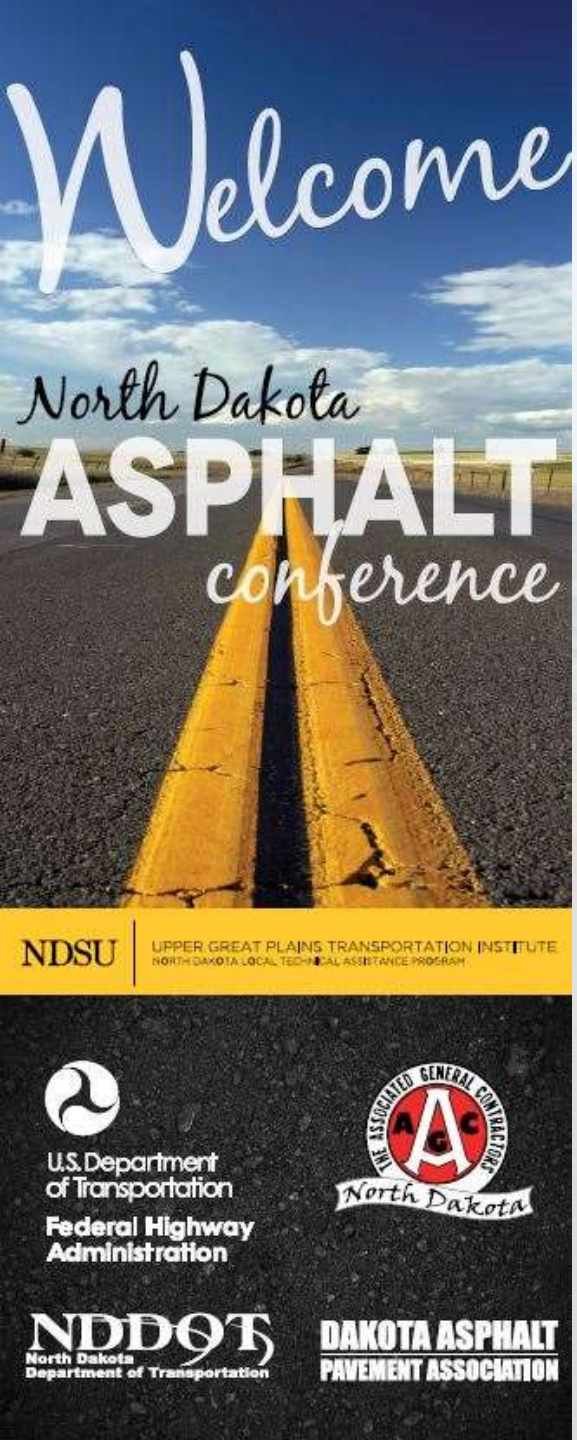
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(photo credit: Shane Biggs, Bowman County Highway Superintendent)

Smart Paving: Rolling Density Meter, a TLN Plug

Presented by: Bryce Wuori,
Wuori Consulting and Developer of PaveWise

PAVE WISE

North Dakota Asphalt Conference

Bismarck, ND - April 7-8, 2020

Photo Credit – Chad Beggs, Minot NDDOT

PaveScan RDM 2.0 GPR, Dielectric Principles

- PaveScan 2.0 GPR Overview
- How PaveScan is used as a Quality Control Tool
- Looking for Uniformity
- GPR Project data overview
- Why PaveScan GPR Testing?

PaveScan RDM 2.0 Overview

- Collects surface dielectric value
- Dielectric values indicate uniformity
- Cores can be taken to calibrate with compaction (Pucks can be used instead)
- An option to collect data viewing void content percentage instead of dielectric based on the calibrations


2020 NDDOT Highway 8

Achieving Quality with PaveScan

Used immediately after compaction, on-site full data shows the potential of possible low-density patterns to be evaluated on-site

- Roller pattern issue
- Paver issue
- Asphalt transportation issue

Having a continuous full coverage information, this can have a direct affect regarding pay factors

Increase chances for incentive payments

- Decrease penalties
- Provide information to improve procedures for both the DOT and contractors

Using PaveScan, RDM 2.0 as a PAQC

Produces Data in Real-Time

- Provides on-site dielectric values of newly laid and compacted asphalt
- Continuous Full Coverage (CFC)
- Provides a full-lane compaction contour map
- Core results calibrate Dielectric to:
  - Compaction percentage
  - Void content percentage
  - Density

