



TRANSIT ASSET MANAGEMENT

CONNECTING PERFORMANCE MEASURES,
TARGETS AND BUSINESS STRATEGIES

2017 TAM Roundtable August 28, 2017

CONNECTING PERFORMANCE MEASURES, TARGETS AND BUSINESS STRATEGIES

Moderator

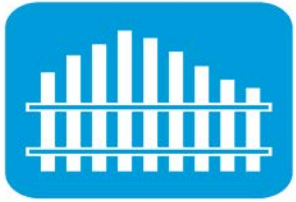
Mshadoni Smith *Federal Transit Administration (FTA)*

Panel

Kristyl Horton *Bay Area Rapid Transit (BART)*

Shruti Hari *Metropolitan Transportation Council (MTC)*

David Springstead *Metropolitan Atlanta Rapid Transportation Authority (MARTA)*



asset
management

FTA ROUNDTABLE UPDATE

PEOPLE



PROCESS



TECHNOLOGY



Our Agency

- Tier 1 Rail Agency Serving the Greater Bay Area
- Carry 400K passengers per day
- Primarily electric rail but as we expand we now have a “cable car” system and soon diesel trains
- Diverse asset base
 - Underwater tube



Agency Projects:

Expansion:

- 2014 - Oakland Airport Connector
- 2017 – Warm Springs / South Fremont
- 2018 – eBART to extend the yellow line
- 2018 – SVBX with VTA to extend to the South Bay



Agency Projects:

Other Asset Centric Initiatives:

- New Train Cars
 - Train Control Modernization
 - New Maintenance Facility
- Earthquake Safety
- Station Modernization
- Transit Oriented Development



BART Asset Management

- 2013 Started our Asset Management Journey
 - Board Approved Policy
- 2014 – 2015 Asset Registers, Risk Registers, etc.
- 2016 Formalized the AM Program
- Key Deliverable = Annual State of the Assets Report
 - Demonstrated our need for a Bond
- Function as a Governance Group

- ✓ Strategy & Policy
- ✓ Decision Making
- ✓ Lifecycle Delivery
- ✓ Asset Information
- ✓ Risk & Review
- ✓ Organization & People

How does our ISO55000/IAM journey differ from traditional Asset Management approach?



Ask the question:

Are you willing & able to prioritize investments based on risk to your organizational objectives?

Management of Assets Advancements:

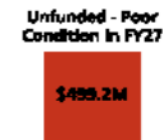
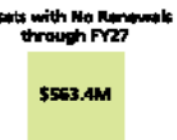
- State of the Asset Report (SOAR) = 10 Year Optimization Model
 - Plugs the color of (planned) money into assets
 - Basis for our holistic TAM Plan
 - Byproduct = Automated Unfunded Risk Register

Asset Family: SYSTEMS

Data Completeness (2017)



BART Optimized Investment Scenario, FY17 to FY27



Total Investment FY17 to FY27: \$1.3B

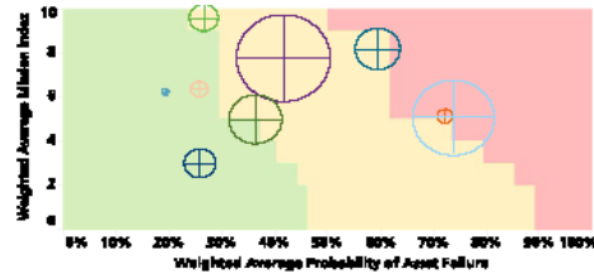
Asset Condition Profile FY17



Asset Condition Profile FY27



Mission / Probability of Failure FY17



Mission / Probability of Failure FY27



The Mission Index reflects the importance of an asset to BART's mission of providing "safe, reliable, clean, quality transit for riders". Values are shown weighted by CXC.

Business Units within Asset Family



Management of Assets Advancements

- Neutral Feedback Tool to Quantify Data Confidence
 - Provides transparency into SOAR settings

AIM Data Completeness Roadmap for COMM



Present
96%



Completeness by Asset Management Strategy Category (AMSC)

	# Assets in AMSC	Total Asset Value	# Data Points Analyzed	% Assets in AMSC	Completeness %
Unknown FAILURECODE Missing	4	\$0M	164	0.03%	89%
AMSC 1 1 - Run to Failure	15,252	\$105M	625,132	97.59%	97%
AMSC 2 2 - Scheduled Maintenance	89	\$564M	3,649	0.57%	99%
AMSC 3 3 - Predictive Maintenance	284	\$3M	11,644	1.82%	67%
Grand Total	15,629	\$472M	640,789	100.00%	96%

Note: Asset Records missing FAILURECODE values evaluated as AMSC 1 assets for analysis.

Color Legend

Present, Required	
Absent, Required	
Not Required, Present	
Not Required, Absent	

Detailed Report by Asset Type (Failurecode) and Data Fields

AMSC	Asset Class/ FAILURECODE	Mission Index	Grand Total	1 - Core Data														2 - AMSC 2+ Required			3 - AMSC 3+ Required			
				Maximo ID/ AssetNum	Asset Class (Failure Code)	BART Dept. Code	Asset Description	Asset Install Date	Cost - Current Replacement Cost	Cost - Cost to Renew Asset	Location Code	Expected Useful Life	Source of Useful Life Value	TERM Life AssetType Code	Current Status of Asset	CFC - Condition & Source Fields	General Ledger Account #	Criticality	Conditional - Vehicle Data	Conditional - Linear Data	CFC - Function Score & Source Additional Cost Fields	Vehicle Model Year	Vehicle Repair Limit	CFC - Capacity Score & Source
Unknown	Missing FAILURECODE	1		[Data points]														[Data points]			[Data points]			
AMSC 1	CCTV	4		[Data points]														[Data points]			[Data points]			
	COMM	18		[Data points]														[Data points]			[Data points]			
	COMM NET	1		[Data points]														[Data points]			[Data points]			
	CONTROL	1		[Data points]														[Data points]			[Data points]			
	PHONE	1		[Data points]														[Data points]			[Data points]			
	PUBLIC ADDR	4		[Data points]														[Data points]			[Data points]			
	RADIO (WRLS)	1		[Data points]														[Data points]			[Data points]			
	SCADA	1		[Data points]														[Data points]			[Data points]			
	SECURITY SYS	18		[Data points]														[Data points]			[Data points]			
	TRANSCEIVER	1		[Data points]														[Data points]			[Data points]			
AMSC 2	CABLE PLANT	1		[Data points]														[Data points]			[Data points]			
AMSC 3	COMM SYS	1		[Data points]														[Data points]			[Data points]			
	POWER SYS	1		[Data points]														[Data points]			[Data points]			
	RAIL TRIP	18		[Data points]														[Data points]			[Data points]			

