Asset Management and Transportation Performance at Oregon DOT

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for

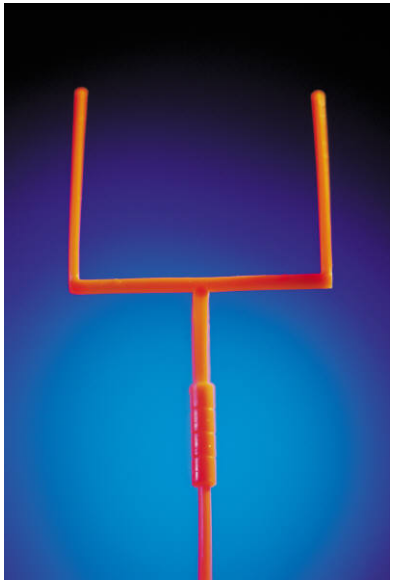
Asset Management Peer Exchange

Preparing for MAP-21 Implementation

May 1, 2014

Much Like a Football Game

Performance measures frame the goal



Asset inventory and condition tell you where you are on the field – or the gap in performance

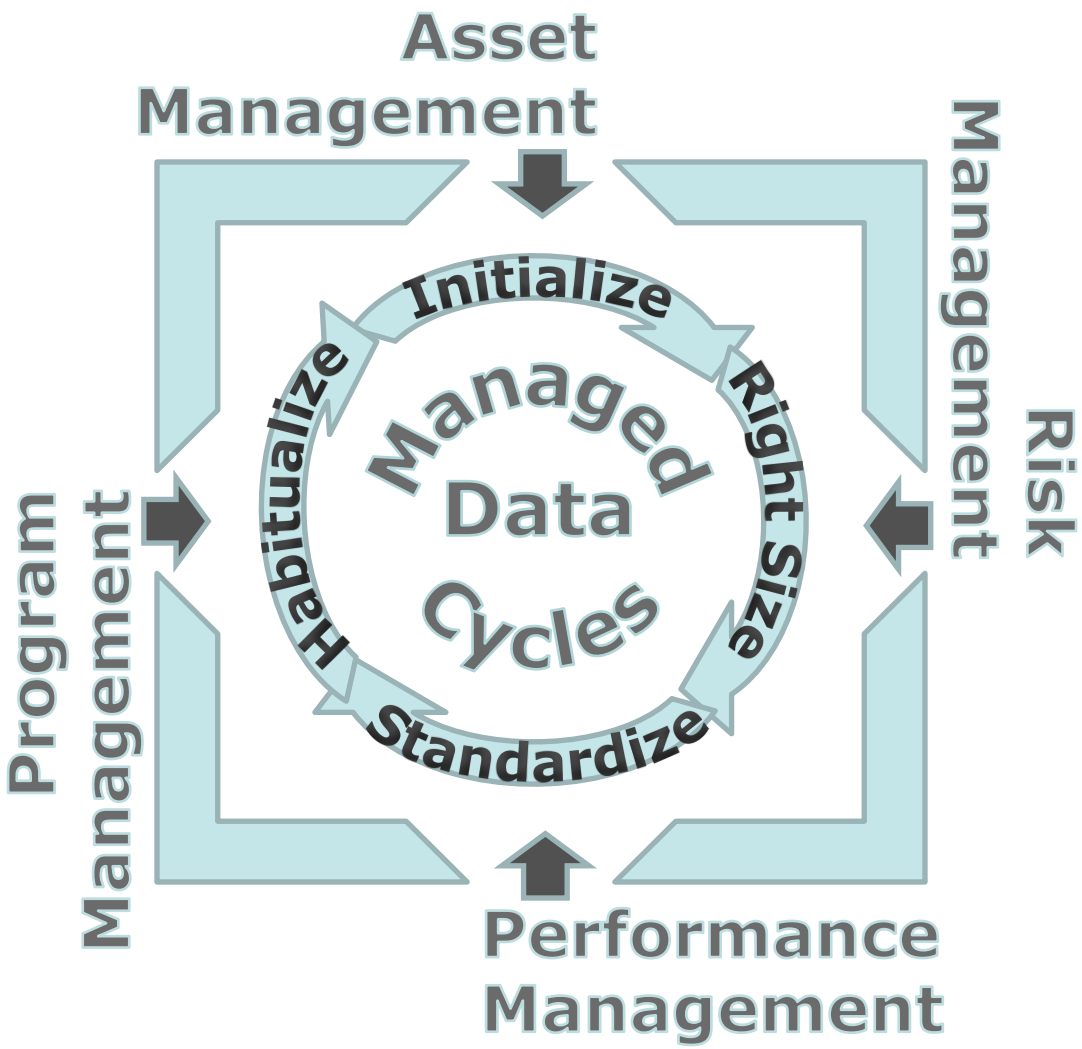
Making Performance Measures Work

- History
  - Oregon Transportation Management System
  - Oregon Transportation and Highway Plan policies
- Performance Management in Agency
  - Pilot then Program in Director's Office
  - Key Performance Measures/Budget
- Asset Management Practices in Oregon
  - Asset Management Strategic Plan
  - Asset Management Integration Unit
  - Performance Management Position in Director's Office

