

# Recycled Asphalt Pavement Toolkit

## Building Market Confidence in Using High Volume RAP on Public Roads

In 2018, the City of Richmond as a member of the National Zero Waste Council Construction, Renovation and Demolition Working Group, began assessing ways in which government and industry could work together to build confidence in using recycled asphalt pavement (RAP). This included the idea of undertaking and documenting the performance of a pilot project to assess throughout the life cycle of a high RAP pilot application. This document provides details on the pilot's objectives and process.

### Objectives:

- Encouraging asphalt suppliers to improve their plants and processes towards increased recycled content use.
- Encouraging governments to drive sustainability goals by encouraging higher RAP while maintaining quality and life cycle guarantees,
- Promoting and encouraging the alignment of governments' sustainability, engineering and procurement department objectives.
- Demonstrating how the circular economy can preserve virgin resources and natural ecosystems by encouraging improved material flows and resource recovery.
- Advancing circularity within the industry by bringing stakeholders across the supply chain together to collaborate on circular solutions.

### Process Stages:

1. Stakeholder Engagement and Scoping Study
2. Development of Assessment Framework and Procurement Tool
3. Application of RAP Pilot on Richmond Road
4. Long-term Assessment and Validation

### Stage 1: Stakeholder Engagement & Scoping Study

To design a collaborative RAP pilot project, the team recognized the need to engage with local stakeholders across the supply chain. Engagement sessions were held to identify opportunities and barriers for increasing RAP content in pavement mix design and to test market readiness for accelerating its use. The engagement sessions involved regional stakeholders such as asphalt producers, consultants, contractors, other Metro Vancouver municipalities, and the BC Ministry of Transportation and Infrastructure. The engagement process included the following activities:

- Interviews with industry stakeholders around the Lower Mainland (18 interviews).
- Industry site visits to verify current best practices, opportunities, and barriers (15 visits)
- Engagement workshops with regional stakeholders (4 workshops)
- Interviewing organizations that have successfully increased the RAP content in their jurisdictions' paving activities

Throughout the engagement period, stakeholders emphasized the need for a circular economy model to increase recycling, support sustainable business models and identify best practices to reduce energy and waste. Stakeholder feedback indicated that a monitored pilot project would be essential to build

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industry capacity and buyer confidence in high RAP content projects. This feedback led to the development of a pilot project with 40% RAP content.

During the engagement activities, stakeholders identified that the pilot should aim to:

- Demonstrate that RAP performs equal to or better than virgin mixtures;
- Confirm that RAP content is free of contaminants; and
- Ensure the asphalt producer controls and analyzes all material sources.

Finally, a scoping study was conducted which researched the following areas:

- Existing certification systems on quality standards for recycling manufacturers and their products.
- Strategies, technologies, and administrative processes employed in existing RAP and RCA operations.
- The key stages in the manufacture and quality control of RAP.
- Quantifying the sophistication levels of each stage and their implications on material performance and risk.
- Legislation, guidelines, and standards governing RAP quality and life-cycle criteria.

The scoping study includes a literature review and consultation with experts to better understand best practices used in other jurisdictions, as well as an analysis of market and supplier readiness, and environmental and technological considerations. The paper can be found on the [Resources & Media page of the RAP Toolkit](#).

## Stage 2: Development of Assessment Framework and Best Practices Checklist

Following extensive stakeholder consultation and research in stage 1, key documents were prepared to inform performance and evaluation metrics for using RAP.

The RAP Technical Assessment Framework allows users to compare best practices found in other jurisdictions and procurement requirements from purchasers. The criteria was developed based on best practices found in other jurisdictions around the world, as well as local considerations with pavement producers and government purchasers. The Technical Assessment Framework was used to evaluate the material flows for the RAP pilot project application.

The Best Practices Checklist for RAP projects was developed to identify the critical categories to evaluable when planning RAP projects. The checklist is based on best practices in the asphalt and concrete recycling industry which were identified through research findings from site visits, interviews, and the RAP Scoping Study. It also took into consideration the need to focus on improving quality, increasing industry involvement and governments' increased focus on circular procurement.

## Stage 3: Application of RAP Pilot on a high volume public arterial road in Richmond, BC.

In the fall of 2020, the City of Richmond and Lafarge agreed to undertake a pilot pavement application under an existing contract along an 800-metre stretch over four lanes of road on the 7000 block of No. 5 Road in Richmond using 40% recycled asphalt pavement (RAP). This pilot application garnered positive media attention and interest from surrounding local governments and suppliers. The project serves to meet the critical need for fulsome data on RAP projects on public roads in Canada. This data

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along with the leadership of the collaborators has inspired confidence in stakeholders that are interested in scaling their RAP content allowances to advance circularity goals.

## **Stage 4: Long-Term Assessment and Validation**

The City of Richmond and Lafarge Canada have an agreement to monitor the RAP pilot site on an annual basis. Long-term performance assessments will be provided as results become available. The expected impact will be an increase in confidence from other asphalt producers and purchasers, including governments, to produce or buy asphalt paving mix with higher levels of recycled materials. It is expected that the City of Richmond will continue to expand its use of RAP on its roads in future years. In 2021, the City of Richmond requested its annual paving program bid that a high RAP application be included on a low volume residential road.