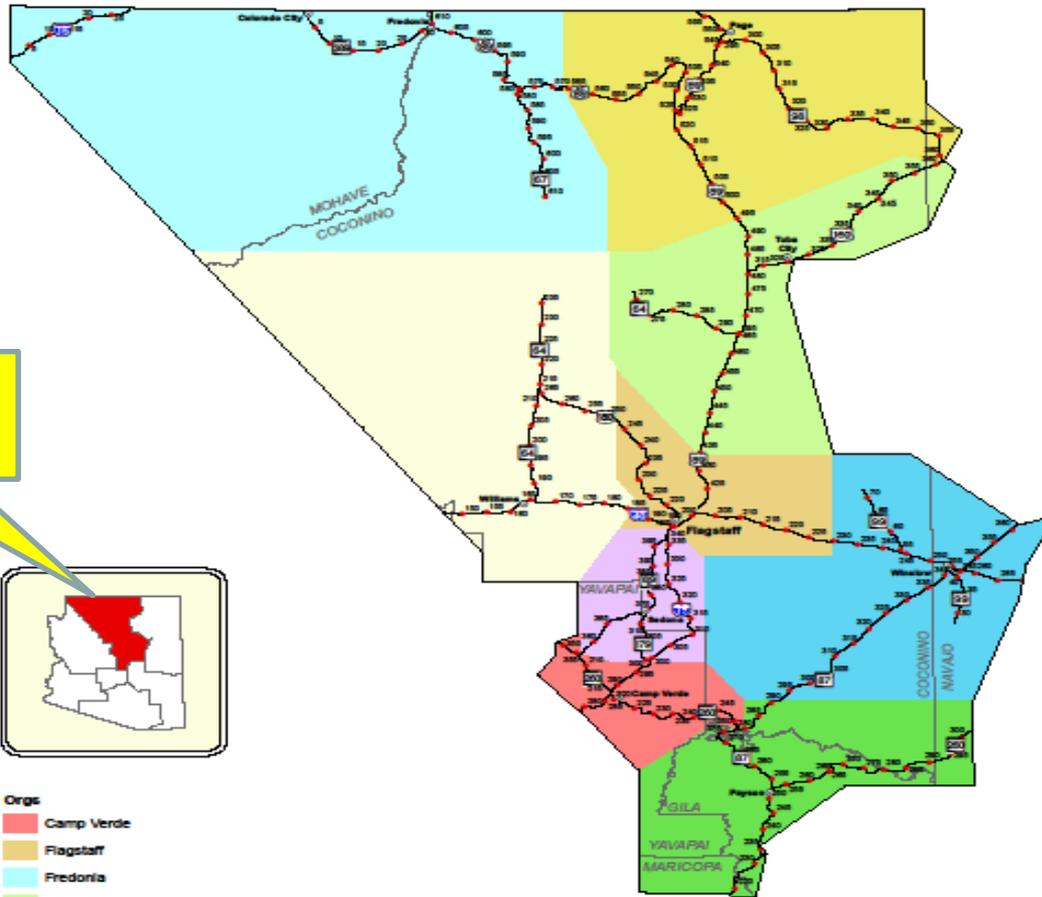


Winter Highway Maintenance in Northern Arizona



ADOT Engineering and Maintenance District Northcentral



**Northcentral
District**



Orgs

- Camp Verde
- Flagstaff
- Fredonia
- Gray Mountain
- Little Antelope
- Page
- Payson
- Williams
- Winslow

- Cities and Towns
- Milepost
- Highway System
- County Boundary

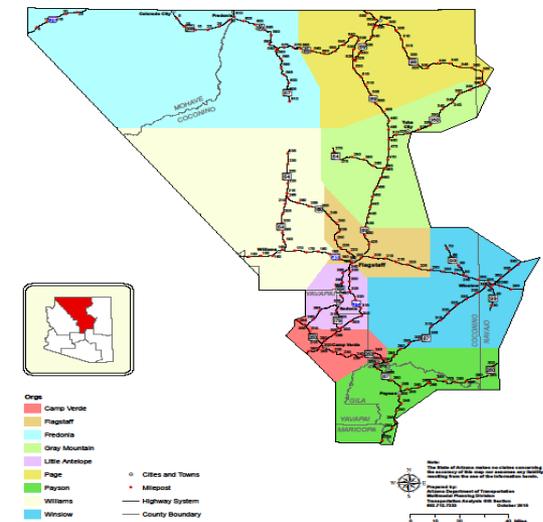
Note:
The State of Arizona makes no claims concerning the accuracy of this map nor assumes any liability resulting from the use of the information herein.