Our History Makes this Possible

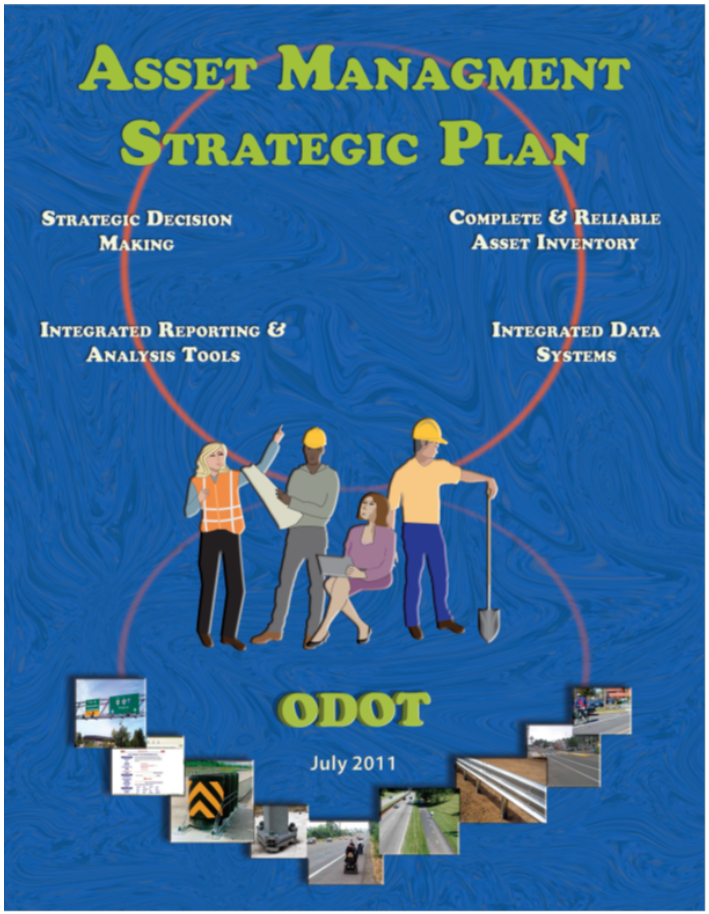
- 1990's:
  - Performance measurement implemented all levels of ODOT, program in Director's Office (pilot - 1989)
  - Oregon Transportation Management System
  - Oregon Transportation and Highway Plan policies
- 2000's
  - Asset Management Strategic Plan
  - Asset Management Integration Unit
- 2010's
  - Performance Management position back in Director's Office
  - MAP-21

Triggers to Get Started



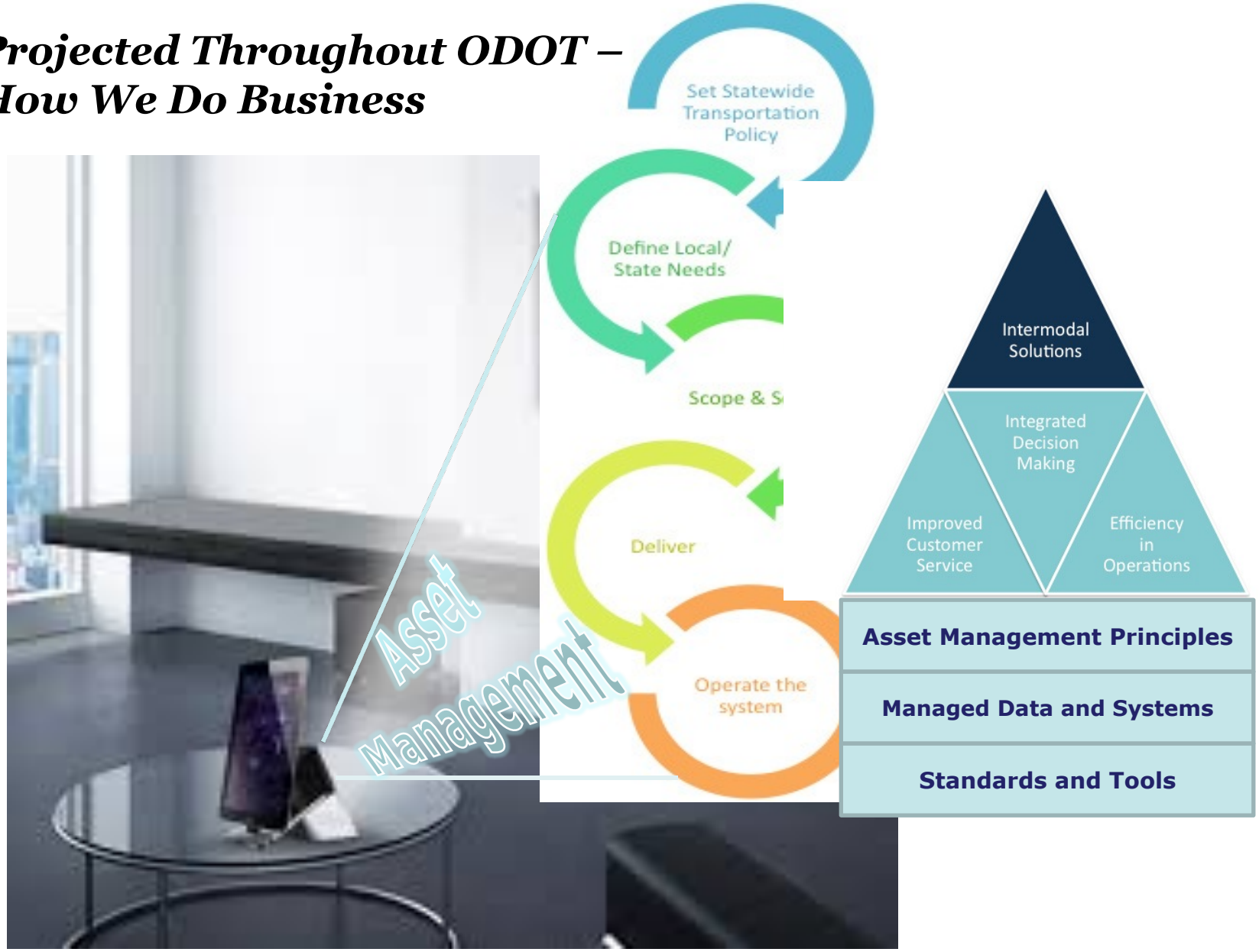
- **Initialize**
  - Management triggered
- **Right size**
  - Analyze for criticality and sustainability
- **Standardize**
  - Data standard and tools
- **"Habitualize"**
  - Routine update cycle based on needs

