MDOT MTA Asset Management Pilot

Field Inventory Verification

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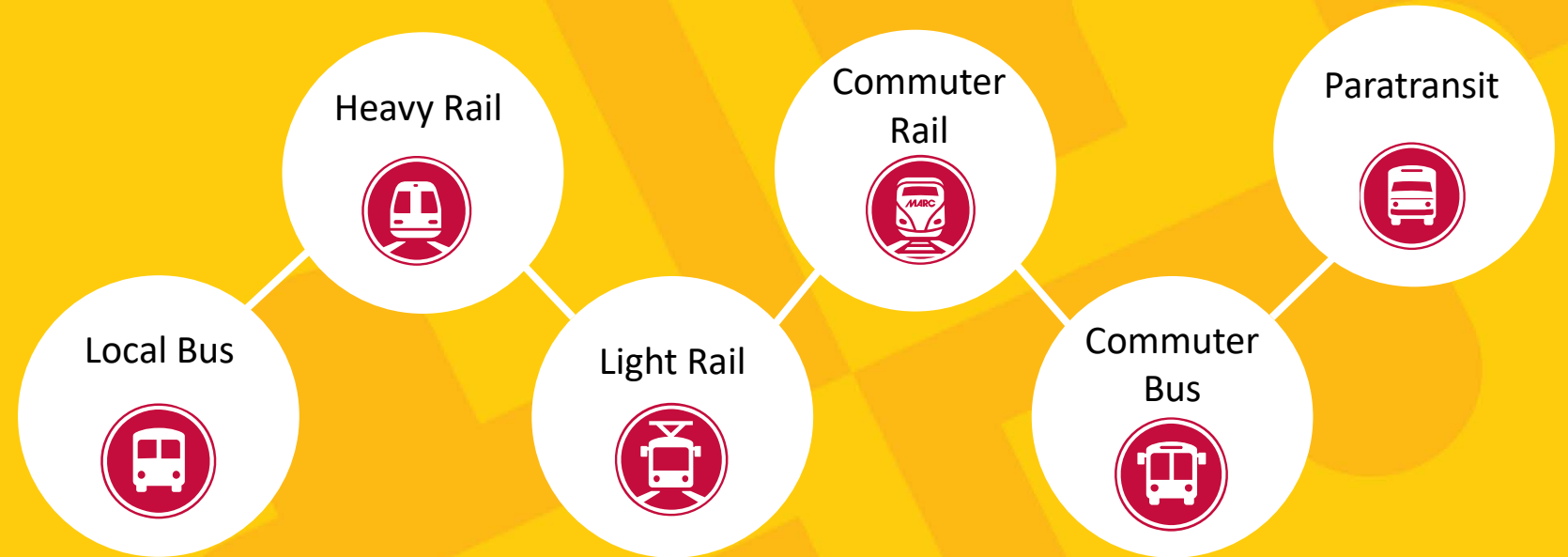
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MDOT MTA Asset Management

1,795 sq. miles
Service Area

$9.25 Billion
Asset Base (2017)

