

Manitoba's Experience with Warm Mix Asphalt

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What is WMA?

- Warm Mix Asphalt (WMA)
 - A generic term used for various technologies that allow production and compaction of asphalt pavements at lower temperatures

Why WMA?

- Construction
 - Improve compaction
 - Introduce longer paving season
 - Allow longer haul distances
 - Increase use of RAP
- Environmental Benefits
 - Reduced energy consumption (fuel use)
 - Reduced emissions (plant, at the paver)

Manitoba's Goals for WMA

- Obtain hands on experience with WMA technology
- Contractor friendly - little or no modifications to asphalt plant
- WMA to be an acceptable alternative to HMA



PE
NS

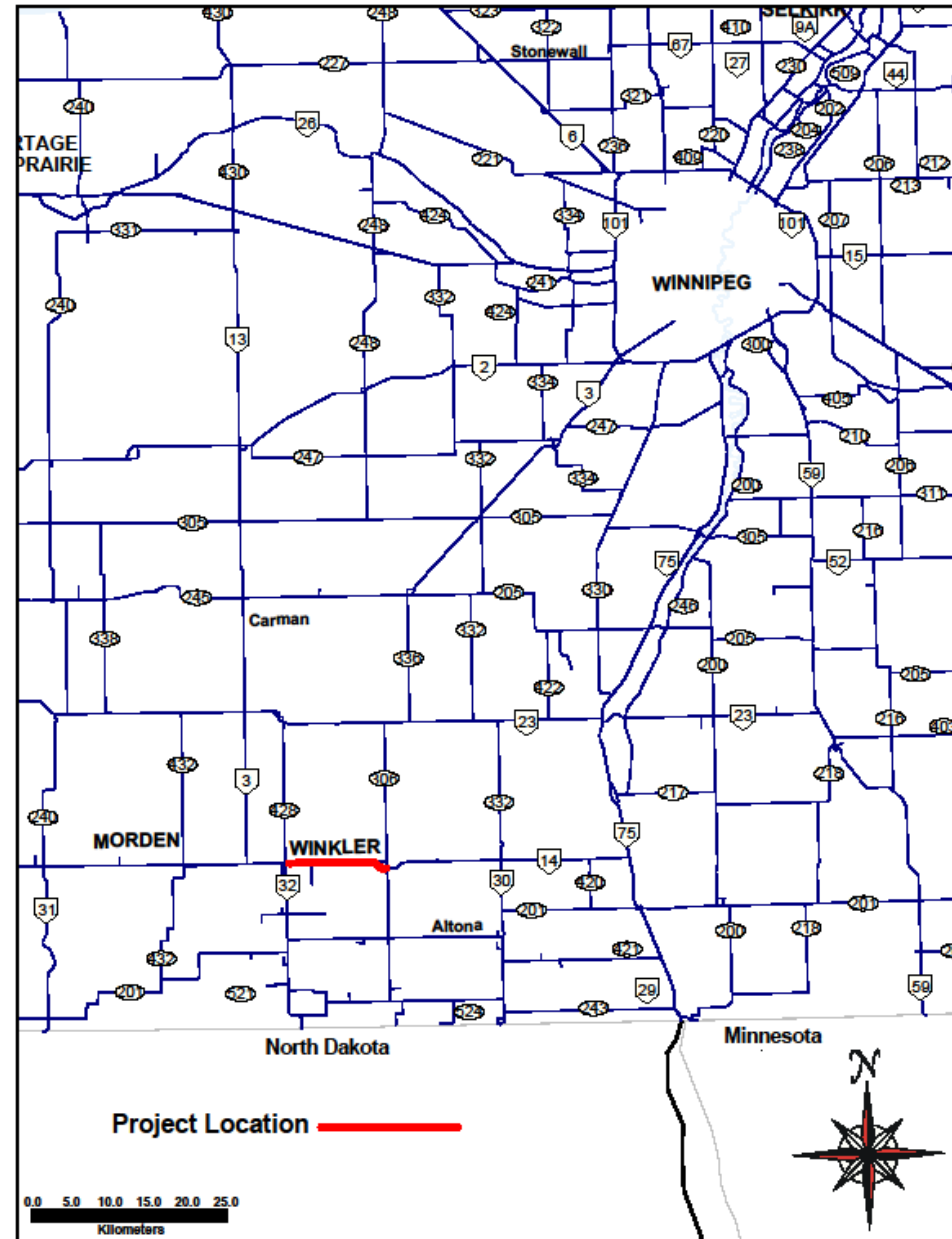
VT
NJ
DE
DC

RI
CT
NH
MA
MD

HI

WMA Project Location

PTH 14
length - 12km (7.5 miles)



Project Details

- Tendered as a WMA project
- Rehabilitation project (mill and fill)
 - Mill
 - 35mm (1-1/2")
 - Fill
 - Lower lift: 50mm (2"), 35% RAP
 - Top lift: 50mm (2"), virgin mix

Project Details

- No specification changes
 - HMA mix design = WMA mix design
 - Temperatures
- To reduce variables, add additive at the plant

Products Used

- Advera (zeolite)

- 0.25% weight of total mix (will not vary with RAP)



Products Used

- Sasobit (wax)
 - 1.5% of total weight of asphalt cement



Products Used

- Evotherm DAT System (chemical)
 - 0.5% by weight of asphalt cement (with RAP)
 - 0.3% by weight of asphalt cement