Strategic/Implementation Plan



- Four Goals:
  - Integrated Decision-Making
    - Weaving data into processes for optimum decisions
  - Inventory
    - Sustain or establish appropriately reliable statewide inventories
  - Integrated Data Systems
    - TransInfo integrated with other key systems such as Pontis
  - Integrated Tools
    - Supporting efficient updates and use of data

Projected Throughout ODOT – How We Do Business



Inventory – Highway

Where we started:

Asset	Statewide data available in 2005?
Bridges	Yes
Tunnels	
ITS	Yes
Pavement	Yes
Right of Way	Yes
Signs	
Traffic Barriers	
Sidewalks	
ADA Ramps	
Bike Facilities	
Culverts 6ft and over	*NBI*
Culverts under 6ft	
WIM Sites	
Sound Barriers	
Wetland Mitigation Sites	
Material Sources	
Signals and Beacons	*Tri-color only*
Retaining Walls	
Unstable Slopes	
Approaches	
Major Traffic Support	
Storm Water Facilities	
Illumination	

As of 2010:

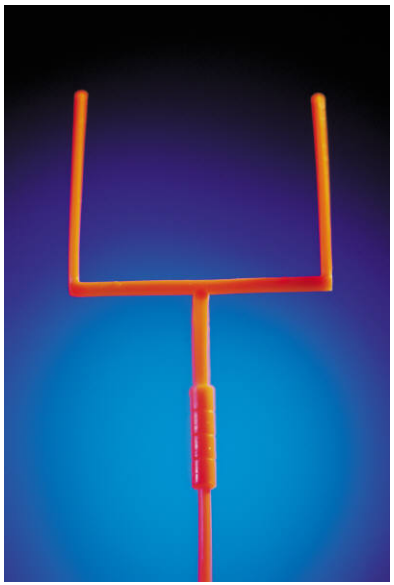
Asset	Statewide data available now?
Bridges	X
Tunnels	X
ITS	X
Pavement	X
Right of Way	X
Signs	X
Traffic Barriers	X
Sidewalks	X
ADA Ramps	X
Bike Facilities	X
Culverts 6ft and over	*in progress*
Culverts under 6ft	*in progress*
WIM Sites	X
Sound Barriers	X
Wetland Mitigation Sites	X
Material Sources	X
Signals and Beacons	*Tri-color only*
Retaining Walls	*in progress*
Unstable Slopes	*in progress*
Approaches	*in progress*
Major Traffic Support	*just starting*
Storm Water Facilities	*just starting*
Illumination	

Where we are now:

	Asset	Type	Statewide Data Available
Priority Tier 1	Bridges		Yes
	Culverts	6 ft +	Yes
		> 6 ft	Fall 2014
	Pavement		Yes
	Tunnels		Yes
	Signals		Tri-color
Priority Tier 2	Retaining Walls		No
	Traffic Barriers		Yes
	Vertical Clearance	Bridges	Yes
		Traffic Structures	No
		All the Rest	No
	Signs		Yes
	Traffic Structures		No
	Storm Water		No
	Unstable Slopes		Progress
	Right of Way		Yes
	Sidewalks		Yes
	ADA Ramps		Yes
	Bike Facilities		Yes
Priority Tier 3	ITS		Yes
	Material Sources		Yes
	Approaches		Mostly
	Illumination		No
Priority Tier 4	Wetland Mitigation Sites		Yes
	Weigh-in-Motion Sites		Yes
	Sound Barriers		Mostly

Note: **GREEN** is an indication of progress, but not an ability to maintain that progress

