



Every Day Counts in Puerto Rico and USVI: Warm Mix Asphalt Initiatives

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Symposium: Theory to Practical Implementation of
Warm-Mix Asphalt in Puerto Rico
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Acronyms



AASHTO	American Association of State Highways and Transportation Officials
ARRA	American Recovery & Reinvestment Act
CMA	Cold Mix Asphalt
DTPW	Department of Transportation and Public Works
DUI	Driving Under Influence
EDC	Every Day Counts
FARS	Fatal Accidents Reporting System
FHWA	Federal Highway Administration
GTR	Ground Tire Rubber
HMA	Hot Mix Asphalt
ITE	Institute of Transportation Engineers
NAPA	National Asphalt Pavement Association
PRHTA	Puerto Rico Highway and Transportation Authority
PRLTAP	Puerto Rico Local Technical Assistance Program
RDG	Roadside Design Guide
ROR	Run Off the Road Crashes
UPRM	University of Puerto Rico, Mayaguez
USVI	United States Virgin Islands
VIDPW	Virgin Islands Department of Public Works
WMA	Warm Mix Asphalt



Introduction



- The Every Day Counts (EDC) Initiative is an FHWA national program designed to identify and deploy innovation in strategic areas aimed at
 - ✓ shortening project delivery,
 - ✓ enhancing the safety of our roadways, and
 - ✓ protecting the environment.





EDC and the 4 i's



1. Innovation
2. Ingenuity
3. Invention
4. Imagination

∞ The coverage of the EDC national program includes the 50 states, D.C., Puerto Rico and the USVI.





The Role of Puerto Rico Transportation Technology Transfer Center in the EDC Initiatives



1. Assisting in the EDC Implementation Plan of the Department of Transportation and Public Works (DTPW) of the Government of Puerto Rico.
2. Serving as a technical oversight of each EDC
3. Assisting in the development of training modules.
4. New training resources





The Role of Puerto Rico Transportation Technology Transfer Center in the EDC Initiatives (Cont.)



4. Participated in the Safety Edge Shoe training entitled “Hands on training” held in Ocala, FL, June 2011
5. Incorporated FHWA Dwight David Eisenhower Summer Interns from UPRM and Purdue University in research projects at different stages of the EDC initiatives.
6. Provided technical assistance to PRHTA and USVI designated Champions using trained undergraduate, graduate students and consultants to work on EDC research projects.





Nine (9) EDC Initiatives Currently being Implemented in Puerto Rico and the USVI



1. **Warm-Mix Asphalt (WMA)*** ✓
2. Safety Edge*
3. Geosynthetic Reinforced Soil (GRS)
4. Prefabricated Bridge Elements Systems (PBES)
5. Adaptive Signal Control Technology (ASCT)
6. Enhanced Technical Assistance on Stalled EISs
7. Flexibilities in ROW *
8. Flexibilities in Utility Relocation
9. Design Build (D-B)

* EDC initiatives also applicable to USVI.



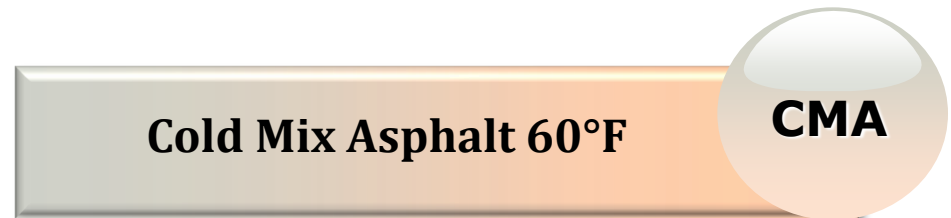
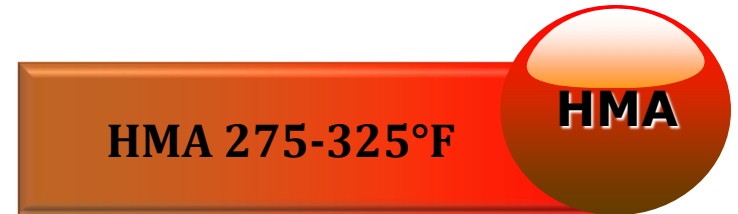


Warm Mix Asphalt (WMA)



Definition

- Asphalt concrete mixtures that are produced at temperatures approximately 50 °F (28 °C) or more cooler than typically used in the production of conventional Hot Mix Asphalt (HMA).



