



# *Transportation Asset Inventory*

Marsha K. Mays, P.E.

Chris Kinsey, P.E.

Planning Conference

October 8, 2014



# What is ERP?

- Enterprise Resource Planning System
- Also Known as



- Basically the Modernization and Integration of the ALL of the State's Computer Systems, including:
  - Financial Systems
  - Procurement System
  - Human Resources
  - Payroll
  - Transportation Management System

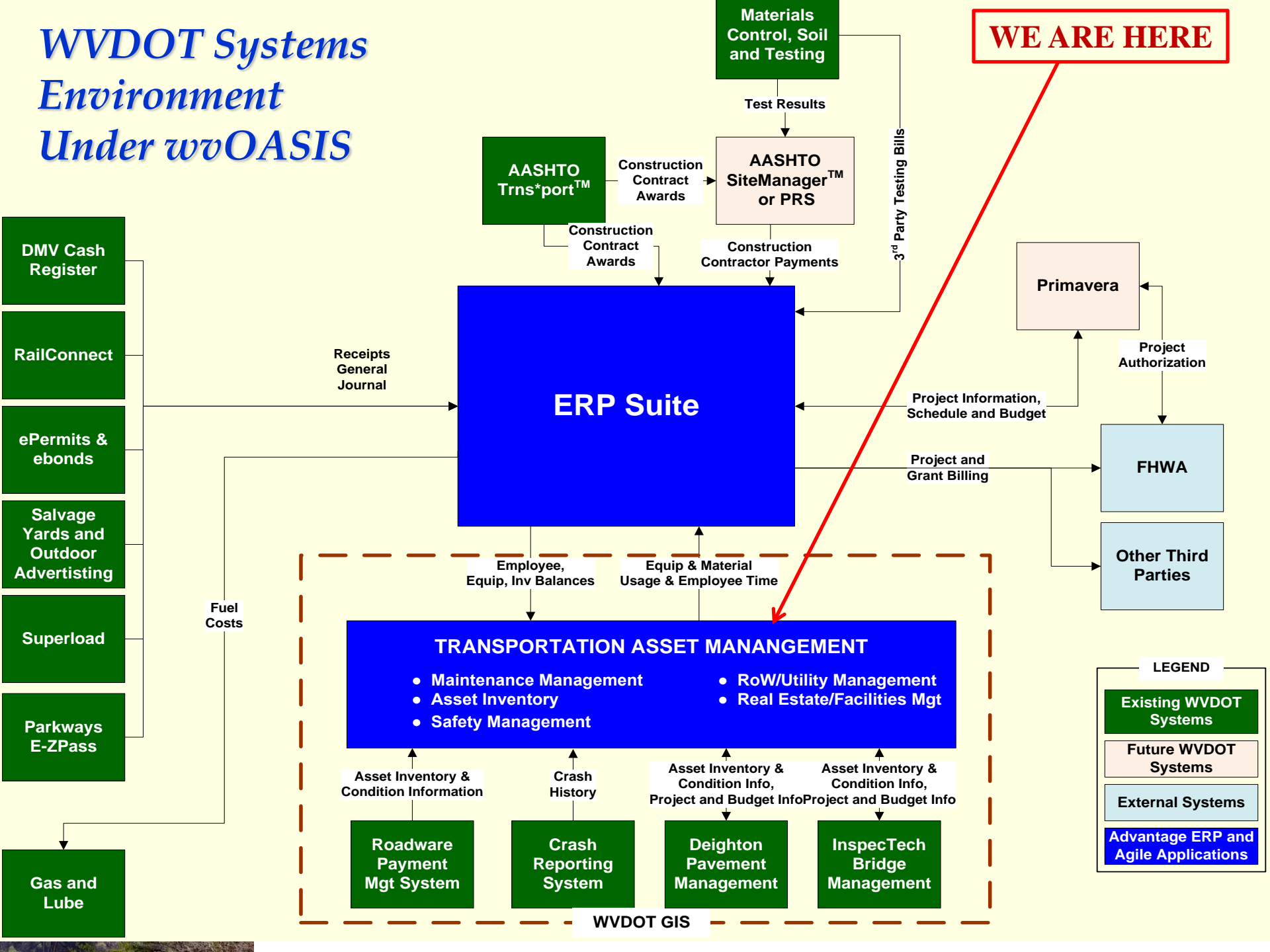


# Phased Implementation

wvOASIS Deployment Phasing for WVVDOT



# WVDOT Systems Environment Under wvOASIS





# *Transportation Suite*

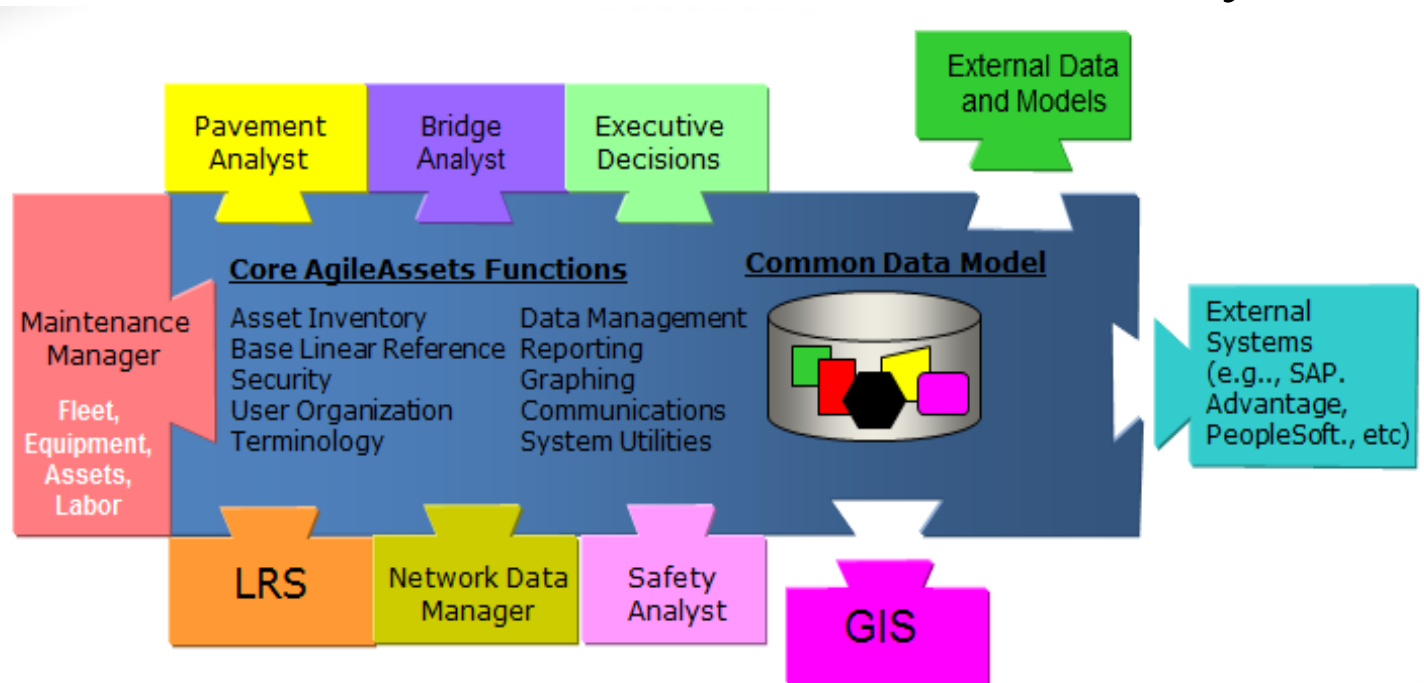
---

- Being Developed by AgileAssets
- Includes Systems for:
  - Transportation Asset Inventory
  - Safety Management
  - Right of Way / Utility Management
  - Transportation Operations Management
  - Real Estate / Facilities Management
  - Fleet



# AgileAssets® Asset Management Suite

- Comprehensive Transportation Asset Management System
- Modular Framework
- Centered around Core Functionality





# *Transportation Asset Inventory Goals*

---

- Locate ALL DOT Assets on the State's Highway Network using a Standardized & Systematic Approach
  - Utilize a Location/Linear Referencing System
- Maintain a Systemic Record of Individual Assets & their Attributes
- Allow the New System to Either:
  - Store Asset Information within the new System
  - Pull Asset Data from an Existing System that WVDOH Desires to Keep
- Enable the Development of a Defined Program for Sustaining the Transportation Assets through
  - Planned Maintenance
  - Scheduled Repair
  - Scheduled Replacement Based upon Life Cycles of Assets



# *What is a Linear Referencing System (LRS)?*



---

A Natural & Convenient Means of Associating Events or Attributes to Locations or Portions of a Linear Feature.



