Transportation Association of Canada’s
The Canadian Guide for Greener Roads

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Policy & Sustainability Group
MMM Group Limited

Annual Western Canada Pavement Workshop
February 2013
Why is there a TAC CGGR?
What is the need?
What is the need?

Pressure

Confusion

Resources
How did “we” solve the problem?

What is the Canadian Guide for Greener Roads?
Who is it for?
“We” are MMM + TAC PSC:

<table>
<thead>
<tr>
<th>FEDERAL (1)</th>
<th>MUNICIPAL CON’T</th>
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</thead>
<tbody>
<tr>
<td>Transport Canada</td>
<td>City of Ottawa</td>
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<td>City of Toronto</td>
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<td>PROVINCIAL (8)</td>
<td>City of Winnipeg</td>
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<tr>
<td>Alberta</td>
<td>Halifax Regional Municipality</td>
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<td>British Columbia</td>
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<td>Manitoba</td>
<td>Region of Peel</td>
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<td>Nova Scotia</td>
<td>Region of Waterloo</td>
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<td>Ontario</td>
<td>Region of York</td>
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<td>Prince Edward Island</td>
<td>Ville de Montréal</td>
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<td>Québec</td>
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<td>Saskatchewan</td>
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<td>MUNICIPAL (12)</td>
<td>ASSOCIATIONS / OTHER (4)</td>
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<tr>
<td>City of Calgary</td>
<td>Cement Association of Canada</td>
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<td>City of Edmonton</td>
<td>ColasCanada</td>
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<td>City of Hamilton</td>
<td>Ontario Hot Mix Producers Association</td>
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<td>Ready Mixed Concrete Association</td>
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What does it need to do?

Provide **objectives** that are clear, meaningful relevant and achievable.

Organize and describe **sustainability practices** to meet the objectives.

Provide a way to **self-evaluate** a “road project”.
What is a “road project”? 
What is a “road project”? 

Inside the ROW / Curb to Curb + sidewalk 

Policy 

Linked areas 

Users / Communities
Who’s it for?

Technical Layperson
What is the CGGR?
CGGR Framework

Sustainability Objectives

Sustainability Practices

Sustainability Questions

Interactive Tool and User Guide
Sustainability Objectives

Why develop them?
Where did they come from?
What are they?
Why develop Sustainability Objectives?

- **Sustainability is an unclear concept** when applying it to a project. It just means “do better” with little insight into what is trying to be achieved and the trade-offs being made.

- **Scope of Sustainability unclear.** Does it include social justice (child labour)

- **Specific reason for doing things / actions unclear.**
  - Using recycled materials can have many benefits. The ones realized depends on the context of the project.
    - explicit goal
    - potential benefits
Where is the goal?
Sustainability Objectives

- Provide **objectives** that are clear, meaningful, relevant and achievable.
Resources Used

1. Greenroads (USA)
2. Sustainable Highways Self-Evaluation Tool - INVEST (FHWA)
3. GreenLITES (New York DOT)
4. CEEQUAL – (UK)
5. IS Rating Scheme (Australia)
7. Envision™ (USA)
8. LEED® ND (Canada)
9. GreenPave (Ministry of Transportation Ontario)
10. The Sustainable Sites Initiative
12 Objectives

1. Reduce Virgin Material Use
2. Optimize Waste Stream
3. Reduce Energy Use
4. Reduce Emissions to Air
5. Maintain or Improve Hydrologic Regime Characteristics
6. Maintain Biodiversity
7. Engage Community Values and Sense of Place
8. Improve Safety
9. Improve Access and Mobility
10. Improve Local Economy
11. Increase Lifecycle Efficiency
12. Promote Innovation
Transportation Agency Sustainability policy, plan or program

- Waste is reduced towards zero

CGGR Sustainability Objectives

- Optimize Waste Stream
CGGR Framework

Sustainability Objectives

Sustainability Practices

Sustainability Questions

Interactive Tool and User Guide
The Practice Sheets

Development

1. Survey of TAC Membership
2. Environmental Scan/Literature Review
3. Review of TAC Task Force Suggestions (113)

Result – over 90 practices - PSC picked top 30
The Practice Sheets

Why “Fact” Sheet Approach?
1. Easier to focus
2. Easier to update / add to
3. Discreet information you can take with you
# The Practice Sheets

