



**RPUG 2024**  
Road Profile Users' Group

April 29 - May 2



**ST. AUGUSTINE**  
FLORIDA

*New Technology For An Old World*

# TEXTURE SIGNATURE PERFORMANCE INDEX

EVERETT SCHMITZ

PATHWAY SERVICES INC.



**RPUG**  
Road Profile Users' Group

*Low friction roads will always  
have higher crash rates.\**

\*No caveats

*Current practices to  
identify low friction  
roads are limited.*

- *Manual Surveys*
- *Accident count response*
- *Routine maintenance/fingers crossed*
- *Skid testing*

# *SKID TESTING*

- *Data is collected on a small sample*
- *Testing is expensive and time consuming*
- *Dangerous*
- *Impedes traffic flow*
- *Generally impractical for network level data collection*
- *Data varies (See discussion from pooled fund meeting)*

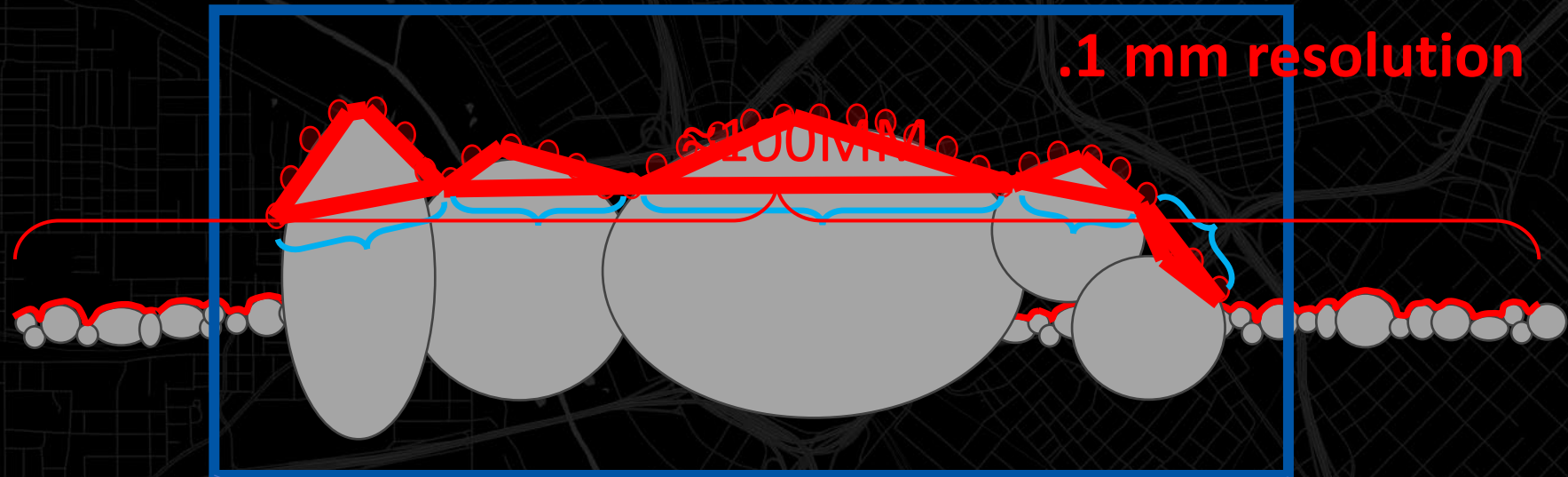
*An alternative  
solution: Texture  
Signature*

*Texture Signature  
Number Recap: What  
is it?*

*Quantification of aggregate components by size and how the aggregate components relate to each other...*



