

# Linking Assets to Projects —

## *Process for Investment Prioritization*

FTA TAM Roundtable #9

Baltimore, MD

July 16, 2019



**Metro**



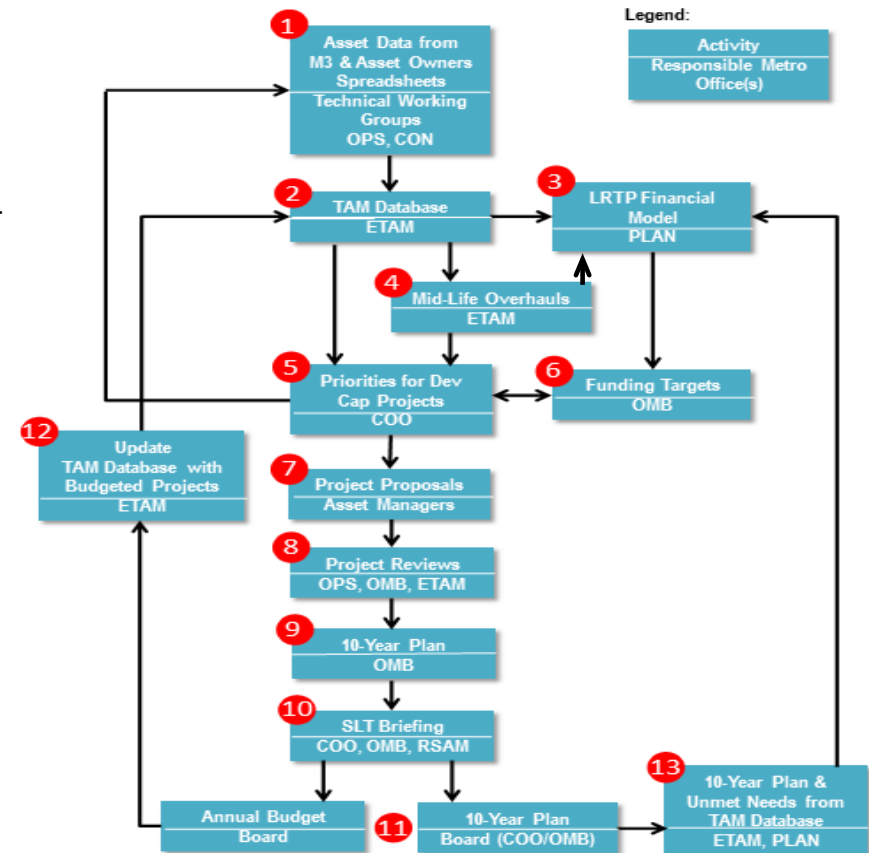
# Application of Asset Inventory in Decision Making

## What is an “Asset”? Metro’s TAM Policy Defines

**An SGR asset** is one that is currently in use, in operation and its rehabilitation or replacement needs shall be included in the asset inventory

