

# Pothole Patching Alternatives

Roads Operations

**Core Service Review**



# Pothole

A **pothole** is a type of failure in an asphalt pavement, caused by the presence of water in the underlying soil structure and the presence of traffic passing over the affected area.



# What are we doing now?

- Pothole Patching is done on a priority basis
- Regular road patrol identifies problem areas
- Information received through complaints
- Patching schedule is governed by Minimum Maintenance Standards (MMS)
- Patching done mostly with cold mix, some hot mix
- Labour is combination of City staff and contracted resources

# Minimum Maintenance Standards

## Potholes on Paved Surface of Roadway

Class of Hwy	Surface Area	Depth	Time
1	600 cm <sup>2</sup>	8 cm	4 days
2	800 cm <sup>2</sup>	8 cm	4 days
3	1000 cm <sup>2</sup>	8 cm	7 days
4	1000 cm <sup>2</sup>	8 cm	14 days
5	1000 cm <sup>2</sup>	8 cm	30 days

# What are we doing now?

- Each depot area has their own budget for patching
- Schedules are prioritized and managed by each depot supervisor
- Patching is designed to be a temporary solution to mitigate liability until the road can be properly resurfaced through the capital resurfacing program

# What is it costing us?

- 2015 Cost (operating) = \$929,648.86
- This area has been consistently over budget

2015					
	LABOUR	EQUIPMENT	MATERIAL	CONTRACT	TOTAL
EAST	\$ 188,869.97	\$ 89,892.44	\$ 128,734.26	\$ 102,502.25	\$509,998.92
WEST	\$ 174,183.01	\$ 83,097.41	\$ 112,038.10	\$ 50,331.42	\$419,649.94
<b>TOTAL</b>	<b>\$ 363,052.98</b>	<b>\$ 172,989.85</b>	<b>\$ 240,772.36</b>	<b>\$ 152,833.67</b>	<b>\$929,648.86</b>

# Extend the life of our road network

- There are options to extend the life of our road network and protect our assets
- There will be an increased cost to implement these options

# Methods

- Cold Mix
- Hot Mix
- Mid-Life Road Extension
- Increased Brushing/Ditching Program
- Resurfacing Program Enhancement



# Cold Mix

- Currently use cold mix for most patching



# Cold Mix - Benefits

- Material very versatile
- Year Round Application (winter availability and usage)
- Keep stock inventory at each depot for immediate use when necessary
- Allows for timely response and efficient to address immediate issues

# Cold Mix - Risks

- Short life expectancy
- More Costly to purchase material
- High Instability

# Cold Mix - Costs

- High cost of Material/Limited longevity
- Placement cost (labour)
- \$120/tonne for cold mix (Supply)

# Hot Mix

- Pothole Patching
- Base repairs/culverts/road cut Repair
- Grader “Smear”
- Localized Resurfacing
- Resurfacing Program



# Hot Mix Pot Hole Patching- Benefits

- Pliable when hot, rigidity gained following placement, compaction and cooling
- Extended longevity
- Reduced number of times required to repair the same pothole
  - Improves public perception
  - Reduction in labour costs
  - Reduction in material usage

# Hot Mix Pot Hole Patching - Risks

- Capital assets required – Hot boxes
- Not enough budget currently to outfit all depot areas with proper resources
  - Two Hot boxes approved in 2016 budget
- Availability
  - Seasonal and geographic limitations
  - Product Mix Availability
  - Cannot stockpile at depots

# Hot Mix Pot Hole Patching - Costs

- \$80/tonne (Supply)
- Hot Boxes (Capital Outlay) – \$40-45k each
- Use it or lose it



# Enhance Ditching & Brushing Program

- Ditching - Improves road structure drainage by removing water presence by deepening ditches and improving drainage
- Brushing – Increases roadway exposure to sun and wind, in turn resulting in drier conditions



# Ditching & brushing program benefits

- Deeper ditches/proper drainage results in elimination of water from road structure. A free draining roadbed is critical to the long-term health of the roadbed and road surface.
- Brushing provides safe sight lines, road base drainage, and road exposure to the sun which results in elimination of water from the road structure.

***Elimination of water from road structure results in fewer potholes***

# Ditching & brushing program risks

- Labour/resource intensive
- Utility conflicts
- Seasonal constraints
- Public Perception
  - Brushing (Aesthetics)
  - Deeper ditches (Accessibility for maintenance)
- Costs/Budget – Contractors
- Disposal of Ditching Spoils

# Ditching & brushing program costs

- Current program provides insufficient resources to establish minimum levels relating to drainage, sightlines, exposure
- Requires heavy contractor supplement

	<b>2014</b>	<b>2015</b>
Brushing	\$ 196,482.67	\$ 494,935.72
Ditching	\$ 213,268.47	\$ 628,416.89

# Mid-life road extension

- Surface Treatments
  - Micro-resurfacing
  - Slurry Seal
  - Single Surface Treatment (High Float)
- Route and Seal
- Combination of surface treatment with road cut repairs, hot mix repairs, or similar

# Mid-life road extension

- Extends the lifespan of the road
- Not done regularly

# Cold Mix Patching Vs. Hot Mix Patching Scenario

## Cold Patch



## Hot Patch



**Life Expectancy**

35 Days

84 Days

**Annual Patching Requirement**

10.4 Times/YR

4.4 Times/YR

**Material Cost**

\$120/tonne

\$80/tonne

# Conclusion

- Combination strategy encompassing all options
- Two issues – fixing the current potholes and preventing new ones
- Will be using hot boxes in 2 areas this year and will monitor results (fixing)
- Recommend an increase to the ditching & brushing budget (prevention)