

Twenty-Five Years of Rubber Tire Wheel Tracking of Asphalt Pavements in a Laboratory [Presentation TRBAM-22-04725]

Ben C. Cox (ERDC), Ashley S. Carey (MSU), Jessica V. Lewis (MSU), Isaac L. Howard (MSU)

Objectives

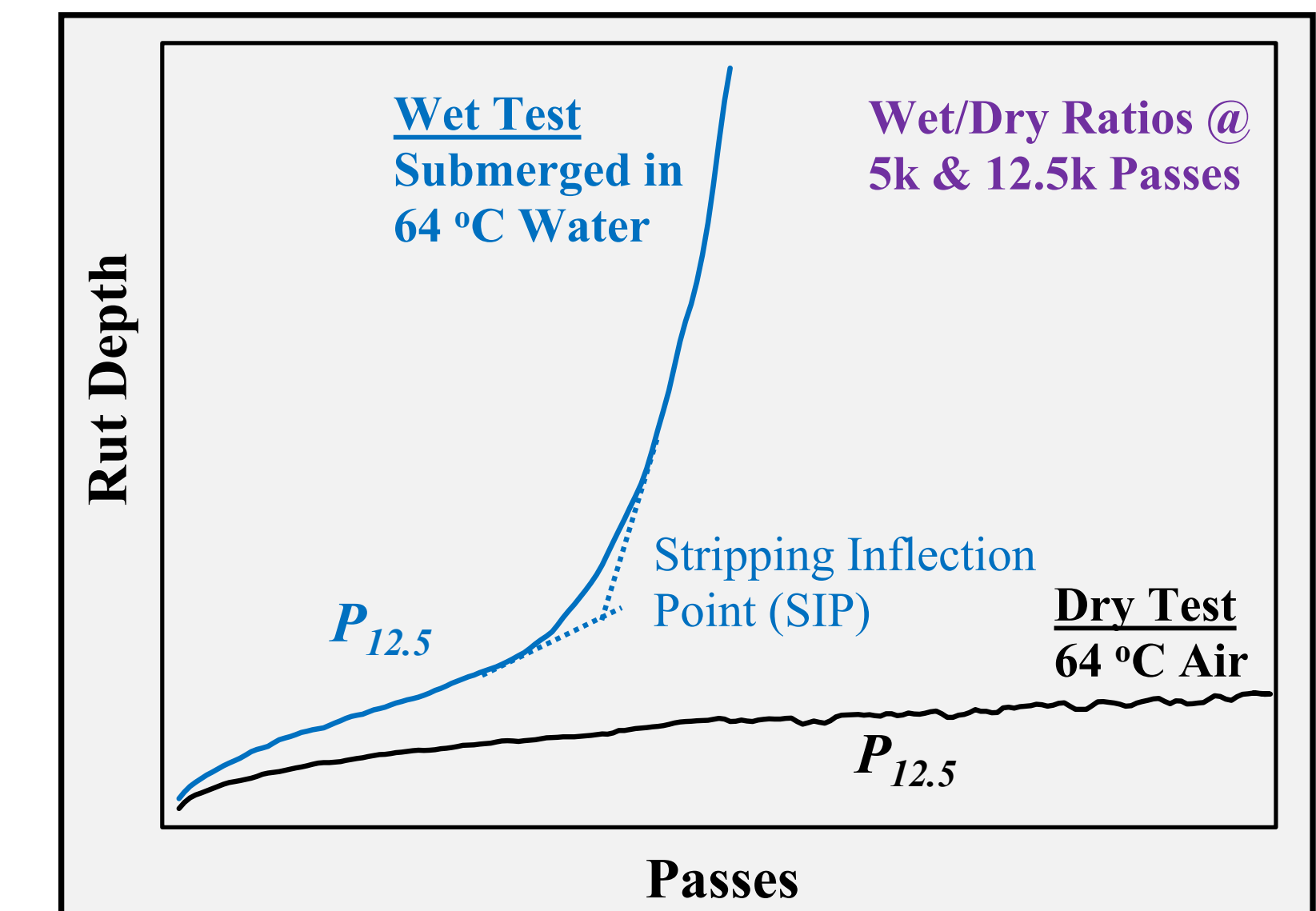
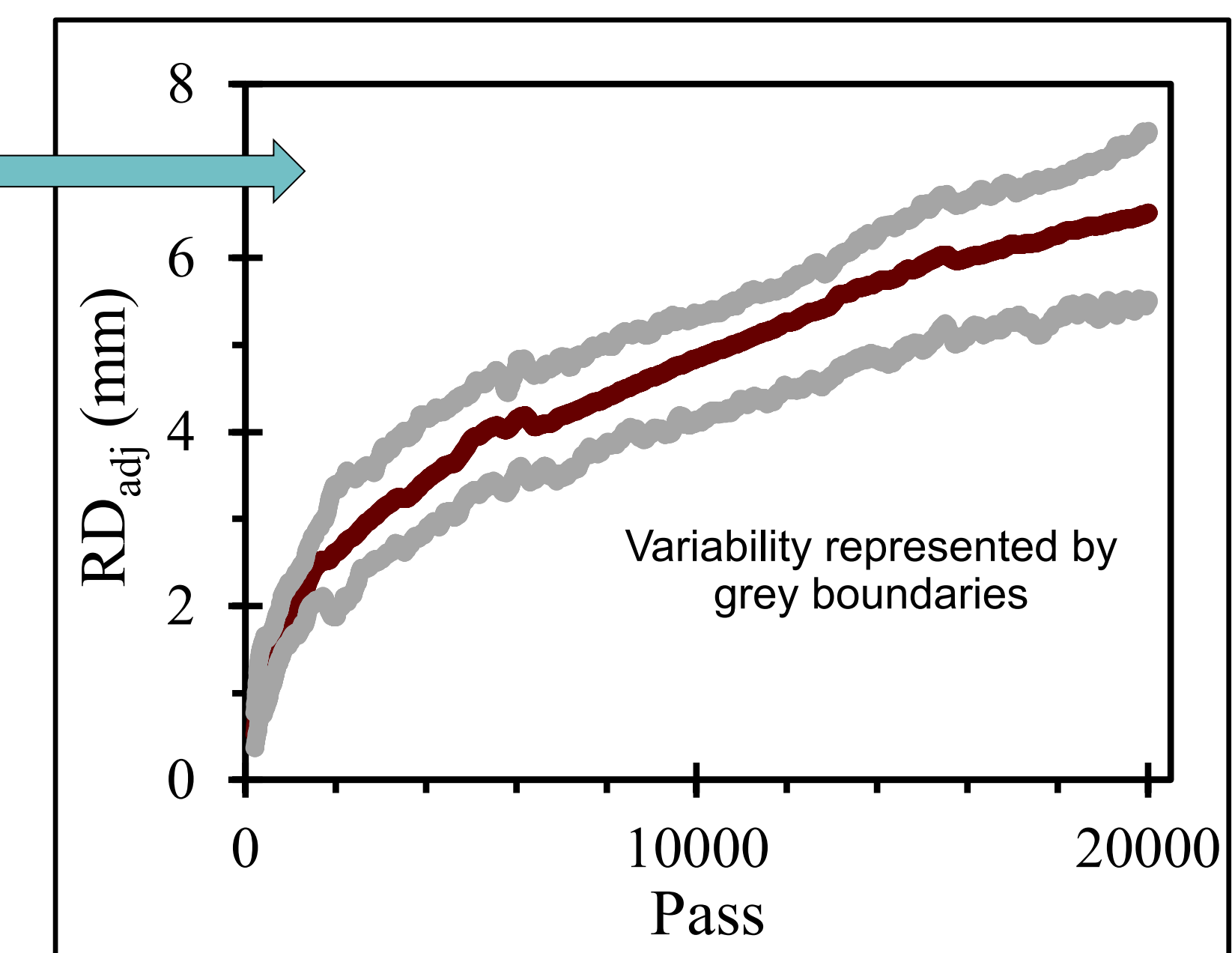
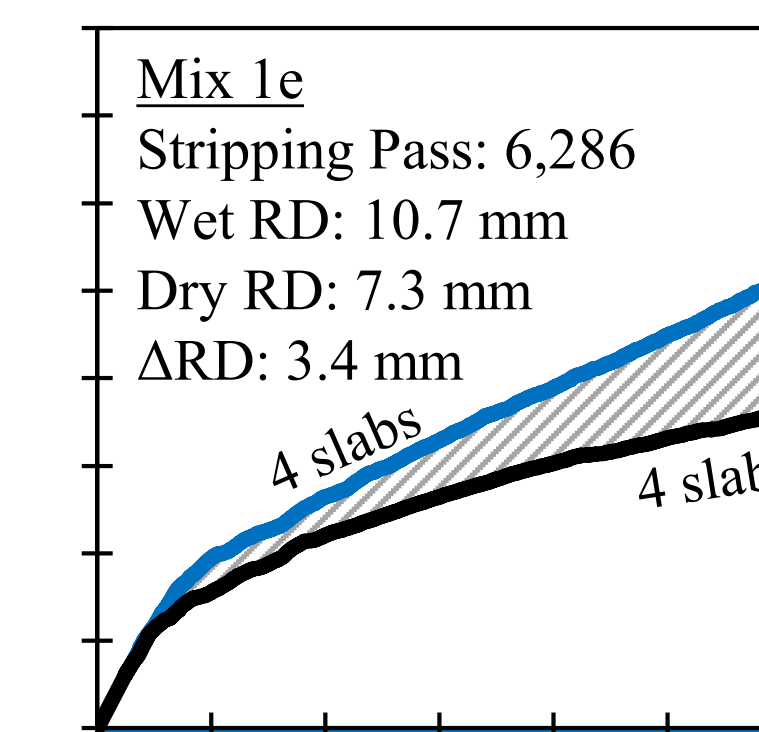