<http://www.asphaltpavement.org/>
<http://www.fhwa.dot.gov/>



WMA: The five (5) primary Goals



To meet existing standards for HMA specs.

Similar durability as HMA

Similar strength as HMA

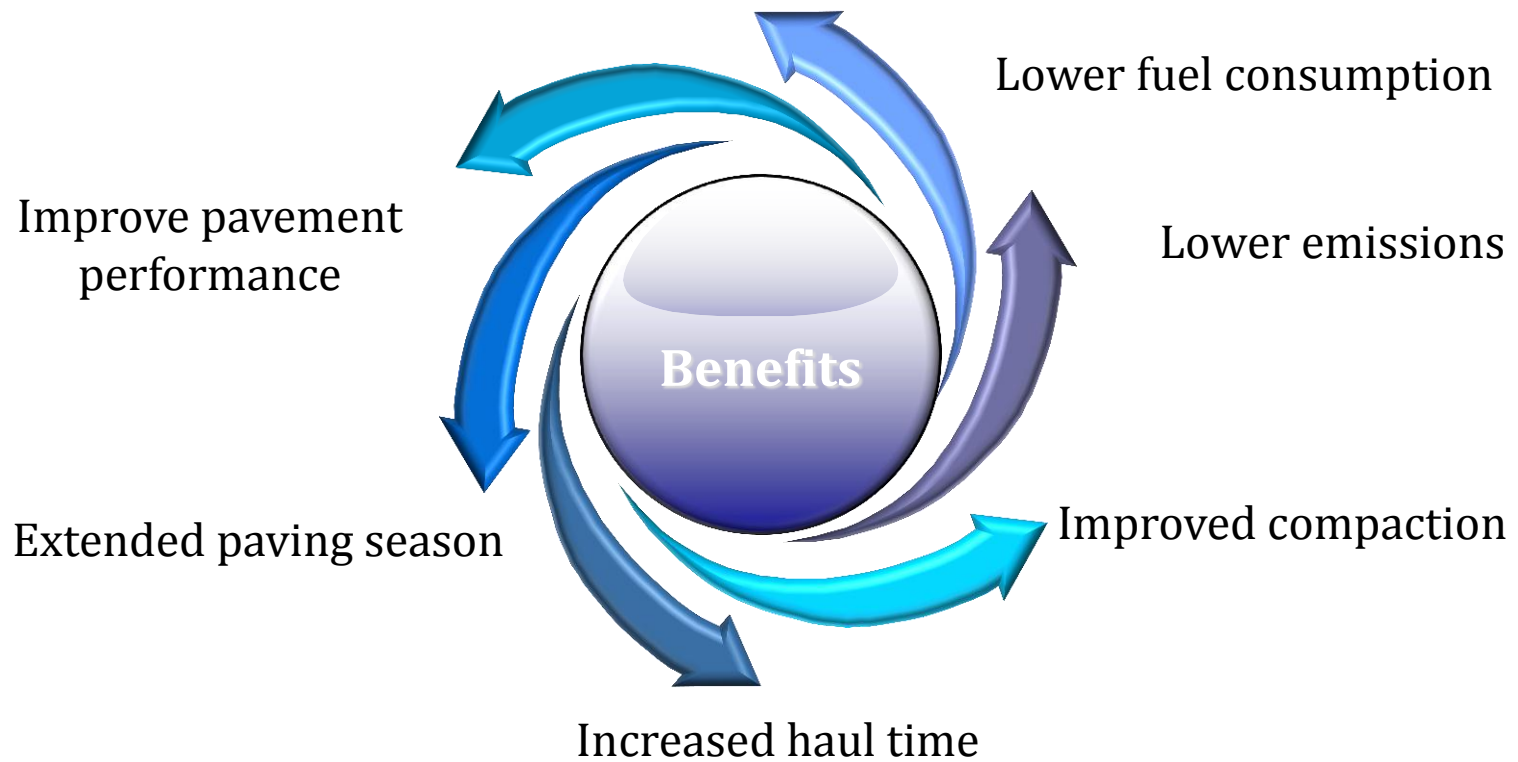
Use existing HMA plants

Similar performance as HMA

<http://www.fhwa.dot.gov/>



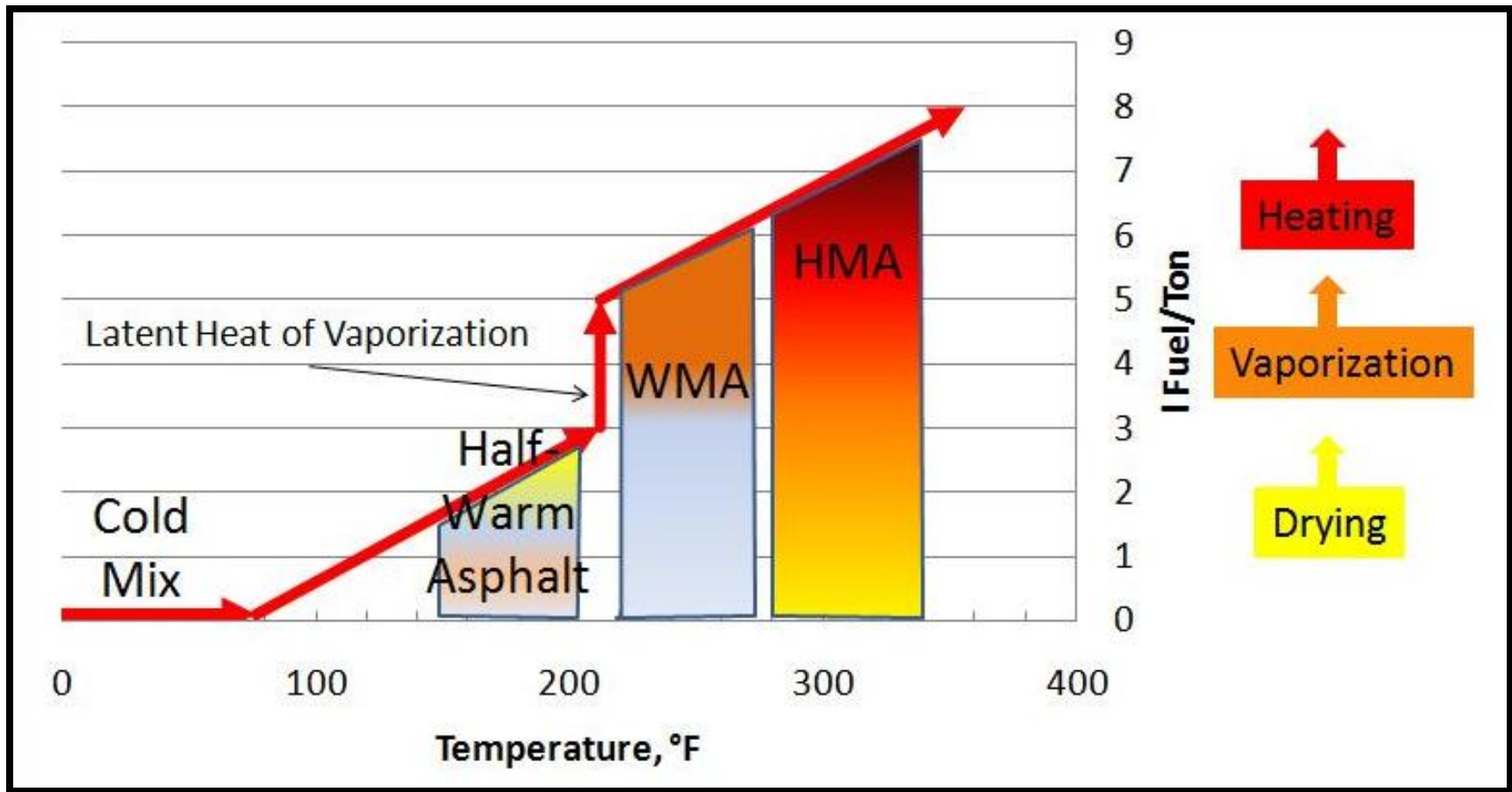
WMA: Six (6) Environmental and Health Related Benefits



<http://www.fhwa.dot.gov/>



Comparison of WMA Benefits with respect cold, halfwarm and hot mix asphalt: (fuel/ton and other attributes)



Reference: Warm Mix Asphalt best practices, NAPA



WMA Technologies Approved for PRHTA Projects in Puerto Rico



WMA Technology	Process Type	WMA Supplier
Evotherm™ DAT	Chemical Additive	Mead Westvaco
Evotherm™ DAT	Chemical Additive	Mead Westvaco
Rediset™ WMX	Chemical Additive	Akzo Nobel Surfactants
Sasobit®	Organic Additive	Sasol Wax Americas



WMA Critical Issues



- ∞ The minimum temperatures for delivery, placement and compaction should be adjusted to accommodate the WMA reduced temperature and sacrifice workability and density requirements.
- ∞ WMA technology's ability to be placed and compacted at the reduced temperatures may be required.
- ∞ Minimum ambient paving temperature requirements may be lowered 20° F from normal temperature requirements.



