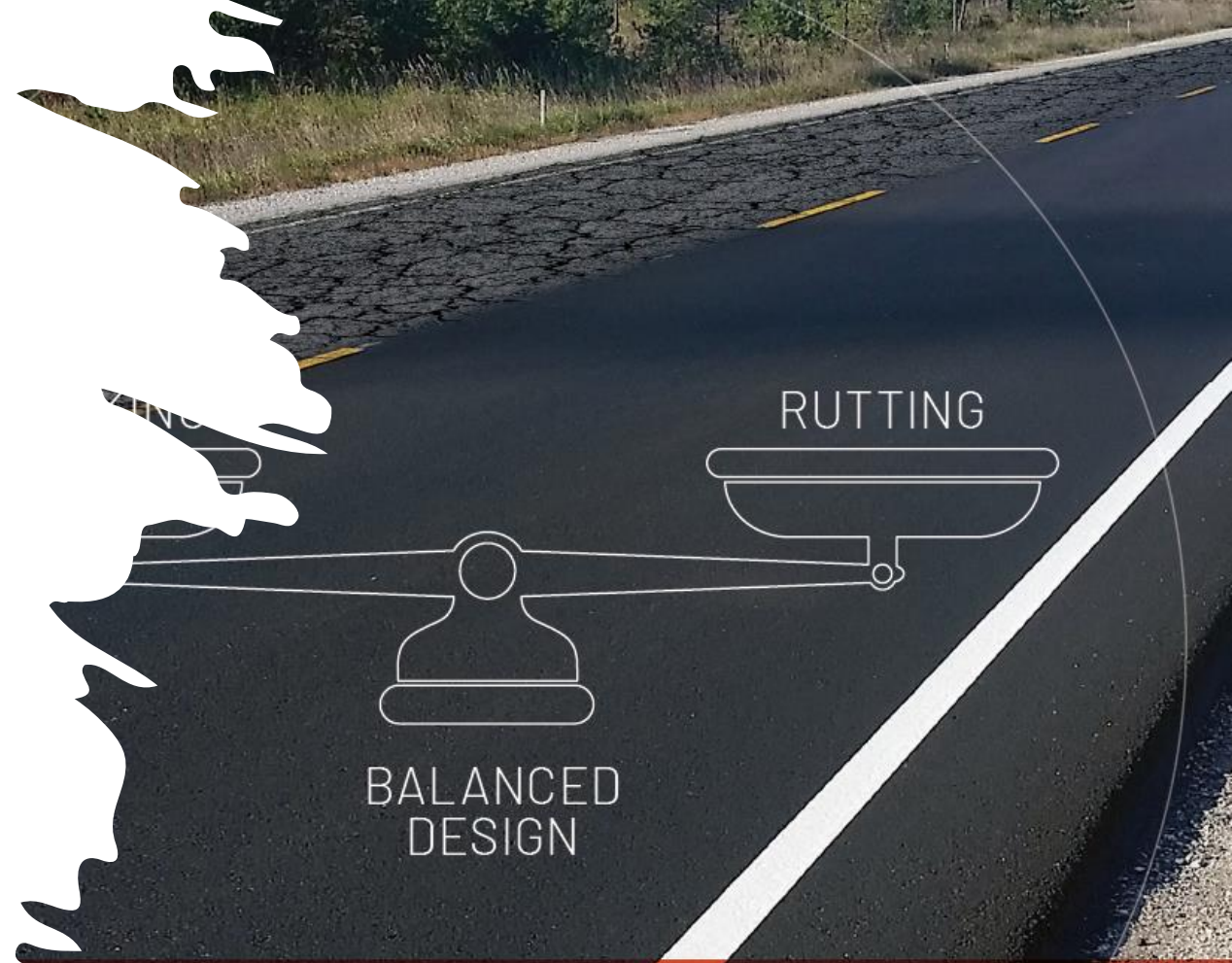


Advancing Opportunities and Collaborations for a High-RAP Mix Technology Demonstration Trial in Ontario.

Doubra C. Ambaiowei, Ph.D., P.Eng.

Director, Technical Services, ORBA/OAPC & ATS Co-Chair



2024 OAPC ASPHALT TECHNICAL SYMPOSIUM

asphalt ontario rides on us

2024 OAPC ASPHALT TECHNICAL SYMPOSIUM (ATS)
JUNE 11 2024 Scarborough Convention Center
20 Torham Pl, Scarborough, ON M1X 0B3



Growing RAP Stockpiles in Ontario – Concerns, Opportunities and Risks!

