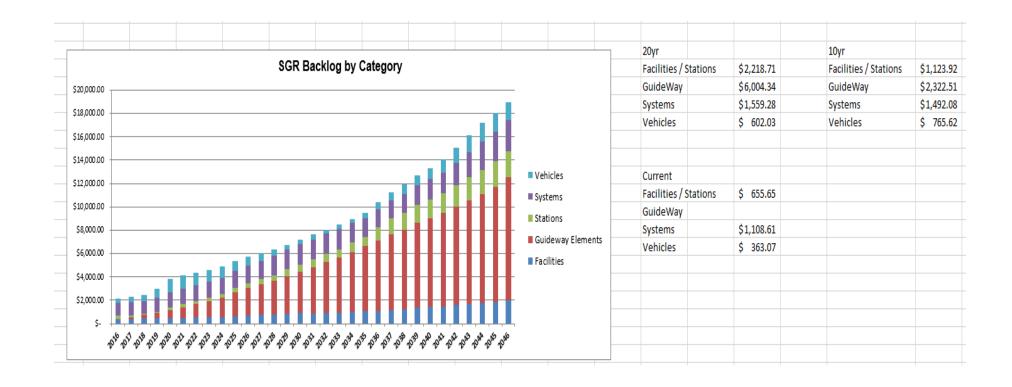
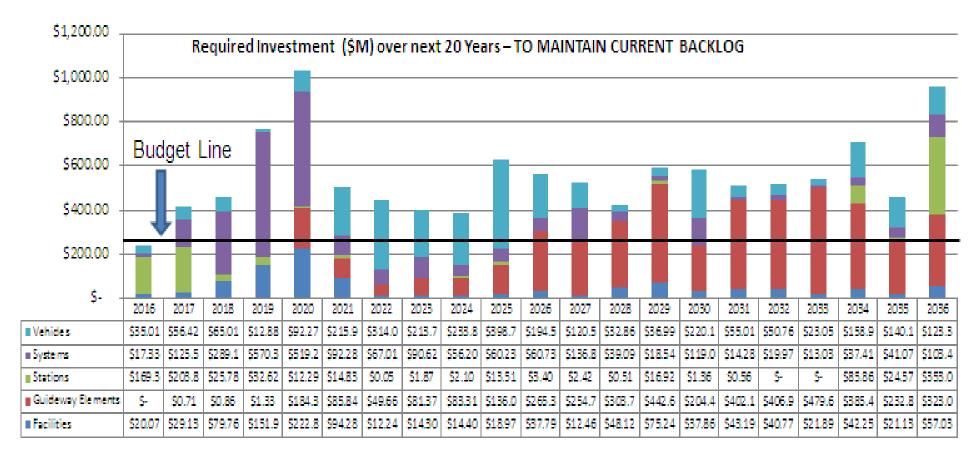


# Projected Backlog

(when unaddressed)



# FTA's Transit Economics Requirements Model (TERM) w/ MARTA Asset Data



In order to *maintain current backlog*...meaning we hold the line on total value of assets in need of replacement (roughly \$2.5B) we should double our Capital investment over 20 years.



# Do I know the <u>status</u> of my agency relative to MAP-21 requirements?

**Inventory of Capital Assets Condition Assessment All Providers** (Tier I & II) **Decision Support Tools Investment Prioritization** TAM and SGR Policy Implementation Strategy Tier I only List of Key Annual Activities **Identification of Resources Evaluation Plan** 



# Are we clear on the new terminology?

### Useful Life Benchmark (ULB)

- is <u>not</u> the Useful life for FTA grant programs.
- is the expected lifecyle of a capital asset for a particular Transit Provider's operating environment, or the acceptable period of use in service for a particular Transit Provider's operating environment

### Performance Restriction

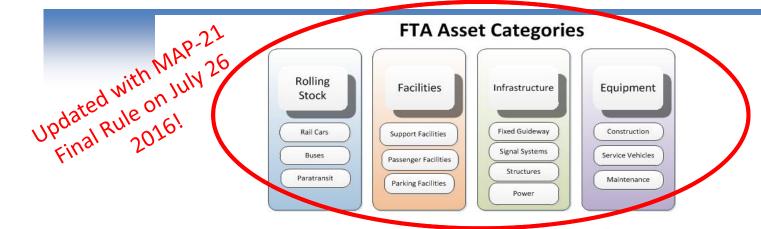
 the maximum speed of vehicles on a fixed guideway segment is below the segment's design speed for any reason - planned or unplanned.



