



LONG LIFE ASPHALT PAVEMENTS

Regional Technical Meetings



Committed to:

- Safe, Smooth, Sustainable,
Long Lasting Pavements!

PA Asphalt Pavement Association

- Gary Hoffman, Director of Technical Services

Long Life Asphalt Pavements



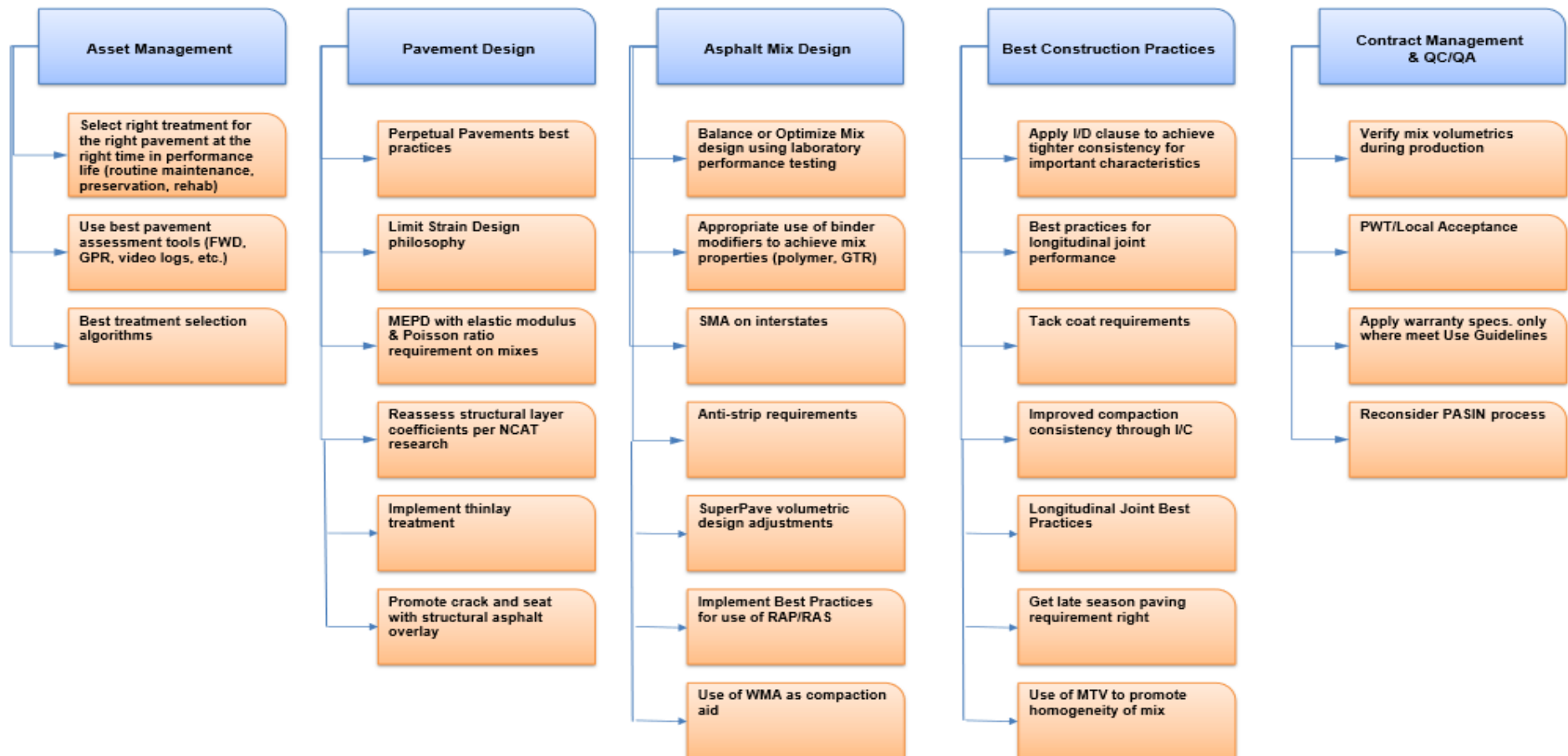
TQI Technical Work Group Schedule

- PennDOT, FHWA, Industry Coordination Meeting – October 2015
- LLAP Spec Draft for APQIC – January 2016
- CT Step 1 for Review – April 2016
- CT Step 2 for Review – June 2016
- Request Candidate Pilot Projects (2017 Const. Season) – November 2016

