



McGrath Roads Reconstruction Dust Abatement Options



Option	Advantages	Disadvantages	Application Rate and Frequency	Funded by City of McGrath or others		Funded by Denali Commission	
				Maintenance Equipment Required (estimated cost, FOB McGrath)	Est. Annual Maintenance Cost ^{1,2}	Estimated Project Cost ¹	
Options presented in July 2010 survey sent with utility bill	Calcium Chloride	- Considered most-cost effective application in rural Alaska - Proven effectiveness	- Requires yearly application - Corrosive to metal - Rainwater leaches out calcium chloride	Yearly	- Truck mounted flake spreader (\$6,000) OR - Brine distributor (\$6,000) - Storage/mixing tank (\$2,000) - Motor Grader (\$40,000)	\$15,000	\$20,000
	Double Chip Seal Asphalt Treatment	- 7 to 10 year life per application - Will provide a dust free surfacing for a long period of time without maintenance, longer with maintenance.	- Material and equipment availability - Will require substantial maintenance in 7-10 years. - If not maintained, the road conditions will become much worse than a gravel surface - Toxic leaching potential of binder - Water main break repairs would require removal and replacement of a portion of the surface	Reapplication every 7 to 10 years	- Crack seal sprayer and tank (\$4,000) - Pickup (to carry pothole patch material) (\$15,000)	\$25,000 + \$180,000 for reapplication in year 7 and \$180,000 in year 14	\$180,000
	Asphalt Pavement	- 20 year life per application - Will provide a dust free surfacing for a long period of time without maintenance, longer with maintenance.	- Material and equipment availability - Will require substantial maintenance in 10 years. - If not maintained, the road conditions will become much worse than a gravel surface - Water main break repairs would require removal and replacement of a portion of the surface	20 year life per application with major maintenance after 10 years.	- Crack seal sprayer and tank (\$4,000) - Pickup (to carry pothole patch material) (\$15,000)	\$20,000 +\$530,000 for major maintenance in year 10	\$1,280,000
	Water	- Readily available - No specialized equipment	- May require daily applications	Daily	- Water truck (\$30,000)	\$15,000	\$0
	Magnesium Chloride	- Slightly lower unit cost than calcium chloride	- Higher application rates than calcium chloride after initial application. - Less effective than calcium chloride - Requires yearly application - Corrosive to metal - Rainwater leaches out calcium chloride	Yearly	- Similar to calcium chloride	\$16,000	\$18,000
	High Float Asphalt Treatment	- 7 to 10 year life per application - Will provide a dust free surfacing for a long period of time without maintenance, longer with maintenance.	- Material and equipment availability - Will require substantial maintenance in 7-10 years. - If not maintained, the road conditions will become much worse than a gravel surface - Toxic leaching potential of binder - Water main break repairs would require removal and replacement of a portion of the surface	Reapplication every 7 to 10 years	- Crack seal sprayer and tank (\$4,000) - Pickup (to carry pothole patch material) (\$15,000)	\$25,000 + \$180,000 for reapplication in year 7 and \$180,000 in year 14	\$160,000
	EK35 (synthetic polymer)	- Less frequent reapplications - Later applications require less material	- Slippery when wet - Requires specialized equipment purchase or rental - Higher maintenance costs for re-application	Reapplication every 3 years	- Specialized E-sprayer system (\$15,000) OR - Agricultural sprayer (\$5,000) - Storage tank (\$2,000)	\$20,000	\$60,000

1. July 2010 dollars

2. Includes labor, materials and equipment depreciation costs.

Additional Resources:

- *Dust Palliative Selection and Application Guide*, U.S. Forest Service 1999; www.fs.fed.us/t-d/pubs/html/99771207/99771207.html

- *Dust Control for Unpaved Roads*, Federation of Canadian Municipalities and National Research Council, 2005; http://gmf.fcm.ca/Infraguide/Roads_and_Sidewalks/dust_control_unpaved_rd.pdf