



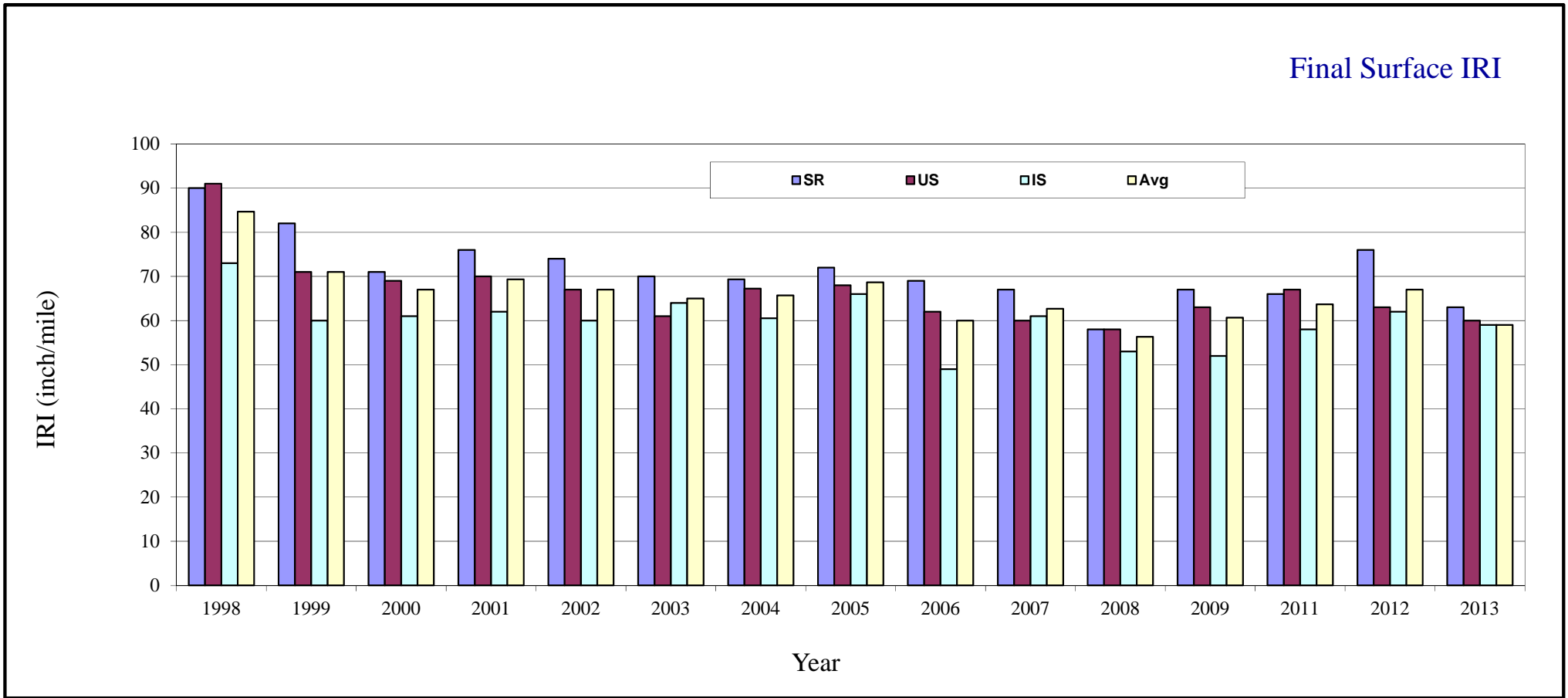
## **AN ASSESSMENT OF INCENTIVE-ONLY RIDE SPECIFICATION FOR ASPHALT PAVEMENTS**

**Hari Nair and Kevin McGhee - VTRC**  
**Affan Habib, Michael Wells, and Bipad Saha - VDOT**



- Applied to both concrete and asphalt pavements
- Uses a high-speed inertial profiler
- *Agency performed* acceptance testing
  - (i) “Full” Incentive-Disincentive Spec
    - Exceptions:
      - ❖ Sections less than 0.5 mile
      - ❖ Excessive grade change
      - ❖ Too many signalized intersections
      - ❖ Curb and gutter
      - ❖ Less than 10 feet lane width, etc....
  - (ii) Incentive-only Spec
    - Exceptions:
      - ❖ Projects that qualify for “Full” Spec
      - ❖ Low-volume secondary roads





## Asphalt Quality Task Force (AQTF) – circa 2011

- Makeup – Leaders from VDOT and Industry
- Mission - develop and offer recommendations that will promote higher quality asphalt construction on Virginia roadways.

