

N.J.D.O.T.
STANDARD SPECIFICATIONS

401.03.03.J. Ride Quality
Requirements

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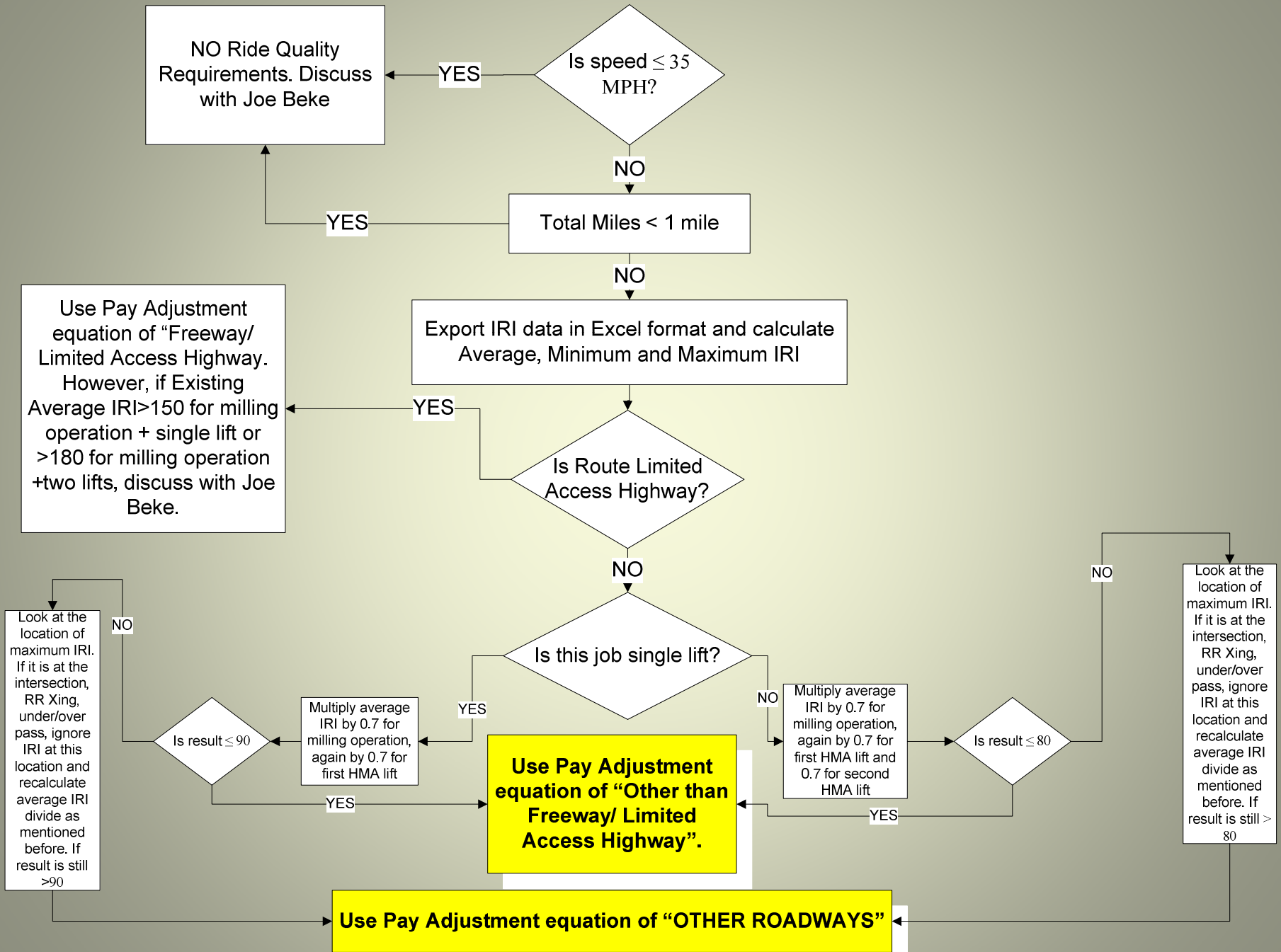
Why A Smoothness Specification?

- In repeated surveys, road condition was cited as the public's #1 criteria for satisfaction
- NCHRP analysis showed that improved smoothness extends pavement performance life by as much as 50%
- Rough pavements adversely affect driver safety, fuel efficiency, ride quality, vehicle wear-and-tear and congestion

- **NJDOT 2004 report to FHWA:**
 - **76.5% of the NHS had IRI \leq 170 inches/mile (2008 goal=95%)**
 - **12.6% of the NHS had IRI \leq 95 inches/mile (2008 goal=60%)**
- **1999 National HPMS report:**
 - **91.7% of NHS IRI \leq 170"/ mile**

- **NJDOT 2008 report to FHWA:**
 - **82% of the NHS had IRI \leq 170 inches/mile (goal=95%)**
 - **41% of the NHS had IRI \leq 95 inches/mile (goal=60%)**

