

# Transportation Services

## Gravel Road Maintenance



# Procedure C-425

<b>Gravel Road Inspections</b>	<b>Grader Operators</b> – Inspect during their regular blading activity <b>Maintenance Foremen</b> – Quarterly or as required
<b>Blading Frequency</b>	Blading frequency is based on the type of road as follows: <ul style="list-style-type: none"><li>i. Arterial and collector gravel roads are bladed once per week during non winter conditions.</li><li>ii. Local gravel roads are bladed on a 3 – 4 week rotation, however local gravel roads that are experiencing higher than usual traffic volumes may be added to the weekly blading route.</li><li>iii. Low volume roads are bladed up to twice a year on an as-needed basis.</li></ul>



# Low Volume & Non-Standard Roads

<b>Low Volume Roads</b>	<p>Low volume roads are maintained to the same safe and reasonable maintenance standard as local rural and subdivision roads. Service levels are as follows:</p> <ul style="list-style-type: none"><li>i. They are bladed less frequently due to the lower traffic volumes.</li><li>ii. They are inspected on a 3-4 week frequency by grader operators and maintenance foremen.</li></ul>
<b>Non-Standard Roads</b>	<p>Non-Standard Roads receive up to two bladings per year. Anything more frequent is done at the discretion of the Manager on an as-needed basis. Regular snow and ice control are not performed on these roads.</p>



# Stabilized & Oil Gravel Roads

<b>Stabilized Roads</b>	<p>These gravel roads are roads that have been treated with chlorides as a part of the County's gravel road dust abatement program and require different maintenance methods. These differences are:</p> <ul style="list-style-type: none"><li>i. Reduced gravelling frequency</li><li>ii. Calcium chloride re-applied as required</li></ul>
<b>Oil Roads</b>	<p>About 4% of the County's gravel roads were treated with an oil-based dust abatement product between 2002-2006. Since this product was shown to have an approx. lifespan of 1-3 years before major maintenance was required, the County deduced this was not cost effective and the use of oil-based dust abatement products was discontinued.</p>



# Gravel Replenishment & Spot Gravel

<b>Gravel Replacement</b>	Each year, the maintenance group determines which roads require significant replenishment of gravel. Local and collector roads are typically re-gravelled approximately every three years.
<b>Spot Gravel Repairs</b>	<p>Where a gravel road has localised soft spots or bare patches but is in otherwise good condition, spot repairs are performed. These areas are identified, inspected and prioritized for repair based on budgetary constraints and resource availability, taking into account:</p> <ul style="list-style-type: none"><li>i. Safety considerations</li><li>ii. Traffic volumes</li><li>iii. Overall roads condition</li><li>iv. Size &amp; scope of failure</li><li>v. Historical data from gravel tracking program</li></ul> <p>The areas that are shown to have ongoing failures are identified and prioritized for major repairs. (Subject to budgetary considerations)</p>



# Ag Field Access & Undeveloped Road Allowances

<b>Ag Field Access</b>	Landowners that require assistance with agriculture field access may contact the County to request blading of a road allowance in the Spring and again in the Fall. Any additional maintenance is at the sole discretion of the Manager.
<b>Undeveloped Road Allowances</b>	Undeveloped road allowances receive no maintenance to the driving surface and do not receive regular inspections. Illegal dumping activity on these roads is addressed on an as-needed basis.



