

**2023 ISSA
Preservation Performance Award**

York Region, Ontario, Canada

Contract No. YR 09-174 (2009)

Weston Road High Performance Double Chip Seal Project



A COLAS COMPANY

High Performance Chip Seal 14 Years Later



2009 – Original Construction



2023 – Present Day

— Why Weston Road (Regional Road 56)?

- Arterial road in very good condition, preserved in 2009 and remains in good service today! (14 years)
- Pavement preservation project completed using the right treatment, on right road at the right time
- Preservation methodology consisted of high-performance double chip seal:
 - Premium (i.e. abrasion resistant) aggregates and rapid setting emulsion
 - Application rates designed based on site specific information
 - Constructed uniquely using 2 distributors and 2 chip spreaders working in tandem
 - Topped with a fog seal
- Extended the life of Weston Road, going on year 14, with minor maintenance work to address localized cracking
- Cost-effective and low-carbon emission alternative for York Region's toolbox to manage similar assets

— Applicant & Agency Information

Applicant:

**Miller Paving Limited
Ontario Pavement Products Group (OPPG)
281 Hillmount Road, Markham, ON L6C 2S3**

**Peter Linton
General Manager
peter.linton@millergroup.ca**

Agency:

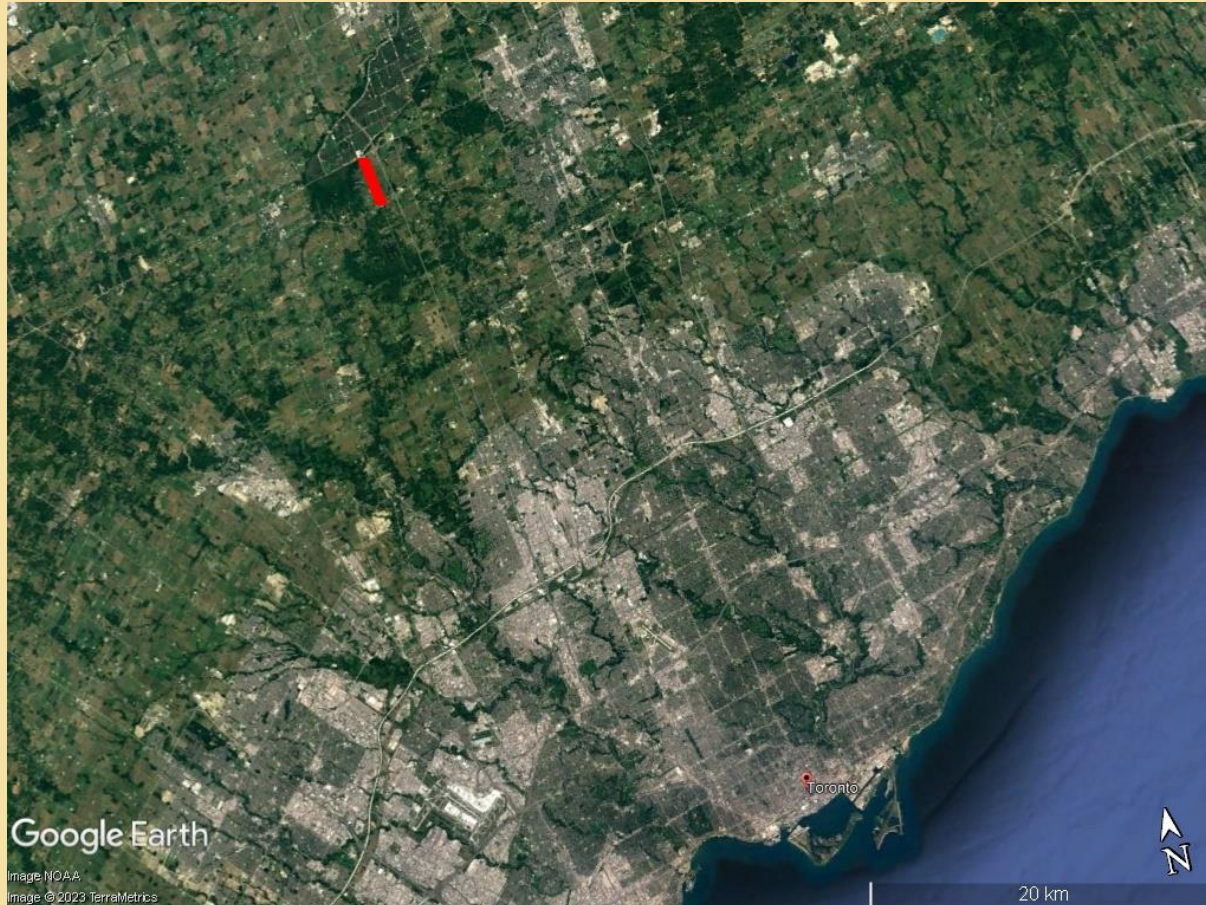
**The Regional Municipality of York
Capital Delivery
90 Bales Drive E, East Gwillimbury, ON L0G 1V0**

