

Asset Management & State of Good Repair: Planning for a smarter tomorrow



Transit Asset Management:

Asset Management involves the balancing of costs, opportunities and risks against the desired performance of assets, to achieve the organizational objectives.

Source: ISO55000

State of Good Repair

The condition in which a capital asset is able to operate at a **full level of performance**. This means the asset:

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

What is an Asset?

Any tangible item of a defined value; based on cost or criticality to service, that is owned, leased, or maintained by RTD, or a subcontractor, which may at some point after its useful life require a capital repair or replacement.

SGR Grants Program

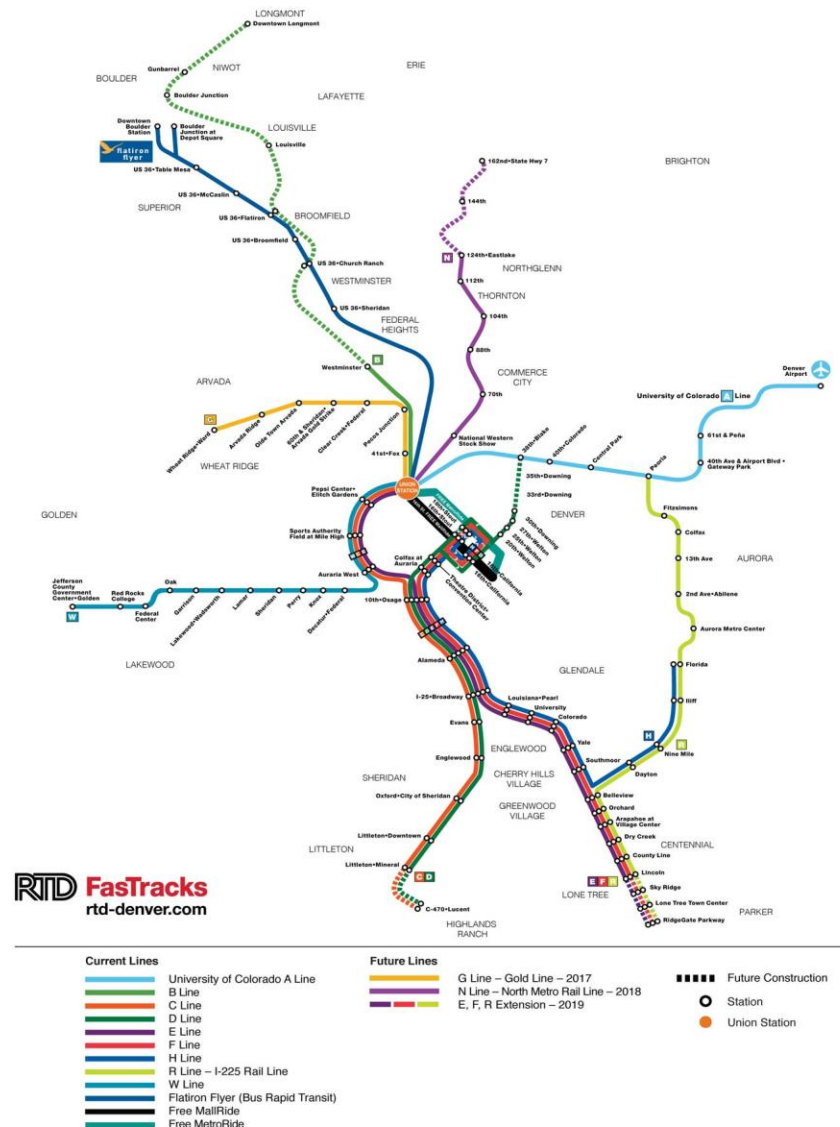
These grants are to assist agencies with major repair, refurbishment, and/or replacement of assets no longer in a state of good repair.

What does this have to do with my group?

- Every division has projects or assets
 - Forecasting when best to replace assets
 - Based on risk and condition rather than age alone
 - Better data can help to get them prioritized correctly
- Better stewards of taxpayers' money
 - 50% of RTD' s funds are tax based

RTD Overview

- **Regional Transportation District in Denver**, or RTD, started operation in 1972
- RTD has a service area of 2,410 square miles in eight counties
- RTD employs about 2,500 people
- RTD has over 140 bus routes, 80 Park-n-Rides, 10,000 stops
- RTD has approximately 1,200 full size buses, 400 cut-a-way buses, 400 support vehicles.
- RTD has 9 light rail lines, 35 miles of track, 37 stations
- RTD has 174 Light rail vehicles, with 20 more on order
- RTD has 58 commuter rail vehicles
- Accessibility services, call-n-Rides, seasonal rides and many other programs
- Fastracks will add 5 new lines, approximately 35 miles of track for light and commuter rail, and over 35 new Stations and P-n-Rs



RTD's Asset Management program

- RTD's Board of Directors as part of a strategic objective put into place the goal to create an Asset Management program with a State of Good Repair component in 2010
- RTD created an Asset Management division and began the process of creating and implementing a State of Good Repair (SGR) program in July 2011
- Pilot program was completed in December of 2011 with program adoption

RTD's Asset Management Program

- The quick implementation of AM and SGR was made possible by the District's complete ERP upgrade in 2007
- Data is housed in an Enterprise Asset Management software (EAM) Trapeze, AssetWorks or "Maximus" database (historical data starting in 2007)
- AM and SGR reporting & analysis is preformed using ETLs (Extract, Transform and load process) to a data warehouse and using Oracles Business Intelligence Enterprise Edition (OBIEE 11g)

Paradigm Shift

- Different ways of thinking about long range budgeting
- Policy and procedure change must come from the top down
- Lifecycle costing versus lowest up front cost
- Monitoring back log of rebuild or replacements

Show Me the Money



Organization

2011 – Cost analyses done on hiring a consulting firm vs. using in-house resources