## Recommendation (primarily industry driven):

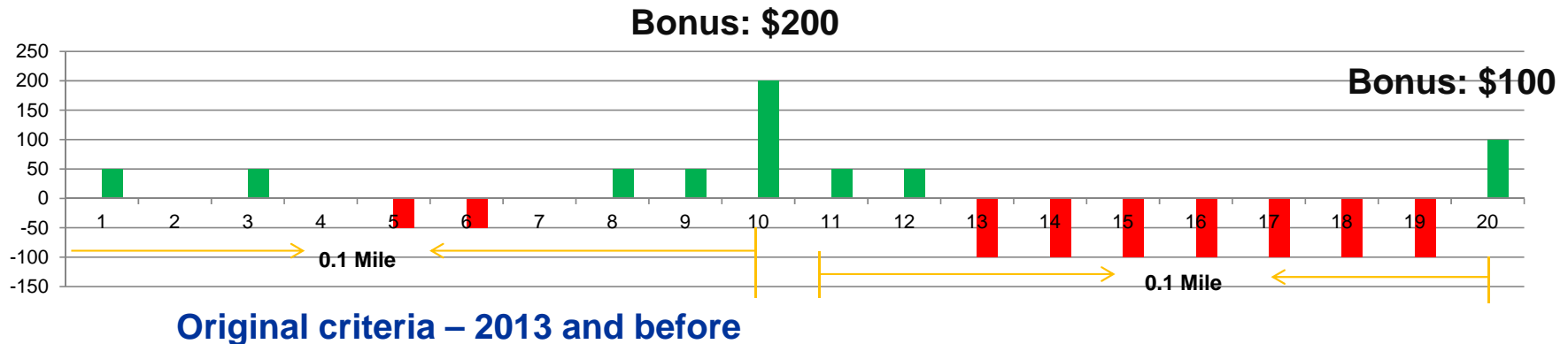
- Make the “incentive only” rideability specification a default on all maintenance and construction contracts (w/speeds  $\geq 45$  mph).
- BUT FIRST, complete a pilot project to assess:
  - Contractors response
  - Quality improvement and value
  - Balance of risk and reward



## Applied criteria:

- Pay adjustments estimated for each 0.01 mile segment
  - Penalty segments ignored
  - Bonus segments add to bonus
- No corrective action

Original Incentive-Only	
IRI After Completion (Inches Per Mile)	Pay Adjustment (Percent Pavement Unit Price)
<b>55.0 and Under</b>	<b>115</b>
<b>55.1-65.0</b>	<b>110</b>
<b>65.1-80.0</b>	<b>100</b>



- Urban Project Review
  - Incentive-only Projects
    - Project 1 – considerable improvement (43%), substantial incentives, little locally-high roughness
    - Project 2 – good improvement (29%), some incentives, considerable locally-high roughness
  - Control Projects
    - 26% average improvement ← What should we expect this to be?
    - “Normal” assortment of local high-roughness lots
- Rural Project Review
  - Substantial improvement, although “after IRI” still high
  - Limited contractor ability to change process



## VTRC Report 16-R2: Assessment of an Incentive-Only Ride Specification

<http://vtrc.virginia.gov/PubDetails.aspx?PubNo=16-R2>

### Recommendations:

- Modify method for calculating incentives and revise pay bands
- Extend a pilot to involve all districts  
(At least 2 per district)



