Florida Department of
TRANSPORTATION

Florida's APT Research Program Update

ACAF Asphalt Expo

December 1, 2021

Florida's HVS Program

- Initiated in 2000
- Located at the State Materials Office
- Test site consists of
  - Seven 12-ft wide, 450-ft linear tracks
  - One 12-ft wide, 180-ft linear track
  - Two test pits with water table control
- Loading performed with two Heavy Vehicle Simulators (HVS)

Test Track Facility

Heavy Vehicle Simulators

- Two HVS systems
- Dual or single tires
- Radial or aircraft tire
- Wheel wander from 0 to 30-in
- Enclosed environmental chamber
- On-board laser profiler system
- On-board crack progression monitoring system
- 10,000 uni-directional load repetitions per day

SP-9.5 NMAS Study

- Motivation
  - SP-9.5 mixes are not allowed as surface mixes for Traffic Level D & E roadways
  - This restriction may place unnecessary limits on design & construction
- Mix Design
  - Control: SP-12.5 with PG 76-22 PMA
  - SP-9.5 with PG 76-22 PMA
- Preliminary Results: ***Similar rutting performance***

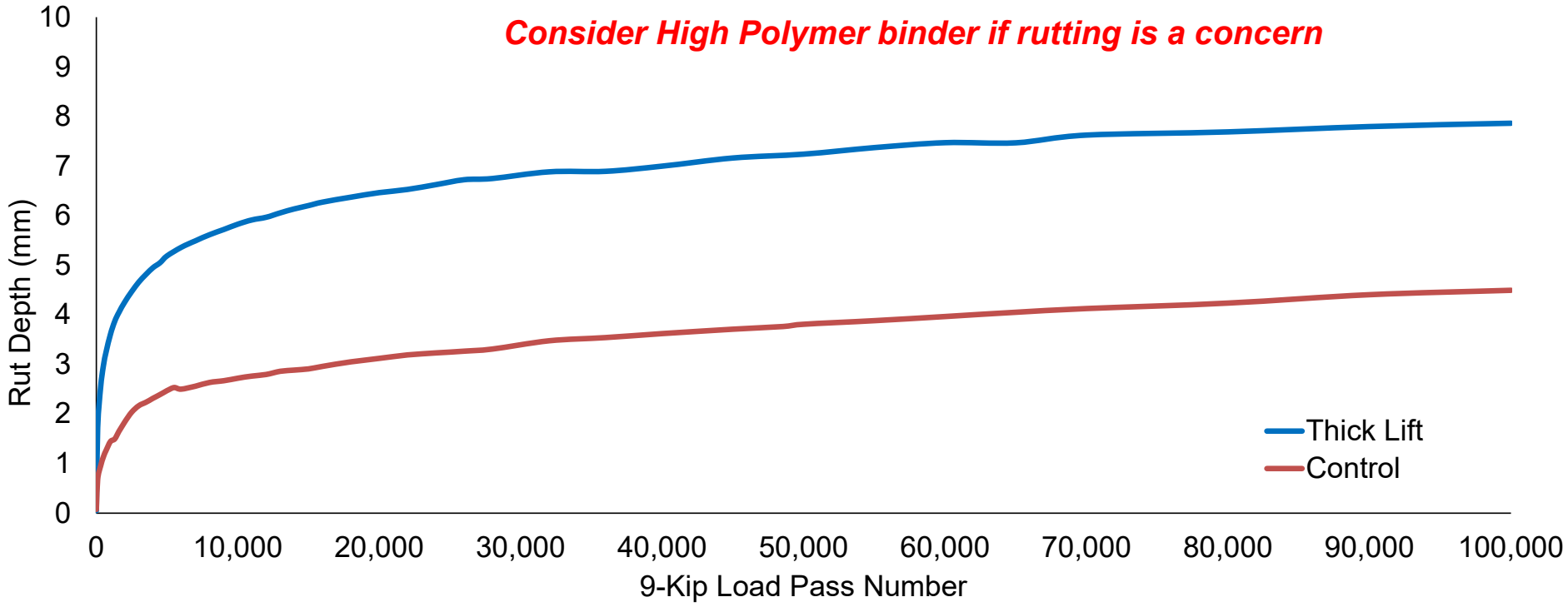
Low Gyration Study

- Motivation
  - Lower design gyrations (N_{design}) results in higher asphalt content
  - Higher asphalt content increases pavement durability
- Mix Design
  - Control: SP-12.5 with PG 76-22 PMA, N_{design} = 100
  - SP-12.5 with PG 76-22 PMA, N_{design} = 50 (≈96% density)
  - SP-12.5 with PG 76-22 PMA, N_{design} = 50 (≈ 91% density)
- ***No results to report yet***

