Warm Mix Asphalt (WMA):
Paving the Way to Energy Savings

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Overview

• Asphalt Production and Energy Use
• What Is Warm Mix Asphalt?
• WMA History
• Energy Savings
• Non-Energy Benefits
• Barriers to Entry
• Program Considerations
Asphalt Production - Where Is Energy Used?
What is Warm Mix Asphalt?

• Warm Mix Asphalt (WMA) technology is a method of producing asphalt pavement at lower mixing and placing temperatures than traditional Hot Mix Asphalt (HMA).
How Is This Done?

Warm Mix Asphalt is typically made by one of two methods:

1. **Water-Based**: injection to expand binder
2. **Additives**: organic or chemical (typically wax form)

- Improve adhesion
- Reduce viscosity
Background and History

- 1870’s: First use of asphalt (HMA)
- 1990’s: Research on WMA
- 2004: First WMA pilot roads
- 2008-2010: California trials and test roads
- 2011: Caltrans institutes WMA approval process
- 2015-2017: CA use of WMA increases from 1% to 25%
Energy Savings

• WMA vs. HMA: natural gas savings of roughly 20%

0.3 to 0.5 therms per ton

450 to 1200 therms per mile of 2-lane highway
Non-Energy Benefits

• Greenhouse gas reductions of approx. 8 lbs/ton vs. HMA
• Healthier for workers – less smoke and dust
• Reduced heat losses as compared to HMA
  – Longer hauling distances
  – Faster application times
  – Extended paving season
Barriers to Entry

• Cost for WMA additives of $3 to $5 per ton
• Quality concerns / perception
  – Longer curing time
• Lack of training for design engineers and placement workers
• Changes in operation at mixing plant
Next Steps & Program Considerations

• Market characterization in CA
  – Agencies, Designers, Producers / Installers

• Determine proper incentive channel
  – Production or Purchaser level

• Workpaper development
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For more information, contact Stephen Walmsley at SWalmsley@semprautilities.com

The project report can be found at www.etcc-ca.com/reports/warm-mix-asphalt-literature-review
Resources
DOT: https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/wma.cfm
Cal APA: http://www.calapa.net/wma.html
CalTrans: https://dot.ca.gov/programs/engineering-services/

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