



Winter Asphalt Maintenance



SAINT JOHN

March 25, 2019



Winter 2019 Conditions

- Increased storm activity out of the South
- Bringing mixed precipitation
 - Snow
 - Ice
 - Rain
- Followed by sub-zero temperatures

Asphalt Surface Defects

- Delamination

- Failure of the wear layer leaving the base layer intact
- Failure of the bond between the layers
- Cannot be maintained during the winter months



- Pothole

- Bowl shaped hole penetrating all layer of asphalt
- Results from the continued deterioration of other defects
- Can be maintained through the winter months with a temporary repair



Asphalt Surface Defects

- Alligator Cracking
 - Multiple block cracking on the surface
 - Fatigued section work loose and eventually create a pothole
 - Failure of the road base
 - Road beyond preventative maintenance
 - Cannot be maintained during the winter months and will require overlay or full-depth repair in construction season



Asphalt Surface Defects

- Seam Separation
 - Longitudinal cracks occur parallel to the centerline
 - Caused by:
 - shrinkage of the asphalt
 - cracks reflecting up from an underlying layer
 - longitudinal segregation due to improper paver operation
 - Maintained through the crack sealing program during the summer





What Affects Asphalt Life?

- Pavement life is influenced by many factors:
 - Vehicle loading (axle loads, tire pressure and gross vehicle weight)
 - Traffic volume and mix
 - Topography
 - Subgrade condition
 - Initial pavement design and construction practices
 - Maintenance activity
 - Pavement age
 - Environmental conditions (weather)

What Affects Asphalt Life?

- Weather conditions in Saint John
 - Multiple freeze/thaw cycles
 - Water enters through cracks in the asphalt
 - Water freezes and expands stressing the asphalt
 - During the thaw cycle the ice melts and leaves a void under the surface
 - Repeated freeze-thaw cycles coupled with traffic load further deteriorate the asphalt until failure occurs





Materials used to address Potholes

- Pothole Repairs can be either temporary or semi-permanent
 - Temporary repairs
 - Cold mix
 - Polymer modified asphalt
 - Used during the winter months
 - Tumbler/recycler
 - Hot mix
 - Semi-permanent repairs
 - Care and attention to prep the repair
 - Ensure it is dry and clean
 - Use hot mix to fill the repair
 - It is noteworthy that in both cases:
 - The importance of adequate compaction
 - Successive freeze-thaw will eventually cause the repair to fail

- As work orders are generated for potholes, they are prioritized according to their physical characteristics and location:
 - Physical characteristics
 - Critical - $> 4'' \times 8'' \times 4''$ deep in the road surface
 - Urgent - $< 4'' \times 8'' \times 4''$ deep in the road surface
 - Important and Minor – potholes located in driveway aprons and edge of road
 - Location
 - Based on the street priority



Other priorities

- During the winter season Transportation and Environment Services has multiple competing services:
 - Snow and Ice Control for streets and sidewalks
 - Responding to winter snow events
 - Snow removal in high density areas
 - Ice cutting
 - Winter Drainage
 - Maintaining priority catch basins
 - Responding to localized flooding
 - Repairing washouts
 - Illegal Dumping
 - Surface Maintenance
 - Potholes
 - Utility Cuts

- The City has many maintenance programs for asphalt repairs. The type of surface defect and the time of year will determine how and when the defect can be addressed:
 - Winter Asphalt Maintenance
 - Focused on identifying priority potholes
 - Addressed using either recycled hot mix or cold mix
 - 1,500 potholes fill as of March 18th
 - Spring Pothole Blitz
 - Filling potholes throughout city
 - All other asphalt work on hold until complete
 - All resources allocated towards this initiative

- Sand Seal Blitz
 - Address other surface defects
 - Delamination
 - Alligator cracking
 - Pavement temperature of at least 15 degrees Celsius
 - Typically can start in late June
- General Construction Season Maintenance
 - All other asphalt work
 - Overlay program
 - Driveway aprons
 - Water rolls and swales
 - Crack sealing
 - All other surface defects

Questions?

