

Utah DOT

Randy Park

Peer Exchange - Integrating Risk Management in Transportation Asset Management Programs

UDOT Asset Management

Data, Information, Decisions, Funding

Randy Park, UDOT Project Development Director
August 26, 2015

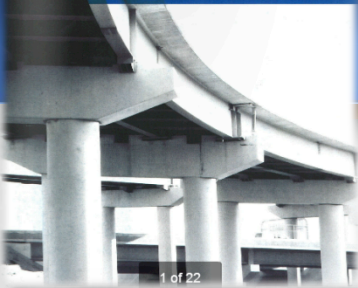


Utah

- Population 2,950,000 (32th largest state)
- Land Area: 84,900 sq. mi (13th largest state)
- UDOT
 - 5860 Centerline Miles
 - 16,000 Lane Miles
 - 24,700 Surface Areas
 - 1,600 Employees



2009 STRATEGIC DIRECTION
& Performance Measures



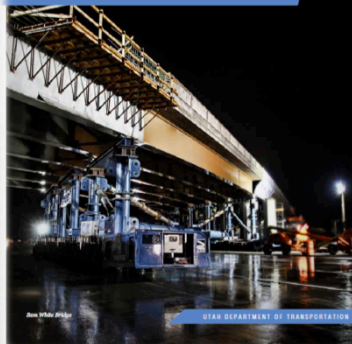
1 of 22

2010 STRATEGIC DIRECTION
& Performance Measures



UTAH DEPARTMENT OF TRANSPORTATION

2012 STRATEGIC DIRECTION
& PERFORMANCE MEASURES



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2013 STRATEGIC DIRECTION
& PERFORMANCE MEASURES



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UTAH DEPARTMENT OF TRANSPORTATION
2014 STRATEGIC DIRECTION
& PERFORMANCE MEASURES



utah.gov/transportation

UTDOT

2015
STRATEGIC DIRECTION
UTAH DEPARTMENT OF TRANSPORTATION



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Annual Strategic Direction and Performance Measures

Guiding Principals - Strategic Goals

- Zero Crashes, Injuries, and Fatalities
- Preserve the Infrastructure
- Optimize Mobility

2011 STRATEGIC DIRECTION
& PERFORMANCE MEASURES



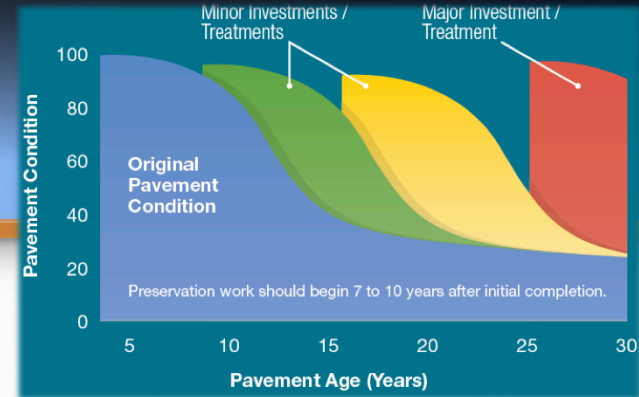
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UTDOT

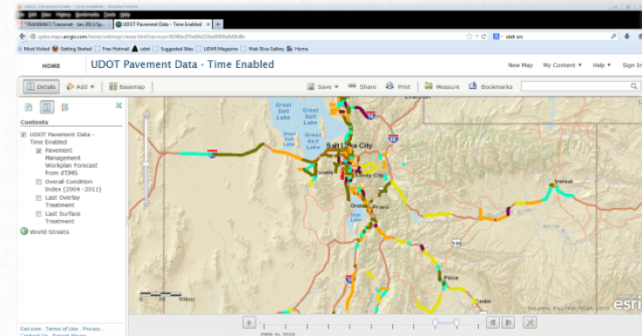
Asset Management Timeline

"It is a Journey"

- 1977 – “Good Roads Costs Less”
- 1992 – “A Plan for Every Section of Every Road”
- 2002 – Created Asset Management Division
- 2007 – Pavement Distress Survey Contracted with Industry
- 2010 – Began Development of Bridge Management (changed focus)
- 2011 – Issued RFP – Inventory all Above Ground Features (LIDAR)
- 2011 – Created GIS Division
- 2013 – Enterprise Data Warehouse



Good Roads Costs Less



A Plan for Every Section of Every Road



I-15 DB



Asset Gap Analysis

Dilemma: Where to Allocate the Last \$ and Why?

- Inventory
- Condition
- Deterioration
- Evaluate Risk
- Compare Value
- Performance
 - Measures
 - Targets
- Stewards of the Public \$
- Political Capital and Trust



The Right Project, At the Right Time, At the Right Cost

Yes ...
“Engineer Judgment and
Institutional Knowledge are
Critical”
but...
“Data Provides
Transparency and
Consistency”



2012/2014/2016 Pavement Distress and Data Collection

- Entire state highway system
- Both directions
- 5,869 centerline miles/ 14,000 driven miles
- Maintenance
- Traffic & Safety
- Structures
- GIS
- IT
- Motor Carriers
- Preconstruction
- ROW
- Regions
- Programming



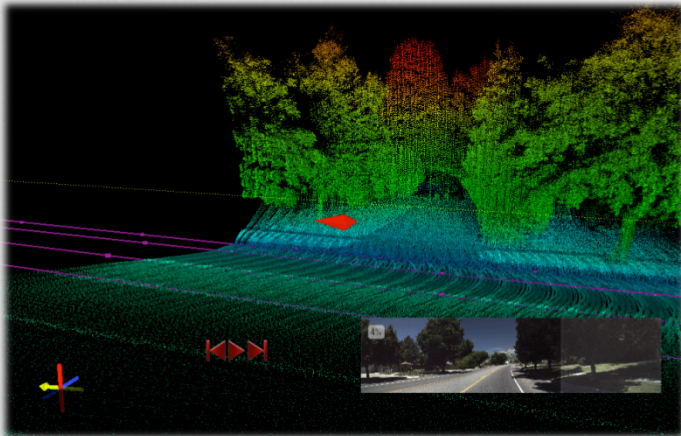
Data, Data, and More Data



3 HD Images (2400 X 3200) every 26.2 ft.

Scope

- Pavement Condition
- Roadway Geometry
- All Visible Assets:
 - Guardrail
 - Signs
 - Barrier
 - Signals
 - Painted Lines, etc.