PAPA LLAP Flow Chart

S:\L L A P Long Life Asphalt Pavement\LLAP FlowChart-Hoffman version.xlsx

Long Life Asphalt Pavements

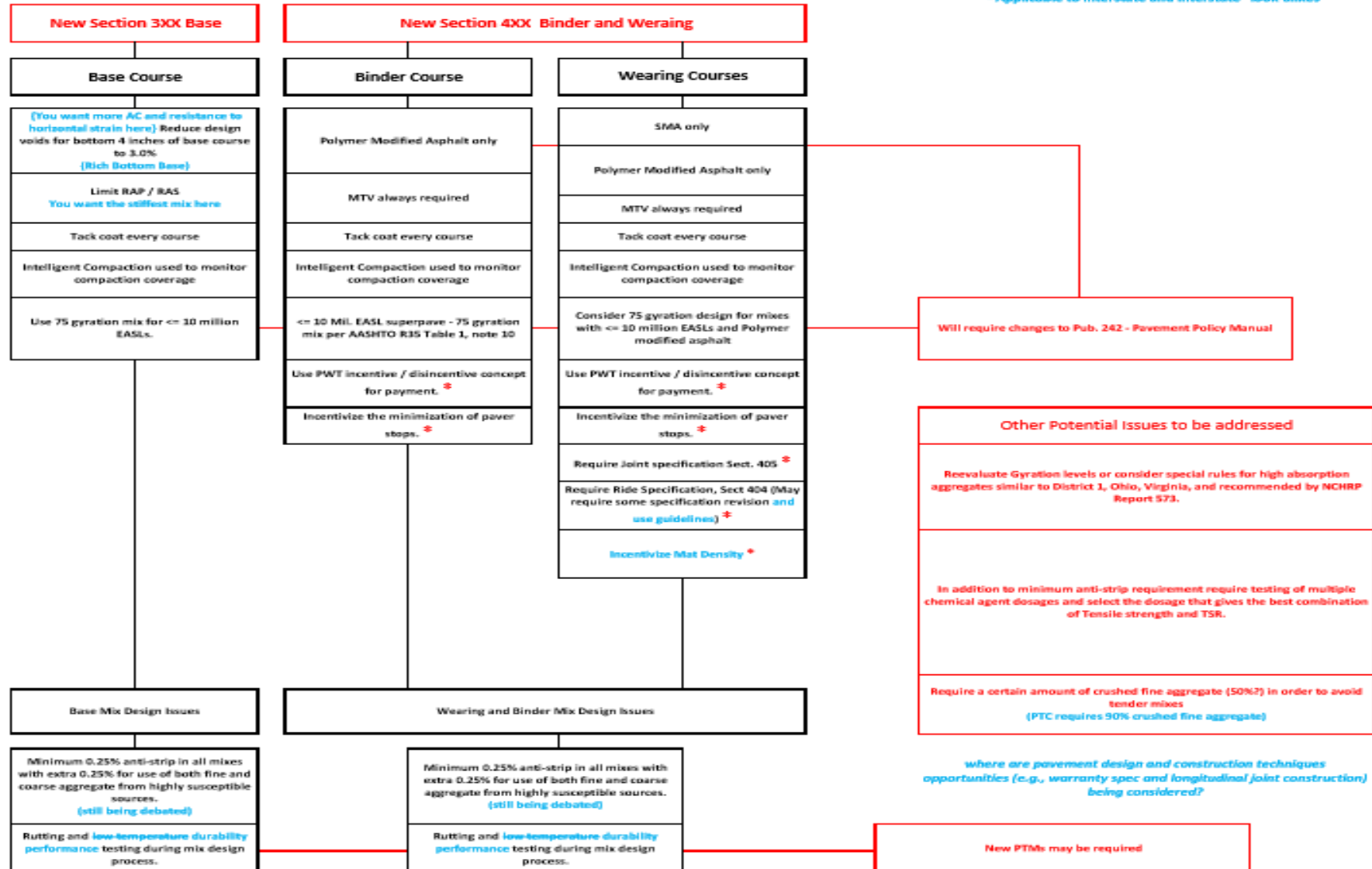


PennDOT LLAP Flow Chart

Long Life Asphalt Pavement Specification Outline **

* - Potential for Incentive / Disincentive Pay.

** - Applicable to Interstate and Interstate "look-alikes"



Although the spec is early in process,
many of the components are well
along.