Management of Assets Advancements:

- Calculated Criticality for Departments
 - Mission Index X CRC X Location

BART State of the Assets Report - Asset Family Detail

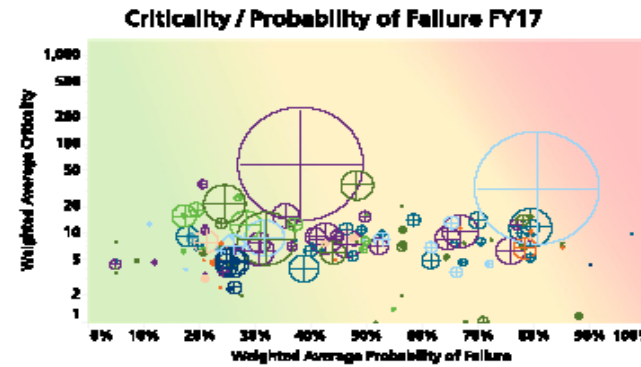


Asset Family: SYSTEMS

Assets are grouped by asset type and colored by business unit. For additional information, please see the state of the assets report for that business unit. Criticality numbers location, cost, and mission index.

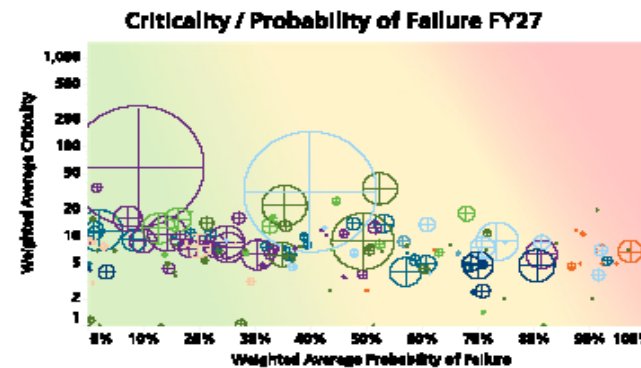
Top 20 Most Critical Assets in Asset Family (All Business Units)

THIRD RAIL Total Value: \$339.4M Criticality: 61	BLST DAMPER Total Value: \$2.4M Criticality: 16	TRAIN WASH Total Value: \$48.0M Criticality: 21	
CABLE PLANT Total Value: \$86.6M Criticality: 32	DAMPER Total Value: \$2.3M Criticality: 25	CAR LIFT Total Value: \$66.6M Criticality: 22	FRESH WASH Total Value: \$6K Criticality: 28
HYDRANT Total Value: \$6K Criticality: 16		FIRE ALARM Total Value: \$66.5M Criticality: 16	STANDPIPE Total Value: \$22.7M Criticality: 16
DELUGE SYS Total Value: \$1.1M Criticality: 16	FAN Total Value: \$11.3M Criticality: 16	TURN CAR Total Value: \$4.8M	PHONE Total Value: \$6.8M
VALVE Total Value: \$6K Criticality: 16	TC RM, BAT Total Value: \$6.4M Criticality: 14		
WHEEL PRESS Total Value: \$36K Criticality: 16	TC RM, UPS Total Value: \$0.8M	WHL TRUSS Total Value: \$6.1M	

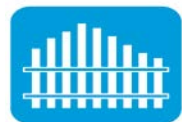


Total CRC (Circle Size)

4,500
200,000,000
400,000,000
599,396,663



Thank you!