**In our case, the Roadway Network**







# *What is a Linear Referencing Method (LRM)?*

---

- Methodology for Locating Events or Attributes on the LRS. In Our New System, we have Two:
  - **Statewide**
  - **County-Based**



# *Commonalities between Statewide & County-Based LRM*

---

- Conversion Between the Two LRMs Allowed in Most Modules:
  - ✓ Asset Locations
  - ✓ Work Orders
  - × Safety Analysis - NOT ALLOWED
- Route ID
  - Dual-Geometry (Basically 1 Route ID per Direction of Travel)
    - Interstate Routes
    - US Routes
  - Single Geometry (1 Route ID per Route)
    - WV Routes
    - County Routes
    - All Other Sign Systems



# *Statewide vs. County-Based LRM*

---

## **Statewide LRM**

- Allows for More Comprehensive Analysis Across the State
  - Especially Beneficial in Safety Analysis
- One Route ID per “Route”

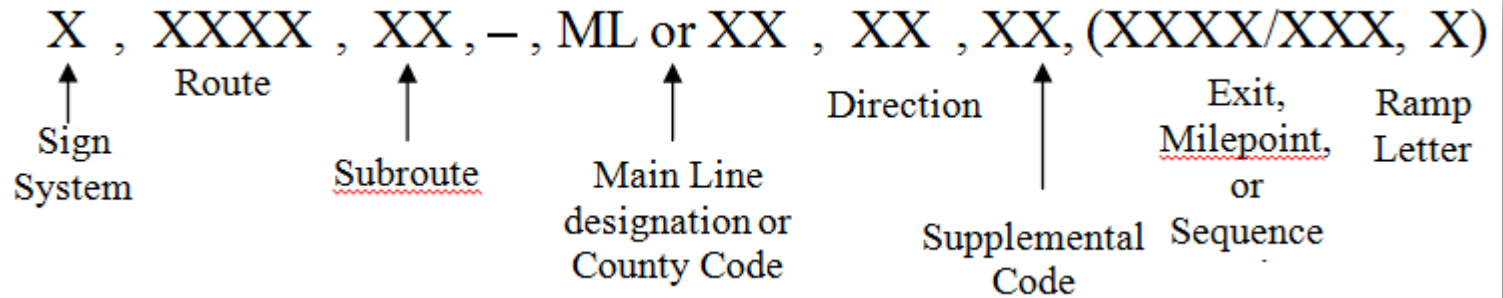
## **County-Based LRM**

- Historically Used by WVDOH
- Less Learning Curve for Users
- One Route ID per Route per County



# Statewide LRM

## Route ID:



LRS Location Will be Defined by:

- One Route ID field
- Beginning Milepost
- Ending Milepost (if Linear Asset)



