Capital Project Prioritization and Selection – MBTA Process & Plans

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July 22, 2011
Capital project prioritization and selection
It’s all about balance.

“The underlying goal of asset management is to take a broad approach to resource allocation and programming decisions that will provide greater value to the system and overall satisfaction for end users through improvements in program effectiveness and system performance.”

Source: USDOT - “Asset Management Overview”
Capital project prioritization and selection
We all do it (some better than others).

The process is generally the same for most transit agencies...

… but some implement it more effectively than others.
Capital project prioritization and selection
MBTA current process

1. Capital project “new need request” forms submitted to Budget Office to initiate the annual CIP process.
Capital project prioritization and selection
MBTA current process

2. Evaluation criteria and weights incorporated into CIP scoring matrix (based on MBTA enabling act)
## Capital project prioritization and selection
### MBTA evaluation criteria and scoring matrix

<table>
<thead>
<tr>
<th>Health Impact (Customers or Employees)</th>
<th>Environmental Impact</th>
<th>State of Good Repair</th>
<th>Operational Impact</th>
<th>Legal Commitment</th>
<th>Cost/Benefit (e.g., passengers, budget impact)</th>
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<tbody>
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<td>10</td>
<td>Critical (6-10)</td>
<td>Critical (6-10)</td>
<td>Past useful life now (11-20)</td>
<td>Operations critical (16-20)</td>
<td>Currently overdue (20)</td>
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<td>9</td>
<td>Critical (6-10)</td>
<td>Critical (6-10)</td>
<td>Past useful life during CIP (6-10)</td>
<td>Moderate operational improvement (1-10)</td>
<td>Positive cost/benefit (11-20)</td>
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<td>8</td>
<td>Yes (1-5)</td>
<td>Yes (1-5)</td>
<td>Past useful life after CIP (1-5)</td>
<td>Due after CIP (1-10)</td>
<td>Neutral (10)</td>
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<td>7</td>
<td>Yes (1-5)</td>
<td>Yes (1-5)</td>
<td>Does not replace/renew asset</td>
<td>No operational improvement</td>
<td>Negative cost/benefit (0-9)</td>
</tr>
<tr>
<td>6</td>
<td>No health impact</td>
<td>No envir. Impact</td>
<td>No health impact</td>
<td>No legal commitment</td>
<td></td>
</tr>
</tbody>
</table>

- **Health Impact (Customers or Employees):**
  - 0: No health impact
  - 1: No health impact
  - 2: No health impact
  - 3: No health impact
  - 4: No health impact

- **Environmental Impact:**
  - 0: No envir. Impact
  - 1: No envir. Impact

- **State of Good Repair:**
  - 0: Past useful life now (11-20)
  - 1: Past useful life during CIP (6-10)
  - 2: Past useful life after CIP (1-5)

- **Operational Impact:**
  - 0: Does not replace/renew asset
  - 1: No operational improvement

- **Legal Commitment:**
  - 0: No legal commitment
Capital project prioritization and selection
MBTA current process

3. Division managers prioritize/rank their project requests. Scoring matrix establishes basis for evaluation.
Capital project prioritization and selection
MBTA current process

4. Finance/Budget project available capital funding (federal, state, bond) over 5-year CIP period.
Capital project prioritization and selection
MBTA current process

1. Capital project requests submitted
2. Establish project evaluation criteria
3. Score/rank capital project requests
4. Determine how much funding is available
5. Select projects; prepare the capital plan

5. After public process, internal meetings and Board approval, the CIP project list is finalized.
Capital project prioritization and selection
MBTA current process

Current system works very effectively, but...

• Not linked directly to MBTA goals, objectives, performance measures
• Safety always #1 priority, but sometimes hard to quantify (as most all projects have a safety impact at some level)
• Can be difficult to find proper balance/mix between modes and purpose (e.g., SGR/preservation, customer enhancement, accessibility, etc.)
• Individual project rankings based on manager’s judgment as opposed to a consensus-based scoring system
• Budget office must fill role of “referee” at times

It works very well, but we think it can work even better.
Capital project prioritization and selection
MBTA plans

We would like capital project evaluation, prioritization and selection to be part of a more comprehensive Transit Asset Management (TAM) system.
Capital project prioritization and selection
It’s at the center of Transit Asset Management.

“Asset management is, at its core, a process of resource allocation and utilization.”

Source: AASHTO – Transportation Asset Management Guide
Transit Asset Management (simplified)

The TAM data should directly support capital project prioritization and selection decisions. If not, what’s the purpose of doing all that work to capture and manage the data?
Capital project prioritization – within TAM framework

- Identify Well-Defined Set of Policy Goals and Objectives
  (based on customer needs and expectations)

- Establish Performance Measurements
  (policy objectives translated into system performance measures)

- Analysis of Options and Tradeoffs (with Limited Funds)
  How best to allocate funds between (for example):
  - Agency Objectives: 1. SGR/preservation, 2. Enhancements/ADA, 3. Expansion
  - Types of Investment: 1. Capital - replace/rehab, 2. O&M - preservation

- Resource Allocation Decisions (Investment Choices)
  (Project prioritization and selection - based on agency objectives)

- Implementation (Program Delivery)
  How best to implement investment choices (e.g., in-house, contracted work)

- System Monitoring and Performance Results
  (on a regular basis, to provide clear accountability and feedback
  and to refine objectives, resource allocations, etc. as needed)
TAM plans – the pieces of the puzzle

**Maintenance Management Systems**
- Asset Preservation and Preventative Maintenance Tool
  - **MMS Data Types:**
    - Asset inventory - micro level (component/subcomponent)
    - Service date and useful life
    - Replacement cost
    - Condition/performance rating (based on periodic reviews)
    - O&M cost data (tracked throughout life of asset)
    - Manufacturer warranty and PM service data
  - **MMS Functionality (O&M Focus):**
    - PM scheduling / work orders / inventory control
    - Warranty recovery
    - Condition and performance monitoring (e.g., MMBF)
    - Input for rehab v. replace investment/timing decisions

**Performance Measurements**
- Internal Monitoring and Reporting (Operations Focus)
  - Clearly define policy goals and objectives
  - Establish specific performance metrics
  - Monitor performance (as a result of investment decisions)
  - Reevaluate goals, metrics, prioritization criteria annually

**SGR Database**
- Financial Planning and Programming Tool
  - **SGR Data Types:**
    - Asset inventory - macro level (MMS "roll up")
    - Remaining useful life (i.e., ideal rehab/replacement date)
    - Replacement cost (fully loaded)
    - Condition/performance rating (e.g., TERM rating)
    - Life cycle costs (e.g., decay curves)
    - Basic prioritization criteria (for analysis purposes)
  - **SGR Functionality (Capital Focus):**
    - Calculate “SGR backlog” (definition configurable)
    - Calculate SGR backlog impact at various funding levels
    - Develop basic capital plans (“what if” scenarios)
    - Life cycle cost optimization analysis (future initiative)

**Project Prioritization/Selection System**
- Internal Procedure and/or Software Tool
  - Clearly define policy goals and objectives
  - Rank/weight importance of each goal/objective
  - Score projects based on agreed-upon rankings
  - Prioritize projects within financial constraints

**Capital Investment Program (CIP)**
- 5-Year Capital Plan, Updated Annually
  - Select projects based on prioritization system
  - Report progress/spending through project completion
  - Update MMS, SGR database to reflect investments

**Third State of Good Repair Roundtable**
TAM and project prioritization/selection

We know what it should look like.
We have most of the pieces.
But how do we make them fit together?

I guess that’s why we’re all here!
Any ideas?
Thank you.