asset
management



MTC's Role in Regional TAM Coordination - SF Bay Area

2017 FTA TAM Roundtable, Cambridge MA

August 28, 2017

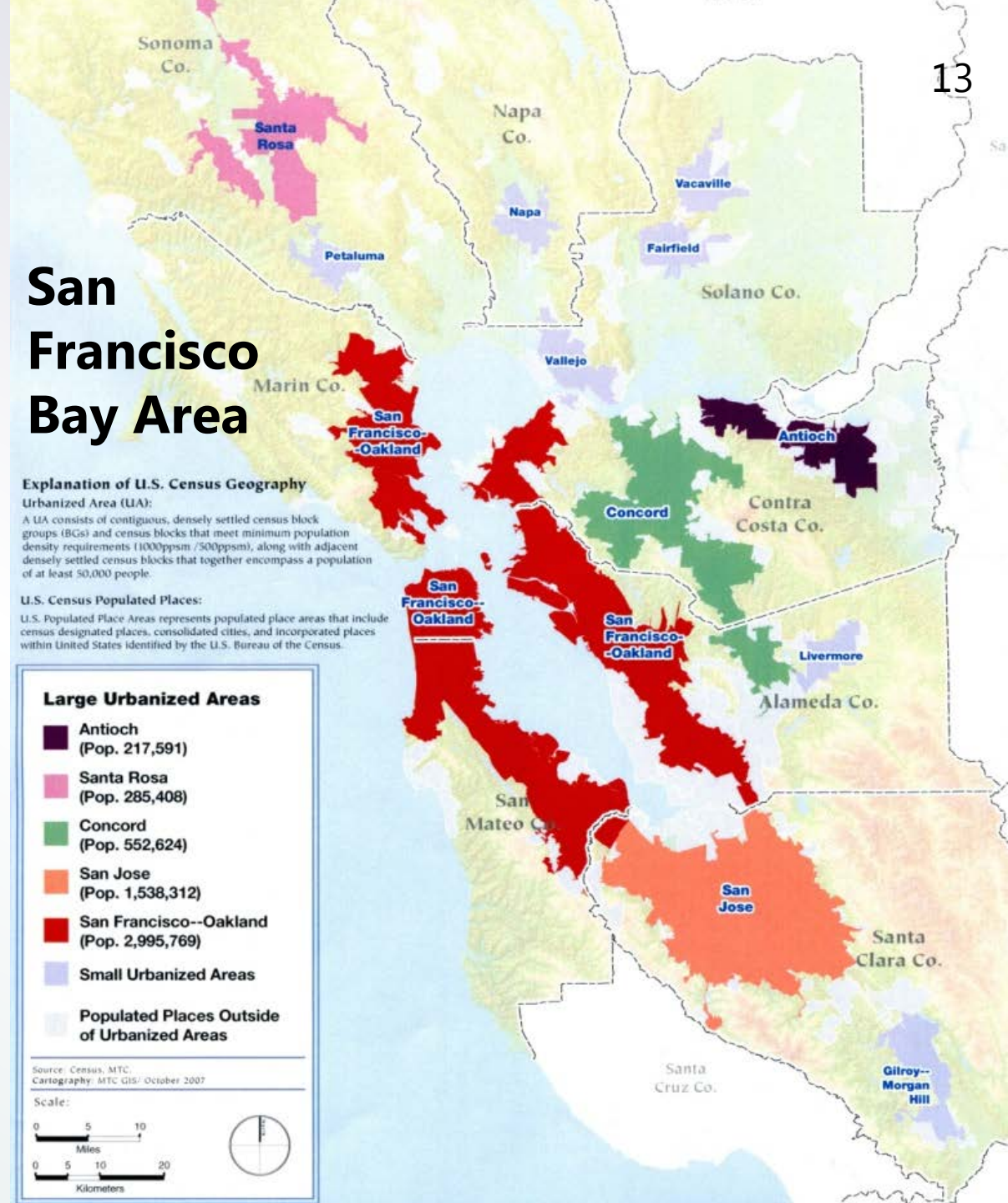
Shruti Hari

Metropolitan Transportation Commission



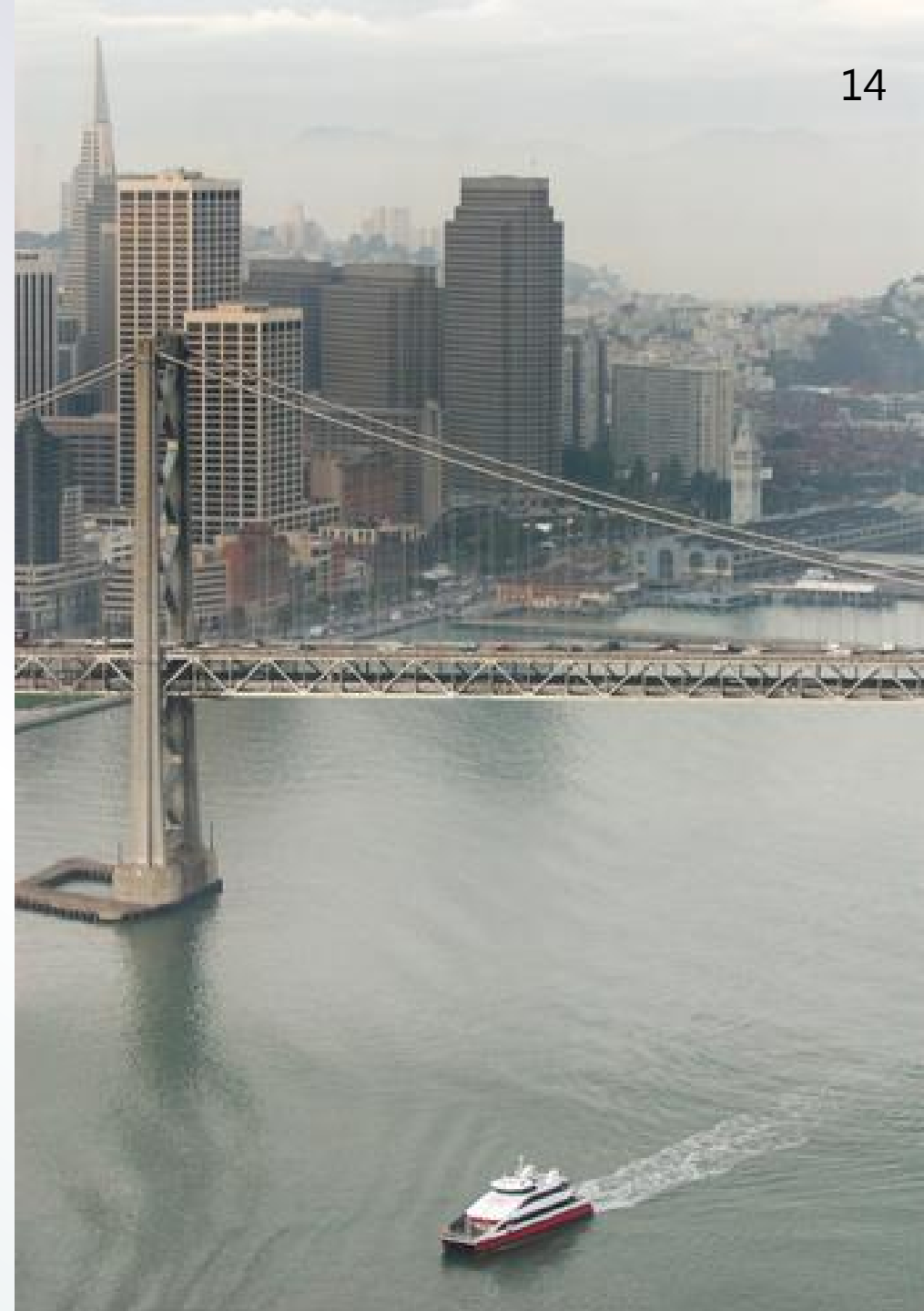
Metropolitan Transportation Commission (MTC)

- Metropolitan Planning Organization (MPO) for San Francisco Bay Area
 - 9 counties, 12 urbanized areas, 101 cities & towns
 - 7,000 square miles
 - Population 7.4 million
 - Served by 27 independent transit operators
- Develops long-range Regional Transportation Plan
 - Projected needs & funding for transit capital replacement & rehabilitation



Designated Recipient – Federal funds

- ▶ **Federal formula funds:**
 - FTA 5307, 5337, 5339
 - FHWA Surface Transp. Program
- ▶ **MTC programs formula funds to 22 transit operators, including:**
 - San Francisco MTA
 - SamTrans
 - Caltrain
 - Golden Gate Transit
 - BART
 - Santa Clara VTA
 - AC Transit



Roles and Responsibilities

Transit Operators

- Own, Operate, Maintain Assets
- Transit Asset Management Plans
- Performance Targets/Monitoring