LiDAR – Geospatial
Location of Features



Sign Face

Sign Support



Walls

Shoulder

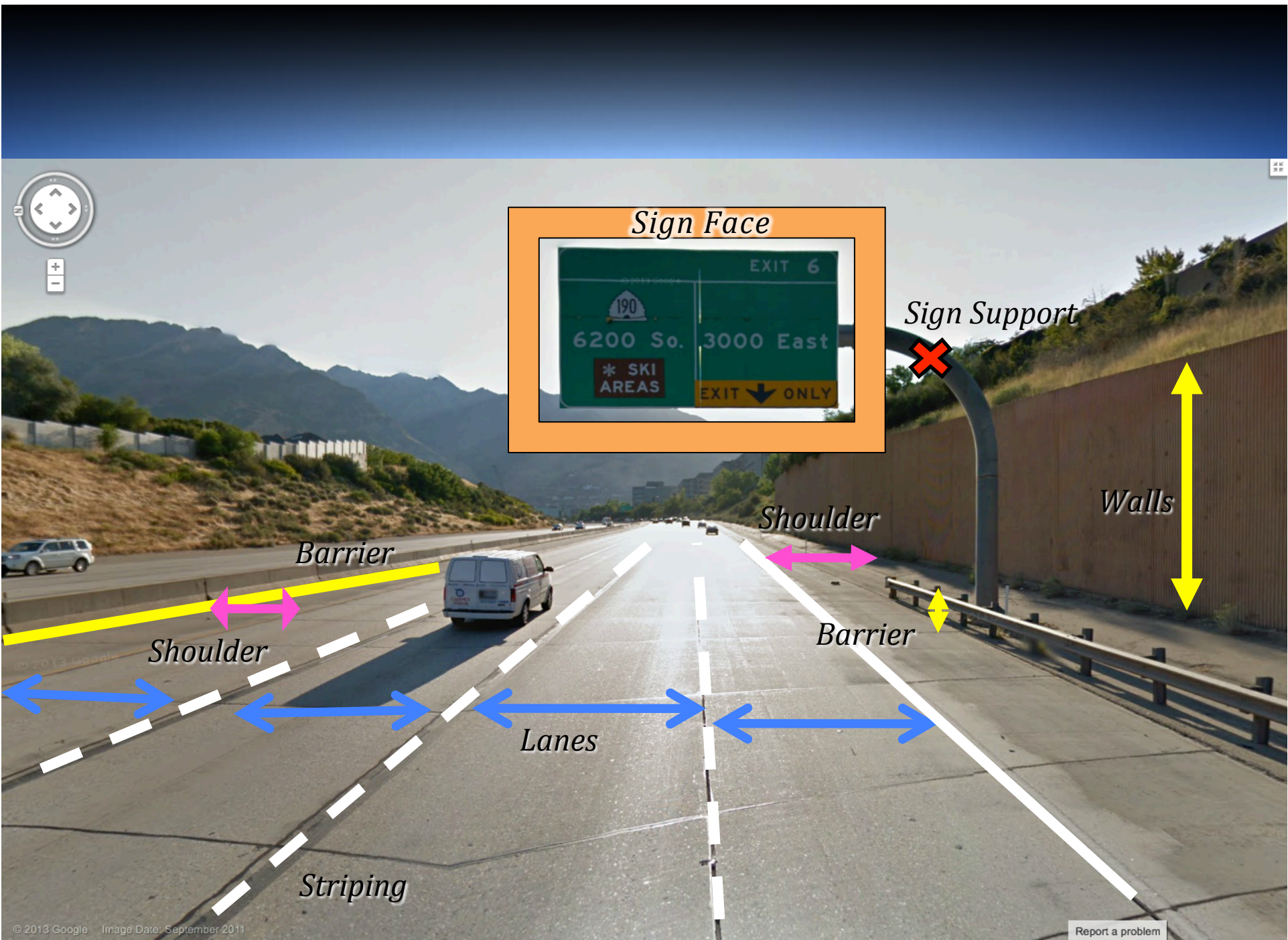
Barrier

Shoulder

Barrier

Lanes

Striping





U.S. 191, Utah, United States
Address is approximate





1982 Utah 108, Syracuse, Utah, United States
Address is approximate

© 2013 Google

Signal Cabinet



Power Pedestal



Drainage

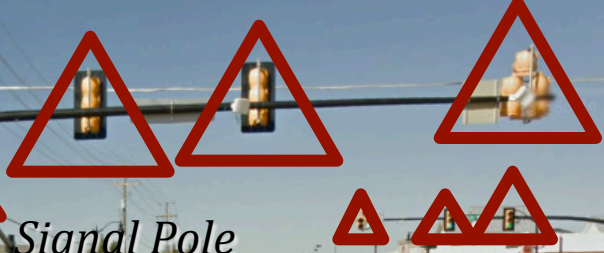


Edge Type

Signal Pole



Intersections



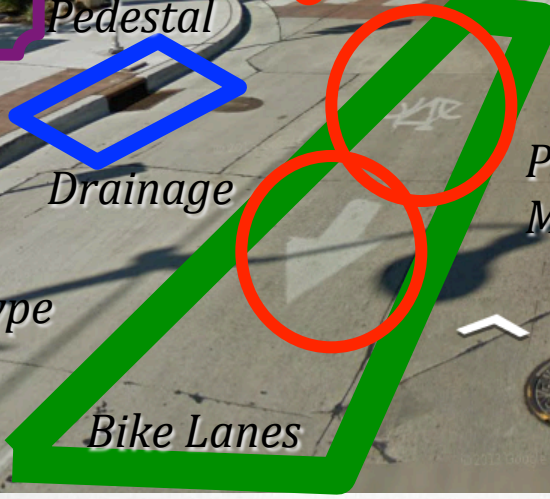
Islands



Pavement Messages