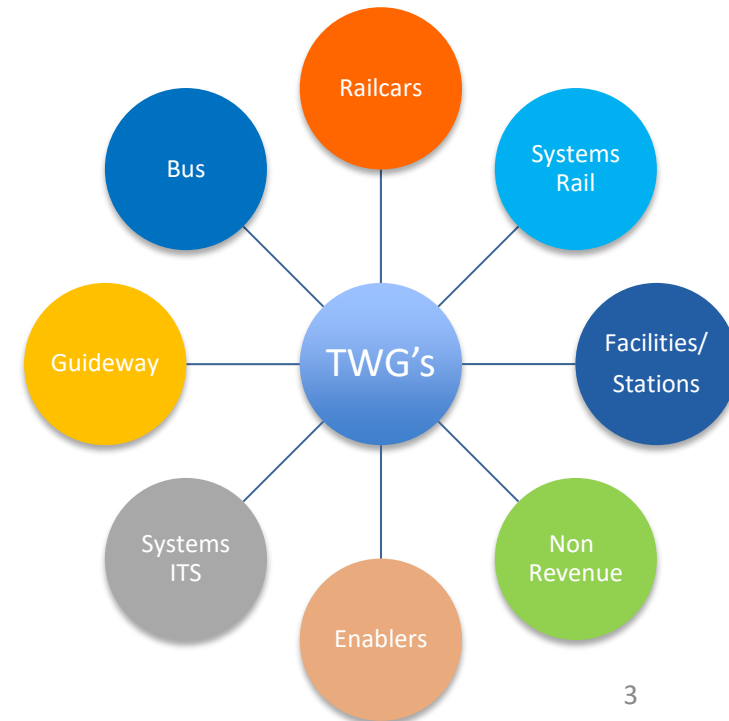
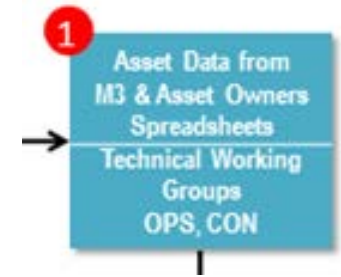
**An SGR capital project involves** rehabilitating or replacing an **existing** asset. *Excluded from this definition are capital projects for capacity enhancements or expansions to existing projects or new services*

- Metro’s definition of “Asset” refers to physical equipment and infrastructure including rolling stock, right-of-way, stations, facilities, systems, tools, etc. which make up Metro’s transit system
  - An individual asset >\$5,000 (per accounting)
  - Expected Life >1yr
  - Groups of similar items >\$500 each and totaling >\$100k
- Metro’s identification and prioritization of projects is based on application of flowchart process for decision making



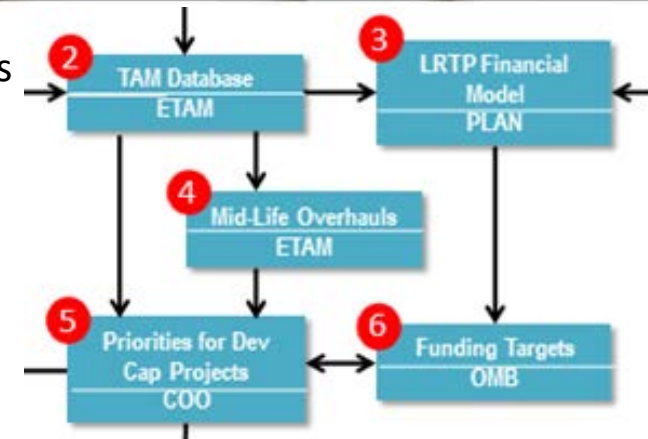
# Step 1: Asset Data Gathering

- Maintenance and Materials Management System (M3) is current Enterprise Asset Management (EAM) system – contains work order, materials management and failure/performance data (for vehicles). A new, improved & expanded EAM system project is in process.
- Technical Working Groups (TWG's) - Includes asset owners who manage/own assets and ETAM processes expert advice on technical issues for:
  - Renewing assets
  - Assessing performance, conditions, business processes
  - Updating asset inventories, provide input on hierarchies
  - Developing asset projects from prioritized inventory for capital budget process
  - Sharing ideas across departments and asset groups
- M3 and TWG asset data informs the contents of the TAM database



## Steps 2 - 6: Input into TAM Database

- TAM Database houses the asset inventory (26,000+ asset records representing 370,000+ assets) and supports performance measurement and target setting
- Estimates present and future asset conditions using age-based FTA decay curves (TERM)
- Used as a foundation for decision making for asset renewal and replacement and supports the development of capital project proposals
- Asset needs along with mid-life/component overhaul needs for Rolling Stock assets are inputs into the LRTP financial model



Average SGR Condition Rating*		
Facilities	3.78	Adequate
Equipment	2.81	Marginal
Infrastructure	4.37	Good
Rolling Stock	3.35	Adequate
Metro Overall	<b>3.95</b>	Adequate