**Neil Wilson, C.E.T.
Planning and Design Coordinator
neil.wilson@york.ca**

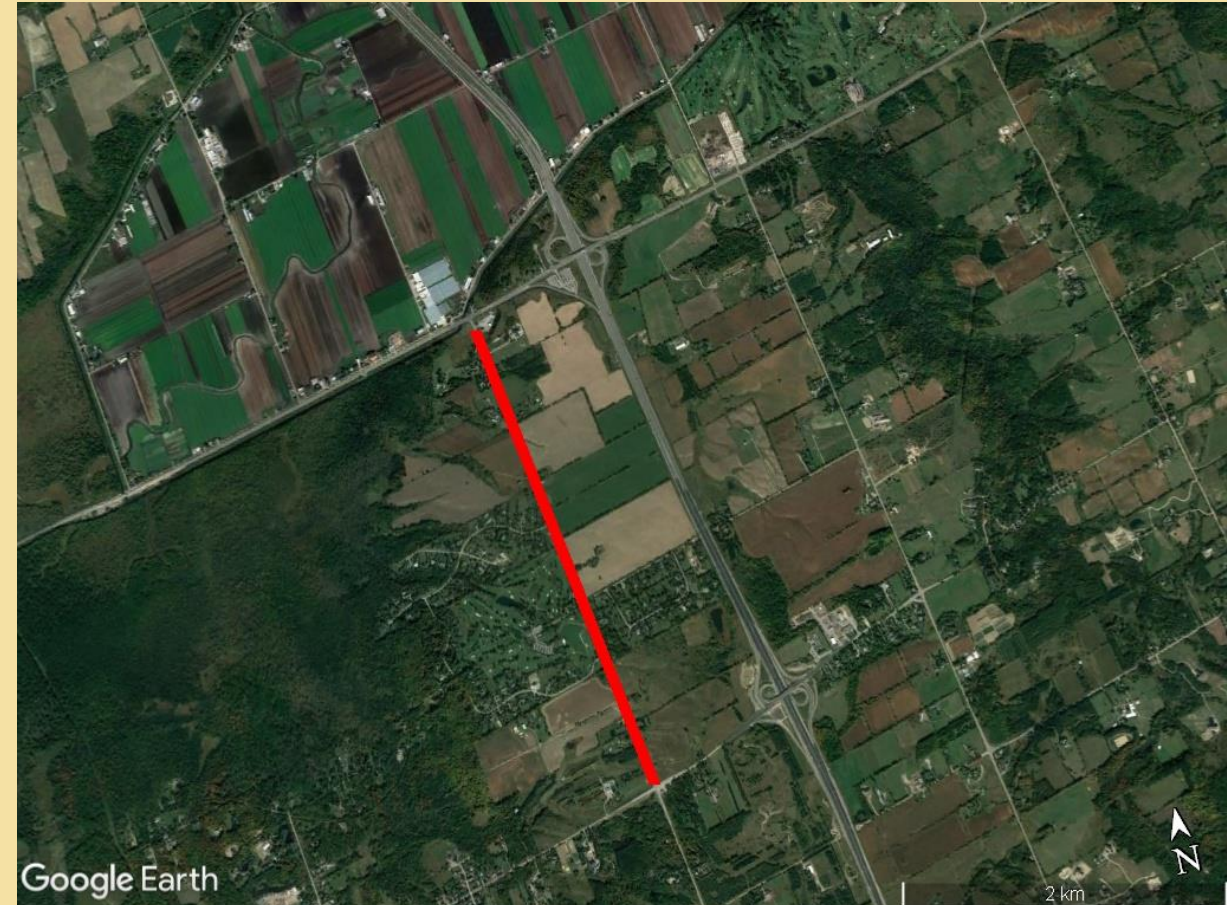
Project Overview

Project Owner:	Regional Municipality of York
Contract No.:	YR-09-174
Location:	King, Ontario
Road Name:	Weston Road (Regional Road 56)
Road Limits:	Davis Rd (RR9) to Lloydtown-Aurora Rd (RR16)
Road Length:	2.7 km
Total Area:	23,130 m ²
Contract Value:	\$210,410 CAD
Total Working Days:	1