## Proposed criteria:

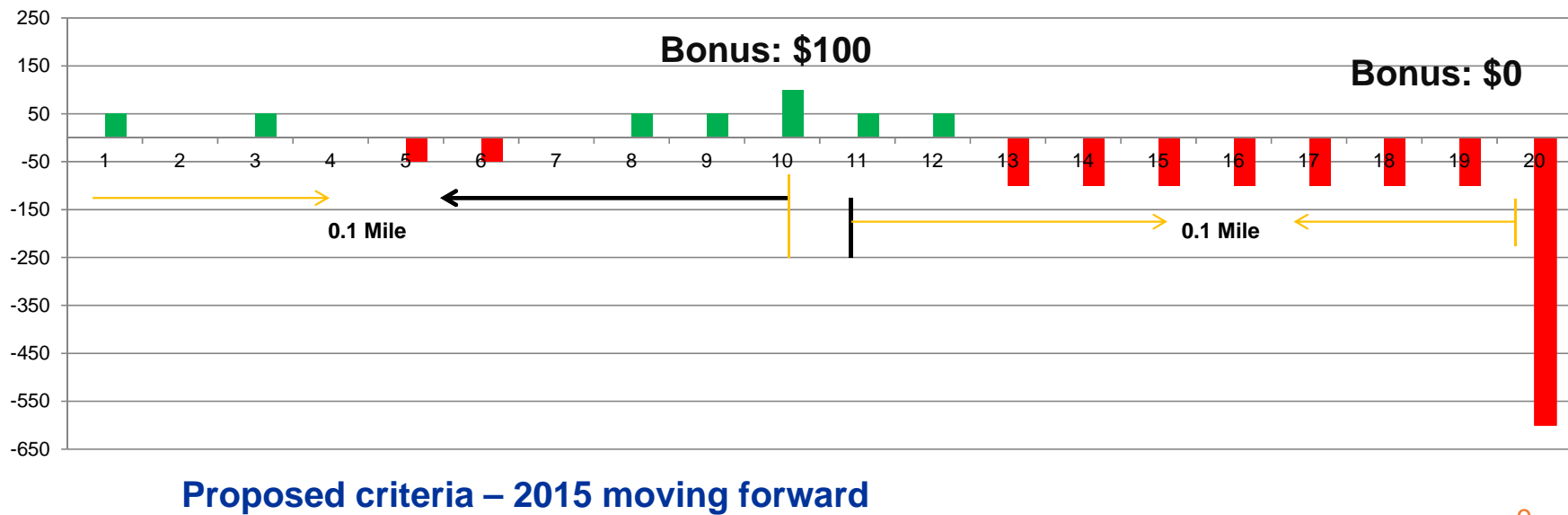
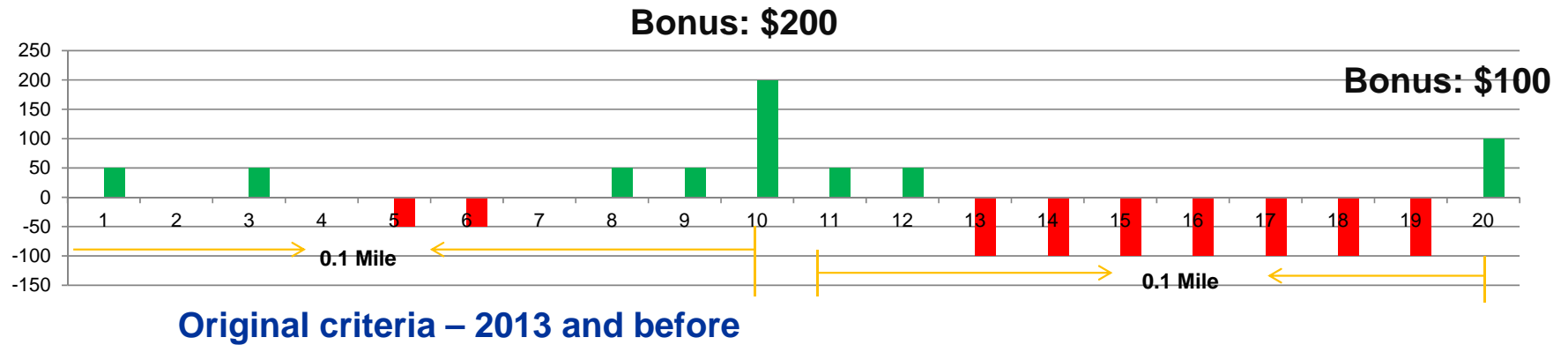
- Pay adjustments estimated for each 0.01 mile segment
- Adjustments then aggregated every 0.1 mile (see next slide)
  - Net penalty ignored
  - Net incentive added to bonus
- No corrective action

Revised INCENTIVE-ONLY	
IRI After Completion (Inches Per Mile)	Pay Adjustment (Percent Pavement Unit Price)
60.0 and Under	115
60.1-70.0	110
<b>70.1-85.0</b>	<b>100</b>
85.1-95.0	90
95.1-105.0	80
105.1-115.0	70
115.1-135.0	60
135.1-155.0	40
155.1-175.0	20
Over 175.1	0