Bike Lanes



Development of Financial Plan

Asset Value

Feature	Count	Value
Pavement (yd ²)	172,045,914	\$24,086,427,904
Bridge (ft ²)	19,515,339	\$4,878,834,750
Walls (ft.)	150,000	\$3,455,500,000
Culverts (ea.)	31,553	\$1,009,733,000
Barrier (ft.)	7,347,574	\$448,202,019
Signs	96,160	\$264,440,000

Development of Financial Plan Pavement

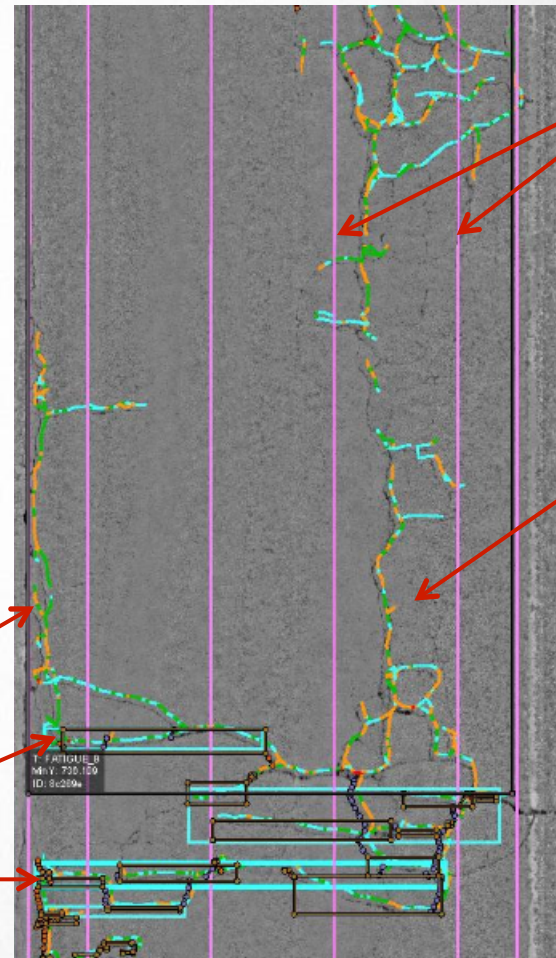
Feature	Count	Value
Interstate (yd ²)	56,108,800	\$9,257,952,000
Level 1 (yd ²)	84,360,320	\$11,388,643,200
Level 2 (yd ²)	31,560,320	\$4,102,841,600

