



# Capital Project Prioritization and Selection – MBTA Process & Plans

Eric Waaramaa Massachusetts Bay Transportation Authority July 22, 2011



# Capital project prioritization and selection It's all about balance.

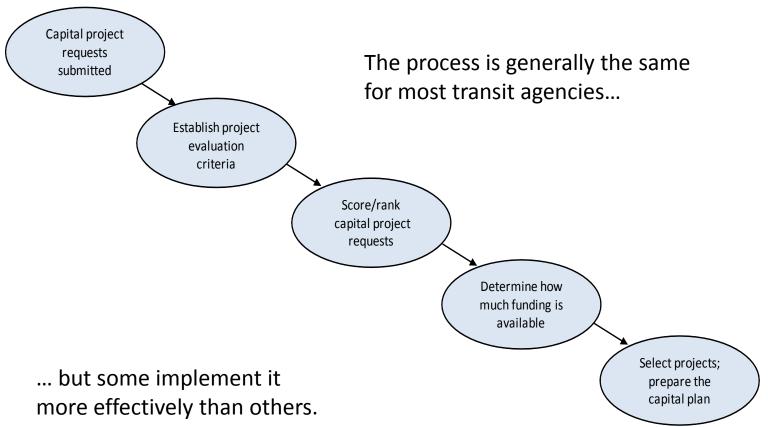


"The underlying goal of asset management is to take a broad approach to resource allocation and programming decisions that will provide greater value to the system and overall satisfaction for end users through improvements in program effectiveness and system performance."

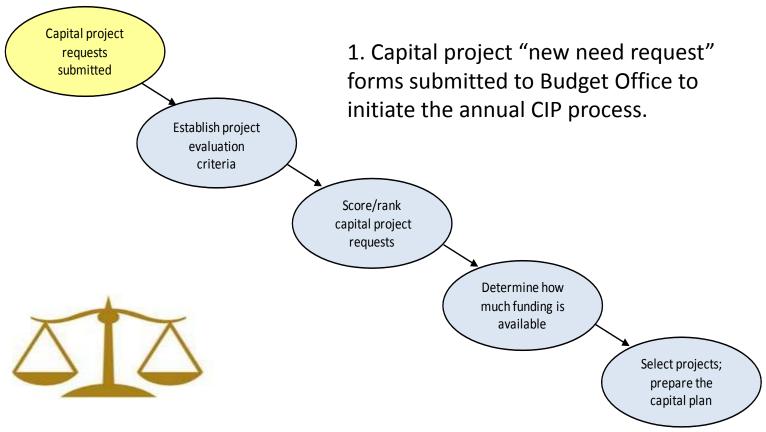
Source: USDOT - "Asset Management Overview"



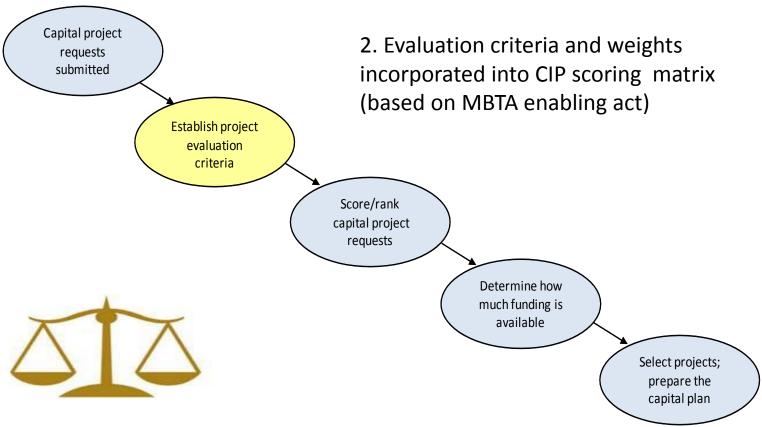
Capital project prioritization and selection We all do it (some better than others).









