

# IRI TESTING IN NORTH CAROLINA

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## *CURRENT SPECIFICATIONS*

- Starting in January 2012, the rideability in NC can be evaluated using the following options:
  - 10 ft. Stationary Straightedge (joints, etc)
  - 10 ft. Rolling Straightedge (Hearne)
  - Inertial Profiler w/ line laser



# *CURRENT PROJECT CRITERIA AND SPECIFICATIONS*

- Implemented on projects in 2012 and future
- Criteria for Asphalt:
  - Facility is 45 mph or greater
  - Length is 1 mile or greater
  - Must have at least 2 new lifts of asphalt
- And all concrete pavements



# *CURRENT PROJECT CRITERIA AND SPECIFICATIONS*

- Hearne measurement uses 2500' sections and 0.2", 0.3" and 0.4" deviations (blanking bands):
- Less deviations can lead to incentives of \$100 to \$300
- Moderate CSI values can results in disincentives of up to \$600
- More than 6 deviations exceeding 0.2" results in corrective action



# INCENTIVES AND DISINCENTIVES BASED ON MIRI VALUES

MIRI After Completion (in/mile)	Price Adjustment Per Lane (0.10 Mile Section)
45.0 and under	\$200.00
45.1 – 55.0	$PA = 600 - (10 \times MIRI)$
55.1 – 70.0	Acceptable – no adjustment
70.1 – 90.0	$PA = 650 - (10 \times MIRI)$
Over 90.1	Corrective Action

*IRI Incentive is approximately 3 times Hearne Incentive*

*Table 10-7, 2013 NCDOT QMS Manual*



# *CURRENT PROJECT CRITERIA AND SPECIFICATIONS – LOCALIZED ROUGHNESS*

- Localized Roughness threshold is 125 in/mile
  - Uses Smoothness Assurance Module (SAM) in ProVal.
  - 25 ft intervals
  - Any LR exceeding 125 in/mile requires corrective action



# *PROJECTS*

- IRI Projects in the last 2 years in NC have included:
  - Interstates – I-540 (concrete), I-40
  - 4-6 lane divided – US 64, US 74/19, NC 147, US 311
  - 2 lane rural – NC 158