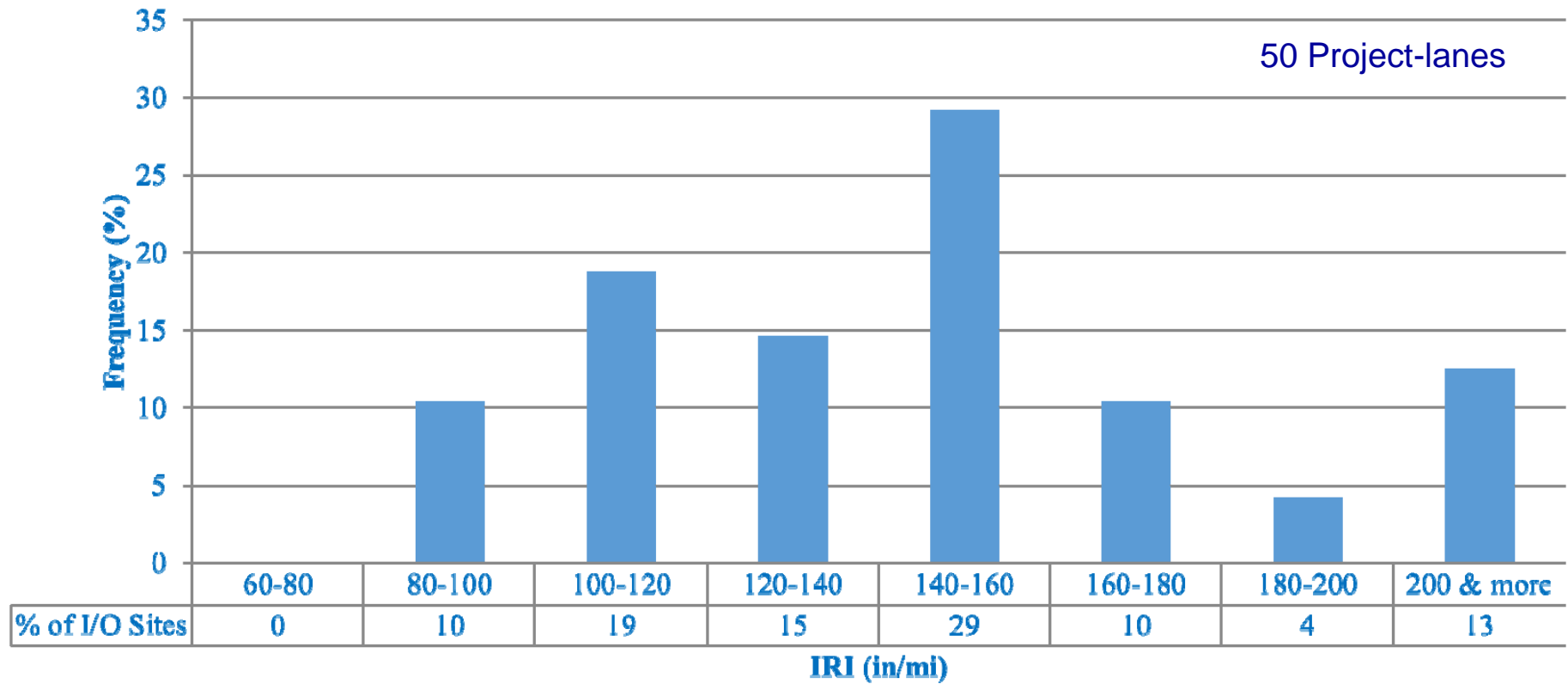




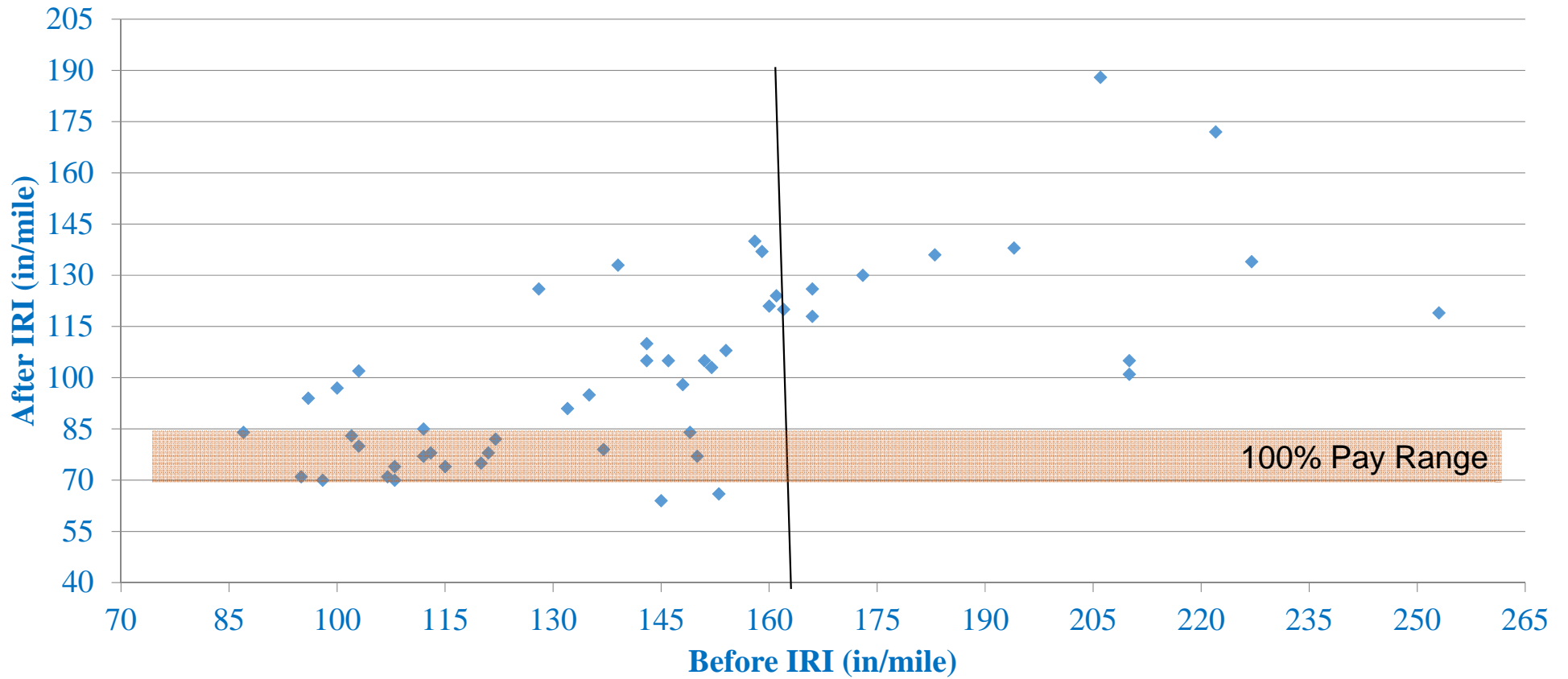
# CRITERIA COMPARISON



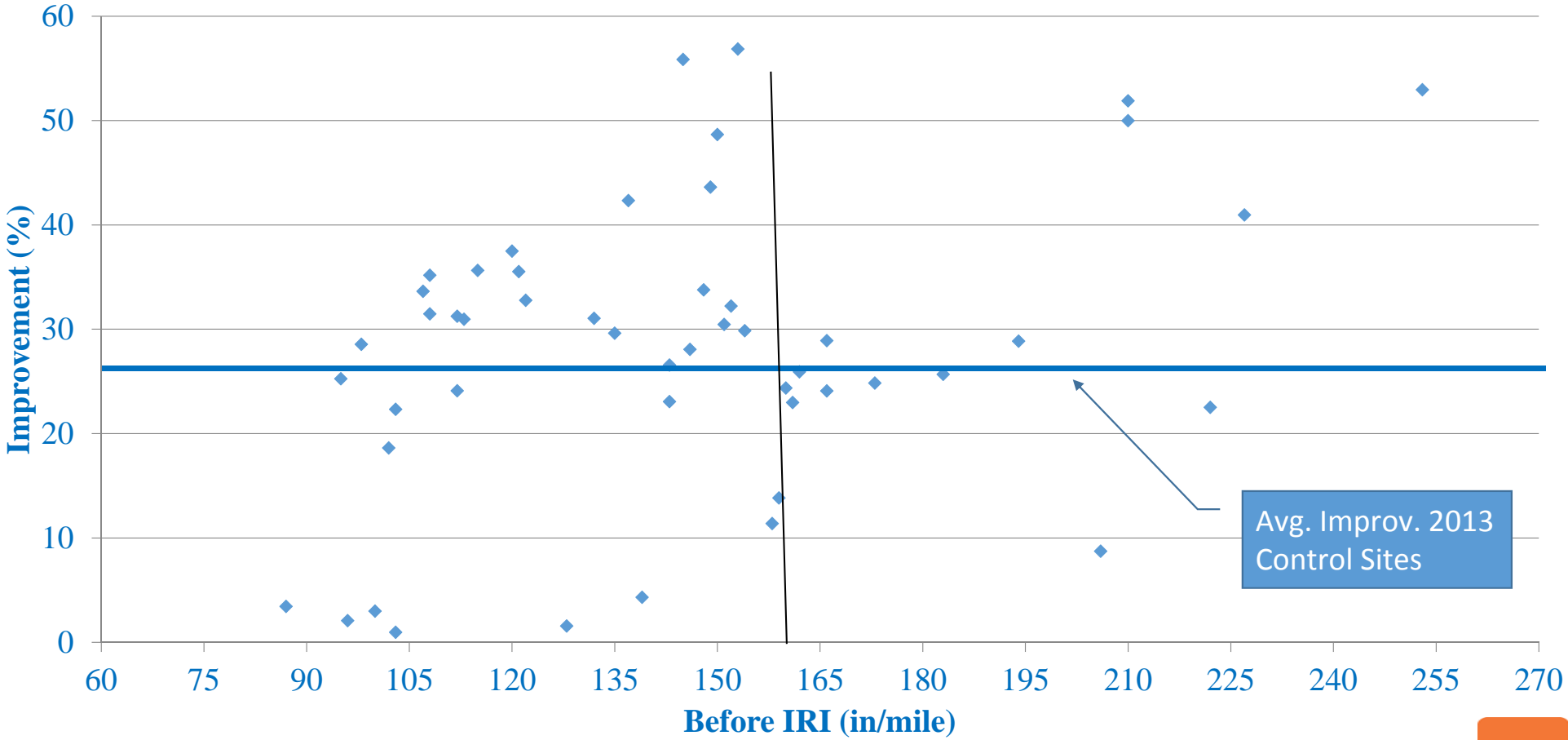