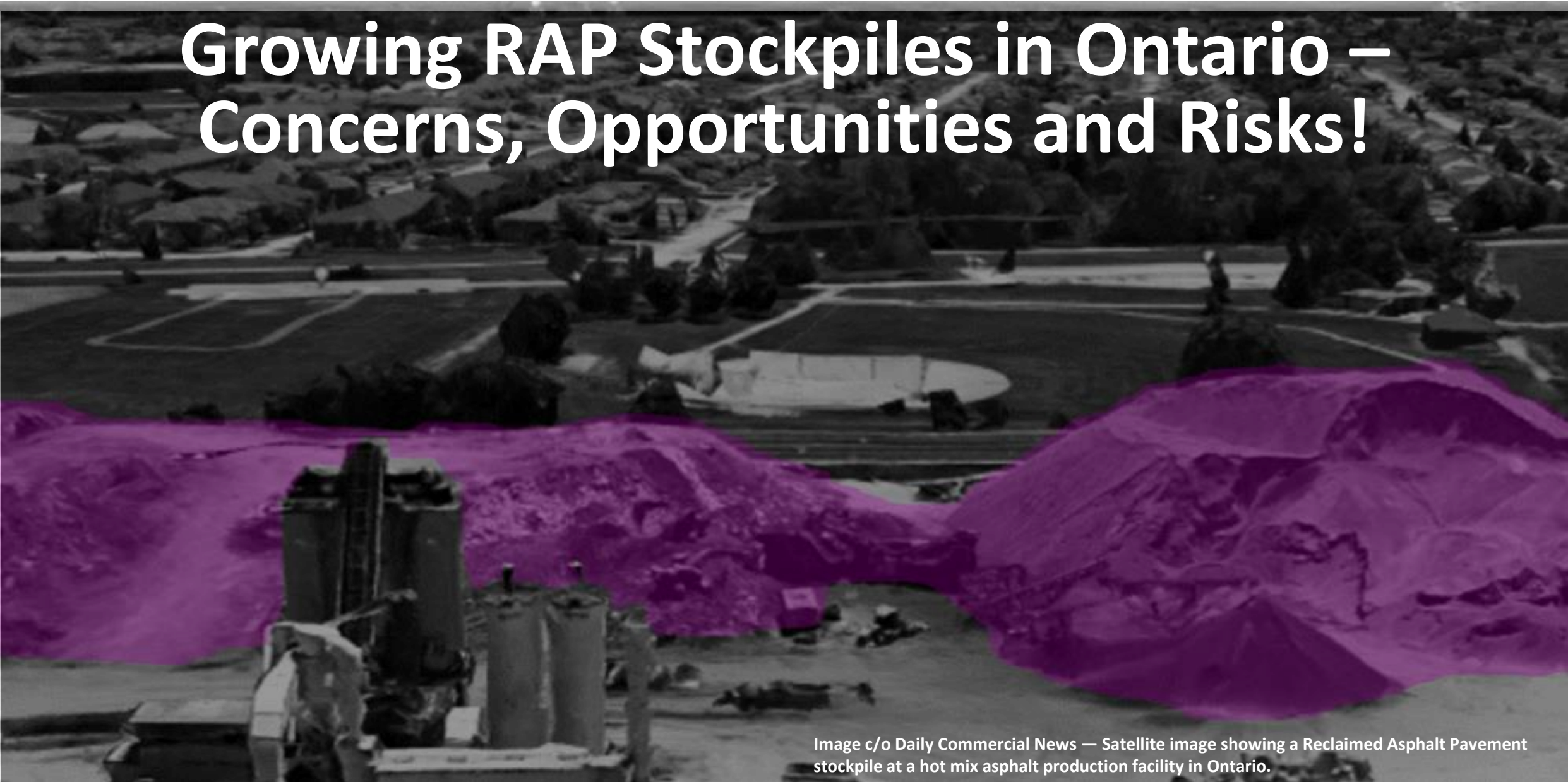
