Next Generation Concrete Surface in Ontario

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- Asphalt: 77.1%
- Exposed PCC: 1.1%
- Composite: 5.7%
- Surface Treated: 14.8%
- Gravel: 1.3%
Highway 115

- Rural freeway.
- SW of Peterborough.
- 55 lane-kms concrete surfaced.
- Built 3 twinning Conts. (1989 to 1991)
- AADT = 22,000
- 9.5% commercial.
• Life Cycle of Concrete Pavement

- Joint Reseal
- Minor CPR*
- Extensive CPR*
- Asphalt Overlay

Hwy 115

10 20 30 40

* Concrete Pavement Restoration (CPR) incl. Diamond Grind/Groove
Source: LCCA on MTO Freeway Projects, MERO-018, March 2005
• Highway 115
  – Completed 4 CPR contracts between 2007 to 2010 (slab repair, crack stitching and dowel bar retrofit)
  – Completed Diamond Grinding in 2011
  – Friction improved right after construction, but dropped back down after one year of service (2012)
  – Diamond Grooving & resealing in 2014
• Diamond Grinding and Grooving
  – Next Generation Concrete Surface (NGCS)
• Improve Ride, correct minor faulting and slab warping.
• Improve Friction.
• Studies suggest significant improvements in hydroplaning.
• Studies indicate NGCS as the most quite concrete pavement surface commonly used.
• Grinding remove remnants of old transverse tines, establish new longitudinal pattern (~10 mm structure).
• Land areas (ridges) partially break off under traffic.
• Grooving let into ground surface, no loss of structure.
• Diamond Grooving in 2014
  – Grooving in 4 passes to complete one lane
• Challenges
  • Maintaining lateral drainage across paved shoulders with grinding. (not an issue for grooving).
  • Sealant impacted by cutting blades.. rebound and pull out.
  • Reseal after grind/groove.
• Environmental
  • Effluent transported by tanker truck to settling ponds (4 days process).
  • Water were reused in operation.
  • Deposit managed as non-hazardous waste.
• **Summary**

– First NGCS in Ontario constructed on Hwy 115
– Pre and post RoLine laser testing for texture
– Test results are not available yet, but anticipated significant improvement.
– Driven on NGCS and it is noticeably quieter than just diamond grinding concrete pavement
– Properly timed Concrete Pavement Restoration (CPR) including diamond grinding and grooving is crucial to maintain the serviceability and achieve the full life expectancy of a concrete pavement.