

Montana's Approach to Pavement Preservation



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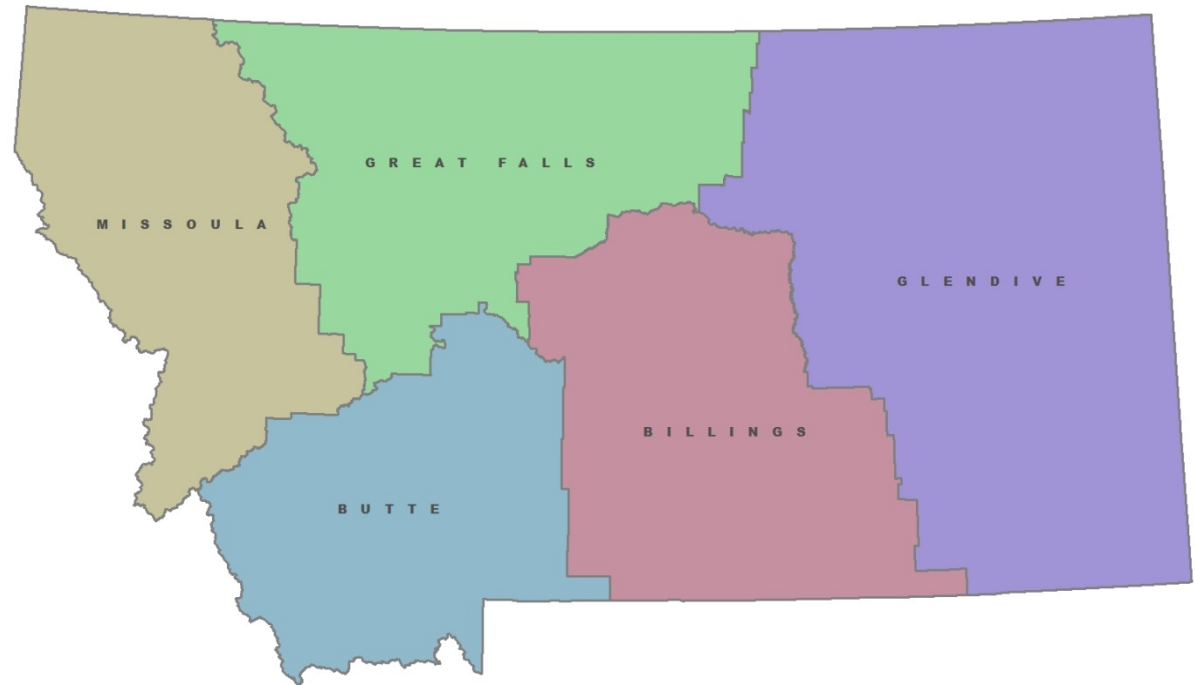
MDT's Pavement System



	System	Centerline Miles	Lane Miles
Assets Included in TAMP	Interstate	1,192	4,770
	Non-Interstate NHS	2,990	6,625
	All NHS	4,182	11,395
	State Primary	2,575	5,188
	Subtotal	6,757	16,583
Assets not Included in TAMP	Other State	4,563	9,220
	Off-system	8,430	16,668
	Total	19,750	42,471



- Pavement Management
 - System Condition
 - Treatment Recommendations
- Planning (HQ)
 - Funding Distribution
- Districts
 - Engineering
 - Maintenance
- Preservation is “institutionalized”



TEAM EFFORT

Is Preservation Working?



- “An important impact from this research-implementation project was the importance of pavement preservation for extending the service life and reducing surface distress on flexible pavements and HMA overlays. It was predicted or estimated that the initial pavement preservation strategy applied to the HMA surface shortly after construction was extending the service life (equal distress conditions) of the flexible pavements and HMA overlays by about 5+ years.”

Is Preservation Working?



➤ 2013 Reason Foundation Reports

- Montana Ranked 5th in the nation.
- Most improvement from 1989 – 2008 for overall performance and spending efficiency.
- Top 5
 - North Dakota
 - Virginia
 - Missouri
 - Nebraska
 - Montana

Planning



- **Performance Programming Process (P3)**
 - Used to establish a funding distribution plan
 - Optimized system performance
 - 5 year Statewide Transportation Improvement Program

- **Pavement Preservation “Plugs”**
 - Set by P3, by system.
 - Projects identified roughly 2 years prior to construction

- **Driven by MDT’s Pavement Management System**

Pavement Performance and Condition Recommended Treatments



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MONTANA DEPARTMENT OF TRANSPORTATION

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Report Name: pvmsr0015

PVMS PAVEMENT CONDITIONS AND RECOMMENDED TREATMENTS
Survey Year: 2014 Run Year: 2015

Corridor Id: C000001

From the Idaho State Line easterly via Troy, Libby, Kallispell, Browning, Cut Bank, Shelby, Chester, Havre, Chinook, Malta, Glasgow, Wolf Point, and Culbertson to the North Dakota State Line.

