Asset Management
&
State of Good Repair

RAIL TRANSIT SEMINAR • APRIL 30, 2018

marta

WRI 2018

TAM/SGR

Asset Management and State of Good Repair

Agenda:

1. MARTA's Journey Toward SGR
2. Federal Requirements and Best Practices.
3. SGR for Track and Linear Assets
4. SGR for Rolling Stock.

Metropolitan Atlanta Rapid Transit Authority (MARTA)

- Started bus and rail combined service in 1979
- 8th largest transit system in the U.S.
- 500,000 passengers daily (bus and rail)
- 338 rail cars, 48 miles of service via four lines
  Gold, Red, Blue and Green
- 120 miles of track
- ~530 buses, ~100 routes
- ~190 Mobility (paratransit) vehicles
- 60,000 assets inventoried

Bus Schedules & Maps

Rail Stations & Schedules

Asset Management
State of Good Repair

Benefits

1. Improved system safety
2. Improved system reliability
3. Improved service delivery.
4. Improved budget planning and financial efficiencies.

Asset Management
State of Good Repair

Facts

1. **You do not know if you are in a State of Good Repair (SGR) unless you have an asset management program/process.**
2. **State of Good Repair is easily determined through good Asset Management (AM).**
3. **Reporting SGR/AM is a requirement if you receive federal funding.**

MARTA's SGR/AM Journey

MARTA's SGR/AM Journey
(Approach)

Implement a single MARTA-wide system for **priority** and **condition based** asset replacement,

"standard criteria,
"

Establish a **systematic program** to prioritize and bundle assets into projects; create a **long-range Capital Improvement** Program (CIP)

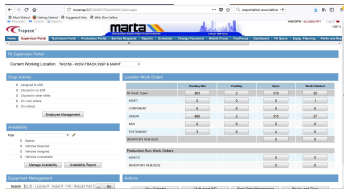
Provide **readily accessible information** for asset monitoring and reporting

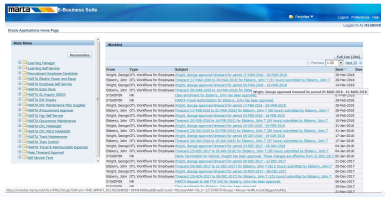
"transparency"

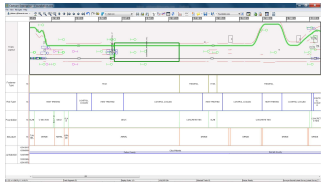
MARTA's SGR/AM Journey

1. **Implemented Business Transformation Program in 2006**

   a) **Transitioned from computerized maintenance management, human resource information and financial information systems to an Enterprise Asset Management and Enterprise Resource Planning System.**







MARTA's SGR/AM Journey

2. In 2007 with the newly implemented Business Transformation Program (BTP), MARTA formed a cross-functional team to address Asset Management.

3. When State of Good Repair and MAP21 took to the Federal Stage 2012, MARTA had already collected much of the required inventory and condition data.

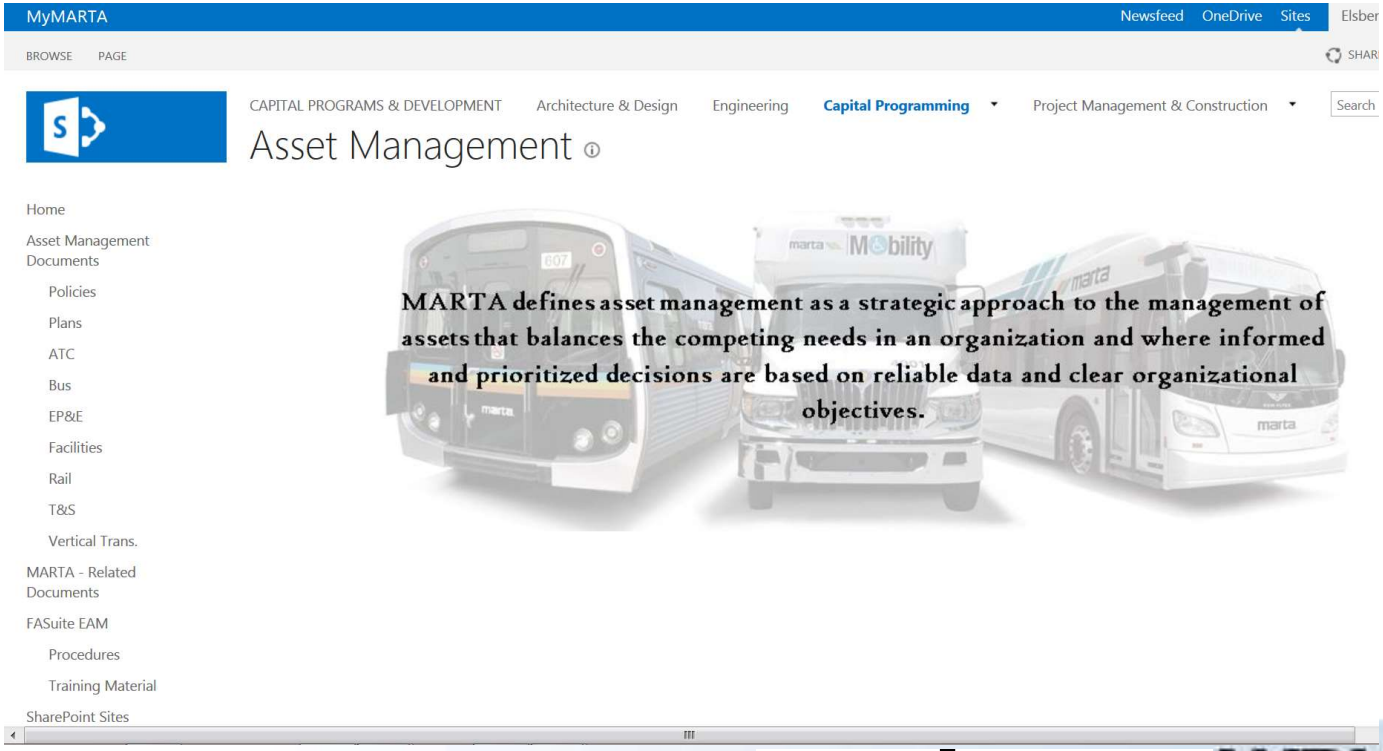
MARTA's SGR/AM Journey

4. **MARTA partnered with Trapeze EAM to create a capital program module.**
   a. **This was a collaborative effort involving MARTA's Asset Managers and Trapeze Product Managers.**
   b. **This module is used to package replacement/rehab projects for executive approval.**
   c. **MARTA implemented a decision software for senior management to approve these projects.**