# Statewide LRM

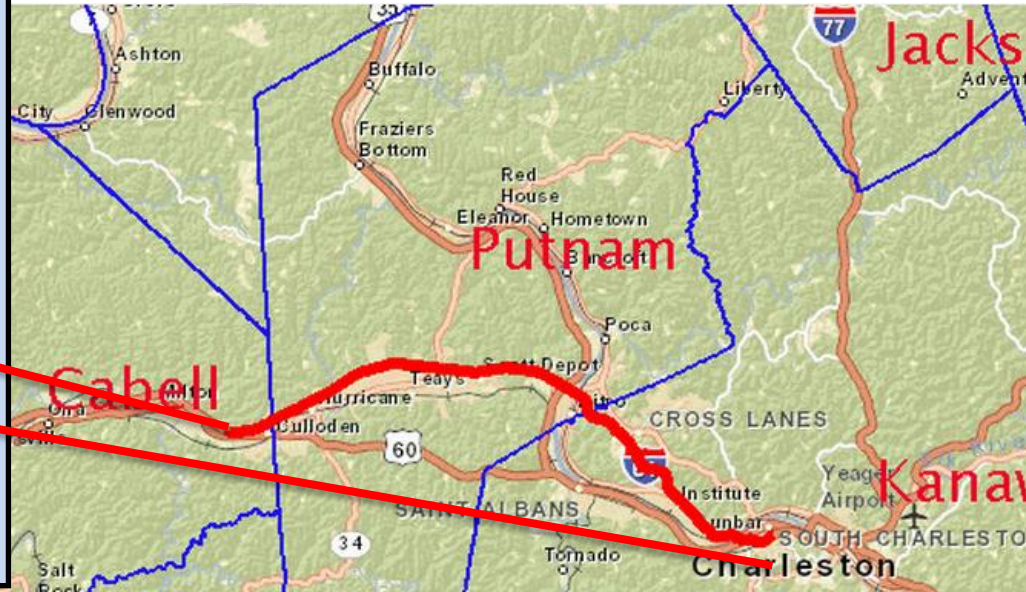
In the **Statewide Routes LRM (Base)**, let's say that an event's location is specified as follows:

**Route = I-64 EB (1006400-MLEB00)**

**Start MP = 30**

**End MP = 55**

That is, the event location spans county boundaries, starts in *Cabell County* and ends in *Kanawha County*



## Construction Projects Location

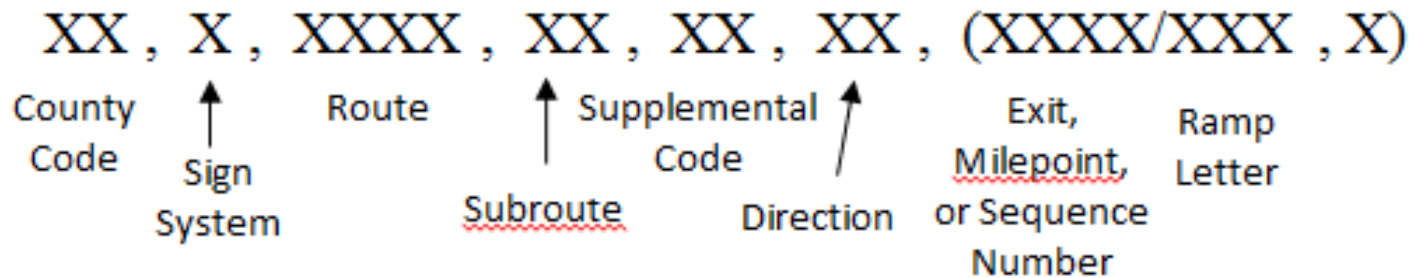
Route ID	Start MP (Statewide LRM)	End MP (Statewide LRM)
1006400-MLEB00	30	55





# County-Based LRM

## Route ID:



## LRS Location Will be Defined by:

- Two Route ID fields:
  - County Route From
  - County Route To (if Linear Asset)
- Beginning Milepost
- Ending Milepost (if Linear Asset)