MTC: MPO

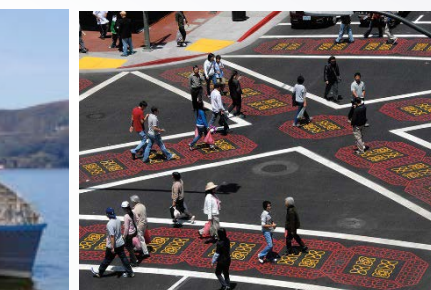
- Prioritizes Regional Projects
- Manages Discretionary Funds
- Performance Targets/ Monitoring

Regional Collaboration

- Funding Policies
- Data Sharing
- Regional Standards/ Best Practices

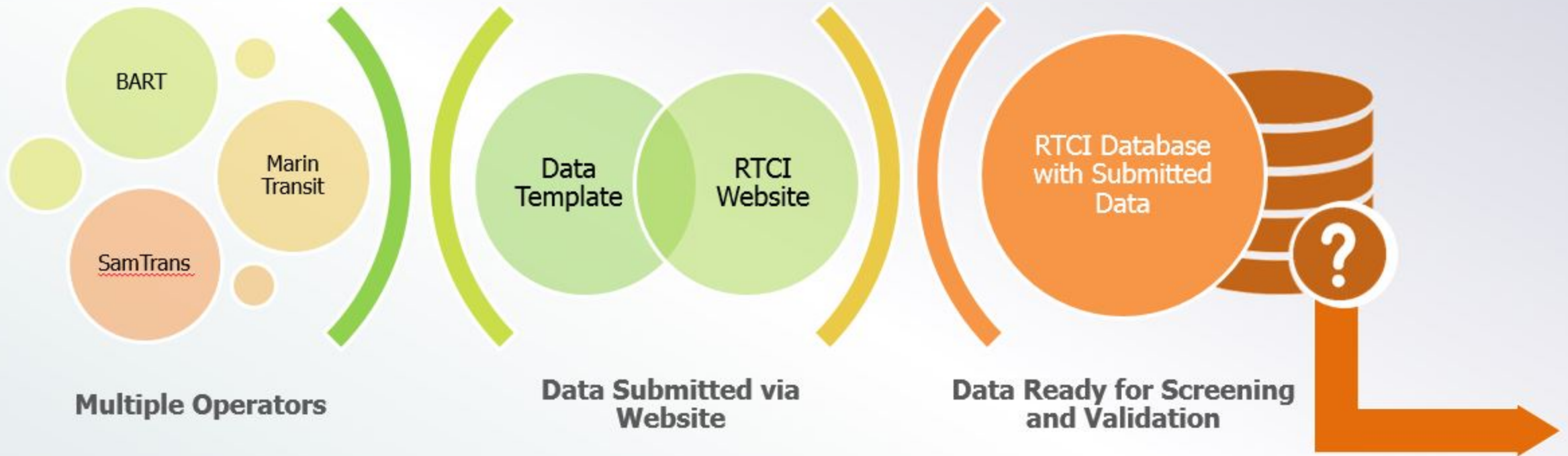
Transit Asset Management at MTC

- Previous TAM activities focused on needs and funding policies
- In 2012, MTC consolidated asset management activities under one group including:
 - Transit
 - Local Streets and Roads
 - Local Bridges
 - Other
- MTC Asset Management Group consists of four FTEs
- @\$500,000 / year in consultant assistance
- TAM Working Group
- MTC sponsoring Regional TAM Group Plan for 16 Tier II operators



Regional Transit Capital Asset Inventory (RTCI)

RTCI Update Process



- Database of existing Transit Capital Assets and their attributes
- Contains asset type, quantity, year in service, and cost
 - Vehicles, Guideways, Facilities, Stations, Systems
- Covers 25 different agencies in 9-county Bay Area Region

TAM Plan Compliance

- RTCI provides basis for compliance with FTA TAM Rule
- Facilitates:
 - Consistent target setting,
 - Condition assessments,
 - Performance tracking, and
 - Group plan development
 - NTD reporting

ABC Transit Agency						
CompanyName	AssetDesc	YRInService	ULB	Quantity	Meet or Exceed ULB	Targets
Revenue Vehicles						
ABC Transit Agency	Articulated Bus (60 ft)	1/1/2000		14	55	55
					Calculated % of Assets that meet or exceed the ULB:	
Articulated Bus (AB)					Targets (AB)	
ABC Transit Agency	Bus (40 ft)	9/30/1998		14	6	6
ABC Transit Agency	Bus (40 ft)	1/1/2003		14	4 No	
ABC Transit Agency	Bus (40 ft)	1/1/2003		14	60 No	
ABC Transit Agency	Bus (40 ft)	12/1/2013		14	25 No	
ABC Transit Agency	Bus (40 ft)	10/1/2014		14	21 No	
ABC Transit Agency	Bus (40 ft)	1/1/2009		14	91 No	
ABC Transit Agency	Bus (40 ft)	1/1/1977		14	2	2
ABC Transit Agency	Bus (40 ft)	1/1/1984		14	1	1
ABC Transit Agency	Bus (40 ft)	9/30/1998		14	3	3
ABC Transit Agency	Bus (35 ft)	1/1/2009		14	40 No	
ABC Transit Agency	Bus (30 ft)	1/1/2009		14	4 No	
ABC Transit Agency	Bus (30 ft)	1/1/2013		14	4 No	
ABC Transit Agency	Bus (30 ft)	1/1/2014		14	12 No	
					Calculated % of Assets that meet or exceed the ULB:	
Bus (BU)					Targets (BU)	
ABC Transit Agency	Over-the-Road Coach	1/1/2002		16	6 No	
					Calculated % of Assets that meet or exceed the ULB:	
Van (VN)					Targets (VN)	

Vision for Multi-function Utility

- Performance and Target Setting Reports
 - Operator and regional targets
 - Transit Asset Management Plans
- Integration with NTD reporting
- Geo-Coding
- Regional risk-based/condition assessment
- Informed funding policies



Questions?

Shruti Hari, MTC
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THANK YOU!