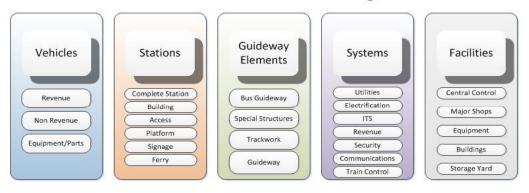
# **Note:** there are some <u>inconsistencies</u> in nomenclature which necessitates cross-mapping and education?

FTA Asset Category	NTD Inventory Category	NTD Performance Measure Category
Facilities	Facilities	Facilities
Facilities /	Track & Guideway	Facilities
Infrastructure	Track & Guideway	Infrastructure
Rolling Stock	Vehicle	Rolling Stock
Equipment	Vehicle	Equipment
	Facilities Facilities Infrastructure Rolling Stock	Facilities Facilities Facilities Track & Guideway Infrastructure Rolling Stock Vehicle

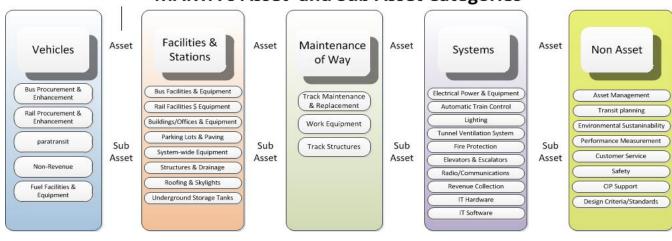




### **FTA TERM-Lite Asset Categories**



### MARTA's Asset and Sub Asset Categories



### **Hot Topics Amongst Transit Peers**

- 1. Keeping asset backlog in context there's a relationship between asset condition, safety and performance but they are not to be overstated (old  $\neq$  unsafe)
- 2. The Accountable Executive's and Board's liability and culpability
- 3. Setting reasonable & achievable **targets** (to the performance measures)
- **4. Nomenclature** changes occurred from the ANPRM, NPRM to Final Rule and there are inconsistencies amongst published documents and tools
- **5.** Lack of focus on best practice; more focused on MAP-21 compliance (what vs. how)
- **6. Group vs. Non-Group Reporting** and MPO relationships/representation
- 7. Fear of Federal funding being withheld due to non-compliance
- 8. When and where will **TAM and SMS connect down** the road?
- 9. Federal (National vs Regional) interpretation of MAP-21 includes PMOCs
- 10. Owner, Operator and Maintainer Roles & Responsibilities
  - Owned vs. Leased vs. Shared or even Rotated assets and fleets
  - Self-performed vs. Contracted Maintenance and Data Management
  - Contract Requirements for new acquisitions
  - Requirements applying to non-Federal Assets when interfacing with Federal Assets
  - How Federal Funds are applied to new assets, in whole or in part (%)

Capital Asset \$ Threshold



# Top 2 risks are...

# 1. Asset Management System (AMS) Risk

Re-evaluating your TAM Program w/ the arrival of MAP-21

- Does my agency have <u>processes</u> in place?
- Have we collectively selected the appropriate targets?

# 2. Asset Risk (of a particular system)

Systems are in state of good repair?

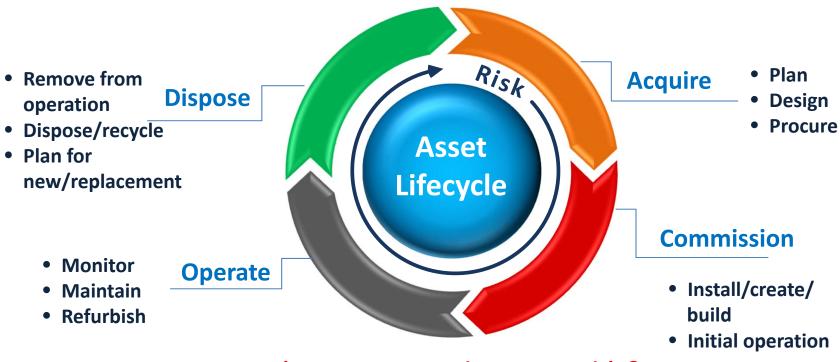
Does my agency <u>have/understand their asset data</u>, <u>making strategic investments</u> and <u>managing performance</u> and <u>risk?</u>





### **Asset Management Lifecycle**

Asset Policy & Asset Management Strategy
Asset Management System



Where are my agencies greatest risks?

