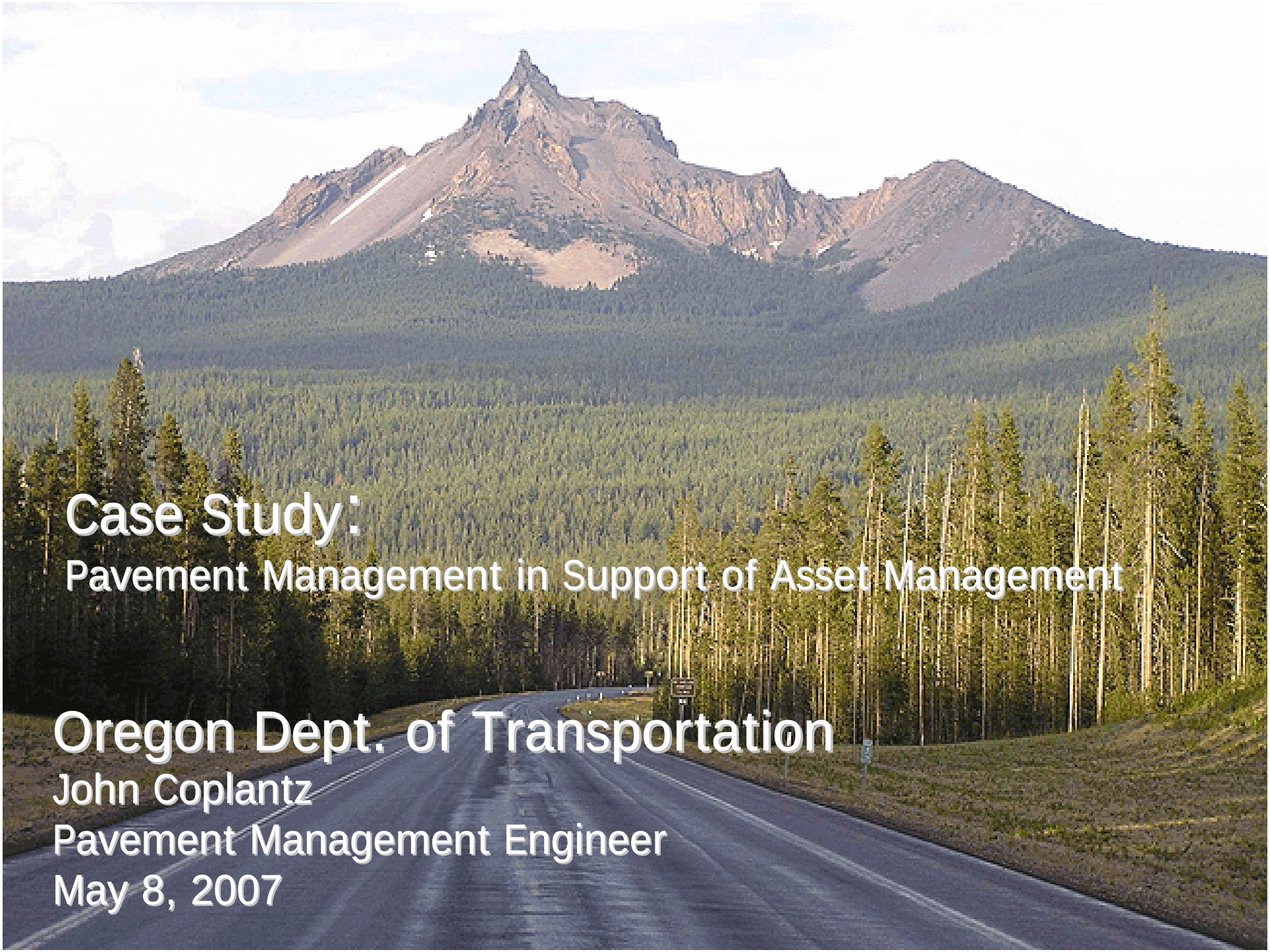


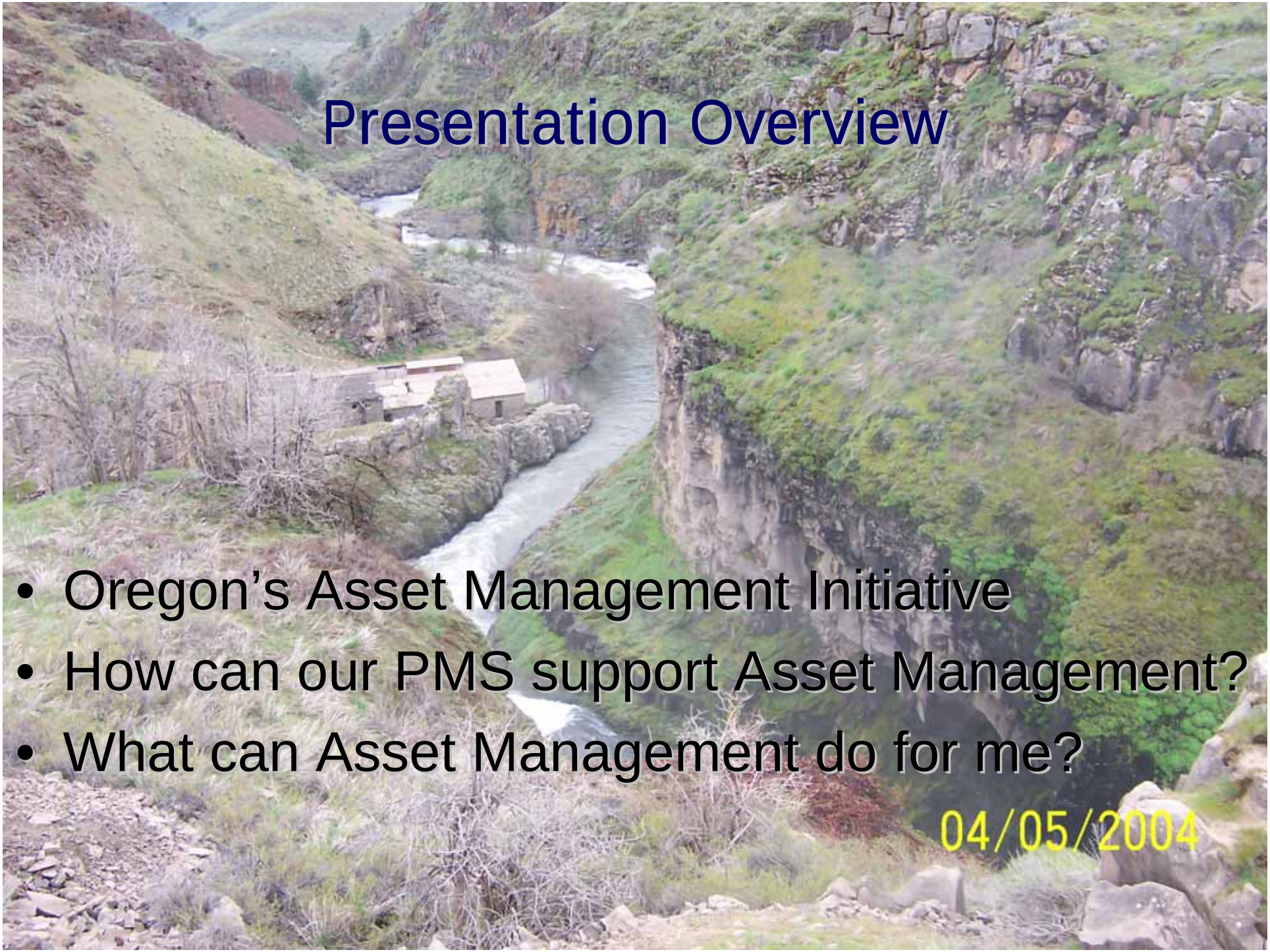
Case Study:
Pavement Management in Support of Asset Management

Oregon Dept. of Transportation

John Coplantz
Pavement Management Engineer
May 8, 2007


You could
live here !
We're recruiting for a
Materials Engineer ….