MARTA's SGR/AM Journey

5. **MARTA furthered their investment in this effort by creating a "Capital Asset Manager" position.**
   a. **The CAP was charged with the following tasks:**
      - **Data scrubbing**
      - **Strategic Asset Management Plan (SAMP) creation**
      - **Assist asset owners with Asset Management Plan (AMP) creation**
      - **Populate Federally required databases and reports**
      - **Monitor overall SGR and AM efforts from all asset owners**

MARTA's SGR/AM Journey



MARTA's SGR/AM Journey

2018: Advanced training and IAM certifications in preparation for ISO certification.

New ISO 55000 standards for asset management introduced 2014

2016: Implementation of EAM Capital Planning Module

FTA publishes "Asset Management Guide" / New GDOT requirement for SSPP Element 22: Transit Asset Management in 2013

Year 2014 – Started Implementation of Capital Planning module; Executive management signed revised Asset Management Policy

FTA MAP-21 standards for asset management published in 2012

Year 2013 – Implemented Expert Choice project decision software.

Year 2012 - With EAM vendor, started development of a new Capital Planning module; Executive management signed formal Asset Management Policy; MARTA awarded a second grant for $343.2K for ISO certification.

Year 2011 - Phase 1 of the Asset Management Program included implementation of new FASuite capabilities.

Year 2010 – MARTA received a 1.36M FTA grant to advance the Asset management Program; Conducted an asset condition assessment.

Year 2009 - conducted a comprehensive assessment of safety critical systems.

Year 2006 – MARTA implemented a new electronic Enterprise Asset Management System

Federal Regulations
(Transit Asset Management)
(State of Good Repair)

Federal Transit Administration

TAMS and SAMPS and AMPS OH MY!

Federal Regulations

(State of Good Repair)

Updated 3/27/17

FTA
FEDERAL TRANSIT ADMINISTRATION

State of Good Repair

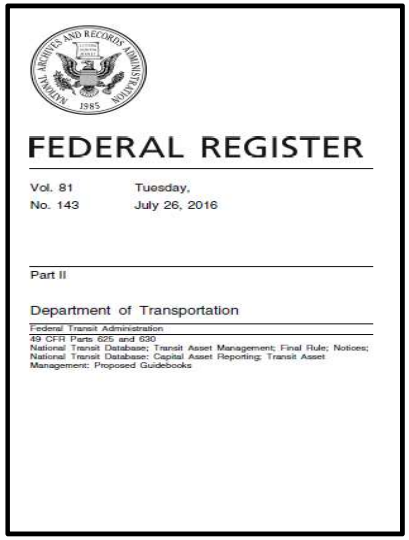
The purpose of the Final Rule is to help achieve and maintain a state of good repair (SGR) for the nation's public transportation assets. Transit asset management is a business model that uses transit asset condition to guide the optimal prioritization of funding. Currently, there is an estimated $85.9 billion transit SGR backlog.

The regulations apply to all Transit Providers that are recipients or subrecipients of Federal financial assistance under 49 U.S.C. Chapter 53 and own, operate, or manage transit capital assets used in the provision of public transportation.

State of Good Repair

The condition in which a capital asset is able to operate at a full level of performance. A capital asset is in a state of good repair when that asset:

1. Is able to perform its designed function,
2. Does not pose a known unacceptable safety risk, and
3. Its lifecycle investments must have been met or recovered.



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Part II

Department of Transportation

Federal Transit Administration

49 CFR Parts 625 and 630
National Transit Database; Transit Asset Management; Final Rule; Notices; National Transit Database: Capital Asset Reporting; Transit Asset Management: Proposed Guidebooks

Federal Regulations

(State of Good Repair)

In 2012, MAP-21 mandated FTA to develop a rule establishing a strategic and systematic process of operating, maintaining, and improving public capital assets effectively through their entire life cycle.

The TAM Final Rule 49 USC 625 became effective Oct. 1, 2016 and established four performance measures. The performance management requirements outlined in 49 USC 625 Subpart D are a minimum standard for transit operators.

Providers with more data and sophisticated analysis expertise are allowed to add performance measures and utilize those advanced techniques in addition to the required national performance measures.

Federal Regulations

Category	Class	
Equipment	▪ Construction ▪ Service Vehicles	▪ Maintenance
Rolling Stock	▪ Railcars ▪ Buses ▪ Other Passenger Vehicles	▪ Ferries
Infrastructure	▪ Fixed Guideway ▪ Signal Systems ▪ Structures	▪ Power
Facilities	▪ Support Facilities ▪ Passenger Facilities	▪ Parking Facilities

Federal Regulations
TAMS

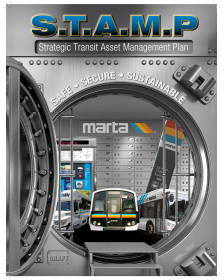
Federal Transit Administration

Transit Asset Management Plans are a requirement for all agencies receiving federal funding.