# Original Surface IRI



# Before IRI vs. After IRI



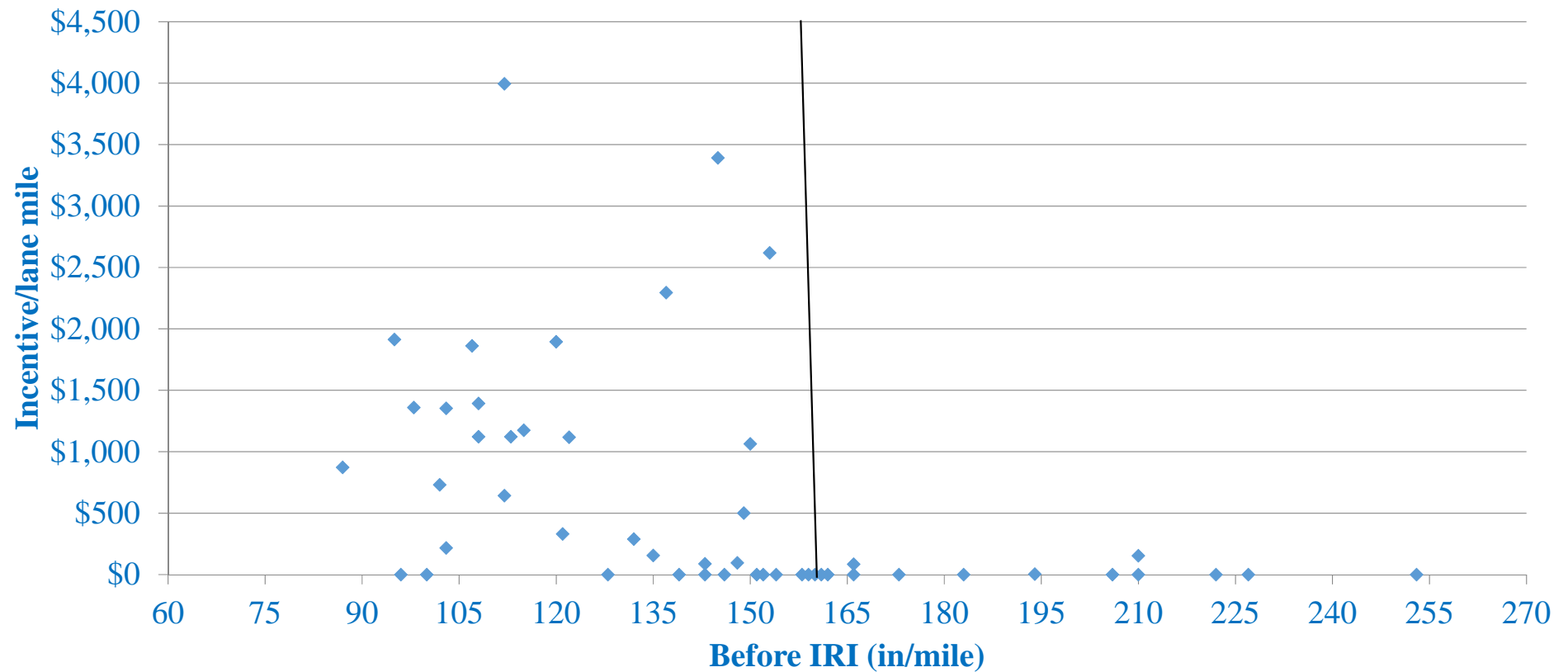
# Before IRI vs. Improvement



Avg. Improv. 2013  