Automated Pavement Distress Data Extraction and Processing

- Highway Speeds
- Location – Outside Lane
- Cycle – Every other Year

Longitudinal
Cracking

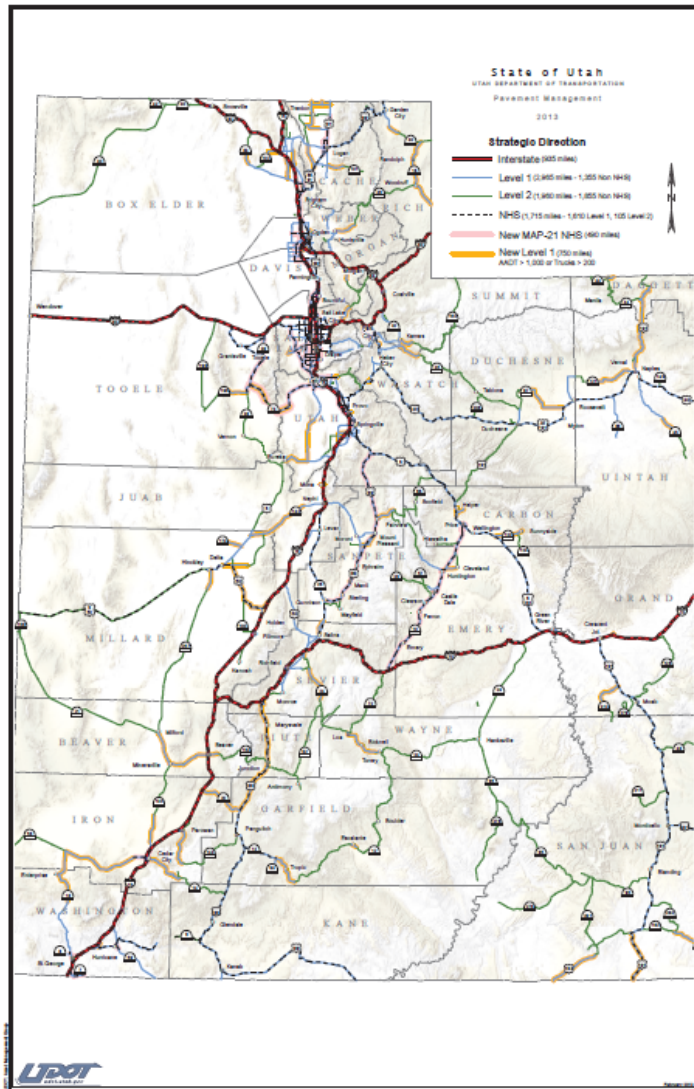
Transverse
Cracking



Wheel
Path

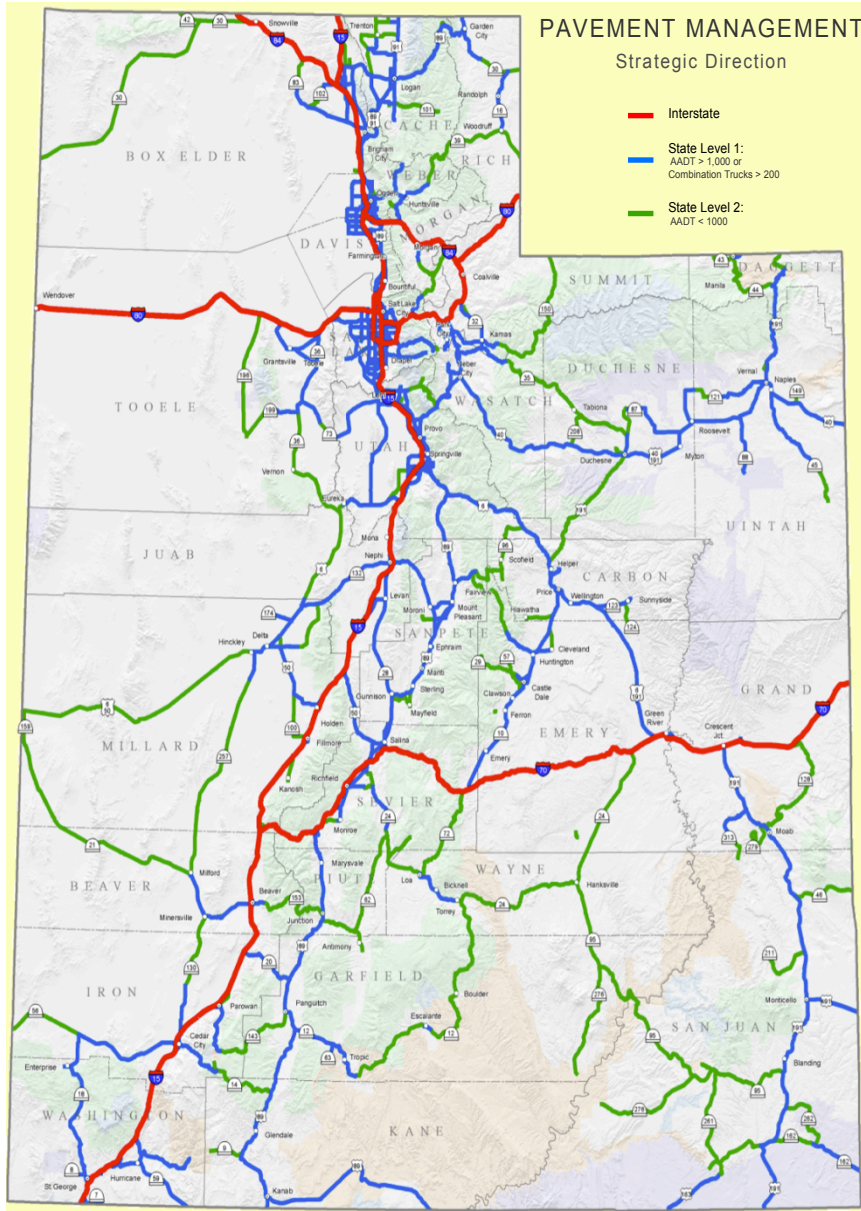
Fatigue
Cracking

UDOT Pavement Management Plan for Every Section of Every Road



- Maintenance Management
 - Interstate, Level 1, Level 2
- Pavement Sections – 1,446
 - Each has a different Condition
- Project Optimization
 - Greatest Benefit – Lowest Cost & Risk
 - Reconstruct, Preservation, etc.
- Asset Management Steering Committee
- Transportation Commission review/
approval

3 Maintenance Levels to Prioritize Resources



Interstate and Level 1

- 75% of all State Highway Lane Miles
- 98% of all Vehicle Miles Traveled on State System