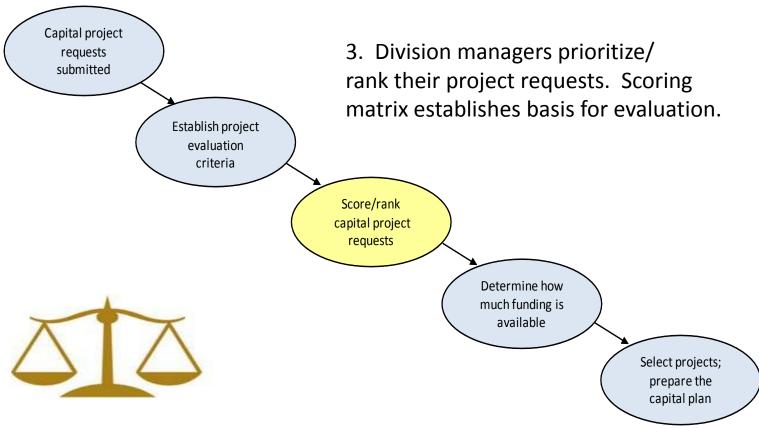




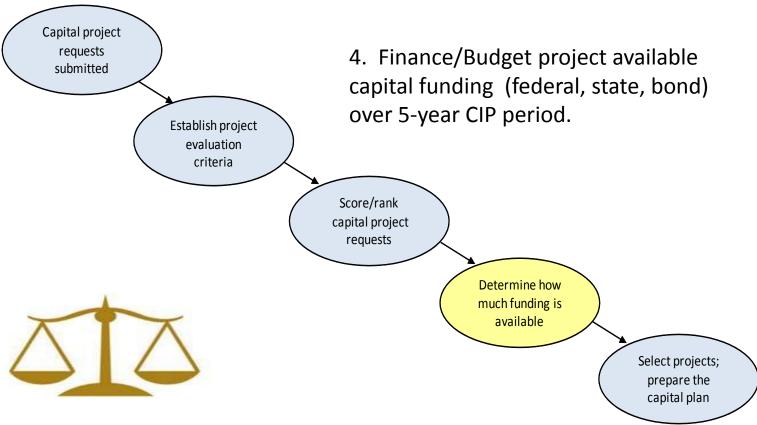
# Capital project prioritization and selection MBTA evaluation criteria and scoring matrix

	Health Impact					Cost/Benefit
	(Customers or	Environmental	State of Good	Operational	Legal	(e.g., passengers,
	Employees)	Impact	Repair	Impact	Commitment	budget impact)
	10	10	20	20	20	20
20					Currently overdue (20)	
19				Operations		
18				critical (16-20)		
17			Past useful life			Positive
16			now (11-20)		cost/benefit	
15			- ( - /			(11-20)
14	-			Major operational	Due during CIP	
13	-			improvement	(11-15)	
12	-			(11-15)	( )	
11						
10	-					Neutral (10)
9		$C_{1}$	Past useful life			
8	Critical (6-10)	Critical (6-10)	during CIP (6-10)	Moderate		
7	-			operational	Due after CIP	
5				improvement	(1-10)	Negativo
4	4			(1-10)	(1 10)	Negative cost/benefit
3	Yes (1-5)	Yes (1-5)	Past useful life	(1 10)		(0-9)
2		103 (1 3)	after CIP (1-5)			(0-9)
1						
-			Does not replace/	No operational	No legal	
0	No health impact	No envir. Impact	renew asset	improvement	commitment	

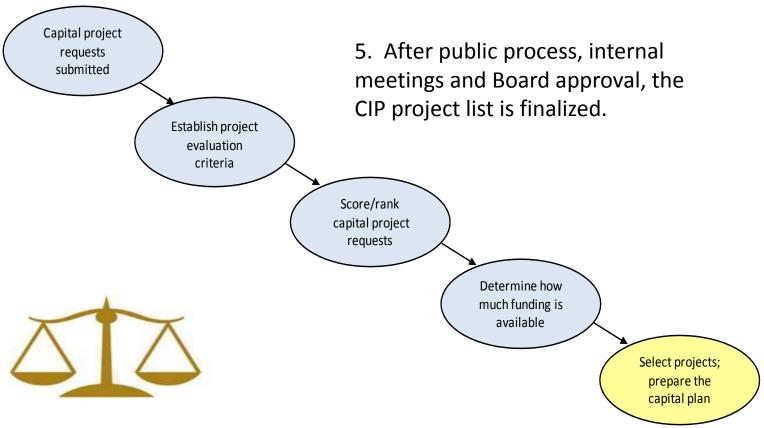














#### Current system works very effectively, but...

- 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.



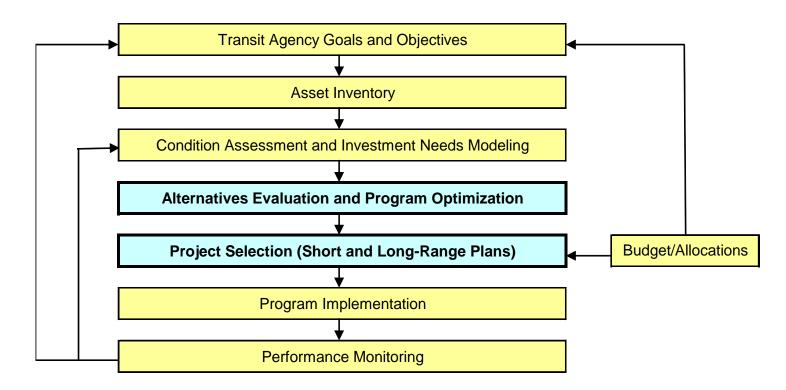
# Capital project prioritization and selection MBTA plans

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.



