



Alaska Department of Transportation & Public Facilities

Compaction Acceptance Specifications
Rich Giessel

Sweden & Norway: April 2-3, 2019

Global Change: Use PaveScan Data

Use Percent Conforming (PC) for Percent Within Limits (PWL) in the Density Pay Factor.

Alaska Mat Density Pay Factor = $0.55 + PC/200$

For a lot (5000 tonnes) of asphalt, placed in a 5 cm thick lift, PC will be based on approximately 400,000 density readings, 10 per square meter. PWL for that same lot of asphalt would be based on 10 density readings (one per subplot of 500 tonnes or 1 test per 4,000 square meters).

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Global Change: Use PaveScan Data

Alaska Mat Density Pay Factor = $0.55 + PC/200$

100% Conforming gives a
1.05 Pay Factor



Compaction Acceptance, Three Approaches:

1. Incentive / Disincentive based on Defects
2. Incentive / Disincentive w/ Local Defect Remediation
3. Grading Scale w/ Global Remediation



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Number and % Defective – File 093

Station	Start Distance	Length (ft)	Defective %	# 2-D Defects	Defect Straddles Segments
826	0	100	23.05	2	No
827	0	100	1.66	0	No
828	0	100	0	0	No
829	0	100	2.82	0	No
830	0	100	2.99	0	No
831	0	100	0	0	No
832	0	100	0	0	No
833	0	100	0	0	No
834	0	100	0.33	0	No
835	0	100	0.33	0	No
836	0	100	0	0	No

832 is a Good Segment

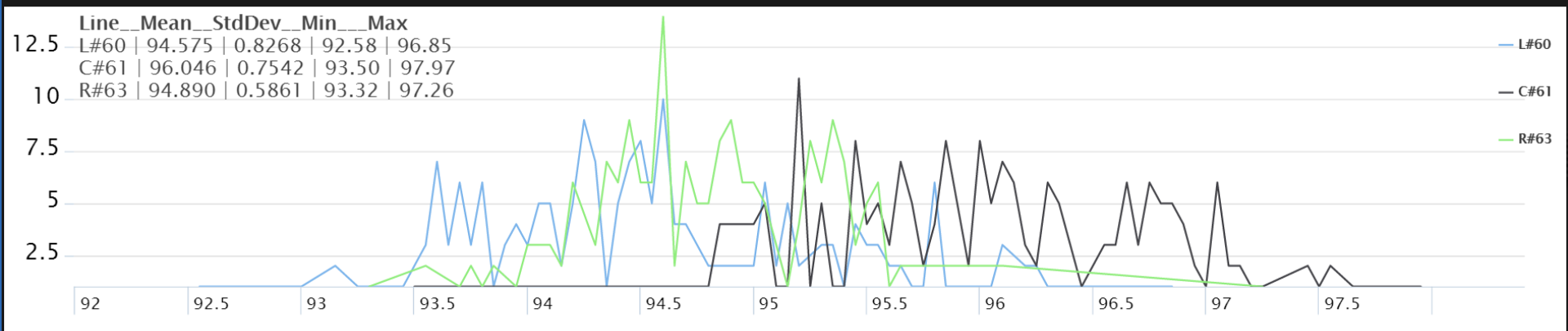
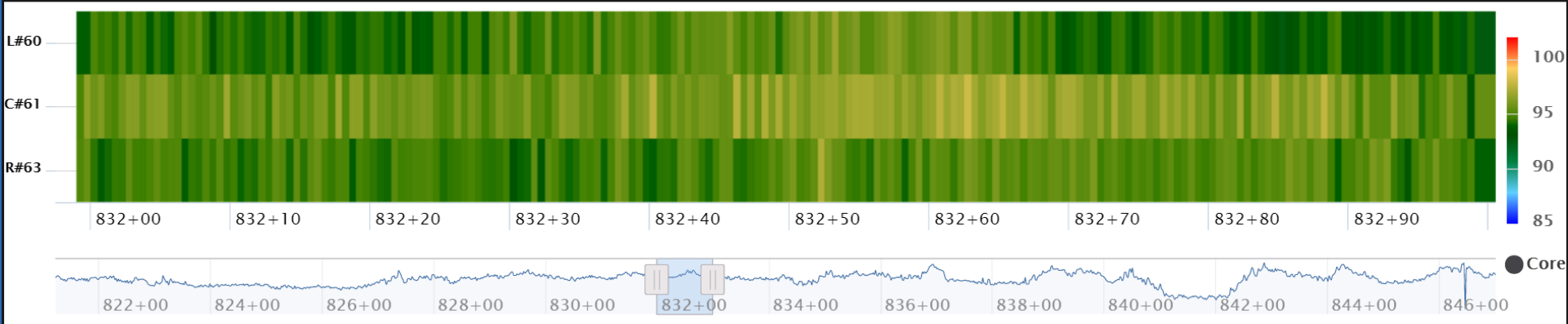
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831	0	100	0	0	No
832	0	100	0	0	No
833	0	100	0	0	No
834	0	100	0.33	0	No
835	0	100	0.33	0	No
836	0	100	0	0	No