Site Details

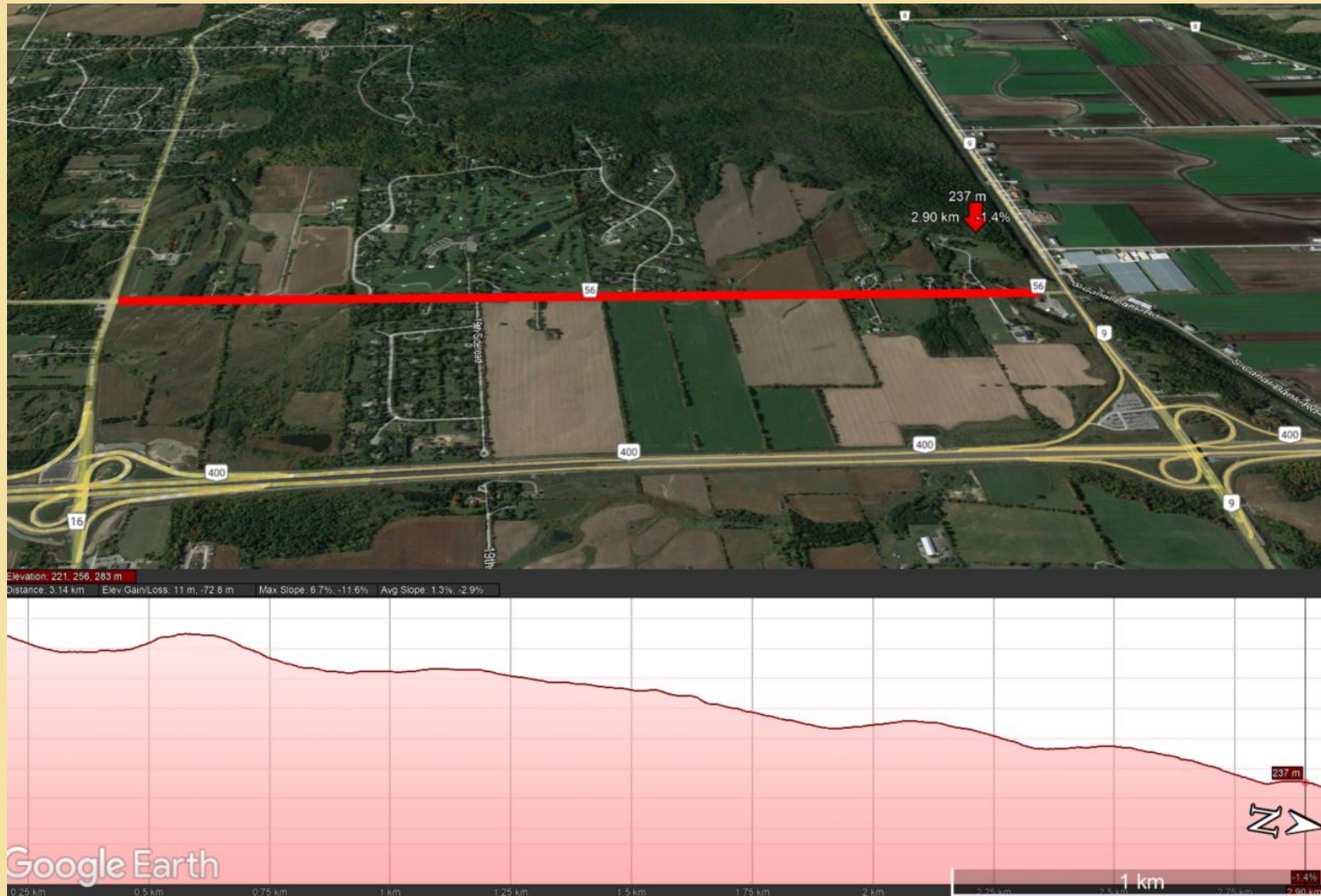


Proximity to Greater Toronto Area (GTA)