23
Locally Operated
Transit Systems

Heavy Rail

Commuter Rail

Paratransit

Local Bus

Light Rail

Commuter Bus

Goal is to Use Data to Make Better Decisions

Data → **Performance Measures** → **Business Decisions**

Data:
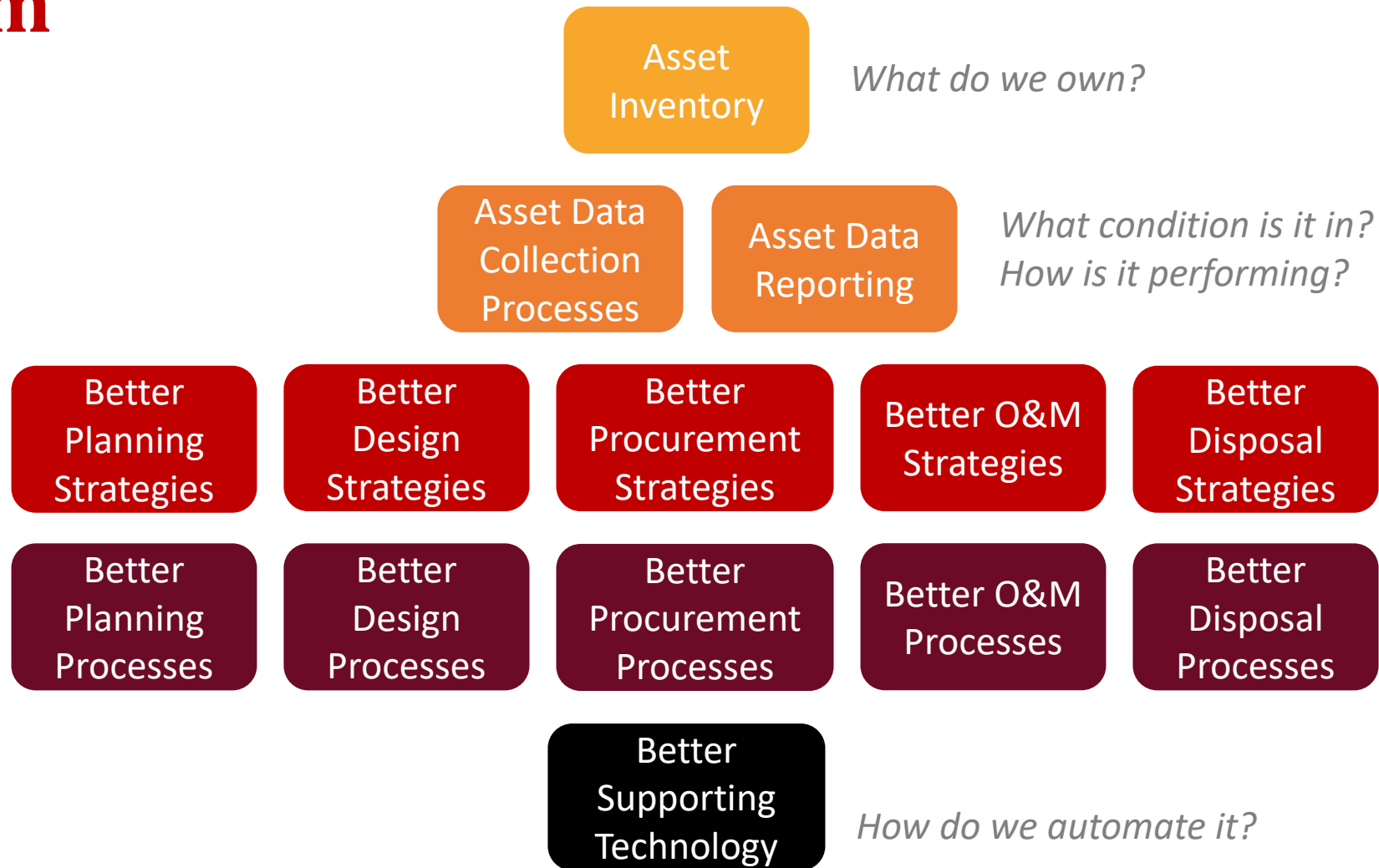- Inventory
- Condition
- Performance
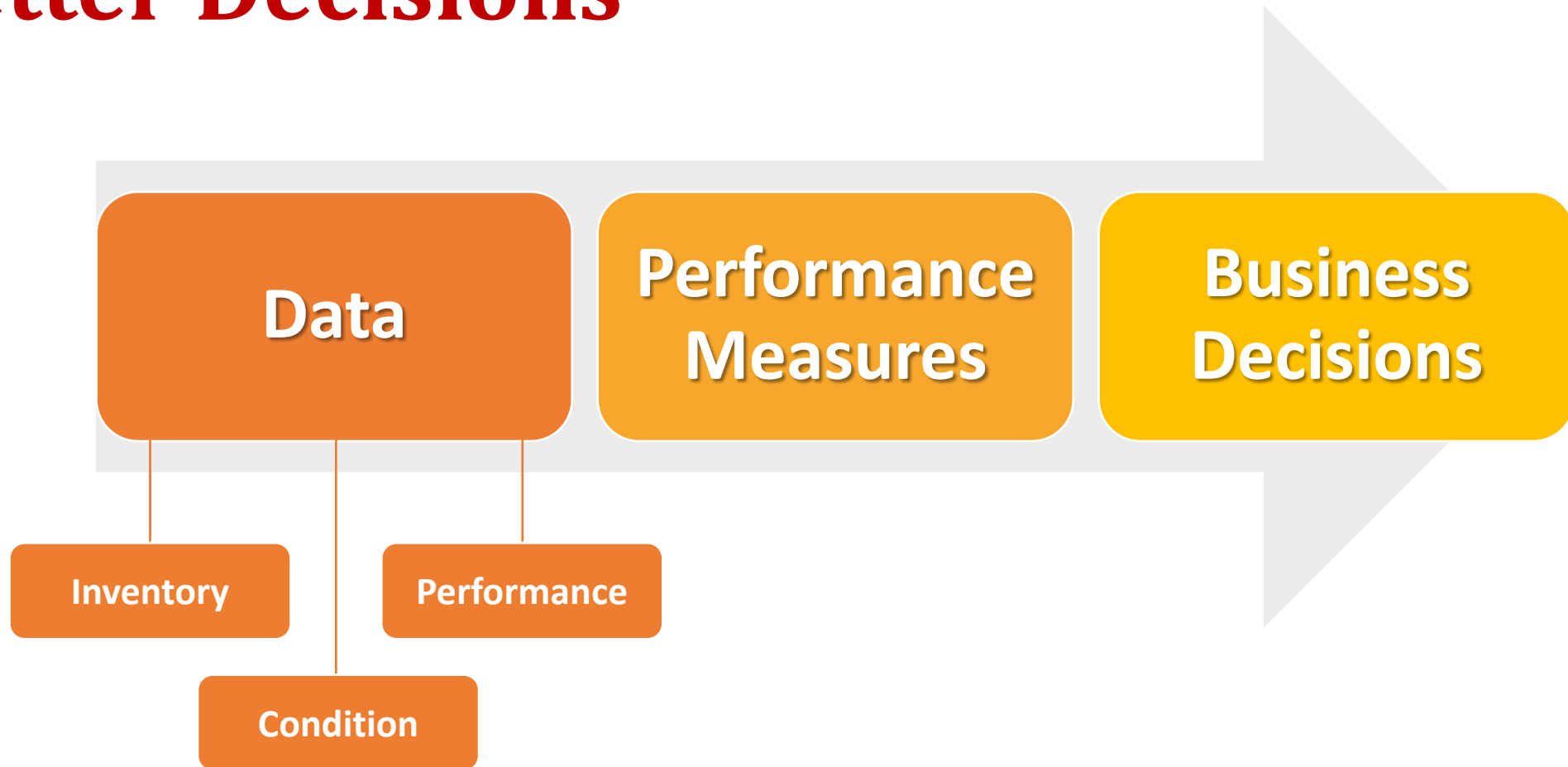
Asset Data Challenges

