THE CITY OF CALGARY’S PERSPECTIVE ON A GREENER APPROACH TO ROAD CONSTRUCTION

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Outline

• The City Of Calgary Environmental Policy
• Triple Bottom Line – Sustainability
  – Green Approach in Transportation
    – Transportation Planning
    – Low Impact Development
  – Green Approach in Roads Construction
    – Roads Mission and Vision
    – Pavements
    – Green Streets
    – Green Street Lights
    – Clean Fill and Clay
• Summary
• Questions
The City Of Calgary Environmental Policy

Working together to conserve, protect and enhance the environment.

- **Three Cs:**
  1. Comply with legislation.
  2. Conserve resources and prevent pollution.
  3. Continually improve our environmental performance.
Triple Bottom Line – Sustainable Development

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

- Approved by City Council, 2004 (Brundtland definition)
Green Approach in Transportation Planning

• **Transportation Planning Mission**

  Provide a safe, reliable, efficient, customer focused transportation system that supports all modes of travel and promotes smart growth principles.

• **Transportation Planning Vision**

  A system that moves people and goods in a way that uses our resources efficiently, minimizes the impact on our natural environment, supports social needs and economic activity and is adaptable to change.
Complete Streets

17 Ave SE
Now

Concept - future
Low Impact Development

- Permeable Pavements
- Erosion and Sediment Control
- Storm Water Management
- Water Harvesting
Roads Mission

• **Roads Mission**
  To provide a safe, effective and well maintained road system for all travel modes with a commitment to excellence, innovation, sustainability and environmental sensitivity.

• **ISO14001 registration since 2001**
  Greener approaches are a way of business
Green Approach In Pavement Construction

Recycled Asphalt Pavement (RAP)
Green Approach In Pavement Construction

Cold In-Place Recycling
Green Approach In Pavement Construction

Full Depth Reclamation

– Saved more than $3 Million just in capital costs of one project in one year.

• Environmental benefits:
  – lower greenhouse gas emissions
  – lower use of energy
  – lower consumption of non-renewable resources
  – Bonus: less damage to the surrounding roads by hauling traffic
Green Approach In Pavement Construction

Asphalt Rubber

- 2002 – 112th Avenue NW
- 2004-2005 – Macleod Trail SE
- 2006 – Crowchild Trail NW.
- 2006 – 17 Ave SW
- 2009 – 85 Street NW
- 2010 – Beddington Trail NW.

- 58,000 recycled tires were used.
- Overall, exhibits good performance under heavy traffic.
Green Approach In Pavement Construction

Allowance of Recycled Shingles in Asphalt Mix

- Currently working on a study of the effects of recycled shingles in hot mix asphalt.
- In 2012 three major Asphalt producers have been adding 1.5-3% Recycled Shingles in Hot Mix
Green Approach In Pavement Construction

Recycled Glass in Pavement Structure:

- In 2012, produced 45,000 tonnes of 80mm Base Course Gravel - 10% crushed glass
- Toilet Recycling
Green Approach In Pavement Construction

- Allowance of Fly Ash in Concrete – 2012 Roads Specs Change
  - Fly ash in the concrete mix up to 20% by total mass of cementitious materials
  - Improves long-term durability of concrete
  - No short-term adverse effects, improves workability
Green Approach In Pavement Construction

Concrete Recycling

– Required by The City Contracts Standard General Conditions

Environmental Benefits:

– Not going to the Landfill
– Lower consumption of non-renewable resources
Green Approach In Pavement Construction

WARM MIX ASPHALT (WMA)

- 2005 - Calgary the 1st jurisdiction in Canada to introduce WMA
- 2012 – ALL Major Asphalt producers mixing WMA
13 Ave Heritage Greenway

‘sets a framework for the shaping of a unique and vibrant public realm along a residential street within inner city neighbourhoods’
Recycling

Recycled Rubber Sidewalks
Clean Fill and Clay Recycling

- Water Resources & Roads joint project for last 30 years
- 200,000 tonnes of clay from utility excavations is recycled every year
Street Lights – Energy Savings

Potential Calgary energy savings of 20%-50% when 100 W HPS bulbs are replaced with LED luminaires

**Estimated potential Calgary energy savings are based on the lowest value reported overall and the highest value reported by Calgary**
Street Lights – Energy Savings

Before Image – Streetlights with HPS Fixtures (Morante, P. 2008).

After Image – Streetlights with LED Fixtures (Morante, P. 2008).
Challenges

• Change in approach to ‘GREEN’
• Research and Engineering
• Legislation & Regulation
Summary

• The City of Calgary is very open to the ‘GREENEST’ approach possible.
• Recycling of asphalt and Concrete, CIR, FDR, WMA, and many more in Pavements
• Use of recycled materials.
• Low Impact Development
• Green Streets
• Energy Saving Street Lighting
Thank You!

Questions?