Prepared by:
Arizona Department of Transportation
Multimodal Planning Division
Transportation Analysis GIS Section
802.712.7332 October 2016

Northcentral District Facts

- ▶ 23,000 Square Miles (Larger than 8 US States)
- ▶ 3330 Travel Lane Miles (4592 MLM)
- ▶ 9 Maintenance Units
- ▶ 93 Maintenance Employees
- ▶ 5 Different Counties
- ▶ 5 National Forests
- ▶ 6 Cities

ADOT Engineering and Maintenance District
Northcentral

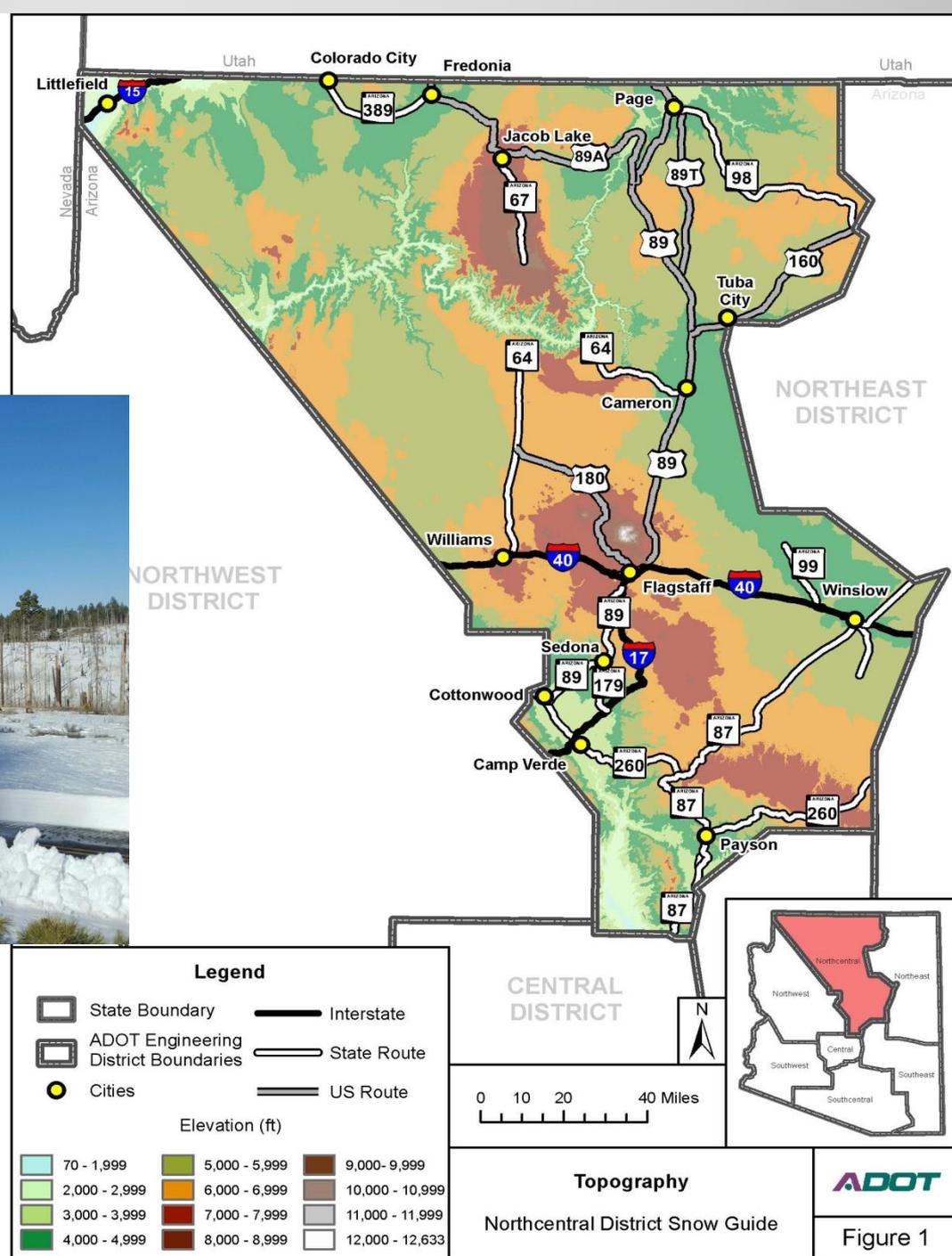


Major Winter Maintenance Activities

- ▶ Snow Operations *
- ▶ Incident Response *
- ▶ Pavement Repair *
- ▶ Crack Sealing *
- ▶ Drainage / Erosion
- ▶ Shoulder Buildup
- ▶ Guardrail Repair
- ▶ Fence Repair
- ▶ Etc., Etc.



