Capital Project Prioritization and Selection – MBTA Process & Plans

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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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<td>Critical (6-10)</td>
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<td>Past useful life during CIP (6-10)</td>
<td>Moderate operational improvement (1-10)</td>
<td>Due after CIP (1-10)</td>
<td>Neutral (10)</td>
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<td>Past useful life after CIP (1-5)</td>
<td>No operational improvement</td>
<td>No legal commitment</td>
<td>Negative cost/benefit (0-9)</td>
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<td>Does not replace/renew asset</td>
<td>No operational improvement</td>
<td>No legal commitment</td>
<td>Negative cost/benefit (0-9)</td>
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- **Past useful life now (11-20)**
- **Operations critical (16-20)**
- **Major operational improvement (11-15)**
- **Due during CIP (11-15)**
- **Due after CIP (1-10)**
- **Neutral (10)**
- **Critical (6-10)**
- **Yes (1-5)**
- **No health impact**
- **No envir. Impact**

- **Positive cost/benefit (11-20)**
- **Neutral (10)**
- **Negative cost/benefit (0-9)**
- **Currently overdue (20)**
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

1. Capital project requests submitted
2. Establish project evaluation criteria
3. Score/rank capital project requests
4. Finance/Budget project available capital funding (federal, state, bond) over 5-year CIP period.
5. Determine how much funding is available
6. Select projects; prepare the capital plan
Capital project prioritization and selection
MBTA current process

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)

TAM Inputs
- Goals and Objectives
- Performance Measures
- Asset Inventory
- Condition Ratings
- Remaining Useful Lives
- Fully Loaded Replacement Costs
- SGR Backlog Calculation
- Capital Funding Scenarios
- Decay Curves

TAM Outputs

Better Decisions
(Especially Capital Project Prioritization and Selection)

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):
    - **Asset Classes:**
      1. Vehicles
      2. Power
      3. Facilities
    - **Agency Objectives:**
      1. SGR/preservation
      2. Enhancements/ADA
      3. Expansion
    - **Types of Investment:**
      1. Capital - replace/rehab
      2. O&M - preservation

  - (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

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

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)

Clear definition of policy goals and objectives
Establish specific performance measures
Monitor performance (as a result of investment decisions)
Reevaluate goals, metrics, prioritization criteria annually

Performance Measurements
- Internal Monitoring and Reporting (Operations Focus)

Project Prioritization/Selection System
- Internal Procedure and/or Software Tool

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

MBTA - Transit Asset Management Plan

Fleet
Facilities
Linear Assets
IT / Other

Asset Preservation and Preventative Maintenance Tool

MBTA - Transit Asset Management Plan

Financial Planning and Programming Tool

Broken Down by Asset Class (CIP Categories)
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.