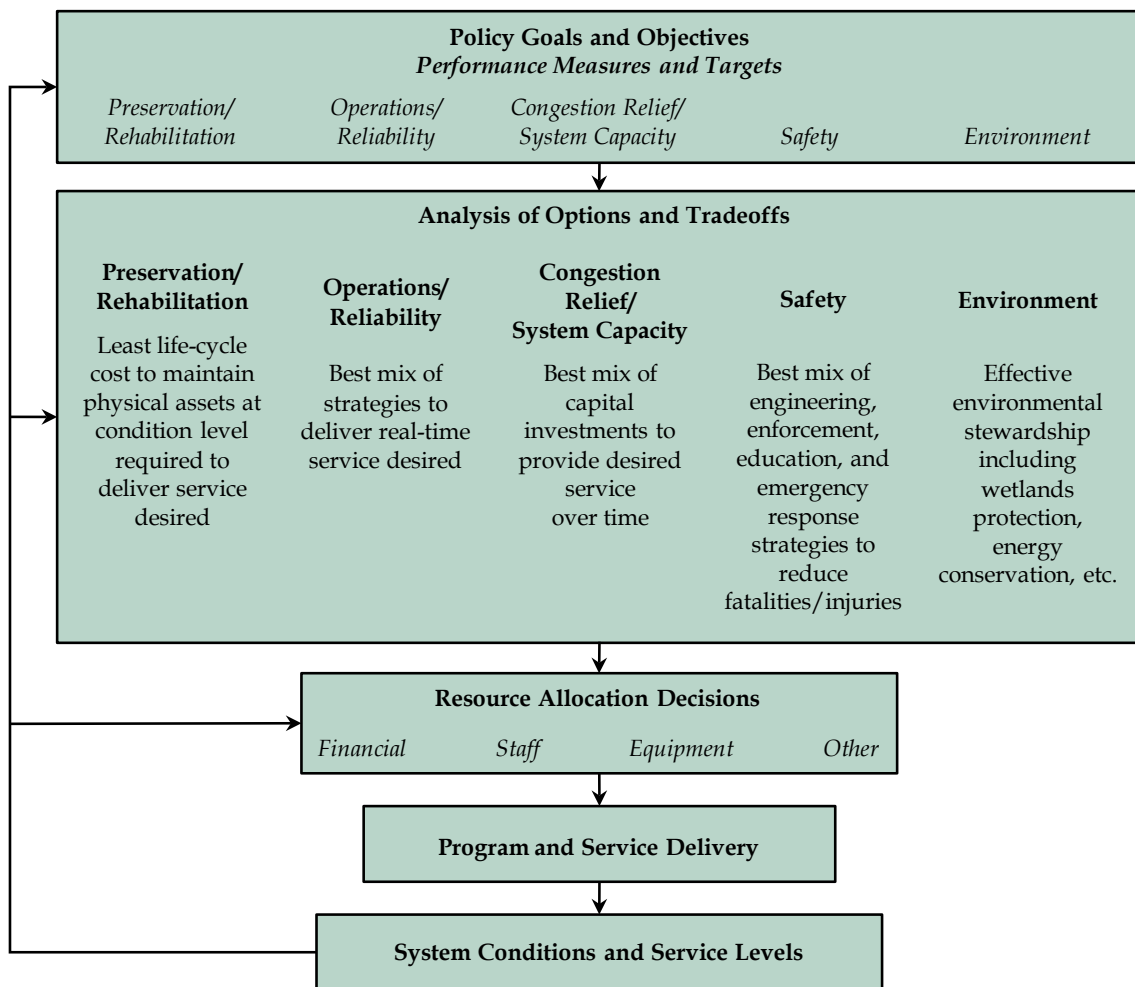


Figure 2. Strategic Resource Allocation Process

Performance management principles apply to all the elements of this process while asset management refers to the application of these principles to the management of physical assets. This suggested way of

looking at the relationship between asset management and performance management is not meant to imply that one is more important than the other. Both are essential in a well managed transportation agency and program. It is hard to imagine a comprehensive performance management strategy being very effective unless it includes a strong asset management component. Delivering on any important transportation system performance goal will require effective management and preservation of the physical assets needed to deliver that performance. These physical assets extend beyond bridges and pavement and include, for example, the facilities, equipment, and roadside features that support safety, traffic operations, and traveler information. These assets, as mentioned earlier, include lighting, signing, traffic signals, guard rails, median barriers, drainage, traffic management centers, incident response equipment and other facilities and equipment needed to manage, maintain and operate the system.