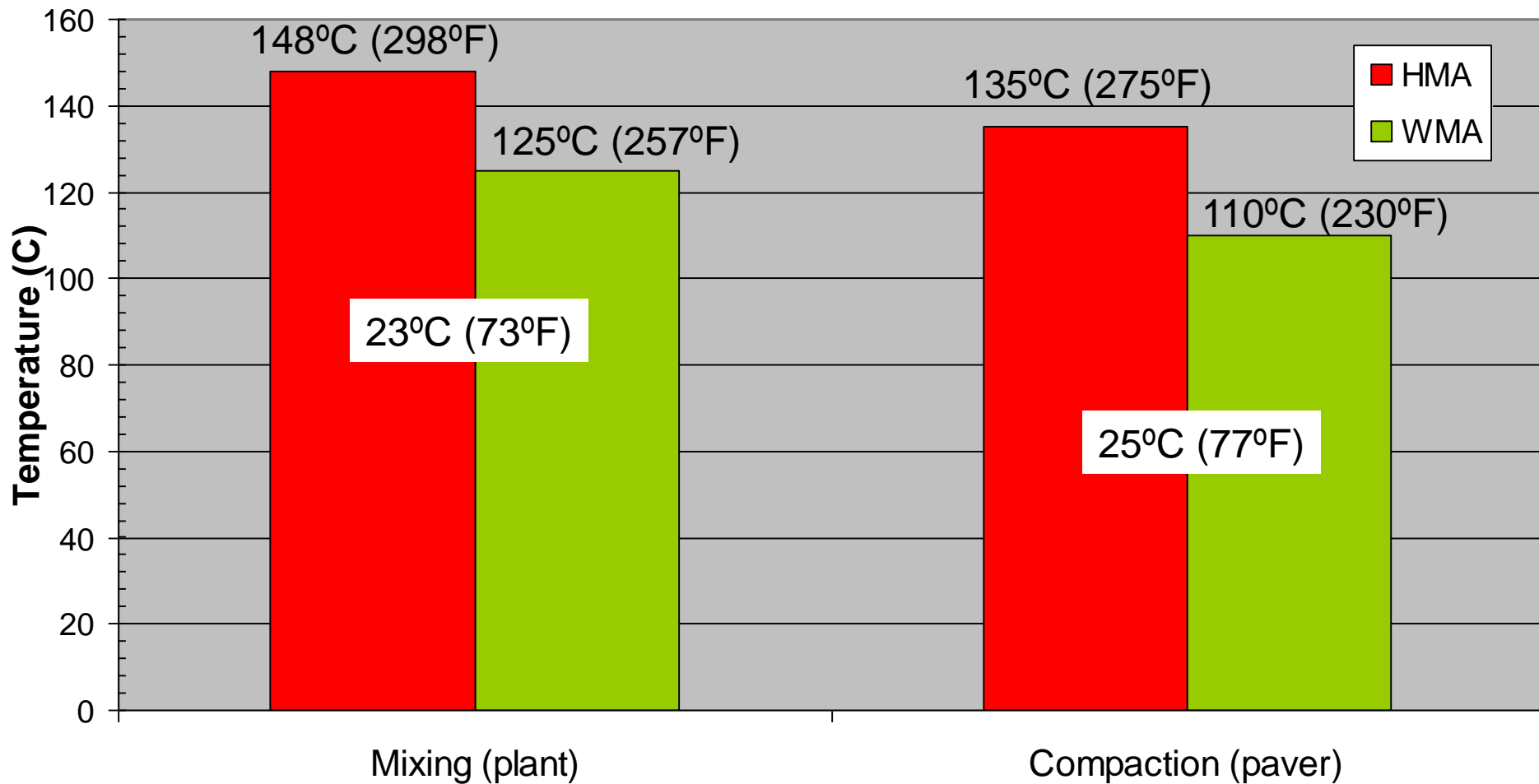
Project Layout

	500 m (0.3 mi.)	3 km (2 mi.)	1 km (0.6 mi.)	3 km (2 mi.)	1 km (0.6 mi.)	3 km (2 mi.)	500m (0.3 mi.)
Top Lift 50 mm (2")	HMA	Advera	HMA	Sasobit	HMA	Evotherm	HMA
Bottom Lift 50 mm (2")	HMA 35% RAP	Advera 35% RAP	HMA 35% RAP	Sasobit 35% RAP	HMA 35% RAP	Evotherm 35% RAP	HMA 35% RAP

WMA Project Specifics

- Construction end of May – end of June
- Haul distance – 24 km (15 mi.)
(time ~ 30 minutes)
- Temperatures
 - Air Temperature ~12–27°C (54–81°F)

Mixture Temperatures



Emissions Testing

- Asphalt Plant Emission Testing
 - Stack tests – US EPA test methods
 - Confirmed reduction in concentration and emission rate of carbon monoxide
 - Correspondingly a reduction of fuel consumption
 - Other gas components were inconclusive due to variability

Emissions Testing

- Paving Site Air Quality Testing
 - Emissions were well below occupational exposure limits
- Emissions Testing on Fresh Asphalt
 - Emissions were low

Partnerships

Asphalt Research Consortium (ARC)



University of Nevada, Reno



North Carolina State University

Monitoring Plan

- ARC will be monitoring the 150m (500') sections annually (crack mapping)
- Manitoba collect annually
 - Ride (IRI)
 - Rut
 - FWD
 - 150mm (6") cores

Future WMA Projects

- 2010 – Evotherm (additive in asphalt cement)
 - Long haul (170 km – 106 mi.)
 - Extended paving season
- 2011
 - Tender as WMA/HMA? Specify WMA?
Approved Products List?
 - Foamed WMA
 - Other products

Thank You

Questions?