# Texture Signature Number



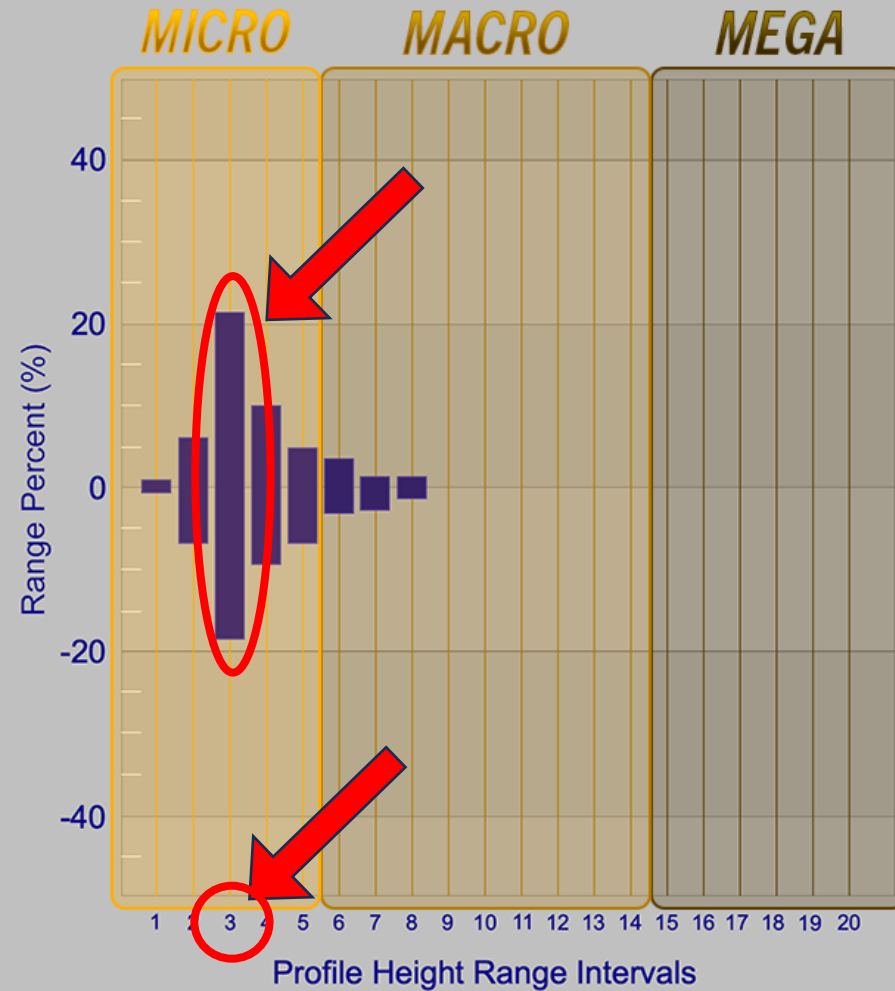
# Texture Signature Number

Texture Signature

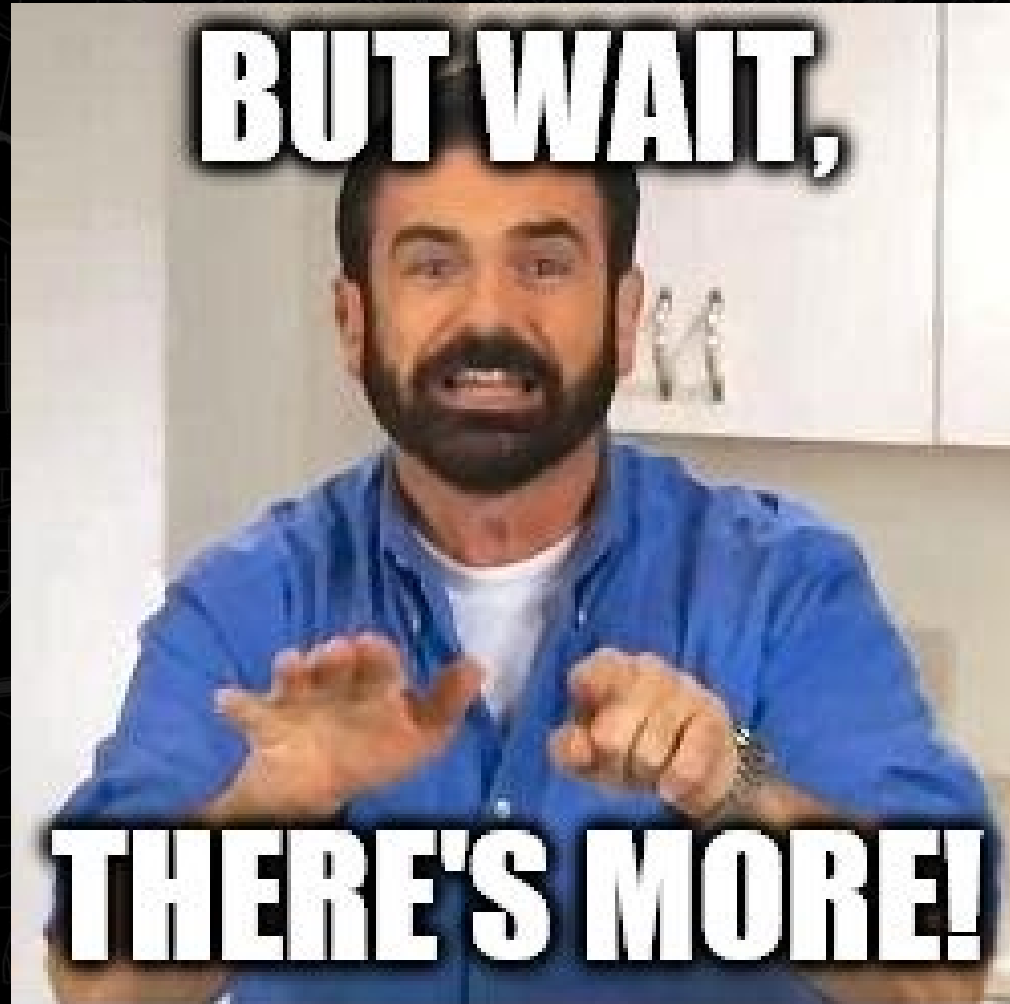
LOCATION	TEXTURE
■ LWP	■ MICRO
■ CENTER	■ MACRO
■ RWP	■ MEGA

