MBTA Review

Topic: Capital Project Delivery

State of Good Repair (SGR)

What SGR is…

- For the MBTA, the SGR standard is where all capital assets are functioning at their ideal capacity within their useful life

- A national leader as FTA continues to develop common standards required under MAP-21

What SGR is not….

- Completed…it is a work in progress:
    - Since 2012 we have improved the system by adding more assets, improving decay calculations and moving to a web based platform
    - By June we will have a system that measures the impact of funding scenarios on recorded assets

- Static…as assets age and investments are made, the backlog will change

- Unsafe…assets are only no longer within their useful life and replacement and renewal must be planned

- Our only measure or planning tool…part of broader Asset Management Plan

Backlog Estimates

Asset Category	# of Assets	Replacement Value	SGR Score	SGR Backlog Amount	% of Total Backlog
Revenue Vehicles	20,262	$6,807,342,488	2.83	$2,634,418,286	39.4%
Bridges	1,335	$5,148,275,301	3.39	$799,663,040	11.9%
Signals	401	$2,900,740,296	2.57	$1,369,027,122	20.5%
Stations	50,054	$2,699,874,652	3.86	$255,984,809	3.8%
Facilities	2,855	$1,527,289,845	3.19	$477,930,928	7.1%
Track/ROW	129	$823,254,368	2.69	$304,603,884	4.6%
Power	3,047	$793,073,100	2.18	$462,319,775	6.9%
Parking	47,215	$228,188,855	2.12	$172,050,515	2.6%
Communications	15,334	$172,916,740	4.25	$3,195,090	0.0%
Technology	1,092	$138,231,180	1.39	$131,592,980	2.0%
Tunnels	67	$132,750,000	3.10	$24,000,000	0.4%
Non-Revenue Vehicles	1,089	$77,414,330	2.70	$33,724,000	0.5%
Fare Collection	2,982	$64,152,548	3.79	$425,000	0.0%
Elevators and Escalators	338	$49,370,000	2.94	$22,950,000	0.3%
	146,200	$21,562,873,703	3.05	$6,691,885,429	100%

The SGR score is the average rating of all recorded assets within their respective category. A score of less than or equal to 2.5 notes an asset that is not in a state of good repair. The backlog is the current estimated cost to bring all recorded assets into a state of good repair.

Project Selection Process

Overview

- New system implemented used in past two CIP cycles

- Applies to MBTA funded projects

- Departments submit projects which are then scored by subject matter experts according to criteria

- Budget Office then optimizes the scored list to fit within financial constraints

- The final list is published in the draft CIP for review and comment

Criteria and Weights

- Environmental Impact
  - 10% weight

- System Preservation
  - 35% weight

- Financial Considerations
  - 15% weight

- Operations Impact
  - 40% weight

Construction Project Timeline

Concept Planning	Design Procurement	Design	Construction Procurement	Construction
(Variable Timeframe)	**(11 - 12 Month Process)**	**(Variable Timeframe)**	**(7 - 9 Month Process)**	**(Variable Timeframe)**

- Planning
    - Conceptual Estimate and Schedule
- Preliminary Design & Design Reviews (15% & 30%)
    - Preliminary Estimate
    - Preliminary Schedule
- Permitting
- Real Estate/ROW
- Community Involvement
- Final Design & Design Reviews (60%, 90%, 100%)
    - Develop Estimates
    - Develop Construction Time Determination Schedule
    - Constructability Reviews
    - Value Engineering Reviews
    - Risk Analysis