Presentation Overview



- Oregon's Asset Management Initiative
- How can our PMS support Asset Management?
- What can Asset Management do for me?

Why Asset Management?

- ODOT is responsible for managing billions of dollars in non-linear and linear assets
- Aging infrastructure
- Limited resources and many competing needs
- Need to get the ***right information***, at the ***right time***, to the ***right people***, so that the ***right decisions*** can be made

ODOT Asset Management Vision

ODOT's assets are *managed strategically* by utilizing *integrated and systematic data collection*, storage, analysis and reporting standards on a *broad range of transportation system assets*, optimizing funding and *life cycle decisions for operations, maintenance and construction* business functions.

ODOT Asset Management Mission

- to put in place the *plans, people, processes and products* that enable ODOT to implement accepted Asset Management practices in a timely and cost-effective manner; and

- to *continually monitor and improve* Asset Management implementation over time

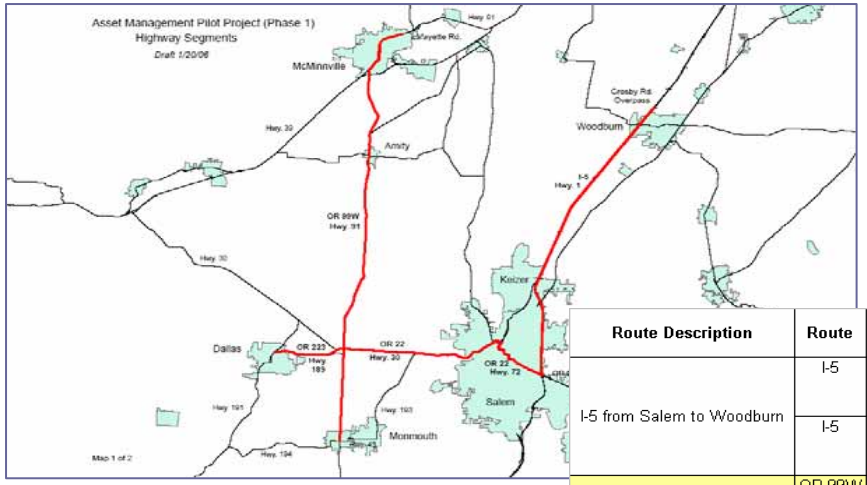
Implementation Strategy

- Use national and international best practices
- Build on existing ODOT management system work
- Incorporate lessons learned from pilot efforts
- Include a high-level assessment of all ODOT assets
- Be a staged approach drilling in on a prioritized list of assets
- Incorporate asset management principles and practices into ODOT daily work functions
- Be implemented within a 5-year timeline

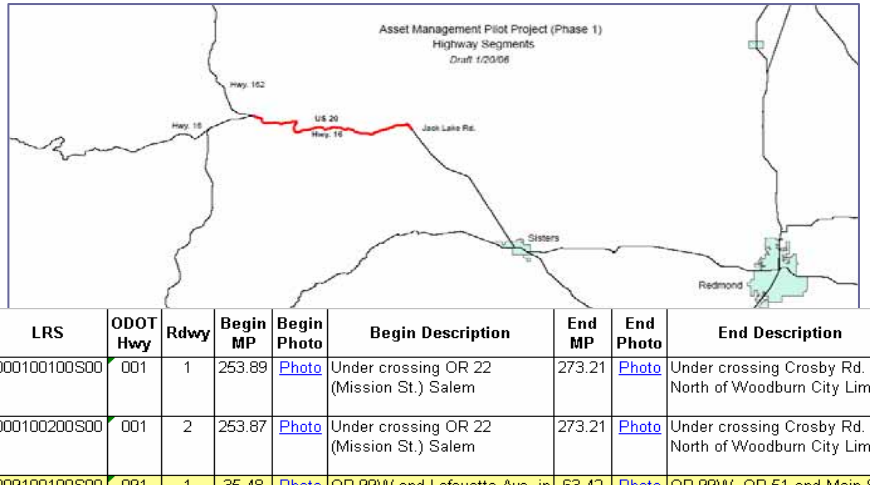
PILOT – Getting our feet wet

ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

Mid-Willamette Valley



Snow Zone



Note:

- Corridors (point-to-point) chosen to represent the system
- Decide what data to collect and how

Route Description	Route	LRS	ODOT Hwy	Rdwy	Begin MP	Begin Photo	Begin Description	End MP	End Photo	End Description
I-5 from Salem to Woodburn	I-5	000100100S00	001	1	253.89	Photo	Under crossing OR 22 (Mission St.) Salem	273.21	Photo	Under crossing Crosby Rd. North of Woodburn City Limits
	I-5	000100200S00	001	2	253.87	Photo	Under crossing OR 22 (Mission St.) Salem	273.21	Photo	Under crossing Crosby Rd. North of Woodburn City Limits
Oregon 99W from McMinnville to Monmouth	OR 99W	009100100S00	091	1	35.48	Photo	OR 99W and Lafayette Ave. in McMinnville	63.42	Photo	OR 99W, OR 51 and Main St. in Monmouth
	OR 99W	009100200S00	091	2	37.06	Photo	Roadway splits. Rdwy 2 segment begins.	38.22	Photo	Split roadways come together. Rdwy 2 segment ends.
Oregon 223 and Oregon 22 from Dallas to Salem	OR 22	003000100S00	030	1	15.87	Photo	Jct. OR 223 and OR 22 in Dallas	26.14	Photo	Jct. Commercial and Center St. in Salem
	OR 22	003000200S00	030	2	16.40	Photo	Roadway divides with barrier. Rdwy 2 segment begins.	18.38	Photo	Barrier ends
	OR 22	003000200S00	030	2	18.84	Photo	Roadway divides with barrier. Rdwy 2 segment begins.	19.40	Photo	Barrier ends
	OR 22	003000200S00	030	2	24.08	Photo	Roadway divides with barrier. Rdwy 2 segment begins.	26.18	Photo	Jct. Commercial and Marion St. in Salem
	OR 223	018900100S00	189	1	0.00	Photo	Ellendale and OR 223	4.01	Photo	Jct. OR 22 and OR 223
	OR 22	007200100S00	072	1	5.01	Photo	OR 22 crossing under Center St.	8.48	Photo	Jct. with Hwy 162, 0.02 mile east of center of structure over Mill Creek
	OR 22	007200200S00	072	2	5.01	Photo	OR 22 crossing under Center St.	6.57	Photo	Split roadways come together.
	OR 22	016200100S00	162	1	1.17	Photo	Jct. with Hwy 072	1.41	Photo	OR 22 crossing over southbound I-5
US 20 from Santiam Junction, east to Jack Lake Rd.	US 20	001600100S00	016	1	74.90	Photo	Jct.of US 20 and OR 22	88.20	Photo	Jack Lake Rd.

ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

Asset List - Linear

Drainage Structures

- Ditches & Catch Basins
- **Culverts**
- Curbs
- Horizontal/Vertical Drains
- Storm Water Control Facilities
- Storm Water Drainage Facilities
- **Tide Gates**

Roadside

- Access Control
- Bike/Pedestrian Paths
- Bike Lanes
- Delineators/ Mileposts
- Fencing
- Impact Attenuators
- Interchanges
- Landscaping
- Mailbox Supports
- Parking (Restrictions)
- Road Approaches
- **Right-of-Way**
- Rock Fall Protection
- Runaway Truck Refuges
- Sidewalks
- **Traffic Barriers**
- Turnouts

Bridges & Structures

- **Bridges**
- **Retaining Walls**
- Sound Walls
- Tunnels

Pavements

- **Pavements**

*Priority Assets shown in **Red***

Asset List (continued)
Linear & Non-Linear

Special Features - Associated Linear Features

- **Aggregate Sites**
- Communications Network
- **Environmental – Wetlands Mitigations Sites**
- Environmental – Habitat Improvements
- GPS Base Stations
- Safety Rest Areas
- Sno-Parks
- Stockpiles & Disposal Sites
- Weigh-in-Motion (WIM) Sites

Traffic

- Automatic Traffic Recorder (ATR) Sites
- Intersection Flashers
- Illumination
- Intelligent Transportation Systems
- Roundabouts
- Rumble Strips
- Pavement Markings
- **Sign Bridges**
- **Signs**
- Signals

Other ODOT Assets – Non-Linear

- Computer Software
- Data
- Equipment & Vehicles
- Facilities / Property
- Special Management Areas & Archeological Areas
- Transportation Management Operation Centers (TMOCS)

*Priority Assets shown in **Red***

ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

COMMON SCALE - Condition

For comparison across assets & functionality:

Good

Fair

Needs Inspection/Below Avg.

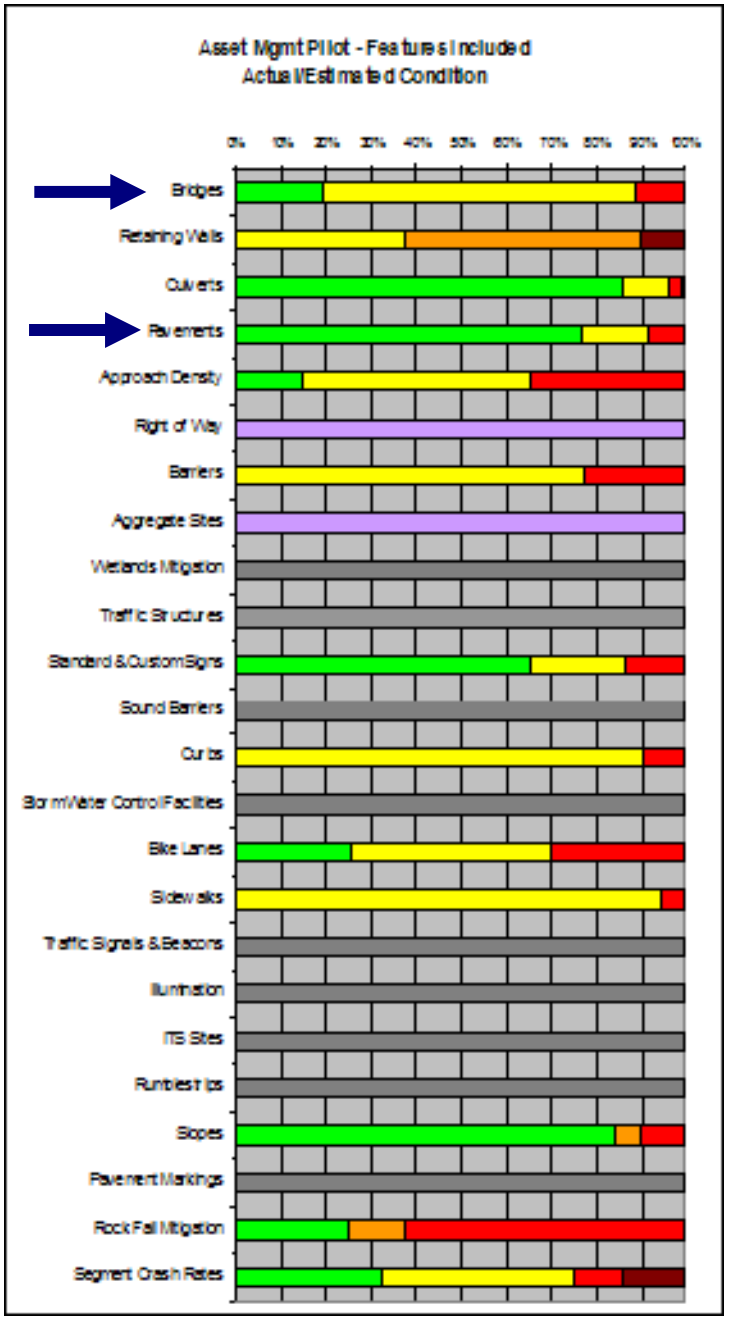
Poor

Not Pertinent

Unknown

Condition:

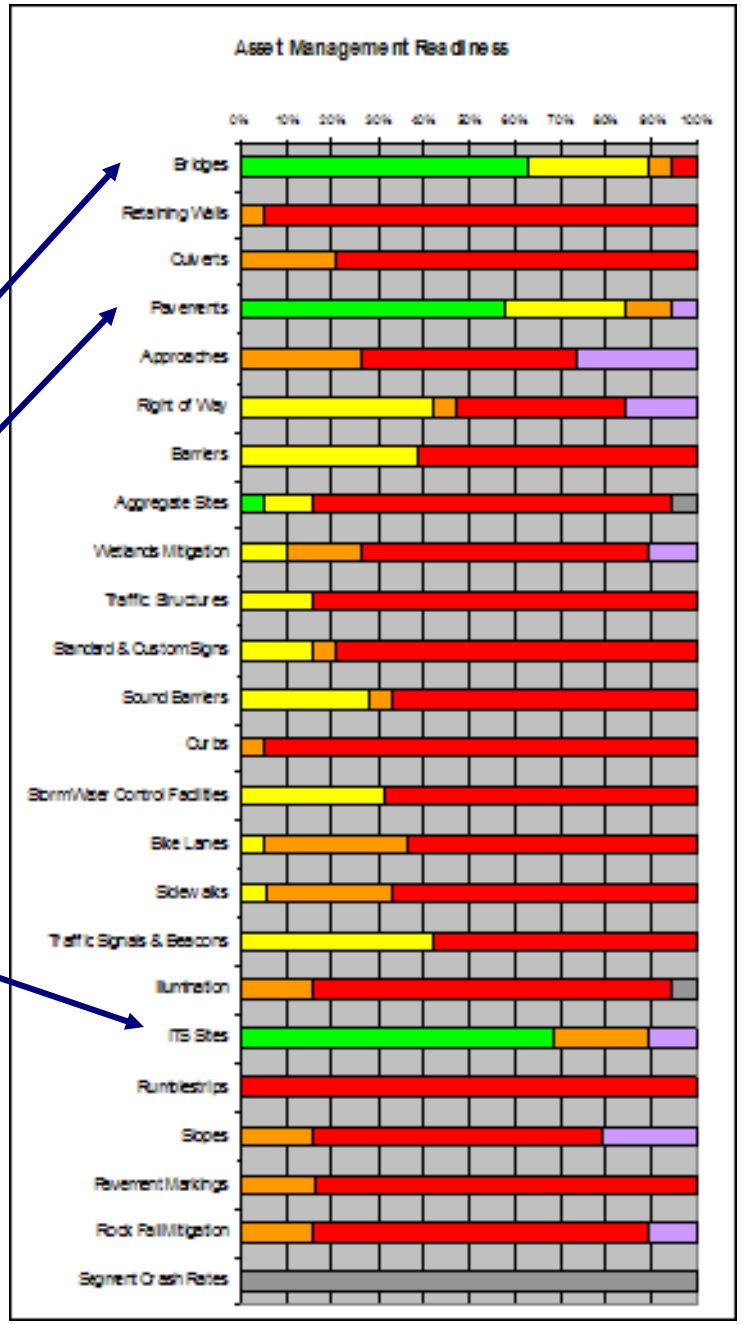
Actual or estimated condition, where available, of transportation assets within the pilot corridors. Only two, pavements & bridges, have established rating systems.



Readiness:

Only three groups of transporation assets included in the pilot have any level of readiness for proactive management:

1. **Bridges**
2. **Pavements**
3. **ITS Equipment**



PILOT - Issues/Findings

- Lack of Basic Inventory Data for most assets/features included in pilot
- Condition data collection cumbersome for certain assets/features
- The “Current State” in Asset Mgmt cycle is not linked to Maintenance and Construction
  - Without solutions, inventory today may not be “Current State” tomorrow
- Ad hoc, fractured data collection ongoing, but inconsistencies equal lack of usable corporate information

Deciding Priorities

- Highest Priorities
  - Core Features (to keep the road open):
    - Bridges
    - Culverts
    - Retaining Walls
    - Pavements
    - Tunnels
    - Interchange Systems
      - Structure
      - Geometry (i.e., ramps)

Deciding Priorities, continued

- Remaining Priority Features:
  - Right of Way
  - Signs
  - Sign Bridges & other Traffic Structures
  - Traffic Barriers
  - Mitigation Sites (Wetlands & others)
  - Aggregate Sites
  - Tide Gates

ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

What can Pavement Management bring to the Asset Management table?

We use established procedures to measure condition of our assets

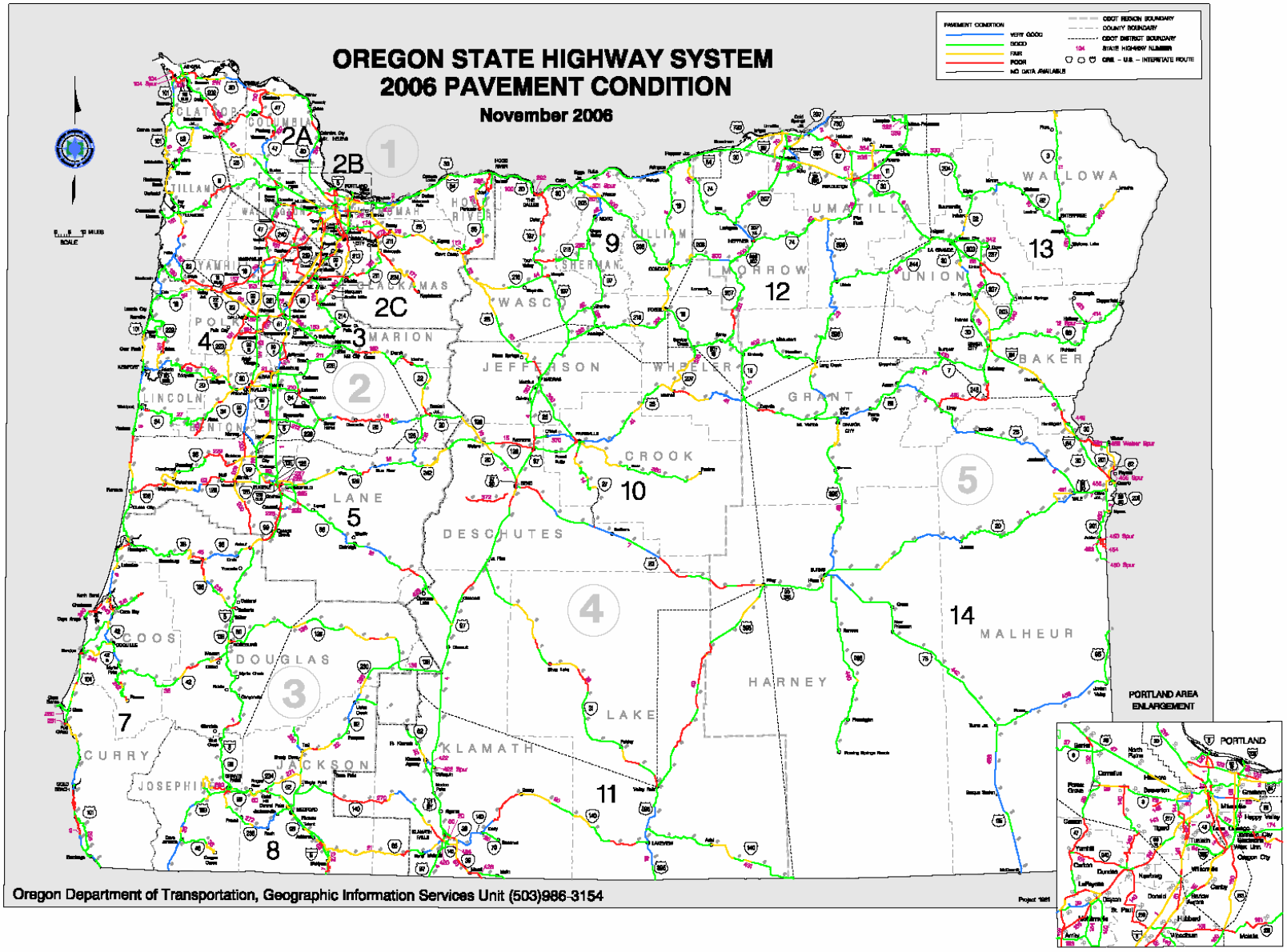
ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

But there are occasional glitches ....