Connecting Performance Measures, Targets and Business Strategies



David M. Springstead

A System of Systems Critical Infrastructure & Rolling Stock

Public Transportation Infrastructure Creates Jobs in Communities Across America

Putting local citizens to work, building stronger communities, and helping create a more energy-efficient America

Architectural

1. Wall System
2. Ceiling Systems
3. Floor Materials
4. ADA Tactile Edging
5. Entrance Canopies
6. Fare Gate Barriers
7. Customer Service Booth
8. Escalators
9. Elevators
10. Elevator Enclosure and Cans
11. Signage and Supports
12. Green Roof
13. Building Façade Design/ Materials
14. Staircases
15. Platform Barriers/Screens
16. Steel Structures
17. Concrete Structures
18. Retaining Walls
19. Slurry Walls
20. Secant Pile Walls
21. Underground Structures
22. Waterproofing
23. Fire Protection/Ratings

Mechanical

24. Heating
25. Air Conditioning
26. Tunnel Ventilation
27. Emergency Exhaust Systems
28. Over-track Exhaust Systems

Electrical

29. Decorative/Architectural Lighting Systems in Public Areas
30. Back of House Lighting Systems
31. Electronic Signs
32. Power Systems

Plumbing

33. Sanitary Systems
34. Track Drainage
35. Cover Drainage Systems
36. Water Supply

Fire Protection

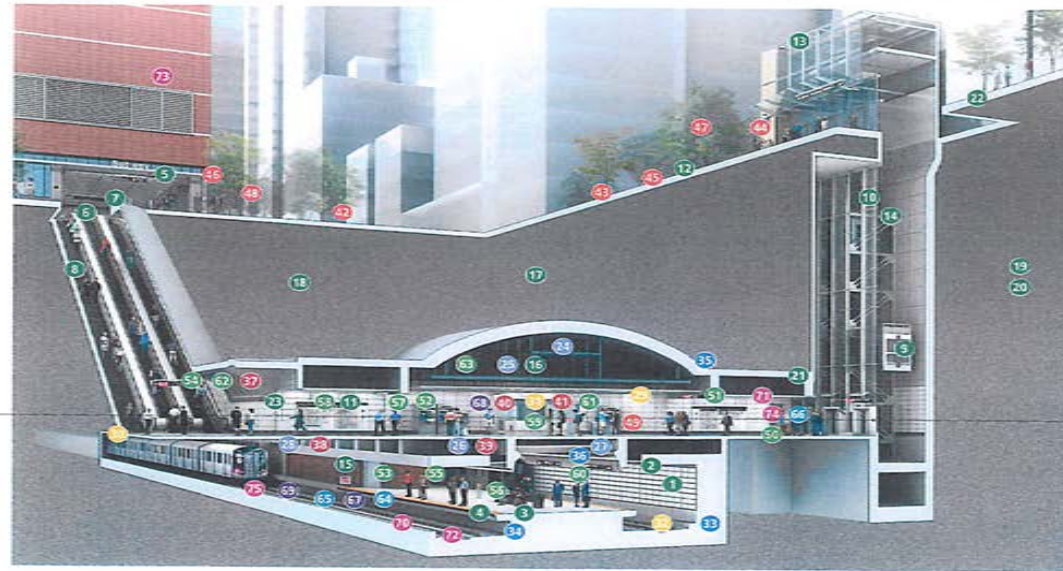
37. Wet Sprinklers
38. Dry Sprinklers
39. Water Mist Systems
40. Halon Systems
41. Inert Gas Systems

Amenities

42. Street Restoration
43. Sidewalk Restoration
44. Signage
45. Pavement Markings
46. Street Lights
47. Trees and Landscaping
48. Bus Shelters
49. Fare Vending Equipment

Communication Systems

50. Fiber Optic Network
51. CCTV
52. Intrusion Access Control
53. Fire Alarm
54. Public Address and Customer Information Signs
55. Help Point and Safe Point Intercoms
56. Emergency and Office Telephone Systems
57. Mobile Communications Network
58. Supervisory Control and Data Acquisition Systems
59. Emergency Alarm (Blue Light & Emergency Shutdown of 3rd Rail)
60. Emergency Booth Communication Systems
61. Time Clock Synchronization
62. Induction Loop Intercom (ADA wireless system for deaf)
63. WiFi Networks



Track

64. Track Fixation (attachments)
65. Rail
66. Rail Switches and Crossovers

Signal Systems

67. Component Infrastructure
68. Wayside Signal Display Boxes
69. Track Circuit Hardware

Traction Power

70. Trackbed Infrastructure
71. SCADA Train Control System
72. Third Rail (and third rail material)
73. Substation
74. Power Control Room
75. Regenerative Braking Equipped Railcar

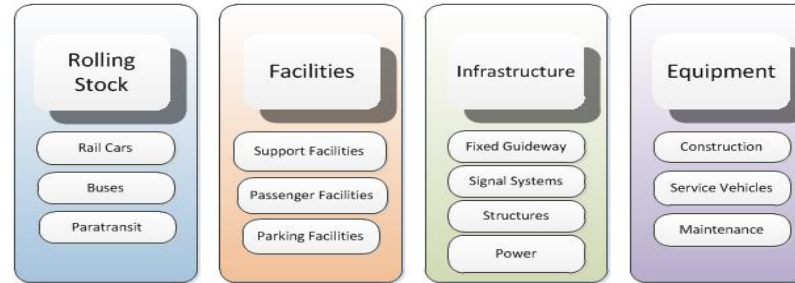
Quick Facts

- Every dollar communities invest in public transportation generates approximately \$4 in economic returns.
- Public transportation investment can create or save more than 500,000 private sector jobs per year through reduced congestion.

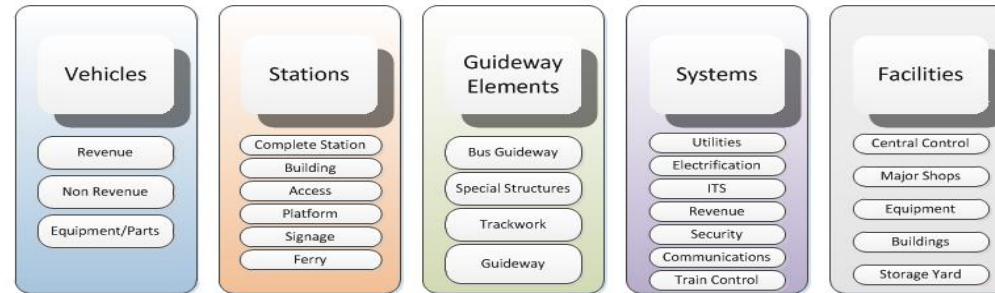
75 INTER-RELATED SYSTEMS; OVER 58,000 ASSETS