- Bid Phase
- Construction Permitting
- Operational impact finalization
- Requests for Information
- Change Orders
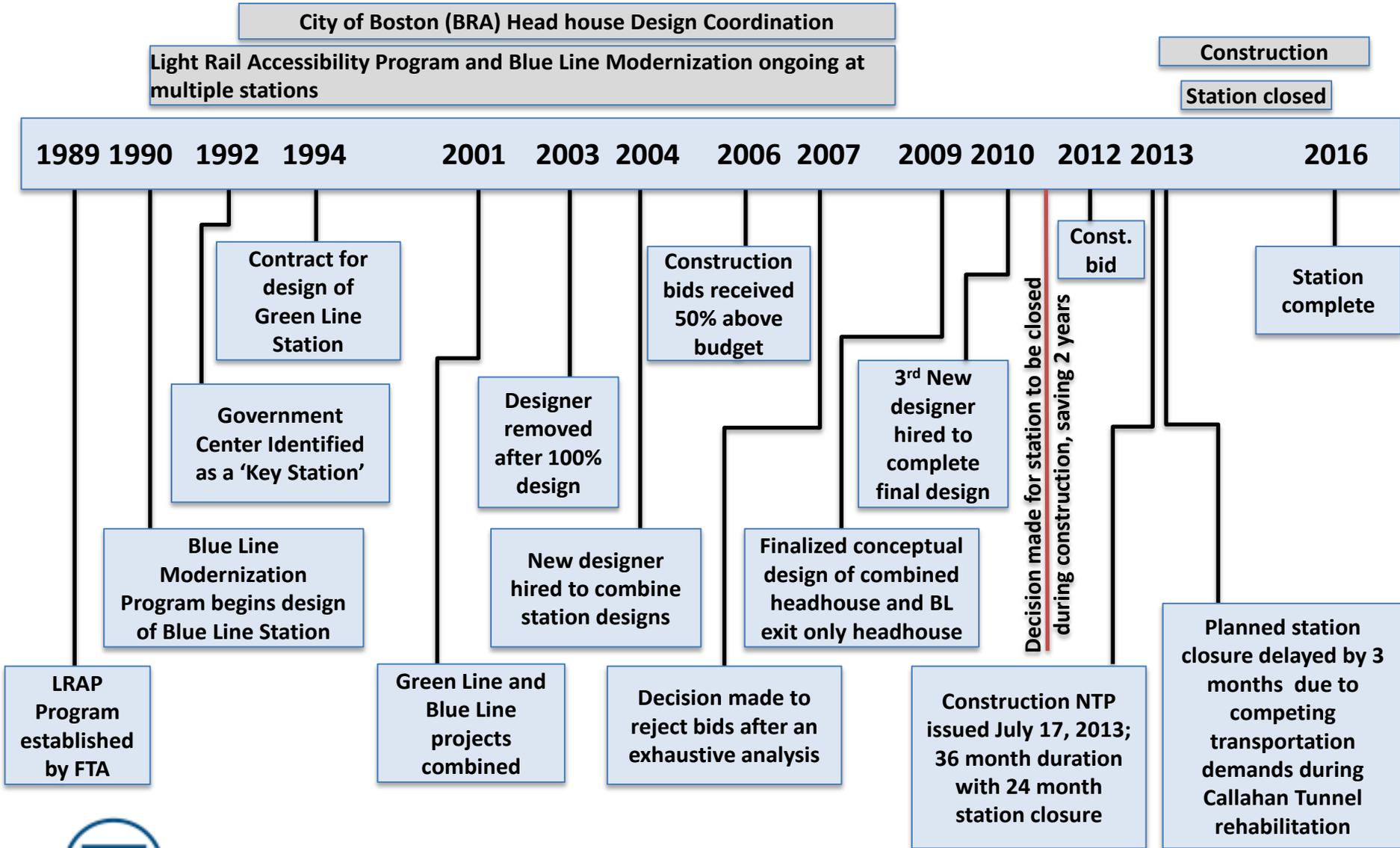- Beneficial Occupancy
- Substantial Completion
- Final Closeout

- Payments made against cost and resource loaded construction schedule and documented earned value

Case study: Government Center

massDOT
Massachusetts Department of Transportation
Rail & Transit Division

City of Boston (BRA) Head house Design Coordination

Light Rail Accessibility Program and Blue Line Modernization ongoing at multiple stations

Construction

Station closed

| 1989 1990 | 1992 | 1994 | 2001 | 2003 | 2004 | 2006 | 2007 | 2009 2010 | 2012 2013 | 2016 |

Contract for design of Green Line Station

Construction bids received 50% above budget

Const. bid

Station complete

Government Center Identified as a 'Key Station'

Designer removed after 100% design

3rd New designer hired to complete final design

Decision made for station to be closed during construction, saving 2 years

Blue Line Modernization Program begins design of Blue Line Station

New designer hired to combine station designs

Finalized conceptual design of combined headhouse and BL exit only headhouse

Planned station closure delayed by 3 months due to competing transportation demands during Callahan Tunnel rehabilitation

LRAP Program established by FTA

Green Line and Blue Line projects combined

Decision made to reject bids after an exhaustive analysis

Construction NTP issued July 17, 2013; 36 month duration with 24 month station closure