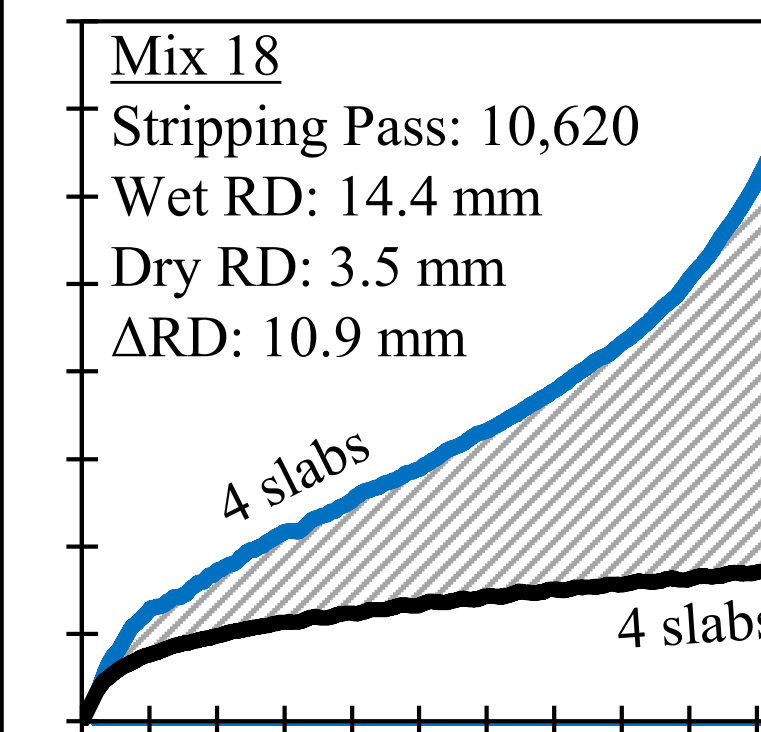
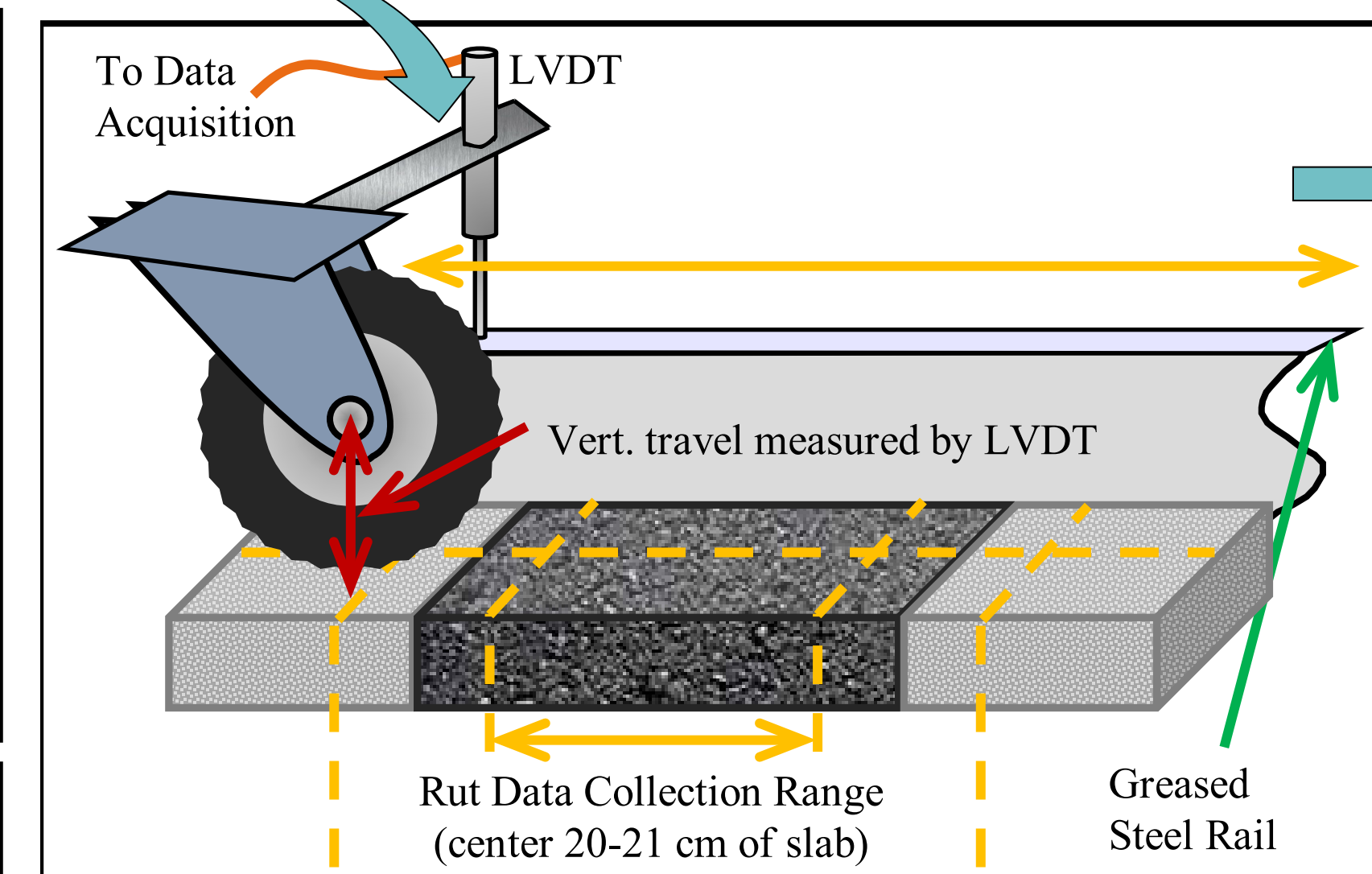
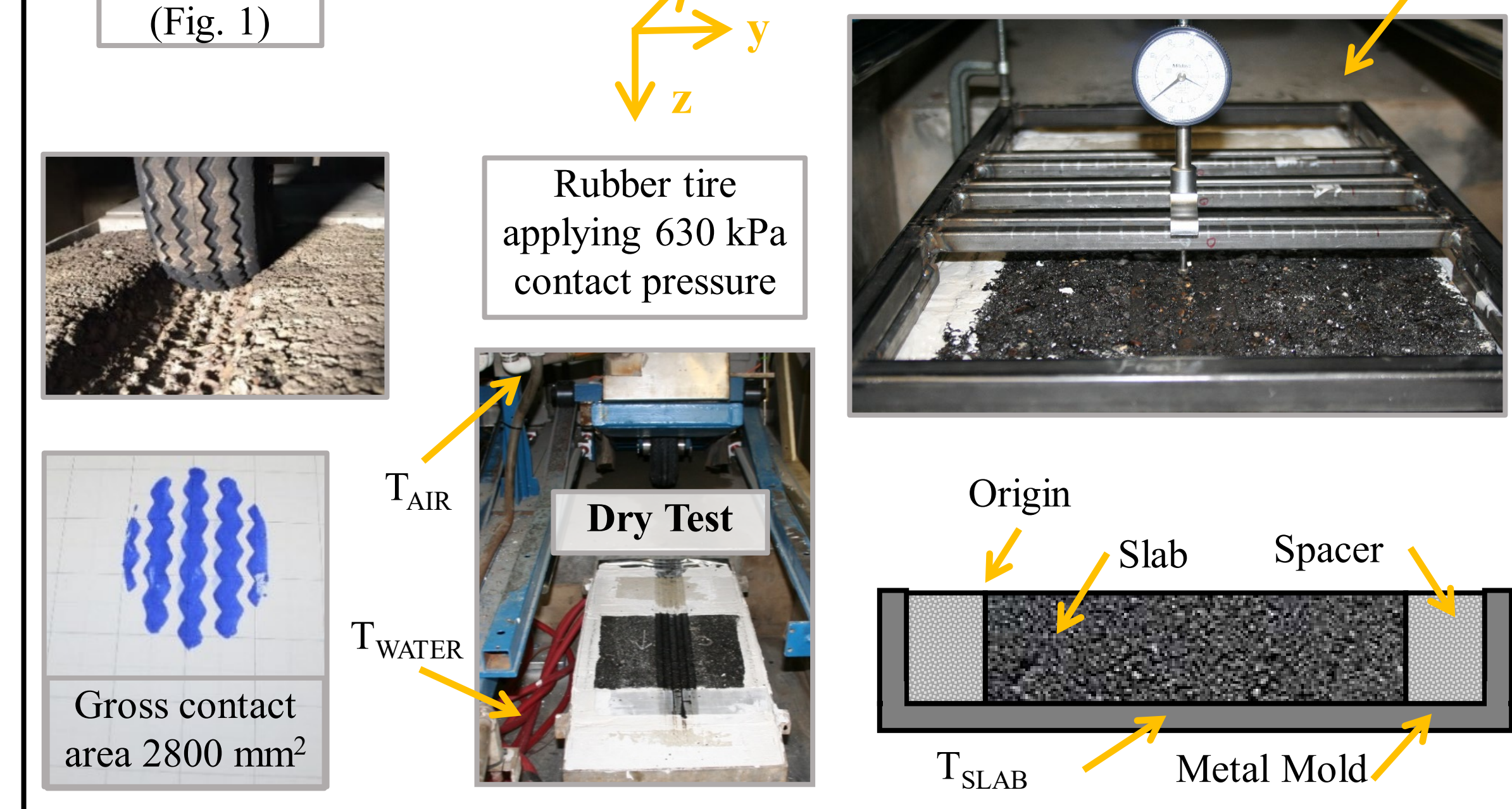
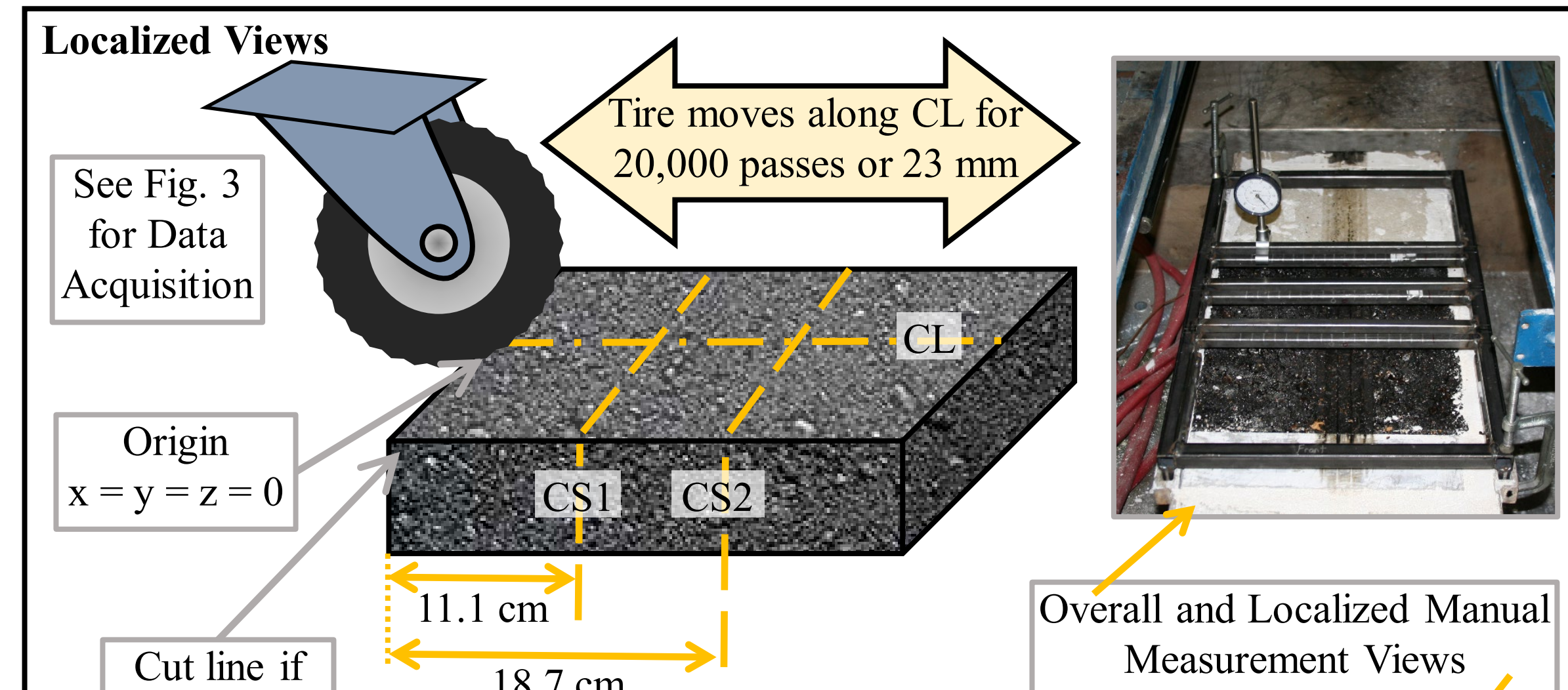
- Demonstrate a gap in testing asphalt mixes with rubber tires - separating dry rutting from moisture damage.
- Provide guidance on test protocols that could be useful toward a standardized test procedure for rubber tire wheel tracking.

Literature Review

- 42 references – a clear gap was identified of insufficient test methods that allow for the effects of rutting and moisture damage to be directly decoupled.
- Asphalt Pavement Analyzer and Hamburg testing were not considered in any detail in this work – it is noted some works have tried to decouple the effects of rutting and moisture damage with these methods.

Test Data

- PURWheel-G2 (MSU version from 2007-2017) evaluated 20 different mixes – data in this paper was not a designed experiment – used the best data available from previous studies.



Major Observations and Path Forward

- Rubber tire wheel tracking under wet conditions is not commonly used.
- Moisture effects were detected – multiple mechanisms, including stripping, were observed in roughly 2/3rd of cases tested – i.e., a rubber tire led to identifiable moisture effects in the lab.
- PURWheel-G2 was large equipment with large slabs – RTrack is next generation of rubber tire wheel tracker that uses gyratory specimens w/in existing equipment package.
- PURWheel-G2 data acquisition was variable and needed improvement.
- Working toward standard test method that uses a rubber tire in wet and dry conditions to separate dry rutting from moisture damage.



Jessica V. Lewis is current holder of the Ergon Asphalt & Emulsions Distinguished Doctoral Fellowship in Construction Materials