Asset Categories

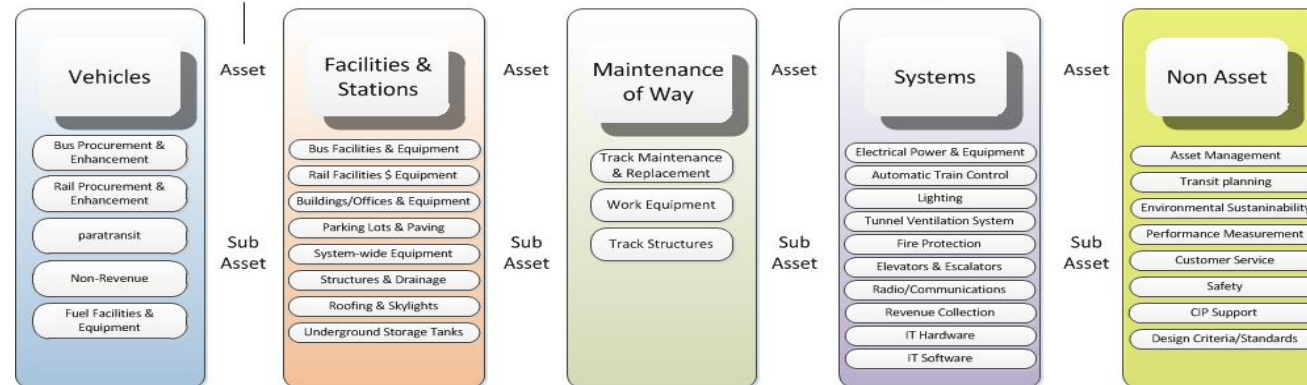
FTA Asset Categories



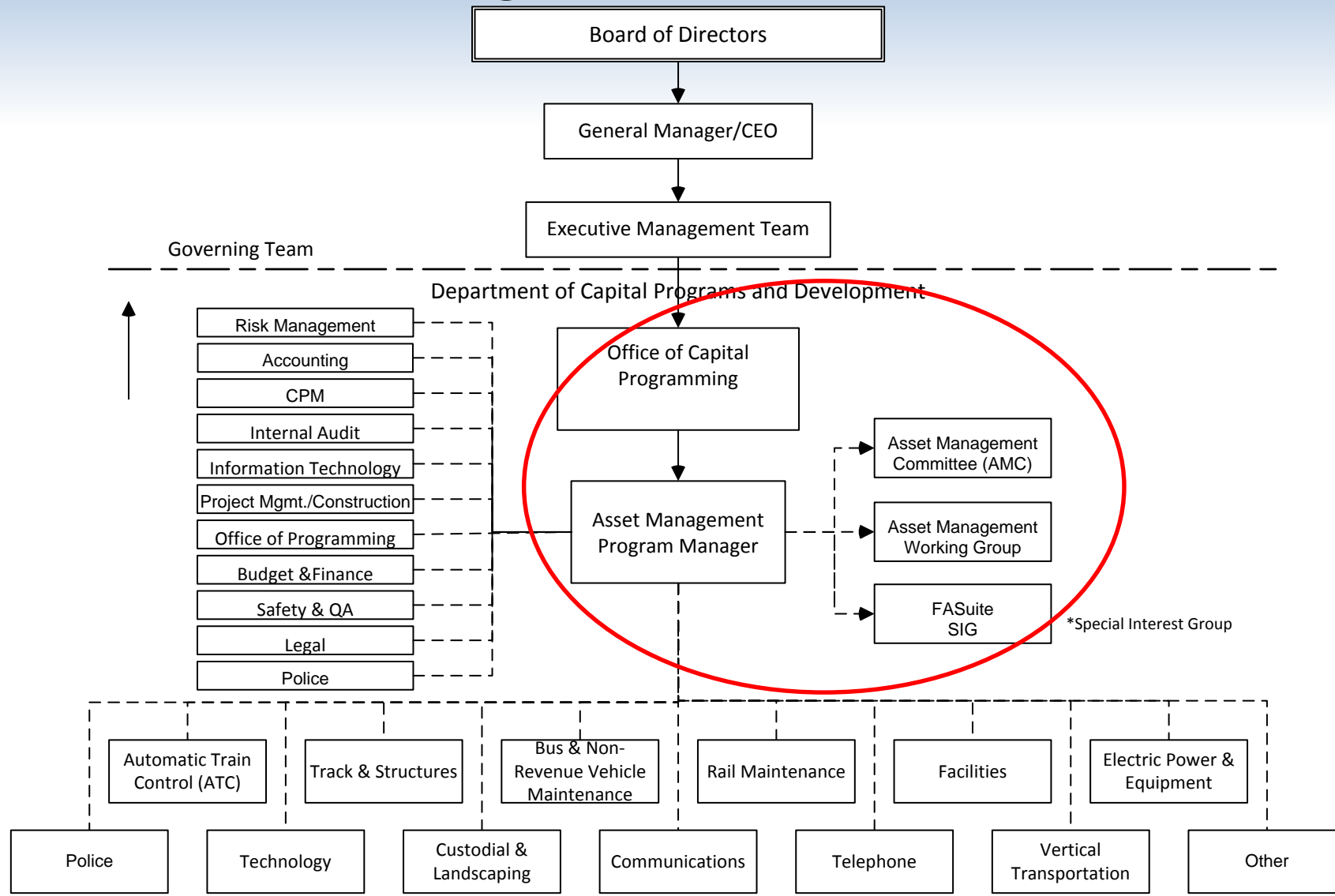
FTA TERM-Lite Asset Categories



MARTA's Asset and Sub Asset Categories



Organizational Chart

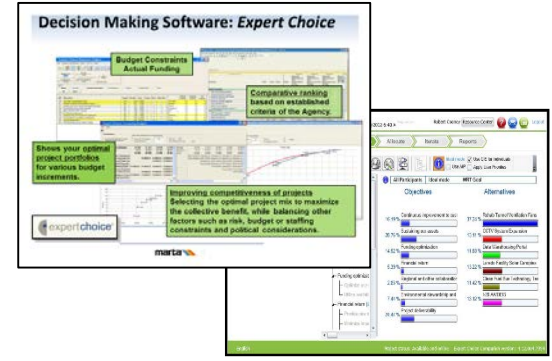
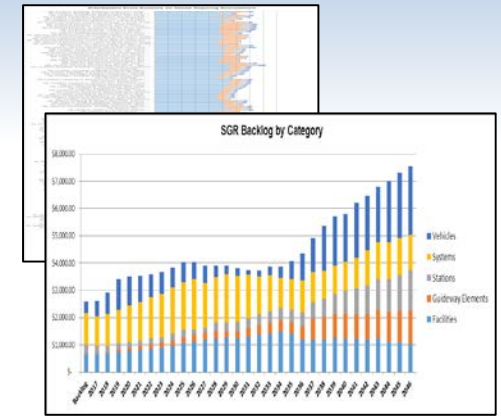
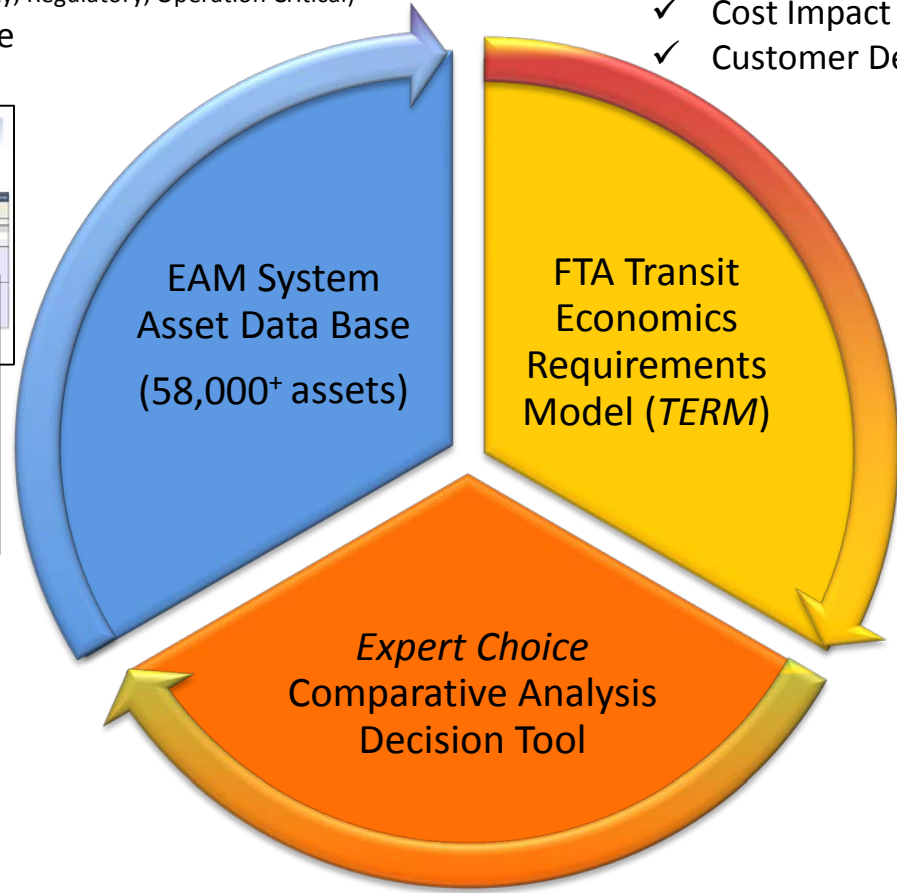
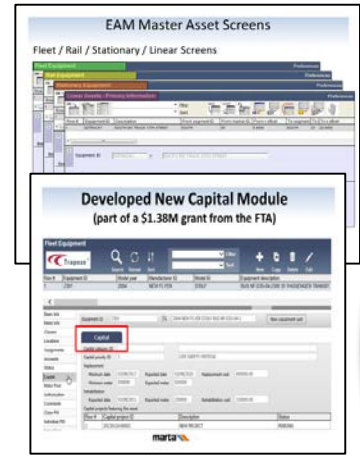