- Inconsistent records on assets owned by MDOT MTA
- Unknown asset data attributes
- Incompatible Maryland State, TERM, and FTA/NTD asset hierarchies
- Not up-to-date
  - Annual snapshot
  - Records coming from multiple sources
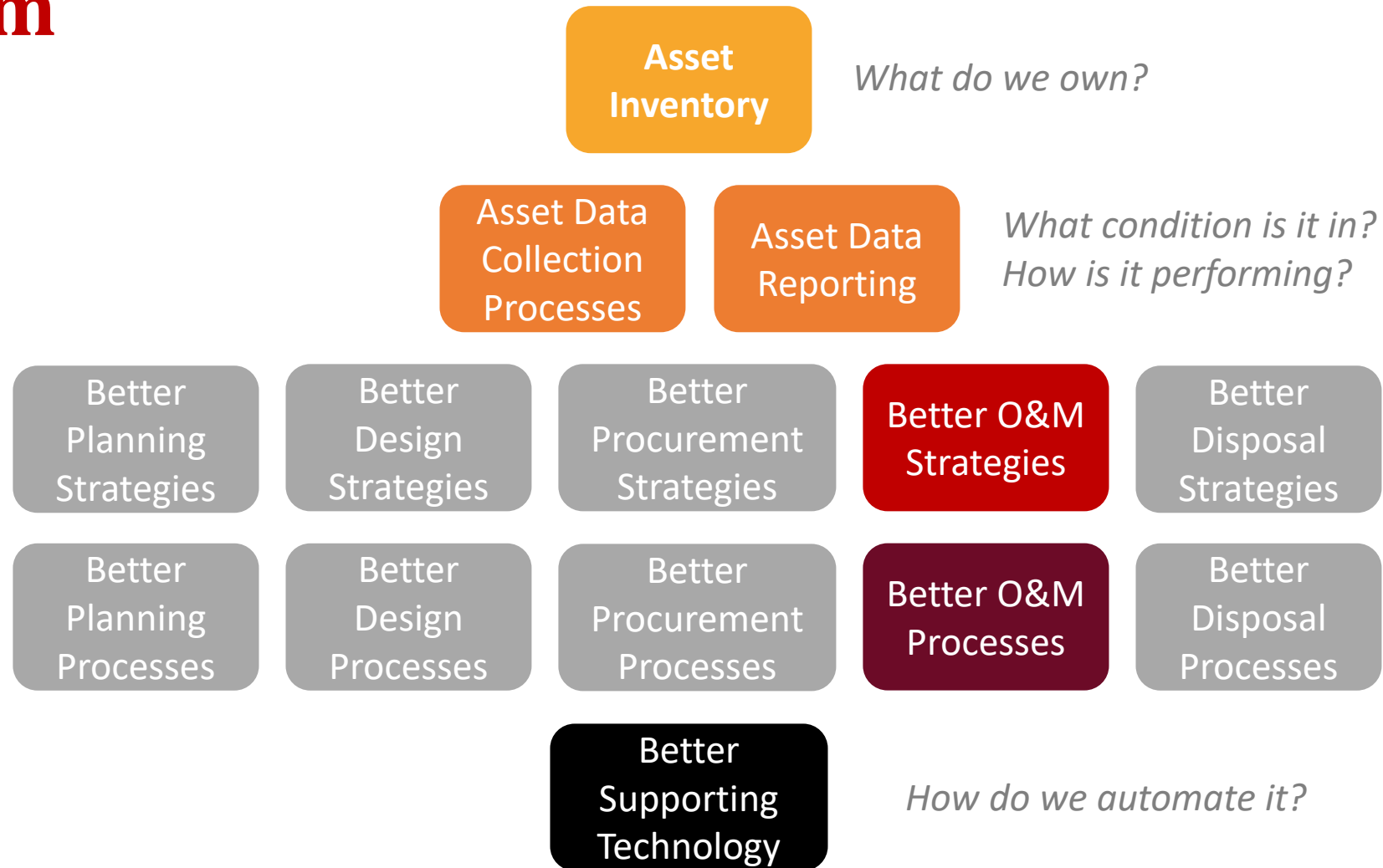 - Not all records are in "system of record"