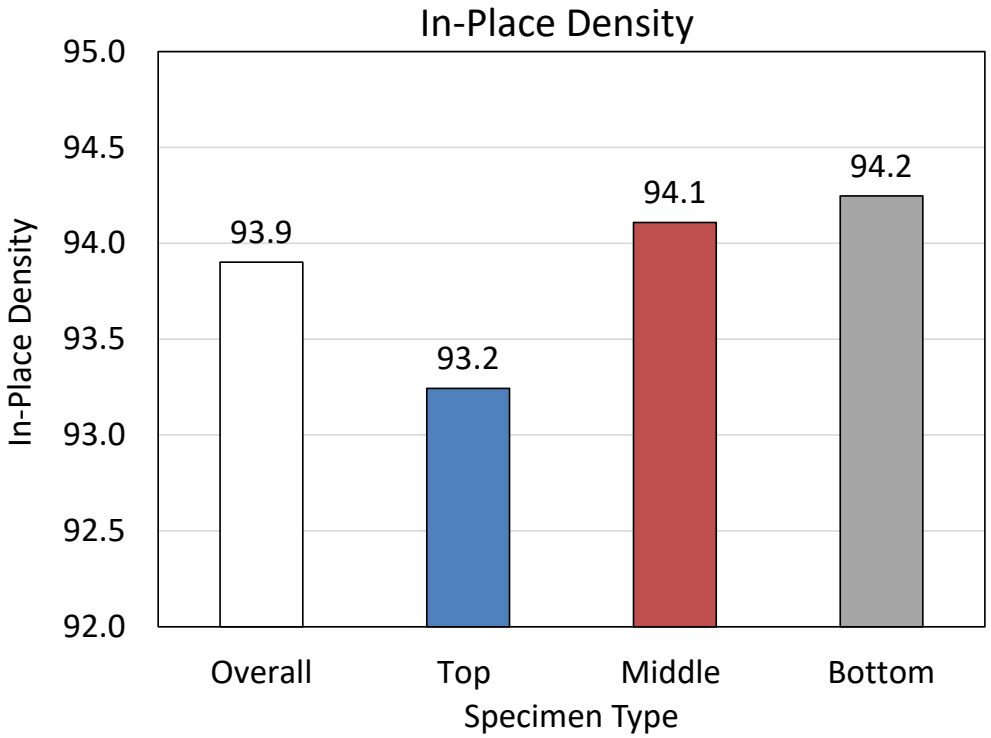
Thick Lift Study

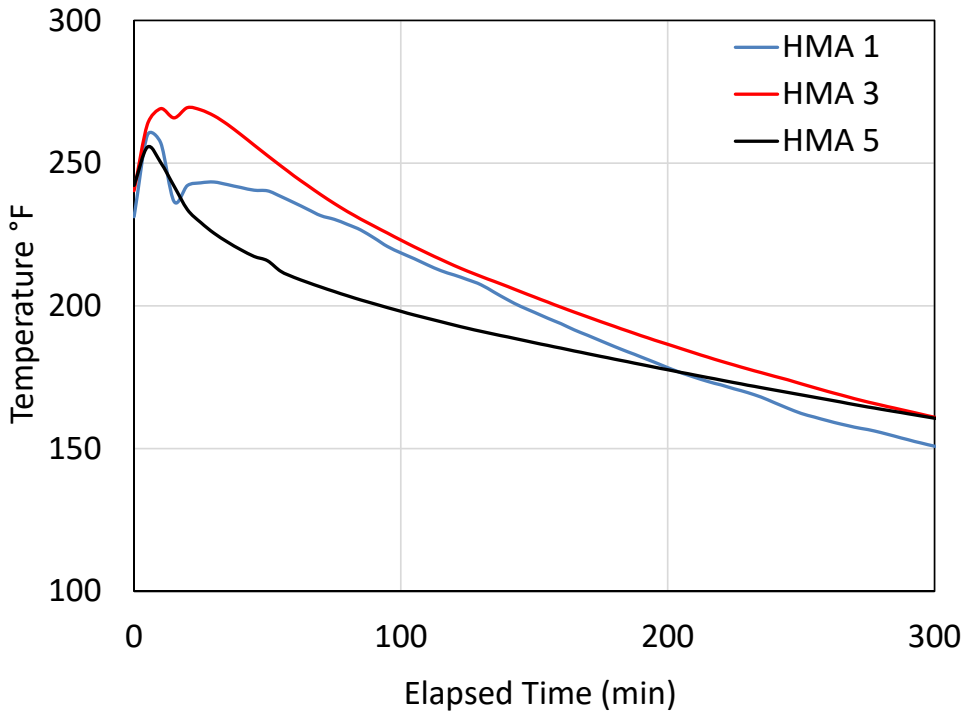
- Motivation
  - Field sections exhibiting full-depth cracking require deep mill & fill
  - Accelerate full-depth rehabilitation
- Mix Design
  - Control: 1.5-in SP-12.5 with PG 76-22 PMA
  - 6-in single lift, SP-12.5 with PG 76-22 PMA

Rut Depth Results



Thick Lift Density & Cooling Rate





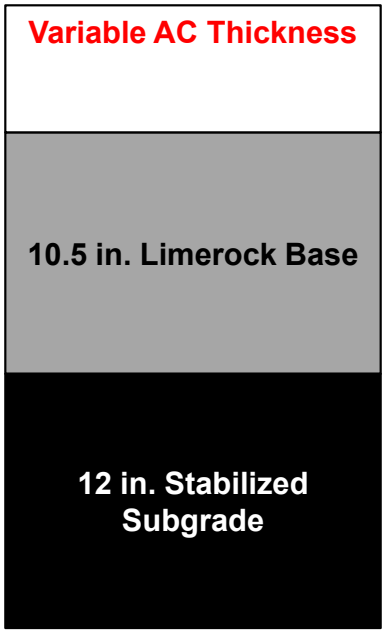
Fiber-Reinforced Asphalt Study

- Motivation
  - Potential to increase asphalt rutting & cracking resistance
- Mix Designs
  - Control 1: SP-12.5 with PG 76-22 PMA
  - Control 2: SP-12.5 with HP (no RAP)
  - 1.5-in SP-12.5 with aramid fiber, PG 67-22
  - 1.5-in SP-12.5 with aramid fiber, PG 76-22 PMA
  - 3-in SP-12.5 with aramid fiber, PG 67-22 PMA
  - 3-in SP-12.5 with aramid fiber, PG 76-22 PMA
- ***No results to report yet***

Two fiber sources for rutting study

One fiber source for cracking study

Current HVS Studies



Typical Cross Section

Past Major HVS Studies

- Superpave mixtures with & without polymer modified binders
- Coarse and fine-graded Superpave mixtures
- Impact of wide-base tires on pavement damage
- Validation of Dominant Aggregate Size Range (DASR) Porosity
- ARMI effect on reflection cracking & rutting resistance
- PG 82-22 asphalt binder
- PG 76-22 (ARB) asphalt
- High polymer asphalt binder
- Prime and tack-coat effect on pavement performance
- Asphalt segregation impact on pavement performance
- Density effect on pavement performance

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Thank You!

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