INDOT’s Recap of Thin Concrete Overlay Test Program
Lessons Learned To Date

David B. Holtz, P.E.
Pavement Director, INDOT

2019 Purdue Road School

06 March 2019
SR 55

- Construction damage

- People do what people do
Six district offices
3,500 employees
$1 billion/annual capital expenditures
28,000(+) lane-miles
Nearly 6,000 INDOT-owned bridges
Assists 42 railroads in planning & development of more than 3,880 miles of active rail lines
Supports 69 Indiana State Aviation System Plan airports
In 1818 the Institution of Civil Engineers was founded in London, and in 1820 the eminent engineer Thomas Telford became its first president. The institution received a Royal Charter in 1828, formally recognizing civil engineering as a profession. Its charter defined civil engineering as:

**The art of directing** the great sources of power in nature for the use and convenience of man, as the means of production and of traffic in states, both for external and internal trade, as applied in the construction of roads, bridges, aqueducts, canals, river navigation and docks for internal intercourse and exchange, and in the construction of ports, harbors, moles, breakwaters and lighthouses, and in the art of navigation by artificial power for the purposes of commerce, and in the construction and application of machinery, and in the drainage of cities and towns.
The Stage

Affective domain

Characterising by Value or Value Concept

Organising and Conceptualising

Valuing

Responding

Receiving

The Stage

Universal Intellectual Standards

Testing the quality of your thinking.

- Clarity
- Accuracy
- Precision
- Relevance
- Depth
- Breadth
- Logic
- Significance
- Fairness

A good start...

What standards might you add for your discipline?
Elements of Reasoning

We reason for a purpose; and from a point of view, having implications and consequences; We use information; to answer a question or solve a problem; which is based on assumptions; we examine concepts and theories; we draw inferences and conclusions; Taking thinking apart...
Thin PCCP Overlays - Current Status

- Test projects currently completed, under construction, or being let
- Project pavement condition data collection scheduled for summer CY2018/19
  - ‘Initial’ data collection to be upon project completion
  - Projects’ on-going data collection to be annual
- Project cost data being analyzed at this time
  - Final cost data for test immediately follow
- Program decisions to be made when appropriate
- Initial assessment:
  - Costs higher than planning level estimates
  - Construction quality appears mostly higher than expected
Thin PCCP Overlays - Concept Timeline

- 2010 - 1st INDOT TCO constructed on SR 161
- 2012 - INDOT’s current pavement organization generated
- 2015 - 2nd INDOT TCO constructed: SR 55
- June 2015 - TCO programmatic interest initiated
- Summer 2015 - TCO performance investigations
  - Multiple design methods w/multiple performance expectations
- Fall 2015
  - Existing TCO pavement condition data collection plan executed
  - Design method resolved later in CY2015
Thin PCCP Overlays - Concept Timeline

- **CY2016**
  - INDOT guidance to investigate conducting multiple test projects
  - Candidate project criteria developed
  - Project pavement design criteria developed
  - Construction considerations determined
  - Unique special provision developed
  - 10 projects designed

- **CY2017 - Most test projects let**
Thin PCCP Overlays - Concept Timeline

- **CY2018**
  - Construction on multiple projects

- **CY2019**
  - Multiple projects completed and being assessed.

And Here We Are Today!
Thin PCCP Overlays - Candidate projects

- **SEYMOUR**: SR 46, Columbus to Nashville
- US 50, Aurora to end of 4-Ln Section
- SR 37, I-69 to Dillman Rd.
- US 50, City of Seymour
- **CRAWFORDSVILLE**: US 52, Teal Rd. to CR 800S
- SR 63, Vermillion Co.
- US 421, Kirklin to SR 29
- US 36, Wabash River to US 41
- **VINCENNES**: SR 66, Rockport to SR 70
- SR 65, SR 165 to SR 65 41
- SR 161, SR 68 to Holland
Thin PCCP Overlays - Candidate projects

- **LAPORTE**: SR 14, US 35 to SR 17
- SR 18, Brookston to US 421
- SR 55, SR 14 to SR 10
- **GREENFIELD**: SR 234, ST 109 to SR 38
- SR 3, CR 300 North to SR 67
- US 31, SR 38 to SR 28
- US 31, 3 mi. S of US 24 to 0.5 mi S of US 24
- **FORT WAYNE**: SR 101, US 24 to Allen/Decatur Co Ln
- SR 9, SR 26 to SR 37
- US 20, 1 mi. E of US 27 to IN-OH St Ln
Candidate Criteria

- MOT & CN trafficability
  - 1 Ln?
  - Echeloned closure?

- NLT 4 inch HMAP needed under TCO
  - Sound HMAP necessary, NLT 4”
  - or thinner if on composite pavement
    - NLT 3 inch sound HMAP necessary

- Full-depth patching accomplished if necessary
Full closure
Early test

Looks good in most places

Some issues

Construction issues will be monitored
Design Considerations

- Expansion joints & gap pours
  - Isolation & CN Joints
  - Drives

- Drainage
  - Bound Open-Graded Shoulder Drains?

- Milling
- Upper half of criteria (screening criteria)
- May replace 1 or 2-lift HMAP overlay or inlay
Gap pours at drives and intersections
Texture of underlying pavement important consideration
Current Pavement Asset Management Practice

- Mechanistic-Empirical Pavement Design Guide (M-EPDG) philosophy
Design Considerations

- Profile Re-establishment
- Crown Re-establishment
- Centerline or Edge Rumble Stipes
- Safety Edge
- Method of Payment
  - Neat lines plus variable “Filet” vs. SYDs
SR 9

- Edge support
- Appearances can be deceiving
SR 3

- Underlying pavement surface texture
- Construction joint
Construction Considerations

- Weather
- Maintenance of traffic
- Paver width, construction operations
- Real time smoothness
- Centerline profile
  - Low and high speed
- Safety Edge support & constructability
- Sawing, sealing & curing
SR 3

- Maintenance of traffic
- Flexibility due to panel size
Moister management considerations critical
Due to composite nature, surface preparation is critical
Note inlay method
Edge support condition is critical design consideration
SR 9

- Material properties and ramifications
Importance of contractor’s QC plan review

AND ADHERENCE!

This was later in project
Curing method
Curing method
- Finished surface
- Note fibers
- Note curing compound
Specification Considerations

- “Filet” payment
  - Thickness bonus
  - Fibers
  - Dip stick thickness measurement?

- Pavement profile

- QC / QA

- Milling & existing surface cleaning

- Pre-overlay repairs

- Concrete placement, curing & sawing
Use of fibers
Sawing operations are critical!

Contractor’s experience and QC plan must be discussed prior to construction.
Thin PCCP Overlays - Current Status

- Test projects completed, currently under or completed
  - ‘Initial’ data collection to be upon project completion (CY2018/19)
  - Projects’ on-going data collection to be annual
- Final Project cost data to be analyzed
  - Final cost data for test immediately follow
- Final assessment: TBD
- Program decisions to be made when appropriate
  - INDOT will continue to examine TCO as another pavement preservation tool in our tool box
  - Strong executive interest in challenging SR 3 project
Cost comparison

½ of cost comparison considerations

Other half will be in-service field life of treatment
Final

Questions?