



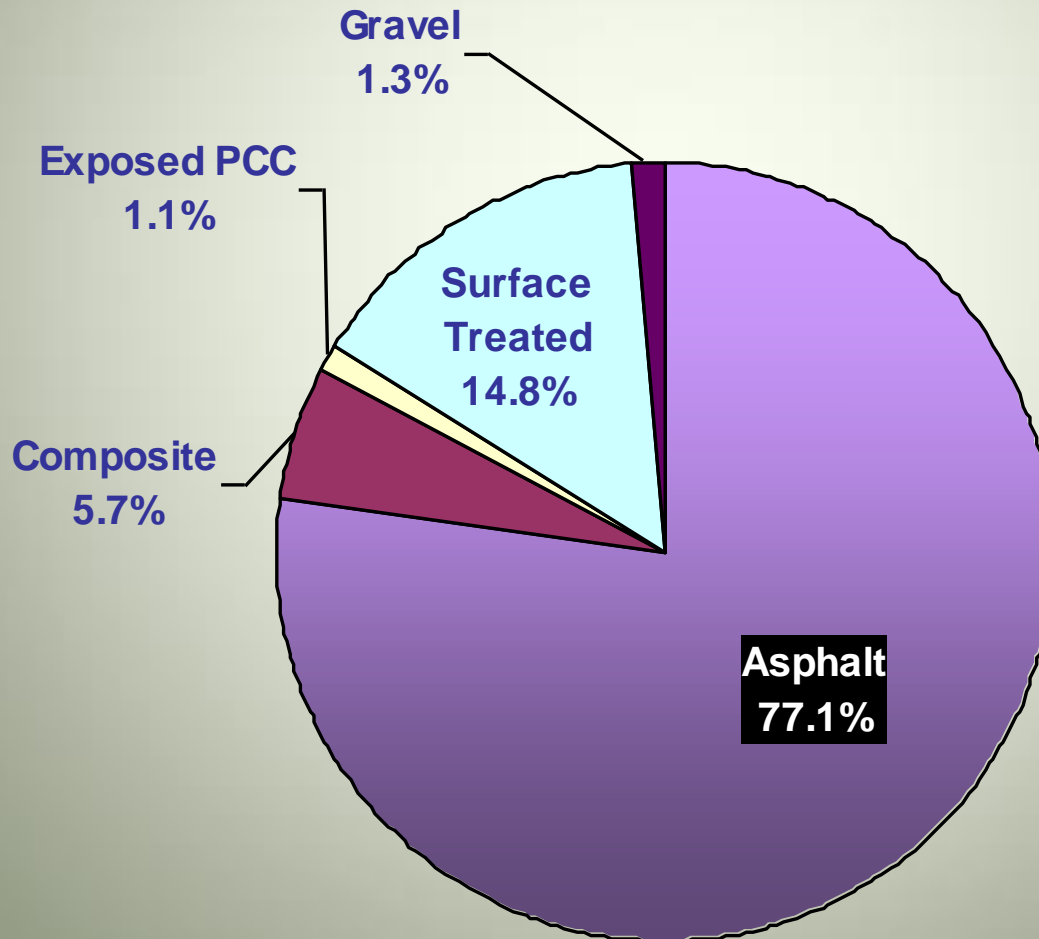
Next Generation Concrete Surface in Ontario