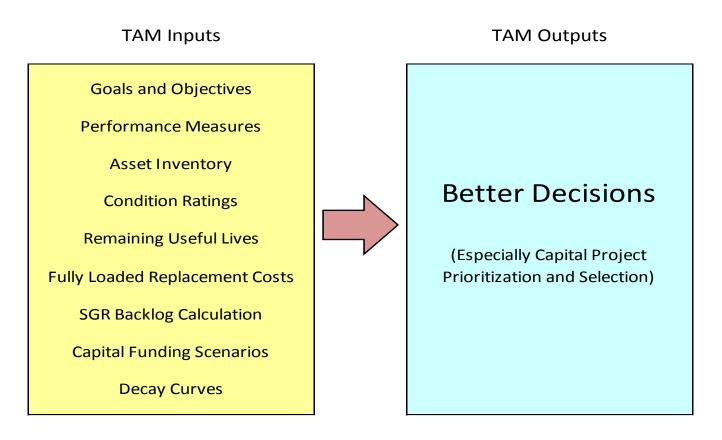
"Asset management is, at its core, a process of resource allocation and utilization."

Source: AASHTO – Transportation Asset Management Guide



# Third State of Good Repair Roundtable

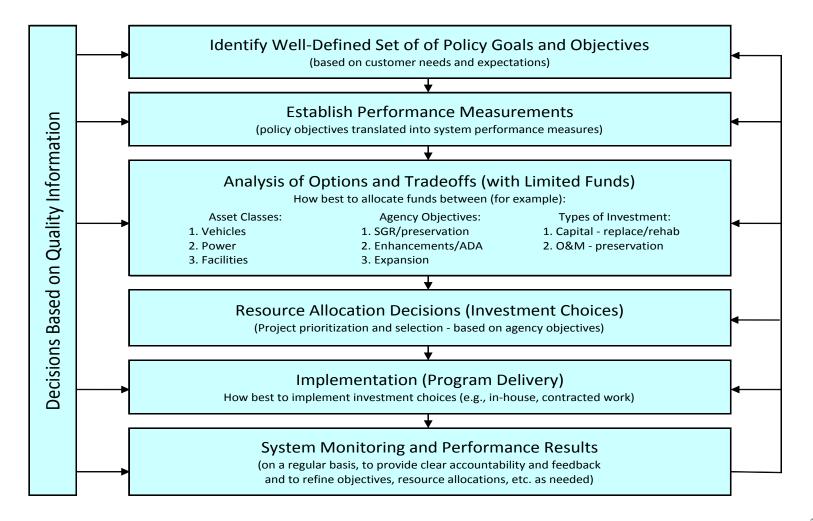
#### Transit Asset Management (simplified)



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





# Third State of Good Repair Roundtable

#### TAM plans – the pieces of the puzzle

Maintenance Management SystemsAsset Preservation and Preventative Maintenance ToolFleetFacilitiesLinear AssetsIT / O	SGR Database Financial Planning and Programming Tool Broken Down by Asset Class (CIP Categories)			
MMS Data Types:	SGR 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	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)	•	MBTA - 1	
MMS Functionality (O&M Focus):	SGR Functionality (Capital Focus):		<b>I</b> ra	
PM scheduling / work orders / inventory control Warranty recovery Condition and performance monitoring (e.g., MMBF) Input for rehab v. replace investment/timing decisions	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)		ransit Asset	
\$	<b>↑</b>			
Performance Measurements Internal Monitoring and Reporting (Operations Focus)	Project Prioritization/Selection System Internal Procedure and/or Software Tool			
Clearly define policy goals and objectives Establish specific performance metrics Monitor performance (as a result of investment decisions) Reevaluate goals, metrics, prioritization criteria annually	<ul> <li>Clearly define policy goals and objectives</li> <li>Rank/weight importance of each goal/objective</li> <li>Score projects based on agreed-upon rankings</li> <li>Prioritize projects within financial constraints</li> </ul>	•	Management Pla	
	↓		n	
	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	•		



#### 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?



# Third State of Good Repair Roundtable

### Thank you.

