WHITE PAPER

Destination: Transit Asset Management
The journey has begun – don’t get left behind!
October 1, 2018, is around the corner. Are you ready?
When the Federal Transit Administration’s (FTA) Final Rule on Transit Asset Management took effect in October 2016, transit agencies were given until January 2017 to develop initial state of good repair targets, and two years to complete their initial Transit Asset Management plans. The first deadline has already passed, and the second will arrive in no time. Where are you in the journey?

How we got on this path

In mid-2008, roughly one-quarter of the nation’s bus and rail assets were in marginal or poor condition, based on the FTA’s Transit Economic Requirements Model (TERM) scale; by 2010, the figure had risen to one-third and by 2013, it was at forty percent. Over roughly the same time period, the state of good repair (SGR) backlog grew from $77.7 billion to $86 billion; it is now at $89 billion and is projected to grow to $122 billion by 2032.

The FTA began taking steps to “focus attention on transit capital asset preservation and renewal [in order to move] the industry towards an overall ‘state of good repair.’” It was no easy task: The US transit industry has long struggled to develop an effective, efficient and integrated asset management system that pulls maximum value from assets without jeopardizing business, financial and operational objectives.

Over the next several years, the FTA conducted roundtables, documented practices, developed case studies, and solicited input from transit agencies and experts across the country. The result was the Final Rule, which establishes a National Transit Asset Management (TAM) System, designed to improve public transportation capital assets through effective lifecycle management.

What the Final Rule means for the transit industry

The Final Rule was designed to address the $89 billion price tag of replacing or repairing the nation’s aging transit infrastructure by incorporating best practices that will help broaden the reach of limited capital funding. The requirements are mandatory for “all recipients and subrecipients of Federal financial assistance under 49 U.S.C. Chapter 53 that own, operate, or manage capital assets used for providing public transportation.”

The rule establishes “state of good repair” performance measures and dictates that transit agencies set performance targets that can be used to determine federal funding priorities. In addition, new asset inventory and performance information will be reported to the National Transit Database.

All public transportation providers were required to develop initial performance targets by January, 2017, and complete an initial TAM plan by October 2018. These TAM plans are required to be updated every four years, and are subject to Triennial Review by the FTA. The TAM plan must include an asset inventory, condition assessments of inventoried assets, and a prioritized list of investments to improve the condition of capital assets.
Key elements of the FTA’s Final Rule

The specific requirements of the TAM rule depend upon whether a transit provider is classified as Tier I or Tier II, which relates to the size of the operation as shown in Figure 1.

<table>
<thead>
<tr>
<th>Tier</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier I</td>
<td>Operators of rail fixed-guideway public transportation systems or operate ≥101 vehicles in peak revenue service or ≥101 non-fixed route vehicles in peak revenue service</td>
</tr>
<tr>
<td>Tier II</td>
<td>Sub-recipient of 5311 funds or American Indian Tribe or &lt;101 vehicles across all fixed route mode or &lt;101 vehicles in one non-fixed route</td>
</tr>
</tbody>
</table>

Figure 1: Tier structure

The requirements for Tier I agencies are more extensive than the requirements for smaller, Tier II agencies, as indicated in Figure 2 below. To help further reduce the burden on Tier II agencies, they also have the option of participating in a group plan instead of creating individual plans; group plans are subject to the requirements listed in Figure 2.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Applies to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inventory of capital assets</td>
<td>Tier I and Tier II</td>
</tr>
<tr>
<td>2. Condition assessment of inventoried assets</td>
<td></td>
</tr>
<tr>
<td>3. Description of analytical processes or decision support tools</td>
<td></td>
</tr>
<tr>
<td>4. Investment prioritization</td>
<td></td>
</tr>
<tr>
<td>5. TAM and SGR policy</td>
<td>Tier I only</td>
</tr>
<tr>
<td>6. TAM implementation strategy</td>
<td></td>
</tr>
<tr>
<td>7. List of key annual activities</td>
<td></td>
</tr>
<tr>
<td>8. Summary of resources to develop and carry out TAM plan</td>
<td></td>
</tr>
<tr>
<td>9. Evaluation plan for continuous improvement</td>
<td></td>
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</tbody>
</table>

Figure 2: TAM requirements

Different agencies will have many different assets; however, there are a common set of categories and classes, defined by the FTA, into which assets fall. The category and class of assets shown in Figure 3 are grouped so that a common approach to inventory, management, monitoring and reporting can be achieved.