**Asset Portfolio** 



# Risk 1A: Identifying the Need

### **Priority Codes:**

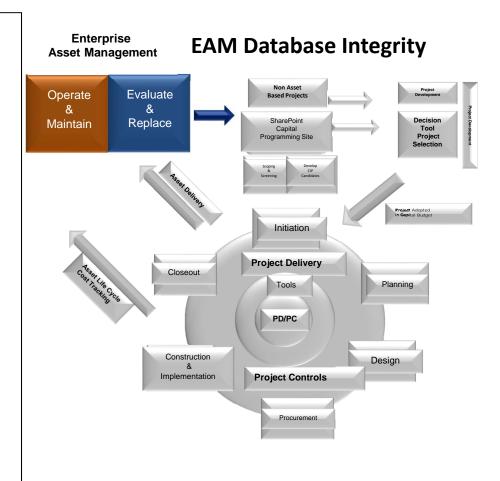
- 1.Life Safety Critical
- 2. Operation Critical
- 3. Operation Support
- 4. Operation Enhancement

#### **Condition Codes:**

- 5. Excellent
- 4. Good
- 3. Adequate
- 2. Marginal
- 1. Poor

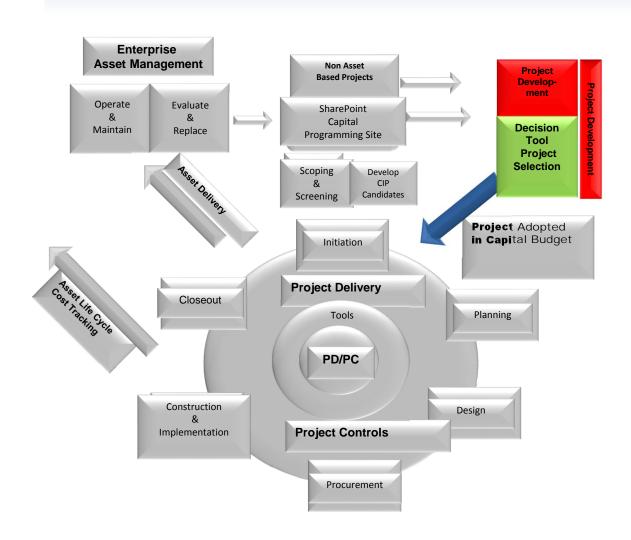
### Minimum Req'mts:

- 1. Equipment ID
- 2. Manu / Model
- 3. Description
- 4. Serial Number
- 5. Asset Category
- 6. Asset Classes
- 7. Equipment Type
- 8. EUL
- 9. Location
- 10. Life Cycle Status
- 11. Priority Code
- 12. Condition Code
- 13. Date in Service
- 14. Original Cost
- 15. Cap. Cat. Code
- 16. Cap. Priority Code





# **Risk 1B: Identifying the Projects**



Integrated project decision making, align EAM asset database with capital programming effort

- Group candidate replacement assets by agency-driven criteria
- Creates investment scenarios using capital project decision tool
- 3. Present unconstrained and constrained capital improvement plans



"Effective control and governance of assets by organizations is essential to realize value through managing risk and opportunity, in order to achieve the desired balance of cost, risk and performance."



The IAM on ISO 55000



# Risk 1C: Project Approval & Governance

### **Accountable** Executive

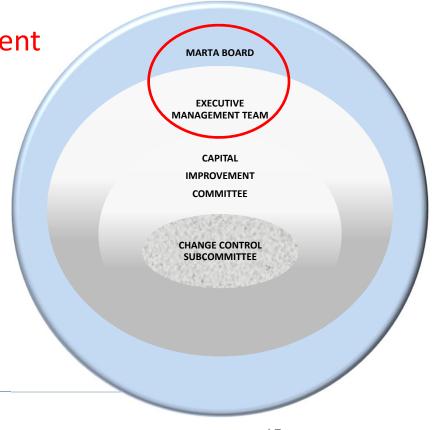
Does the **GM/CEO** know what is being proposed and approved? Does the **Board...?** 

