So Many Choices; So Much Data

Rick Miller
Kansas Department of Transportation
The Years of Worst First

Pavement Condition

Leave It

Replace It
The Easy Age to Better Data

• “Measuring” Pavement Condition
  – Panel Ratings
  – Small Samples

• Fairly easy to summarize and use
Learning from data

• Could not build our way out
• Started to see ranges for mix of fixes strategies
• Mix of fixes toolbox was growing
  – Overlays, seals, recycling, grinding, etc.
• Bigger push for data driven decisions
Data improved with needs and use

• Profilers
  – ~100% sample (at least longitudinally)
  – Objective
  – Repeatable
  – Uses: roughness, rutting, faulting
More data, more effort to use it

- Profile → IRI (calibrated to old ride index)
- Profile → Automated Faulting (calibrated to old manual measurements)
- Profile → Automated Rutting (calibrated to old manual measurements)
- (Cracking was still a visual assessment)
Fat and Happy all going well

• And then...

• Maybe we can/should get more/better data
  – ~100% sample
  – Objective/repeatable
  – Surface 3-D
    • Roughness(es), rutting(s), faulting(s), cracking(s)
Data, data, everywhere; like a fire hose

• At this point mimicking our previous data
  – Roughness from profile in wheelpath (simulated point or 4-inch spread)
  – Rutting from 5-point
  – Faulting from ????
  – Cracking well, this is hard to compare back...but that did not stop us.
Comparisons (not Calibration)
Range and Intensity on U-56
2012 NOS vs 2013 RSP IRI

2012 NOS IRI vs 2013 RSP IRI Values
070U0005600S0EB

International Roughness Index (in/mile)

Milepost

0 20 40 60 80 100 120

23 24 25 26 27 28 29 30 31 32

IRIR
Left Wheelpath IRI Field
IRIR
Right Wheelpath IRI Field
Comparing Transverse Cracks

2012 NOS TCR1+2+3 vs 2013 LCMS Transverse Crack Values

070U0005600S0EB

Number of Transverse Cracks per 100 linear feet

Milepost

23 24 25 26 27 28 29 30 31 32

CountTCR1+2
Z1-5TCR/12/52.8
2012 NOS Sealed Transverse vs LCMS Sealed Cracks

2012 NOS TCR0 vs 2013 LCMS Sealed Crack Values
070U0005600S0EB

Milepost

Number of Sealed Transverse Cracks per 100 linear feet

- TCR0
- Sealed/52.8/12
Fatigue Cracking Comparison

2012 NOS Fatigue vs 2013 LCMS Zone2+4 Crack Values
070U0005600S0EB

Wheelpath Feet of Fatigue Cracking per 100 linear feet

Milepost

- FCR1
- \((\text{LongZ2+Z4})/52.8^*2\)
Lessons Learned? From 2013
Lessons Learned Since 2013

• Finally got over comparing new to old data
  – Profiler – gave us a continuous linear set of elevations. From those we could easily compute the IRI statistic and faulting. With 3 of these we could even compute rutting.

• Finally started thinking about opportunities to use the new data
  – Today we can get a 3-D surface elevation (and intensity map).
  – What do we do with all this data?
  – Why collect a surface of data and then throw most of it away to get back to where we were?
How do we use all this data?

• Evaluate different parts of the data to use to generate the input profiles to compute IRIIs.
  – Maybe the roughness in the wheel path relative to the roughness not in the wheel paths becomes meaningful

• Evaluate rutting using different methods of determining the 5 points; generate different statistics for pavement deformation
  – Maybe rutting needs to be tied to cross slope and vertical curvature to be meaningful

• Evaluate faulting at various locations relative to the joints (which were also found automagically)
So Much Data; So Many Choices

• Kansas has learned a lot through pavement condition data
• We are proud that we use the data to make decisions
• We continue to evaluate how to better use the data.