An Update on Smoothness Specifications at ODOT

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ODOT Pavement Engineering
Ohio Asphalt Paving Conference
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Overview

- Review Major Points from 2 yrs ago
- Smoothness Specs Transition to IRI
- Equipment/Operator certification
- Ohio Smooth Paving Workshop
- Old Dilemma: New Solution?
10 ft Rolling Straightedge
California Profilograph

courtesy of Ed Morrison
California Profilograph
International Roughness Index (IRI)
Using profiles to simulate vehicle response (What the public “feels”)

Measured Profile → 50 mph → Computer Algorithm → IRI

Body Mass
Suspension Spring and Damper
Axle Mass
Tire Spring
Desired State (next 2-3 years)
Comprehensive Highway RQ Spec(s)

- Every finished highway project rides as well or better than before
- Thin overlays to Major Rehab/New
- Holistic – Highway Ride Quality (not just Pavement Ride Quality)
- Cradle to Grave statistic (IRI) (Construction & Pavement Mangmt)
- Grounded in Ride Quality
Desired State (2-3 years)
Comprehensive Highway RQ Spec(s)

- Incentives/disincentives for RQ
  - Proper thresholds
- Contractors use profilers for construction Quality Control
- Contractors and ODOT project staff understand spec/profiles to achieve high quality highway ride
- “buy-in” from all parties
How do we get there?

- Specification Changes
- Enhanced Profiler Certification
- Operator Certification
- Smoothness QARs
- Communication
  - Smooth Paving Workshop
  - ProVAL software – smoothness QC tools
- Working Together
Specification Changes

Proposal Note 420

1st Dual Index specifications
- CA PI & IRI
- How CA PI & IRI affect $$$

2nd solely IRI specifications
## PAY SCHEDULE

<table>
<thead>
<tr>
<th>PROFILE INDEX</th>
<th>IRI</th>
<th>PAY ADJUSTMENT</th>
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<tbody>
<tr>
<td>Inches per mile per 0.1 mile section (mm/km per 0.16 km section)</td>
<td>Inches per mile per 0.1 mile section (m/km per 0.16 km section)</td>
<td>Pavement Thickness less than 8 inches (200 mm)</td>
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<tr>
<td>1 (16) or less</td>
<td>45 (0.71) or less</td>
<td>$375.00</td>
</tr>
<tr>
<td>Over 1 to 2 (16 to 32)</td>
<td>Over 45 to 50 (0.71 to 0.79)</td>
<td>$225.00</td>
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<tr>
<td>Over 2 to 3 (32 to 47)</td>
<td>Over 50 to 55 (0.79 to 0.87)</td>
<td>$150.00</td>
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<tr>
<td>Over 3 to 4 (47 to 63)</td>
<td>Over 55 to 60 (0.87 to 0.95)</td>
<td>$75.00</td>
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<tr>
<td>Over 4 to 7 (63 to 110)</td>
<td>Over 60 to 70 (0.95 to 1.10)</td>
<td>$0.00</td>
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<tr>
<td>Over 7 to 8 (110 to 126)</td>
<td>Over 70 to 75 (1.10 to 1.18)</td>
<td>-$150.00</td>
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<tr>
<td>Over 8 to 9 (126 to 142)</td>
<td>Over 75 to 80 (1.18 to 1.26)</td>
<td>-$300.00</td>
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<td>Over 9 to 10 (142 to 158)</td>
<td>Over 80 to 85 (1.26 to 1.34)</td>
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<td>Over 10 to 11 (158 to 174)</td>
<td>Over 85 to 90 (1.34 to 1.42)</td>
<td>-$600.00</td>
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<tr>
<td>Over 11 (174)</td>
<td>Over 90 to 95 (1.42 to 1.50)</td>
<td>-$750.00</td>
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<tr>
<td>Over 95 (1.50)</td>
<td>(1)</td>
<td>(1)</td>
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</table>

(1) Corrective work required
Specification Changes

Plan Note 401.19

Already dual index spec
- Incentive only
- How CA PI & IRI affect $$$

1. Change to IRI solely

2. Change to Proposal Note
Equipment/Operator Certification

Changes to SS 1058

- Utilize AASHTO PP 49-03 & PP 50-03
- New certification course (build Fall ’06)
  - State Fairgrounds – Columbus
  - 2 lanes consisting of all material types and surface textures ODOT commonly builds
  - Limited availability
Equipment/Operator Certification

Timeline of new Equipment Requirements

Up to March 2007

- No changes
- Conducted by Materials Management
  Bituminous Section
- Based on CA PI
- Only lows speed equipment certified
Equipment/Operator Certification

Timeline of new Equipment Requirements
After March 1, 2007
- Conducted by Pavement Engineering
- Based on CA PI & IRI
- Multiple sections
- All inertial profiling equipment certified
  (not limited to lightweight or low speed devices)
- Operator demonstrates equipment proficiency
- Must use ProVAL to generate indices
Equipment/Operator Certification

Timeline of new Equipment Requirements

After March 1, 2008

- Based on ability to collect accurate profiles
  - Repeatability
  - Reproducibility
- Multiple sections
- All inertial profiling equipment certified
- Operator demonstrates equipment proficiency & knowledge of Specifications
- Must use ProVAL to generate indices
Equipment/Operator Certification

Timeline of new Equipment Requirements

2008 and beyond

- Eliminate texture measurement issues

May require height sensor upgrade!
Ohio Smooth Paving Workshop

March 20-22, 2006 (Mon, Tue, & Wed am)
ODOT Central Office Auditorium
1980 West Broad Street
Columbus, Ohio 43223

Registration Required
Cost $0/person = FREE

Brochures at FHWA exhibit
Ohio Smooth Paving Workshop

- For Paving Contractors & ODOT Pavement acceptance staff
- Learn in detail about:
  - How road profilers work
  - IRI and Ride Quality
  - Spec changes
  - Equipment/Certification Changes
Ohio Smooth Paving Workshop

- Learn how to use ProVAL software
  - FHWA shareware free at: www.roadprofile.com
  - Finding IRI hotspots
  - Smoothness QC tools
  - Diamond grinding simulator
  - Answers to $$$$ questions
Ohio Smooth Paving Workshop

- Learn from Contractors experienced with IRI and smooth paving techniques
  - Construction tips
  - Lessons learned
  - How smoothness incentives affect their bids
  - How they identify what helps or hurts IRI
Old Dilemma: New Solution?

- Pilot Bridge Ride Specification
  - ODOT Structures
  - ODOT Construction
  - ODOT Pavement Engineering
  - Industry
- 25’ Pave, approach slab, deck, approach slab, 25’ pavement = ?? IRI
- Achievable
- Incentive based
- Experimental Spec on 2006 project
Questions ???????

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- http://www.dot.state.oh.us/pavement/PavementManagement/RideQuality.htm
- http://www.roadprofile.com
- http://www.rpug.org