Regional, State & Federal Engagement

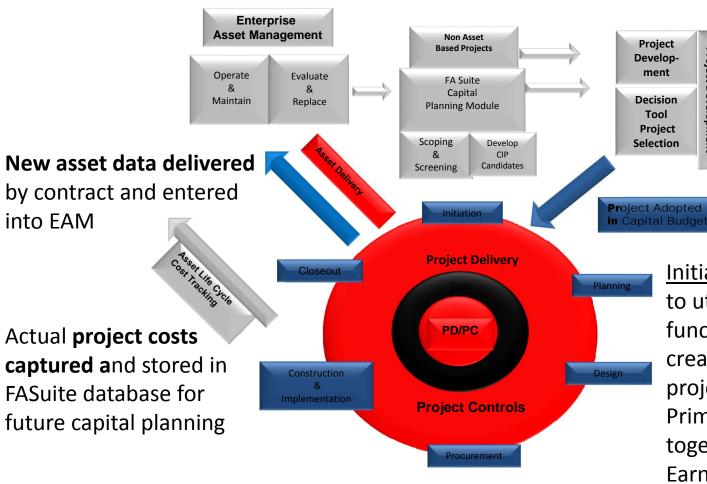
Does the MPO...?

Does the SSO...?

Does the FTA...?



## **Risk 1D: Project Delivery**



### <u>Initiative</u>:

**Project Development** 

to utilize sub-project functionality in Oracle to create programs (of projects) and to link Primavera and Oracle together to achieve Earned Value Management.





