

# Research Summary

## Data-Driven Approaches for Transit Capital Planning

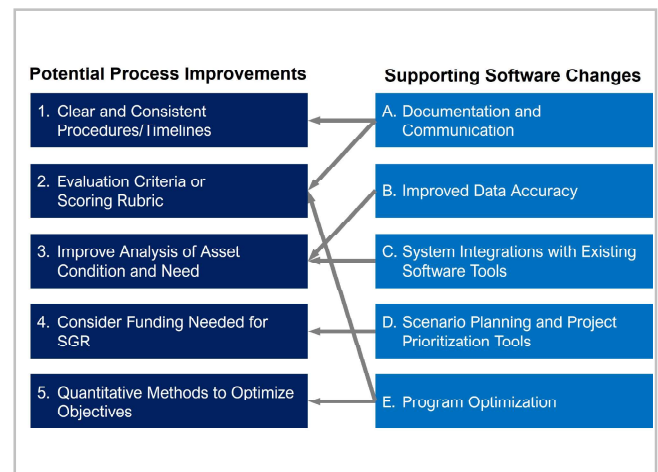
### Research Need

Capital investments are planned and prioritized across 15 Regional Transit Authorities (RTAs) in Massachusetts for the Capital Investment Plan (CIP). Existing processes for data collection, aggregation, and analysis are susceptible to discrepancies due to differences in data definitions and interpretations across users. Transparent and repeatable processes are needed to support planning decisions that are driven by data and consistent with needs and priorities.

### Goals/Objectives

The project has three objectives:

- 1) To identify and prioritize the data requirements, aggregation methods, and analysis techniques to forecast needs for transit capital investment decisions that align with the Commonwealth's priorities over a 5-year planning horizon.
- 2) To identify software tools and workflows that make data aggregation and analysis processes more transparent, consistent, and repeatable for prioritizing capital investments.
- 3) To create an implementation plan so that proposed processes are adopted consistently across RTAs and are repeatable over time.



### Methodology

The research approach begins with a review of the current processes for aggregation of transit capital data in Massachusetts and comparing this with the literature on practices in other states. Interviews with RTA staff provide additional insights about the existing challenges associated with the capital planning process.

Based on the best practices identified in the literature and analysis of the existing transit capital planning process in Massachusetts, potential changes to the aggregation and analysis processes are identified to increase the transparency, consistency, and repeatability of the process for planning and prioritizing transit capital investments.

The research team at UMass partnered with Cambridge Systematics to identify how existing software tools can be used or potentially modified to improve data aggregation and analysis for transit capital assets.

## Key Findings

The research findings identify a variety of process changes that would make the transit capital planning process more data driven. These are broadly summarized by 5 types of potential process changes:

- 1) Clear and consistent procedures and timelines;
- 2) Establish evaluation criteria or project scoring rubric;
- 3) Improve analysis of asset condition and anticipated needs over time;
- 4) Consider total investment need for state of good repair; and
- 5) Use quantitative methods to optimize objectives–this may be formulated to achieve multiple objectives, including selecting projects to maximize benefits, maximize the rank-order of requests, or ensuring equitable distribution of funds.

These process improvements would be supported by 5 types of changes to the asset management software:

- A) Documentation and communication;
- B) Improved data accuracy;
- C) System integrations with existing software tools;
- D) Scenario planning and project prioritization tools;
- E) Program optimization

The report includes an assessment of the relative implementation effort for each of the software changes based on the amount of data that would need to be collected and the complexity of modifying existing software tools.

General insights from the research are that data and software tools support good capital planning and funding processes, but they are not solutions in and of themselves. Collecting and processing data comes at a cost, so it is best to focus on the data that affects decisions. Ultimately, more transparent and consistent processes help everyone involved understand why decisions are made and what to expect.

## Project Information

This project was completed as part of the Massachusetts Department of Transportation (MassDOT) Research Program with funding from Federal Highway Administration (FHWA) State Planning and Research (SPR) funds.

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### Key Words:

transit capital planning; asset management

## Use of Findings

This study identifies a range of process changes that would make transit capital planning more data-driven. It is not envisioned that all of these changes should be made or that they should be adopted quickly. Instead, the research findings provide information for decision makers and RTA staff about how the capital planning program could be changed. In the interest of transparency and communication, an outreach presentation has been created to help disseminate the research findings to stakeholders with the intent to communicate not only the potential benefits of changes to the capital planning process but also the costs or drawbacks to consider.