PROFILE HEIGHT RANGES (mm)

1	0.0 - 0.1 (micro)
2	0.1 - 0.2
3	0.2 - 0.3
4	0.3 - 0.4
5	0.4 - 0.5
6	0.5 - 0.6 (macro)
7	0.6 - 0.7
8	0.7 - 0.8
9	0.8 - 0.9
10	0.9 - 1.0
11	1.0 - 2.0
12	2.0 - 3.0
13	3.0 - 4.0
14	4.0 - 5.0
15	5.0 - 6.0 (mega)
16	6.0 - 7.0
17	7.0 - 8.0
18	8.0 - 9.0
19	9.0 - 10.0
20	> 10.0



*Texture Signature Number*



*Texture Signature Number:  
What do we do with it?*

*MPD alone can be misleading...*



*Pavements with very different characteristics \*can\* provide very similar MPD values*

*Texture Signature Number*

*Introducing:  
Texture Signature  
Performance Index*

*An index that is easy to interpret:*

- 1) Indicates the pavement friction potential*
- 2) Indicates the water displacement potential*

*###, A*

*(Scale 0-100), (Scale A-F)*



# *Texture Signature Performance Index: 72B*

*First number describes  
the potential friction  
capability*

*Second letter describes the  
potential water  
displacement capability*



## *Example: 84F*

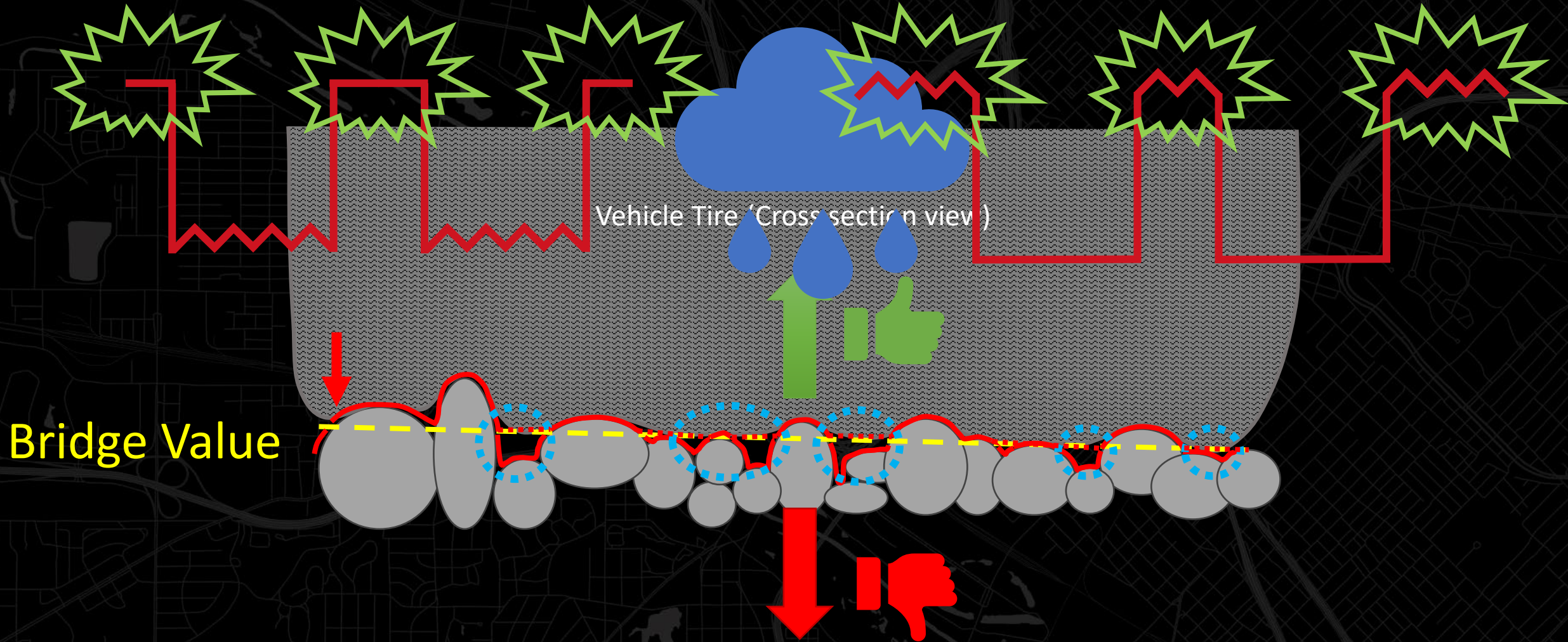
*A pavement that is achieving good friction,  
but has very poor water displacement capabilities.*