# Risk 1E: Evidence...Show Me, Don't Tell Me



# **Asset Management SharePoint Site**





# **Asset Data Integrity**

CAPITAL PROGRAMS & DEVELOPMENT

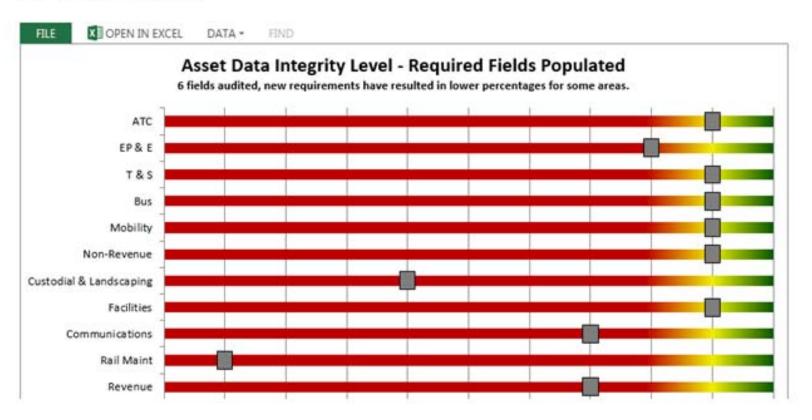
Architecture & Design

Engineering

Capital Programming

Project Management & Constructic

### **FASuite EAM**



new document or drag files here



### Performance Management "Money Ball"

Strategy Map

Strategic KPIs

Safety KPIs

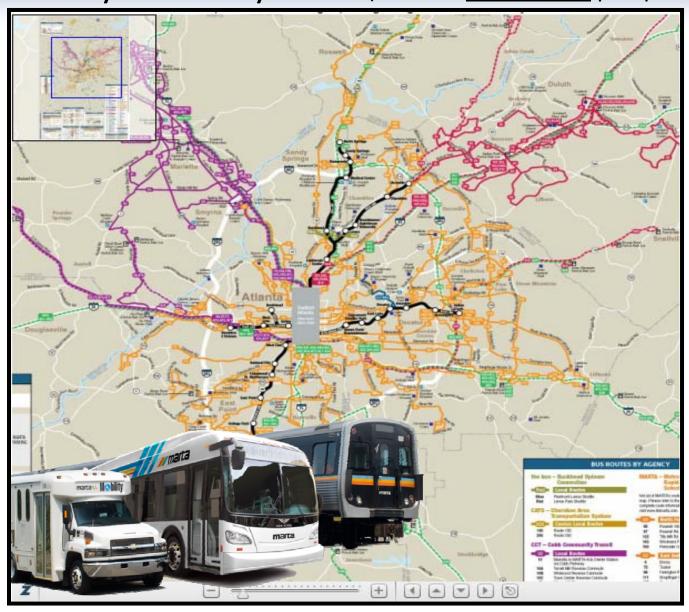
MARTA's Five Pillars

#### **BSC List of Objectives Portlet**

SC List of Objectives Fordet		
	Actual	Plan
ARTA Strategy Map		
Ontime Performance Index		
BUS AVL Generated OTP	78.58%	78.50%
Rail System Generated OTP	96.84%	95.00%
MARTA Mobility Generated OTP	83.59%	85.00%
Mobility Trip Denial Rate	10.23%	0.00%
Ridership Increases		
X Ridership	10,520,561	10,859,646
Security Index		
✓ Part I Crime Rate	3.52	3.80
Reliability Index		
Rail Service MDBSI	495	500
✓ Infra Escalator Availability	98.76%	97.00%
✓ Infra Elevator Availability	99.45%	98.50%



# Transit is a system of systems (from an operational perspective)



### Transit is a system of systems (from an asset perspective)

### 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

- Wall System Ceiling Systems
- Floor Materials ADA Tactile Edging
- **Entrance Canonies** Fare Gate Barriers
- 3. Escalators Elevators
- 10. Elevator Enclosure and Cars 11. Signage and Supports
- 12. Green Roof 13. Building Façade Design/
- 14. Staircases
- 15. Platform Barriers & creans 16. Steel Structures
- Concrete Structures
- 18. Retaining Walls 19. Sturry Walls
- Secant Pile Walls
- 21. Underground Structures
- 22. Waterproofing 23. Fire Protection/Ratings

#### Mechanical

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

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

#### Plumbing

- 33. Sanitary Systems
- 34. Track Drainage
- 35. Cavern Drainage Systems 36. Water Supply

#### Fire Protection

- 37. Wet Sprinklers
- 30. Dry Sprinklers
- 39. Water Mist Systems
- 40. Halon Systems 41. Inergin Systems
- 42. Street Restoration
- 43. Sidewall Besteration
- 46. Street Lights
- 45. Fare Vending Equipment

#### Communication

- 51. CCTV
- 53. Fire Alarm
- Information Signs
- 3nd Railli 60. Emergency Booth
- 61. Time Clock Synchronization
- (ADA wireless system for deal)
- 63. WiFi Networks

- Amenities
- 44. Signage
- 45. Pavement Markings
- 47. Trees and Landscaping
- 40. Bus Shelters

### Systems

- 50. Fiber Optic Network
- 52. Intrusion Access Control
- 54. Public Address and Customer
- 55. Help Point and Safe Point Intercoms
- 56. Emergency and Office **Telephone Systems**
- 57. Mebile Communications Metwork 52. Supervisory Control and Data
- Acquisition Systems 59. Emergency Alarm (Blue Light
- & Emergency Shetdown of
- **Communication Systems**
- Track 62. Induction Loop Intercom 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. Trackhed Infrastructure
- materiall
- 73. Substation
- 74. Power Control Room

- 71. SCADA Train Control System
- 72. Third Rail (and third rail
- 75. Regenerative Braking Equipped Railcar

#### **Ouick 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

**APTA Excerpt** 

### marta.

# FY17 CIP Uses by Asset Category Year-to-Date September 30, 2016 – 1st Quarter

Total: 25.2 .6,2% 4.0,16% 4.4,18% 4.0,16% 12.2 , 48% Facilities ■ Maintenance of Way ■ Non-Asset Systems Vehicles

marta

## Critical Systems & Prioritization

- 1. Train Control System Upgrade construction complete, operating system entering test, complete in 24 months
- 2. SCADA upgraded simultaneously under Train Control System Upgrade
- Encroachment Detection Systems beyond useful life, assessing technology
- 4. Traction Power Substations (TPSSs) multi-year project nearing advertisement, aged but highly redundant system
- 5. Emergency Trip Stations (ETSs) Phase IV three lines complete, last line in design
- 6. Auxiliary Switchgear (Rail Station Power) multi-year project nearing advertisement, aged but reliable
- 7. Track and Structure (TRIV Project) the 4th phase of track renovation now in design (running rail, switches)
- 8. Fire Detection, Protection, & Suppression Systems (101 facilities, 70% construction complete, 100% design complete)
- 9. Tunnel Lighting (tunnel lighting project 70%, well underway, industry leading LED effort)
- 10. Tunnel Ventilation System (awarded multi-year contract this year to rehabilitate all subway sections)
- 11. Standby & Emergency Generators (awarded multiyear contract this year)
- 12. Uninterruptible Power Supply (UPS) System wide Upgrade (awarded contract this year)
- 13. Elevator & Escalator (awarded Operating (O&M) and Capital Project 20% escalators done, 10 year program awarded)
- 14. CCTV (100% vehicles complete)
- Fiber Plant and Network; fiber plant and network under review.