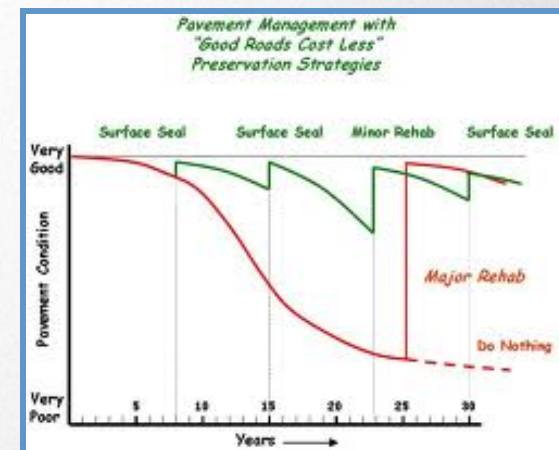
Level 2

- Less than 1,000 vehicles per day

Interstate: 935 miles
Level 1: 2,935 miles
Level 2: 1,970 miles

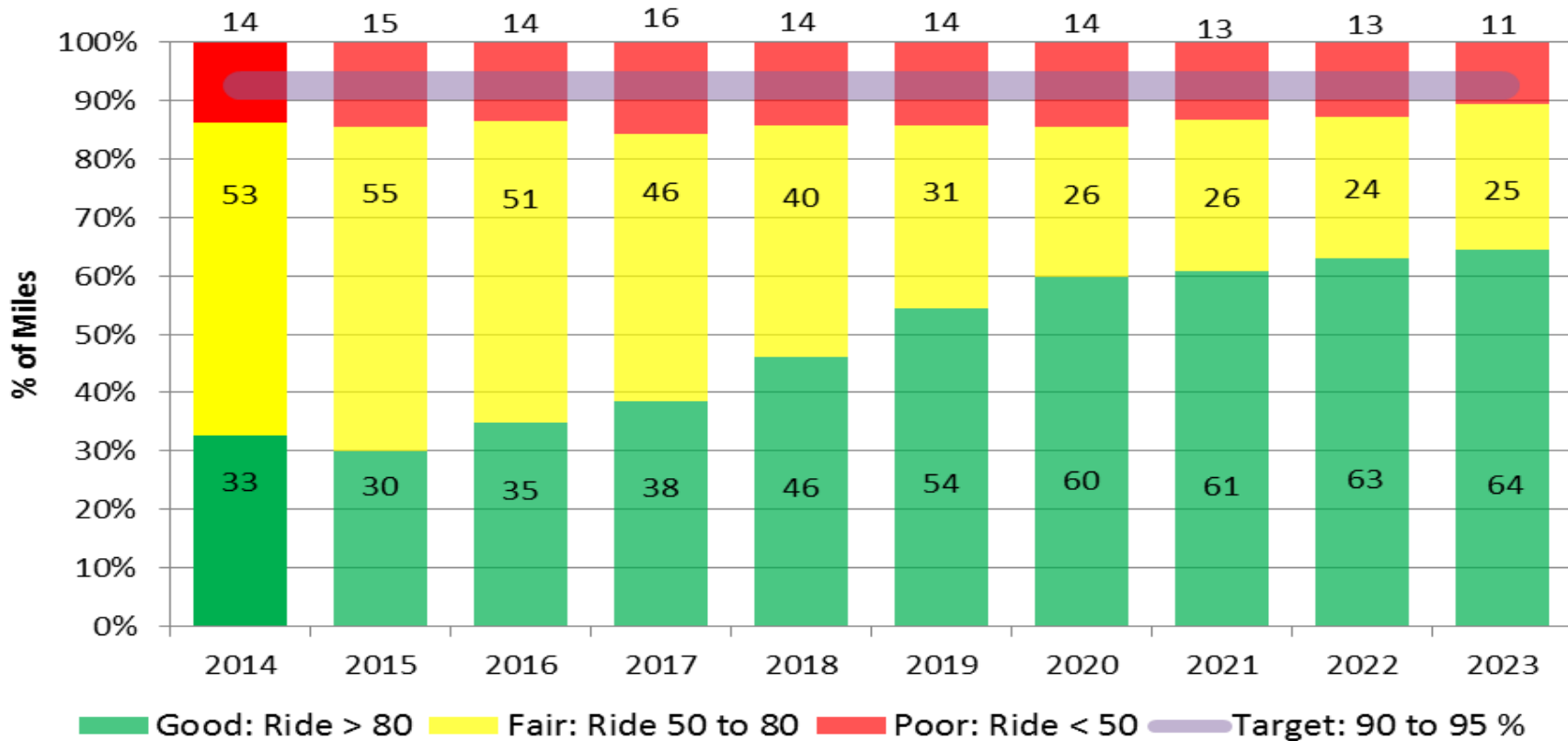
Pavement Management System

- Optimization Strategy – Not Worst First
- 1,446 Sections (Known Condition)
- Treatments
 - Preservation – Chip, Slurry Seals
 - Rehabilitation – Rotomill/Replace
 - Reconstruction – Generally Capacity
- Costs vs. Benefits
- Project at the Right Time
 - 7 – 10 Year Cycle