1. **TAM Plans Must Include**
   a) **Asset Inventory**
   b) **Condition Assessment (Fixed Guideway Excluded)**
   c) **Performance Measure Targets**

Federal Regulations

TAM Plans



- Transit provider's vision
- Executive-level direction to support the goals of the TAM program
- Documented commitment to achieving SGR
- Defined TAM objectives Defined and assigned roles and responsibilities

Federal Regulations

TAM Plan Elements

1.	Inventory of Capital Assets	**All Providers** (Tier I & II) I II
2.	Condition Assessment	
3.	Decision Support Tools	
4.	Investment Prioritization	
5.	TAM and SGR Policy	**Tier I only** I
6.	Implementation Strategy	
7.	List of Key Annual Activities	
8.	Identification of Resources	
9.	Evaluation Plan	

Federal Transit Administration

Performance Metrics and Targets

Form Name: Transit Asset Management Plan Performance Metrics and Targets

Line No.	Performance Measure	Annual Target	Annual Performance	Difference	Row Complete Yes / No
1	Percentage of revenue vehicles that have met or exceeded their useful life benchmark				No
2	Percentage of service vehicles that have either met or exceeded their useful life benchmark		0%	0%	No
3	Percentage of track segments, signals, and systems with performance restrictions				No
4	Percentage of Passenger and Maint. facilities rated below condition 3 on the condition scale			0%	No

Infrastructure Asset Classes

Federal Regulations

Reporting Infrastructure Inventory in NTD

Asset Category	Previous Reporting (Performance)	New Reporting (Performance)
Infrastructure	Inventory Only (No performance reporting)	Average Annual Restrictions: Miles of speed-restricted track miles as of 9:00 AM on the first Wednesday of each month* Annual Target: Average percentage of track segments with performance restrictions by class

NTD Reporting

Fixed Guideway

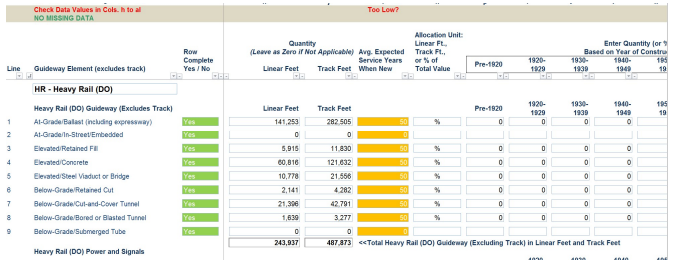
The NTD Inventory Form is submitted each year and contains a breakdown of the fixed guideway assets.

This form is designed to capture quantity and the year the asset came into service.

Examples:

Ballasted Track
Elevated Aerials
Single Crossovers
Etc.

Tangents
Curves
Double Crossovers



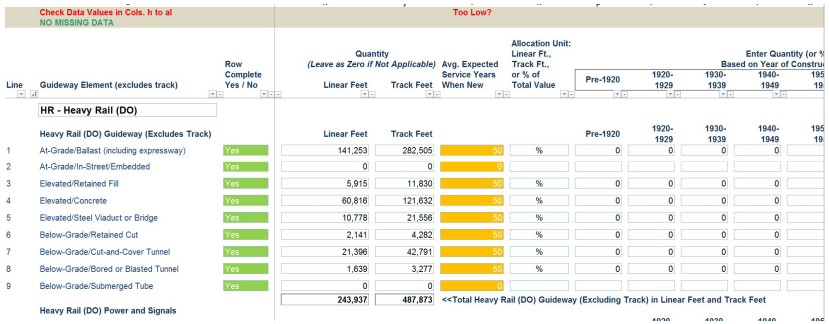
Line	Guideway Element (excludes track)	Row Complete Yes / No	Quantity (Leave as Zero if Not Applicable) Linear Feet	Track Feet	Avg. Expected Service Years When New	Allocation Unit: Linear Ft., Track Ft., or % of Total Value	Pre-1920	1920-1929	1930-1939	1940-1949	195 19
	HR - Heavy Rail (DO)										
	Heavy Rail (DO) Guideway (Excludes Track)		Linear Feet	Track Feet			Pre-1920	1920-1929	1930-1939	1940-1949	195 19
1	At-Grade/Ballast (including expressway)	Yes	141,253	282,505	40	%	0	0	0	0	
2	At-Grade/In-Street/Embedded	Yes	0	0	40						
3	Elevated/Retained Fill	Yes	5,915	11,830	40	%	0	0	0	0	
4	Elevated/Concrete	Yes	60,816	121,632	40	%	0	0	0	0	
5	Elevated/Steel Viaduct or Bridge	Yes	10,778	21,556	40	%	0	0	0	0	
6	Below-Grade/Retained Cut	Yes	2,141	4,282	40	%	0	0	0	0	
7	Below-Grade/Cut-and-Cover Tunnel	Yes	21,396	42,791	40	%	0	0	0	0	
8	Below-Grade/Bored or Blasted Tunnel	Yes	1,639	3,277	40	%	0	0	0	0	
9	Below-Grade/Submerged Tube	Yes	0	0	40						
			243,937	487,873		<<Total Heavy Rail (DO) Guideway (Excluding Track) in Linear Feet and Track Feet					
	Heavy Rail (DO) Power and Signals										

NTD Reporting

Fixed Guideway

Of special note:

- Substation buildings
- Substation Equipment
- Train Control and Signaling



Check Data Values in Cols. h to al — NO MISSING DATA — Too Low?

Line	Guideway Element (excludes track)	Row Complete Yes / No	Quantity (Leave as Zero if Not Applicable) Linear Feet	Quantity Track Feet	Avg. Expected Service Years When New	Allocation Unit: Linear Ft., Track Ft., or % of Total Value	Enter Quantity (or % Based on Year of Construc Pre-1920	1920-1929	1930-1939	1940-1949	195 19
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			243,937	487,873	<<Total Heavy Rail (DO) Guideway (Excluding Track) in Linear Feet and Track Feet						
	Heavy Rail (DO) Power and Signals										

Are all reported on the Infrastructure Inventory Form.

Example of NTD Reporting

Fixed Guideway

Check Data Values in Cols. h to al
NO MISSING DATA

Too Low?

