

2015 PILOT PROJECTS

GRAVEL ROAD CONVERSIONS

(AC GRINDINGS AND OTTA SEAL)

OCTOBER 14, 2015
BOCC BUSINESS MEETING



EXISTING GRAVEL ROAD MAINTENANCE PROGRAM

■ System Data:

- 200 miles of gravel road
- Maintenance demand/service levels:

Activity/Data	High	Medium	Low
Grading frequency	2 or 3 times per year	Annually or every other year	Infrequent/upon request
Dust palliative	Annual	None	None
Material add	8/10 years	12/16 years	>20 years
\$/Mile/Year	\$5,000/\$7,500	\$2,500/\$3,500	<\$1,500
# of miles +/-	50	70	80

Local/Residential road annual surface maintenance (paved): \$6,000/\$8,000/mi/yr.

CURRENT DUST ABATEMENT PROGRAM

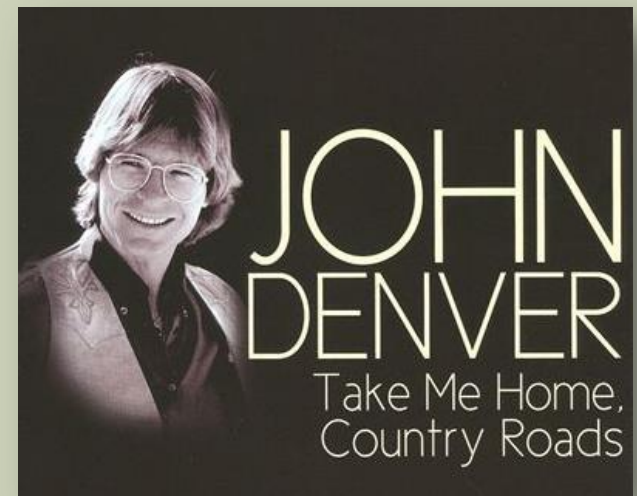
- Deschutes County has used magnesium chloride as a dust palliative on County road facilities for the last 10-15 years.
- Many dust palliative products on the market and Deschutes County has experimented with many of these products.
- Magnesium Chloride determined to provide the best dust palliative for roads in the high desert.
- Added benefit of soil stabilization.
- Magnesium Chloride is hygroscopic. It draws and attracts moisture from the atmosphere to provide a wet looking surface and reduce airborne dust particles.



THE PROBLEM:

HIGH MAINTENANCE GRAVEL ROADS

- 1. Negative attributes of Magnesium Chloride dust palliative.
 - Draws fines to surface which create slick and mucky conditions during freeze/thaw periods. Sticks to tires/wheels and tracks into driveway/garage.
 - Can impact some roadside vegetation (Juniper kill).
- 2. Customer dissatisfaction with road condition and negative attributes:
 - Leads to more service requests
 - Higher costs
- 3. Rural gentrification
 - City folk moving to the country
- 4. Other issues



ROAD TREATED WITH MAGNESIUM CHLORIDE FREEZE/THAW



ROAD TREATED WITH MAGNESIUM CHLORIDE TREE KILL



ROAD TREATED WITH MAGNESIUM CHLORIDE POTHOLING



TYPICAL GRAVEL ROAD WASHBOARDING



THE GOAL

Find an improved low-cost surface treatment with annual surface maintenance costs that are at or near that of a high maintenance gravel road (\$5,000/\$7,500/mi/yr.)

- Target low-volume Local/Residential facilities.
- Evaluate/estimate long-term maintenance costs and strategies.
- Potentially develop/evaluate partnership opportunities with adjacent property owners (ie, a “maintenance LID”) to fund the upgrade.

PILOT PROJECT TREATMENTS

Otta Seal

- Developed in Norway in 1960s. Relatively new to USA.
- Aggregate (1"-minus) rolled into a layer of high-float liquid asphalt.
- Life Expectancy: 8-12 yrs.
- A poor-man's oil mat.