Next Steps

There are a few issues that have been raised as concerns in the asset management community that should not get lost as attention is given to the broader application of performance management approaches. These concerns include:

- Asset management, defined as performance management principles applied to the maintenance and preservation of physical facilities, is an absolutely critical application of performance-based management and decision-making. The bulk of most agencies' resources are spent in this area and effective use of these resources is essential not only for the preservation and performance of these assets but to minimize the funds needed to achieve objectives in this area given the level of funding available.
- An effective asset management strategy must be long term. The focus is not worst-first but least life-cycle cost to achieve facility condition targets over the long term where the desired condition levels and appropriate strategies must reflect the funding available. However, the need for asset management to have a long-term focus is not in conflict with a broader application of performance management principles. A broader application of performance management has to distinguish where short- versus long-term performance goals are the appropriate objective. For the physical preservation of assets the focus should be on the long term even where asset management is part of a broader application of performance management principles. In contrast, some system operational performance goals may be short-term oriented (real time system management as an example).
- Performance measures used to make asset management decisions at the state and local level must be consistent with the long-term focus needed to maintain facilities in the desired condition. Part of the concern about asset management needing a long-term focus may be due to the fact that IRI is the only pavement condition indicator available nationwide on a consistent basis. As a result, IRI has been suggested as a measure for an initial national performance measure reporting effort and AASHTO's Standing Committee on Performance Management (SCOPM) supports reporting IRI as part of an initial national effort. However, surface roughness alone, which IRI measures, is not a sound basis for allocating resources to pavements and there is broad agreement that a

comparable pavement structural condition measure also is needed. AASHTO and FHWA have begun work to define more robust pavement and bridge health measures that could be used on a consistent basis nationwide. AASHTO and FHWA are also working together to develop appropriate national performance measures for other aspects of system performance.

All states have asset management programs focusing on pavements and bridges. However, a comprehensive asset management strategy should include all the physical assets that support the full set of performance goals, including safety, system operations, traveler information, environmental stewardship, and agency operations. These assets include signing, lighting, guard rail and median barriers, rest areas, traffic signals, traffic operations centers and other buildings, equipment, and facilities will require that all key physical facilities be included.

In addition to addressing these issues, a number of recent asset management and performance management workshops, peer reviews, and conferences have identified a number of other important action items for the asset management community. All of these issues have been identified in the new Asset Management Strategic Plan (2011-2015) and include:

- Communicate the benefits of applying transportation asset management throughout the life cycle of all assets to policy and technical decision-makers, elected officials, and other stakeholders.
- Develop strong collaboration and communication between the AASHTO Subcommittee on Asset Management and FHWA and other groups within AASHTO, including SCOPM.
- Support the development of a performance-based Federal program based on sound transportation asset management and performance management principles.
- Continue to define and communicate both the common features and the differences between transportation asset management and broader performance management.
- Develop strong collaborative efforts among AASHTO, FHWA, FTA, AMPO, APTA, APWA, TRB, and ITE.

All of these areas represent a challenging and important future agenda for the asset management community. During 2011, SCOPM developed a new strategic plan which also supports the need to coordinate and leverage asset management and other performance management activities.

Conclusion

The basic principles of asset management and performance management are the same and the two concepts are not in conflict. This discussion paper suggests that the term asset management be used to describe a performance-based approach for managing transportation system physical assets. The term performance management can then be used to describe the application of the same basic principles used in asset management to the broader set of performance objectives related to system operations/reliability,

safety, congestion relief, freight mobility, environment, etc., as well as to aspects of a transportation organization itself such as project and program delivery.