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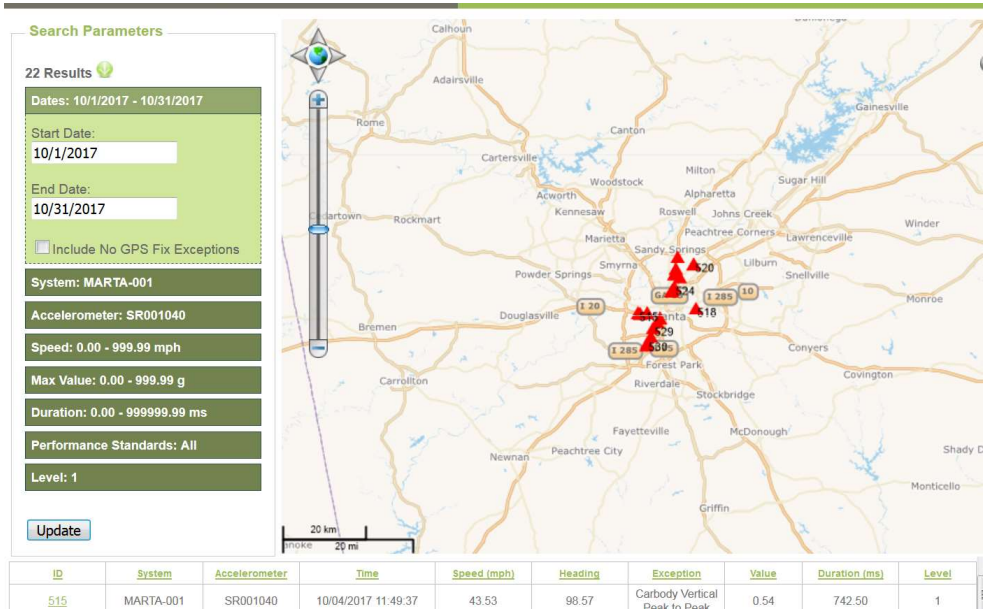
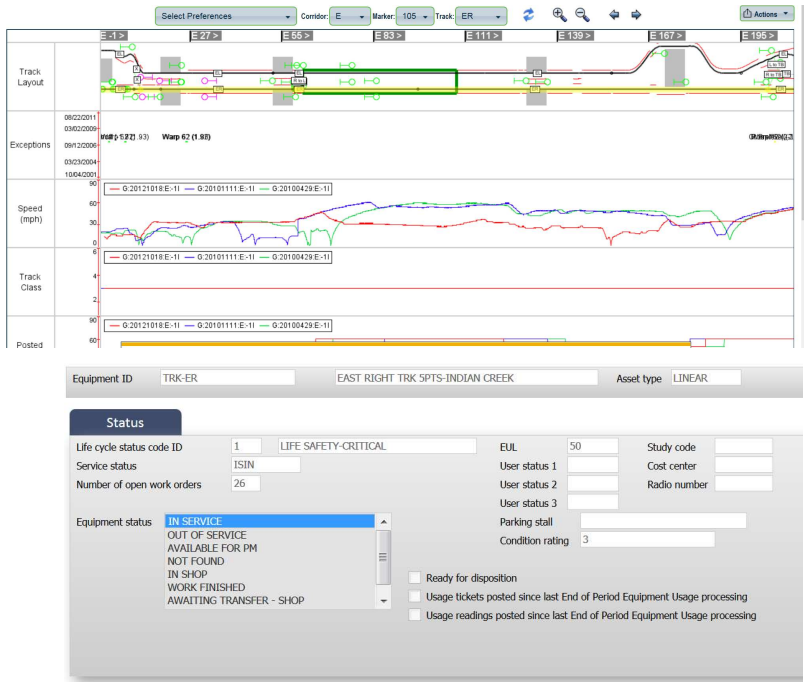
Infrastructure Asset Classes

- Although percentage of trackway under a performance restriction is currently the only SGR reporting requirement to FTA/NTD, this **does not** guarantee your system is in SGR!
- Agencies should implement condition rating processes for components within the fixed guideway class.
- Track Quality Indexes, Rail Profile Measurements, Geometry, Ultrasonic Rail Inspections, etc. should continue to be utilized as these fit the TAM requirements for Capital Planning.

Infrastructure Asset Classes

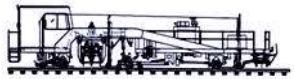




Infrastructure Condition Assessment

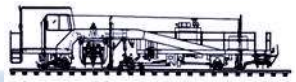
- One method that can be implemented is utilizing the “Term” scale to rate track and guideway components.

TERM Rating	Condition	Description
Excellent	4.8–5.0	No visible defects, near-new condition.
Good	4.0–4.7	Some slightly defective or deteriorated components.
Adequate	3.0–3.9	Moderately defective or deteriorated components.
Marginal	2.0–2.9	Defective or deteriorated components in need of replacement.
Poor	1.0–1.9	Seriously damaged components in need of immediate repair.