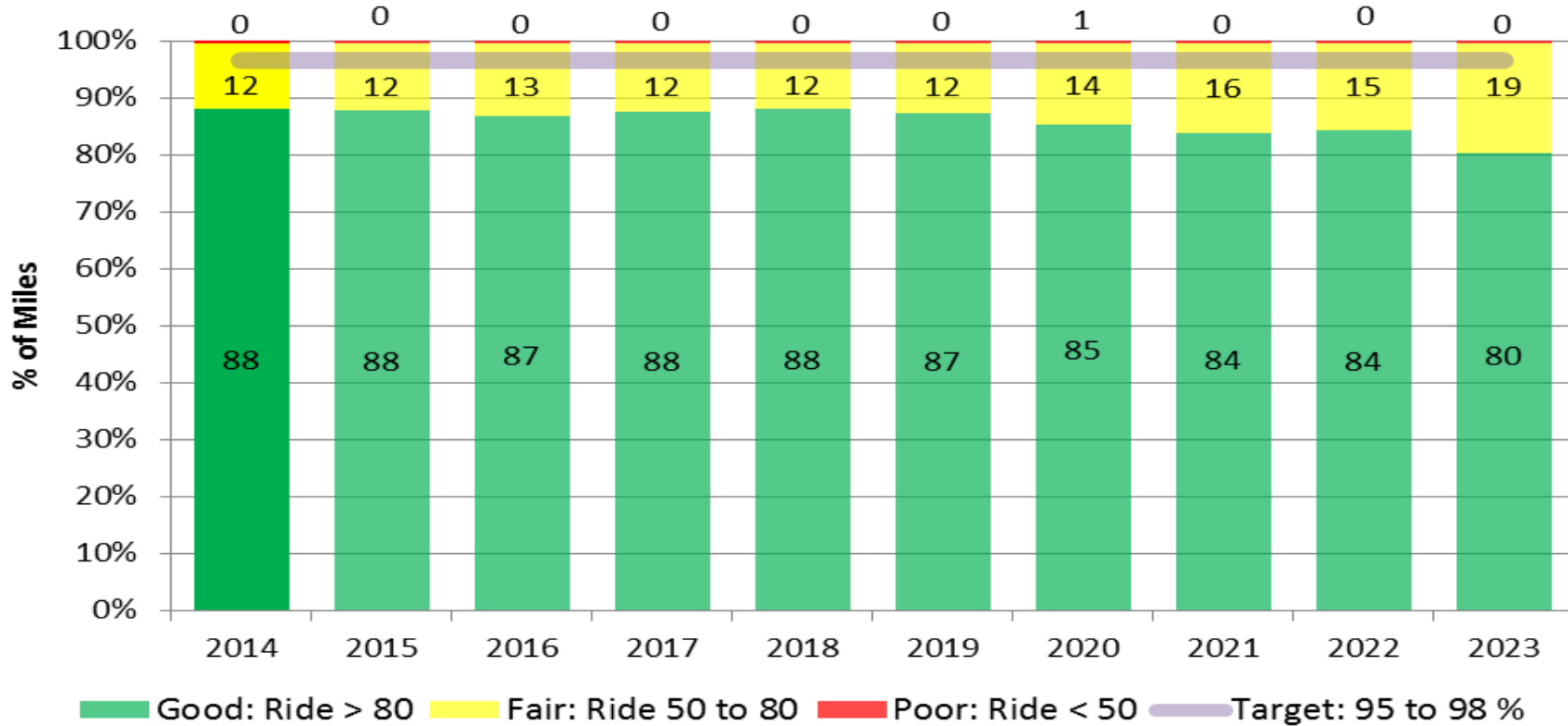
Statewide Pavement Condition

Statewide Level 1 (3,760 Surface Areas)
dTIMS Ride Index Forecast with 46 Million / Yr



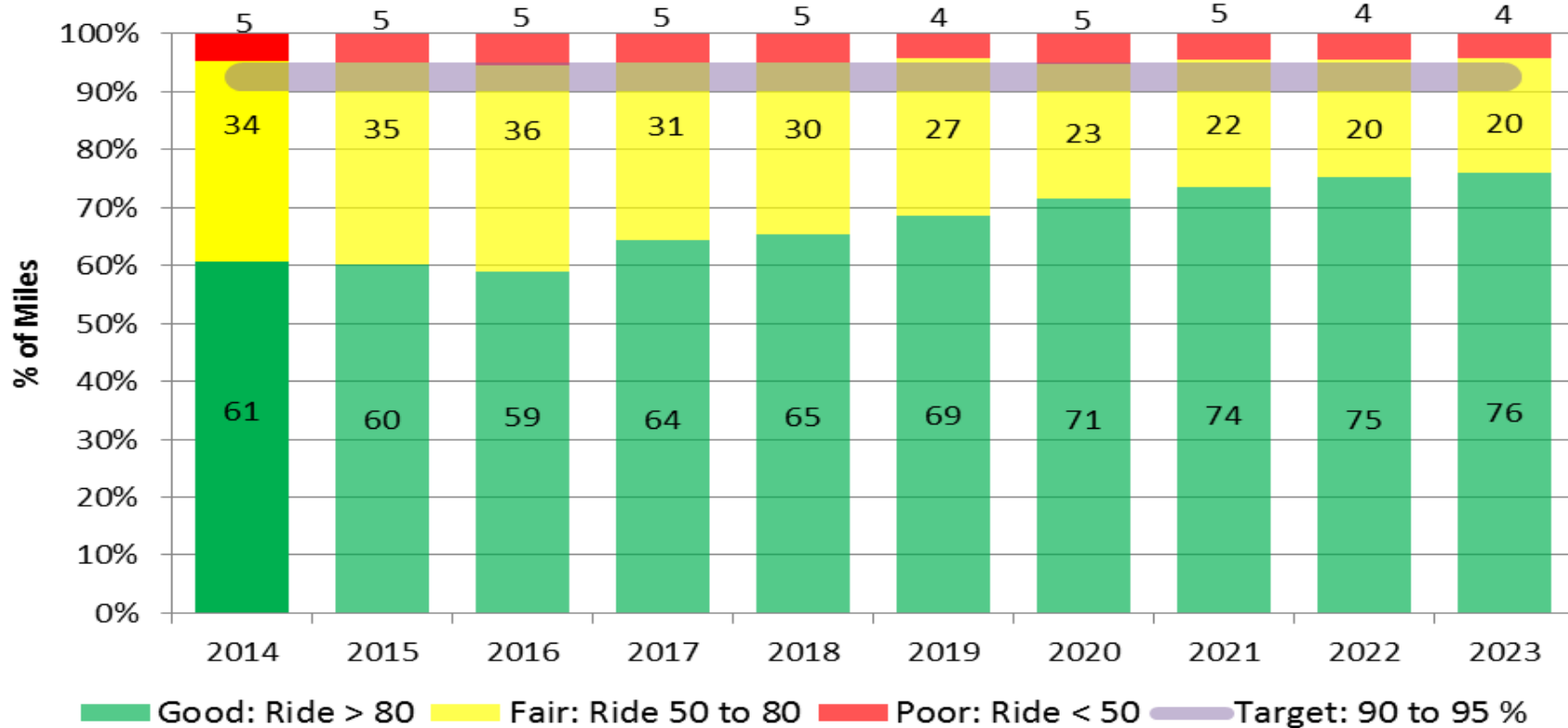
Interstate Pavement Condition

Statewide Interstate (7,725 Surface Areas)
dTIMS Ride Index Forecast with 50 Million / Yr