# How is Gravel Summer Road Maintenance Performed?

10 Divisional Operators utilizing leased graders

10 hr shifts, 5 day weeks

Cost: \$120 per hour

4 Equipment Operators utilizing County owned graders

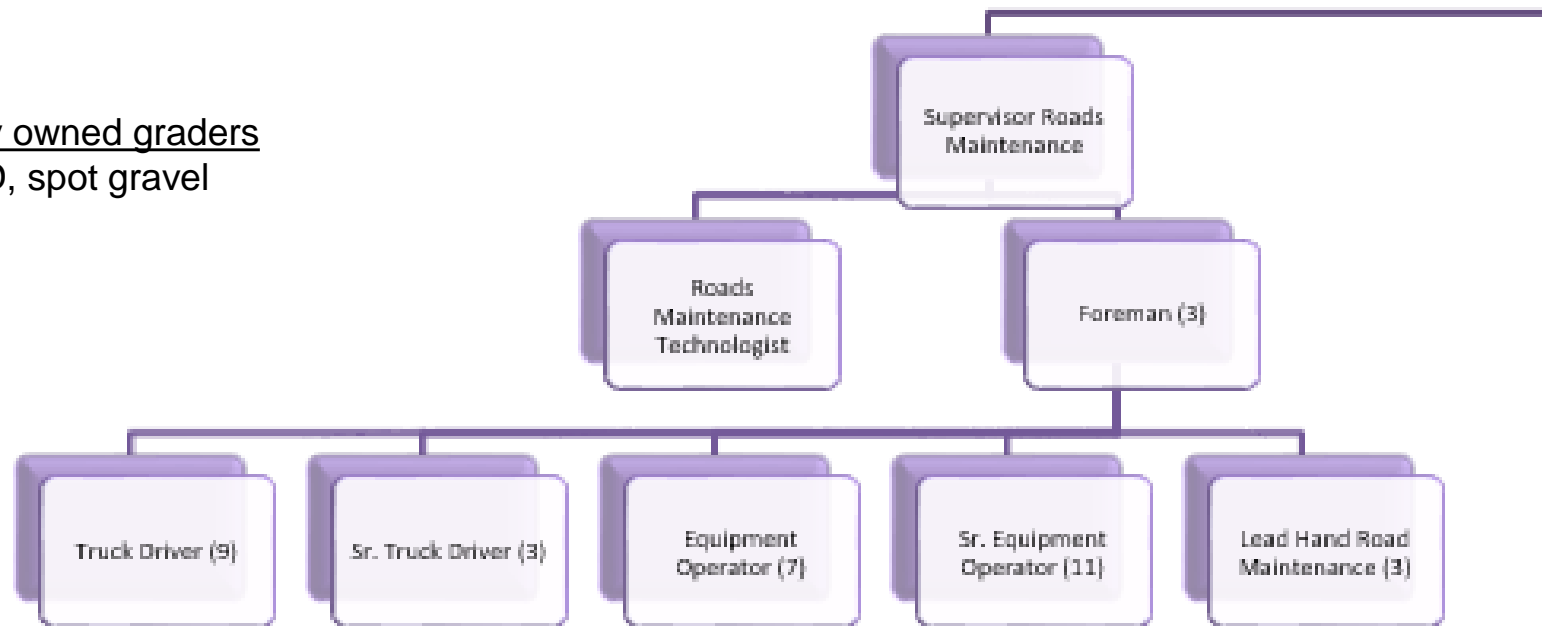
Maintenance as needed. Calcium, R&D, spot gravel programs

Cost: \$165 per hour

Contract Graders

As needed basis, winter SNIC

Cost: \$167 to \$220 per hour





## Best Practices





# Best Practices

Spec	Crush \$	Blade \$ & Loose Rock	Life Cycle \$	% Rock	% Sand	% Silt and Clay Binder	% Clay Binder
AT 4-20				55%	36%	9%	3%
AT 4-20 Modified	2% More	50% Less	50% less	46%	34%	20%	6.3%

Note: Data from WSP Interim Report on Range Road 14-0, dated January 2017  
 AT 4-20 gravel from Reeve Pit  
 AT 4-20 gravel from Bussey Pit

Spec	Condition Index (15 months)	
	No CaCl <sub>2</sub>	With CaCl <sub>2</sub>
AT 4-20	-25	57
AT 4-20 Modified	35	75