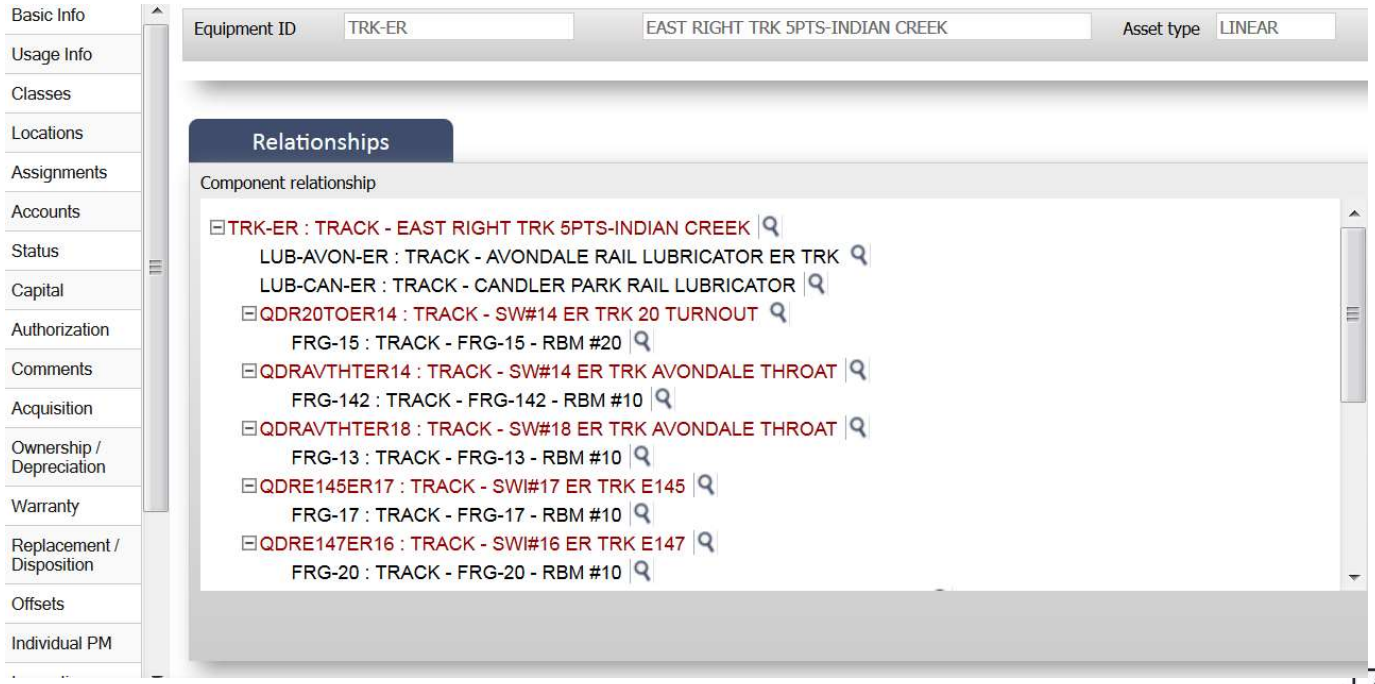


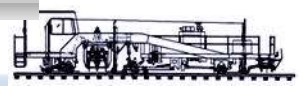
Infrastructure SGR

- An overall score of 3 or greater is generally considered as State of Good Repair.
- It is important to have a relevant Asset Breakdown Structure or (ABS).
- Historically this has been a challenge with linear assets.

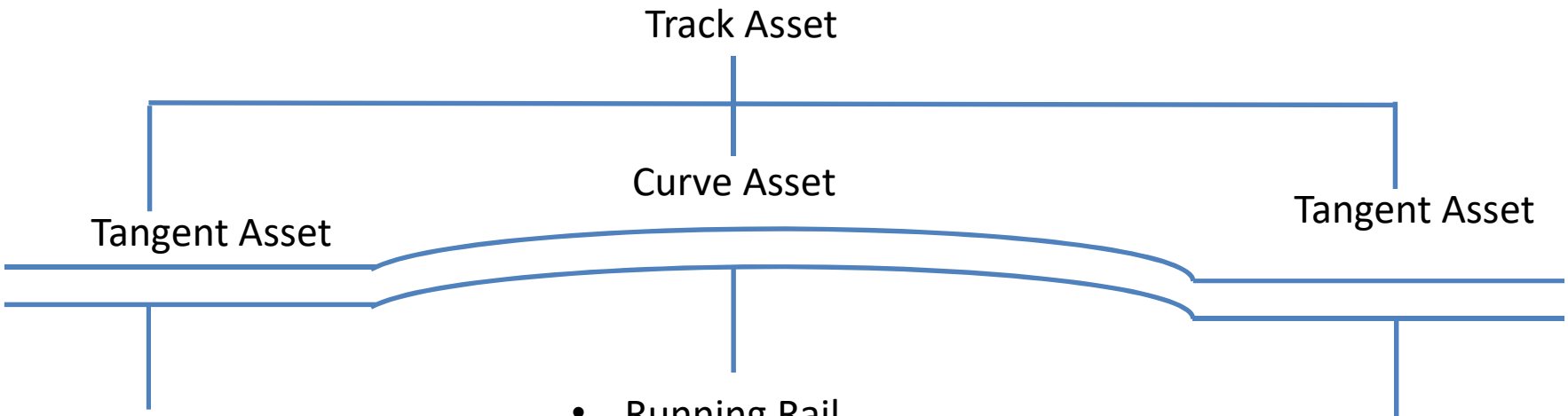


Asset Breakdown Strucutre





Track Asset Breakdown Structure



- Running Rail
- Rail Fasteners
- Crossties
- Contact Rail
- 3rd Rail Insulators

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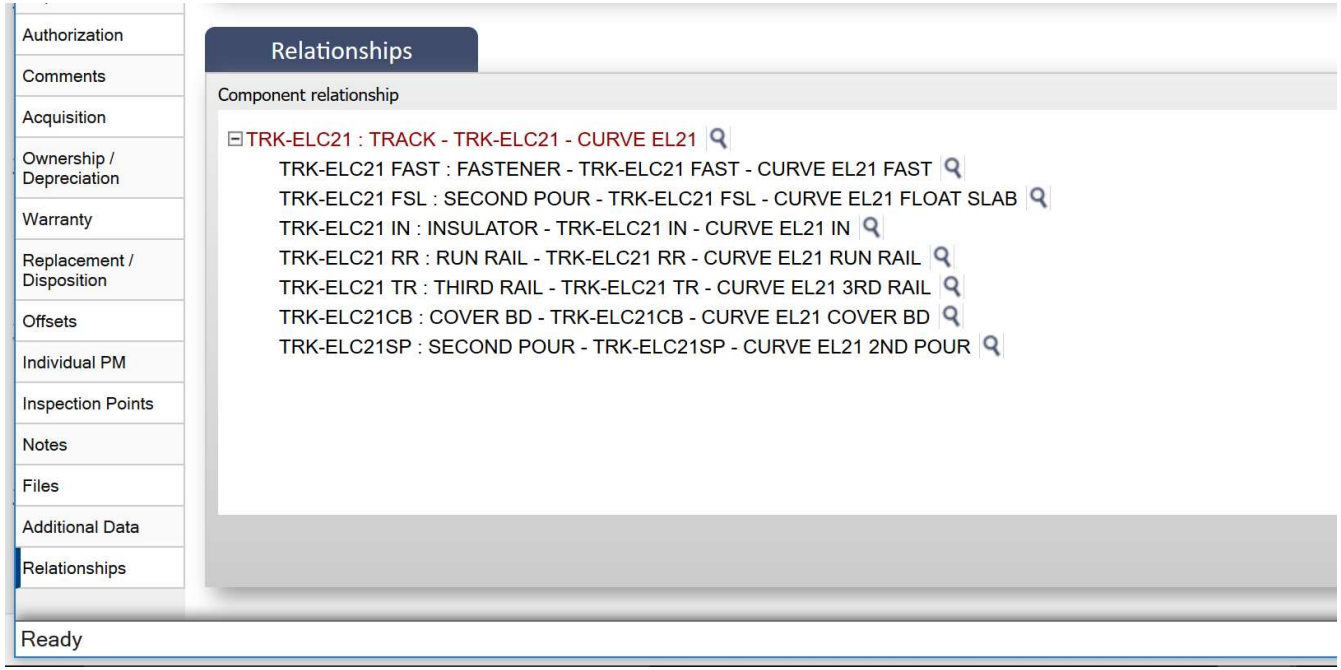
Asset Breakdown Strucutre