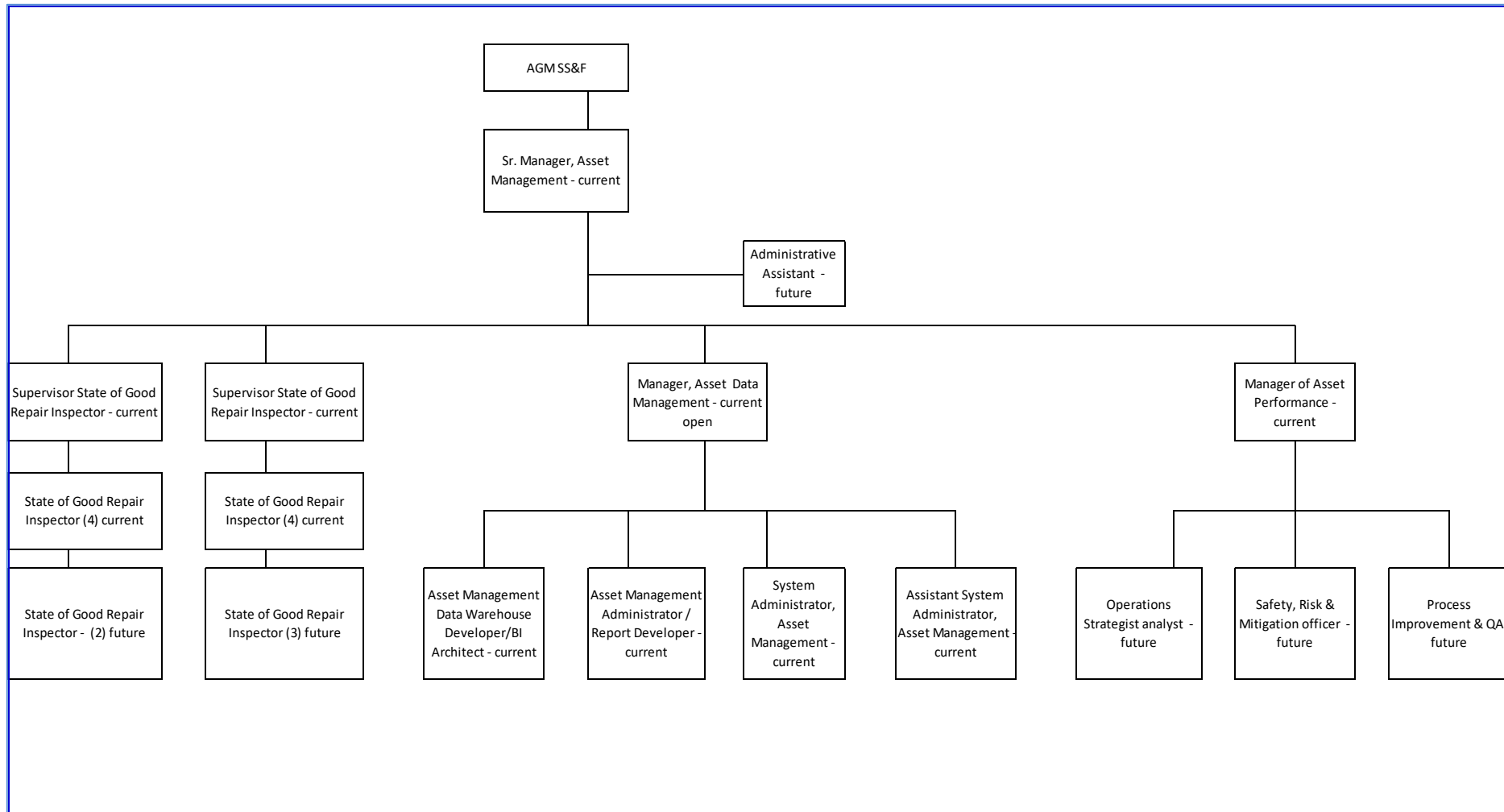
2012 – Approval of a three year roll out of AM division to include

- Manager
- Data group - 3
- SGR group – 9

2014 – Started reorg to move reporting to Executive Safety Officer and add additional positions

