Instrumented Pavement Response
I-64 Recycling Project

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Virginia Pavement Research and Innovation Symposium
June 19, 2019
Overview

- Objective
- I-64 project
- Instrumentation
- Results
- Summary
Objective

- Install sensors to conduct periodic monitoring using loaded trucks
- Compare results with other test sections (NCAT) to quantify the structural performance of the I-64 section
VDOT Sponsored Sections at NCAT
NCAT Test Track Sections

N3
- 6-inch AC
- 5-inch CCPR
- 6-inch Agg Base
- Subgrade

N4
- 4-inch AC
- 5-inch CCPR
- 6-inch Agg Base
- Subgrade

S12
- 4-inch AC
- 5-inch CCPR
- 8-inch FDR
- Subgrade
I-64 Segment II

• Location
  – Newport News, James City, and York Counties

• Scope
  – 7.08 miles, both directions
  – Add a travel lane and a 12ft shoulder to the inside
  – Reconstruct existing lanes and outside shoulder
  – $189.7 Million

• Traffic
  – 3,000+ trucks per day (per direction)
    • I-81 = 8,400+, NCAT = 20 years on I-64
I-64 Segment II

- New travel lane and inside 12ft shoulder
  - Import crushed concrete or RAP, stabilize as FDR
  - OGDL
  - CCPR
  - 4 inches SMA

- Existing lanes and outside 12ft shoulder
  - Remove existing concrete
  - FDR existing base
  - OGDL
  - CCPR
  - 4 inches SMA
I-64 Segment II Design

<table>
<thead>
<tr>
<th>Processes</th>
<th>Quantities</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDR existing lanes</td>
<td>345,000 SY</td>
</tr>
<tr>
<td>Cement treated concrete/ RAP</td>
<td>146,000 tons</td>
</tr>
<tr>
<td>new lanes</td>
<td></td>
</tr>
<tr>
<td>CCPR</td>
<td>168,000 tons</td>
</tr>
<tr>
<td>Total recycled materials</td>
<td>519,000 tons</td>
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</tbody>
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Instrumentation

- Pressure cell on top of OGDL
- Pressure cell on top of subgrade
- Horizontal asphalt strain
- Temperature probe array
- TDR moisture probe array

Direction of Traffic

Edge Stripe

Center of Wheel path

3.5 ft

2.5 ft

1.5 ft

2 ft

4 ft

2 ft

20 ft
Installation

- **Part 1 (after FDR)**
  - Excavate portions of FDR layer
  - Place pressure cells and moisture probes on top of and 2 ft into the subgrade
  - Replace material and compact

- **Part 2 (prior to CCPR)**
  - Place strain gauges, pressure cells, and moisture probe on top of OGDL
  - Place CCPR
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Results:

17.2 ft / 0.193 sec = 60.7 mph
Summary

• Pavement instrumentation can be used to quantify structural performance

• Results will be compared over time and to other sections

• More to come...
Thank you!

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