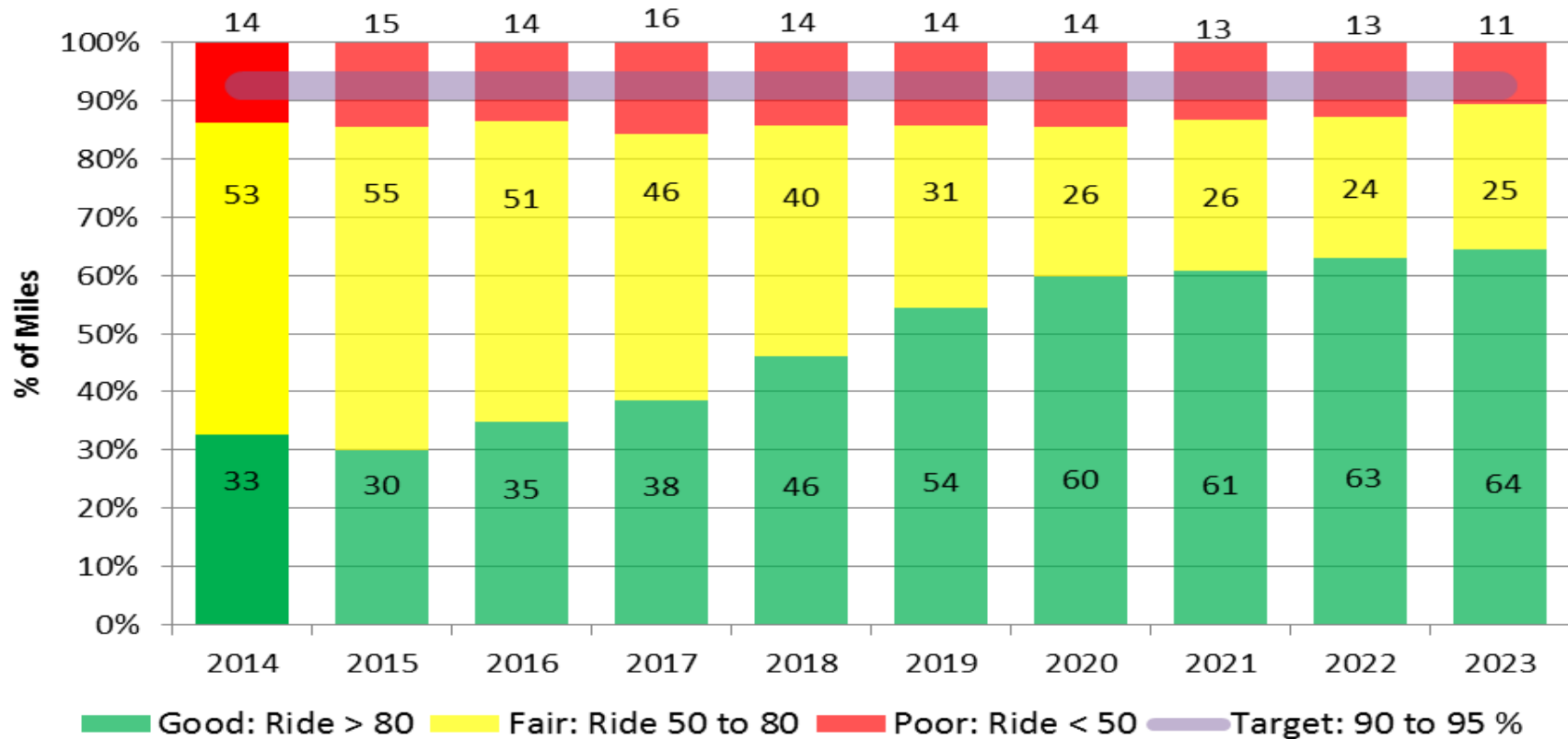
NHS Pavement Condition

Statewide NHS (8,735 Surface Areas)
dTIMS Ride Index Forecast with 80 Million / Yr



Level 1 Pavement Condition

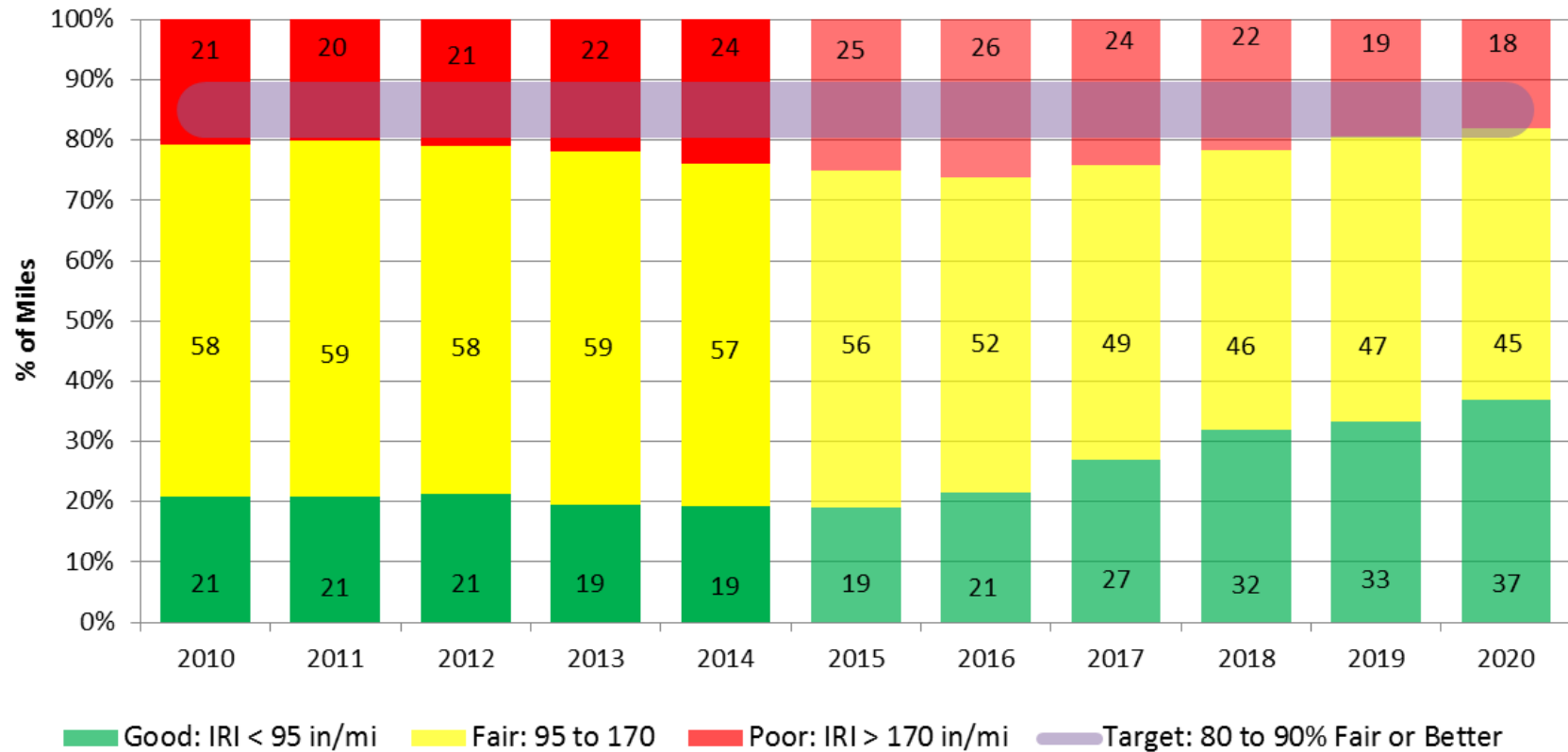
Statewide Level 1 (3,760 Surface Areas)
dTIMS Ride Index Forecast with 46 Million / Yr