Good Compaction - Station 832

Heatmap + Histogram

Heatmap + Linechart

Linechart + Histogram



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Number and % Defective – File 093

Station	Start Distance	Length (ft)	Defective %	# 2-D Defects	Defect Straddles Segments
837	0	100	0.17	0	No
838	0	100	1.82	0	No
839	0	100	0.5	0	No
840	0	100	8.13	1	Yes
841	0	100	83.42	3	Yes
842	0	100	10.12	2	Yes
843	0	100	0	0	No
844	0	100	0	0	No
845	0	100	0	0	No
846	0	79	0	0	No

841 is a Bad Segment

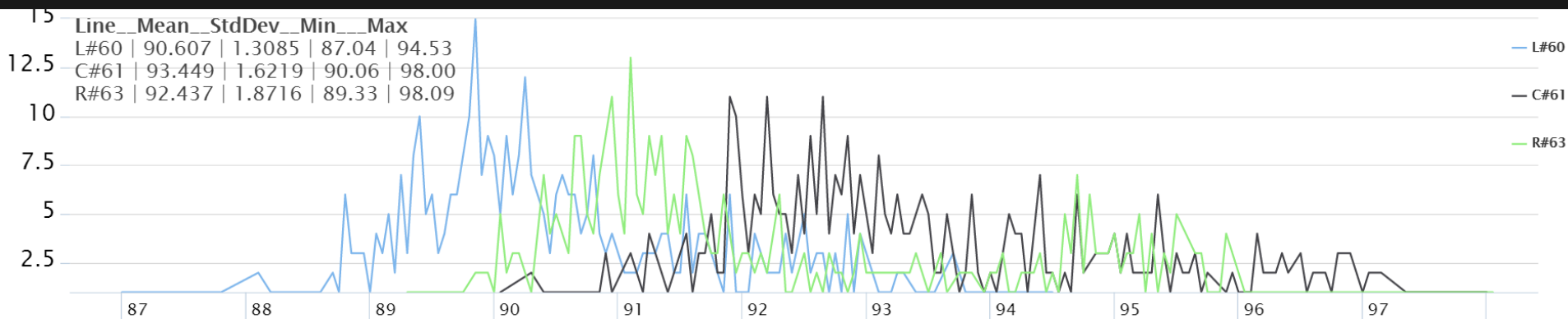
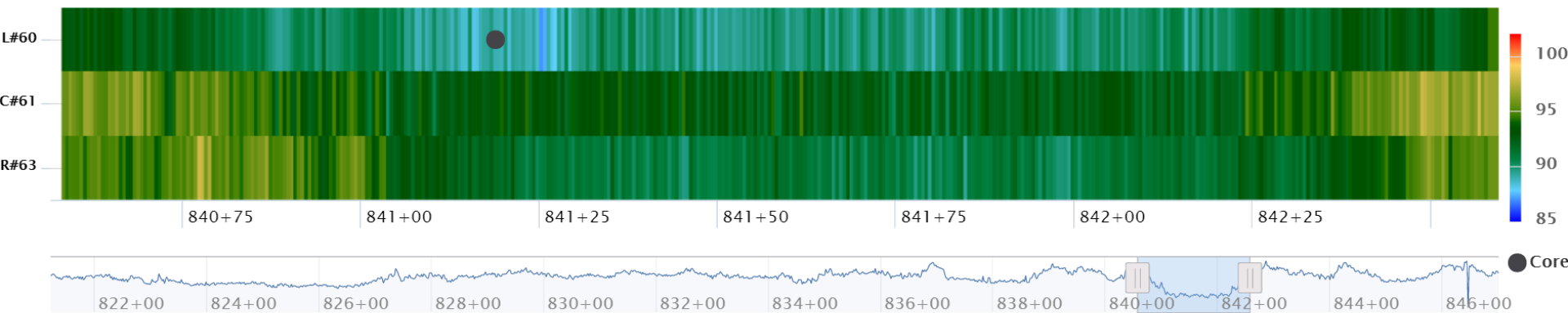
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843	0	100	0	0	No
844	0	100	0	0	No
845	0	100	0	0	No
846	0	79	0	0	No