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Asset Management System Pilot at Eastern Bus Division

Scope of an Asset Management System

Asset Inventory — *What do we own?*

Asset Data Collection Processes / **Asset Data Reporting** — *What condition is it in? How is it performing?*

Better Planning Strategies	Better Design Strategies	Better Procurement Strategies	Better O&M Strategies	Better Disposal Strategies
Better Planning Processes	Better Design Processes	Better Procurement Processes	Better O&M Processes	Better Disposal Processes

How does this data help us do everything better?

Better Supporting Technology — *How do we automate it?*

Focus of an Asset Management System

Asset Inventory — *What do we own?*

Asset Data Collection Processes — **Asset Data Reporting** — *What condition is it in? How is it performing?*

Better Planning Strategies | Better Design Strategies | Better Procurement Strategies | **Better O&M Strategies** | Better Disposal Strategies

Better Planning Processes | Better Design Processes | Better Procurement Processes | **Better O&M Processes** | Better Disposal Processes

Better Supporting Technology — *How do we automate it?*

How does this data help us do everything better?

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Whole Agency At Once

Asset Inventory

All vehicles, facilities, guideway, and systems, across all modes

7+ Years of Effort Thus Far

Asset Data Collection Processes

Asset Data Reporting

Not yet started

Better O&M Strategies

Better O&M Processes

Better Supporting Technology

Eastern Bus Division Pilot

Asset Inventory

Just the vehicles, facilities, and systems at the bus division

Asset Data Collection Processes

Asset Data Reporting

14?

~~12~~ *months projected effort*

Better O&M Strategies

Better O&M Processes

Includes a pilot Asset Inventory maintenance SOP

Better Supporting Technology

Proposed Approach

Pilot for Eastern Bus Depot

Scope: 3 Buildings / Facilities, 2 Parking Lots, ~175 Buses, Numerous Systems

Milestone	Comprehensive Asset Inventory	Condition and Performance Analysis	Asset Management Strategies	Repeatable Processes	Software Requirements
Description	Build a data foundation	Analyze asset condition and performance	Develop lifecycle plans	Document workflows	Plan Maximo configuration changes
Target End Date	August 2018	February 2019	July 2019	August 2019	October 2019
Department Responsibilities	Identify fatal flaws in inventory hierarchy and standard attributes	Identify fatal flaws in condition and performance analysis requirements and approaches	Help identify strategies for achieving asset condition and performance targets	Help develop SOPs related to inventory maintenance, condition and performance assessment	Identify fatal flaws in approaches to software configuration