# PROJECT LOCATIONS

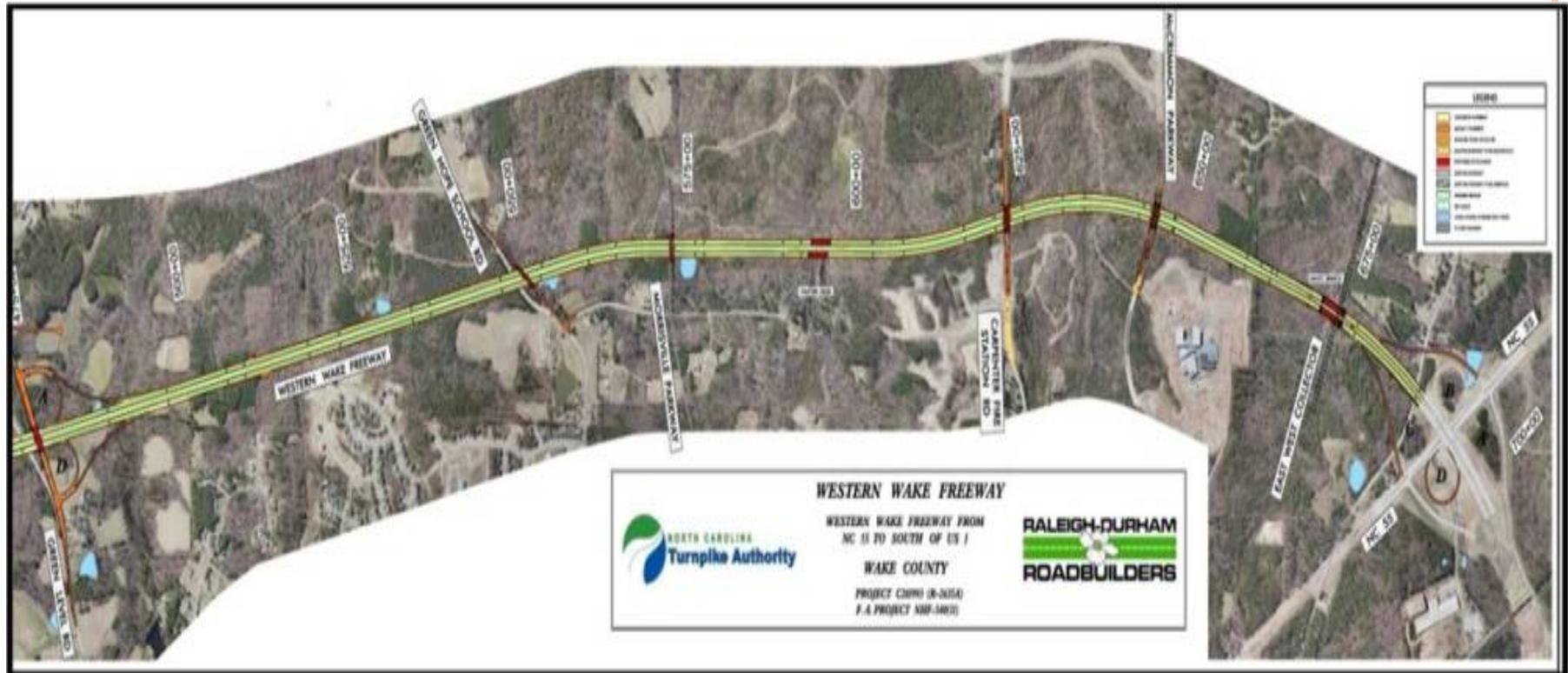


## *PROJECT RESULTS – I540*

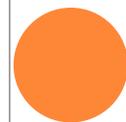
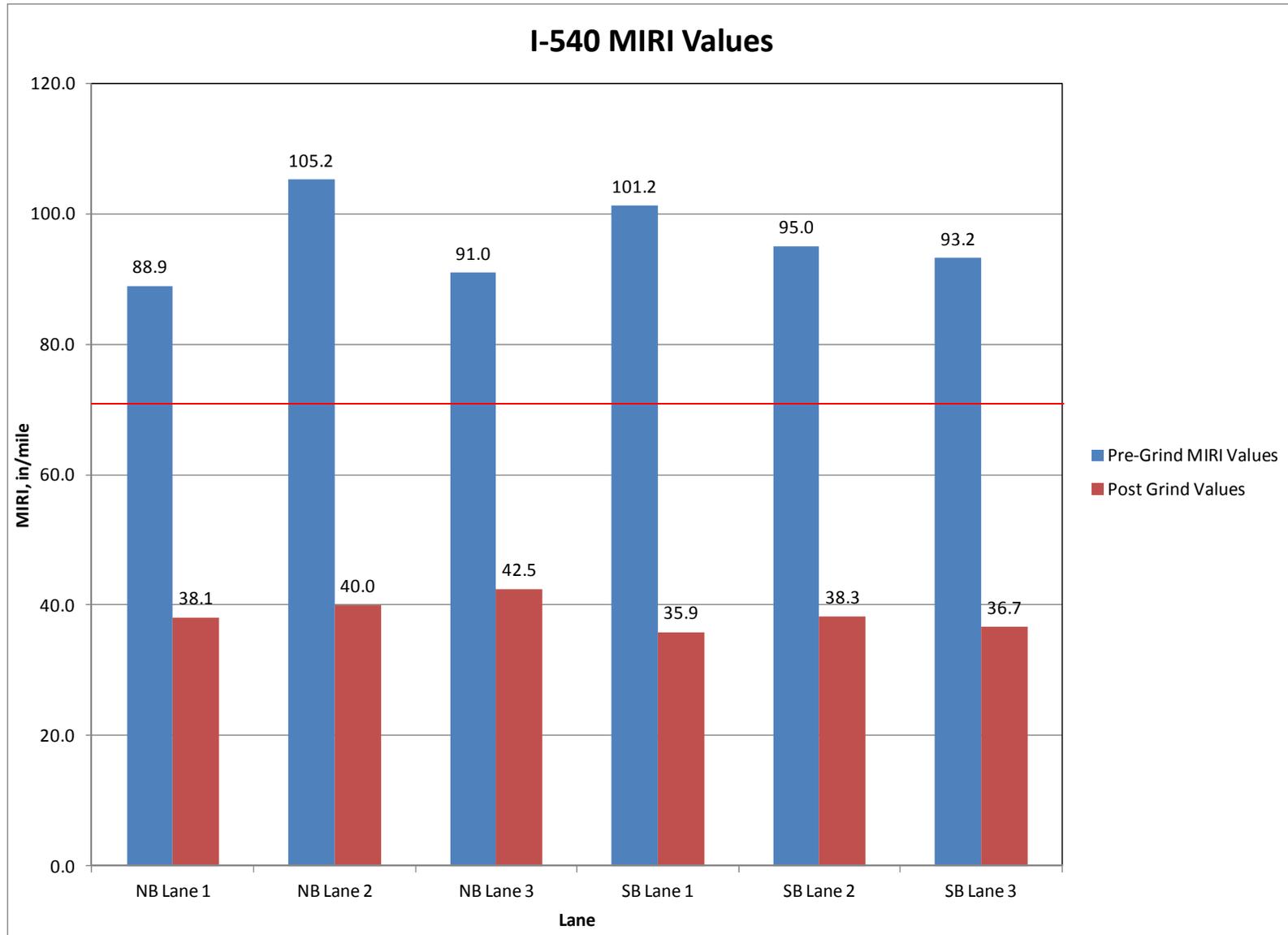
- I-540 Raleigh, NC
- New Construction – 13 miles (tested only 1 section), 6 lane divided
- Diamond ground concrete
- Pre-grind and post grind testing performed
- Diamond grinding resulted in an average reduction of 60% in MIRI
- Contractor qualified for \$52,000 in bonus