\* cost-weighted average

Metro Asset Line Items and Replacement Costs (000's of FY 2019 Dollars)

Asset Category	Number of Asset Line Items	Replacement Cost
Facilities	1,666	\$ 5,786,867
Equipment	2,267	\$ 139,140
Infrastructure	11,871	\$ 7,871,244
Rolling Stock	2,994	\$ 3,653,705
Metro Overall	18,798	\$ 17,450,956

Replacement Costs by Est Asset Condition (2019 Dollars)

FY 2019 Replacement Cost (thousands) based on TERM Condition						
	Excellent (4.8 - 5.0)	Good (4.0 - 4.7)	Adequate (3.0 - 3.9)	Marginal (2.5 - 2.9)	Substandard (2.0 - 2.4)	Poor (1.0 - 1.9)
s	\$559,279	\$ 1,555,193	\$ 3,173,887	\$302,476	\$65,697	\$ 53,058
t	\$ 23,166	\$ 9,699	\$ 11,124	\$ 32,817	\$24,879	\$ 37,446
e	\$ 3,248,178	\$ 2,834,964	\$ 1,160,418	\$166,291	\$338,180	\$122,670
k	\$279,456	\$452,083	\$ 1,458,291	\$ 1,124,567	\$282,870	\$ -
ll	\$ 4,110,078	\$ 4,851,939	\$ 5,803,720	\$ 1,626,151	\$711,626	\$213,174
	24%	28%	34%	9%	4%	1%
	86% Adequate or Better			14%		



**Metro**



# Steps 5 - 7: Candidate SGR Project List for Investment Prioritization

- 10-year TAM Candidate Project List groups over 8,000 assets into 35 capital project categories to illustrate State of Good Repair (SGR) needs over a 10-year period