Snow Operations



Winter Conditions

- ▶ Flagstaff Average Snowfall = 103” per year
- ▶ Average 34 Days of snow
- ▶ Over 220 Freeze/Thaw Cycles per year
- ▶ December and January
 - Average High Temperature 42 deg F
 - Average Low Temperature 17 deg F
- ▶ 2016 / 2017 Winter
 - Close Average Winter with 98” of Snow
 - 17 Different Storms (many multiple days)

Snow Operations

- ▶ 63 Plows in the District
- ▶ 12 hr Shift for Snow Plow Operators
- ▶ Snow Operations requires District wide and State wide Support
- ▶ 50 Loaners and Volunteers from Other Areas
- ▶ Road Block and Motorist Assist Crews

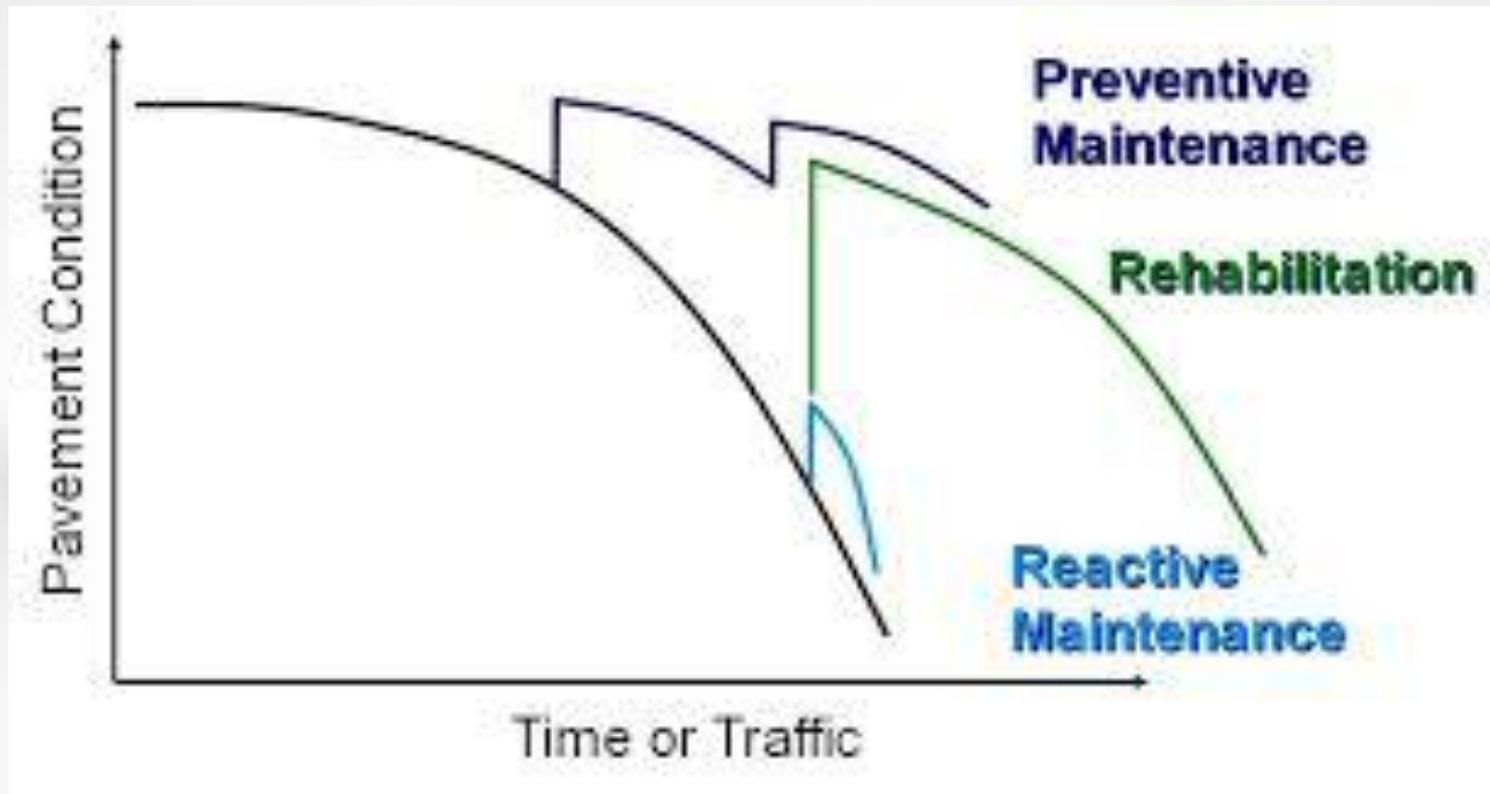


Incident Response in the Winter



Pavement Preservation Cycle

The Right Treatment at the Right Time



Reality

▶ 1995 Pavement Preservation Project – I-40



2005 – 10 years



2010 – 15 years



2013 – 18 years



2015 – 20 years



2016 – 21 years

February 2017 – 22 years after last pavement project.

Pavement Preservation Project in Summer of 2017 replaced this area.