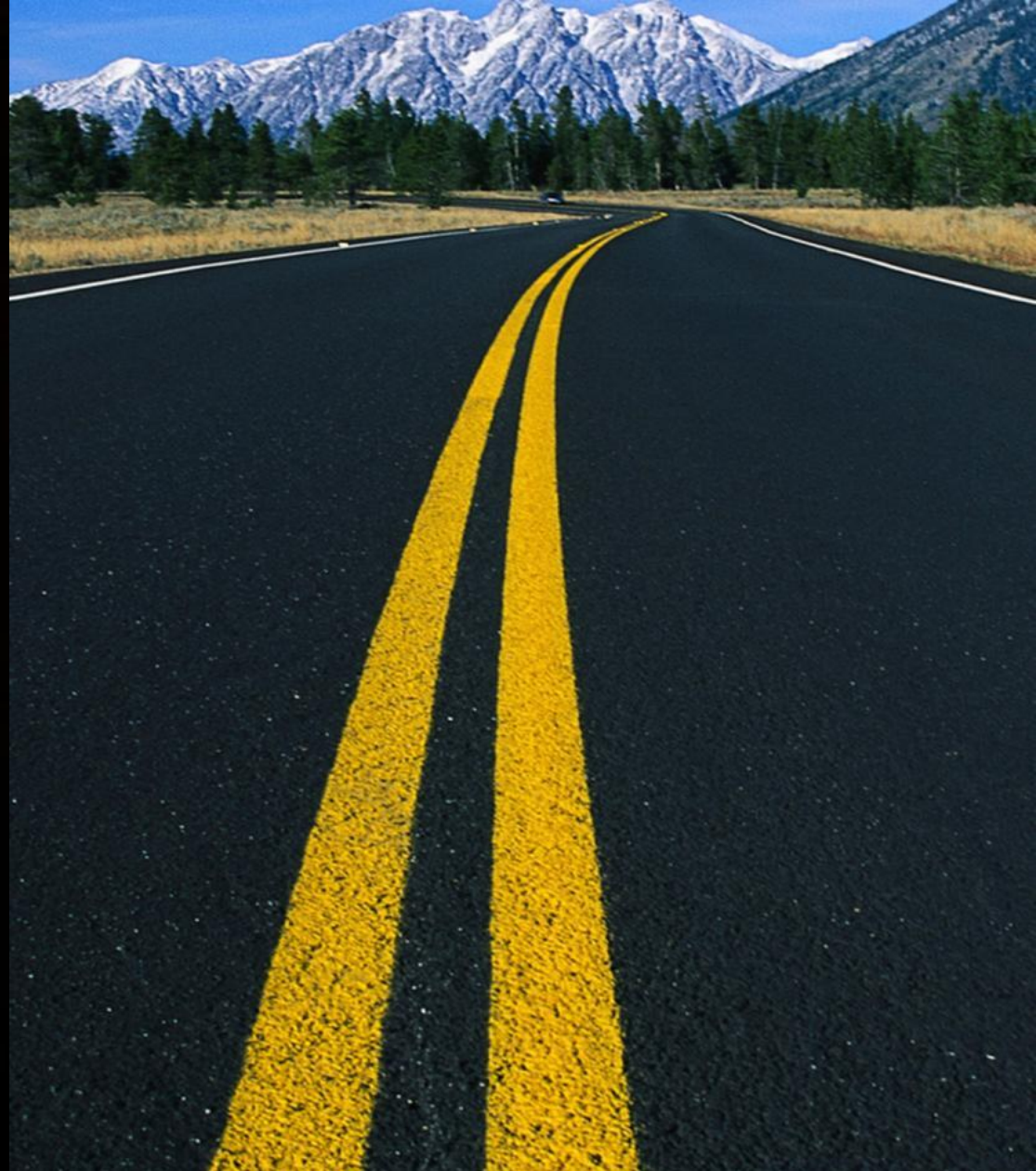