Dept Rte	Seg Mp	End Mp	Bed	Lanes	Width	Dist	F Div	M Div	Ride	Performance Indexes			Treatment Recommendations		Maintenance			Current Project			
										Rut	ACI	MCI	Construction	2015	Construction	2015	Maintenance	2017			
N-1	0.00	13.72	*	2	28	1	12		68.3	55.0	91.4	99.5	C_AC Thin Overlay		C_AC Minor Rehab_Rut		M_AC Thin Overlay		M_Maintenance Rut Fill		
N-1	13.72	20.10	*	2	43	1	12		71.9	55.2	91.6	99.2	None		Do Nothing		None		Do Nothing		C_AC Thin Overlay
N-1	20.10	29.94	*	2	43	1	12		83.1	69.1	99.0	100.0	Do Nothing		C_AC Crack Seal		Do Nothing		M_AC Crack Seal		
N-1	29.94	33.90	*	4	65	1	12		72.5	73.4	94.2	99.7	Do Nothing		C_AC Thin Overlay		Do Nothing		M_AC Thin Overlay		
N-1	33.90	37.97	*	4	65	1	12		62.5	48.3	93.8	99.8	C_AC Minor Rehab_Rut		C_AC Minor Rehab_Rut		M_Maintenance Rut Fill		M_Maintenance Rut Fill		
N-1	37.97	44.30	*	2	26	1	12		78.1	72.9	98.9	99.3	None		Do Nothing		None		Do Nothing		C_AC Thin Overlay
N-1	44.30	48.60	*	2	23	1	12		81.0	70.6	98.1	99.0	None		Do Nothing		None		Do Nothing		C_Reconstruction
N-1	48.60	53.80	*	2	24	1	12		69.4	65.9	93.3	98.6	C_AC Thin Overlay		C_AC Thin Overlay		M_AC Thin Overlay		M_AC Thin Overlay		
N-1	53.80	57.03	*	2	31	1	12		88.1	68.0	98.0	99.6	C_AC Crack Seal & Cover		C_AC Crack Seal & Cover		M_AC Crack Seal & Cover		M_AC Crack Seal & Cover		
N-1	57.03	65.13	*	2	42	1	12		79.9	61.6	97.2	99.4	Do Nothing		Do Nothing		Do Nothing		Do Nothing		
N-1	65.13	68.98	*	2	36	1	12		71.0	61.6	86.3	98.1	C_AC Thin Overlay		C_AC Thin Overlay		M_AC Thin Overlay		M_AC Thin Overlay		
N-1	68.98	80.68	*	2	40	1	12		80.0	55.6	93.4	99.6	Do Nothing		C_AC Minor Rehab_Rut		Do Nothing		M_Maintenance Rut Fill		
N-1	80.68	89.42	*	2	30	1	12		81.6	68.4	94.9	99.7	Do Nothing		C_AC Crack Seal		Do Nothing		M_AC Crack Seal		
N-1	89.42	99.41	*	2	27	1	12		77.4	76.9	96.2	99.3	Do Nothing		C_AC Crack Seal		Do Nothing		M_AC Crack Seal		
N-1	99.41	103.18	*	2	27	1	12		76.8	72.8	97.3	98.3	Do Nothing		C_AC Crack Seal		Do Nothing		M_AC Crack Seal		
N-1	103.18	106.45	*	2	27	1	12		68.0	51.7	59.5	96.2	C_AC Minor Rehab_Rut		C_AC Minor Rehab_Rut		M_AC Reactive Maintenance		M_AC Reactive Maintenance		
N-1	106.45	113.33	*	2	27	1	12		73.9	45.9	83.3	98.0	C_AC Minor Rehab_Rut		C_AC Minor Rehab_Rut		M_Maintenance Rut Fill		M_Maintenance Rut Fill		
N-1	113.33	115.18	*	2	30	1	12		66.3	45.8	91.9	96.6	C_AC Minor Rehab_Rut		C_AC Minor Rehab_Rut		M_Maintenance Rut Fill		M_Maintenance Rut Fill		
N-1	115.18	119.53	*	2	32	1	12		75.9	67.1	93.0	99.4	Do Nothing		C_AC Thin Overlay		Do Nothing		M_AC Thin Overlay		
N-1	119.53	120.11	*	4	80	1	12		40.0	69.0	82.9	96.0	C_AC Major Rehabilitation		C_AC Major Rehabilitation		M_AC Reactive Maintenance		M_AC Reactive Maintenance		
N-1	120.11	120.83	*	4	65	1	12		51.6	74.2			C_PCC Major Rehabilitation		C_PCC Major Rehabilitation		C_PCC Minor Rehabilitation		C_PCC Minor Rehabilitation		
N-1	120.83	121.60	*	4	61	1	12		55.5	60.7			C_PCC Major Rehabilitation		C_PCC Major Rehabilitation		C_PCC Minor Rehabilitation		C_PCC Minor Rehabilitation		
N-1	121.60	124.70	*	4	48	1	12		57.1	52.6	76.4	97.6	C_AC Major Rehabilitation		C_AC Major Rehabilitation		M_AC Reactive Maintenance		M_AC Reactive Maintenance		
N-1	124.70	128.90	*	4	80	1	12		81.7	58.1	85.4	98.9	C_AC Crack Seal & Cover		C_AC Crack Seal & Cover		M_AC Crack Seal & Cover		M_AC Crack Seal & Cover		
N-1	128.90	133.90	*	4	83	1	12		85.0	48.0	94.4	98.9	C_AC Minor Rehab_Rut		C_AC Minor Rehab_Rut		M_Maintenance Rut Fill		M_Maintenance Rut Fill		