# PROJECT RESULTS – I540

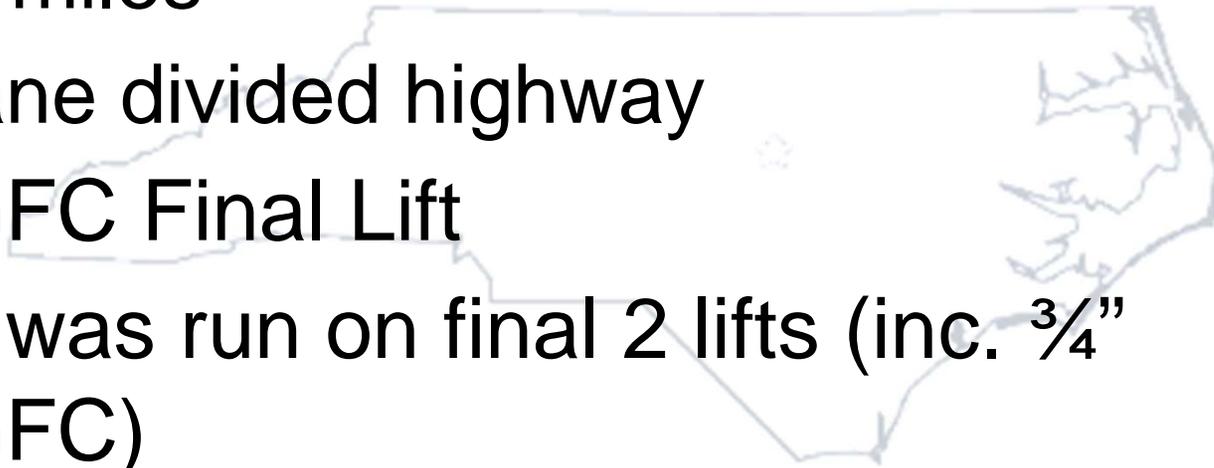


# PRE-GRIND VS. POST GRIND

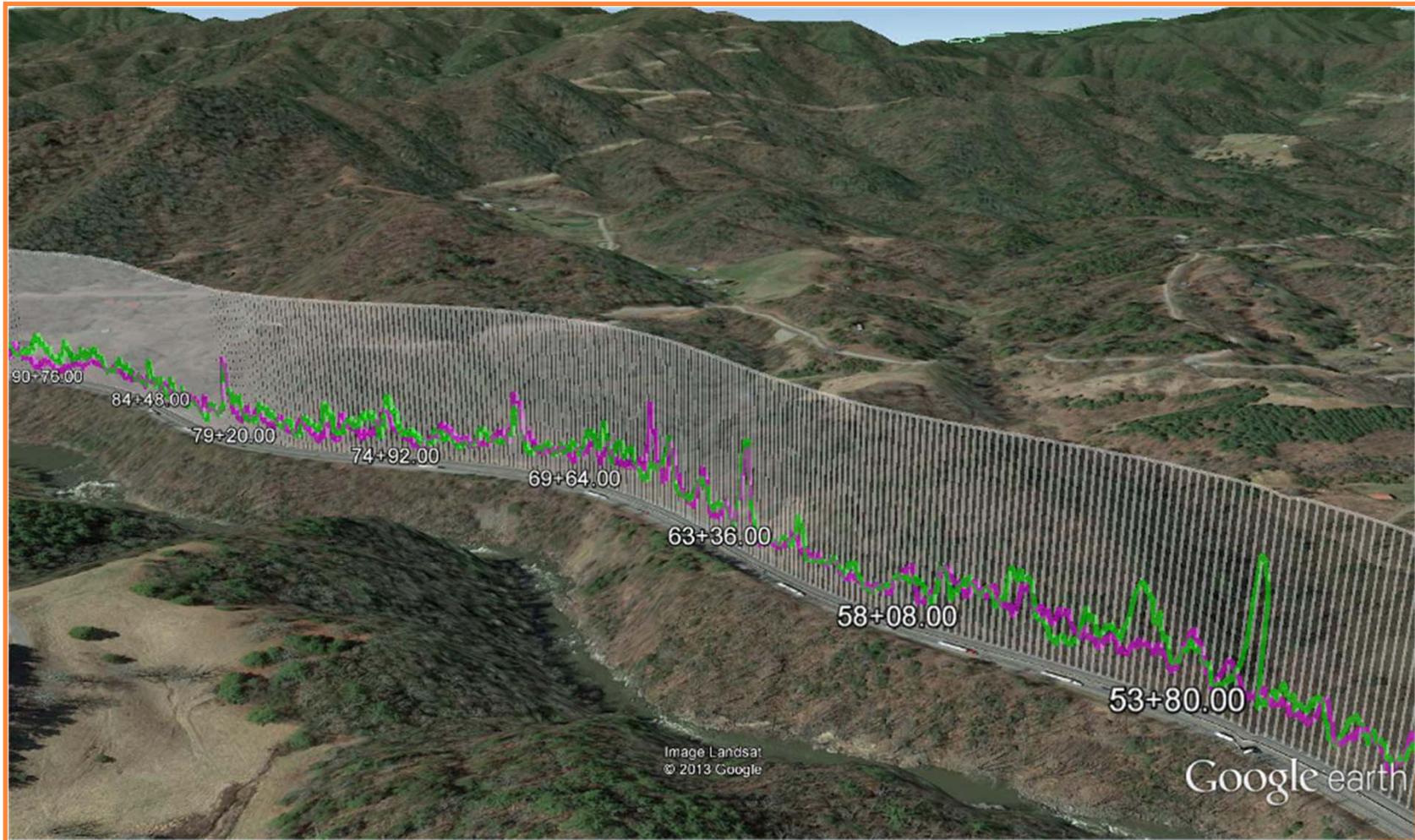


## *PROJECT RESULTS – I-40*

- I-40 Haywood County
- Asphalt Resurfacing (4.5" mill and fill) – 5.4 miles
- 4 lane divided highway
- OGFC Final Lift
- IRI was run on final 2 lifts (inc.  $\frac{3}{4}$ " OGFC)