Rolling Stock Assets

Equipment/Rolling Stock Assets

Equipment and Rolling Stock

Category	Example asset class/mode/type
Equipment	■ Construction Vehicles ■ Non-revenue Service Vehicles ■ Maintenance Vehicles
Rolling Stock	■ Railcars ■ Buses ■ Ferries ■ Other Passenger Vehicles

Federal Regulations

Equipment and Rolling Stock

- Recipients of Section 5310 funding will start reporting their inventory or rolling stock to the NTD starting in FY 2018.
  - ULB for each asset class
  - Data historically reported

- TAM Plan
  - Agency may choose to inventory and assess the condition of rolling stock differently, such as documenting each vehicle separately, including mileage, **documenting condition qualitatively**, or using the **TERM** scale.

Federal Regulations

Sample Default ULBs

Revenue Vehicle Type	Default Useful Life Benchmark	Useful Life in Grant Programs
Automated Guideway Vehicle (AG)	31	12
Bus (BU)	14	12
Cutaway Bus (CU)	10	10
Ferryboat (FB)	42	25
Heavy Rail Passenger Car (HR)	31	30
Light Rail Vehicle (LR)	31	25
Commuter Rail Locomotive (RL)	39	30
Trolleybus (TB)	14	12
Van (VN)	8	7

Term Scale

TERM Rating	Condition	Description
Excellent	4.8–5.0	No visible defects, near-new condition.
Good	4.0–4.7	Some slightly defective or deteriorated components.
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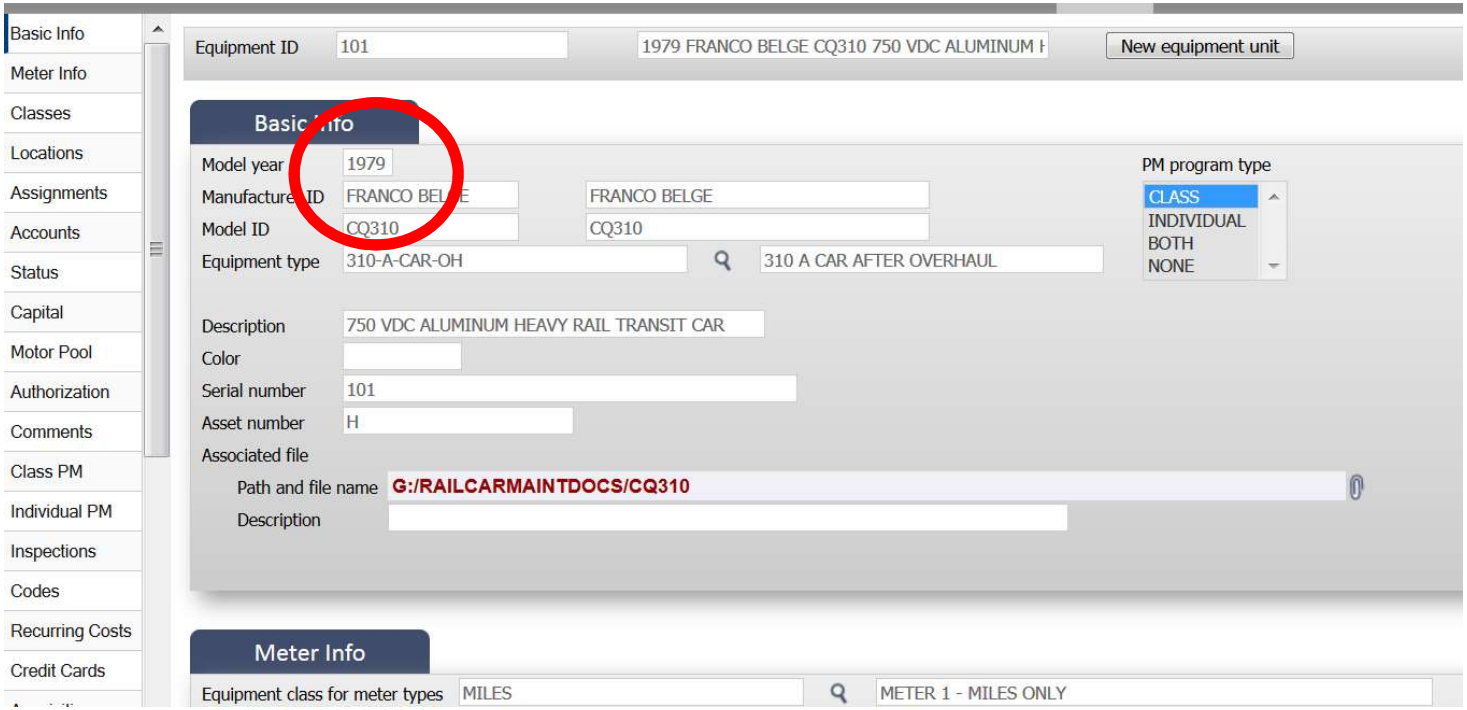
MARTA's Condition Scale