We can report condition in easy to understand terms (for consistency across assets)

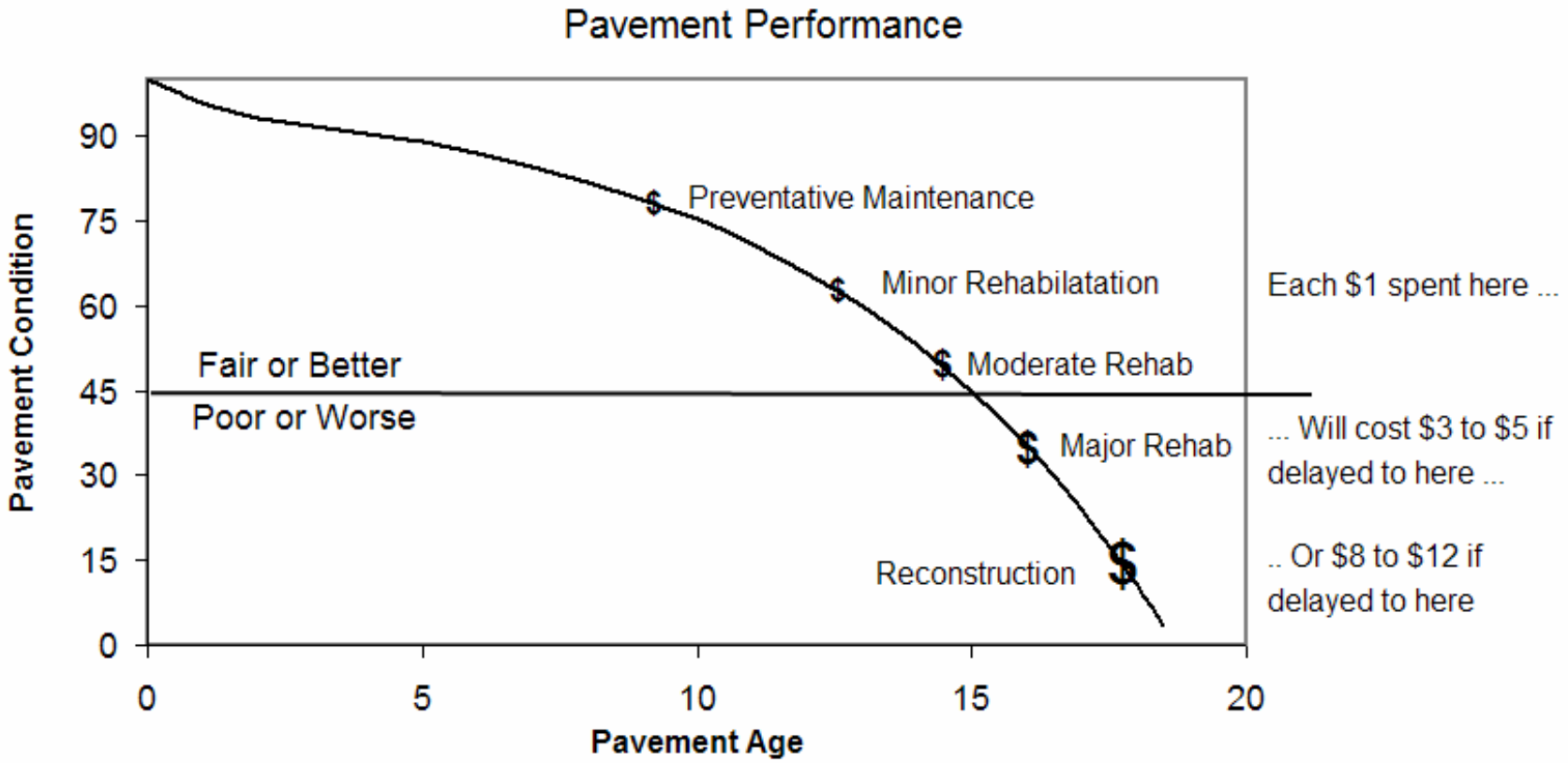
Condition	Overall Condition Index
Very Good (VG)	100 to 98.1
Good (GD)	98.0 to 75.1
Fair (FR)	75.0 to 45.1
Poor (PR)	45.0 to 10.1
Very Poor (VP)	10.0 to 0.0

We can tie to GIS



ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

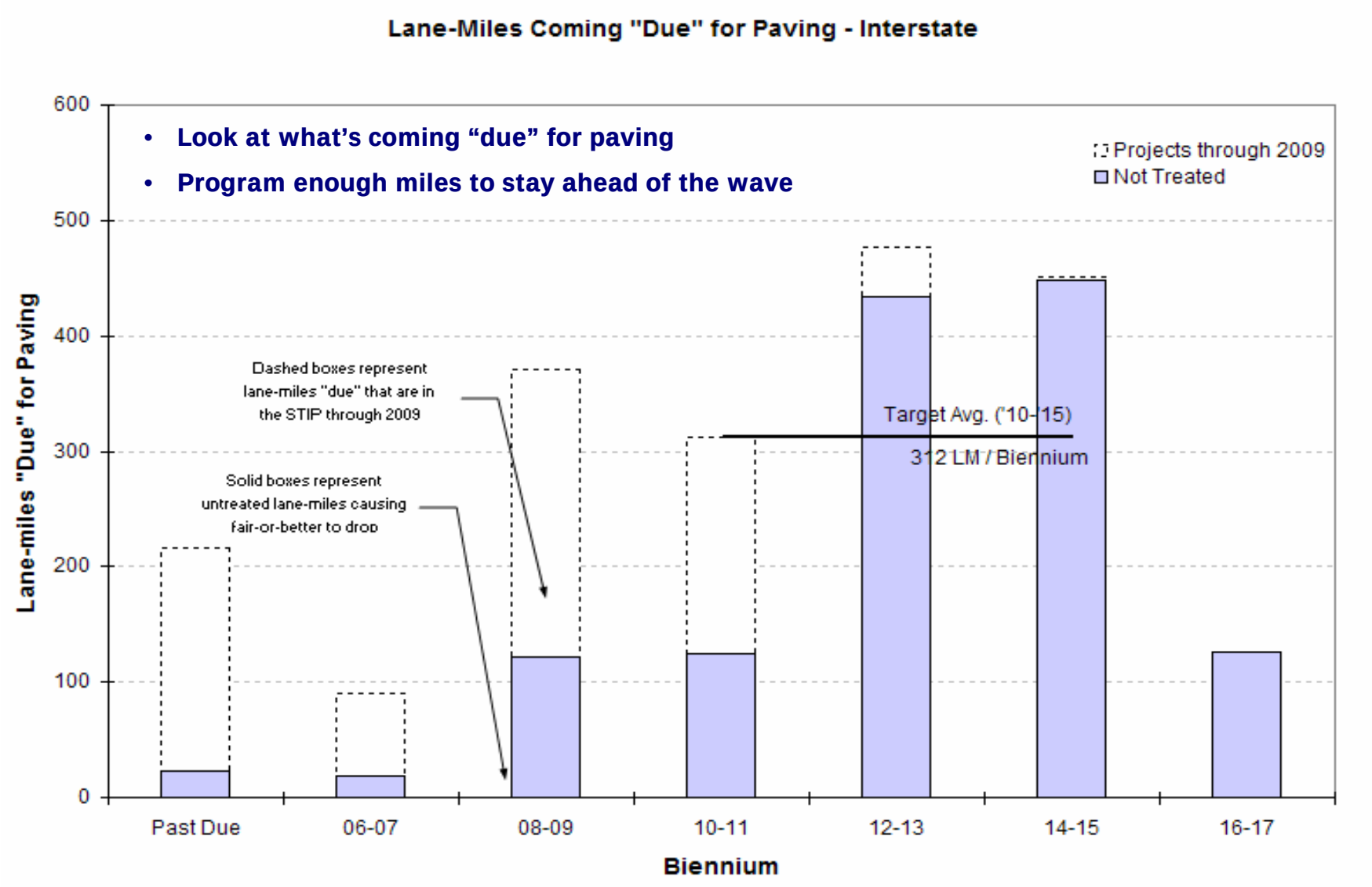
We can educate others - Performance Modeling & Window of Opportunity concepts



Maintenance of roadway pavements in fair or better condition costs significantly less than rehabilitating or reconstructing those in poor condition.