# PROJECT RESULTS – I-40

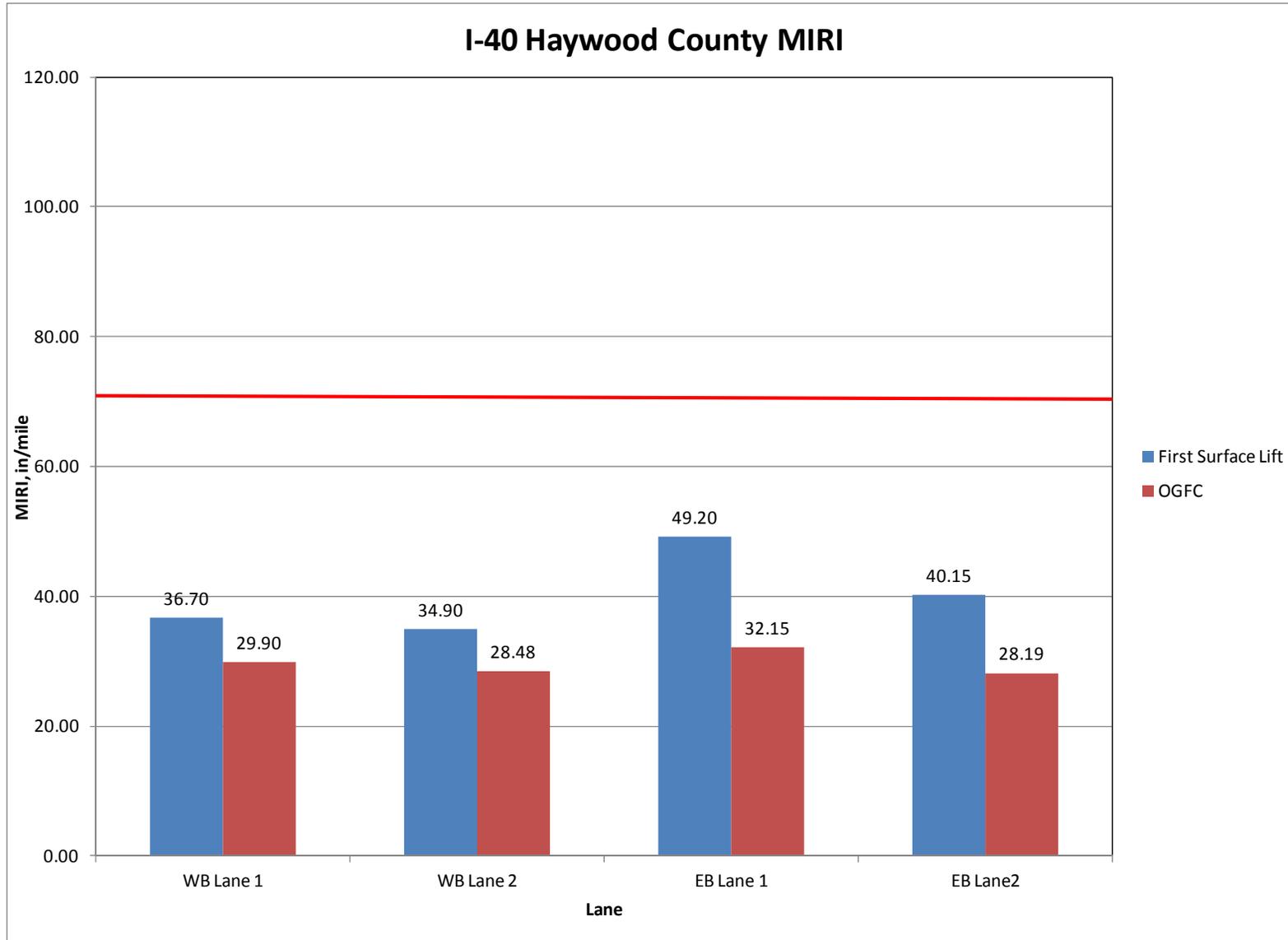


## *PROJECT RESULTS – I-40*

- Average MIRI
- Eastbound – 30.17 in/mile
- Westbound – 29.19 in/mile
- Avg. of 26% reduction in MIRI between lifts, however Localized Roughness events increased slightly
- Contractor qualified for \$42,000 in bonus