Condition rating

ID	Description
0	FAILED
1	POOR
2	SUBSTANDARD
3	ADEQUATE
4	GOOD
5	EXCELLENT

Rolling Stock Asset Class



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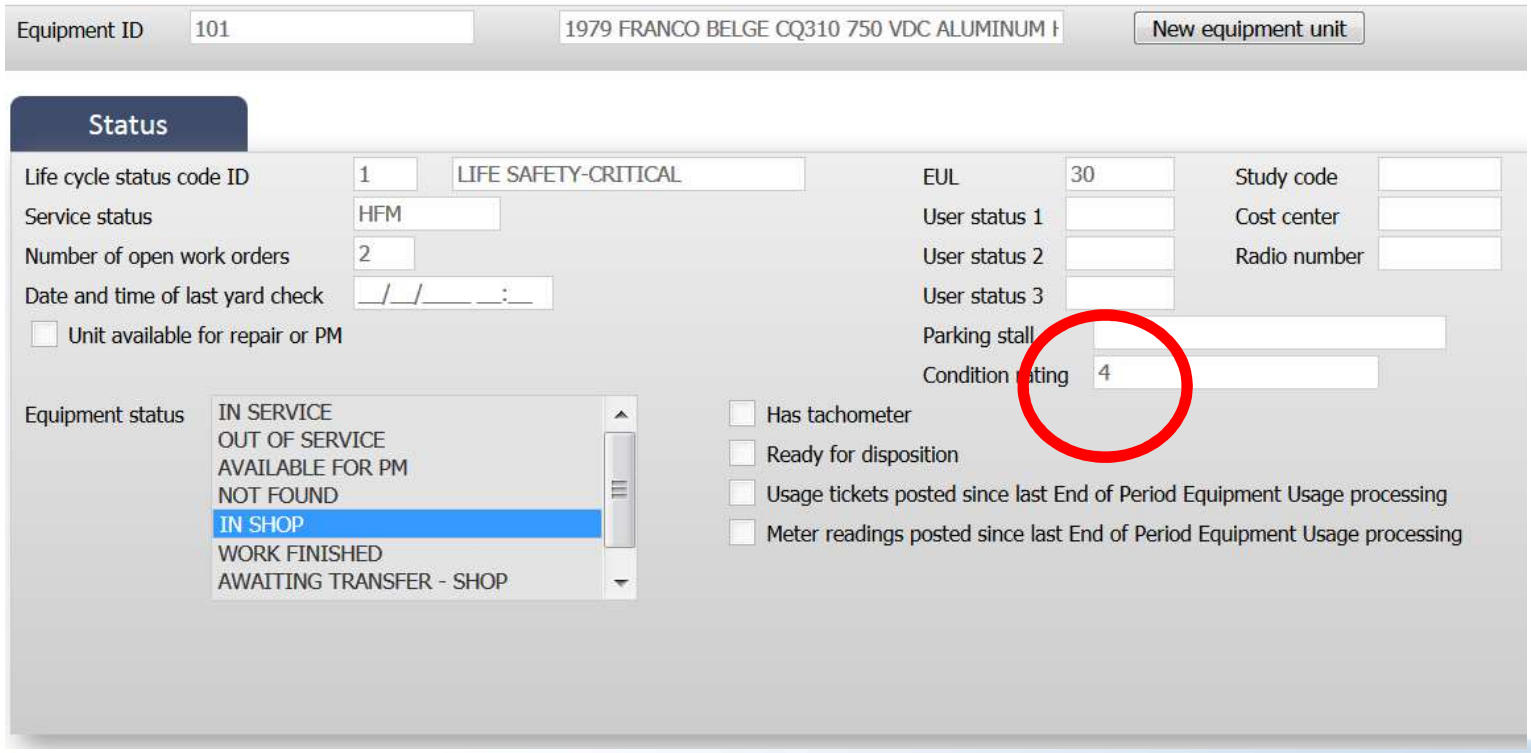
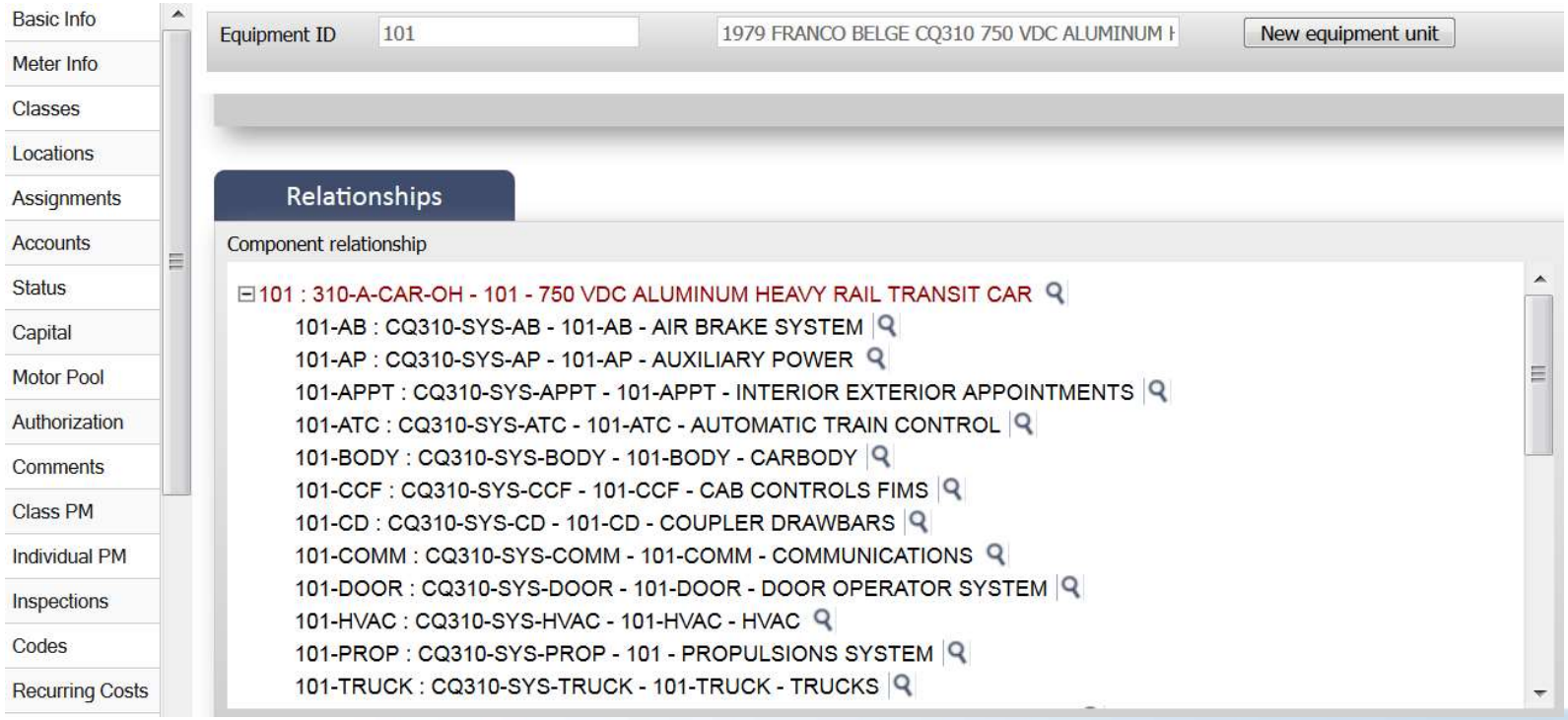