FLOW CHART FOR RIDE QUALITY REQUIREMENTS



Current IRI

Rte	Dir	MP From	MP To	date tested	IRI
<i>287</i>	<i>S</i>	<i>30.10</i>	<i>30.20</i>	01-Jun-07	52
<i>287</i>	<i>S</i>	<i>30.20</i>	<i>30.30</i>	01-Jun-07	80
<i>287</i>	<i>S</i>	<i>30.30</i>	<i>30.40</i>	01-Jun-07	67
<i>287</i>	<i>S</i>	<i>30.40</i>	<i>30.50</i>	01-Jun-07	67
<i>287</i>	<i>S</i>	<i>30.50</i>	<i>30.60</i>	01-Jun-07	61
<i>287</i>	<i>S</i>	<i>30.60</i>	<i>30.70</i>	01-Jun-07	62
<i>287</i>	<i>S</i>	<i>30.70</i>	<i>30.80</i>	01-Jun-07	57
<i>287</i>	<i>S</i>	<i>30.80</i>	<i>30.90</i>	01-Jun-07	59
<i>287</i>	<i>S</i>	<i>30.90</i>	<i>31.00</i>	01-Jun-07	63

RIDEABILITY SPEC / IRI SPEC

- **NJDOT will test**
- **Use Class 1 Profiler**
- **0.01 mile test sections**
- **Full extent of paving, in wheel paths, average of 3 runs**
- **Test “Final Riding Surface” of traveled way**

RIDEABILITY SPEC / IRI SPEC

- **Control testing**
- **Preparation**
- **Acceptance / Exclusions**
- **Formulas**
- **Retest provision**

Table 401.03.03-7 Pay Equations for Ride Quality for 0.01 Mile

		More than one lift	
Freeways / Limited Highways	Access:	IRI < 43	PA = \$100
		43 ≤ IRI < 63	PA = \$315 – (\$5.00 × IRI)
		IRI = 63	PA = \$0
		63 < IRI ≤ 125	PA = (IRI – 63) × (–\$16.1290)
		IRI > 125	Remove & Replace
		One lift	
		IRI < 55	PA = \$50
		55 ≤ IRI < 75	PA = \$187 – (\$2.50 × IRI)
		IRI = 75	PA = \$0
		75 < IRI ≤ 145	PA = (IRI – 75) × (–\$7.1429)
		IRI > 145	Remove & Replace

**Highways Other Than
Freeways/
Limited Access**

More than one lift

IRI < 60

PA = \$50

$60 \leq \text{IRI} < 80$

PA = \$200 - (\$2.50 × IRI)

IRI = 80

PA = \$0

$80 < \text{IRI} \leq 150$

PA = (IRI - 80) × (-\$7.1429)

IRI > 150

Remove & Replace

One lift

IRI < 70

PA = \$50

$70 \leq \text{IRI} < 90$

PA = \$225.00 - (\$2.50 × IRI)

IRI = 90

PA = \$0

$90 < \text{IRI} \leq 160$

PA = (IRI - 90) × (- \$7.1429)

IRI > 160

Remove & Replace

Other Roadways	IRI < 80	PA = \$50
	80 ≤ IRI < 100	PA = \$250 – (\$2.50 × IRI)
	IRI = 100	PA = \$0
	100 < IRI ≤ 170	PA = (IRI – 100) × (–\$7.1429)
	IRI > 170	Remove & Replace
Ramps and Shoulders	IRI = 120	PA = \$0
	120 < IRI ≤ 170	PA = (IRI – 120) × (–\$10.00)
	IRI > 170	Remove & Replace

WHAT THE FORMULAS MEAN

Interstate /Restricted Access with more than one lift of paving:

Per 0.01 lane mile \$100 or - \$1000

Interstate /Restricted Access with one lift, and other Traveled Way:

Per 0.01 lane mile \$50 or - \$500

Ramps & Shoulders – no positive PA, only negative PA (stick, no carrot)

Statistical Analysis

1 Lift Interstate Road	69
2 Lifts Interstate Road	46
1 Lift State Road	141
2 Lifts State Road	77

OTHER STATES

www.smoothpavements.com

- Bonus payments are generally capped at \$600 per 0.1 mile by most states; New Jersey pays \$1000 as maximum.
- Most states use 30 or 35 as the top of the range for maximum bonus payment; New Jersey pays maximum at 45 and higher.
- Many states require corrective action at IRI = 70; New Jersey has remove and replace at >125 and above.

2008 PROJECTS RESULTS

IRI TARGET % OF LOTS IN POSITIVE PA

120 >91 %

100 >52 %

90 >88 %

85 >67 %

80 >89 %

70 >90 %

63 ~90 %



HIGH SPEED PROFILER



ROADWAY DATA COLLECTION VEHICLE



Front end showing cameras, GPS and laser box



INO Rut Bar

- ANY QUESTIONS?