Control Sites



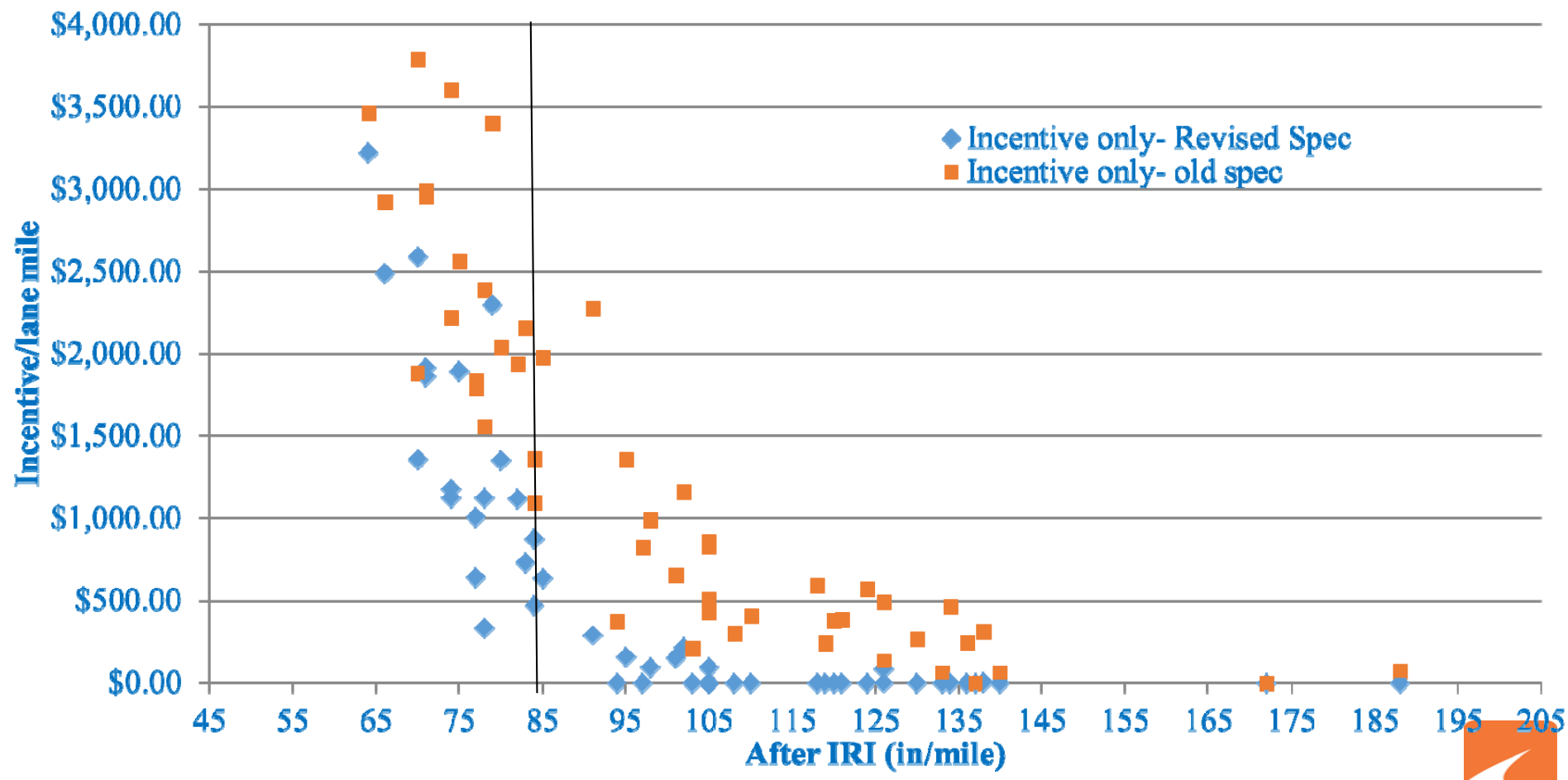
# Before IRI vs. Incentives



Note: incentive prospects poor when before-IRI > 160