Asset Record Number	Category	Sub-Category/Project #	Project Name/Element	10 Year Future Needs	In Thousands									
					FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
					1	2	3	4	5	6	7	8	9	10
1	Equipment	Logistics Equipment	Logistics Equipment Projects	\$ 3,316	\$ -	\$ 3,316	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2	Equipment	Maintenance Equipment	Maintenance Equipment Projects	\$ 16,140	\$ 5,050	\$ 613	\$ 689	\$ 685	\$ 1,624	\$ 731	\$ 4,466	\$ 68	\$ 476	\$ 748
3	Equipment	Maintenance Vehicle	Maintenance Vehicle Projects	\$ 8,762	\$ 3,423	\$ 910	\$ 154	\$ 929	\$ -	\$ 262	\$ 825	\$ 406	\$ 288	\$ 1,566
4	Equipment	Non-Revenue Vehicles	Non-Revenue Vehicles Projects	\$ 1,367	\$ 532	\$ 388	\$ 13	\$ 119	\$ -	\$ -	\$ -	\$ -	\$ 20	\$ 173
5	Equipment	Service Vehicle-Automobile	Service Vehicle-Automobile Projects	\$ 22,715	\$ 6,299	\$ 1,370	\$ 409	\$ 82	\$ 3,650	\$ 450	\$ 2,607	\$ 1,794	\$ 3,344	\$ 2,709
6	Equipment	Service Vehicle-Steel Wheel Vehicle	Service Vehicle-Steel Wheel Vehicle Projects	\$ 8,607	\$ 4,304	\$ 4,304	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	Equipment	Service Vehicle-T&ORTV	Service Vehicle-T&ORTV Projects	\$ 40,899	\$ 18,215	\$ 4,307	\$ 1,303	\$ 2,364	\$ 2,007	\$ 1,283	\$ 1,903	\$ 3,683	\$ 3,990	\$ 1,845
8	Facilities	Building-Admin/Maint	Building-Admin/Maint Projects	\$ 31,067	\$ 8,887	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,101	\$ 1,042	\$ -	\$ 15,037
9	Facilities	Building-Administration	Building-Administration Projects	\$ 123,634	\$ 118,446	\$ 1,411	\$ -	\$ -	\$ 648	\$ 1,411	\$ -	\$ -	\$ 1,081	\$ 637
10	Facilities	Building-Maintenance	Building-Maintenance Projects	\$ 120,487	\$ 84,426	\$ -	\$ -	\$ -	\$ 3,064	\$ -	\$ -	\$ 5,838	\$ 5,400	\$ 20,869
11	Facilities	Building-Other	Building-Other Projects	\$ 53	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 53	\$ -	\$ -
12	Facilities	Fire Suppression	Fire Suppression Projects	\$ 169	\$ 169	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
13	Facilities	Maintenance Equipment	Maintenance Equipment Projects	\$ 58,470	\$ 7,484	\$ -	\$ 2,973	\$ 4,401	\$ 11,141	\$ -	\$ 9,296	\$ 14,346	\$ 1,685	\$ 7,144
14	Facilities	Parking, Employee	Parking, Employee Projects	\$ 8,666	\$ 1,580	\$ 6,305	\$ -	\$ -	\$ -	\$ 782	\$ -	\$ -	\$ -	\$ -
15	Facilities	Parking, Passenger	Parking, Passenger Projects	\$ 98,501	\$ 20,828	\$ 9,417	\$ -	\$ -	\$ -	\$ 1,065	\$ 2,822	\$ 58,726	\$ -	\$ 5,644
16	Facilities	Passenger Facility	Passenger Facility Projects	\$ 367,527	\$ 106,597	\$ 34,401	\$ 41,040	\$ 27,182	\$ 36,127	\$ 2,822	\$ 82,047	\$ 27,312	\$ -	\$ -
17	Facilities	Special Structure	Special Structure Projects	\$ 3,056	\$ -	\$ -	\$ 1,423	\$ -	\$ -	\$ -	\$ -	\$ 1,632	\$ -	\$ -
