Why Municipalities Choose HMA

A.W. (Sandy) Brown, P.Eng.
Technical Director – Ontario Hot Mix Producers Association
Canadian Regional Engineer – Asphalt Institute

Outline

- Green Side
- Economical Choice
- Speed of Construction and Ease of Maintenance
- Skid Resistance
- Smoothness
- Noise
The Green Choice

- Biggest environmental benefit is that Recycled Asphalt Pavement 100% recyclable
  - RAP is the most recycle material in North America
  - RAP can be recycled with little additional energy
  - RAP saves virgin material
  - RAP saves on CO₂ due to reduced transport
  - Puts aggregate and asphalt cement in the bank for future generations to use over and over again

The Green Choice

- Urban Heat Island
  - Its about heat, not reflectivity
  - FHWA 3 year study on heat modeling of pavements
    - How heat is stored and released by pavements
    - What is the effect of time of the year
    - What is the effect of the stage in the life of the pavement
    - What is the effect of varying solar energy
  - APA study ay Arizona State University – 6 surfaces
    - Air temperature at 3 ft. and 5 ft. above grade is unaffected by the pavement type
    - Air temperature at 1 ft. above grade is slightly affected
The Green Choice

- Rolling Resistance
  - NCHRP Report 720 (NCHRP 1-45) *Estimating the Effects of Pavement Condition on Vehicle Operating Costs*
  - It is overall smoothness not pavement type that effects fuel consumption

Findings of the NRC Phase III study

The Economical Choice

COMPARISON OF COSTS - PCC VS HMA
BASED ON ARA REPORT FOR THE CONCRETE INDUSTRY

Excavation  Bound Layers  Granular Layers  M&R
Speed of Construction and Ease of Maintenance

- Staging of traffic
  - Roads can be opened for service before all the pavement layers are in place
  - No curing period required
- Periodic pavement overlays can renew the surface
  - Maintenance can be carried out in low traffic periods to reduce impact on the driving public

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Skid Resistance
Micro vs. Macro Texture

- Micro texture depends on aggregate type
  - Depends on the aggregate type at the surface
  - Economical for HMA as only the surface layer need high quality aggregate
- Macro texture depends on the characteristics of the surface over the life of the pavement
  - Asphalt pavement typically has good macro-texture and allows dissipation of water under tires

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**Smoothness**

- Asphalt pavements are smoother than PCC surfaces
- MTO released their guide to inputs for use with the Mechanistic-Empirical Pavement Design Guide
  - Initial IRI value for HMA: ~ 0.9 m/km
  - Terminal IRI value for HMA: 1.9 m/km
  - Initial IRI value for PCC: 1.3 m/km
  - Terminal value for PCC: 2.4 m/km
- HMA pavements are smoother than concrete pavements

**Noise**

- Pavement noise is an issue for municipal pavements
- Many studies carried out in Europe and North America
  - Dense graded HMA pavements are quieter, both for the surrounding public and the driver by 3 to 6 dB
  - Open graded surfaces tend to have lower noise by ~ 3 dB
  - SMA surface are about 3 dB quieter than dense graded surfaces
ASPHALT: the environmentally sustainable pavement

Thank You – any questions?