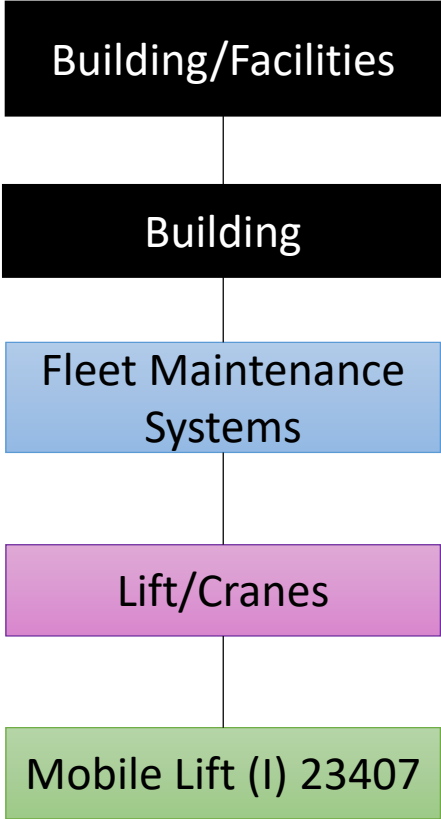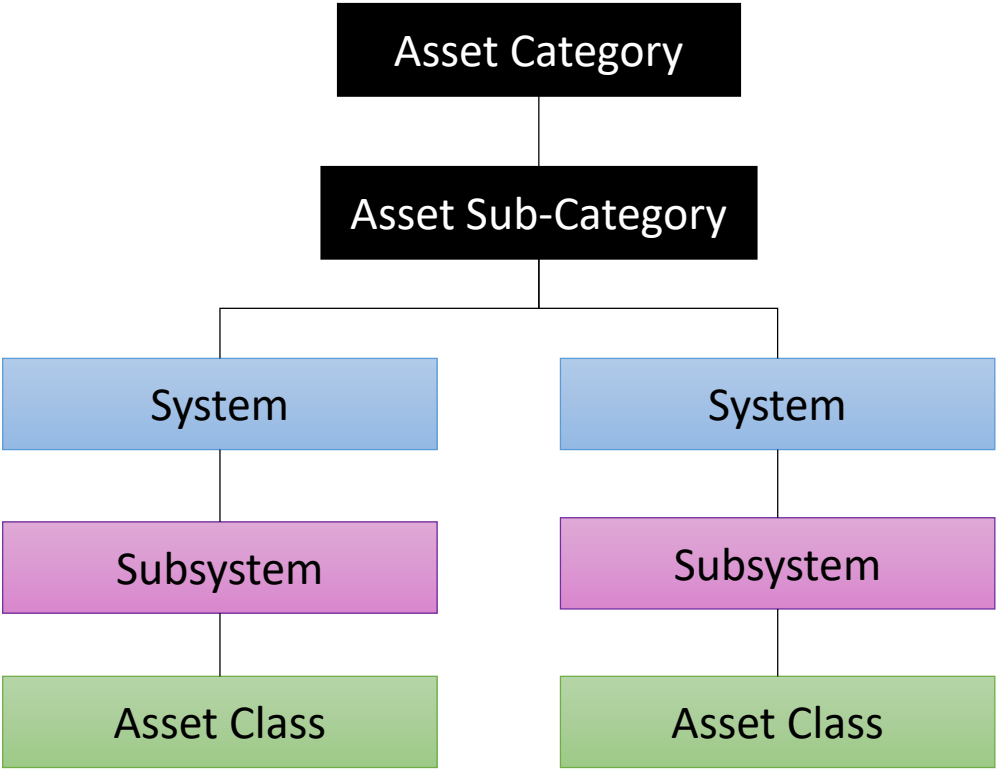# Field Verification & Condition Assessment