Weston Road (Regional Road 56)

Road Details



- Major arterial (regional road)
- Trending North-South
- Sloping down from South (RR16) to North (RR9)
- Rural cross-section

Existing Condition (2009)

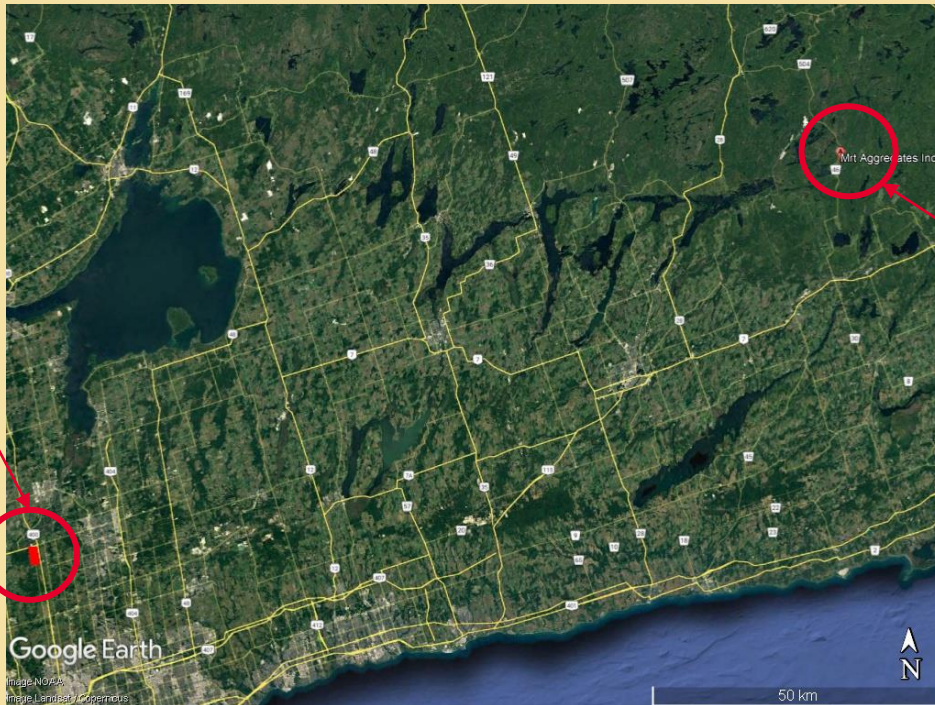


- 2009 Traffic Data:
 - AADT 1508
 - Truck Traffic 2%
- Surface Condition before preservation:
 - Oxidized hot-mix asphalt
 - Polished pavement
 - Hard/stiff pavement
 - Good condition with localized cracking