## Benefits of Best Practices



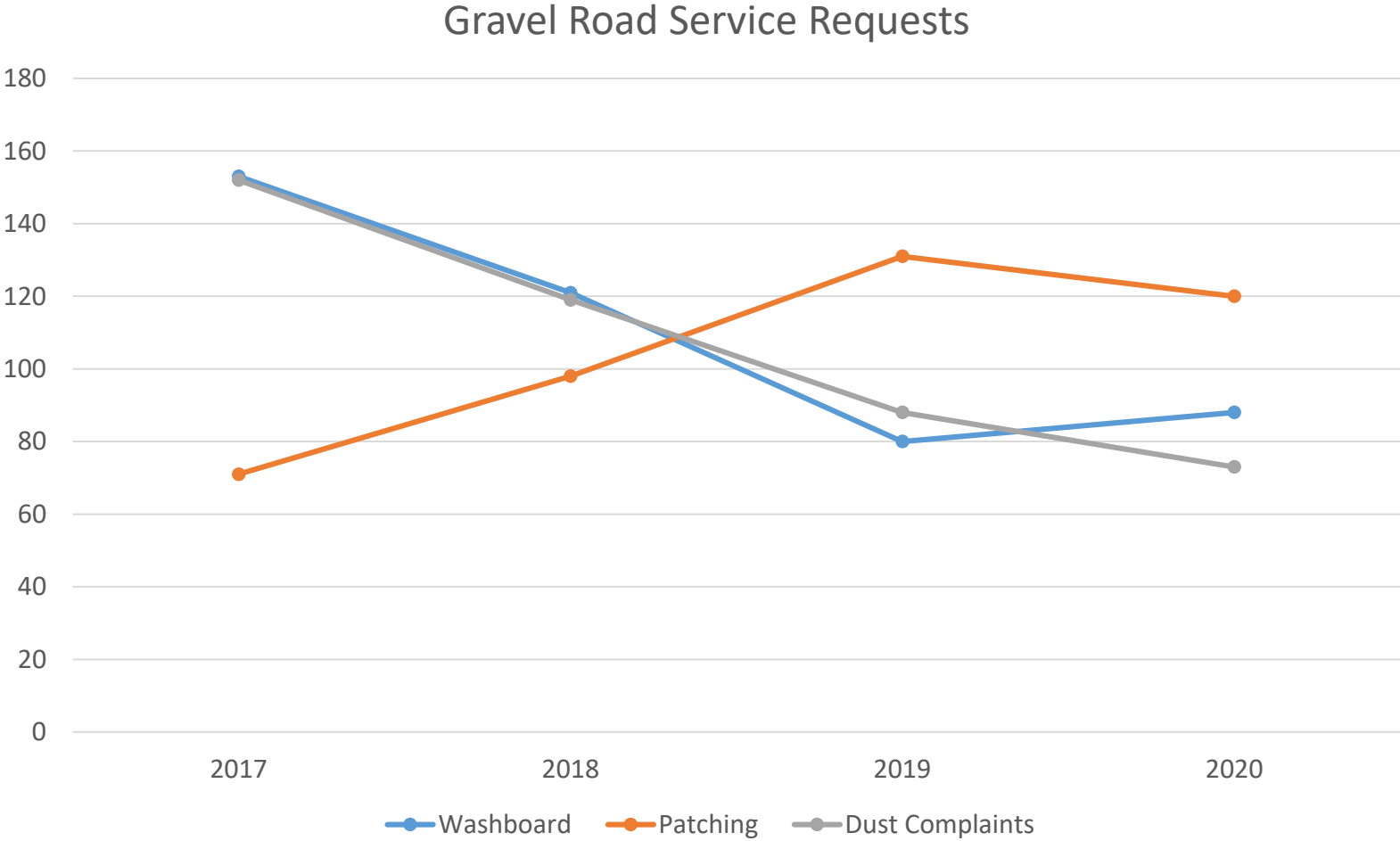
Narrow driving surface  
Reduction in crown  
Retains water  
Washboard  
Fugitive dust



Designed driving surface  
4% crown  
Sheds water  
Minimal washboard  
Sealed surface – less dust



# Benefits of Best Practices





# Gravel Road Investment

Gravel Road Maintenance				
	R01	R04	R05	Total
Year	\$/km	\$/km	\$/km	\$/km
<b>2020</b>	\$1,643.88	\$548.15	\$194.03	\$2,386.06
<b>2019</b>	\$1,606.02	\$478.93	\$216.80	\$2,301.75
<b>2018</b>	\$1,531.50	\$489.02	\$174.29	\$2,194.80
<b>2017</b>	\$1,547.28	\$307.73	\$110.72	\$1,965.73



# Future Risks

<b>Gravel Supply</b>	<ul style="list-style-type: none"><li>▪ The County currently crushes under contract in one pit.</li><li>▪ Lack of supply in SE requires purchasing of gravel at a lesser quality.</li></ul>
<b>Gravel Volume</b>	<ul style="list-style-type: none"><li>▪ Budget pressure will result in decreased gravelling frequency or application rate, resulting in a lower satisfaction index.</li></ul>
<b>Traffic Volumes</b>	<ul style="list-style-type: none"><li>▪ Significant increases in traffic results in increased grading cycle, gravel and dust abatement treatments.</li></ul>





# Risk Mitigation

<b>Gravel Supply</b>	<ul style="list-style-type: none"><li>▪ Continue to source appropriate supply of quality gravel and secure crushing agreements (Bussey Pit).</li><li>▪ Source County owned gravel supply (SE).</li></ul>
<b>Gravel Volume</b>	<ul style="list-style-type: none"><li>▪ Continue applying modified specification gravel combined with best practices to reduce or extend the need for additional gravel.</li></ul>
<b>Traffic Volumes</b>	<ul style="list-style-type: none"><li>▪ Identify and analyze traffic volumes patterns to better identify future capital upgrades.</li></ul>



# Questions?