Example: Traffic Barriers



- Goal is to replace all pre-230 traffic barrier - those barriers constructed before 1980.
- Measured by
  - Percent Fair or Better Barrier
    - Good is 350 compliant or better
    - Fair is 230 compliant
    - Poor is pre-230 barrier types

Distance to the goal was $76 million

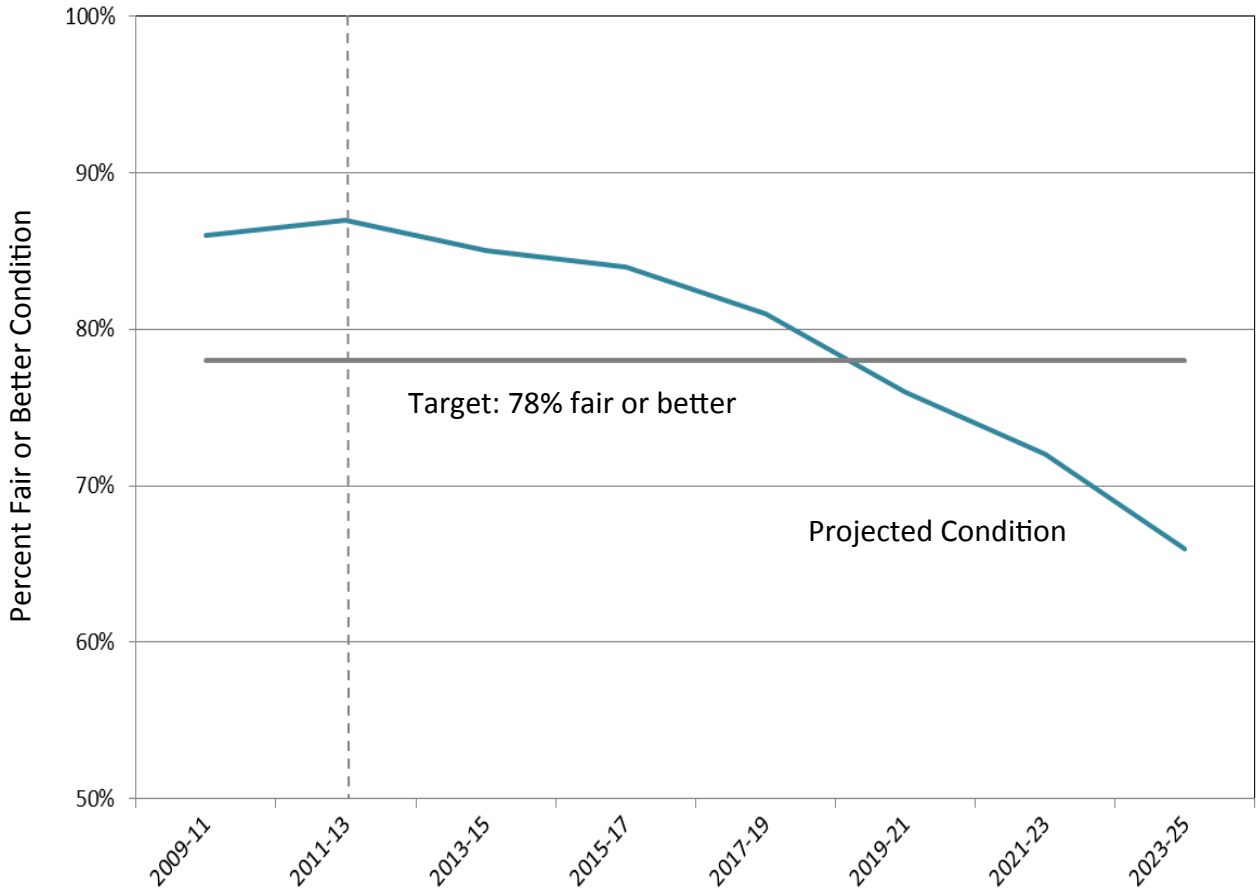
Traffic Barriers, continued

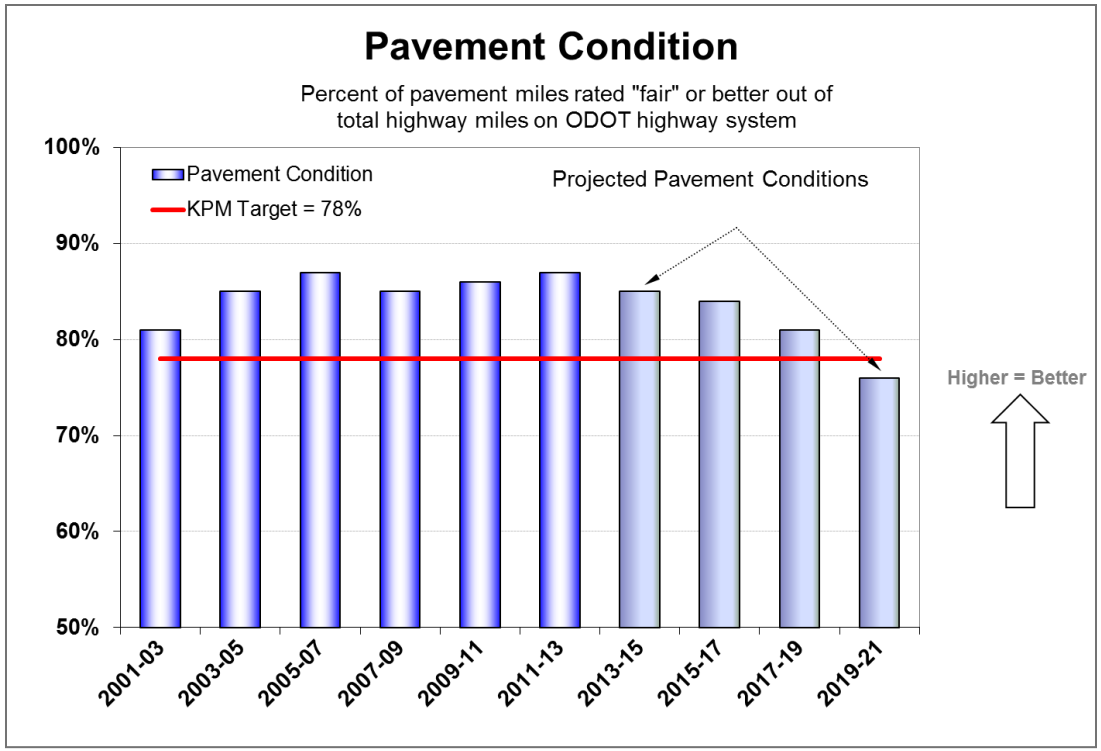
- Primary issues were
  - Initially
    - Establishing the inventory
  - Subsequently
    - Funding availability
      - Taking from preservation allocation
    - FHWA expectations for roadside safety features
      - Replacing substandard
      - Maintaining inventory

Traffic Barriers, continued

- Performance measure is not enough – this must be supported by
  - Inventory on defined maintenance schedule
  - Gap identified in terms of dollars based on actual data
  - Priorities for replacement must be clearly defined to allow for incremental progress
  - Additional considerations, like route priorities, must be identified
  - Funding MUST be available