- Senior Manager
- Performance group - 4
- SGR group – 4

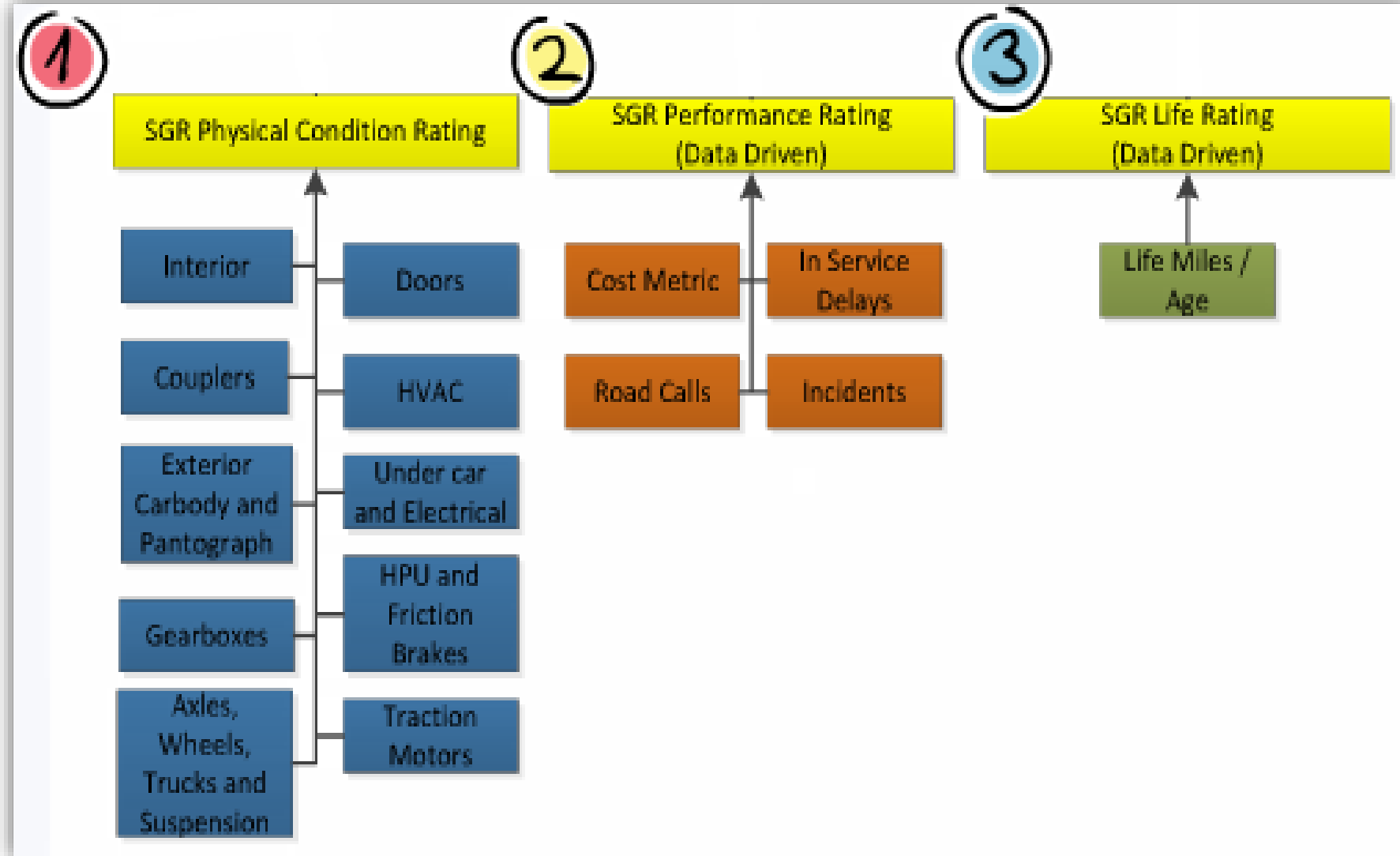
Org Chart

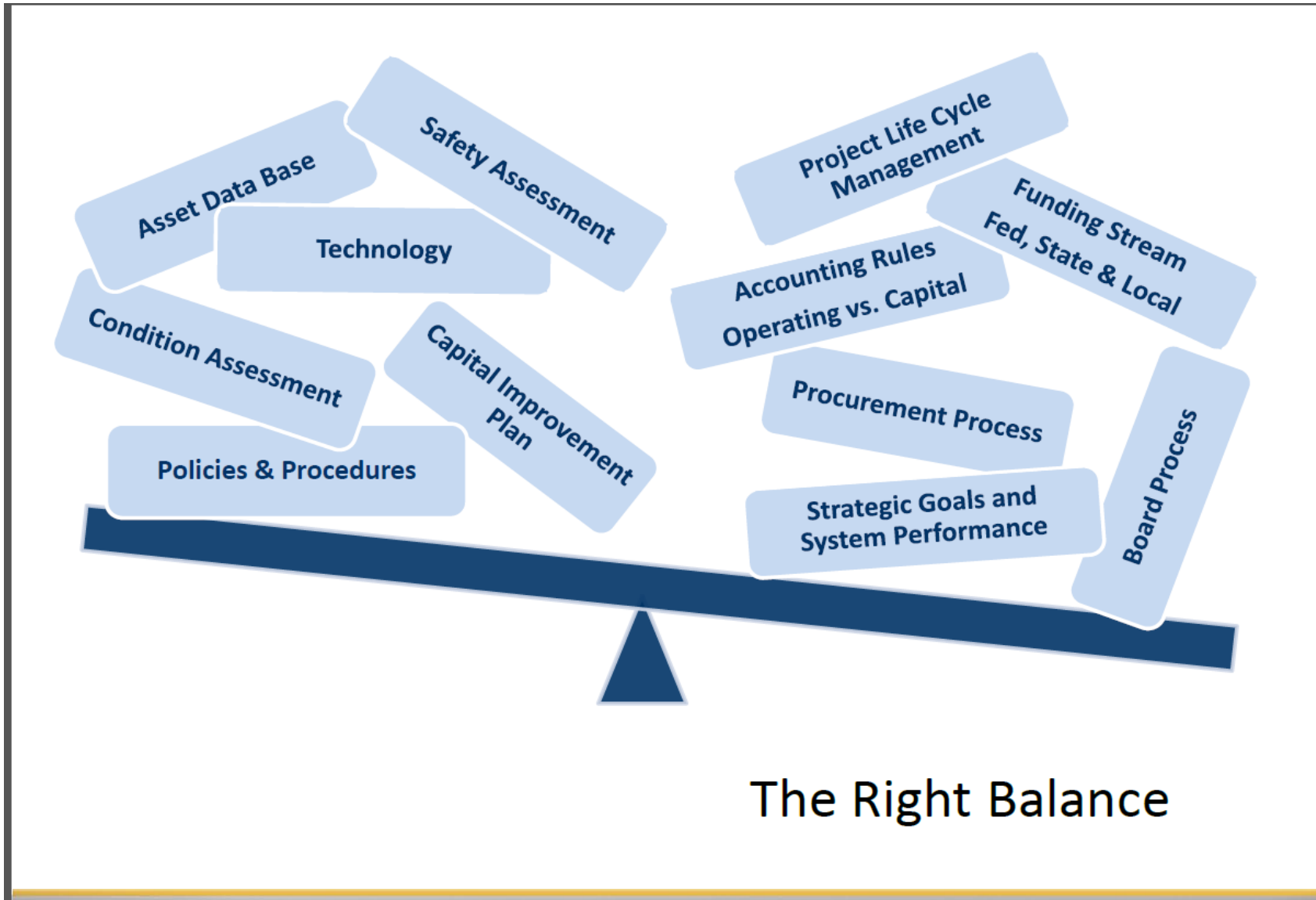


Structure



Monitoring RUFL



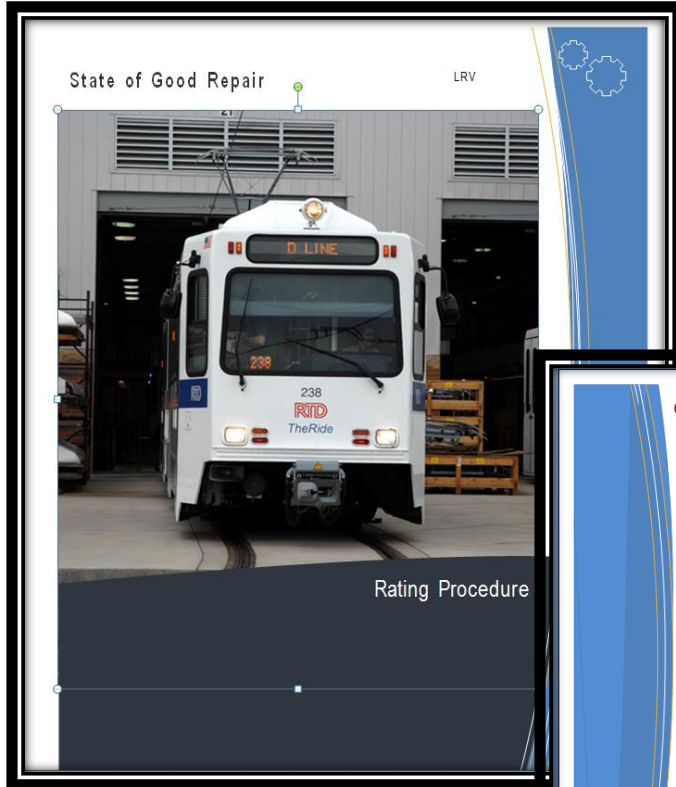


Preventive Maintenance and SGR



Does the term State of Good Repair imply that an asset's (or subsystem) preventive maintenance needs are met?

Ratings Inspections



Task Number	Equipment	Task
SGR1	Axles, Wheels & Tires, Trucks and Suspension	<ol style="list-style-type: none"> 1. Inspect wheels and tires for general condition and estimate approximate remaining tire life. 2. General inspection of axles, truck frames, shocks, primary and secondary suspension systems.
SGR2	Electro-Hydraulic Unit and Accumulators and Friction Brakes	<ol style="list-style-type: none"> 1. Using Assetworks generated report as the baseline mileage combined with system inspection. 2. Inspection of sanding system for damage or deterioration 3. Inspect Brake calipers, pads, rotors, reaction rods, mounts, lines, hoses and fittings.

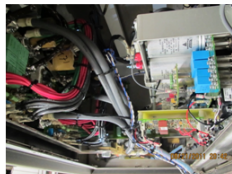
General Guidelines

General guidelines pertaining to all sections of the inspection:

- The State of Good Repair Inspection is to determine the overall condition of the "Asset" being inspected on this particular day at this particular time.
- In each section we are looking at the overall condition of the specified system listed including loose, damaged, leaking and deteriorated items. Good inspection practices include physically touching, shaking and using other mechanical measures to assess the overall condition of the Asset. You have a vast amount of experience and expertise in your field, please use this and communicate specialized information that we can include in these procedures to improve our product.


Administrative guide lines:

- A record of your inspection must be kept either in AssetWorks (Maximum) (Work Orders) or by completing a hard copy inspection sheet if you do not have the appropriate system access.