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Transportation



MTO Pavement Network



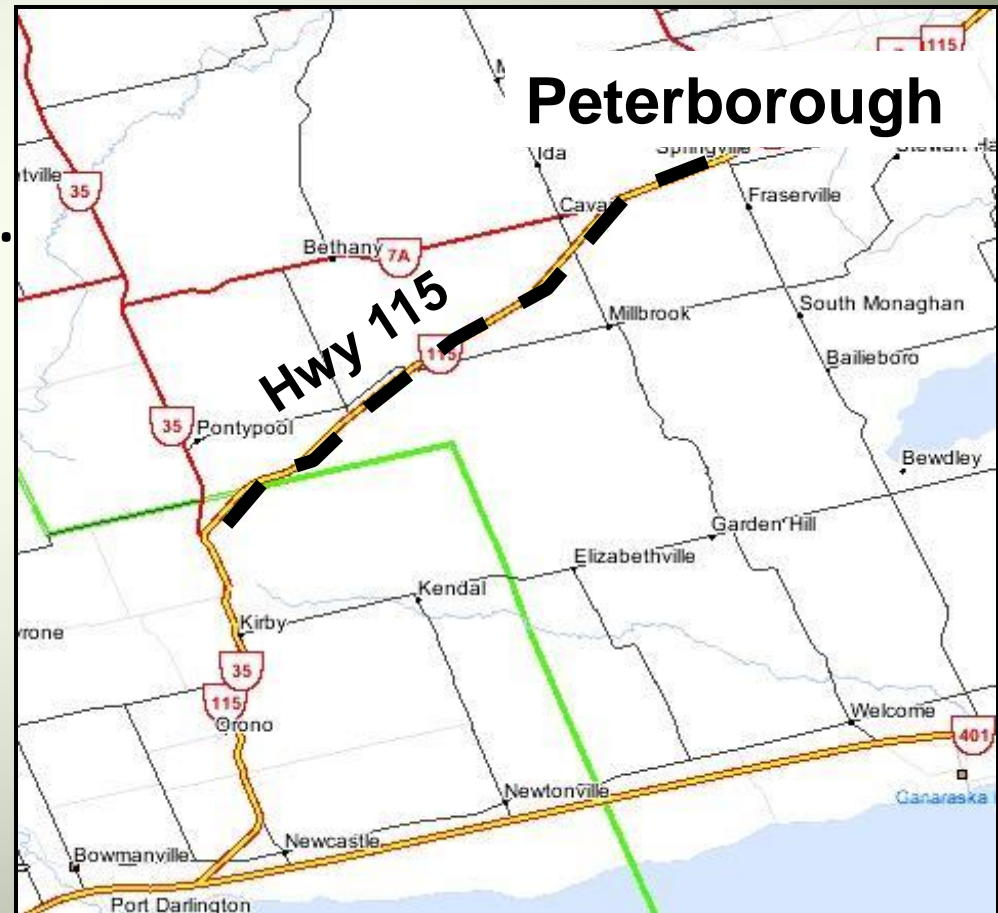


Transportation System Preservation
Technical Services Program

Pavement Preservation

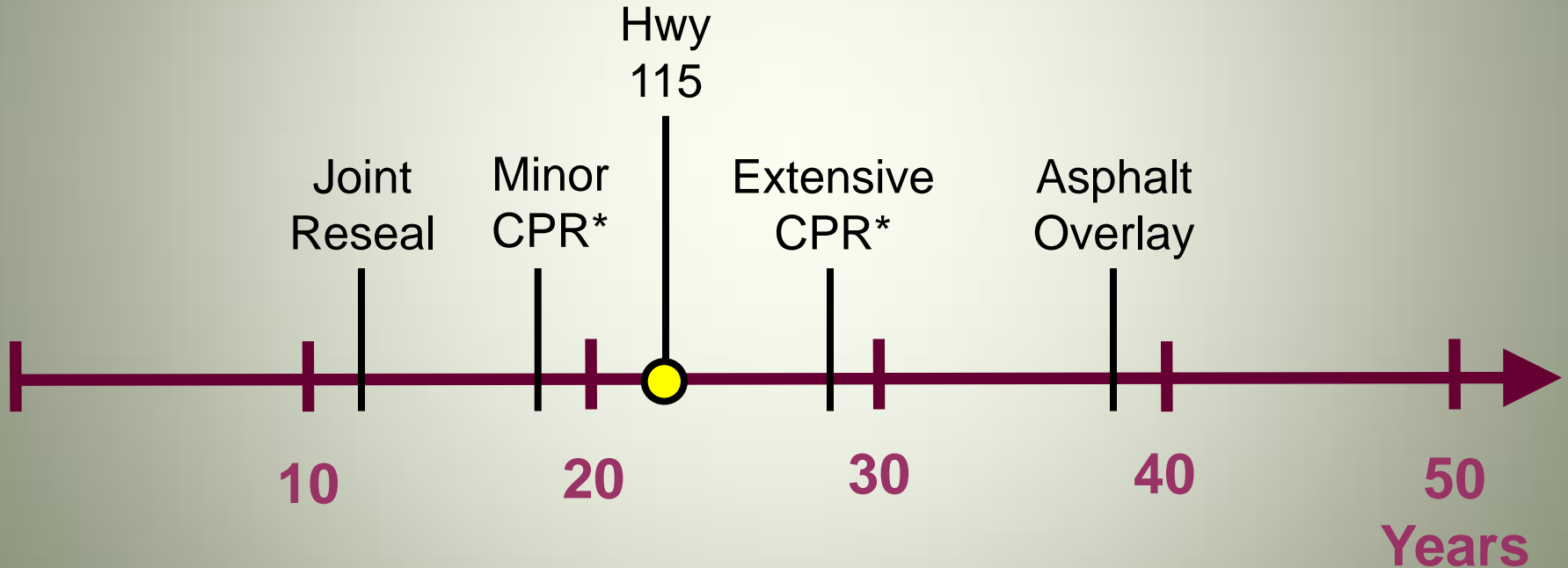