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<tbody>
<tr>
<td>1.</td>
<td>Award Winning Case Study: MTQ Environmental Monitoring</td>
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<td>2.</td>
<td>Bicycle Access</td>
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<td>3.</td>
<td>Context Sensitive Solutions</td>
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<td>4.</td>
<td>Earthwork Balance</td>
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<td>5.</td>
<td>Energy Efficient Illumination</td>
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<td>6.</td>
<td>Environmental Protection During Road Construction</td>
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<td>7.</td>
<td>Environmental Protection During Road Maintenance</td>
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<td>8.</td>
<td>Erosion and Sediment Control Plan</td>
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<td>9.</td>
<td>Green Procurement</td>
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<td>10.</td>
<td>Habitat Retention</td>
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<td>11.</td>
<td>High Occupancy Vehicle (HOV) Lanes</td>
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<td>12.</td>
<td>Holistic ROW Landscape</td>
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<td>13.</td>
<td>Intelligent Transportation Systems (ITS)</td>
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<td>14.</td>
<td>Lifecycle Assessment (LCA)</td>
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<td>15.</td>
<td>Lifecycle Cost Analysis (LCCA)</td>
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<td>16.</td>
<td>Light Pollution Control</td>
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<td>17.</td>
<td>Long-Life Pavements</td>
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<td>18.</td>
<td>Low Impact Development</td>
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<td>19.</td>
<td>Non-Pavement Concrete Reuse and Recycling</td>
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<td>20.</td>
<td>Pavement Preservation and Reuse</td>
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<td>21.</td>
<td>Pedestrian Access</td>
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<td>22.</td>
<td>Permeable Pavements</td>
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<td>23.</td>
<td>Recovered Materials in Pavement</td>
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<td>24.</td>
<td>Reduced Energy Consumption - Pavement</td>
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<td>25.</td>
<td>Reuse of Non-pavement Road Elements</td>
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<td>26.</td>
<td>Road Safety - Urban Bicycles Facilities</td>
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<td>27.</td>
<td>Road Salt Management</td>
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<td>28.</td>
<td>Runoff Flow Control</td>
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<td>29.</td>
<td>Runoff Quality</td>
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<td>30.</td>
<td>Safe Intersections and Driveways</td>
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<tr>
<td>31.</td>
<td>Waste Management Plan</td>
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</table>
Remember - Who’s it for?

Technical Layperson
Canadian Guide for Greener Roads

RECOVERED MATERIALS IN PAVEMENT

This is one of a number of Canadian Guide for Greener Roads (CGGR) practices. Each practice is a general outline of a topic for people interested in being part of the “sustainability conversation” for roads. Applicable jurisdictional requirements, technical standards and guidance documents, and professional advice should be consulted when considering the information provided. CGGR Practices support the Sustainability Objectives defined in the CGGR User Guide. Other CGGR Practices can be found using the hyperlinks in this practice or via the interactive selection tool found here: CGGR Practice Selection Tool.

Environmental Integrity
Practice Sheets

Layout & Content
- What Is ‘Practice Name’?
- Why Do It?
- How?: ‘Practice Name’ In A Project
- What are the Barriers and Issues?
- Who Do I Talk To?
- Examples
- Targets and Metrics
- Relation to Other Practices
- Resources & References
Canadian Guide for Greener Roads

EXAMPLE 2: CRUSHING AND PROCESSING RECLAIMED CONCRETE FOR CITY OF SASKATOON
REHABILITATION OF ROAD STRUCTURES – SASKATOON, SK

In 2009, the City of Saskatoon implemented the “Green Streets” Infrastructure Program. Given the limited success of conventional crushing technologies, an innovative impact crusher with a screener and magnetic metallic extruder was employed to process the concrete rubble materials for the City of Saskatoon’s “Green Streets” Infrastructure Program. Impact crushing production rates averaged between 100 MT and 300 MT per hour, generating up to five alternate sized materials at once with minimal waste in 2009. Recycled HMAC and PCC materials produced in 2009 had at least 30 percent improved mechanistic mechanical properties than virgin source counterparts. Through the implementation of the City of Saskatoon’s “Green Streets” Infrastructure Program, on-site recycling methods and recycled materials were used to construct a number of test sections over the 2009 construction season using recycled HMAC and PCC in the road structures.

Figure 1: Reconfigured Impact Crusher (TAC, 2010)
Target

- Long-life Pavement

Greenroads:
- 75% of the total new or reconstructed pavement... [as] long-life pavement... minimum 40-year design life.

MTO Greenpave:
- 3 Points – Rigid pavement
- 2 points – Composite; perpetual asphalt; deep strength asphalt

FHWA:
- 75% long-life pavement (Greenroads) AND
- Pavement design is in accordance with a design procedure that is formally recognized,... ...1993 AASHTO Design of Pavement Structures manual or AASHTO MEPDG-1.
CGGR Framework

Sustainability Objectives

Sustainability Practices

Sustainability Questions

Interactive Tool and User Guide
38 questions

7 Lifecycle

8 Reduce / Optimize Waste
<table>
<thead>
<tr>
<th>CGGR SELF-EVALUATION</th>
<th>Applicable</th>
<th>Self-evaluation Rating</th>
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<tbody>
<tr>
<td>30</td>
<td>Has beneficial use been made out of any existing materials, structures, etc.</td>
<td>Yes</td>
</tr>
<tr>
<td>36</td>
<td>During construction and operations, have toxic or otherwise hazardous materials on site been reduced or eliminated to diminish the possibility of contamination?</td>
<td>TBD</td>
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<tr>
<td>37</td>
<td>Have you sought to minimize the quantities of waste generated by the construction, and/or maximized the opportunities for the waste generated to be recycled or reused?</td>
<td>Yes</td>
</tr>
</tbody>
</table>
CGGR Framework

Sustainability Objectives

Sustainability Practices

Sustainability Questions

Interactive Tool and User Guide
The Database Tool

1. Filter by project characteristics
   - Objective,
   - Barrier,
   - Cost,
   - Stage,
   - Type, etc.
Final Thoughts

1. Pavement is a focus of sustainability
2. Sustainability
   1. Needs definition
   2. Needs a vision of a future
   3. Is context dependent
Thank you

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