18	Facilities	Storage Yard, Automobile	Storage Yard, Automobile Projects	\$ 621	\$ 621	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
19	Facilities	Storage Yard, Bus	Storage Yard, Bus Projects	\$ 37,911	\$ 37,031	\$ 879	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
20	Infrastructure	ATMS	ATMS Projects	\$ 184,340	\$ 102,116	\$ 33,155	\$ -	\$ -	\$ -	\$ 19,893	\$ -	\$ 29,176	\$ -	\$ -
21	Infrastructure	Communications	Communications Projects	\$ 27,692	\$ 18,057	\$ 2,071	\$ 466	\$ 1,647	\$ 497	\$ 1,369	\$ 139	\$ 2,390	\$ 309	\$ 738
22	Infrastructure	Electrification	Electrification Projects	\$ 711,807	\$ 159,471	\$ 164,893	\$ 169,793	\$ 60,187	\$ 60,185	\$ 31,767	\$ 15,220	\$ 9,800	\$ 14,585	\$ 25,906
23	Infrastructure	Guideway-Bus	Guideway-Bus Projects	\$ 238,015	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 238,015	\$ -	\$ -
24	Infrastructure	Guideway-Rail	Guideway-Rail Projects	\$ 51,567	\$ 9,355	\$ 9,355	\$ 9,355	\$ 9,355	\$ 9,355	\$ 1,198	\$ 1,198	\$ 1,198	\$ 1,198	\$ -
25	Infrastructure	Revenue Collection	Revenue Collection Projects	\$ 91,522	\$ 58,877	\$ -	\$ 30,142	\$ -	\$ -	\$ -	\$ 2,503	\$ -	\$ -	\$ -
26	Infrastructure	SCADA	SCADA Projects	\$ 32,635	\$ 7,524	\$ 3,188	\$ 3,188	\$ 3,188	\$ 9,368	\$ 759	\$ 1,084	\$ 2,711	\$ 1,626	\$ -
27	Infrastructure	Special Structure	Special Structure Projects	\$ 40,310	\$ -	\$ -	\$ 21,022	\$ -	\$ -	\$ -	\$ -	\$ 19,288	\$ -	\$ -
28	Infrastructure	Trackwork	Trackwork Projects	\$ 1	\$ 1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
29	Infrastructure	Trackwork-Special	Trackwork-Special Projects	\$ 60,586	\$ 14,689	\$ 23,619	\$ 10,248	\$ 1,317	\$ 1,581	\$ 3,162	\$ 1,581	\$ -	\$ -	\$ 4,389
30	Infrastructure	Train Control	Train Control Projects	\$ 60,709	\$ 15,204	\$ 6,786	\$ 6,793	\$ 7,311	\$ 7,110	\$ 5,579	\$ 2,290	\$ 3,431	\$ 3,080	\$ 3,125
31	Infrastructure	Ventilation	Ventilation Projects	\$ 70,566	\$ 32,224	\$ -	\$ 6,164	\$ -	\$ 18,374	\$ 375	\$ 1,793	\$ -	\$ 11,635	\$ -
32	Rolling Stock	Motor Bus-AB	Motor Bus-AB Projects	\$ 472,624	\$ 157,541	\$ 157,541	\$ 157,541	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
33	Rolling Stock	Motor Bus-BU	Motor Bus-BU Projects	\$ 1,350,833	\$ 115,180	\$ 127,930	\$ 150,726	\$ 39,399	\$ 26,650	\$ 40,417	\$ 144,944	\$ 261,957	\$ 271,381	\$ 172,248
34	Rolling Stock	Railcar-HRV	Railcar-HRV Projects	\$ 266,270	\$ 16,467	\$ 19,000	\$ 19,000	\$ 19,000	\$ 20,267	\$ 19,000	\$ 34,200	\$ 46,867	\$ 46,867	\$ 45,600
35	Rolling Stock	Railcar-LRV	Railcar-LRV Projects	\$ 160,661	\$ 11,978	\$ 11,978	\$ 26,949	\$ 26,949	\$ 26,949	\$ 14,972	\$ 14,972	\$ 996	\$ 11,978	\$ 32,939
Total				\$ 4,801,106	\$ 1,142,076	\$ 627,134	\$ 659,391	\$ 204,115	\$ 230,606	\$ 147,296	\$ 329,960	\$ 730,746	\$ 378,943	\$ 541,317