for 3 Buildings / Facilities, 2 Parking Lots, ~175 Buses, Numerous Systems
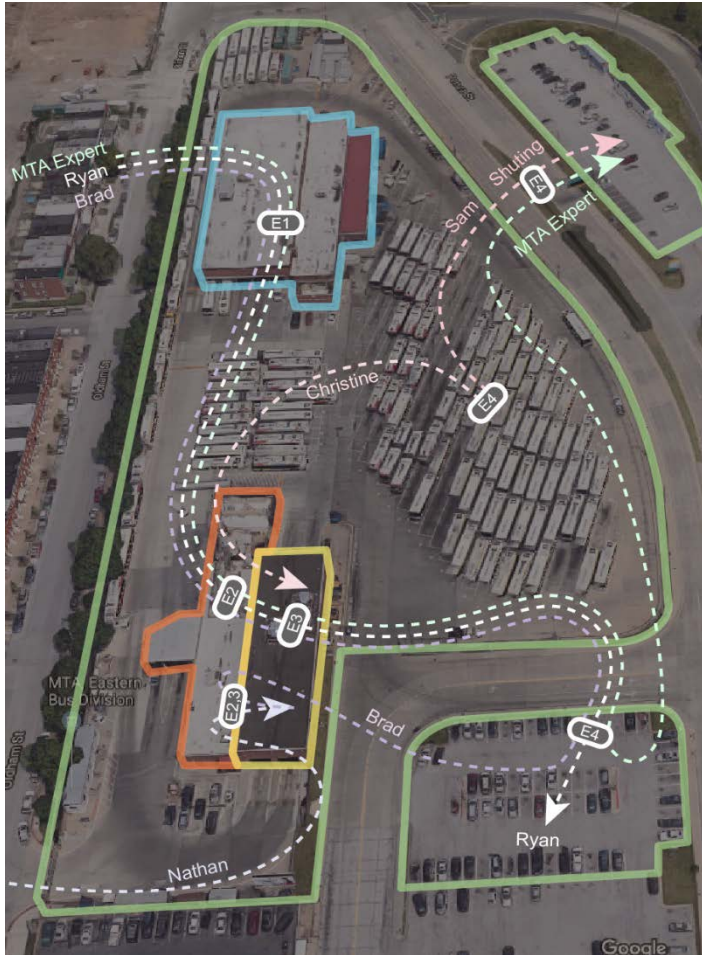
Lessons Learned.

- Preplan the site visit

- Mobile app is essential

- Data that we thought was good was actually not

- Field verification increases data confidence

- Greater confidence in data = better confidence in analysis

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Asset Hierarchy

Example:

```
Asset Category
     │
Asset Sub-Category
     │
  ┌──┴──┐
System    System
  │         │
Subsystem  Subsystem
  │         │
Asset Class  Asset Class
```

```
Building/Facilities
        │
    Building
        │
Fleet Maintenance
    Systems
        │
   Lift/Cranes
        │
Mobile Lift (I) 23407
```
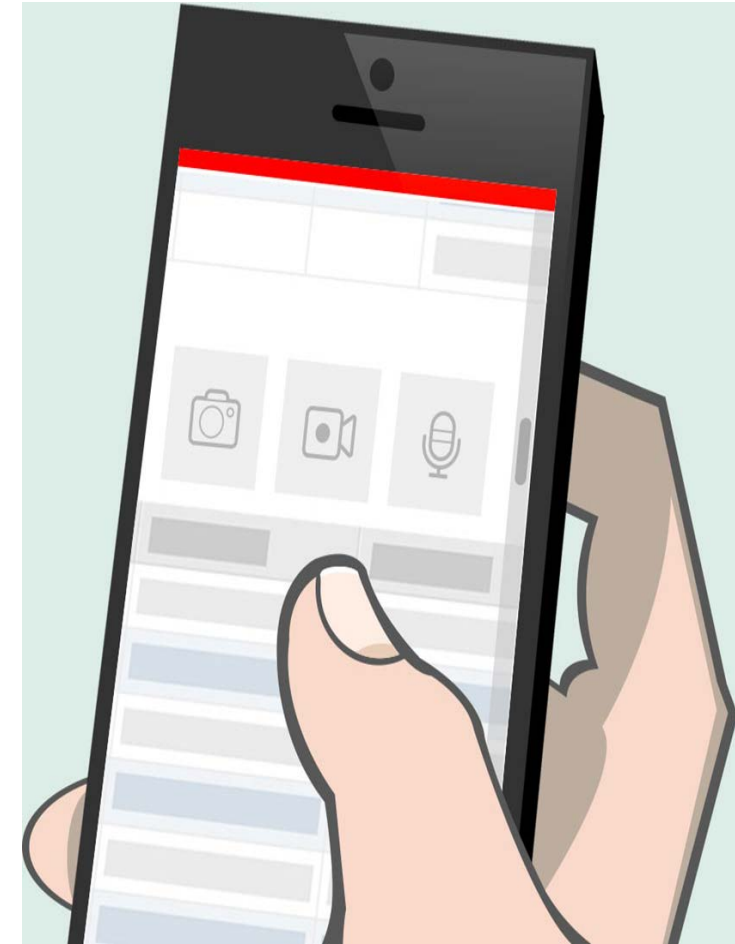
Field Verification & Condition Assessment

Attributes collected in-field
- Unique Object ID
- Location of Asset
- Description
- Manufacturer/Make
- Model Number
- Serial Number
- Year Manufactured or Age
- Physical Condition
- Dimensions Features
- Picture of Asset

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Condition Assessment Approach

Site/Facility Condition Assessment
- Visual/Physical Score (1-5 scale)