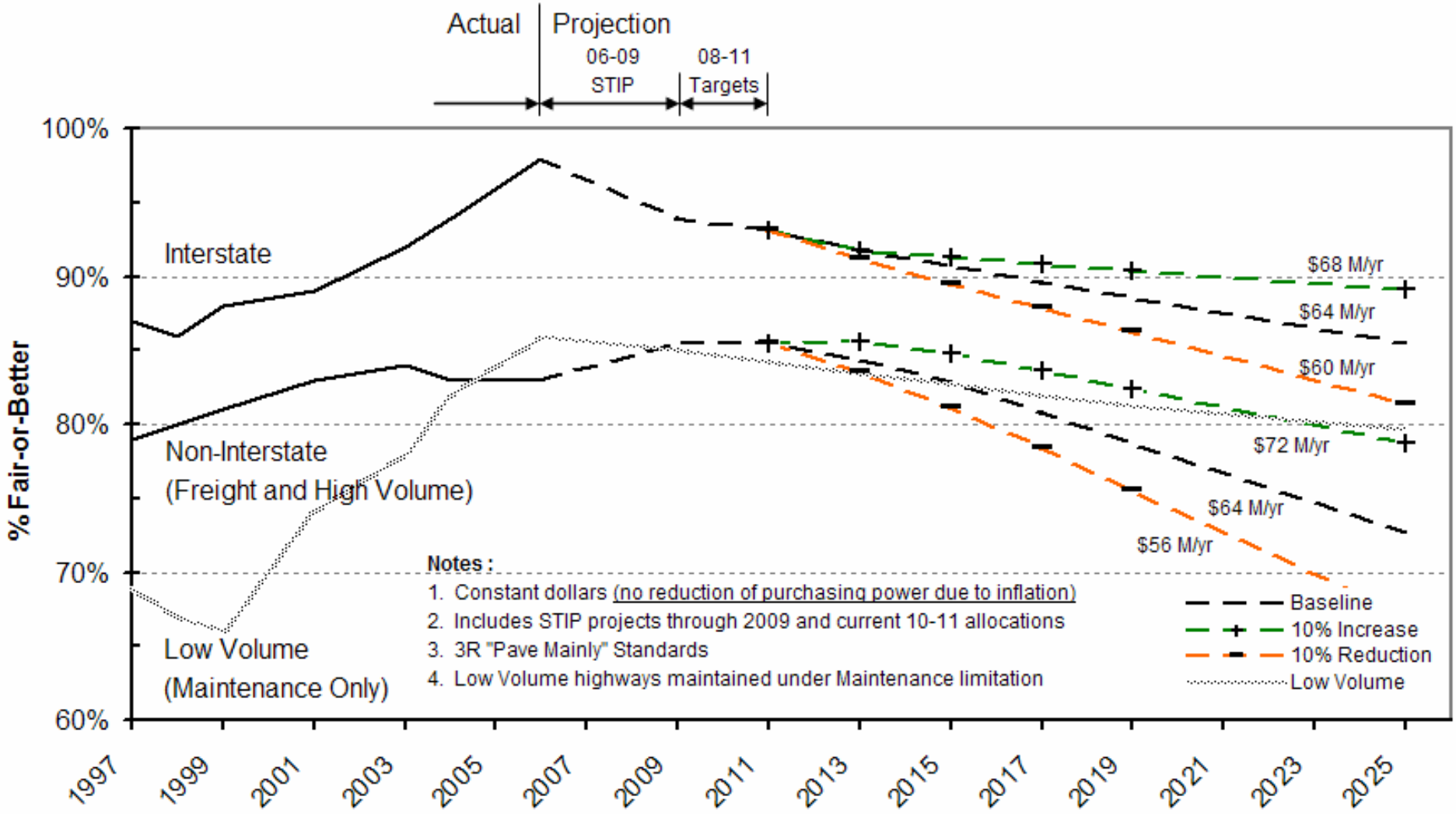
ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

We can evaluate Remaining Service Life



ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

We can show Consequences of Budgets



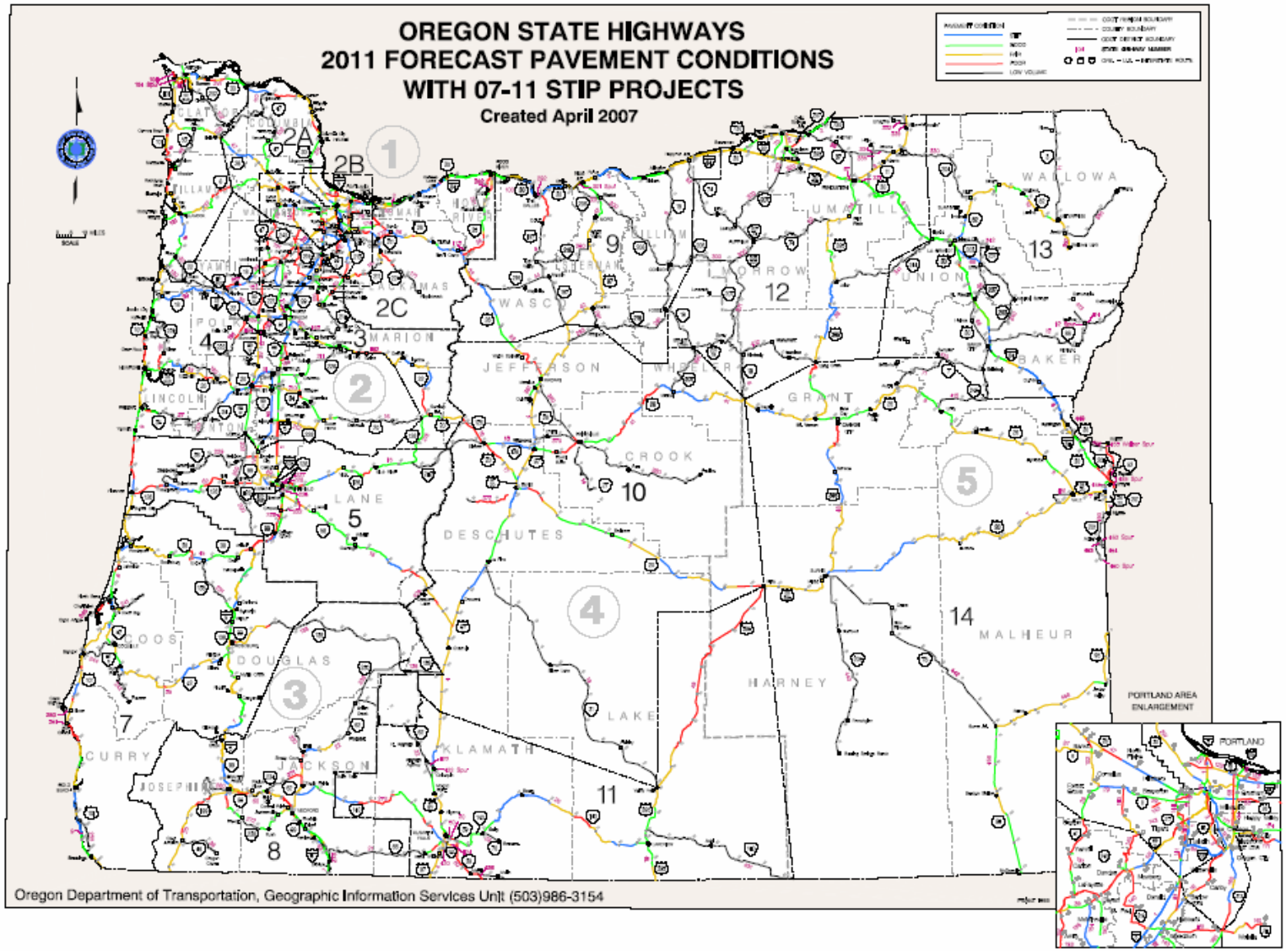
ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