Image c/o Daily Commercial News — Satellite image showing a Reclaimed Asphalt Pavement stockpile at a hot mix asphalt production facility in Ontario.

**THERE IS ALWAYS
ROOM FOR
IMPROVEMENT**

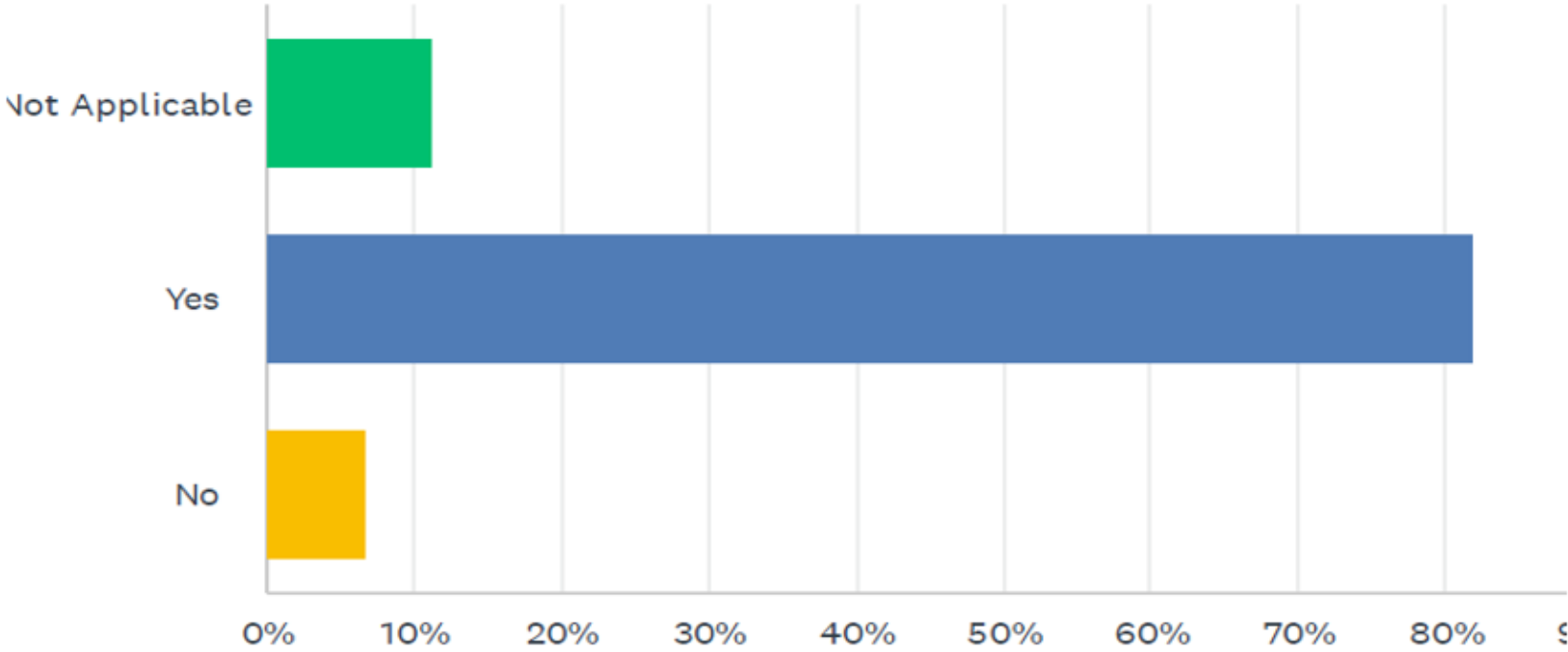
PictureQuotes.com



Q4 – Collaboration on RAP Use

- Would you subscribe to collaborating with the OAPC on RAP pilot projects to further the success of experiences that show the durability of HMA is not compromised by incorporating and/or increasing amount of RAP that is currently allowed?

Answered: 44 Skipped: 1



Building Momentum for a High-RAP Pave-in in Ontario



Council is seeking collaboration from interested road owners to stimulate specifications towards optimizing the use of RAP and Warm Mix Asphalt (WMA).

Building Momentum for a High-RAP Pave-in in Ontario

Partnership/Project Considerations and Objectives

Council proposes for consideration by interested road-owners and industry partners, a “**Pave-in: Technology Demonstration Day**” focused on reviewing the challenges, evaluating, and implementing the opportunities with designing, producing and placing high-RAP asphalt mixtures in Ontario.

Building Momentum for a High-RAP Pave-in in Ontario

Partnership/Project Considerations and Objectives

Mix Consideration(s): Superpave Surface and/or Base mix incorporating RAP up to 50 percent, with opportunities to evaluate the impact from incorporating recycling agents.

RAP Content (%)	Base Virgin Binder PG Grade			
Surface – Control (No RAP)	58 - 28	58-34	52-34	52-40
15 - Surface				
25 - Surface				
40 - Surface				
40 – Base (Lab Focus)?				
50 – Base (Lab Focus)?				

- 15% RAP: Worth considering to push toward a minimum 20% RAP increase in Ontario HMA specifications that are otherwise currently hostile.
- PGAC: Conservative approach for High RAP consideration, with grade change considerations per Ontario's PGAC guidelines.
- RECYCLING AGENTS: This could be instrumental in pushing for RAP use above 25% and up to 40%, with opportunity to see the impact of using rejuvenators. Optimal dosage for the selected rejuvenating agent should be a design consideration.
- Use of Blending Chart for Binder selection is emphasized.

Building Momentum for a High-RAP Pave-in in Ontario

Partnership/Project Considerations

Performance Testing and Monitoring Plan!

