Massachusetts Planning Incorporates Multimodal Performance Trade-Offs

Reimagining Capital Planning

Following its establishment in 2009, the Massachusetts Department of Transportation (MassDOT) began an extensive public outreach campaign to understand customer expectations and needs. This two-year public engagement strategy, combined with thorough internal outreach, allowed MassDOT to develop informed long-term priorities for its first comprehensive, multi-modal, long-range transportation plan. In May 2014, MassDOT published *weMove Massachusetts: Planning for Performance*, which included a new analytical tool to allow the agency to prioritize investments and forecast their results across modes.

Economic Efficiency and Trade-Offs

The passage of MAP-21 in 2012 loosened strict restrictions around Federal funding allocations by transportation asset type. Shortly thereafter, the Massachusetts Legislature passed a transportation funding bill in July 2013 that provided approximately $900 million in additional funding starting in FY14 and continuing beyond. With this new funding came a requirement that MassDOT develop a comprehensive investment strategy to demonstrate exactly how the new funds would be spent and how they would improve the performance of the transportation system.

In response, MassDOT, with the help of a technical consultant, developed an

analytical tool to evaluate the impact of different levels of spending with the goal of maximizing overall system performance over time. By looking at the transportation system in a holistic manner, MassDOT could better prioritize Federal and State funding for improved performance outcomes. The tool allows MassDOT to consider the marginal benefits of allocating funds to one asset category versus another and weigh the trade-offs of each investment decision.

The MassDOT tool is based on the FHWA Highway Economic Requirements System - State Version (HERS-ST) model and the FTA Transit Economic Requirements Model (TERM), and is supplemented with other State-collected asset and condition data. For this reason, the tool could be replicated by other States with relative ease. States can tailor the tool to their funding levels, asset categories, and policy priorities.

Using multi-modal data, the MassDOT tool calculates performance of each asset class under four different funding scenarios: 1) Historical 2023; 2) Historical 2040; 3) Current 2023; 4) Current 2040. The tool then produces outputs that reveal the performance trade-offs that will ultimately need to be considered when allocating funds to achieve state – and eventually national – goals and performance targets.

U.S. Department of Transportation
Federal Highway Administration

Funding Scenarios and Performance Outcomes (2040)

	2012		Historical Funding		Current Funding	
	Division Funding (Annual $ in Millions)	Today's Performance	Scenario Funding (Annual $ in Millions)	2040 Performance	Scenario Funding Annual $ (millions)	2040 Performance
Highway Division						
Pavement (% state of good repair)[a]	$137	88%	$267	30%	$544	60%
Bridges (average health index)[b]	$620	89%	$353	61%	$447	69%
Mobility (delay hours/1000 VMT)[c]	$147	4.8	$65	8.9	$386	6.9
Safety (intersections or segments improved)	$49	TBD[d]	$26	1,426	$65	3,524
Bicycle Facilities (% of Bay State Greenway completed)	$25	31%	$26	100%	$26	100%
Highway Subtotal	*$977*		*$738*		*$1,468*	

Figure 1 MassDOT WMM Funding Scenarios and Performance Outcomes Source: **WMM: Planning for Performance**

These results represent the first phase of integrating data-driven funding into multimodal investment decisions at MassDOT.

The first of the tested scenarios uses a past funding level of $1.2 billion and allocation priorities that remain constant into the future. Alternatively, the current funding scenario shows how increased funding levels, totaling to almost $2.5 billion, are divided among assets based on the agency's new policy priorities and goals. In comparing the performance outcomes of these different funding levels, it is clear that under the historical funding scenario the performance of all assets will deteriorate more than under the current funding scenario. In particular, bus and train performance will be improved under the current funding scenario.

Project Prioritization and Selection

Following the release of the final *Planning for Performance* document, MassDOT developed the *FY2014-FY2018 Transportation Capital Investment Plan* (CIP) released in the spring of 2014. The plan details the way in which each dollar is allocated among transportation projects for the next five fiscal years based on the funding Massachusetts expects to receive. Although not fully applied to this plan as the *Planning for Performance* was still under development, the *Planning for Performance* tool helped to inform certain decisions made in the plan.

In response to another legislative requirement, MassDOT has also created a multi-modal focused Project Selection Advisory Council that will develop a formula and process for the selection and programming of projects. The Council is considering using the *Planning for Performance* tool to help inform whether an appropriate asset

balance is being achieved through the project selection process.

MassDOT is in the process of fully integrating the tool into its processes and is working towards the development of a single, multi-modal Capital Investment Plan (CIP). MassDOT is continuing to update the tool to better connect it with MassDOT policy priorities as well as the most robust available data.

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November 2014

U.S. Department of Transportation
Federal Highway Administration