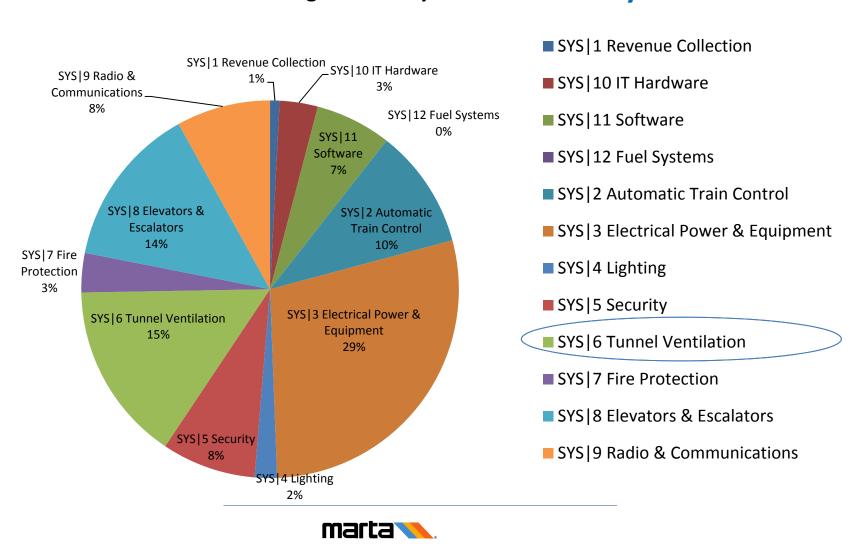
## Critical Systems & Prioritization

### 15. Fiber Plant and Network; fiber plant and network under review

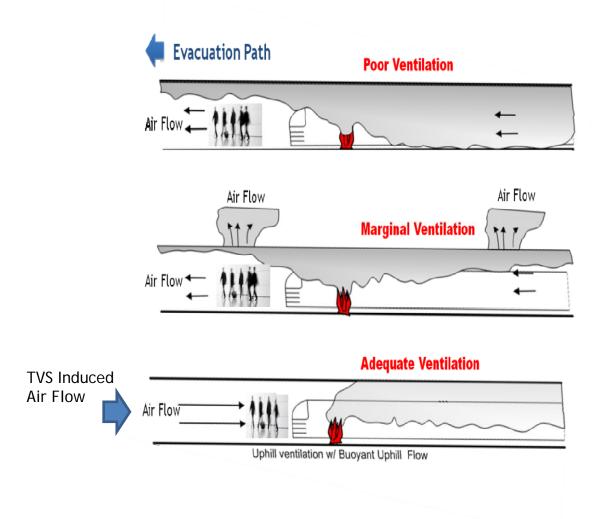
- 16. Emergency Patron Communications (Rail Stations, Blue Lights & Parking Decks) middle aged, being monitored
- 17. 800 MHz Radio (multiple projects but system aging out and performance deteriorating)
- 18. Railcar Braking System no issues
- 19. Railcar Trucks contract underway, trucks not meeting EUL
- 20. Railcar Door Controls door program in place; solution in test
- Rail Vehicle Lifts (Avondale; environmental)
- 22. Bus Garage Gas Detection and Ventilation System (under assessment)
- 23. Bus/Paratransit Lifts, Jacks & Pits (under assessment; environmental, artic. permanent lifts)
- 24. Vehicle On-Board Gas Detection & Fire Suppression upgraded
- 25. CNG Fueling Systems (2 of 3 major depots equipped, last facility out for bid)
- 26. Brakes, Steering, Suspension (bus, mobility) no issues
- 27. System Safety Program Plan (Non Asset) updated during the last triennial
- 28. Underground Storage Tanks (program underway, funding needs review)
- 29. Hazardous Materials Transport, Storage, and Handling (Non Asset) no issues
- 30. Environmental/Water Management Controls (Non Asset) no issues