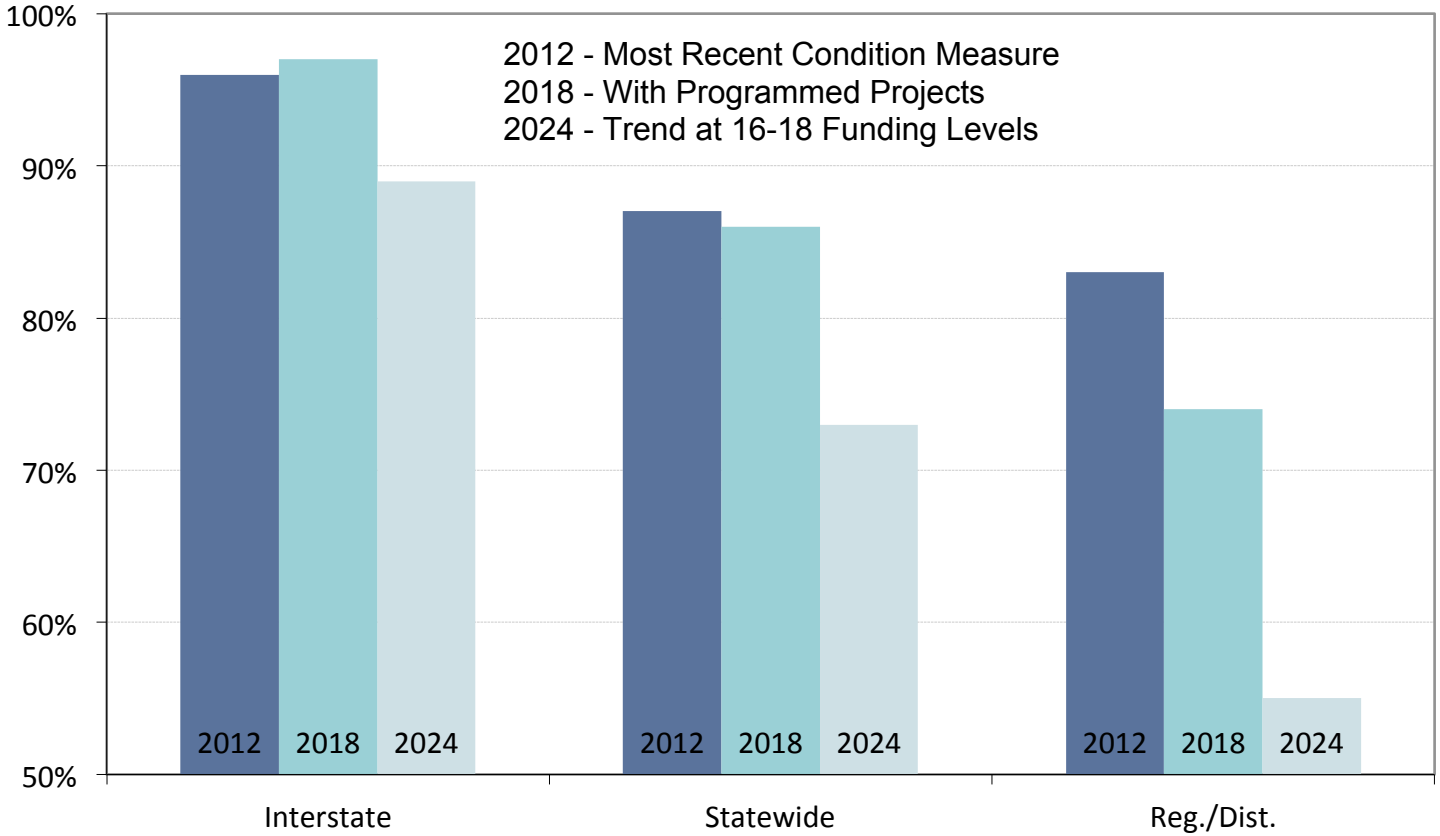
Projected Pavement Condition

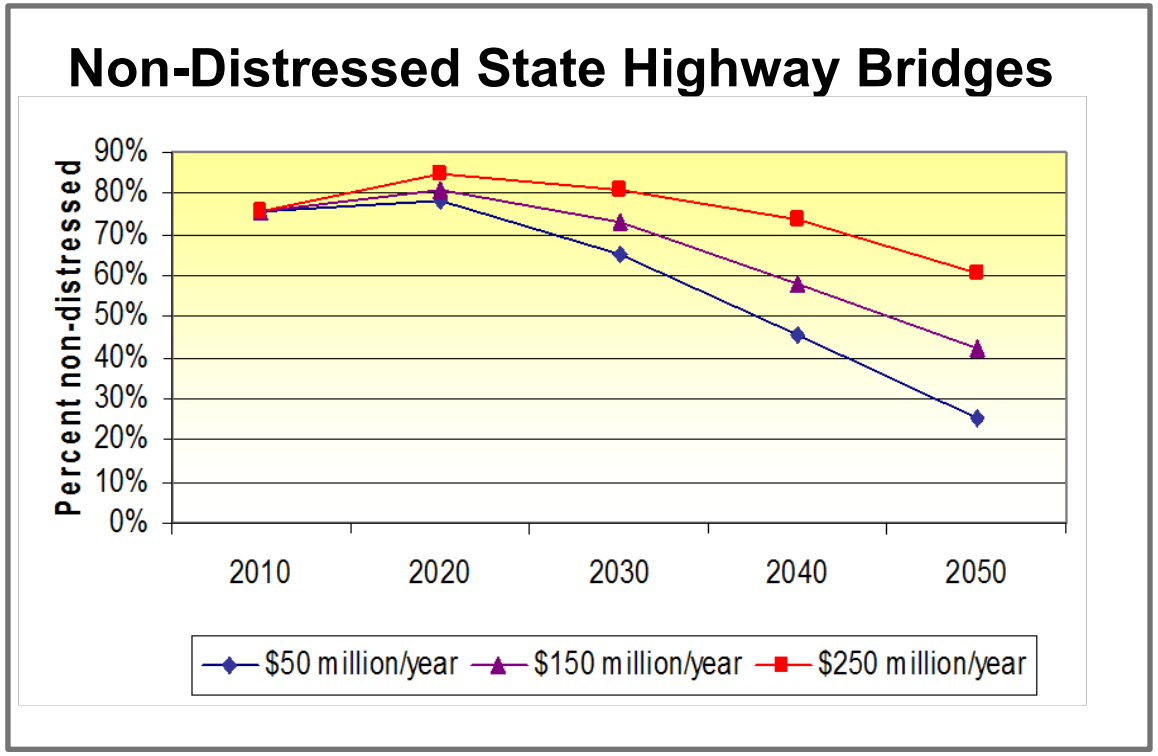




- Condition goals have long been used to guide pavement management decisions
  - ODOT would continue to use the existing process while complying MAP-21 reporting requirements