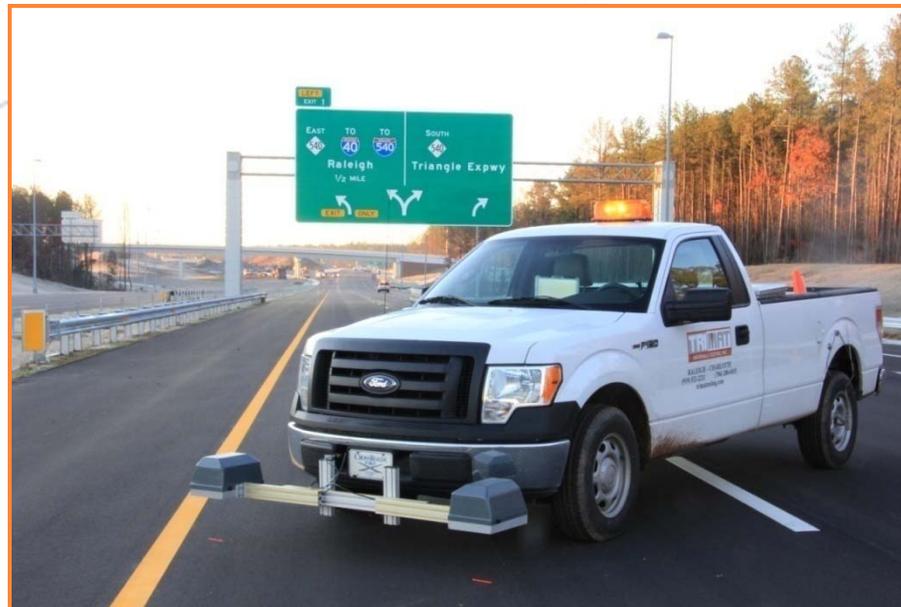


# PROJECT RESULTS – I-40



# PROJECT RESULTS

- NC 147 (Triangle Expressway) Durham, NC
  - New asphalt construction – 3.6 miles
  - 6 (8) lane divided highway
- Paved using a 24' screed, 2 lanes at a time
- IRI was run on final lift only - QA

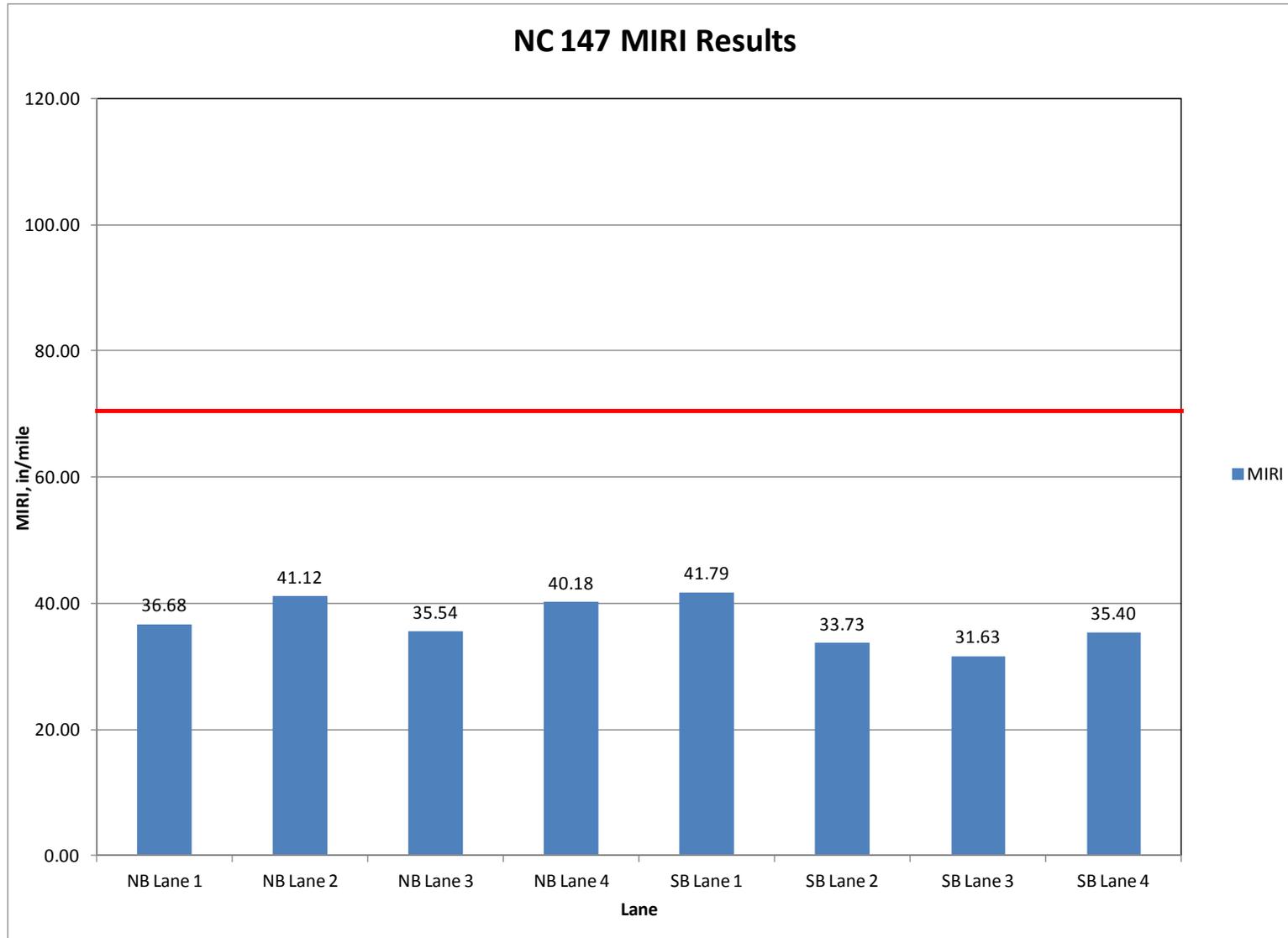


# *PROJECT RESULTS – NC 147*

- All MIRI values were below 45 in/mi
- Contractor was eligible for \$40,000 in bonus under current specs.