Long - Life Asphalt Pavements (LLAP)

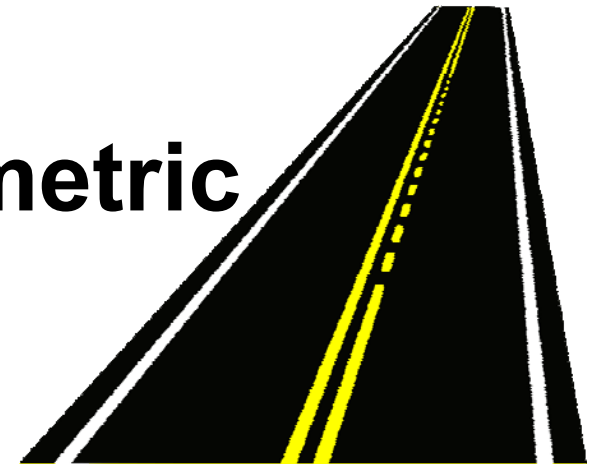
Pavement Design

- **Use Guidelines**
- **PavementME (Binder Modification)**
- **Perpetual Pavement Design**
- **Limiting Strain Design**
- **Rich Bottom Base**

Long - Life Asphalt Pavements (LLAP)

Asphalt Mix Design

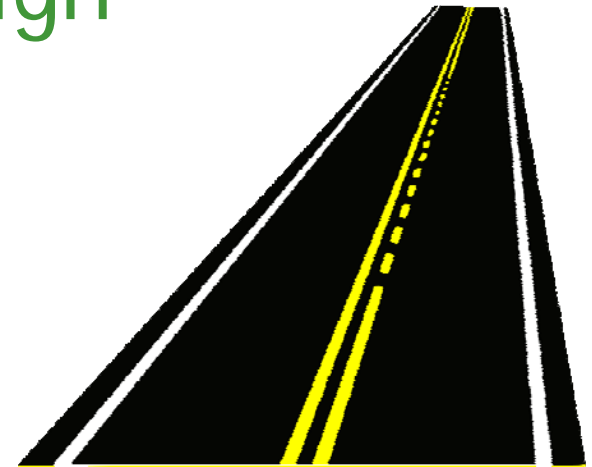
- **Minimum Effective AC Content (P_{be})**
- **SuperPave Design Volumetric Adjustments**
- **Binder Modification (i.e. polymer, GTR, Fiber, etc.)**



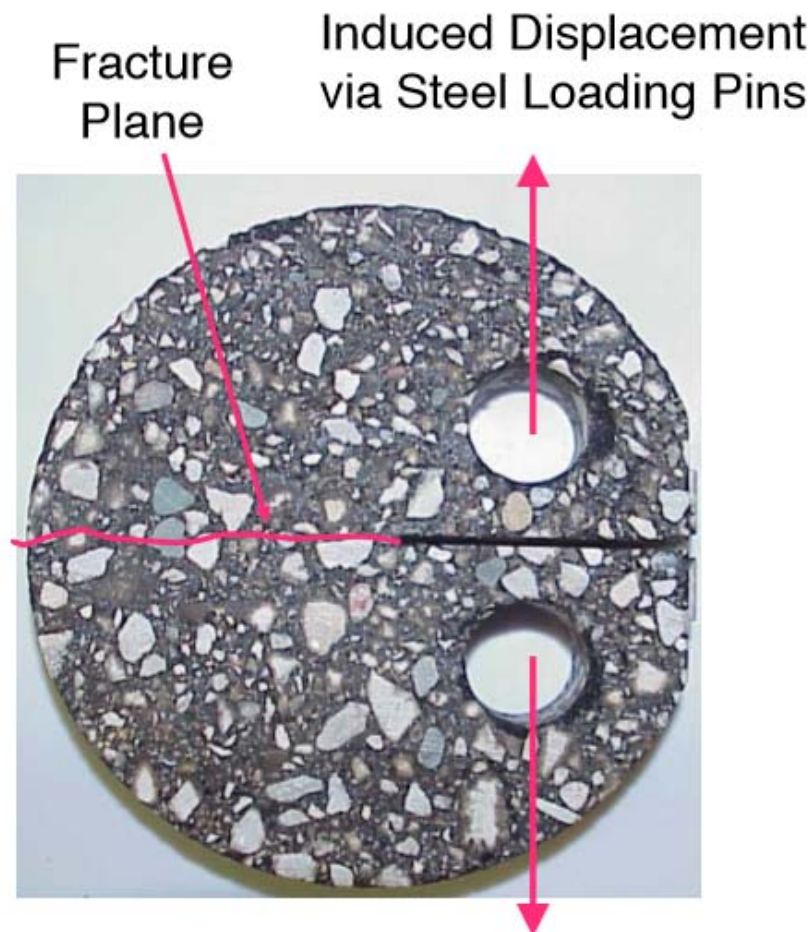
Long - Life Asphalt Pavements (LLAP)

Asphalt Mix Design

- **SMA ON INTERSTATES**
- **FULL DEPLOYMENT OF WMA**
- **USE OF ANTI-STRIP ADDITIVE**
- **ASPHALT RICH BASE**
- **Optimized Mix Design (i.e. Performance Testing)**



Disk-Shaped Compact Tension - DC(T)