Poor Compaction - Station 841

Heatmap + Histogram

Heatmap + Linechart

Linechart + Histogram



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1. Incentive / Disincentive based on Defects
2. **Incentive / Disincentive w/
Local Defect Remediation**
3. Grading Scale w/ Global Remediation

Operator Selects Defect Triggers



Apply Sand Seal to lane station when:

- Low density areas total more than 5%
- There is a low density area > 1 square meter



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Should % Conforming Thresholds Trigger Repair for that Lot?

Alaska Mat Density Pay Factor = $0.55 + PC/200$

If Percent Conforming = 100, then Pay Factor = 1.05

If Percent Conforming = 50, then Pay Factor = .80

Note: Remove and Replace is triggered if PC is below 50%

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What PC should trigger repair?

<u>% Conforming</u>	<u>Grade</u>	<u>Pay Factor</u>	
PC = 90-100	A	PF = 1.00-1.05	
PC = 80-90	B	PF = 0.95-1.00	
PC = 70-80	C	PF = 0.90-0.95	Fog Seal?
PC = 60-70	D	PF = 0.85-0.90	Sand Seal?
PC = 50-60	F	PF = 0.80-0.85	Sand Seal?
PC < 50		Remove & Replace	

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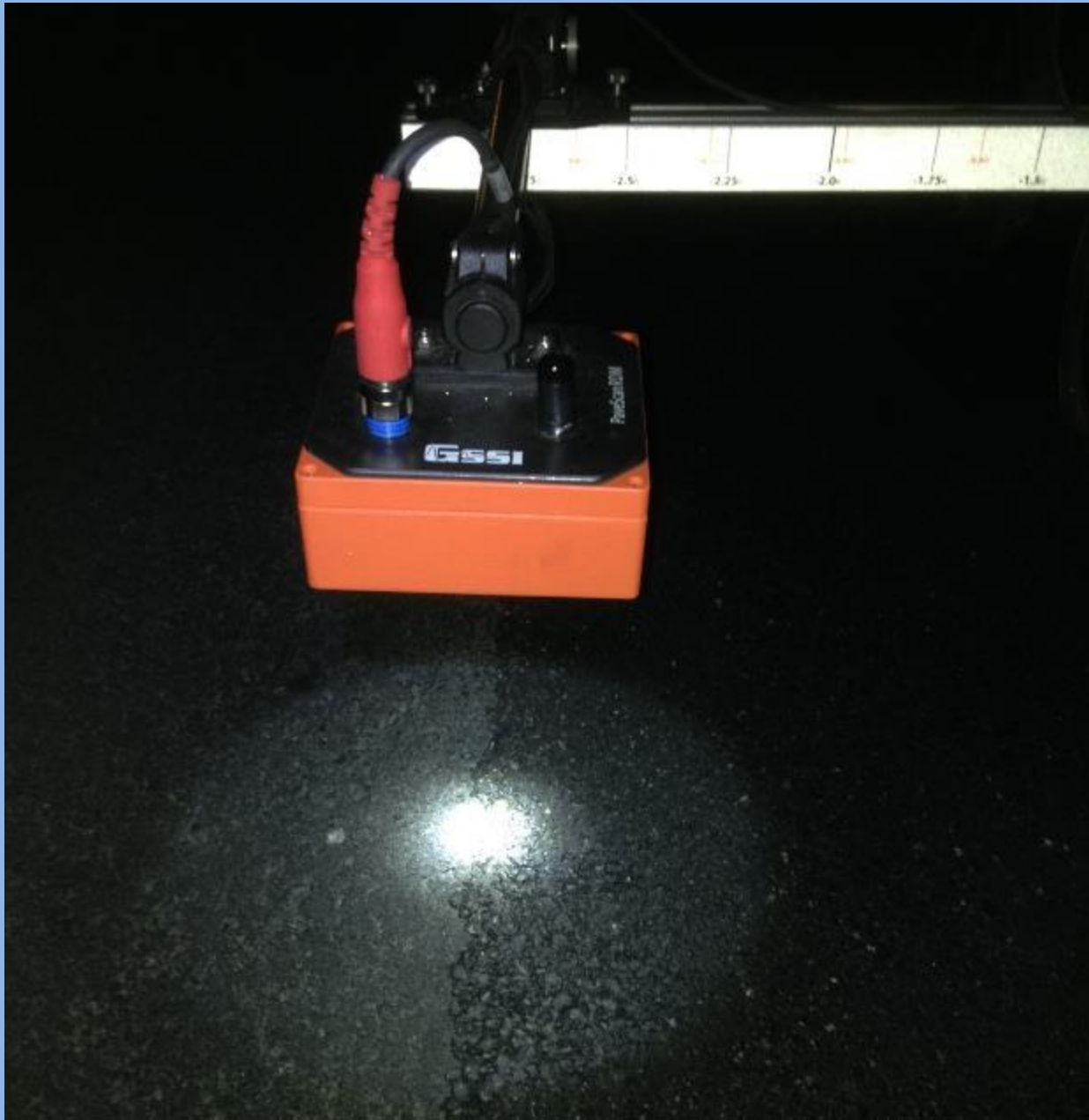
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Longitudinal Joints

Keeping Antenna Centered on Joint



Average Longitudinal Joint Compaction determined by

The average Longitudinal Joint Density for the project¹

Average Longitudinal Joint Compaction determined by

The average Longitudinal Joint Density
for the project¹