# County-Based LRM

Location Reference

Statewide Routes

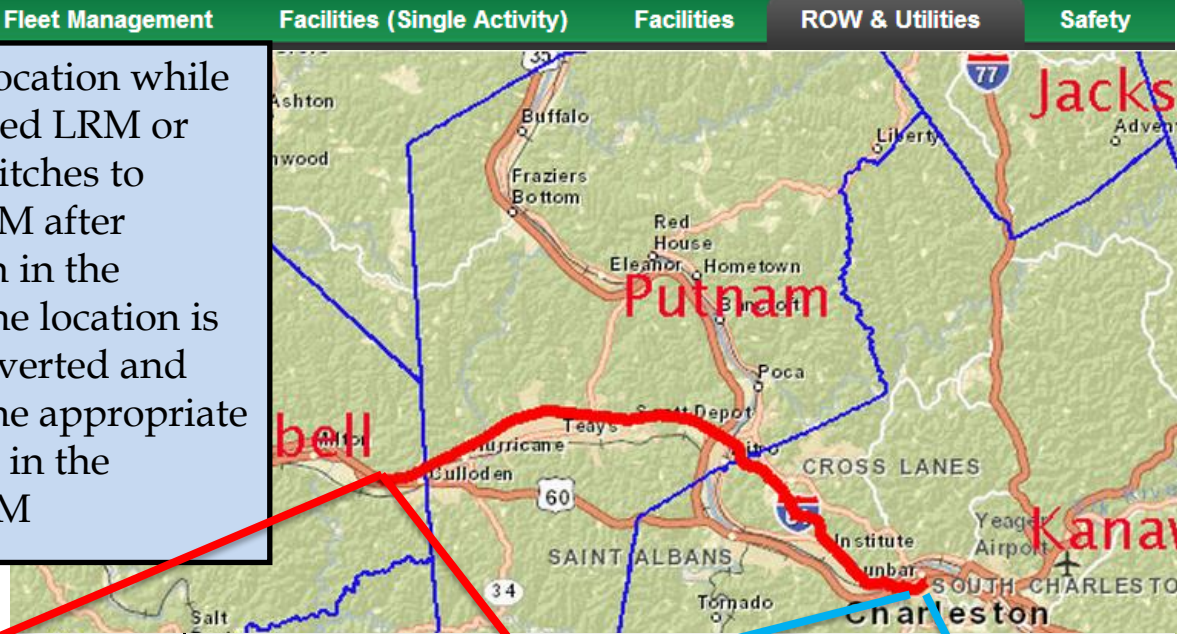
Statewide Routes

County Based Routes

Green

open / close

- 1) User Can Select Location while in the County-Based LRM or
- 2) When the user switches to **County Based LRM** after entering a location in the Statewide LRM, the location is automatically converted and displayed using the appropriate Route / Measures in the County-Based LRM



**Construction Projects Location**

County/Route From	County/Route To	BMP (County LRM)	EMP (County LRM)
06100640000EB	20100640000EB	30	55





# Statewide vs. County-Based LRM

## Statewide LRM

Route Name	Start MP (Statewide LRM)	End MP (Statewide LRM)
1007900-MLNB00	0	160.52
1007900-MLSB00	0	160.52

## County-Based LRM

County/Route From	County/Route To	BMP (County LRM)	EMP (County LRM)
20100790000NB	20100790000NB	0	21.28
44100790000NB	44100790000NB	21.28	36
08100790000NB	08100790000NB	36	44.6
04100790000NB	04100790000NB	44.6	83.15
11100790000NB	11100790000NB	83.15	83.55
21100790000NB	21100790000NB	83.55	106.42
17100790000NB	17100790000NB	106.42	129.22
25100790000NB	25100790000NB	129.22	142.37
31100790000NB	31100790000NB	142.37	160.52
20100790000SB	20100790000SB	0	21.28
44100790000SB	44100790000SB	21.28	36
08100790000SB	08100790000SB	36	44.6
04100790000SB	04100790000SB	44.6	83.15
11100790000SB	11100790000SB	83.15	83.55
21100790000SB	21100790000SB	83.55	106.42
17100790000SB	17100790000SB	106.42	129.22
25100790000SB	25100790000SB	129.22	142.37
31100790000SB	31100790000SB	142.37	160.52