We can pull Inventory, Condition, Treatment and Programmed Work Info for Work Plan Development

SECTION LOCATION							LAST PREDOMINANT DEFINING TREATMENT										CONDITION TREND						PROGRAMMED WORK			
REG	DIST	ROUTE	BEG MP	END MP	LEN	LM	HIST YR	HIST PROJ NAME	HIST BEG	HIST END	THK-1	CD-1	THK-2	CD-2	REM-1	CD-B	99 COND	01 COND	04 COND	06 COND	2011 RSL	2011 AGE	PROJ YR	PROJ NAME	PROJ BEG	PROJ END
2	01	US101	90.31	91.37	1.06	2.48	1993	BROOTEN RD.-LITTLE NESTUCCA RIVER E	90.20	91.85	2	F					91	91	96	91	2	18				
2	04	US101	91.37	91.79	0.42	0.84	1993	BROOTEN RD.-LITTLE NESTUCCA RIVER E	90.20	91.85	2	F					100	95	100	95	2	18				
2	04	US101	91.79	96.15	4.17	9.36	1988	LITTLE NESTUCCA RIVER - ORETOWN SEC	91.85	96.76	2	B	2	B		AG	96	94	96	85	1	23				
2	04	US101	96.76	105.64	8.84	22.43	2000	NESKOWIN - OTIS JUNCTION SEC.	96.77	105.45	2	B2					33	100	100	98	5	11				
2	04	US101	110.75	112.65	1.90	3.82	2006	US101: Otis Jct - Boiler Bay	110.75	115.84	2	C	2	C	4		37	52	47		10	5				
2	04	US101	112.65	113.00	0.35	1.32	2006	US101: Otis Jct - Boiler Bay	110.75	115.84	2	C	2	C	4		80	90	74		10	5				
2	04	US101	113.00	115.56	2.56	8.86	2006	US101: Otis Jct - Boiler Bay	110.75	115.84	2	C	2	C	4		38	41	30		10	5				
2	04	US101	115.56	120.02	4.46	11.10	2006	US101: Otis Jct - Boiler Bay	116.73	120.02	2	C	2	C	4		73	71	69		10	5	2007	US101:SE13TH ST-SE 32ND ST	115.84	116.73
2	04	US101	120.02	123.20	3.06	7.18	2006	US101: Otis Jct - Boiler Bay	120.02	126.41	2	C			2		100	98	100		10	5				
2	04	US101	123.20	126.45	3.25	6.57	2006	US101: Otis Jct - Boiler Bay	120.02	126.41	2	C			2		97	80	70		10	5				
2	04	US101	126.45	127.60	1.15	2.30	1998	DEPOE BAY 1998 PAVING PROJECT	125.21	127.58	2	C	2	C			100	100	97	87	2	13				
2	04	US101	127.60	137.51	9.91	23.44	1993	DEPOE BAY BRIDGE-N.E. 54TH (NEWPORT	127.64	137.38	2	F					93	92	77	74	0	18				
2	04	US101	137.51	139.37	1.86	4.62	1997	N.E.54TH ST.- N.E. 20TH ST. (NEWPORT) S	137.51	139.37	2	F	1	C			100	100	100	93	4	14				
2	04	US101	139.37	141.37	2.00	7.81	1998	20TH ST. - YAQUINA BAY BRIDGE (NEWP	139.37	141.37	2	C	2	C	2		98	100	98	94	4	13				
2	04	US101	141.98	146.95	4.97	10.33	2005	US101: YAQUINA BAY BRIDGE-SE 123RD &	141.98	146.96	2	C					66	66	51	100	9	6				
2	04	US101	146.95	147.51	0.56	1.12	1998	OREGON COAST HWY. AT 130TH DR. (NEW	146.98	147.43	2	F					93	96	90	94	4	13				
2	04	US101	147.51	148.70	1.19	2.38	1992	PASSMORE ROAD-BAYSHORE DRIVE	146.98	154.70	2	F					97	93	97	87	1	19				
2	04	US101	148.70	149.40	0.70	1.40	2001	MAINT OVERLAY	148.70	149.40	2	C					97		100	92	5	10				
2	04	US101	149.40	155.25	5.85	12.28	1992	PASSMORE ROAD-BAYSHORE DRIVE	146.98	154.70	2	F					97	96	87	82	1	19				

We can make Forecasts given programmed work activities

ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...



ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

We can prepare Needs Lists and Candidate Projects Lists

SECTION LOCATION						CLASS / ADT				LAST PREDOMINANT DEFINING TREATMENT											CONDITION TREND						POTENTIAL 2012-2013 CANDIDATES			
REG	DIST	BEG MP	END MP	LEN	LM	SCS	NHS	FRT	2005 AVG ADT	HIST YR	HIST PROJ NAME	HIST BEG	HIST END	THK-1	CD-1	THK-2	CD-2	REM-1	CD-B		01 COND	03 COND	04 COND	06 COND	2011 RSL	2011 AGE	ESTIMATED TREATMENT	ROUGH REHAB UNIT COST (X1000 $/LM)	ROUGH PROJECT COST	COMMENTS
US101: Nedonna Beach Rd. - Barview																													
2	01	**48.73**	**49.51**	0.78	1.56	S	N	N	5,000	1994	NEDONNA BEACH ROAD - BARVIEW	48.57	49.[illegible]	2	F						100	90	92	67	0	17	INLAY	150	$230,000	Raveling only, no fatigue
2	01	**49.57**	**53.79**	4.22	8.44	S	N	N	6,300	1994	NEDONNA BEACH ROAD - BARVIEW	49.71	53.93	2	F						98	95	91	66	0	17	INLAY	150	$1,270,000	Raveling only, no fatigue
US101: Barview - N. Tillamook																													
2	01	**53.79**	**56.72**	2.93	5.86	S	N	N	7,800	1997	BARVIEW-MIAMI RIVER BRIDGE	54.00	56.72	2	F						97	90	90	75	1	14	INLAY+REPAIR	200	$1,170,000	City of Garibaldi
2	01	**56.72**	**57.21**	0.49	0.98	S	N	N	9,100	1992	MIAMI RIVER BRIDGE SECTION	56.60	57.21	2	B	4	B		AG		88	78	80	62	0	19	INLAY / OVLY	200	$200,000	
2	01	**57.21**	**64.23**	6.77	13.54	S	N	N	10,500	1997	HOBSONVILLE POINT ROAD - WILSON	57.21	64.21	2	F	1	C				97	97	97	82	2	14	INLAY / OVLY	200	$2,710,000	Historic wall issues
OR6: Jordan Cr. - Wilson R.																													
2	01	**18.00**	**27.80**	9.80	20.52	R	O	Y	3,900	1983	JORDAN CREEK - MCNAMERS CAME	18.12	27.82	2	B	2	B				60	51	51	38	0	28	INLAY / OVLY	200	$4,100,000	
US30: Rock Creek - Old Hwy. 30																													
2	01	**79.59**	**81.80**	2.21	6.50	S	N	Y	6,000	1986	ROCK CREEK ROAD-GUN CLUB ROAI	79.50	81.70	2	C						62	69	83	71	0	25	INLAY / OVLY	250	$1,630,000	
2	01	**81.80**	**83.40**	1.60	3.20	S	N	Y	7,300	1994	TRIPP ROAD - KNAPPA	81.81	83.44	2	F						94	97	82	78	1	17	INLAY / OVLY	250	$800,000	Clearance Issue - 14'-3" MP
2	01	**83.40**	**87.70**	4.30	9.84	S	N	Y	8,000	1985	DISTRICT 1 PAVING PROJECT	83.40	87.72	2	C	1	C				81	81	82	70	0	26	INLAY / OVLY	250	$2,460,000	

We can evaluate Workplans

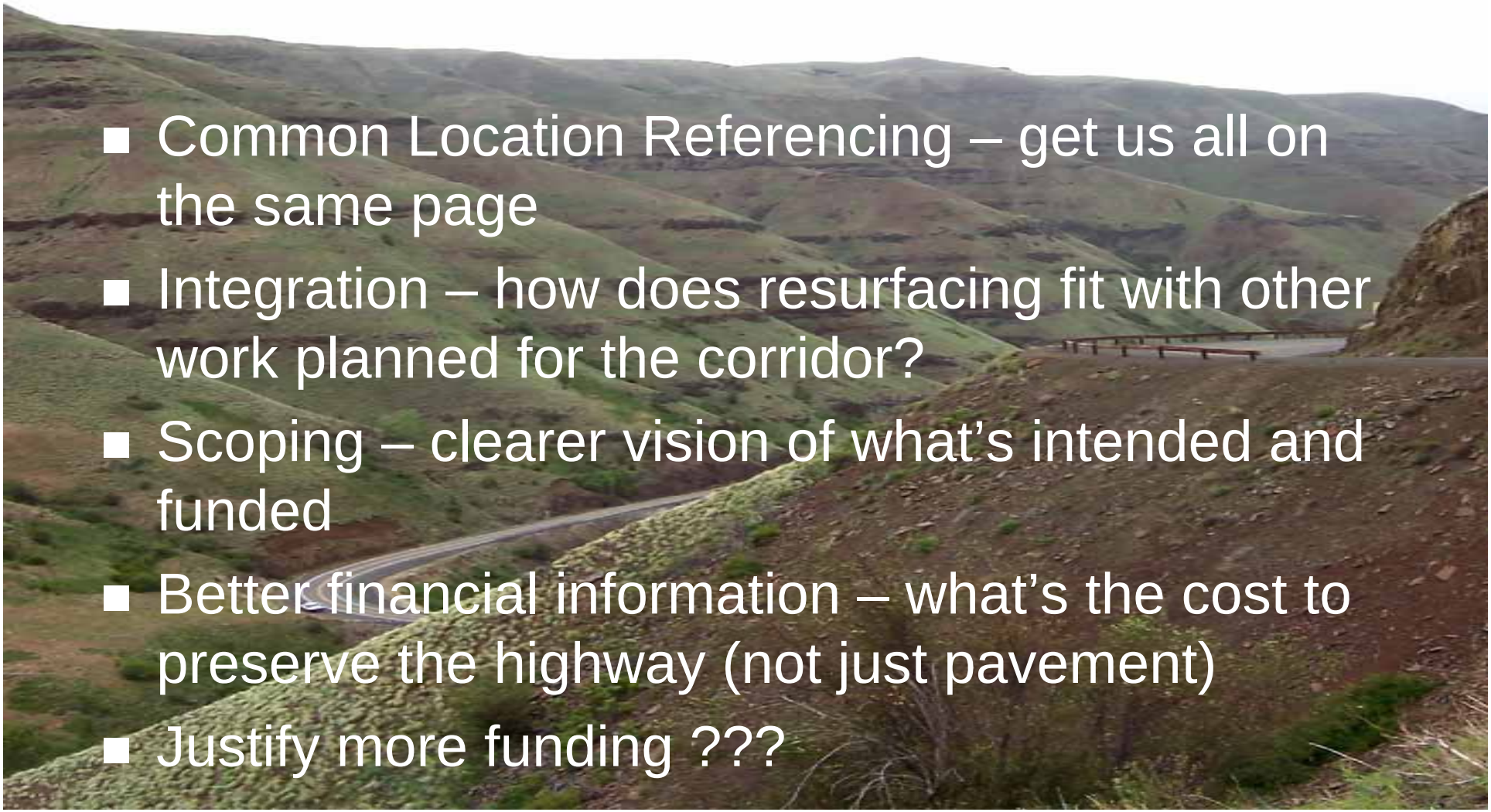
- Where and How are we spending our resurfacing money?
- Are we sustainable?

08-11 STIP Preservation Summary
(excl. Low Volume Region and District highways)

Program	Lane-miles of Inventory	08-11 Preservation Lane-miles	Equivalent Resurfacing Interval	08-11 Pres. Allocation (millions)	Programmed Dollars per lane-mile
Interstate	3126	562	22 yrs.	$253.1	$448,000
Region 1	1340	275	19 yrs.	$69.5	$251,000
Region 2	2808	526	21 yrs.	$89.8	$169,000
Region 3	1215	186	26 yrs.	$34.5	$183,000
Region 4	2027	244	33 yrs.	$49.5	$202,000
Region 5	1892	110	69 yrs.	$15.9	$145,000
Total	**12408**	**1903**	**26 yrs.**	**$512.3**	**$269,000**

ODOT ASSET MANAGEMENT
STAYING AHEAD OF THE CURVE...

Finally,
What can Asset Management do for me?



- Common Location Referencing – get us all on the same page
- Integration – how does resurfacing fit with other work planned for the corridor?
- Scoping – clearer vision of what's intended and funded
- Better financial information – what's the cost to preserve the highway (not just pavement)
- Justify more funding ???

Thank You!