- During inspections, note any defects such as worn, broken, damaged, or defective components, and assemblies, and any loose or missing hardware that may constitute a safety or service concern. These defects requiring attention should be processed through the standard process to initiate repairs for your department.
- Stop the conditional rating inspection immediately, and report any defects that could compromise public safety. (Record this work on a Work Order or other standard means for your department separate from the inspection test). Completion of the ratings inspection should be done after the necessary actions of reporting have been taken. The defects found should be used in your initial assessment.
- Make sure that the AssetWorks (Maximum) test number appears on all documents associated with your inspection.
- Turn in all documents, records, defect reports, and other paperwork in to supervision.
- Turn in all documents, records, defect reports, and other paperwork to supervision. Mail a hard copy to Asset Management @ Bldg-40.



REMEMER PERSONAL AND PUBLIC SAFETY!

- Before beginning any work or test:
- Secure your work area if possible and make your presence known.
- Flag or cone off your work area if applicable
- Use extreme care when working with compressed air, heights, confined spaces, electrical systems or other areas of increased hazard.
- Use the provided personal protective equipment where applicable.
- Keep your work area clean. Remove unused materials. Keep hoses, cords and tools properly stored.
- The work environment presents constantly changing hazards. Remain aware of this and act accordingly.
- Follow all RTD established safety policies and procedures.
- **BE AND THINK SAFE**



YOUR INPUT IS KEY

Please take photos and give your feedback on the ratings procedure. Your feedback can be submitted direct to the SMO HUB page or sent to the Asset Management group for posting and update of materials. Together we can continue to improve the process making our ratings more consistent and increase our system efficiency.

Data Entry into FA Suite "Maximus"

Rating Scores are entered into the Test Results section of Maximus allowing for multiple reports out of FA Suite and OSBE.

