Alabama’s Climate Challenge Project Update

ALDOT Transportation Conference 2024
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• Explore the use of LCA & EPDs for
  • Pavement Materials
  • Pavement Design
• Enhancing pavement sustainability with data
CLIMATE CHANGE, What do you think?

- Pollution / Litter
- Electric Cars / Hybrids
- Recycling

Images: Wikipedia.org / forconstructionpros.com
35 Projects
$7.1 million
Collaborative Effort
$1.2 Million in FHWA Grant funds
What are the interests of the Asphalt Lab?

- Performance
- Cost
- Environment
To provide a safe, efficient, environmentally sound intermodal transportation system for all users, especially the taxpayers of Alabama.
2024 Corvette E-Ray Hybrid

- Zero to 60 mph in 2.5 seconds
- All-wheel drive
- Same gas mileage

2019 Ram eTorque

- 130 extra lbf-ft of torque
- 2 more mpg
- Best in class towing capacity
What exactly did we do?
Sections

- US-82, Prattville, AL
- Three sections were constructed
  - Aramid Fiber
  - Control
  - Warm Mix-1
Sections

- Warm Mix-2 section was placed in December 2023
<table>
<thead>
<tr>
<th>Mix ID</th>
<th>Planned production temperature, °F</th>
<th>Average temp. achieved during production, °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>325</td>
<td>323</td>
</tr>
<tr>
<td>Fiber</td>
<td>325</td>
<td>327</td>
</tr>
<tr>
<td>Warm Mix-1</td>
<td>275</td>
<td>303</td>
</tr>
<tr>
<td>Warm Mix-2</td>
<td>275</td>
<td>295</td>
</tr>
</tbody>
</table>
No significant differences in burner fuel consumption were observed.
What do cookies and asphalt have in common?
Lower temperature, improved cracking performance

- Similar results for +Fibers compared to the control
- Higher CT\text{index} with lower mixing and compaction temperatures
- No significant differences between different PMLC mixes
Lower temperature, slightly higher rutting susceptibility (All Pass < 10mm)

- Satisfactory rutting performance for all the mixes
- Similar results for +Fibers mixes compared to the control
- Higher rut depths with lower mixing/compaction temperatures for WMAs, still satisfactory
Lower temperature, same to slightly higher rutting susceptibility

- Satisfactory rutting performance for all the mixes
- Similar or higher strengths for +Fibers compared to the control
- +WMA PMLC mixes performing worse than control and Fiber mixes
- Lower strengths with lower mixing /compaction temperatures for WMAs
Taking the best of our results:

If our Mix was a Car:
  • 1 more MPG
  • 4 more HP
  • And it’s cheaper!
• NCAT will analyze the rest of the emissions data

• Contribute to the FHWA LCA Pave Database

• Training for ALDOT and Contractor Personnel on this material
Questions?
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