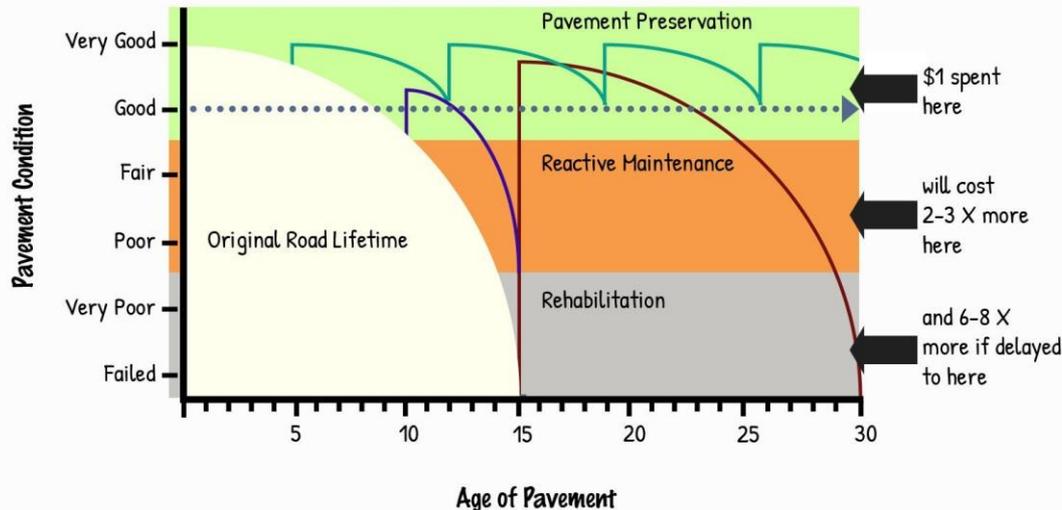
Pavement Repair

- ▶ Aging Pavement System
- ▶ Severe Weather
- ▶ Heavy I-40 Truck Traffic
- ▶ Rapid Deterioration after Design Life



Pavement Repair

- ▶ Preventative – Flush Coat and Crack Sealing
- ▶ Reactive – Pothole repair, Spot Repairs, Overlays
- ▶ Goal for Maintenance to increase Preventative Strategies



Crack Filling and Sealing

- ▶ Prioritized Winter Maintenance Activity
- ▶ Polymerized Asphalt Material
- ▶ Clean and fill
- ▶ Wide Cracks In Old Pavements



Pot Hole Repair

- ▶ Winter of 2016 / 2017
- ▶ Clean
- ▶ Dry (as much as possible)
- ▶ Place
- ▶ Compact



Pot Hole Repair

- ▶ Change in Repair Last Winter (when time allows)
 - 1) Tack
 - 2) Compaction with a Steel Wheel Roller



Asphalt Hot Box

- ▶ Hot Plants Close in the Flagstaff Area for winter
- ▶ Long Haul to get Asphalt Mix from other Areas
- ▶ 4 CY Hot Box – New Equipment



Asphalt Recycler – 1 CY Capacity



Pavement Spot Repairs

- ▶ Mill and Replace is becoming common practice
- ▶ Small areas with reoccurring issues
- ▶ Last Longer than Cold Mix Overlays
- ▶ Less Exposure for Maintenance Personnel
- ▶ Higher Costs \$\$\$
- ▶ Maintenance On-Call Contract for larger areas

Spot Repairs



Overlays – Cold Mix



Challenges

- ▶ Longer cycle time for Pavement Projects
- ▶ Funding
- ▶ Personnel Turnover / Burn-out
- ▶ Equipment / Materials

Winter Damage to Interstates Last Winter



Opportunities

- ▶ Full Depth Pavement Reconstruction Projects
- ▶ Devil Dog – I-40 – MP 156 – 161
- ▶ Cataract Lake – Parks – MP 161 – 179 (6 Miles of Reconstruction)

Devil Dog I-40 – MP 156 - 161



Opportunities

- ▶ Equipment and Training for Personnel
- ▶ Measurements and Continuous Improvement
- ▶ Continue to Implement Pavement Preventative Maintenance Strategies
- ▶ Balance Reactive and Proactive Approach

Upcoming Pavement Rehab Projects

- ▶ I-40 – Parks to Riordan - Current
- ▶ I-40 – Cataract Lake to Parks - FY 18
- ▶ I-17 – County Line to I-40 (NB only) – FY 18
- ▶ I-40 – System Interchange to Walnut Canyon – FY 20
- ▶ SR 89A – Sedona City Limits to MP 386
- ▶ SR 179 – I-17 to Village of Oak Creek
- ▶ SR 64 – Pipe Line Road – Air Park

Thank You!



Chad Auker – Northcentral Assistant District Engineer
928-779-7551