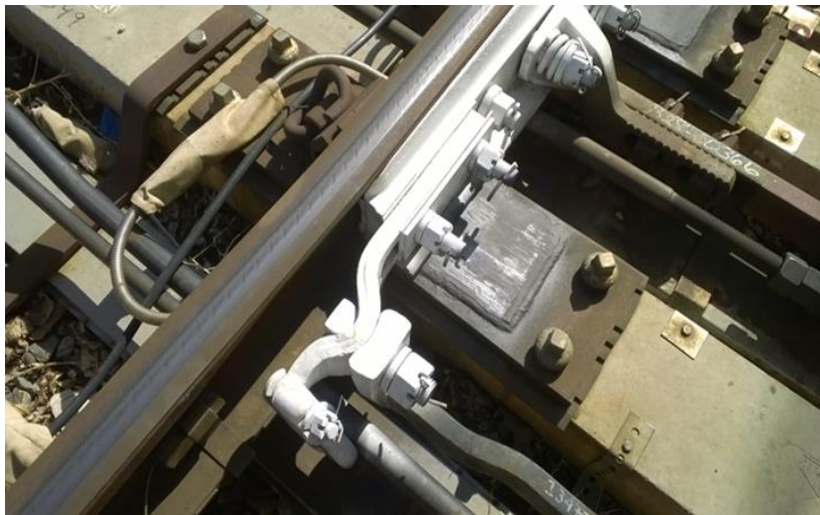
This can be found in Equipment Activity- Test Results

Accuracy and Consistency in Ratings are Key

The data entered into the system should be in .5 increments from 0-5

Current Conditions

Good Condition

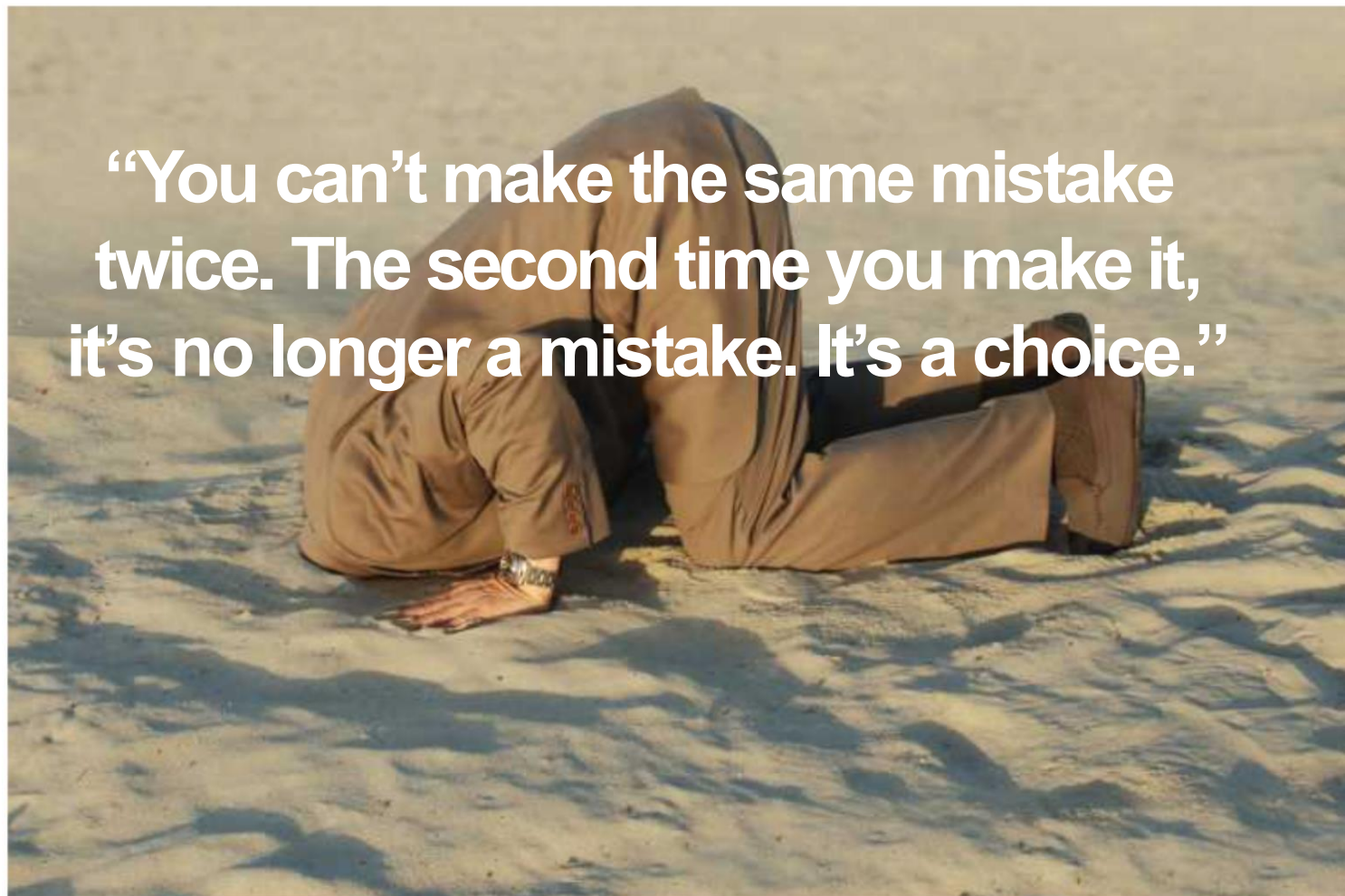


Not in a State of Good Repair



Lessons Learned

“You can’t make the same mistake twice. The second time you make it, it’s no longer a mistake. It’s a choice.”



Questions

- About this part of the presentation?
- Short break



ASSETS

CFR Part 625

Transit Asset Management Final Rule

- A. General Provisions
- B. National Transit Asset Management System
- C. Transit Asset Management Plans
- D. Performance Management
- E. Recordkeeping and Reporting Requirements

TAM Plan Elements

1. Inventory of Capital Assets
2. Condition Assessment
3. Decision Support Tools
4. Investment Prioritization

All Providers
(Tier I & II)



5. TAM and SGR Policy
6. Implementation Strategy
7. List of Key Annual Activities
8. Identification of Resources
9. Evaluation Plan

Tier I only



Timelines

- Final Rule Oct 1, 2016
- SGR Targets Jan 1, 2017
- Initial TAM Plans Oct 1, 2018
- Plan covers 4 years
 - Updated entirely every 4 years
 - Amended during the 4 years
- Targets for Performance Measures
 - Set and reported annually for each asset class
 - Supported by Data (Condition, Performance and financial projections)
- Reporting Inventory and Condition 2018
- Narrative Report 2019

