

Cracking Wars: The Fatigue Awakens



Kevin Hall

Nam Tran

¹ University of Arkansas

NCAT

Our Discussion Today...

- Review “Current” Pavement-ME Fatigue Cracking Estimation
 - “Build 2.3” Release
- Overview of NCAT Research Effort
- NCHRP 9-59 Update – Binder and Mixture Cracking Tests

Cracking Models & Transfer Functions



Bottom-up cracking



Top-down cracking



Transverse cracking



Reflection cracking

Mixture Properties for Cracking Models

Pavement-ME Build 2.3

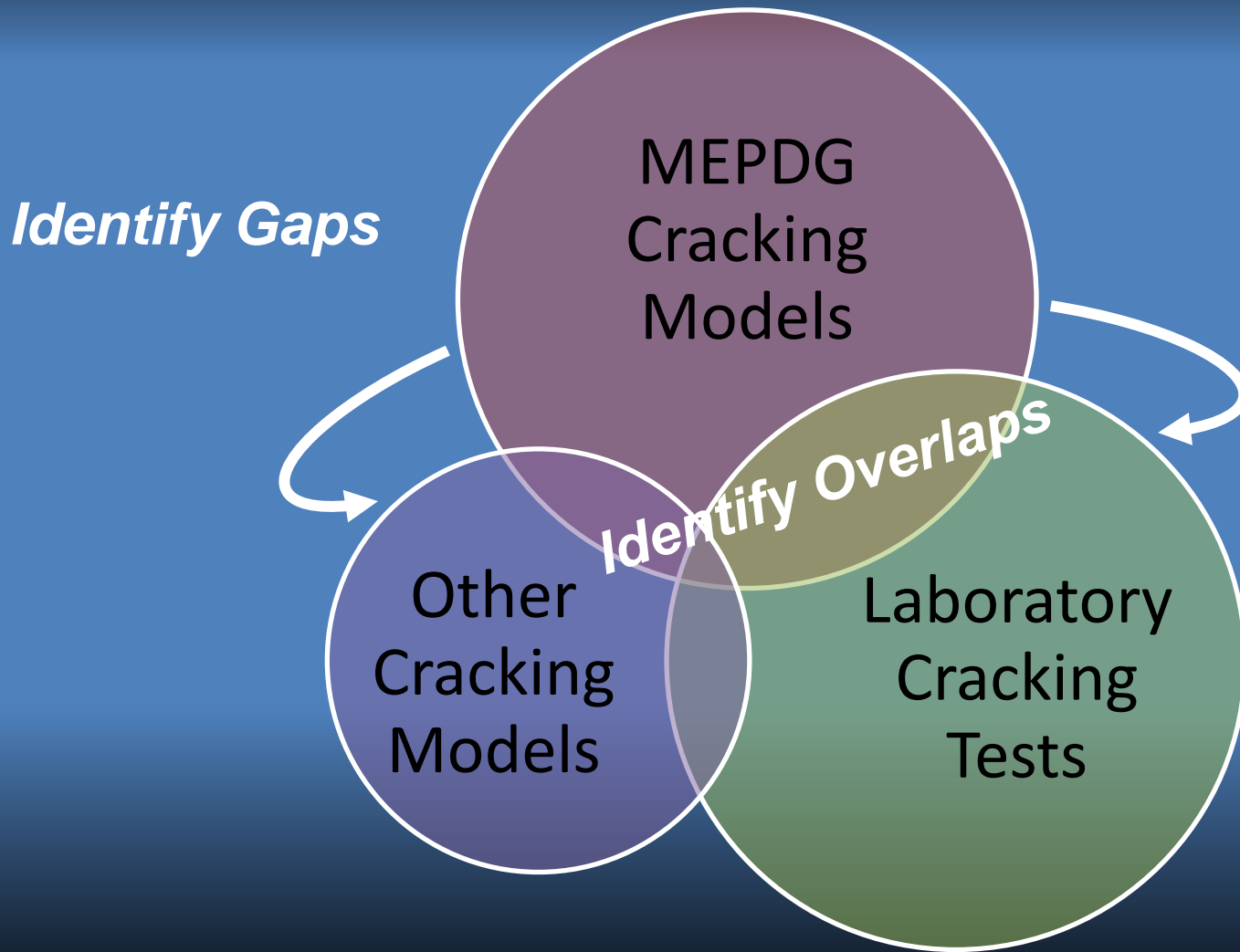
Types of Cracks	Mixture Properties
Bottom-Up	<ul style="list-style-type: none">• Fatigue strength from flexural beam fatigue test
Top-Down	
Transverse (Thermal)	<ul style="list-style-type: none">• Indirect tensile strength• Indirect tensile creep compliance
Reflection	

MEPDG Cracking: Summary

Cracking Designation	Status
Bottom-Up	<ul style="list-style-type: none">• No changes or enhancements; none planned for the short-term
Top-Down	<ul style="list-style-type: none">• No changes to date; changes anticipated (NCHRP 1-52)
Transverse (Low Temp)	<ul style="list-style-type: none">• No changes to date; need for changes identified (long-term)
Reflection	<ul style="list-style-type: none">• Major enhancements in Version 2.2 (<i>replaced regression with M-E</i>)

NCAT Study

NCAT Study Objectives...



...to do what?

Envision:



...material tests

...design models

NCHRP 9-59

Nam Tran & Don Christensen

Questions?

Kevin Hall
(kdhall@uark.edu)

Nam Tran
(nht0002@auburn.edu)