# CRITERIA COMPARISON



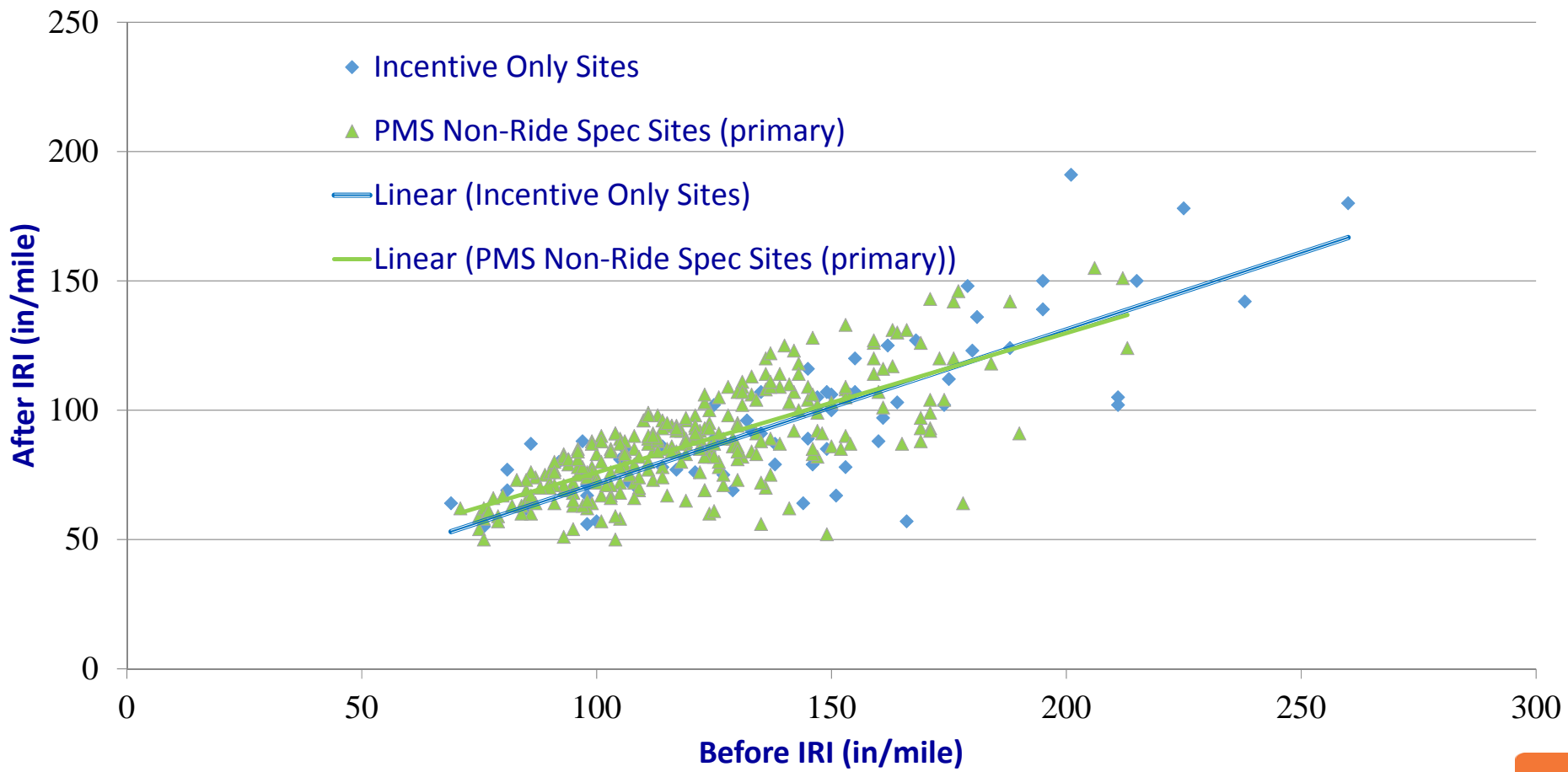
In other words, what do we get in absence of any ride quality requirements?