## Steps 5 - 7 (Cont.) : Candidate SGR Project List for Investment Prioritization

- The Candidate SGR Project List includes 656 Candidate Projects consisting of assets needing replacement in the next 10 years
- Each Candidate Project is made up of similar assets (at the Element Level) which are from the same Service Line and due for replacement in the same year



Project Category

Candidate Project #

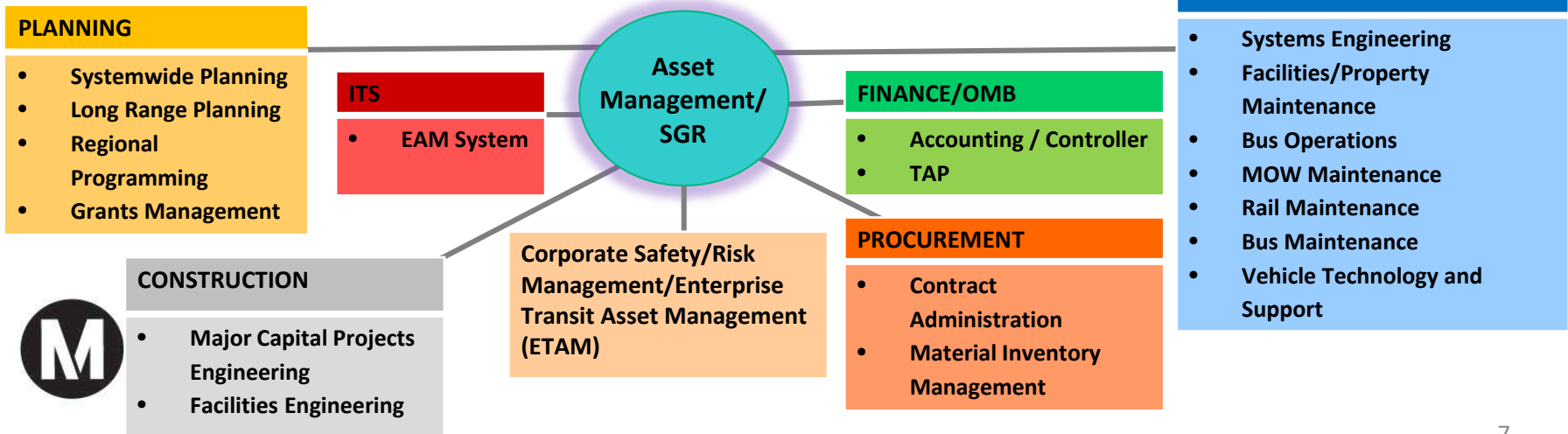
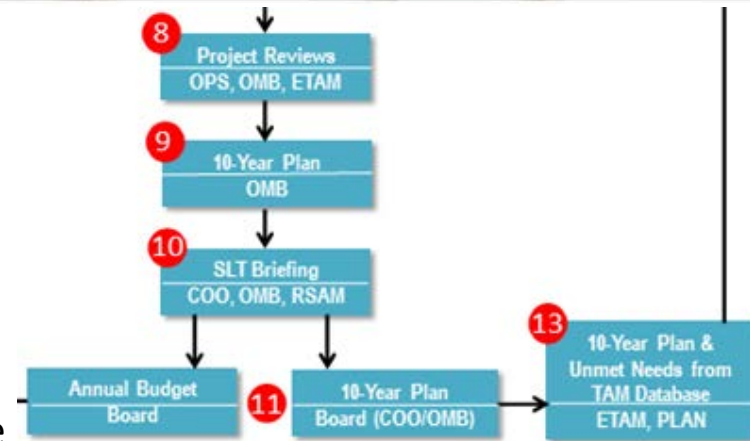
Similar Asset Types

Service Line

Asset Record Number	Category	Sub-Category/Project #	Project Name/Element	Service	10 Year Future Needs	In thousands									
						FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
						1	2	3	4	5	6	7	8	9	10
31	Infrastructure	Ventilation	Ventilation Projects	Metro	\$ 68,951	\$ 30,609	\$ -	\$ 6,164	\$ -	\$ 18,374	\$ 375	\$ 1,793	\$ -	\$ 11,635	\$ -
		Project 560	Damper Project	Blue Total	\$ 1,615	\$ 1,615	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 125	Infrastructure	Ventilation	Damper	Blue	\$ 161	\$ 161	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 146	Infrastructure	Ventilation	Damper	Blue	\$ 161	\$ 161	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 153	Infrastructure	Ventilation	Damper	Blue	\$ 132	\$ 132	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 154	Infrastructure	Ventilation	Damper	Blue	\$ 132	\$ 132	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 155	Infrastructure	Ventilation	Damper	Blue	\$ 132	\$ 132	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 231	Infrastructure	Ventilation	Damper	Blue	\$ 150	\$ 150	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 232	Infrastructure	Ventilation	Damper	Blue	\$ 150	\$ 150	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 233	Infrastructure	Ventilation	Damper	Blue	\$ 150	\$ 150	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 234	Infrastructure	Ventilation	Damper	Blue	\$ 147	\$ 147	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 235	Infrastructure	Ventilation	Damper	Blue	\$ 150	\$ 150	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24 236	Infrastructure	Ventilation	Damper	Blue	\$ 150	\$ 150	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		Project 561	Damper Project	Red Total	\$ 9,833	\$ 9,833	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		Project 562	Fan-Motor Project	Blue Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		Project 563	Damper Project	Purple Total	\$ 3,494	\$ 3,494	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		Project 564	Damper Project	Red Total	\$ 17,283	\$ 17,283	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		Project 565	Fan Project	Blue Total	\$ 6,164	\$ -	\$ -	\$ 6,164	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