Highway 115

- 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



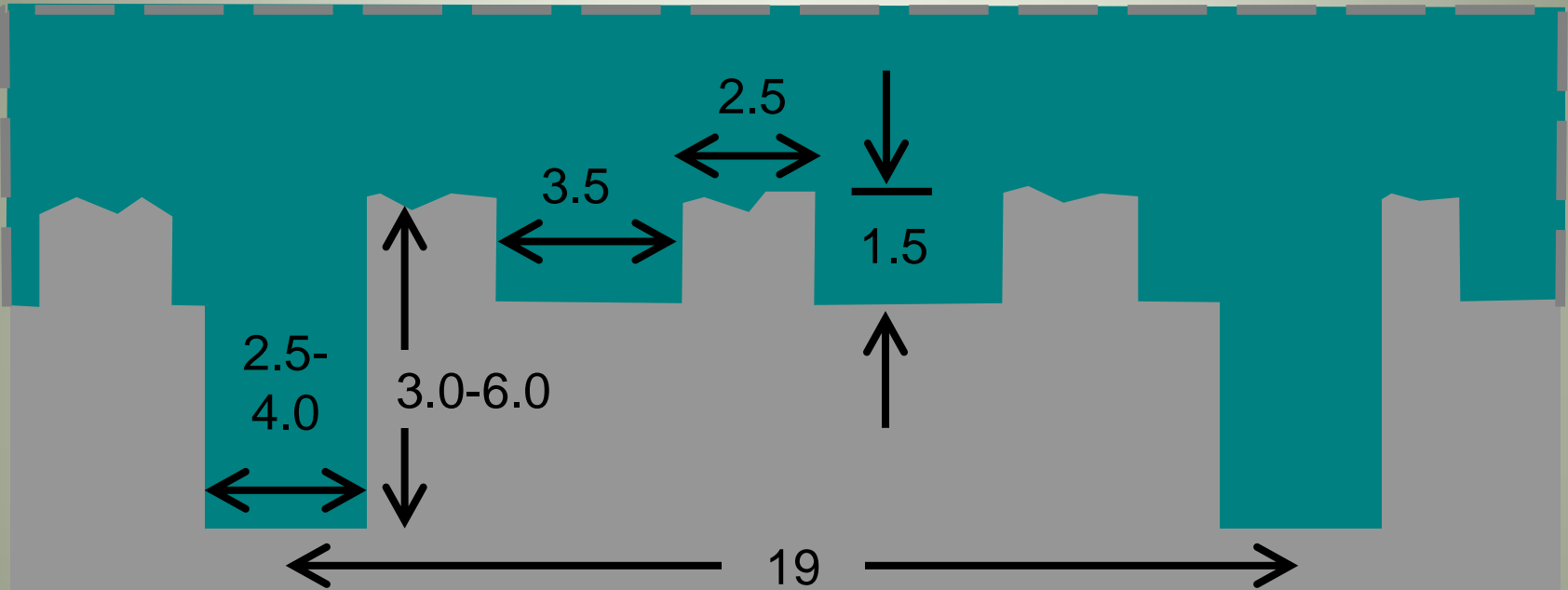
* Concrete Pavement Restoration (CPR) incl. Diamond Grind/Groove
Source: LCCA on MTO Freeway Projects, MERO-018, March 2005