**Subject Matter Experts (SME's) for MARTA's Maintenance departments

Three (3) Focus Areas

- ✓ Age
- ✓ Condition
- ✓ Priority (Safety, Regulatory, Operation Critical)
- ✓ Performance

- ✓ Condition
- ✓ Reliability
- ✓ Safety
- ✓ Cost Impact
- ✓ Customer Defined

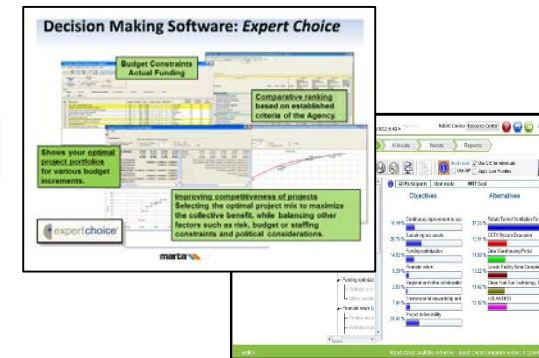
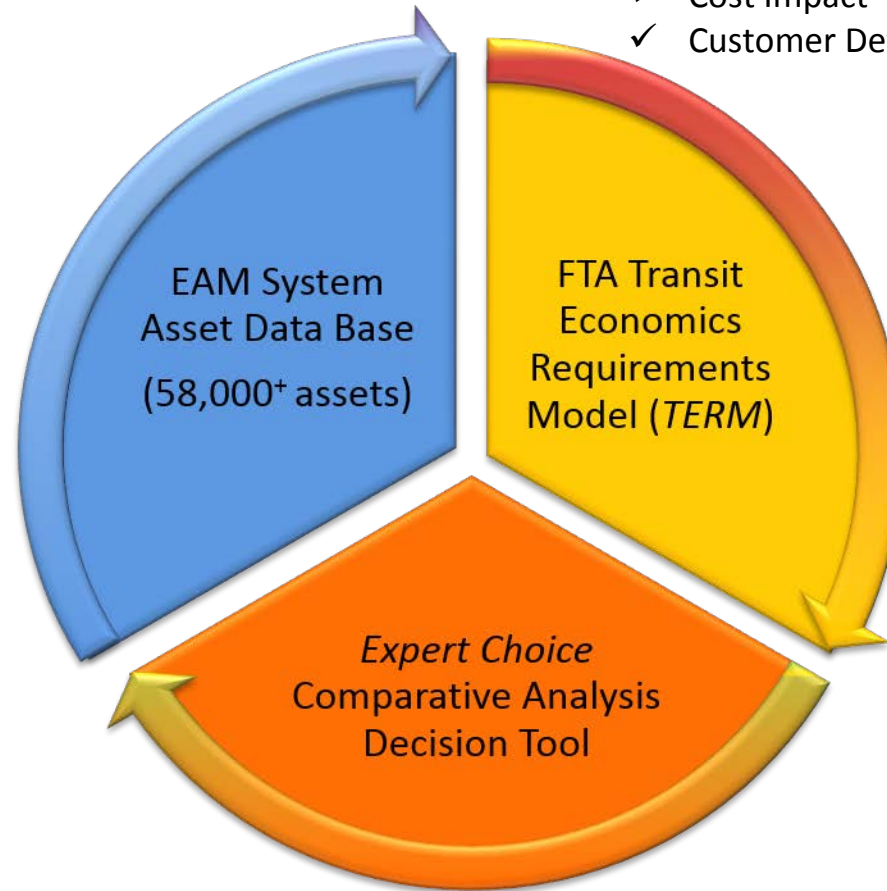
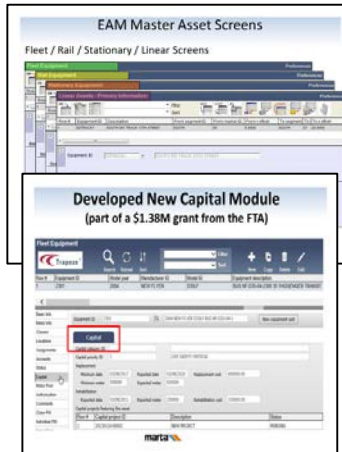
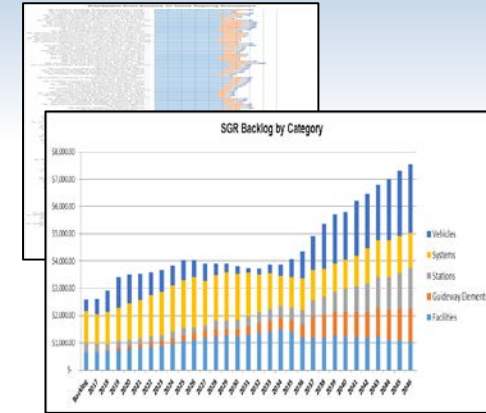