# PROJECT RESULTS – NC 147

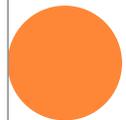
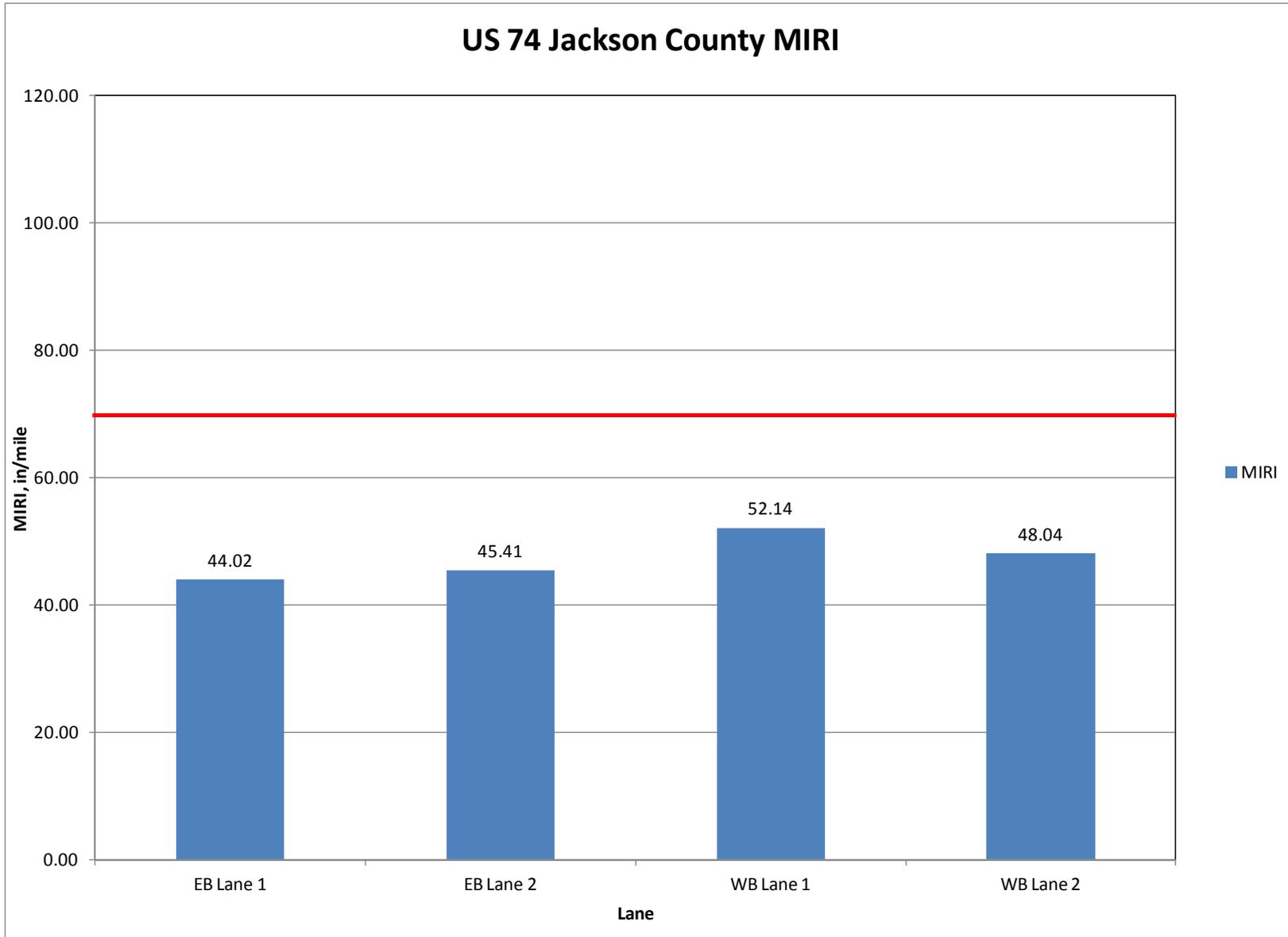


## *PROJECT RESULTS – US 74*

- US 74 Jackson County
  - 2 miles, 4 lanes divided; mill and fill asphalt pavement
  - Avg. MIRI:
    - EB – 44.72 in/mile
    - WB – 50.09 in/mile
  - Contractor was eligible for approximately \$10,000 bonus