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Case Study: Red and Orange Line Vehicle Procurement:

| 1994 | 2004 | 2008 | 2009 | 2012 | 2013 | 2014 | 2018 | 2019 | 2022 |

Industry review of specification #2

Red / Orange RFP issued

First specification draft

Board approval of builder

Final vehicle

74 Red #1 vehicles due retirement

120 Orange Line vehicles due retirement

Industry review of specification #1

First test vehicle

First production vehicle

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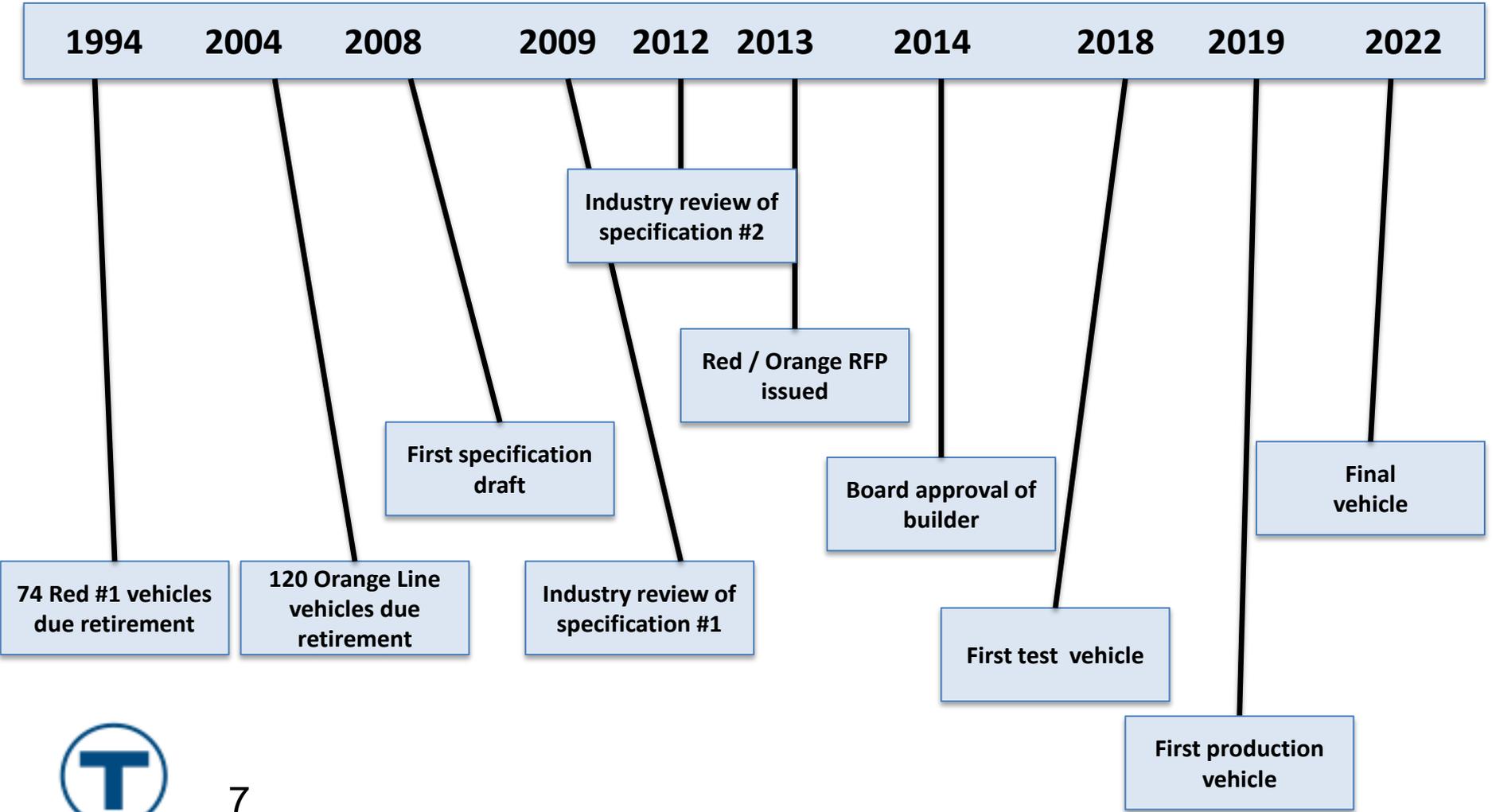
Takeaws

- Asset replacement and overhaul schedules are frequently modified due to funding and re-prioritization issues (unfunded mandates)

- State of good repair vs. expansion is not always a direct choice as funds are not all re-allocable

- Project timelines and budgets are often affected by continued, sometimes conflicted, input from internal and external stakeholders

- Procurement laws and processes must be updated

Project Delivery: Factors

Procurement requirements

Buses and operators for construction diversions

DOT priorities

State Implementation Plan Commitments

Flagging personnel availability

Late night service limits work time on track and vehicles

Public input

Project Delivery

Maintaining daily service around or through project

Public Safety Building Code Requirements

Release of available funding

Non-Revenue Hours (1am to 4am) and Weekend only work

Procurement of technical support services

Abutters

ADA /MAAB requirements

Approved Capital Investment Plan

State Leadership Initiatives