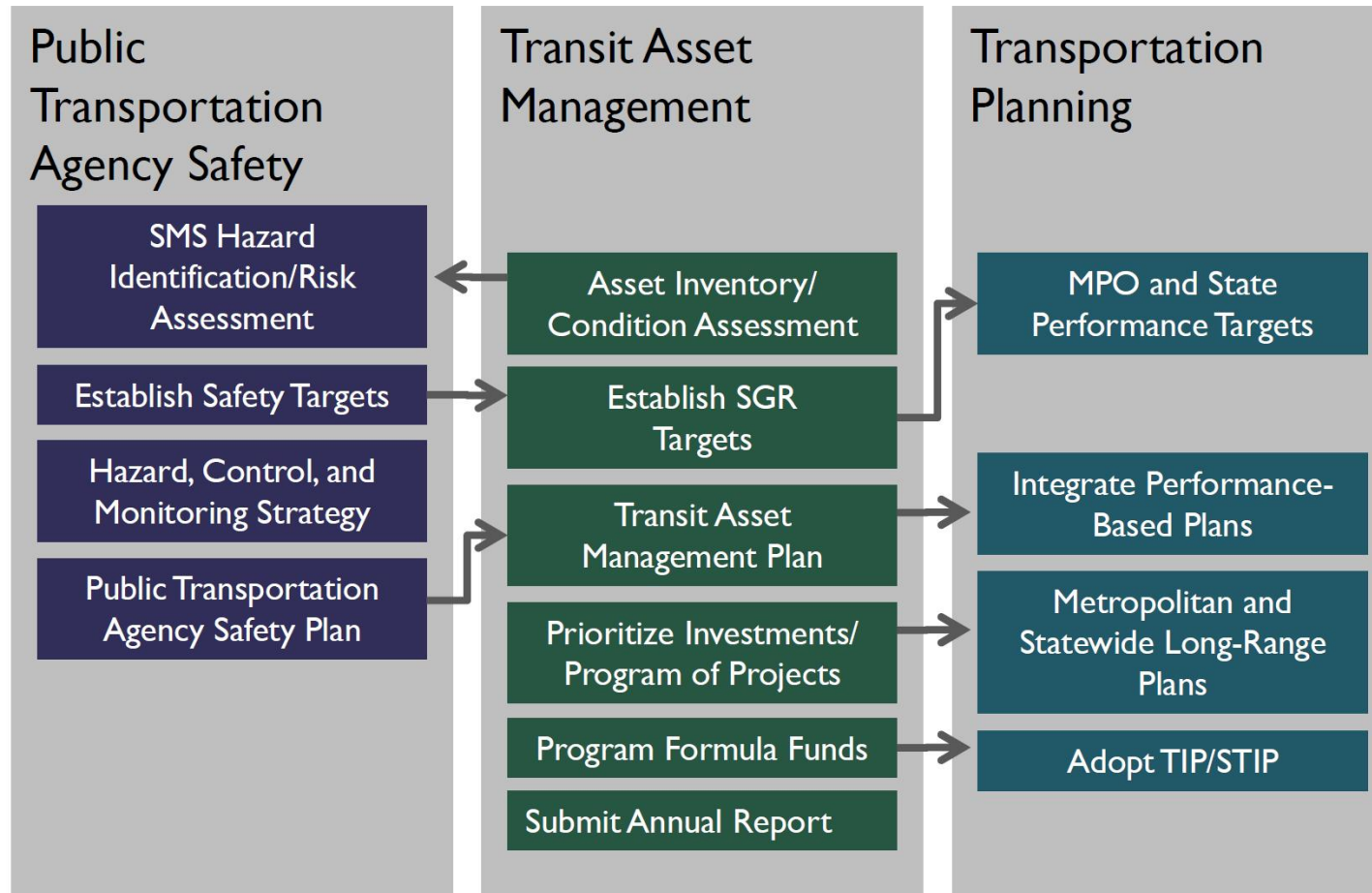
Annual Reporting / Records Requirements

- Data Reports
 - Projected performance targets
 - System Condition and Performance Reports
- Narrative Report
 - Change in condition
 - Progress toward targets
- Maintain Records support TAM Plan
 - Share with MPO (TAM Plan, performance targets, investment strategies, annual condition assessments)

Certification

- TAM Plans are Self-Certified by the Accountable Executive
- FTA will update Certifications and Assurances to reflect TAM Plan requirements
- FTA will review TAM Plans and Programs during Triennial and State Management Reviews

Linking Proposed Regulations



Data Quality

If the quality of data is low then decisions based on this data without external input cannot exceed our level of confidence in the data.

FTA Rule Making Targets



“Section 625.25 lists the TAM plan requirements, including an asset inventory, condition assessments, a description of analytical processes or decision-support tools used to estimate and prioritize capital investment needs over time, and a project-based prioritization of investments.”

FTA TAM Final Rule

Tools & Software Agnostic

A man shall not say he knows or believes that which he has no scientific grounds for professing to know or believe.

– Thomas Henry Huxley



What We Use (Our Tools)