Real-Time Data allows Improvements for Quality

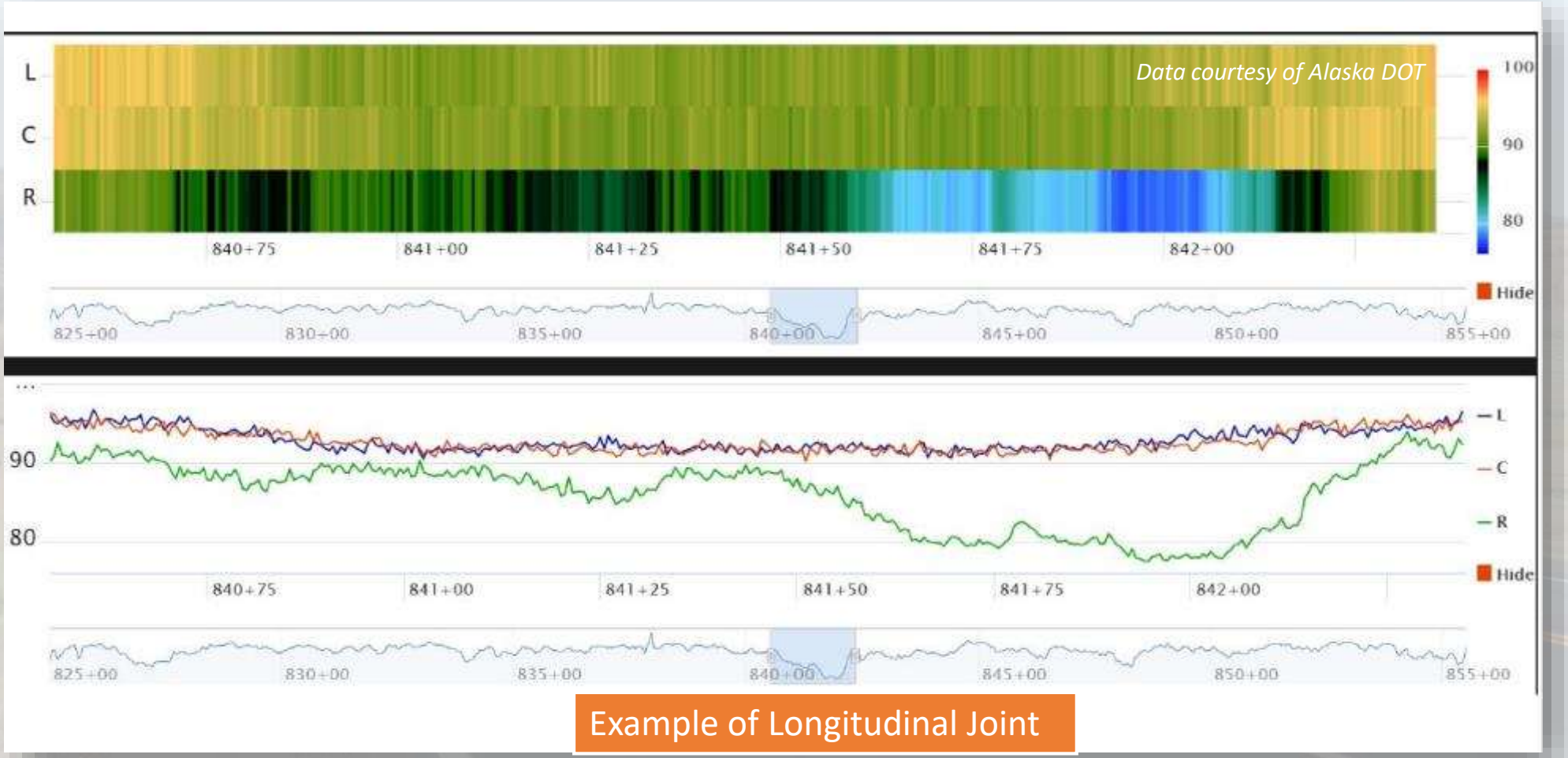
- Dielectric Values for uniformity
- Identifying Areas of Low Dielectric
- Core Calibrations