<table>
<thead>
<tr>
<th>Category</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>Construction, maintenance, service vehicles</td>
</tr>
<tr>
<td>Rolling stock</td>
<td>Railcars, buses, other passenger vehicles, ferries</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Fixed guideway, signal systems, structures, power</td>
</tr>
<tr>
<td>Facilities</td>
<td>Maintenance facilities, parking facilities, passenger facilities, administrative facilities</td>
</tr>
</tbody>
</table>

Figure 3: Asset category and class

The asset inventory is further refined using criteria that establishes a minimum asset dollar value, and agency ownership / capital responsibility as shown in Figure 4:

<table>
<thead>
<tr>
<th>Category</th>
<th>Asset inventory</th>
<th>TAM plan element</th>
<th>Condition assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>All non-revenue service vehicles and equipment &gt; $50K used in the provision of public transit, except third party equipment assets</td>
<td>Only equipment with direct capital responsibility; no third party assets</td>
<td></td>
</tr>
<tr>
<td>Rolling stock</td>
<td>All revenue vehicles used in the provision of public transit</td>
<td>Only revenue vehicles with direct capital responsibility</td>
<td></td>
</tr>
<tr>
<td>Infrastructure</td>
<td>All infrastructure used in the provision of public transit</td>
<td>Only infrastructure with direct capital responsibility</td>
<td></td>
</tr>
<tr>
<td>Facilities</td>
<td>All facilities used in the provision of public transit (excluding bus shelters)</td>
<td>Only facilities with direct capital responsibility (excluding bus shelters)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4: Asset inventory and condition assessment

SGR and safety
Safety is a driving factor behind the FTA’s Final Rule, but it is up to each transit provider to determine what constitutes an “unacceptable safety risk.” This enables individual agencies to bring their own expertise to bear in prioritizing their specific funding needs to satisfy SGR requirements.
With assets categorized and placed into the proper inventory, agencies must then analyze asset performance and set targets each year. In addition to targets, providers must supply recent condition data and financial projections, and annually submit their target projections for the following fiscal year, as well as condition assessments, performance results, and a report on changes and progress to the National Transit Database.

Equipment and rolling stock assets will be measured by percentage of remaining useful life benchmarks (ULBs). The ULBs can be the default values established by the FTA, or defined by the agency based on its individual operating environment. Infrastructure assets (mostly applicable to rail) will be measured by percentage of assets with performance restrictions, and facilities assets will be measured with a condition rating as defined by the FTA’s TERM scale of 0 to 5. The table in Figure 5 shows the minimum required condition to be measured, the performance targets, and the measures by category:

<table>
<thead>
<tr>
<th>Asset category</th>
<th>Performance measure</th>
<th>Applies to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>Age-based</td>
<td>Only non-revenue service vehicles with direct capital responsibility</td>
</tr>
<tr>
<td>Rolling stock</td>
<td>Age-based</td>
<td>Only revenue vehicles with direct capital responsibility by mode</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Percentage of guideway direction route miles with performance restrictions</td>
<td>Only fixed rail guideway, track, signals, and systems with direct capital responsibility</td>
</tr>
<tr>
<td>Facilities</td>
<td>Percentage of facilities with an asset class rated below condition 3 on the TERM scale</td>
<td>1-Maintenance and administrative and passenger stations and parking facilities 2-Passenger stations (buildings) and parking facilities with direct capital responsibility</td>
</tr>
</tbody>
</table>

Figure 5: Category, condition, targets and measures

“...state of good repair directly relates to the safety of a public transportation system, as the likelihood of accidents increases as the condition of equipment and infrastructure worsens.”