Transactional Data

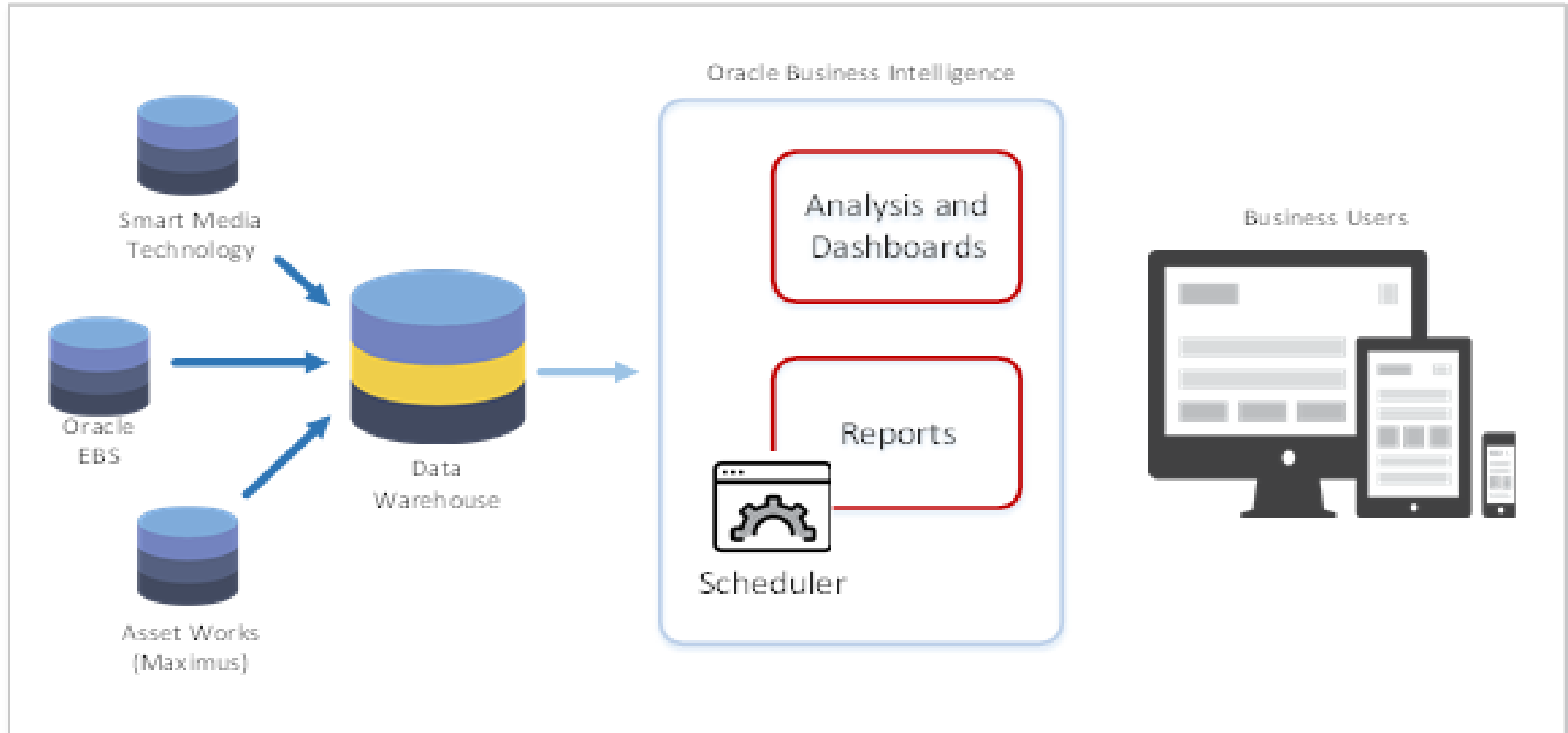
- Asset Works (Trapeze EAM)
- Oracle EBS

Analysis & Visualization

- Oracle OBIEE
- Tableau

How do we make them work as part of a bigger system?

Data Work-Flow



Asset Records

Help Pre

Search
 Reload
 Sort

Filter
 Sort

New
 Copy
 Delete
 Edit
 Save
 Cancel
 Export

Grid View
Map View

Row #	Work order ID	Job status	Equipment ID	Job type	Priority ID	Repair reason ID
1	ELASC-2017-246	CLOSED	LRV101	PM	3	03
2	ELAMA-2017-1455	CLOSED	LRV101	REPAIR	3	02
3	ELAMA-2017-1365	CLOSED	LRV101	REPAIR	3	02
4	ELAMA-2017-1170	CLOSED	LRV101	PM	3	03
5	ELAMA-2017-791	CLOSED	LRV101	PM	3	03
6	ELASC-2017-08	CLOSED	LRV101	PM	3	02

Work order ID

Equipment ID

Job status

Current work delay

Basic Info

Job type	REPAIR PM	Equipment ID	LRV101	License number		Date and time out of service	02/06/2017 14:46			
Meter 1	229140	Meter 1 validation		Life meter 1 usage	1229140	Date and time in	02/06/2017 14:46			
Meter 2	0	Meter 2 validation		Service status	AVAILABLE	Date and time due	02/08/2017 14:46			
Account ID	01.4203.52401.0000.0000		LIGHT RAIL REPAIR PARTS			Date and time opened	<input type="checkbox"/> 02/06/2017 14:46			
Priority ID	3	NORMAL PRIORITY INTERNAL SHOP PRIORITY 2 DAYS					Date and time first labor	02/07/2017 00:29		
Employee ID							Shop downtime begin	<input type="checkbox"/> / / : :		
Vendor ID							Shop downtime end	<input type="checkbox"/> / / : :		
Repair reason ID	02	NON-SCHEDULED	PM service					User downtime begin	<input type="checkbox"/> / / : :	
Repair site	01	FACILITY	PM scheduled					User downtime end	<input type="checkbox"/> / / : :	
Work class							Date and time finished	<input checked="" type="checkbox"/> 02/13/2017 16:20		
Warranty work	UNKNOWN		<input type="checkbox"/> Estimate	<input checked="" type="checkbox"/> Approved					Date and time closed	<input checked="" type="checkbox"/> 02/13/2017 16:21
	YES								Date and time in service	<input checked="" type="checkbox"/> 02/13/2017 16:20
	NO									