Motivation – measure fracture energy, use cylindrical specimens, maximize repeatability, use true fracture test

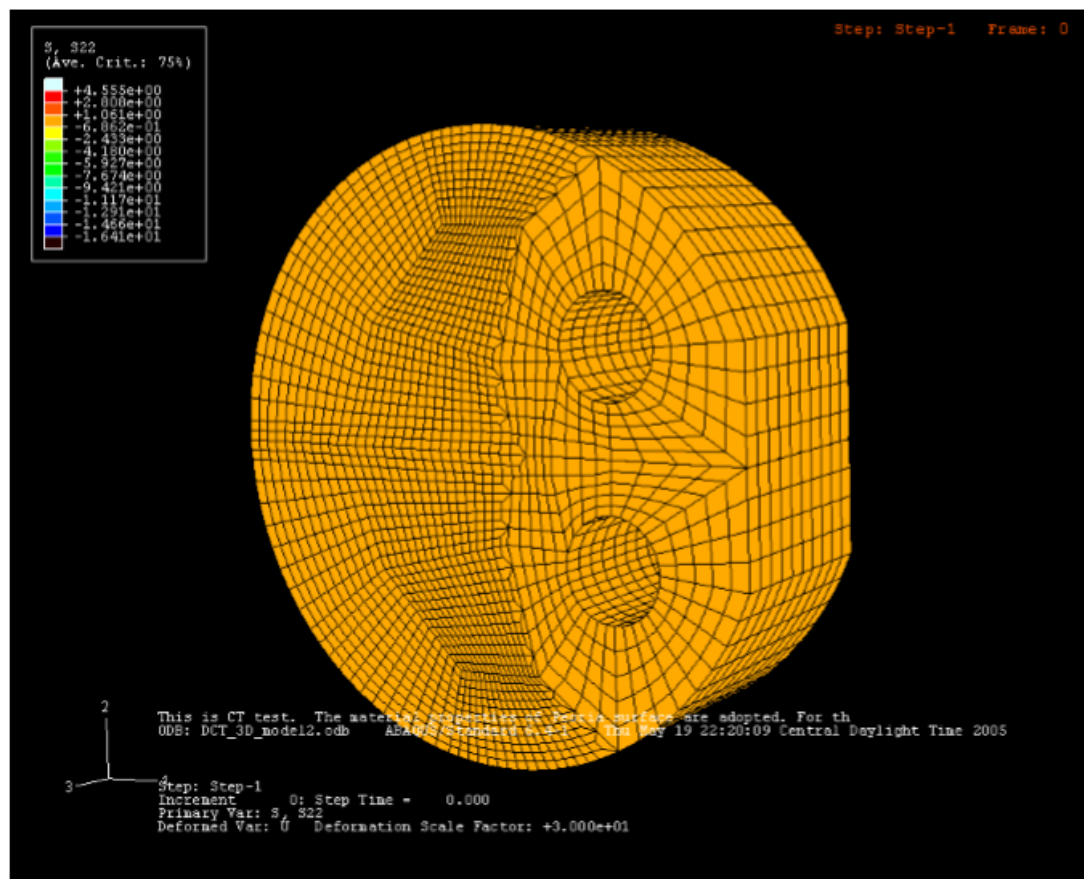
Based on ASTM E399 – Geometry slightly modified to account for differences in the fracture behavior of steel and asphalt concrete

Genesis was NSF GOALI study on reflective cracking: UIUC-NSF-Koch (2004)

Wagoner, M. P., Buttlar, W. G., and G. H. Paulino, "Disk-Shaped Compact Tension Fracture Test: A Practical Specimen Geometry for Obtaining Asphalt Concrete Fracture Properties," *Experimental Mechanics*, Vol. 45, No. 3, pp. 270-277, 2005.

Disk-Shaped Compact Tension - DC(T)

Three-dimensional fracture modeling



Fracture Behavior is
f(Temp.,
time,
specimen
dimensions,
test mode
and
boundary
conditions,
local
strength,
local energy,
modulus)

Disk-Shaped Compact Tension Test (DC(T))

Long - Life Asphalt Pavements (LLAP) Construction Specifications

- **Longitudinal Joint Density Specification**
- **RIDE SPECIFICATION REQUIRED**
- **MTV Required**
- **Tack Coat Requirements (New Specification)**
- **Intelligent Compaction (I/C)**
- **% WITHIN TOLERANCE (PWT) ACCEPTANCE**
- **INCENTIVIZE CRITICAL ELEMENTS (I.E. MAT DENSITY)**



What still needs to change?

Long Life Asphalt Pavement Spec Development

- Please give us your concerns & comments
- Questions?

Thank you!!

To contact 

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