## “Mining” the PMS Data:

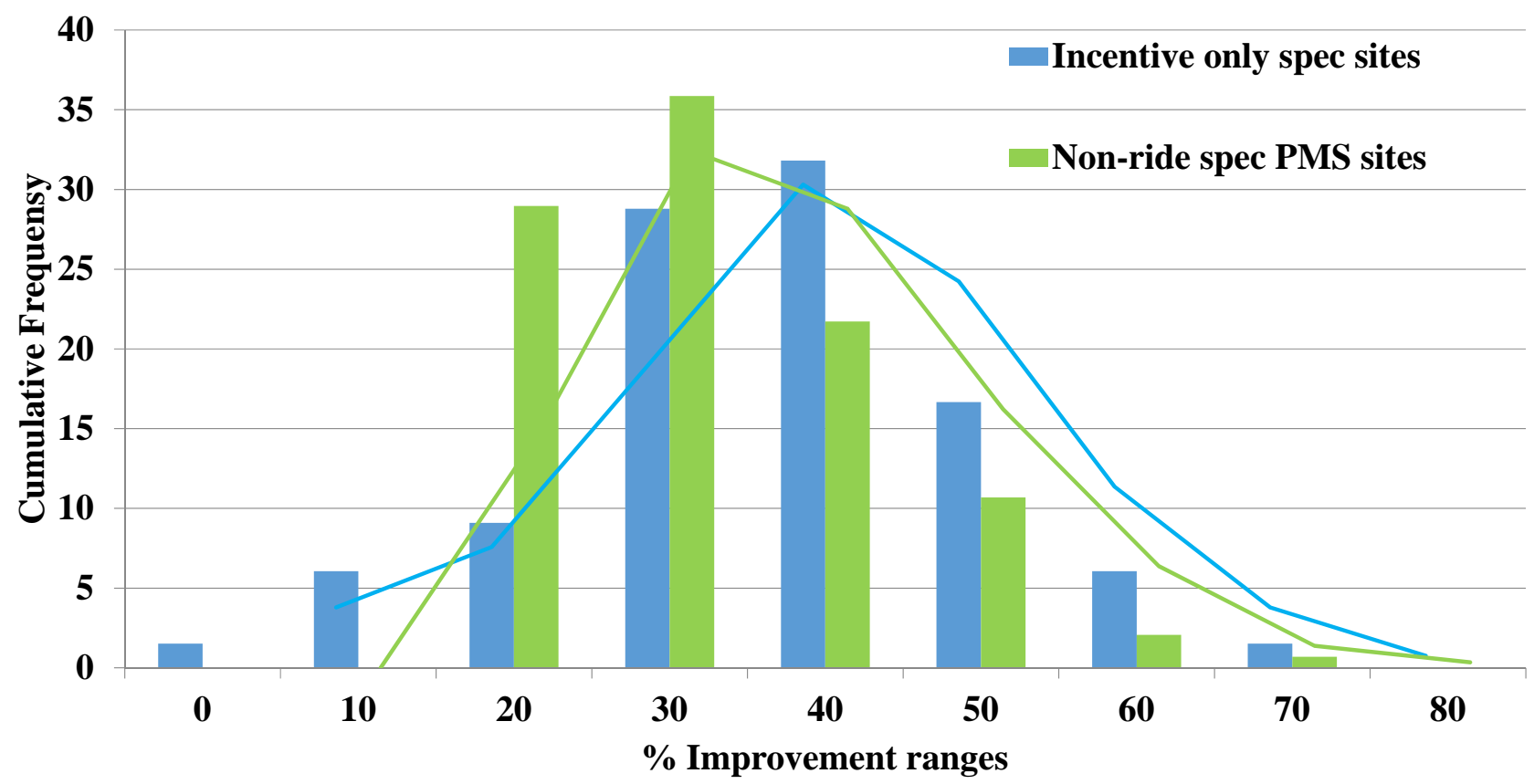
- PMS ride data before- and after- resurfacing
- Non-ride spec and ride spec projects compared
  - Significant and consistent difference?
  - If so, relevant to incentive-only criteria?



# Incentive-Only vs. "Normal"







- The revised specification criteria much improved compared to originally-proposed
  - Maintains potential for significant incentives while...
  - Reducing likelihood for “accidental” bonuses
- Incentives minimal when original-surface IRI>160
  - Application to these projects worth the trouble?
- Overall, no statistically reliable distinction between incentive-only pilot projects and normal (non-ride spec) paving
- Although, higher levels of improvement were observed with the incentive-only pilots



## Rideability Testing Program :

- Currently approximately 800 to 1,000 lane-miles per year
- New program may add approximately 1,000 to 1,500 lane-miles per year

## Maintenance Budget

- Incentive-Only payout for 2015 approximately \$998 per lane mile
- Extrapolated to an additional 1,250 lane miles, potential increase of \$1.25 M per year

## VDOT Resource Need

- Testing currently covered using 2 full time VDOT Profilers and a third Profiler through on-call consultant
- Likely need 3 full time VDOT Profilers and option for fourth (consultant services and/or contractor-performed?)





# QUESTIONS

Want to be Kevin's next boss?

<https://virginiajobs.peopleadmin.com/postings/52702>