PaveScan, RDM 2.0 Data

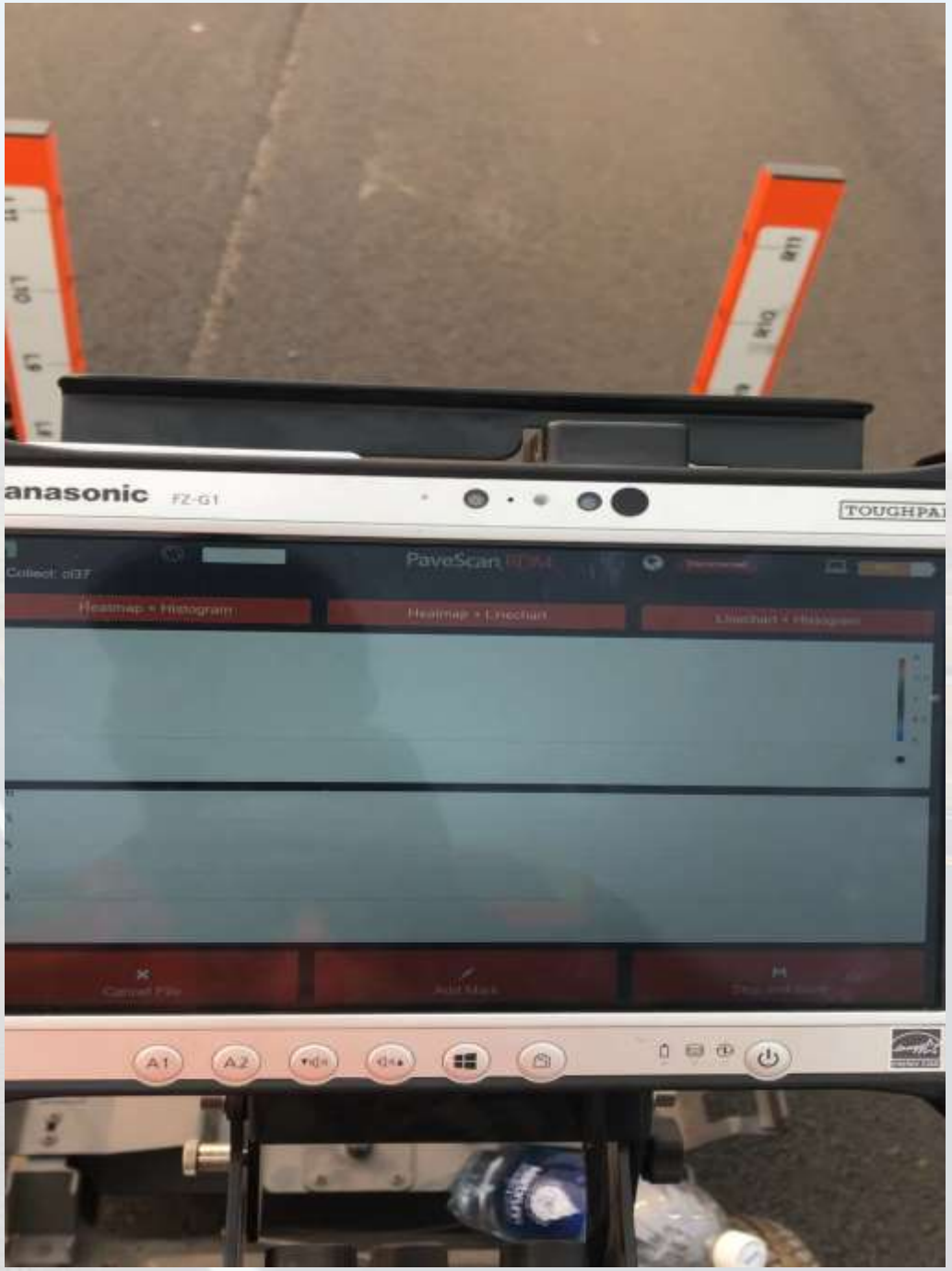
Data courtesy of Alaska DOT

Example of Low Compaction Area

PaveScan, RDM 2.0 Data



Example of Longitudinal Joint


anasonic FZ-G1
TOUGHPA
PaveScan
Heatmap + Histogram
Heatmap + Linechart
A1
A2

PaveScan Longitudinal Joint Data

	Joint Density Data	
Lot #	Average Dielectric Collected at Core Locations for Lot	Average Core Density For Lot
2	4.4	90.6
3	4.46	91.5
5	4.33	89.4
7	4.37	90.5
8	4.41	91.6
9	4.45	91.2
11	4.45	91.6
13	4.46	91.6
18	4.62	93.7

PaveScan HMA Mat Data

	Mat Density Data		
Lot #	Average Dielectric Collected at Core Locations for Lot	Average Core Density For Lot	Average Median Dielectric from RDM (Swerve Method on Mat)
1	4.63	93.4	4.67
2	4.56	93.5	4.64
3	4.43	93.5	4.52
4	4.54	93.6	4.65
5	4.44	92.5	4.51
6	4.52	93.6	4.58
7	4.47	92.7	4.55
8	4.48	93.2	4.59
9	4.44	92.7	4.53
10	4.59	94	4.68
11	4.52	93.3	4.63
12	4.56	93.8	4.65
13	4.42	93.7	4.58
14	4.56	93.3	4.61
15	4.73	95.2	N/A
18	4.59	94.1	4.65

Why PaveScan GPR Testing?

Proactive Procedure

No Physical Damage to Asphalt Section

Accurate Representation of Entire Asphalt Section

Elimination of guessing on if quality is being achieved

Modification made to benefit entire Asphalt Section

Questions?

Wuori Consulting

Bryce.W.Wuori@gmaill.com

PAVE WISE

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Dakota Asphalt Pavement Association, Inc.

"Dedicated to Quality Asphalt Paving Through Engineering, Research, and Education"

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