Note 1, or for each lot (5000 tonnes) of asphalt placed that completes a longitudinal joint.

Average Longitudinal Joint Compaction determined by

The average Longitudinal Joint Density
for the project¹

Note 1, or for each lot (5000 tonnes) of asphalt placed that completes a longitudinal joint.

Tips for measuring Longitudinal Joint Density

- Dedicate one antenna to the longitudinal joint
- Keep this antenna centered on the joint
- Use a laser pointer or focused light beam as a centering aide
- In “Walk” mode average every 5 readings to display a compaction value every 15 cm

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The Carrot

You get what you pay for!

On one project Alaska offered a stepped bonus of up to \$1.50/ft if average longitudinal joint compaction for the project achieved 94% of MSG

- >92.0% = \$0.50 per lineal foot is added
- >93.0% = \$1.00 per lineal foot is added
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What should trigger Longitudinal Joint Repair?

What length should trigger joint repair?
(Currently using 1 m)

What % Compaction should trigger repair?
(Currently using <91%)

What should trigger Longitudinal Joint Repair?

What length should trigger joint repair?
(Currently using 1 m)

What % Compaction should trigger repair?
(Currently using <91%)

What should trigger Longitudinal Joint Repair?

What length should trigger joint repair?
(Currently using 1 m)

What % Compaction should trigger repair?
(Currently using <91%)



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