SINGLE OTTA
SEAL
No Prime
1 Binder
2 Graded aggregate



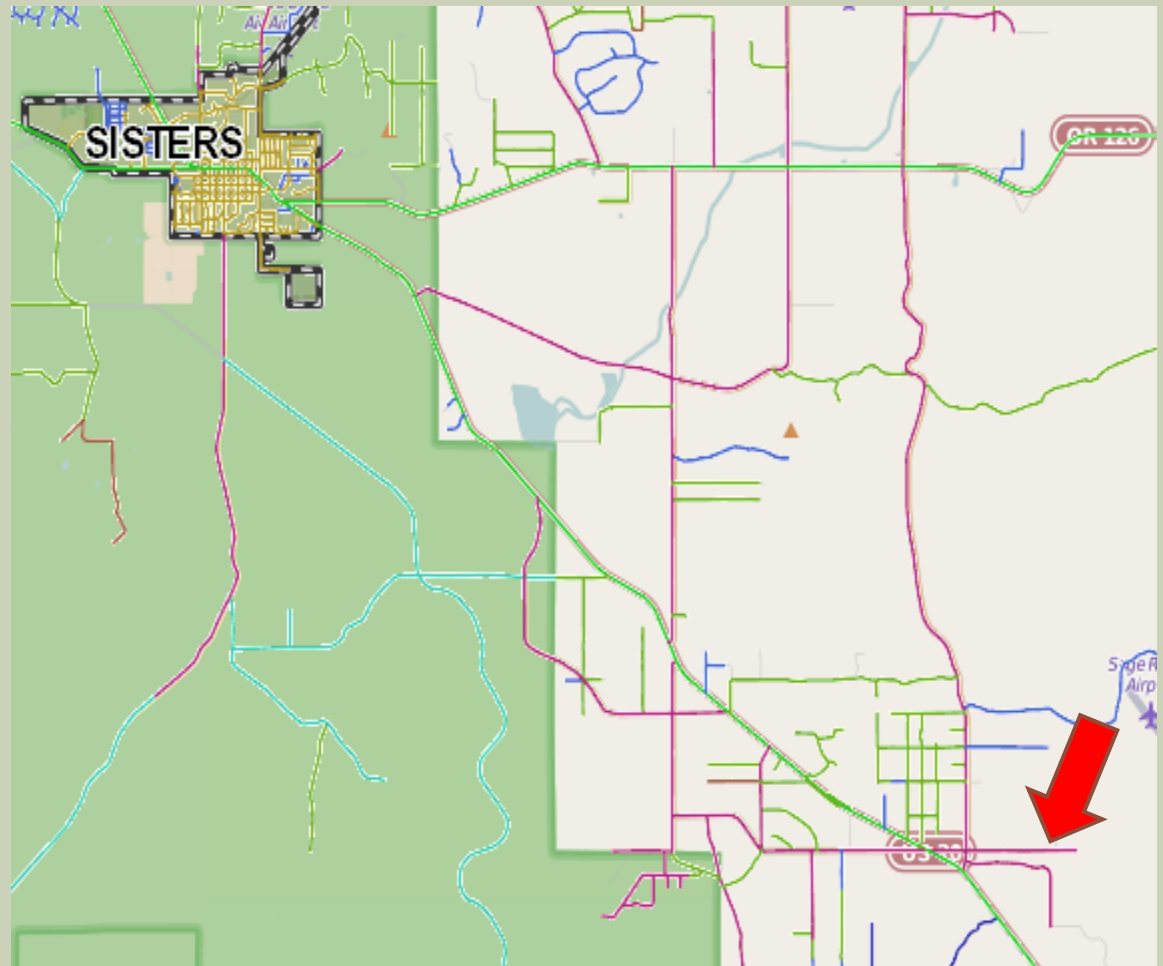
Paving with Asphalt Grindings

- Asphalt grindings are milled from County roads prior to certain overlay projects.
- Asphalt grindings are becoming more frequently used in a variety of maintenance applications.
 - From “high-end gravel” replacement to reconstituted asphalt mix.
- Life Expectancy: Varies

PILOT PROJECT – OTTA SEAL PLAINVIEW ROAD

■ Plainview Road:

- East of Sisters (Fryrear Road)
- 0.90 mile segment, 18' wide
- Local/Residential classification, dead end.
- Low ADT ($110 \pm$ vpd)
- Frequent calls for maintenance
 - Dust complaints (residences are close to the road).
 - Grading requests.
 - Juniper tree kill.



OTTA SEAL INSTALLATION

PRE-INSTALLATION



OTTA SEAL INSTALLATION



OTTA SEAL INSTALLATION



OTTA SEAL INSTALLATION



OTTA SEAL INSTALLATION

POST INSTALLATION



OTTA SEAL INSTALLATION COST

Otta Seal - Plainview	Amount	Unit	Unit \$	Total
Labor/Equipment (excluding prep)	2	days		\$ 25,710.87
Aggregate (1"-minus, dirty)	190.00	ton	\$ 5.70	\$ 1,083.00
High float oil (HFMS-2)	22.33	ton	\$ 450.00	\$ 10,048.50
Fog seal (HFS-901s)	4.8	ton	\$ 225.00	\$ 1,080.00
Sand	20	ton	\$ 15.00	\$ 300.00
		Total		\$ 38,222.37
Surface Area	9850	SY		
Total \$/SY				\$ 3.88