Revenue Vehicle Condition Assessment
- Visual/Physical Score (1-5 scale)
- Age Score (1-5 scale)
- Mileage Score (1-5 scale)
- Maintenance History Score (1-5 scale)

Overall Facility Condition Score (1-5 scale)

Overall Bus Condition Score (1-5 scale)

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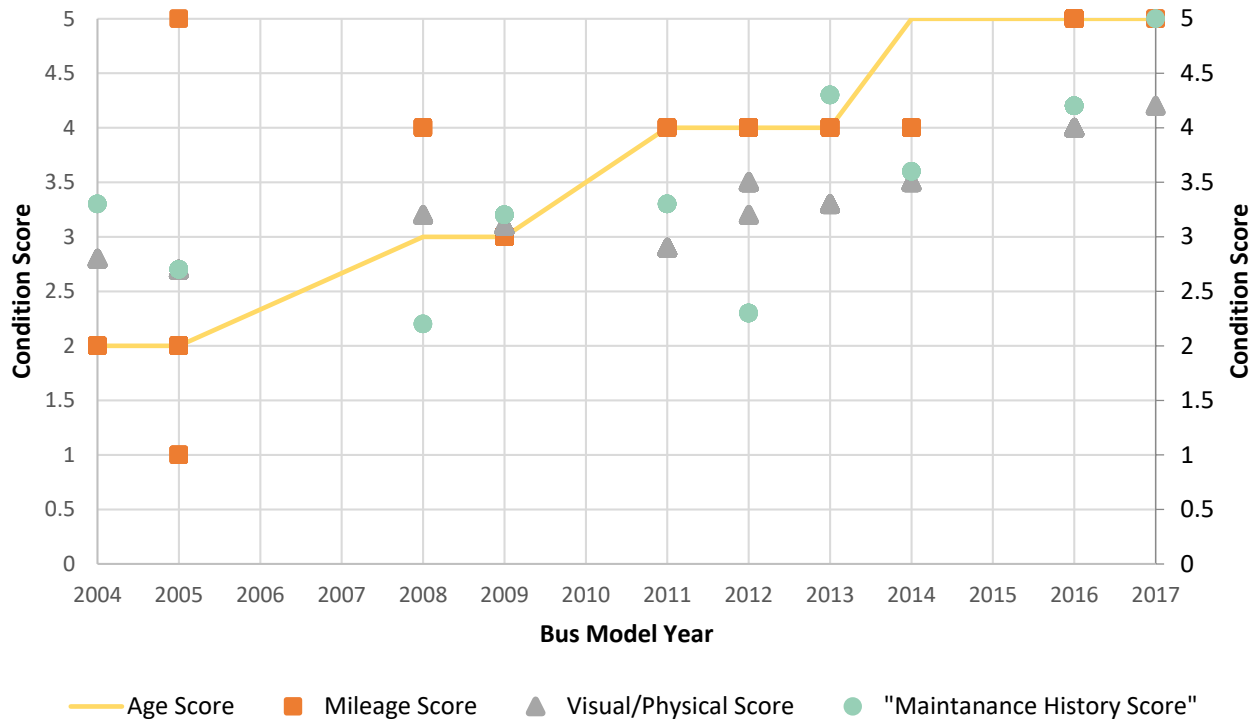# Desktop Review and Data Infill after Site Visit