### 10YR CIP Budget Totals by Sub-Asset within Systems



# What is a Tunnel Ventilation System?

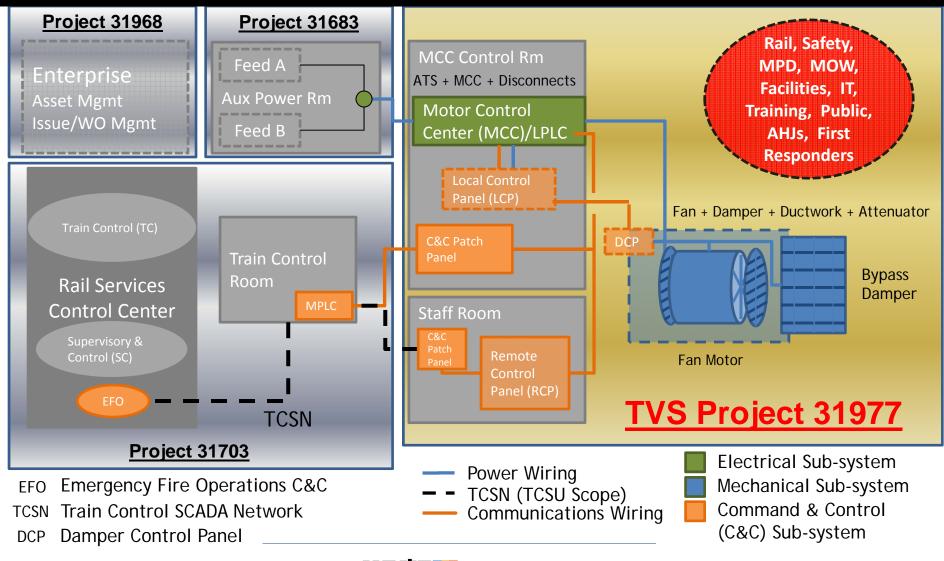


- Life safety system that allows for safe and orderly evacuation in a subterranean fire emergency
- Directs air flow (push or pull) to prevent smoke accumulation
- Scenario based with fire location and evacuation path considerations



# **TVS - Systems Perspective**

(People, Process & Technology)



### **MARTA Tunnel Ventilation System Safety Risk Evaluation**

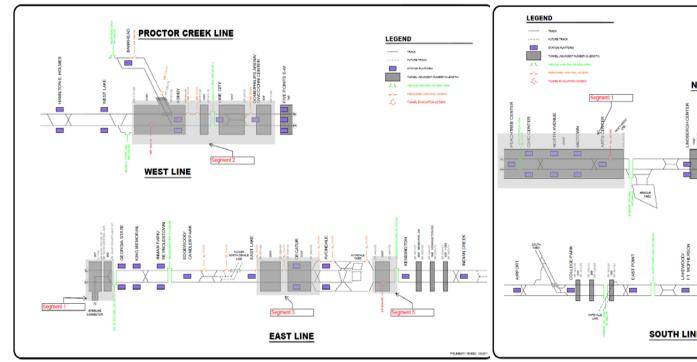
### **MARTA Tunnel Ventilation System**

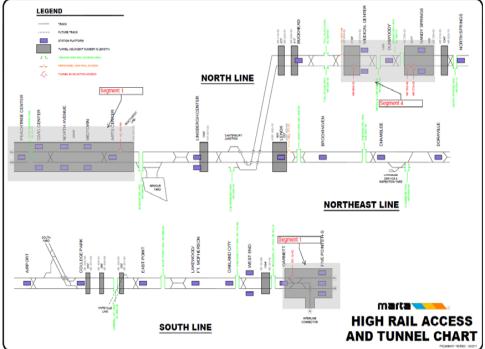
There are several enclosed trainway sections and associated subterranean stations along each line.

This includes cut and cover enclosed trainway, bored tunnel and rock tunnel construction.

Each is served by combinations of emergency, under-platform, and mid-tunnel fans.