- 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.

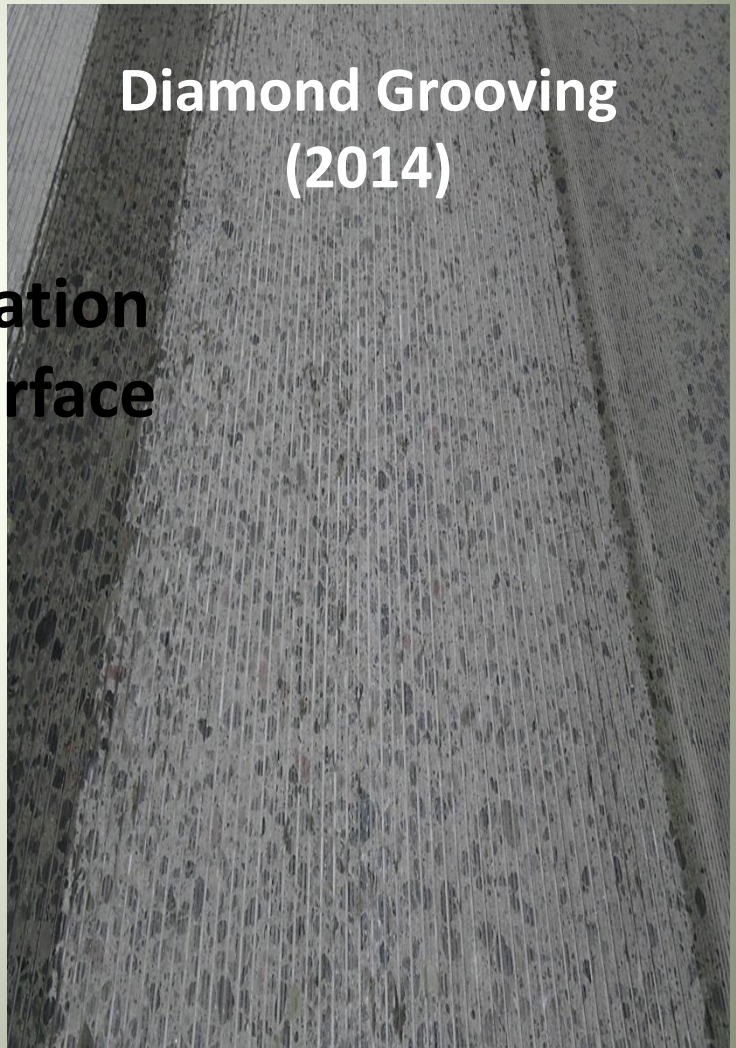


- Diamond Grooving in 2014
 - Grooving in 4 passes to complete one lane





**Diamond Grinding
(2011)**



**Diamond Grooving
(2014)**

**Next Generation
Concrete Surface
(NGCS)**



• 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.