- ✓ Customer Impact
- ✓ SGR/Sustainability
- ✓ Safety & Security
- ✓ Funding
- ✓ Financial Return
- ✓ Regional Collaboration
- ✓ Environmental Stewardship
- ✓ Deliverability

Three (3) Focus Areas

- ✓ Age
- ✓ Condition
- ✓ Priority (Safety, Regulatory, Operation Critical)
- ✓ Performance

- ✓ Condition
- ✓ Reliability
- ✓ Safety
- ✓ Cost Impact
- ✓ Customer Defined



- ✓ Customer Impact
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- ✓ Deliverability

Website

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Asset Management

Home Image Viewer

Asset Management Documents

- Policies
- Plans
- AMPs
- Procedures
- ISO 55000
- FTA
- MAP-21
- TERM-Lite
- GDOT
- Other Government Agencies

607

marta Mobility 4001

marta

marta METROPOLITAN ATLANTA RAPID TRANSIT AUTHORITY

FY2018 BUDGET CALL PACKAGE

breeze

LOPTA marta

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Capital Improvement Program

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DEPARTMENT OF CAPITAL PROGRAMS & DEVELOPMENT

FUNCTIONS & RESPONSIBILITIES

The Department of Capital Programs & Development is responsible for providing centralized and comprehensive management of the Authority's Capital Program. This department consists of the Offices of Capital Programming, Architecture & Design, Engineering & Development, and Project Management and Construction. This department ensures that Capital resources are fully aligned with and support the Authority's overall strategic goals and objectives.

The **Office of Capital Programming** is responsible for developing the Authority's long range Capital Program which includes capital project origination, scope, schedule and budget development, oversight and analyses, project and program performance, and scheduling and estimating. This office also manages the Authority's Strategic Transit Asset Management Plan (STAMP) and State of Good Repair (SGR) initiatives ensuring Moving Ahead for Progress in the 21st Century (MAP-21) compliance.

The **Office of Architecture and Design (A&D)** provides the Authority with complete architectural design services in support of operating and capital programs for rehabilitation of existing facilities as well as for new capital projects. The Office is responsible for designs, design coordination and review, design services during construction, the Roofing Program and MARTA's Sustainability Program. The Office ensures architectural code compliance including all ADA compliance throughout the Authority.

The **Office of Engineering & Development (E&D)** includes Infrastructure Engineering and Systems Engineering. The

STAMP Strategic Transit Asset Management Plan

marta

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Capital Improvement Program CPD Home Diagrams CIP initiatives Help EDIT LINKS Search this site

Workflow Status: POD Approval Workflow (Previous Version:11/10/20)

Site Contents Workflow Information

Initiator: Anderson, Dondre	Item: Training Facilities Modernization - Phase One
Started: 3/23/2017 10:43 AM	Status: In Progress
Last run: 3/30/2017 5:13 PM	



David M. Springstead
AGM of Capital Programs & Development
dspringstead@itsmarta.com

CONNECTING PERFORMANCE MEASURES, TARGETS AND BUSINESS STRATEGIES

Question 1:

How is your agency linking TAM to strategic decision-making?

CONNECTING PERFORMANCE MEASURES, TARGETS AND BUSINESS STRATEGIES

Question 2:

How did you develop your
targets? What about regional
targets?

CONNECTING PERFORMANCE MEASURES, TARGETS AND BUSINESS STRATEGIES

Question 3:

How did you communicate to stakeholders the new TAM requirements & the changes that need to occur to meet the deadline?

CONNECTING PERFORMANCE MEASURES, TARGETS AND BUSINESS STRATEGIES

Question 4:

Does your agency have legacy tools that perform a similar function as the TAM? How are you integrating them into your TAM development?

CONNECTING PERFORMANCE MEASURES, TARGETS AND BUSINESS STRATEGIES

Question 5:

How do you plan to deliver on
your TAM plan?

CONNECTING PERFORMANCE MEASURES, TARGETS AND BUSINESS STRATEGIES

Question 6:

How did you determine or acquire a decision support tool (DST) and decide on your requirements?

CONNECTING PERFORMANCE MEASURES, TARGETS AND BUSINESS STRATEGIES

Question 7:

Did your agency identify staff whose job is solely TAM Rule compliance? Where do they live on the org chart?

CONNECTING PERFORMANCE MEASURES, TARGETS AND BUSINESS STRATEGIES

Questions?



TRANSIT
ASSET
MANAGEMENT

THANK YOU!