Pavement Condition by Highway Class

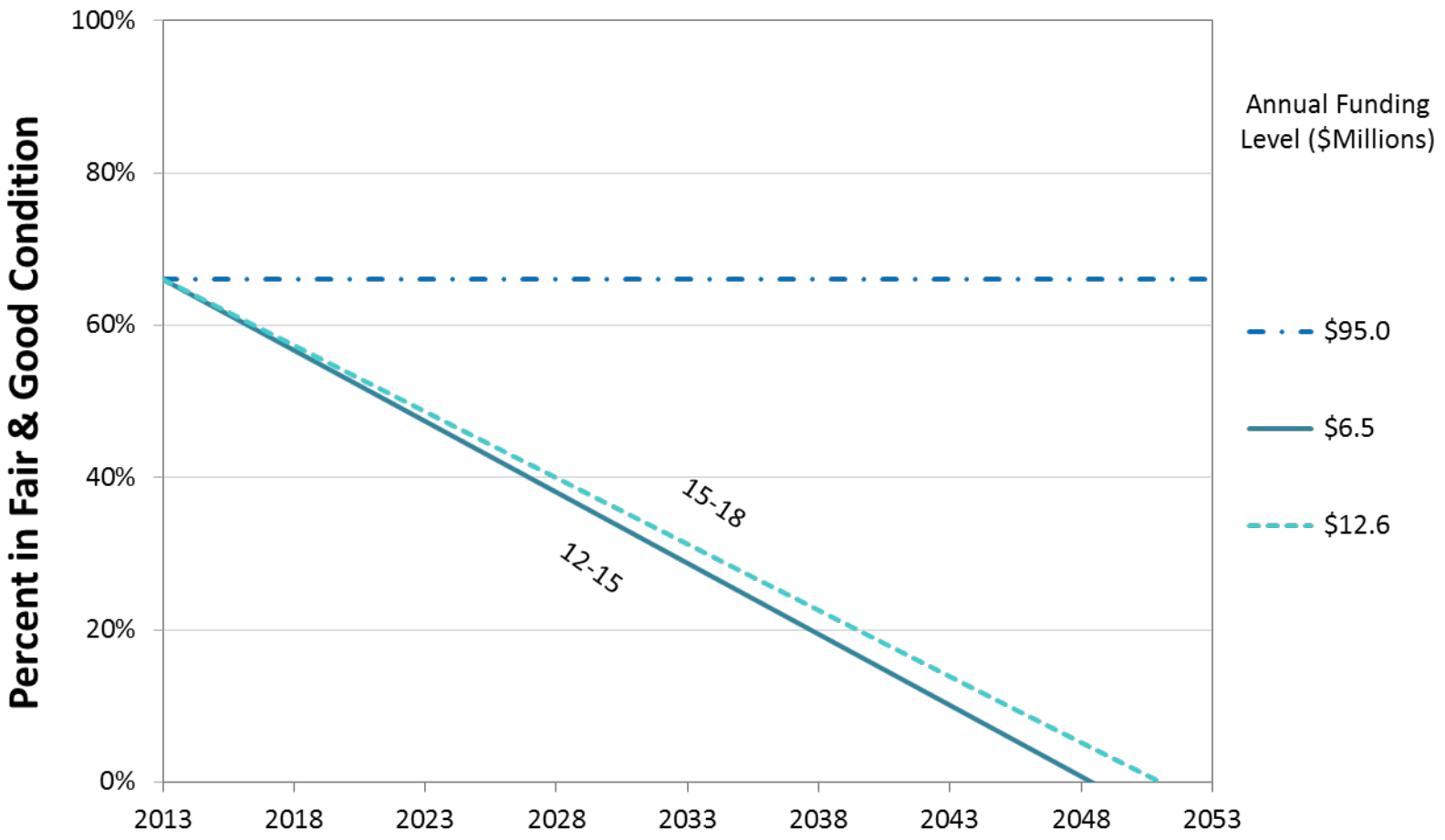




This lagging indicator includes four major needs components: Deterioration, Freight Mobility, Bridge Safety and Serviceability

- Does inform high-level funding allocation decisions
- Does NOT inform project decisions

Projected Culvert Condition



MAP-21 Performance Measures & ODOT Key Performance Measures

National Goal Area	Performance Measure (s)	ODOT Key Performance Measure(s)	Appropriate Scale for ODOT Measure?	Appropriate Measure for ODOT Adoption?
Safety	• Serious injury rate (all public roads) • Fatality rate (all public roads) • Serious injury number (all public roads) • Fatality number (all public roads)	• Traffic fatalities rate • Traffic injuries rate • Fatalities involved alcohol (percent) • Safety belt use (rate) • Large truck crashes (number) • Rail crossing incidents (number) • Derailment incidents (number) • Travelers feel safe (percent)	Yes: Public roads is the appropriate scale	Yes. ODOT already collects this data and reports it.
Infrastructure condition	• Bridge condition on NHS • Pavement condition on the Interstate • Pavement condition on non-Interstate NHS	• Distressed bridges (percent of state highway bridges not distressed) • Pavement condition (percent of state highway pavement miles rated fair or better) • Pavement condition (percent of state highway pavement miles rated fair better)	No: NHS is too narrow a subset of state transportation system	No. ODOT's Bridge KPM is broader than structurally deficient bridges.

MAP-21 Performance Measures & ODOT Key Performance Measures

National Goal Area	Performance Measure(s)	ODOT Key Performance Measure(s)	Appropriate Scale for ODOT Measure?	Appropriate Measure for ODOT Adoption?
System reliability	• Performance of the Interstate • Performance of the non-Interstate NHS	• Travel delay (annual per capita hours in urban areas) • Incident response (percent of lane blocking crashes cleared within 90 minutes) • Travel delay (annual per capita hours in urban areas) • Incidents response (percent of lane blocking crashes cleared within 90 minutes)	No: Interstate is too narrow a subset of state transportation system	No. Neither scale nor the likely measure makes this appropriate for ODOT to adopt.
Freight movement/ Economic vitality	Freight movement on the Interstate	• Travel delay (annual per capita hours in urban areas) • Incident response (percent of lane blocking crashes cleared within 90 minutes)	Not ideal: Interstate is subset of key freight routes, but may still be useful	Possibly: While the scale is not ideal, the measure may provide useful information. Would need to be supplemented by other freight measures