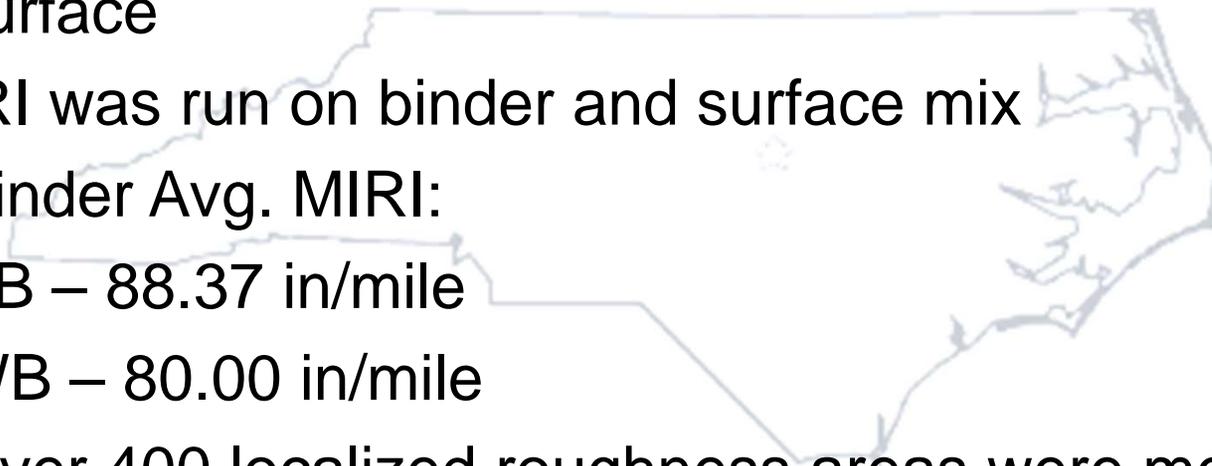
# PROJECT RESULTS – US 74



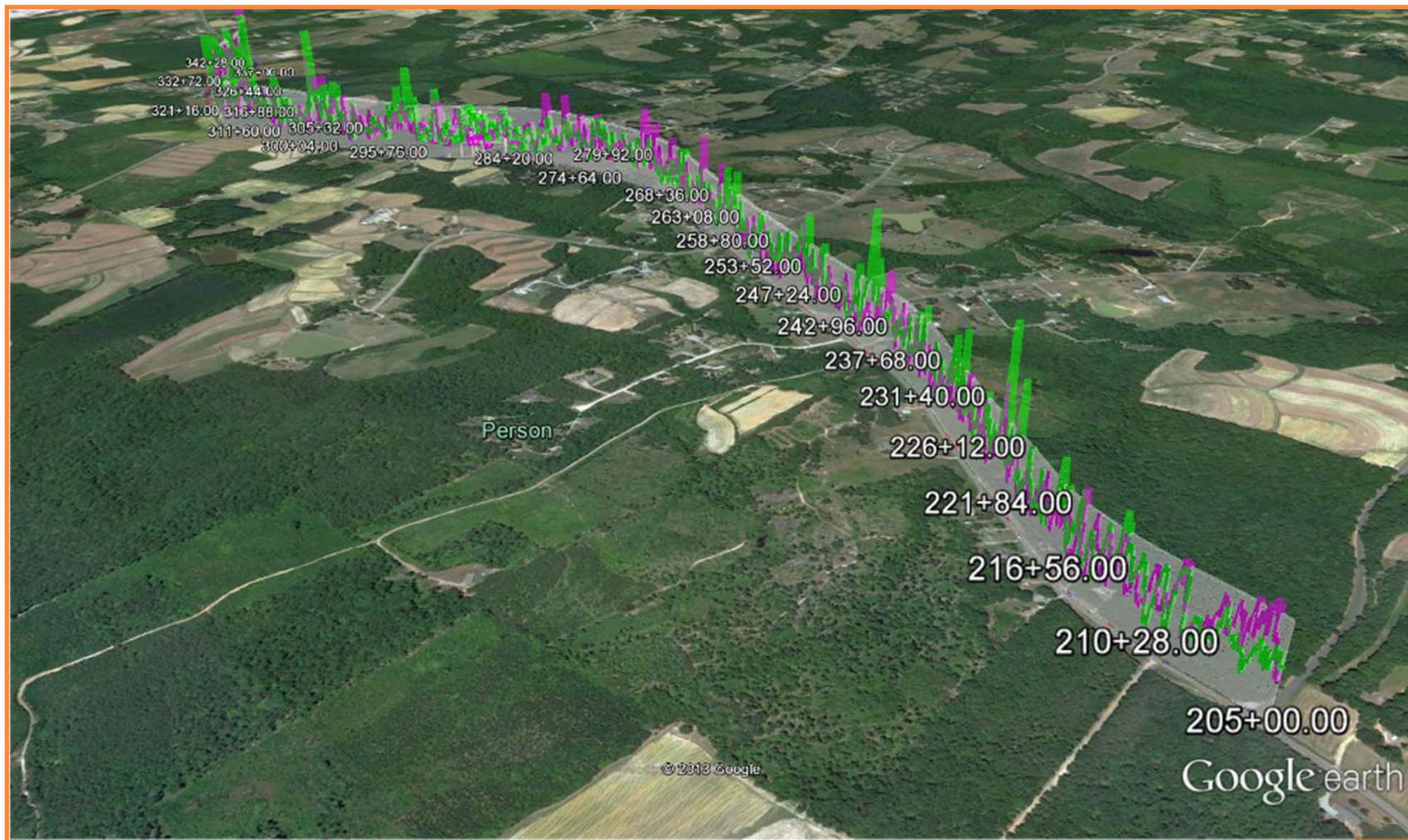
# *PROJECT RESULTS – NC 158*

## ○ NC 158 Oxford

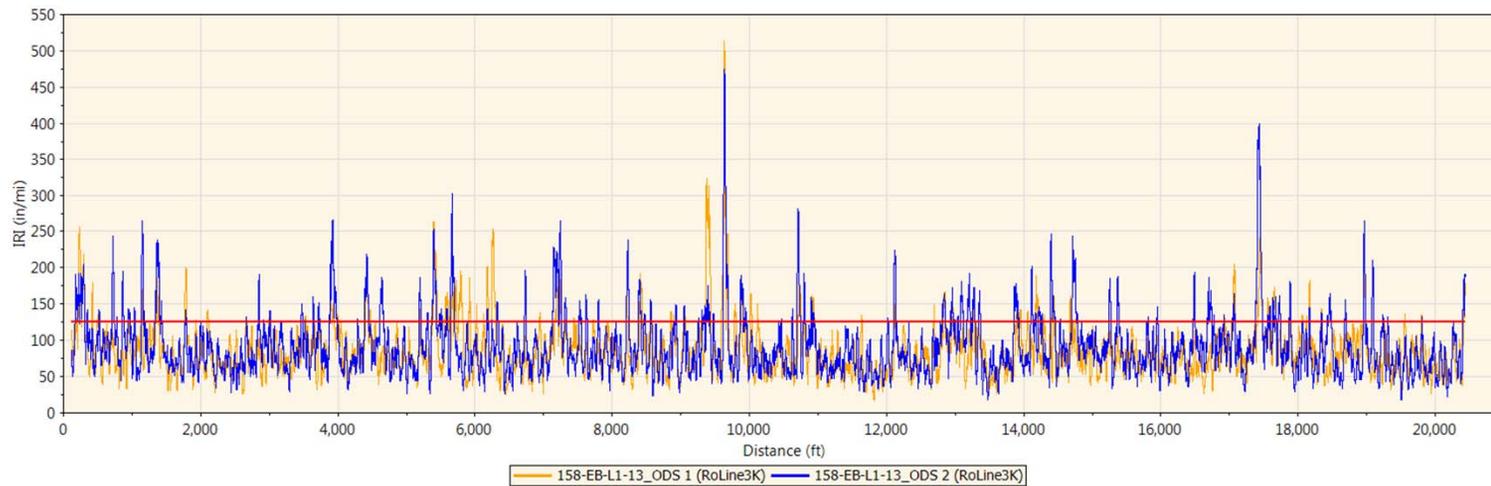
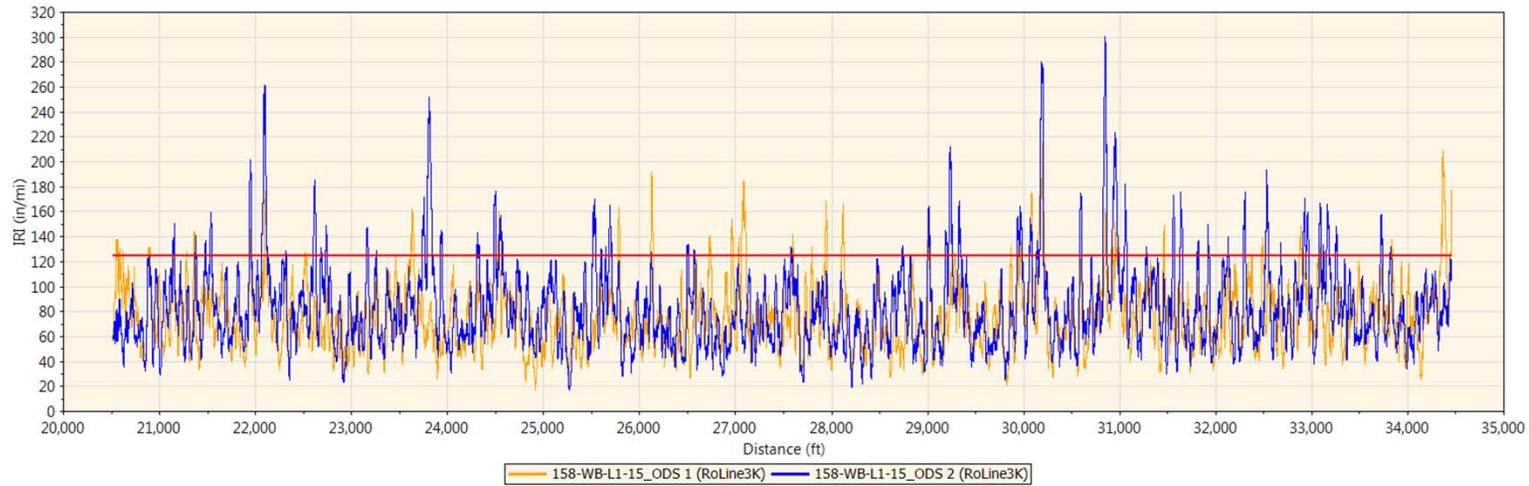
- Approximately 4 miles in length, 2 lane rural asphalt roadway, milled 4", placed 2.5" binder and 1.5" surface
- IRI was run on binder and surface mix
- Binder Avg. MIRI:
- EB – 88.37 in/mile
- WB – 80.00 in/mile
- Over 400 localized roughness areas were measured on binder



# PROJECT RESULTS – NC 158



# LOCALIZED ROUGHNESS - BINDER



## *PROJECT RESULTS – NC 158*

### ○ NC 158 Oxford - Surface

- Final Surface Mix
- Avg. MIRI:
  - EB – 65.07 in/mile
  - WB – 67.15 in/mile
- 28% reduction in MIRI. 192 localized roughness locations
- Contractor received a \$1200 penalty for ride and may assessed a penalty for all areas of localized roughness



## *FUTURE IN NC WITH IRI*

- How to properly address localized roughness problems and/or the threshold?
  - Grinding? Remove and Replace? Patch? Penalties? Change Threshold?
- Percent improvement for use on asphalt resurfacing projects.
  - Run initial IRI, then determine percent improvement based on initial quality. No LR
- Possibly applying different criteria for different facilities