## Steps 8 - 13: Cross-Asset Planning and Management

- Working with Operations, OMB and Long Range Planning to integrate asset inventory/condition/performance data into prioritization process for budgeting projects
- Leverage asset condition/maintenance understanding of Operations with asset knowledge of ETAM and financial capacity understanding of OMB and Planning
- OMB recommended projects are included in the 10-Year Budget Plan with Senior Leadership Team (SLT) concurrence
- Board approved annual budget and projects will then be reflected in the TAM database





# Benefits of Metro Prioritization Process

- Promotes awareness of SGR priorities across all organizational levels and coordinated approach for delivering SGR reinvestments
- Supports the coordinated development of SGR inputs into annual capital budgets, Short Range Transportation Plan and the financial plan supporting the Long Range Transportation Plan
- Defines the basis for investment decision making
- TAM database allows for a comprehensive asset inventory and uniform data collection and monitoring
- Compliance with federal laws and regulations including the Final TAM Rule 49CFR



## NEXT STEPS FOR LA METRO

### Next Steps:

- Further integrate and embed prioritization process in annual budgeting and updates to Short and Long Range Planning
- Monitor progress towards performance/condition measures, NTD reporting, etc.
- Continue refining asset data with TWG's
- Continue assessments of different assets to incorporate more refined condition information into the asset database.



# Thank you!

**DENISE LONGLEY**

**DEPUTY EXECUTIVE OFFICER-ENTERPRISE TRANSIT ASSET MANAGEMENT**

**213-922-7294**



**Metro**

# 2019 TAM Roundtable

## SGR Asset Survey Response to Question #2

## 2) Regarding the funding of SGR projects - how is capital prioritization affected by this definition?

**(1) VTA** - All projects are evaluated based on performance factors and risk. The projects that rise to the top of the funding priorities are those that help VTA approach a SGR and/or resolve a potential safety risk.

**(2) SRTA** - The assets with the lowest SGR score are prioritized for funding and corrective action. For example, the three park-n-ride lots that scored below a 3 on the last SGR inspection are the ones being repaired first and we are concentrating on the specific areas that scored low.

**(3)** Capital prioritization is risk based and more associated with color of money

**(4)** Capital prioritization with regards to funding is not affected by this definition in our Agency.

**(5)** Our capital program priority is based off of the condition. Where assets are at end-of-life and the condition merits, it is replaced. Assets are always maintained to the end of its minimum grant life.



## 2) Regarding the funding of SGR projects - how is capital prioritization affected by this definition?

**(6)** Capital prioritization is heavily influenced by the status and the data of the asset. Or at least it should.

**(7)** NCTD - Rolling Stock, Equipment, Facilities, and Infrastructure are prioritized. Safety, performance, and reliability factor into the prioritization decision-making.

**(8)** TriMet - The definition itself has not affected capital prioritization.

**(9)** The most safety and operationally critical assets are prioritized.

**(10)** The assets must be supported to provide reliable, clean, and safe service.

**(11)** FTA prioritizes funding for capital transit projects

**(12)** SGR has a significant impact on prioritization

**(13)** The determination of a project is originally identified at an asset condition assessment level but has to then be married with risk analysis to the overall service, safety and factors established by the organization to meet goals and objectives.

## 2) Regarding the funding of SGR projects - how is capital prioritization affected by this definition?

**(14)** LA Metro: An SGR capital project involves rehabilitating or replacing an existing asset. This definition excludes capital projects for capacity enhancements aka “betterments” or expansions to existing projects or new services. If expansion projects are included in the prioritization, then backlog grows because SGR needs aren’t being fully addressed under a constrained funding plan. Percentage of SGR needs goes up.