Pavement Management Triggers



Cracking

- Indices in mid-fair to mid-good categories
 - Crack Seals < 6 years of age
 - Chip Seals 6 – 12 years

Rut and Ride

- Overlays are almost always triggered by ride > 112 inches/mile.
- Rut treatments trigger at 0.3 inches
 - Mill/fill
 - Overlay
 - Microsurfacing

Pavement Management System



Pavement Management Equipment







Construction Program



Calendar Year	Contractor Payments	Plant Mix Surfacing
2010	\$334,009,878	\$83,917,612
2011	\$338,623,170	\$93,563,808
2012	\$356,343,432	\$99,263,792
2013	\$310,347,332	\$77,751,986
2014	<u>\$332,461,074</u>	<u>\$82,156,778</u>
Average	\$334,356,977	\$87,330,796



Maintenance Program



- **Limited Budget**
 - \$1,000,000/District
 - \$7,000,000 Statewide
- **Reactive Maintenance.**
- **Aggressive crack sealing program.**
- **Efforts coordinated with the construction program.**
- **Provide critical input to determine appropriate treatments.**



Pavement Preservation Tools – Crack Sealing



Pavement Preservation Tools – Crack Sealing

- MDT's crack sealing program has steadily increased over the past 20 years.
- Work is done as needed and as money allows.
- Performed ahead of chip seals on existing pavements.
- Primarily contracted work.



Pavement Preservation Tools – Chip Seals

- Initially placed under the same contract as the paving.
- Expect 6-8 years service life.
- Contractor's are required to warranty work through the first Wednesday in December of the year it is placed.



MDT Chip Seal History

- Started chipping all pavements around 1990.
- OGFC moratorium and Grade B Mixes
- Grade D Mixes 1994
- Superpave by 2003



Chip Sealing New Pavements



➤ Benefits

- Seals porous pavements
- Increased surface friction.
- Protects pavement from oxidation.
- Reduced water spray

➤ Issues

- Windshield damage
- Premature failures
- Benefit/Cost?

Pavement Preservation Tools –Overlays



- MDT's standard is 1/2" or 3/4" mixes paved 0.15 ft – 0.20 ft deep.
- Chip Seals are applied under the same contract.
- Recently began paving using 3/8" mixes without chip seals.
 - Primary use is for urban areas.
 - Premature chip seal wear.

Pavement Preservation Tools – Microsurfacing



Pavement Preservation Tools - Microsurfacing

- MDT's first projects were constructed in 2011.
- Cost effective solution for relatively minor rutting.
- The main issue to date has been unrealistic expectations.



Pavement Preservation Tools – Cold-In-Place Recycling



➤ Overview

- Montana has been using since the early 1990's.
- Experience with both chip sealing and overlaying CIPR.

➤ Benefits

- Reduced Cost
- Reuse of existing Material
- Minimized loading of reduced pavement section
- No affect on pavement width



Pavement Preservation Tools – Cold-In-Place Recycling



- **Issues**

- No local contractors, limited cost savings.
- Limited ride improvement.
- Weather limitations.
 - Surface must be covered prior to winter.
 - Temperature limits.



Pavement Preservation Tools – Others



- **Slurry seals**
- **Hot-In-Place Recycling**
- **Scrub Seals**
- **Cold Central Plant Recycling**

Challenges



➤ **FUNDING!!!**

- Highway Bill
- Other needs
 - Capital Improvements
 - Safety
 - Bicyclists

➤ **Staffing**

- Succession planning
- Complacency
- Training/education

Industry Suggestions

- Standardize technologies.
- Continue education on the proper use of each technology.
- Quantify the benefits.
- Ensure the quality of the product being delivered.



Montana's Approach to Pavement Preservation



QUESTIONS?