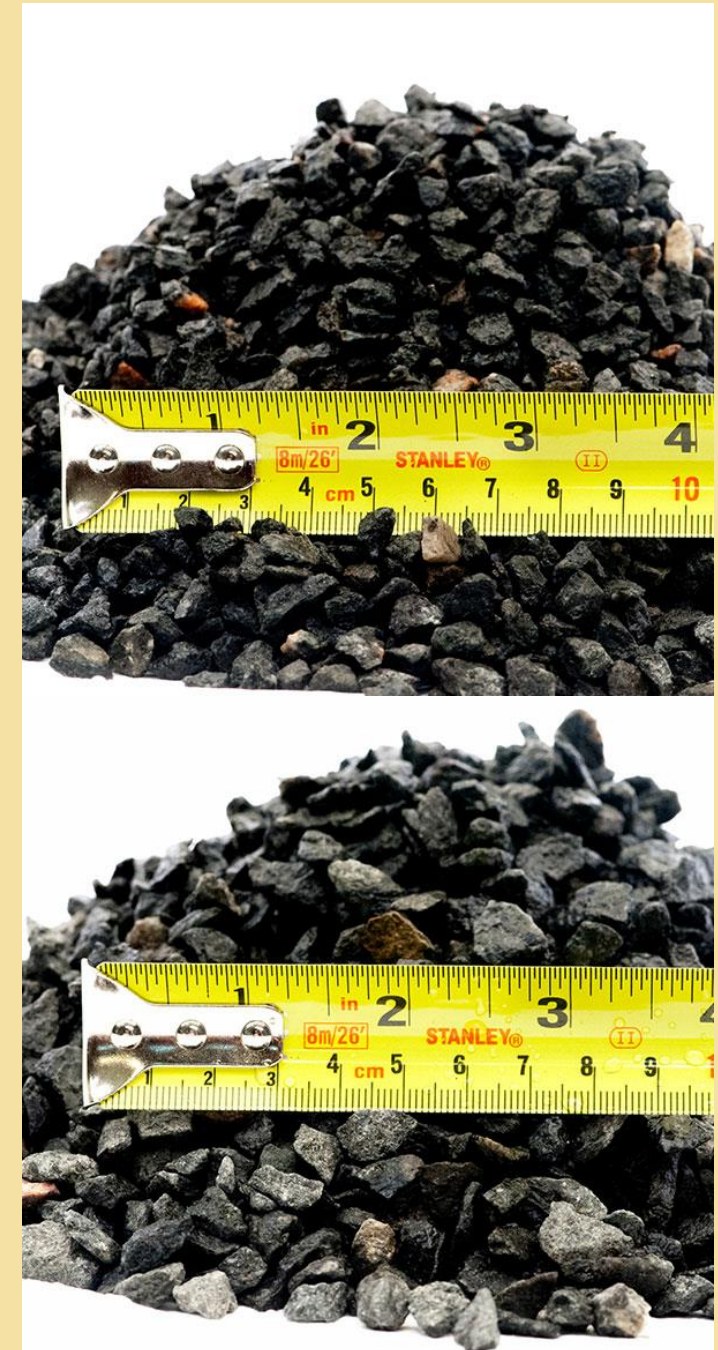
Aggregate Source

- MRT Quarry in Havelock, Ontario (250km away)
- Meta-Gabbro; retains black look for years
- High friction and skid resistance

Project Site



Quarry



— Chip Seal Materials & Laboratory Testing

Material	Type/Name	Testing
Asphalt Emulsion	CRS-2P	OPSS 1103 Compliance (Viscosity, Residue, Penetration, etc.)
Top Aggregate	1"-1/8" (2/5mm) Chip	OPSS 1006 Compliance (Gradation and Physical Properties)
Bottom Aggregate	3/8" (6/10mm) Chip	OPSS 1006 Compliance (Gradation and Physical Properties)

— Chip Seal Performance Testing



**Aggregate-Emulsion Compatibility
(Stripping Resistance)
OPSS 1153**

**Binder-Aggregate Adhesivity
Vialit Plate Shock Test Method
EN 12272-3:2003**

**Sweep Test
ASTM D-7000**

— Chip Seal Design Methodology

- McLeod NW. “A General Method of Design for Seal Coats and Surface Treatments”, Proceedings, Association of Asphalt Paving Technologists, 38, 537-630 (1969).
- *“Enduits superficiels d’usure: Guide technique”, Min. de l’Aménagement du territoire, de l’Équip. et des Transp., Paris, 1995*
- Nicholls JC and al. “Design guide for road surface dressing”, Road Note 39, 5th Edition, Transportation Research Lab. Ltd., Crowthorne, United Kingdom (2002).
- Austroads Provisional Spray Sealing Method, Practitioner's Guide to Design of Sprayed Seals, Sydney, Australia, 2002

Double Chip Seal Design

Material	Type/Name	Application Rate
Asphalt Emulsion	CRS-2P	1.3 L/m ² *bottom and top lift; 2.6 L/m ² total
Top Aggregate	1"-1/8" (25mm) Chip	10-12 kg/m ² (98% coverage)
Bottom Aggregate	3/8" (9.5mm) Chip	6-8 kg/m ² (105% coverage)
Asphalt Emulsion – Fog Seal	CSS-1H	0.3 L/m ²

Base Repairs

- No base repairs or preparation considered.
- Severe cracks were sealed with self-adhesive strips to mitigate reflective cracks; 14 years later and repairs held up (this was not an item, but a trial proposed by contractor no cost)