- ❑ Implement a Balanced Mix Design (BMD), with focus on selecting the final asphalt content after optimizing the mix density, rutting, and cracking requirement(s).
- ❑ Construct field trial/demo sections containing different levels of RAP to demonstrate and validate the balanced RAP mix design.
- ❑ Consider an instrumentation plan to monitor both structural and environmental behaviours post-construction.
- ❑ Implement an agreeable performance testing requirement(s) on the plant produced mixes, including a recovery and testing plan on the binders, as well as other standard sampling and testing project requirements.

Building Momentum for a High-RAP Pave-in in Ontario

Partnership/Project Considerations

Opportunities and The Missing Link!

- ❑ ORBA/OAPC is 100% Committed!
- ❑ Three (3) Recycling Agent Supplier(s) are 100% Supportive - Bio Diffusion Technologies, Sripath Technologies, and Cargill Anova Asphalt Solutions: **All Bio Based Rejuvenators**.
- ❑ There is an opportunity for Collaboration with the National Research Council Canada (NRC) as part of their commitment to support decarbonizing the construction industry.
- ❑ Industry (Consultant/Contractor/Producer) Willingness for Involvement.
- ❑ Road Owner Collaboration **NOT YET SECURED!**



Building Momentum for a High-RAP Pave-in in Ontario

Partnership/Project Timelines



The only things worth counting on are people you can count on.

Deight D. Daubrower

Expectations for
Implementing an OAPC
Pave-in is July/August 2025

Confirm Road Owner
Involvement and
Other Collaborators:
August/September
2024.

Agree on Partnership
and Project Plans:
December 2024 or
Earlier.

Building Momentum for a High-RAP Pave-in in Ontario

❑ 2024 Ontario Paving Report:

https://goodroads.ca/news_articles/2024pavingreport/

❑ [Developing High RAP Mixtures Using International Experiences: Literature Review](#)

❑ [International Experiences with High RAP Content Mixtures](#)

❑ ATS Presentations From Inception-to-Date:

<https://www.onasphalt.org/presentations>

Building Momentum for a High-RAP Pave-in in Ontario

To learn more and/or if interested in joining forces towards realizing the objectives of a high-RAP Pave-in Project in Ontario, please connect with ORBA/OAPC Technical Director at: Doubra.Ambaiowei@orba.org



TECHNICALLY SPEAKING

Doubra C. Ambaiowei
Director, Technical Services

Building momentum for a high-RAP pave-in in Ontario



Circling back to my fall 2023 ASPHALTOPICS Environmental Essentials article "Saving the environment - A collaborative goal with RAP", there is an opportunity for interested municipal road owners, industry partners, and material suppliers to collaborate on reviewing the challenges and opportunities of designing, producing, and placing high-RAP asphalt mixtures in Ontario.

This focus on high-RAP mixes kicked off at a Good Roads-OAPC Municipal IMA Liaison Committee meeting in late November 2023. Since then, OAPC has presented interested parties with a **Pave-in Technology Demonstration Day** proposal to facilitate practical experiences for learning and knowledge transfer, and promote general industry expertise with high-RAP technology.

A pave-in demonstration featuring production and placement of a high-RAP mix will give the factors for use of RAP in asphalt pavements, namely economic savings and environmental benefits. In addition, improvements and confidence can be re-introduced into the practice of recycling that optimize the use of natural resources and sustain the asphalt pavement industry, including more widespread use of higher amounts of RAP in asphalt mixtures.

Consequently, OAPC encourages support from municipal percentages of RAP mixtures, as well as bridge any perceived gaps in information on performance, best practices, and long-term performance monitoring of recycled pavements in Ontario.

Currently, the experimental methodology and mix matrices for evaluation are being discussed in hopes for buy-in from potential collaborators and project sponsors. OAPC proposes an evaluation of the impact that RAP in varying percentages will have on a conventional Ontario Superpave 12.5 mm mix typically used for "Category C" traffic or municipal roadway as defined in QPS5 151.

The experimental plan is expected to demonstrate that it is possible to design, produce and place a surface and intermediate type Superpave mixes incorporating RAP percentages up to 50 per cent without compromising the specified consensus properties and volumetric characteristics, their overall laboratory and in-service performance, as well as evaluate the impact of using rejuvenators in recycled mixes.

An array of possible mix configurations, with due considerations to be given to traffic applications, zonal PGAC selection guidelines, optimal rejuvenator dosage and type to

<https://www.onasphalt.org/publications/spring2024>

ORBA



**FOR ANY INQUIRIES ABOUT
OAPC, PLEASE E-MAIL:
INFO@ONASPHALT.ORG**



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WEBSITE TO LEARN MORE:
WWW.ONASPHALT.ORG**