Data to Information



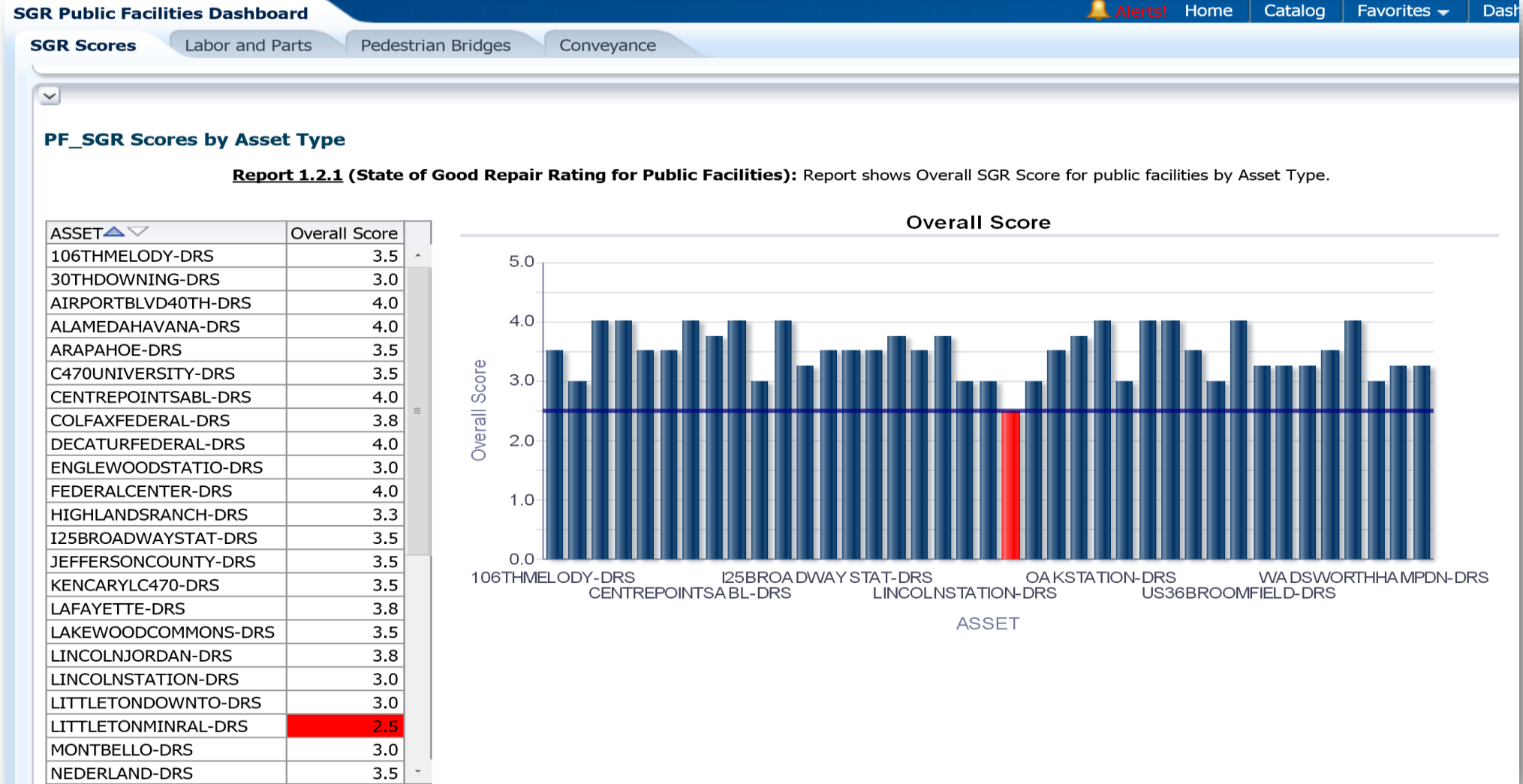
RTD - State Of Good Repair Assets Condition score - Category

Excluding Assets In Replacment Process

Report 1.1.1 (State of Good Repair Score By Category): This report displays Overall Average State Of Good repair Score based on Age,Condition & Performance-Cost base for RTD Bus, LRV Asset Category where 5 is an Asset with Excellent Condition.Score 2.5 and below is Asset with Backlog. The Report Excludes Assets in Replacement Process- procurement in Progress

CATEGORY	Age Based Score	Condition Based Score	Cost Based Score	Road Call Based Score	Incident Based Score	SGR Score
BUS	4.8	4.7	4.2	4.1	3.8	4.3
LRV	4.1	3.7	4.2	4.3	1.7	3.6

Hard to read slide to make a point



“If information were the answer, we’d all be billionaires with perfect abs.”

Derek Sivers

Shifting Perspective

- “MAP-21 fundamentally shifted the focus of Federal investment in transit to emphasize the need to maintain, rehabilitate, and replace existing transit investments.” FTA
- “Deciding how to best balance and prioritize reasonably anticipated funds (revenues from all sources) towards improving asset condition and achieving a sufficient level of asset performance within those means.” FTA

Next Steps

With Leadership investment, sustained effort and a organizational approach to Asset Management, we will increase system safety and performance; while reducing risk and cost -

which supports growing ridership by offering more and safer service at lower cost.



Questions

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ISO 55000

Asset Management

ISO 55000 means:

We say what we do

We do what we say

We constantly improve it

Asset Management purpose:

To maximize value from assets in achieving organizational objectives

Should we pursue ISO 55000?

Does certification really matter?

Crosswalk

FTA TAM Regulation

- more accessible for agencies with less capacity
- Specific deliverables and steps
- Decision making framework

ISO 55000 Standards

- Comprehensive organization wide process
- Scalable non specific and adaptable to environment
- Asset management framework

Focus on leadership, communication and monitoring performance

ROI?

Cost v Benefit



Cost?



Benefits?

**Improved financial
performance**



Can ISO 55000 benefit all industries?



Asset Intensive

Reflects both the **volume** of physical assets and the **importance** of the assets in delivering the organizational objectives

Asset Intensive

1. Net physical assets
2. Physical assets turnover
3. Physical asset proportion

RTD

1. Net physical assets	\$6.13B
2. Physical assets turnover	0.11
3. Physical asset proportion	88%

Move the needle



Change is hard!



Other benefits



Other benefits

- Reduced exposure to legal liability
- Improved carryover of knowledge often lost to attrition
- Demonstrated social responsibility
- Enhanced reputation

Where is RTD on the journey?

Questions?

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