111th Congress
So...how do you get underway?
The Final Rule is all about improving asset management and putting an asset management system in place, so let’s take a closer look at what that means.

Asset management and asset management systems

When asset management is not optimized, passengers, workforce, management and the business are at risk. Structured asset management enables transit operators to make faster, better-informed decisions in both daily operations and long-term planning strategies in order to deliver safety, reliability, sustainability and long-term prosperity.

Optimizing asset management can have some bumps in the road, and may be challenging for the transit sector for many reasons. For instance, you may have:

• No clear asset management policy, plan or strategy in place
• Difficulty demonstrating cost-effectiveness to key stakeholders
• Inconsistent, unsystematic or varied approaches to risk management within the organization
• Difficulty evaluating the benefit of proposed work and/or quantifying the impact of not performing work
• Operational cost inefficiencies; too many teams duplicating activities and competing for resources
• Too many “fire-fighting” incidents, despite increased asset spending
• No long-term investment plans or justification for urgent projects
• No single, accurate, and trustworthy source of information on existing assets, or their function or condition
• Outdated processes, procedures and technology

If one or more of the statements above ring true, then asset management can help.

“Asset management” encompasses everything an organization does to derive value from its assets. An “asset management system” is a key component of asset management; it refers to a strategic set of systematic and integrated business processes for operating, maintaining and improving physical assets, with a focus on both engineering and economic analysis of high-quality information. This information (data) is used to define maintenance strategies that will achieve and sustain the desired state of good repair, as defined by the Final Rule. The result is a balance between cost, risk and performance over the lifecycle of the assets.

An asset management system does not happen overnight, nor can it happen in a vacuum. It cannot be the responsibility of a single department or two; it is an agency-wide effort that must responsibly flow down from top-level business objectives. This will often require more than just process changes – it may require cultural changes as well.

Putting an asset management system in place and developing a TAM plan can seem like a daunting task. Fortunately, you don’t need to start from scratch – well-established standards offer a roadmap to success.
Asset management system standards

The general concept of asset management has been around as long as there have been assets to manage, but well-documented and widespread asset management standards only date back to the late 1980s and have recently culminated in the ISO 55000 international standard for managing physical assets, as shown in Figure 6.

ISO 55000 provides an overview of asset management systems. ISO 55001 specifies the requirements, and ISO 55002 provides guidelines for implementation. Used in combination, this set of documents represents what is required of an organization to achieve its business objectives.

The standards can be applied by any organization for any type of assets, but they specifically target the management of physical assets to sustainably achieve business goals, and help those who are trying to:

- Create value for their organization from the asset base
- Establish, implement, maintain and improve an asset management system
- Plan, design, implement and review asset management activities along with service providers

These standards are a holistic, integrated framework that can systematically balance risk, cost and performance over an asset’s lifecycle. This framework also integrates well with other management systems, such as ISO 9001 Quality Management System, and ISO 14001 Environmental Management System.

Standards such as ISO 55000 promote good asset management practices and will help transit agencies maintain a clear alignment between their strategic plans and specific asset management activities performed by staff personnel. This “line of sight” approach ensures everyone in the organization, from the C-suite to the shop floor, understands their role, responsibilities, accountability and authority, and how they contribute to the strategic plan.
Identification of non-conformance, corrective actions and continual improvement are other major elements covered by the standards. The “Plan-Do-Check-Act” process built into the structure of the management system ensures the organization continues to grow and improve over time by monitoring conditions and adjusting as needed.

There’s no question that the ISO 55000 standards can give your agency a solid framework for developing your TAM plan – in fact, the FTA consulted the standards while developing the Final Rule. Nevertheless, it should be noted that the requirements for ISO 55000 are more extensive than the requirements for the TAM plan, and a fully-compliant TAM plan can be developed without utilizing/complying with ISO 55000.

