

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

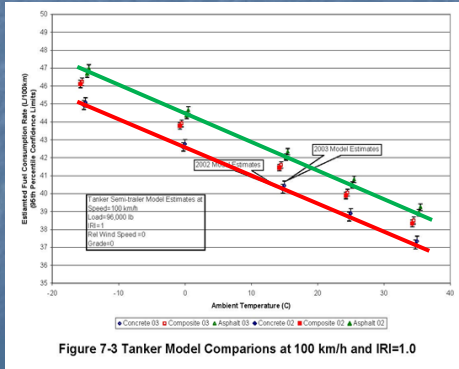
The Green Choice

- 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

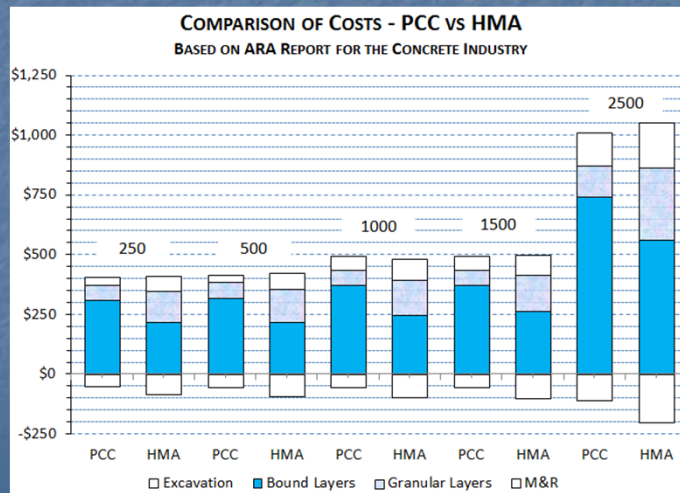
The Green Choice

- 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



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

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

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