WMA Initiative in Puerto Rico





WMA Initiative in Puerto Rico



Tasks Performed

- Laboratory Trials with WMA mixes
- Initial presentation of WMA technology
- WMA test section
- WMA and GTR workshop
- WMA specification development
- Modifying current HMA projects

Before and after WMA





WMA Initiative in Puerto Rico (Cont.)



Next Phase WMA

- Changes from HMA to WMA in on-going projects AC-520108
- Changes from HMA to WMA in on-going projects AC-520109
- Peer exchange: Site inspection to Florida DOT Projects

Before and after WMA





WMA Initiative in Puerto Rico (Cont.)



Task Performed (cont.)

- ☞ Laydown and compaction of WMA, Yauco, PR Betterroads Asphalt Corp. (April 8, 2011)
- ☞ PRHTA Project #200240
- ☞ Approximately 23,500 tons placed and compacted

Secretary DTPW, Eng. Rubén Hernández-Gregorat,
Eng. Carlos Machado, FHWA and
Betterroads officials





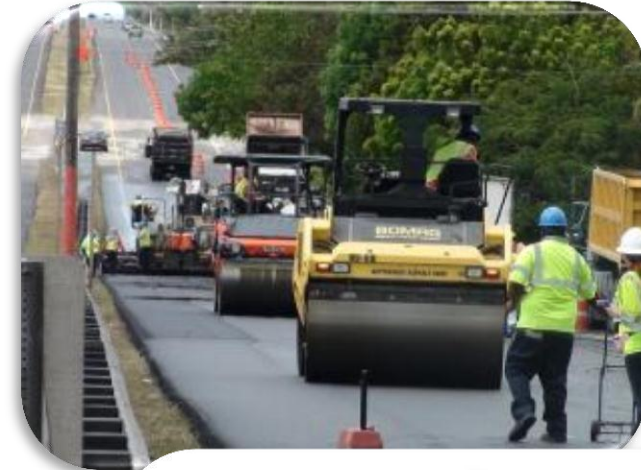
WMA Initiative in Puerto Rico (Cont.)



Task Performed (cont.)

- ∞ Laydown and compaction of WMA, Yauco, Puerto Rico-Betterroads Asphalt Corp. (April 8, 2011)

Laydown and compaction of WMA, Yauco, PR-Betterroads Asphalt Corp. (April 8, 2011)





WMA Initiative in Puerto Rico (Cont.)



Task Performed: Robles Asphalt, Ponce, PR (cont.)

- ∞ Performing laboratory trials with WMA mixes using Kaomin 14 additive
- ∞ Comparative analysis of three (3) additives: Kaomin 14, Sasobit and Rediset

Eng. Moisés Estrada, Robles Asphalt and Eng. Freddie Salado, graduate research assistant, UPRM





Acknowledgments to an Interdisciplinary Effort Well Done



U.S. Department
of Transportation

**Federal Highway
Administration**



PURDUE
UNIVERSITY





Good afternoon!
¡Buenas Tardes!



WMA Initiative in USVI





WMA Tasks During the Next Quarter: Oct. 1 - Dec. 31, 2011, USVI



USVI Tasks for WMA

- Complete the technical specification entitled Section 418. Warm Mix Asphalt (WMA)
- Plan the WMA field pilot program to be implemented in January 2012





Conclusions



1. The WMA and Safety Edge implementation plan in Puerto Rico and USVI is progressing positively as expected.
2. Effective communications between PRHTA , VIDPW, FHWA, and PR-T2 Center officials has been a key factor for this success.
3. The collaboration of asphalt paving contractors in Puerto Rico and USVI has been instrumental in the EDC implementation process.
4. The exchange of knowledge and experience gained by undergraduate and graduate students from UPRM and Purdue University has motivated them to continue their professional career in transportation, does increasing the workforce in highway and transportation engineering.
5. ITE has the potential to be a key player in the different stages of the implementation and outreach program.





Acknowledgments to an Interdisciplinary Effort Well Done



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Información Adicional sobre WMA o EDC



- Las presentaciones estará disponibles en nuestra página de internet www.uprm.edu/prt2
- Pueden contactar a la Sra. Irmalí Franco (irmali.franco1@upr.edu) o al teléfono 787-834-6385.

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http://prt2.uprm.edu/t2-eng.html

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Puerto Rico Transportation Technology Transfer Center

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