Overall, a good asset management system provides many benefits, including:

- Improved communications, cross-functional integration and heightened risk awareness for top managers
- Improved return on investment and reduced cost without sacrificing objectives
- Enhanced customer relations with improved performance and control of product delivery
- Improved asset investment decisions by effectively balancing costs, risks and performance
- Improved health, safety & environment performance, governance, and reduced liabilities such as insurance through demonstrated compliance
- Improved long-term planning through lifecycle management

Starting the journey: the gap assessment

The first step to implementing standards is understanding your organization’s existing maturity level relative to the requirements of the standards and the compliance requirements of the Final Rule. This is best accomplished by completing a gap assessment. As the name implies, a gap assessment will help you to determine what you are doing well, what you could do better and what you are not doing at all (no one is perfect!).

There are self-assessment guidelines available, but as the ISO cautions, “…management reviews, assessments and audits all require the assessor (or auditor) to know what to look for, and to recognize adequacy and ‘fitness for purpose’ in what they find.” You may know your agency better than anyone, but trained subject matter experts will give you access to broader asset management domain knowledge and diverse industry experience that can help you avoid pitfalls such as unconscious bias, “paralysis by analysis,” and even basic fear of the unknown that can blind you to potential process innovations.

The competencies of the audit team will directly impact what is gained. A seasoned professional services organization can help you to understand where your organization is in terms of existing gaps, then guide your prioritization efforts and assist with devising the most appropriate action plans.

The gap assessment must also use an established methodology that is calibrated to a recognized maturity scale, and that results in quantified measures and recommendations. Assessments that are focused on the specific requirements of the standards or the compliance requirements of the Final Rule involve detailed interviews with cross-functional members of the organization, gathering appropriate evidence and documenting the findings for traceability. Such detail will bring clarity and purpose to the organization. Once armed with quantified, detailed assessment results and recommendations, the organization can begin the journey to close the gaps.

This journey can transform a business, so to get the best possible outcome, transit agencies are well-advised to seek the help of a deep bench of asset management professionals that can provide a solid, proven base of knowledge and experience.
Asset management benefits are exponential

Effective asset management has a wide range of benefits. Some can be directly assessed and quantified, such as reduced capital and maintenance costs, increased asset availability and reduced risk exposure. Other benefits can be much more difficult to measure, but may be equally or more important in terms of revenue generation, budget management or overall business performance. Just a few examples would be improved reputation, customer satisfaction and stakeholder support.

Some of the more obvious benefits, such as improved communications, common goals and a more consistently-applied risk reduction process can be realized quickly.

ISO 55000 states that other benefits can include, but are not limited to:

- Improved financial performance
- Informed asset investment decisions
- Managed risk
- Improved services and outputs
- Demonstrated social responsibility
- Demonstrated regulatory compliance
- Enhanced reputation
- Improved organizational sustainability
- Improved efficiency and effectiveness

In addition to the “soft” benefits realized by program and process improvements, savings in whole-life asset cost can also be realized over time. These benefits will show up in leading and lagging performance indicators specific to your business.

The best time to start is yesterday!

There are thousands of different transit systems in the US, from complex big-city networks to small operators in rural communities, and with the TAM plan deadline steadily approaching, these agencies will all be vying for professional assistance at the same time; don’t wait to get underway. Asset management is a best practice that will benefit operators of all sizes by building better-maintained, safer and more reliable transit systems. It is a smart way to make strategic and targeted investments that get the most from available, limited capital funds, but it is a journey – there are no shortcuts.
Proper asset management takes time, resources, commitment and a forward-thinking culture. When done correctly, the benefits are far-reaching and can help an organization achieve critical short-term goals such as the TAM plan while supporting the long-term vision.

The ABB professional services organization offers gap assessment services that deliver quantified measures and help prioritize recommendations for action planning. Using a recognized audit approach, ABB professionals will help clarify your current standing, identify shortcomings and opportunities, and assist in developing a roadmap to close the gaps.

ABB professionals can identify potential quantifiable improvements such as reduced capital and maintenance costs, increased performance and availability, reduced equipment failures or unplanned outages, and reduced risk exposure.
Endnotes