# *Example: 60A*

*A pavement that has low friction capabilities, but has very good water displacement capabilities.*

*“Sounds great... but  
how do we get there?”*

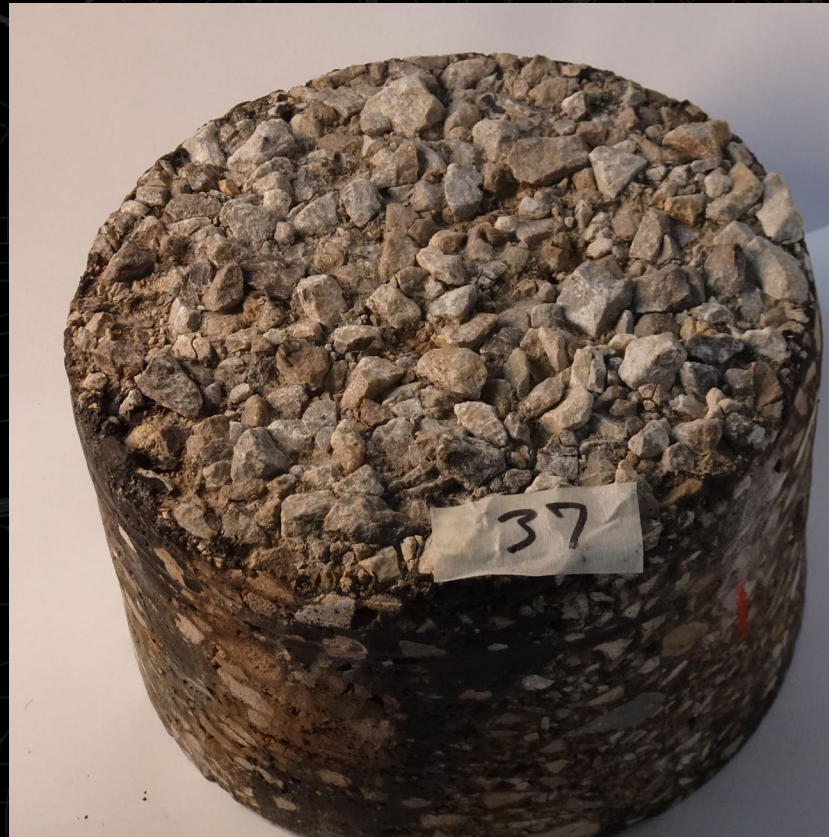
# Texture Signature Performance Index



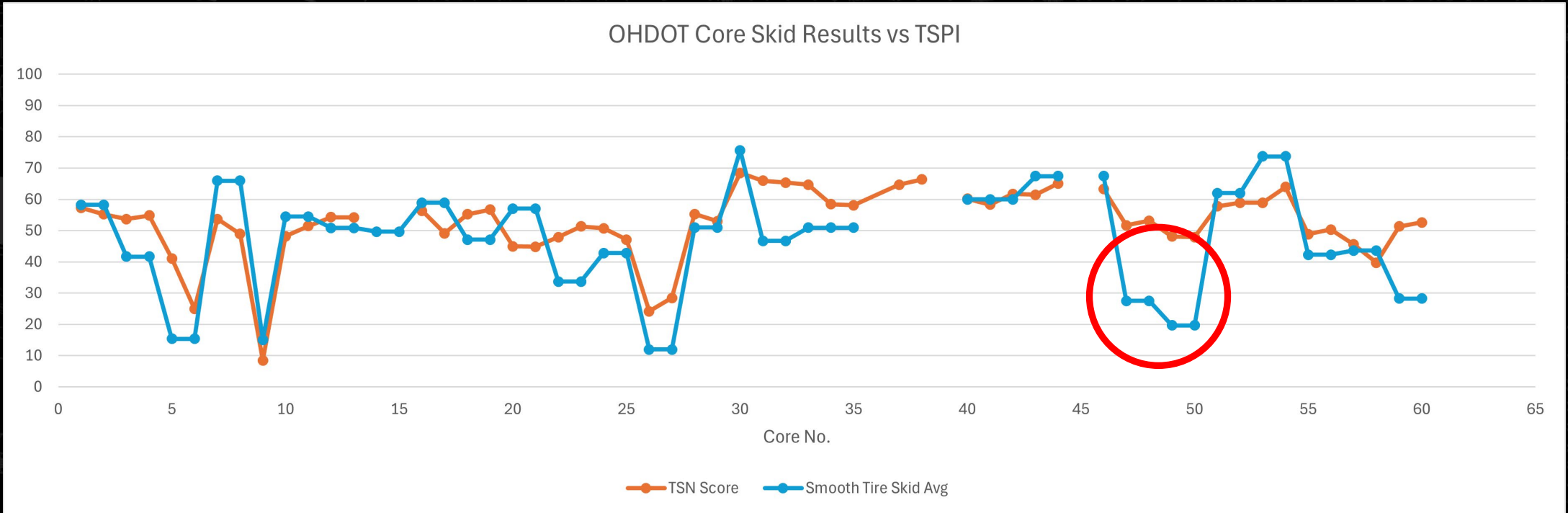