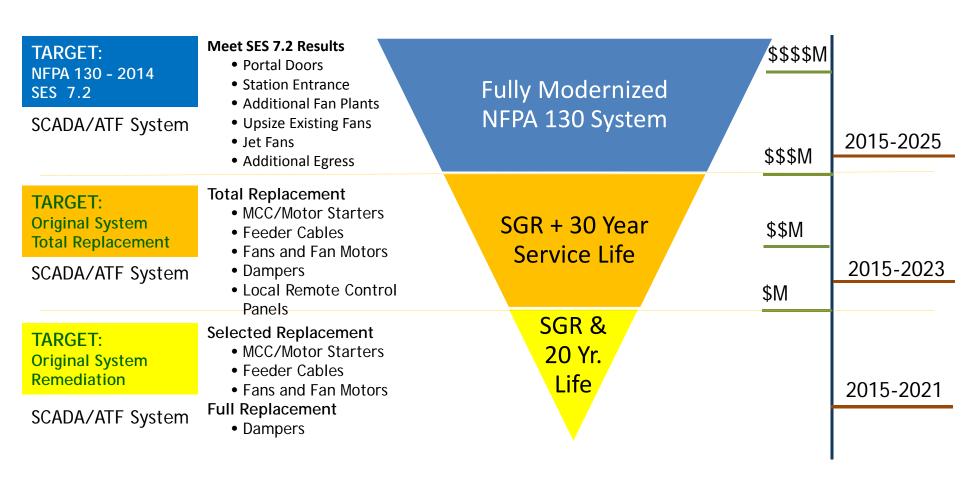
The TVS functions primarily as an emergency system responsible for the protection of approximately 9.2 miles of contiguous and non-contiguous tunnel sections.







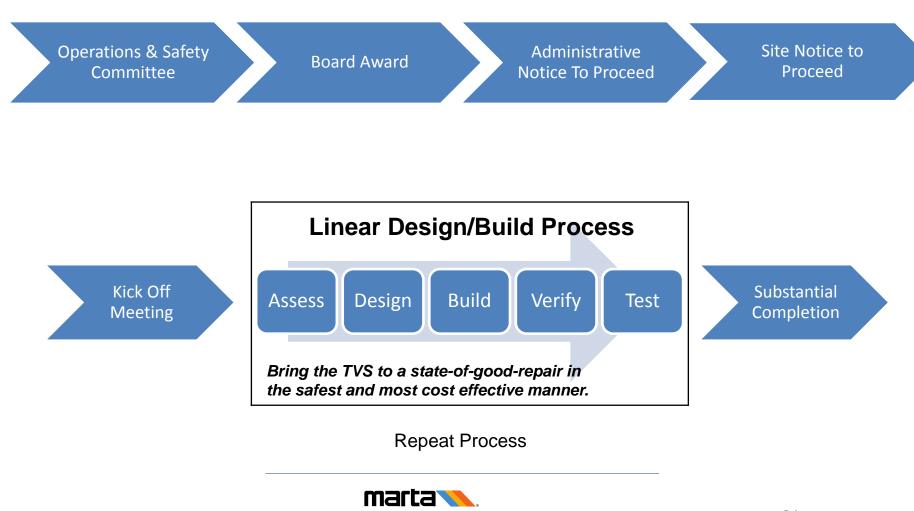
### **Cost Estimates & Execution Timeline**



**Pyramid of MARTA RFP Objectives** 



# TVS – Innovative Project Delivery Method



### 31977 Rehab Tunnel Ventilation Fans April 21, 2016



The Project will rehabilitate the TVS by inspecting, testing and then rehabilitating, replacing or upgrading individual components, assemblies and/or subsystems that make up the complete TVS with an overall program framework which minimizes risks to operations and safety.





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### MARTA awards \$198.5m TVS overhaul contract to Archer Western Construction















12 November 2015



The Metropolitan Atlanta Rapid Transit Authority (MARTA) in the US has awarded a \$198.5m contract to primary contractor Archer Western Construction to renovate and upgrade its tunnel ventilation system (TVS).

Scheduled to be initiated early next year, the improvement project further advances MARTA's ongoing commitment to provide safe and efficient transit operations.

Under this project, Cleveland Electric, RF Knox, WSP Parsons Brinckerhoff and eight disadvantaged business enterprises (seven of which are local) will serve as subcontractors to Archer Western Construction.

MARTA noted that the six-year base contract totals \$165m with an additional \$33.5m in options that include an extended warranty, hardware refresh, and provisions for long-term system operations and maintenance.

The project will cover about nine miles of subway tunnel and underground rail stations, approximately 20% of the rail system's total footprint.

The ventilation system includes a network of fans and dampers that control and direct air flow during normal rail operations and in emergencies.

"In the transit industry, this is the largest single contract

facused on this time

# **Contact Information**

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