MAP-21 Performance Measures & ODOT Key Performance Measures

National Goal Area	Performance Measure(s)	ODOT Key Performance Measure(s)	Appropriate Scale for ODOT Measure?	Appropriate Measure for ODOT Adoption?
Congestion reduction	Traffic congestion	• Travel delay (annual per capita hours in urban areas) • Incident response (percent of lane blocking crashes cleared within 90 minutes)	Unknown: may be applied only to metro areas	Unknown
Environmental sustainability	On-road mobile source emissions	None (specific to emissions)	Unknown: may be applied only to metro areas	Unknown

Lots of Work Left to Do –

State of the Assets – a Work in Progress

DRAFT

	Capacity Status/Needs	Decisions - Programmatic			Inventory				System			Tools			Performance Measures			Risk Mgmt	
Asset Priority Tiers		Status	Needs	Comments	Status	Needs	Comments	Estimated Value	Status	Needs	Comments	Status	Needs	Comments	Status	Needs	Comments	Managed	Needs
Tier 1	Bridges	Bridge Program		1R Roadside Inventory	98%	Maintain			Stable in PONTIS	Maintain	Low Risk	Few Tools	Analysis		Bridge PM	Comply with MAP-21		Yes	
	Culverts	Developing		1R Roadside Inventory	<50%	98%	Gap = High Risk; Current Initiative - HMT Priority Routes		Stable in DFMS/ TransInfo	Maintain		Mobile Data Collection	Maintain		None	Develop		Developing	
	Pavement	Pavement Program			Sample Only	100%		$ 8,030,000,000	Unstable/ unsecure in Excel/ TransInfo	Stable, Secure System	High Risk	Few Tools	Analysis		Pavement PM	Comply with MAP-21		Partially	
	Tunnels				100%	Maintain			Stable in OneDOT	Maintain		None			None	Develop		Partially	
	Traffic Signals								Insufficient in TSIS	Migrate		Laptops			None	Develop		Partially	
Tier 2	Retaining Walls	None			98%	Maintain			Initial DB-Access	Migrate		None			None	Develop		No	
	Traffic Barriers	$6 Million Program/ 10 yr Plan		1R Roadside Inventory	98%	Maintain		$ 225,000,000	Stable in TransInfo	Maintain		Mobile Data Collection	Maintain		1R PM	Comply with 1R requirements		Yes	
	Vertical Clearance	None			<50%	98%			No System Excel-Bridges only	Create		Pilot	Tool for VC measurement of all assets/ features over the highway		None	Develop		No	
	Signs	None		1R Roadside Inventory	98%	Maintain			Unstable/ unsecure in 63 Access DB	Migrate	TransInfo #2	Mobile Data Collection	Maintain		None	Comply with FHWA requirements		Partially	
	Traffic Structures	None			<50%	98%			No Single System - parts in several	Create		Pilot	Tool for VC measurement of all assets/ features over the highway		None	Develop		No	
	Storm water	None			<50%	98%		N/A	Partial in TransInfo	Expand		None			None	Develop		Initial Effort	
	Unstable Slopes	None			<50%	98%		N/A	Access	Migrate		None			None	Develop		Partially	
	Right of Way	None			100%	Maintain			New System: RITS - Beg to End Processes	Maintain		None			None	Develop		Yes	
	Sidewalks	Multiple Programs		1R Roadside Inventory	98%	Maintain			Stable in TransInfo	Maintain		Mobile Data Collection	Maintain		Bike/Ped PM			Partially	
	ADA Ramps	$1 Million Program		1R Roadside Inventory	98%	Maintain			Stable in TransInfo	Maintain		Mobile Data Collection	Maintain		Draft PM			Partially	
	Bike Facilities	Bike Program		1R Roadside Inventory	98%	Maintain			Stable in TransInfo	Maintain		Mobile Data Collection	Maintain		Bike/Ped PM			Partially	
Tier 3	ITS	ITS Program			100%	Maintain			Stable in MicroMain	Maintain		None	Field Data Collection		None	Develop		Yes	
	Material Sources				>50%	98%			Stable in ASIS	Maintain		Mobile Data Collection	Maintain		None	Develop		Partially	
	Approaches	Access Mgmt		OPAL	98%	Maintain		N/A	Unstable in old system: CHAMPS	Replace		Mobile Data Collection	Maintain		None	Develop		No	
	Illumination	None			0%	98%			None - Paper Files	Create		None	Field Data Collection		None	Develop		No	
Tier 4	Wetland Mitigation Sites				98%	Maintain						Mobile Data Collection	Maintain		Draft PM			Partially	
	Weigh-in-Motion Sites				100%	Maintain			Temporary System: Excel	Migrate		None	Field Data Collection		Draft PM			Partially	
	Sound Barriers				98%	Maintain			Temporary System: Access	Migrate		None	Field Data Collection		None	Develop		No	

Key Factors for Success

- Continued strong emphasis on coordination
- Strong, steadfast executive sponsorship
- Continued movement of ODOT culture
  - Built on foundation and principles of Asset Management
  - Enterprise data
  - Alignment and education of data management and governance best practices
- Transparent and inclusive communications

Conclusion

- Performance measures, if structured well, provide the "goal posts"
- However, much more is required for informed decisions that will result in progress
  - Maintained inventory
  - Quantified gap
  - Clear priorities
  - Funding
  - Report on progress