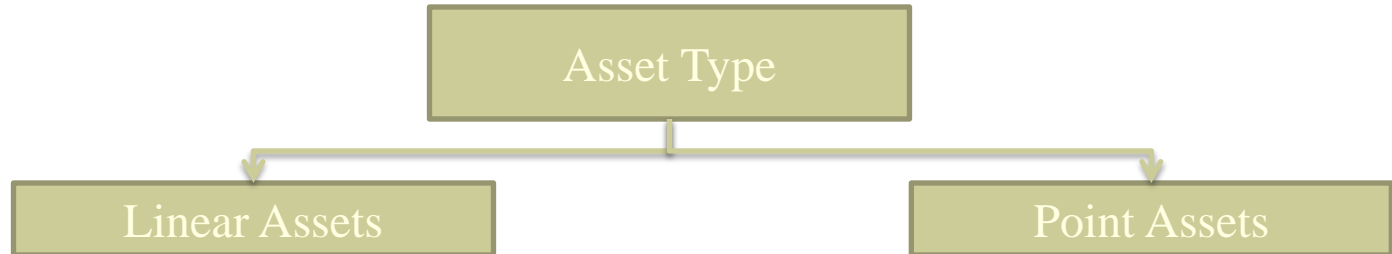
# *Transportation Asset Inventory*

---

- Includes approximately 98 Inventories within 3 Modules
  - Transportation Asset Inventory
  - Sign Module
  - Signal/Lighting/ITS Module
- Implemented Across 2 Phases
  - Phase B - 19 Inventories
    - Went Live in January of 2014
  - Phase E – 79 Inventories
    - Scheduled to Go-Live in July of 2015



# Types of Assets within TAI



- Linear Assets – Span a distance (Begin MP to End MP)
- Point Assets – Occur at only One Mile Point

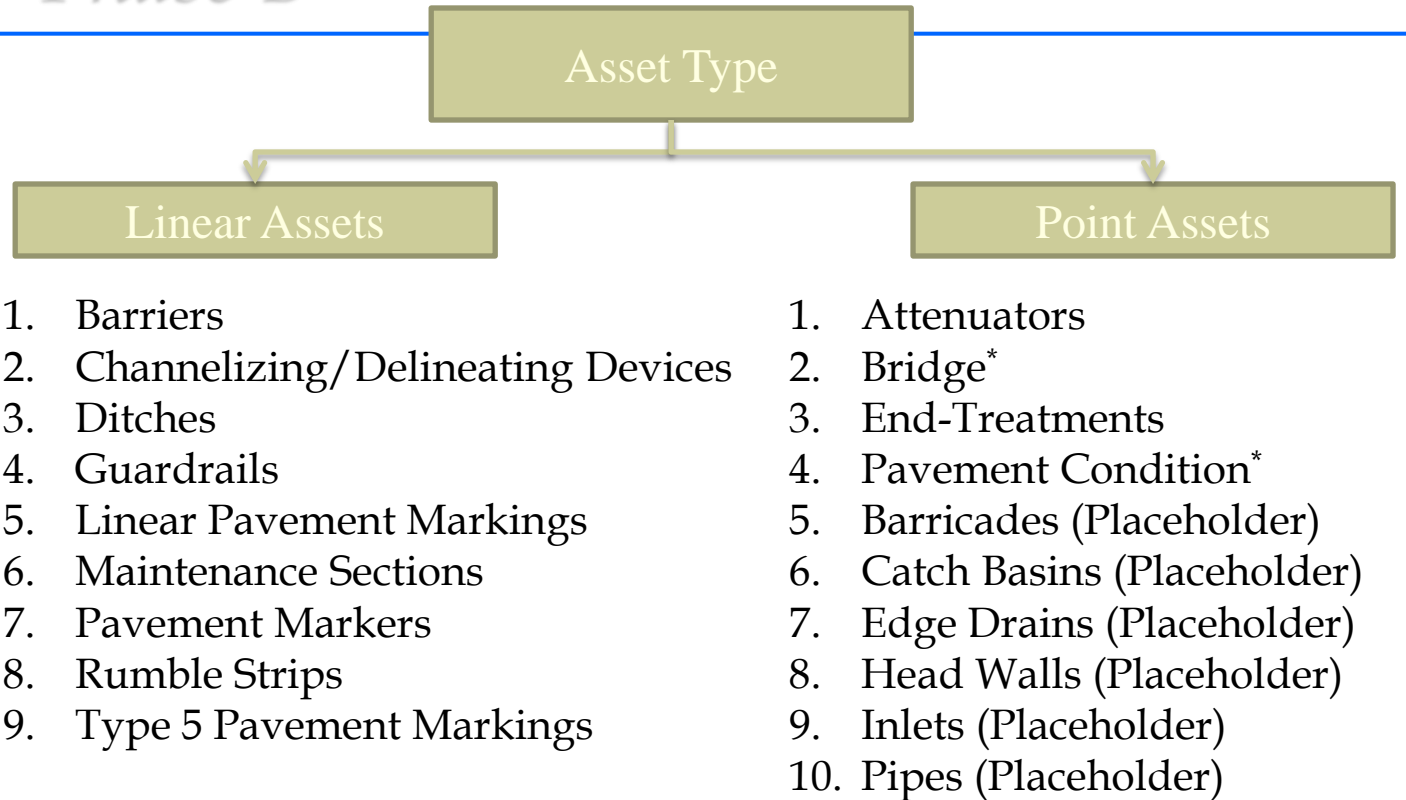
Both Linear & Point Assets Can be Further Categorized As:

- Inventories – Item/Device Located along LRS
  - i.e. Guardrail
- Events – Incident/Activity/Categorization Occurring Along the LRS
  - Incidents (i.e. Crashes)
  - Activities (i.e. Projects)
  - Categorization (i.e. Functional Class)



# Transportation Asset Inventory

## - Phase B



### Notes:

\* Indicates Assets that are being Interfaced from another System  
Placeholder Assets will be further developed after go-live



# *Transportation Asset Inventory*

## *- Phase E Inventories*

---

1. Access Permits
2. At-Grade Intersections & Approaches
3. Brake Checkpoints/Truck Pull-Off Areas
4. Pavement
5. Highway/Railroad Grade Crossings
6. Interchanges & Interchange Ramps
7. Landscaping/Plantings
8. Lanes
9. Manholes
10. Median
11. Median Crossovers
12. Outdoor Advertising Signs
13. Parking - Permissions & Prohibitions
14. SRIC Routes
15. Roadside Vegetation
16. Right of Way Fencing
17. Salvage Yards
18. School Zones
19. Shoulders
20. Sideslopes & Clearzones
21. Slope Remediation
22. Storm Drain Outfalls
23. Truck Escape Ramps
24. Utilities in ROW
25. Maintenance Sections
26. SRA - Rail Banks
27. SRA - Rail Bridges
28. SRA - Rail Stations & Yards
29. SRA - Rail Tunnels
30. SRA - Switches
31. SRA - Tracks



# *Transportation Asset Inventory*

## *- Phase E Events*

---

1. Construction Projects & History
2. Pavement Friction Data
3. Local Names
4. Access Control
5. Coal Resource Transportation System Routes
6. Federal Aid/Route Type
7. Functional Class
8. Mail Routes
9. One/Two-Way Operations
10. Route Ownership
11. Rural/Urban Designations
12. School Bus Routes
13. Terrain Types
14. WV Functional Class
15. Speed Data
16. Speed Limits
17. Traffic Count Data



# *Sign Module - Phase E Inventories*

---



1. Sign Assemblies
2. Signs
3. Sign Supports
4. Sign Structures
5. Historical Markers





# *Signal/Lighting/ITS Module – Inventories*

---

1. Signals/Overhead Flashers
2. Signal Systems
3. Signal/Overhead Flasher Poles/Supports
4. High Mast Tower Lighting
5. Pole Lighting
6. Sign Lighting
7. Navigational Lighting
8. Miscellaneous Lighting
9. Control Stations
10. Variable Message Signs (VMS)
11. Roadway Information System (RWIS)
12. CCTV
13. Advanced Truck Parking Systems
14. Advanced Warning Systems
15. Traffic Management Centers
16. Weigh-In-Motion Stations
17. Radio Towers
18. Power Service
19. Junction Boxes



# *Model Inventory of Roadway Elements (MIRE)*

---

- Federal Standard for Roadway Inventories
  - Includes Data Critical to Making Sound Decisions for the Safe Design and Operation of Roadways
- TAI Includes All Requirements to Meet





# *Involved Agencies & Divisions*

---

## ○ Division of Highways

- Traffic Engineering
- Maintenance
- Right of Way
- Planning
- Engineering
- Materials

## ○ State Rail Authority



# *Integrated Modules*

---

## ○ Safety Management System

- Safety Analysis

## ○ Transportation Operations Management

- Work Orders
- Performance Measures

## ○ Right of Way/Utilities Module

- Utility Relocation