Rolling Stock Asset Class



Example of NTD Reporting

Rolling Stock/Fleet

Year Manufactured	Year Rebuilt	Fuel Type	Dual Fuel Type	Vehicle length	Seating capacity	Standing Capacity	Ownership Type	Funding Type	ADA Accessible Vehicles	Supports Another Mode/TOS	Emergency Contingency Vehicles	Useful Life Benchmark	Useful Life Remaining	Miles This Year	Avg Lifetime Miles per Active Vehicle	Status
1979	2006	Electric Propulsion Power		75	65	33	OOPA	OF	2		0	40	2	177,564	2,103,374	Active
1979	2007	Electric Propulsion Power		75	65	33	OOPA	OF	10		0	40	2	908,211	2,200,909	Active
1979	2008	Electric Propulsion Power		75	65	33	OOPA	OF	34		0	40	2	2,780,094	2,616,863	Active
1980	2006	Electric Propulsion Power		75	65	33	OOPA	OF	2		0	40	3	198,744	1,819,050	Active
1980	2007	Electric Propulsion Power		75	65	33	OOPA	OF	8		0	40	3	544,229	2,394,991	Active
1980	2008	Electric Propulsion Power		75	65	33	OOPA	OF	24		0	40	3	2,035,578	2,768,792	Active
1981		Electric Propulsion Power		75	66	33	OOPA	OF			20	40	4			Emergency
1981	2007	Electric Propulsion Power		75	65	33	OOPA	OF	10		0	40	4	944,703	2,082,503	Active
1981	2008	Electric Propulsion Power		75	65	33	OOPA	OF	6		0	40	4	380,736	2,853,195	Active
1984	2005	Electric Propulsion Power		75	65	33	OOPA	OF	2		0	40	7	156,588	1,647,258	Active
1984	2006	Electric Propulsion Power		75	65	33	OOPA	OF	2		0	40	7	160,833	2,328,387	Active
1984	2007	Electric Propulsion Power		75	65	33	OOPA	OF	2		0	40	7	186,648	3,070,538	Active
1985	2006	Electric Propulsion Power		75	65	33	OOPA	OF	26		0	40	8	2,168,093	2,890,352	Active
1985	2007	Electric Propulsion Power		75	65	33	OOPA	OF	16		0	40	8	1,171,822	2,833,084	Active
1985	2008	Electric Propulsion Power		75	65	33	OOPA	OF	2		0	40	8	195,300	2,701,210	Active
1986	2006	Electric Propulsion Power		75	65	33	OOPA	OF	2		0	40	9	188,062	2,862,855	Active
1986	2008	Electric Propulsion Power		75	65	33	OOPA	OF	2		0	40	9	193,755	2,920,683	Active
1987	2005	Electric Propulsion Power		75	65	33	OOPA	OF	4		0	40	10	358,257	2,310,836	Active
1987	2006	Electric Propulsion Power		75	65	33	OOPA	OF	10		0	40	10	741,296	2,704,112	Active
1987	2007	Electric Propulsion Power		75	65	33	OOPA	OF	8		0	40	10	496,870	2,812,994	Active
1987	2008	Electric Propulsion Power		75	65	33	OOPA	OF	18		0	40	10	1,580,293	2,722,077	Active
1987	2009	Electric Propulsion Power		75	65	33	OOPA	OF	2		0	40	10	154,262	2,796,144	Active
1988	2006	Electric Propulsion Power		75	65	33	OOPA	OF	4		0	40	11	247,512	2,517,417	Active

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TERM

FTA TERM Federal

What is TERM Federal?

- Transit Economic Requirements Model
  - FTA's Capital Needs Analysis Tool
  - National level analysis of:
    - State of Good Repair backlog
    - Asset conditions
    - 20-year projection of reinvestment needs
    - Impact of variations in funding
  - Supports biennial C&P Report to Congress and related studies

Resources

Federal Transit Administration (TAM)
https://www.transit.dot.gov/TAM

https://www.transit.dot.gov/regulations-and-guidance/asset-management/state-good-repair

American Public Transportation Association
http://www.apta.com/resources/standards/state-of-good-repair/Pages/default.aspx