- Data Additions Off Site:
  - Replacement Cost
  - Soft Cost
  - Age
  - Useful Life
  - Maintenance History
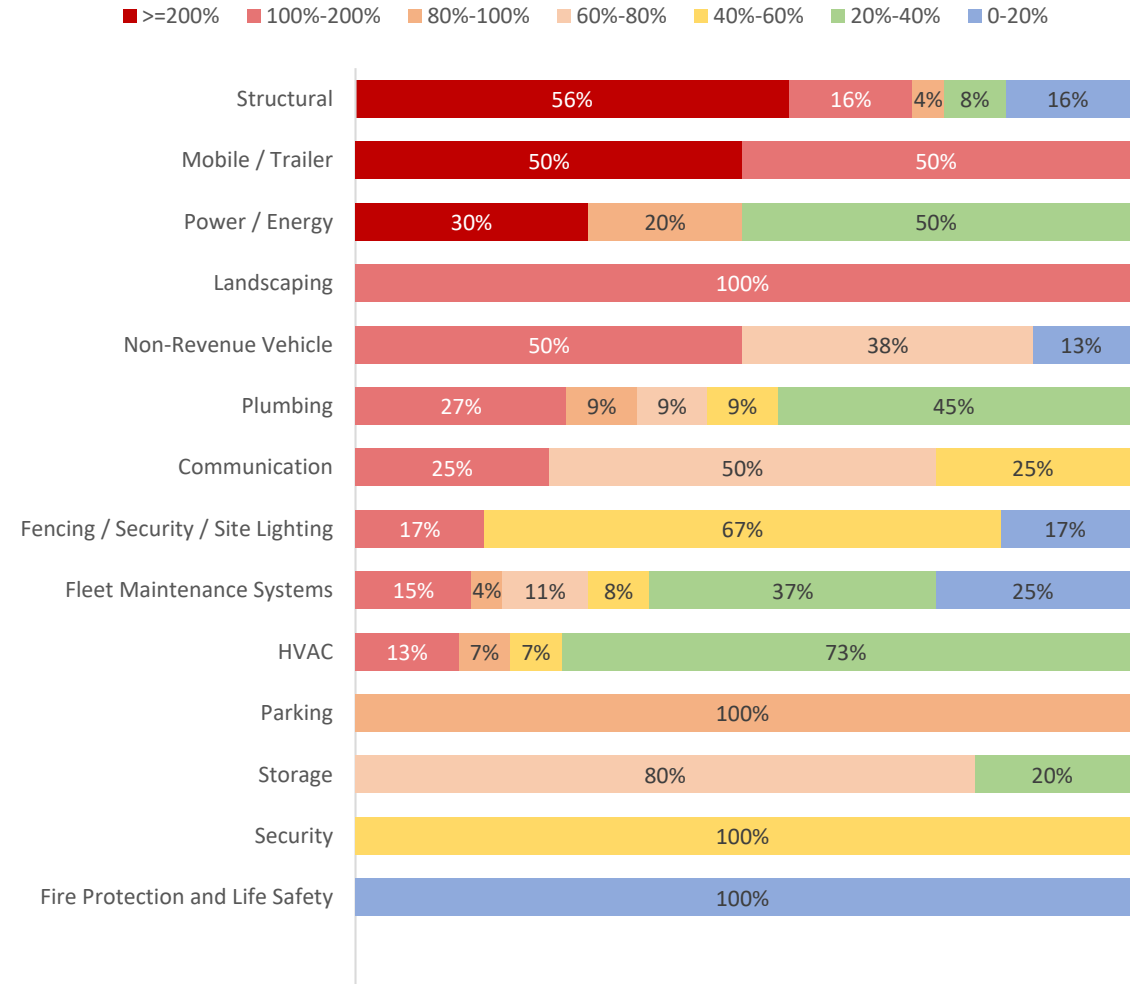- Sources: RSMeans, MTA internal records, Maximo, Maintenance Staff

Analysis of the Data

(10/20/2018 inventory)

Bus Mileage Score, Visual Score, and Maintenance History Score of Buses by Model Year

Legend: Age Score — Mileage Score ■ Visual/Physical Score ▲ "Maintanance History Score" ●

Facility Age as % of Useful Life Benchmark by Systems

Legend: ■ >=200% ■ 100%-200% ■ 80%-100% ■ 60%-80% ■ 40%-60% ■ 20%-40% ■ 0-20%

System							
Structural	56%			16%	4%	8%	16%
Mobile / Trailer	50%				50%		
Power / Energy	30%		20%		50%		
Landscaping	100%						
Non-Revenue Vehicle	50%			38%		13%	
Plumbing	27%	9%	9%	9%	45%		
Communication	25%		50%		25%		
Fencing / Security / Site Lighting	17%		67%			17%	
Fleet Maintenance Systems	15%	4%	11%	8%	37%		25%
HVAC	13%	7%	7%	73%			
Parking	100%						
Storage	80%				20%		
Security	100%						
Fire Protection and Life Safety	100%						

Lessons Learned & Next Steps

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Summary of Findings

- **Pre-plan**ning for field inventory verification/condition assessment is critical to efficiency… and it's difficult the first time around

- A **small team** is best to the conduct site visit including data collectors, SMEs, Facilities Maintenance, and Asset Management experts

- We discovered the **original asset data had significant flaws** including inaccurate data attributes

- After the desktop analysis of the data collected, only 35% of the assets (by count) from the original registry still existed and there were an additional 136 new assets not in our agency-wide asset registry

Next Steps

- Assess Functional Condition of the Assets

- Determine Criticality for the Assets

- Develop Risk Scale (Overall Condition X Overall Criticality = Risk Score)

- Update Lifecycle Plans

- Pilot SOP for Inventory Maintenance for entire Bus Mode and perform field inventory verification for all of Bus
  - Adapt for each additional mode

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Thank You!

Questions?

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