Double Chip Seal Construction



— Finished Surface Appearance

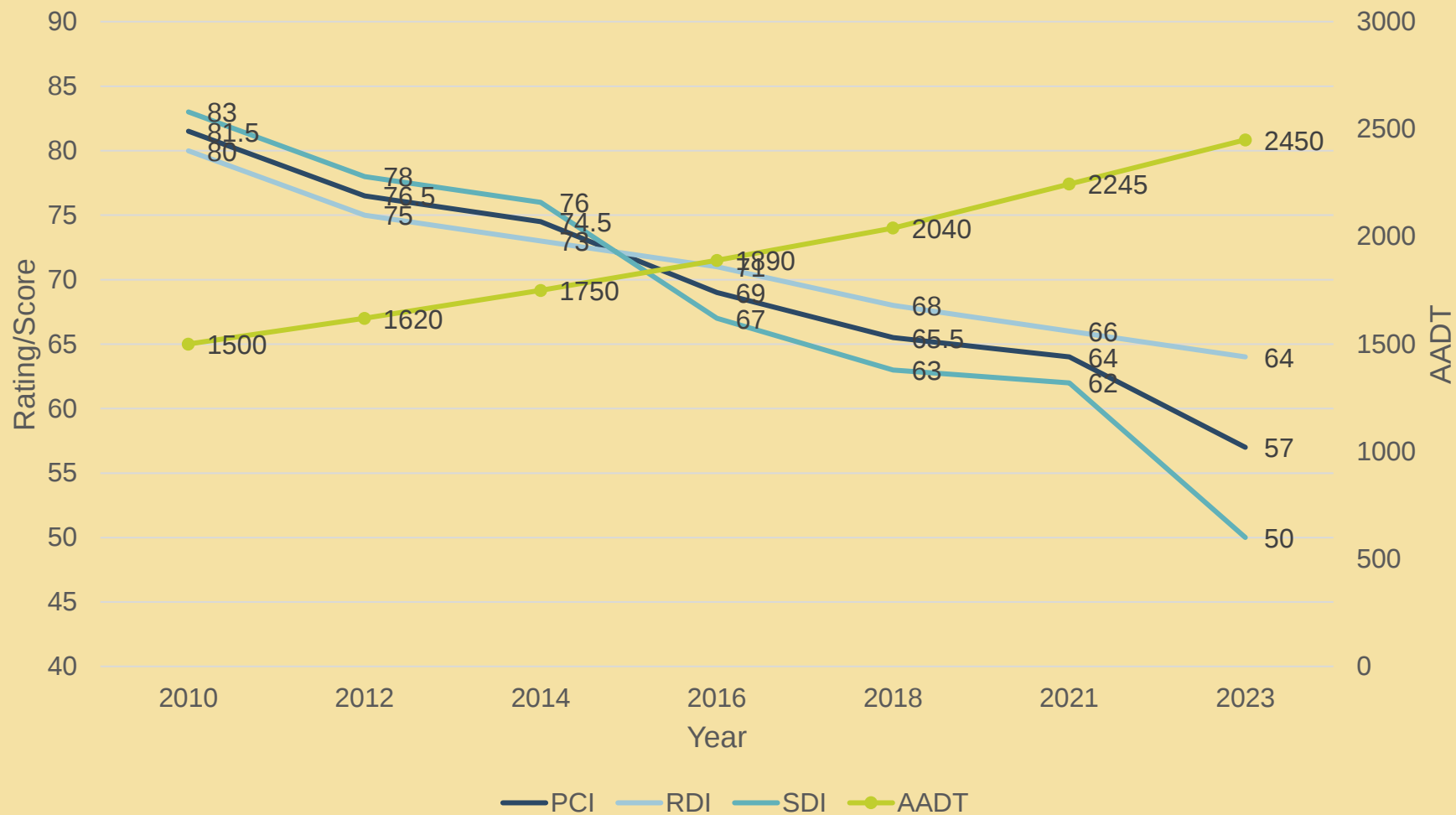


Double Chip Seal Benefit

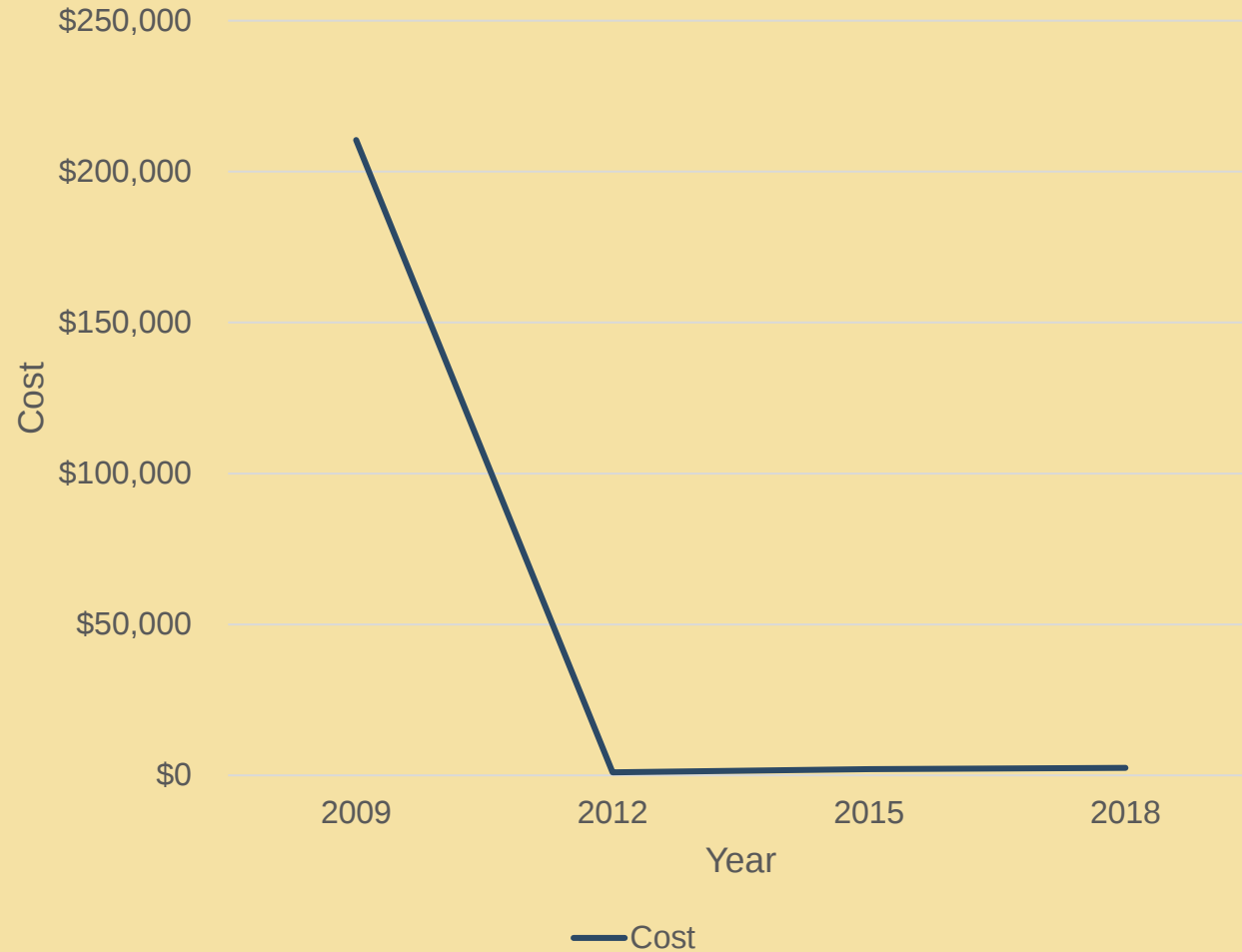
- Tight macro/micro texture and increased skid friction
- Polish resistant from seasonal winter plowing operations
- Application rate adjustments calculated to account for traffic and site conditions (i.e. roadway slope and shaded areas)
- Surface texture minimizes surface spray-off and roadway glare after rain events, improving safety for travelling public
- Low-cost and lower greenhouse gas emission alternative to hot-mix asphalt



Pavement Condition Data



Construction & Maintenance/Repair Costs



-Construction cost = \$210,410

-Maintenance/repair costs ~ \$5,500 (2012-2023)

- Crack sealing;

-Preservation treatment has not required major rehabilitation or repairs since construction

-Increased truck traffic post 2021 (COVID-19 pandemic) has lead to slight rutting and fatigue cracking, with rehabilitation plans for future

Pavement Condition Photos - 2009



Pavement Condition Comparison – South Limit



2009



2012



2022

— Pavement Condition Photos – Present Day



— Preservation Performance Award Candidate

- Weston Road (Regional Road 56) uses multiple innovative preservation treatments that have benefitted the road owner by providing 14+ years of service with only minor maintenance works required
- The design included technical review and consideration to optimize the solution, helping to build confidence in double chip seal design methodologies
- The Region has completed several other roads using this preservation approach, all with similar or better performance
- The Region has successfully added this tool to their toolbox, benefitting their tax-payers and asset management / maintenance group