Hypothetical break-even point: 7.3 years

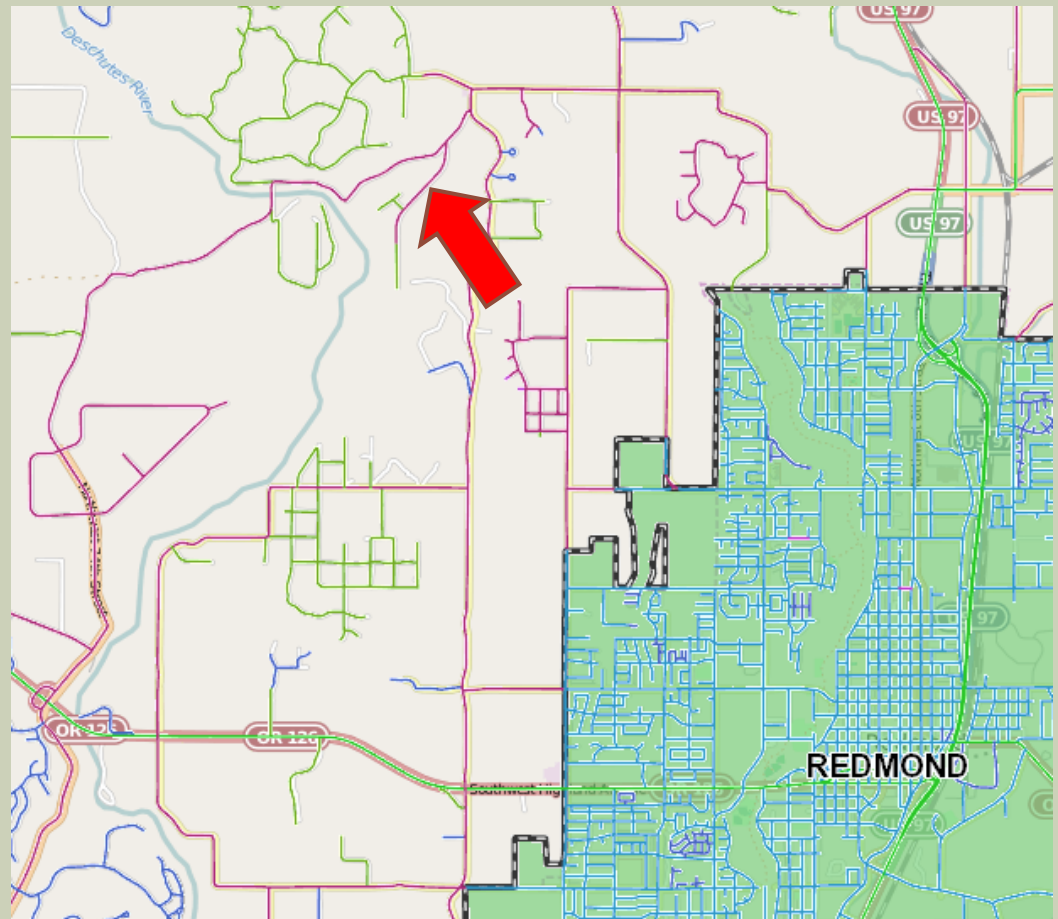
Notes:

- Personnel Rate Multiplier: 3.15 (fully loaded, with overhead)
- Equipment rates include depreciation.

PILOT PROJECT – AC GRINDINGS IVANCOVICH WAY

■ Ivancovich Way:

- Northeast of Redmond
- Local/Residential classification, dead end.
- 0.60 mile, 24' wide
- Low ADT (150± vpd)
- Frequent calls for maintenance
 - Grading requests to address washboarding.
 - Tracking of muck layer during freeze/thaw and wet periods.



AC GRINDINGS INSTALLATION

PRE-INSTALLATION



AC GRINDINGS INSTALLATION



AC GRINDINGS INSTALLATION



AC GRINDINGS INSTALLATION



AC GRINDINGS INSTALLATION



AC GRINDINGS INSTALLATION COST

AC Grindings - Ivancovich	Amount	Unit	Unit \$	Total
Labor/Equipment (excluding prep)	2	days		\$ 30,509.84
Tack	2.5	ton	\$ 350.00	\$ 875.00
Fog Seal	7	ton	\$ 325.00	\$ 2,275.00
Sand	20	ton	\$ 15.00	\$ 300.00
Grindings (est unit \$)	1088	ton	\$ 3.00	\$ 3,264.00
Paver Rental	1	ea	\$ 1,800.00	\$ 1,800.00
Material Re-grind	1088	ton	\$ 7.90	\$ 8,595.20
		Total		\$ 47,619.04
Surface Area	8210	SY		
Total \$/SY				\$ 5.80

Hypothetical break-even point: 10.6 years

Notes:

- Personnel Rate Multiplier: 3.15 (fully loaded, with overhead)
- Equipment rates include depreciation.

PILOT PROJECTS – NEXT STEPS

■ 1. Evaluation of Treatments

- Monitor initial degradation and estimate near-term and long-term maintenance needs.
 - Is this a product we can chip seal and roll into our Pavement Management Program?
 - If so, at what interval for first chip seal and what is the subsequent frequency of treatments?
 - If not, what alternative maintenance treatments or strategies are necessary?

■ 2. Cost Analysis

- How do the initial and projected maintenance investment levels compare to the annual average maintenance investment for gravel roads?

■ 3. Additional Projects/Products

- Are there other products in existence that can address the issues at a lower cost?
- What refinements can we make to our application technique to reduce the initial application cost of the Pilot Projects?