Level 2 Pavement Condition

Level 2 System Condition (4,500 Surface Areas)

Ride Quality - Forecast with 50 Million / Yr



Pavement Condition – OCI

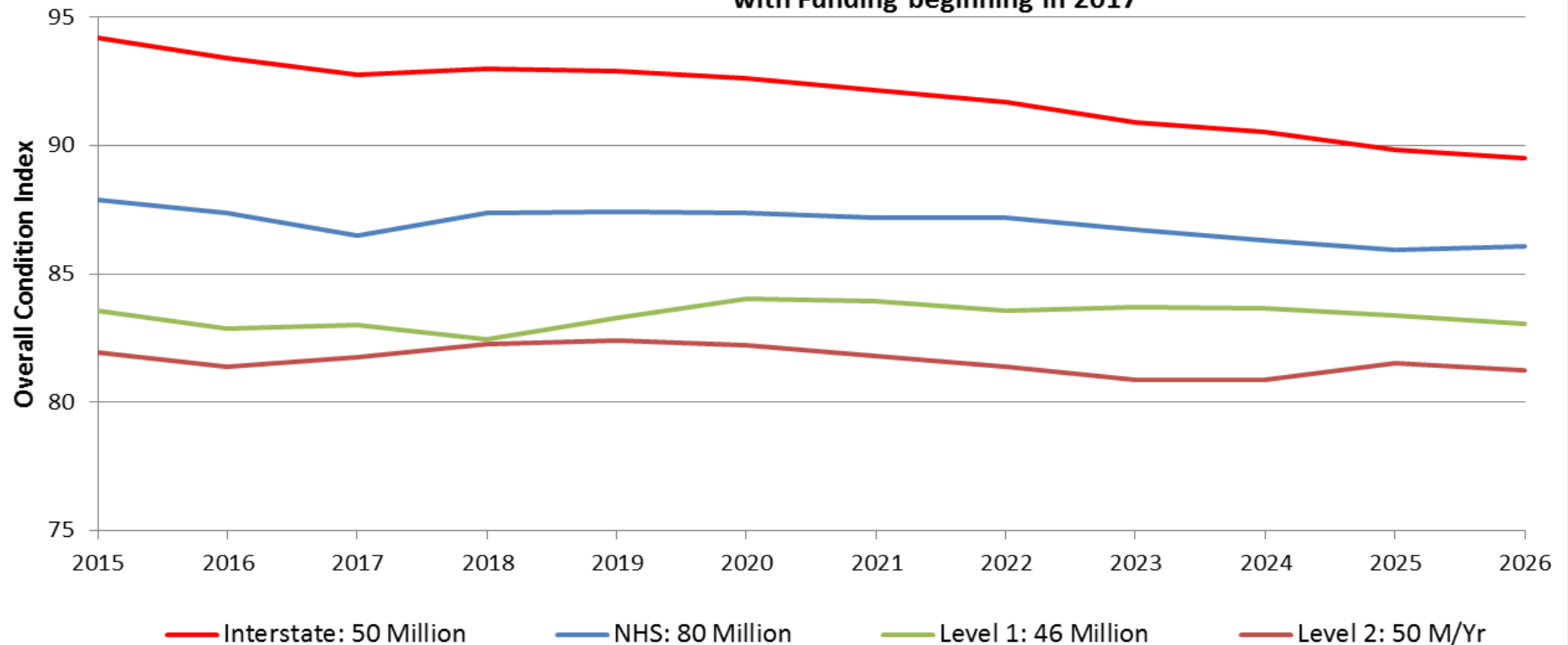
Overall Condition Index

dTIMS Statewide OCI Forecast

Interstate: 7,275 Surface Areas, NHS: 8,735, Level 1: 3,760, Level 2: 4,500

Interstate: 53% VMT, NHS: 37% VMT, Level 1: 8% VMT, Level 2: 2% VMT

with Funding beginning in 2017



Funding per Road Category

UDOT Asset Management

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