### *A few notes:*

- Smooth tire comparison only is assessed*
- The goal is to create a tool to flag or identify potential low friction areas— This will not replace a skid test*
- The TSPI is not a skid number- user configurable scale*

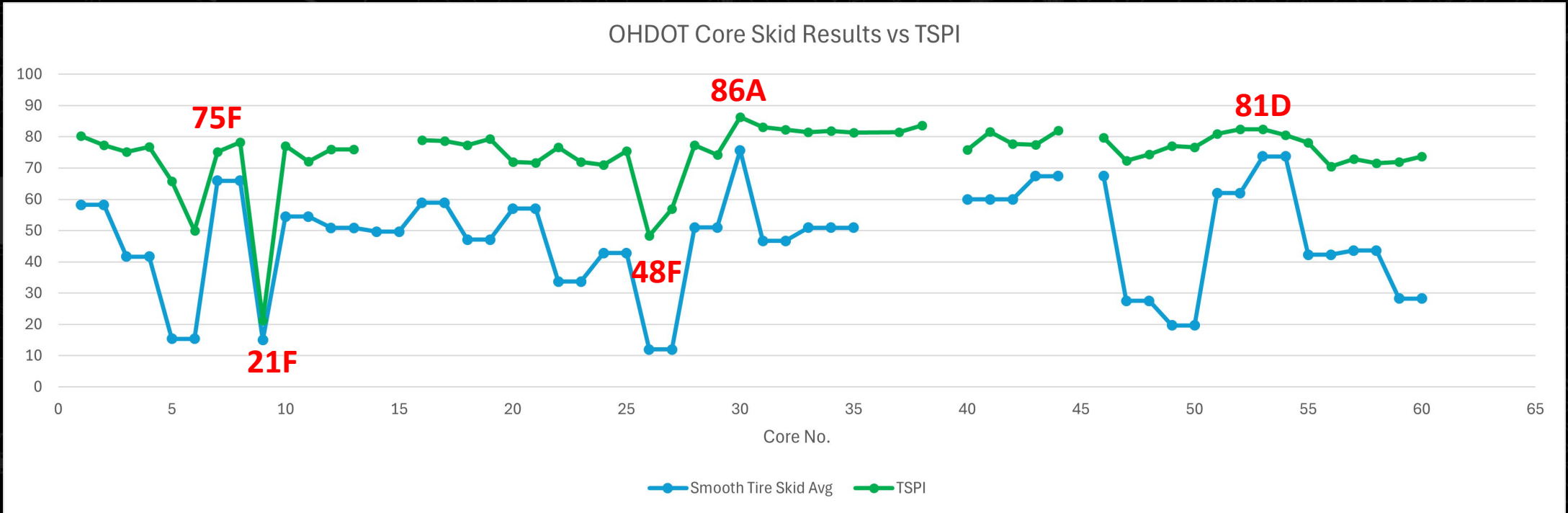
# *Lab results...*



# Texture Signature Performance Index

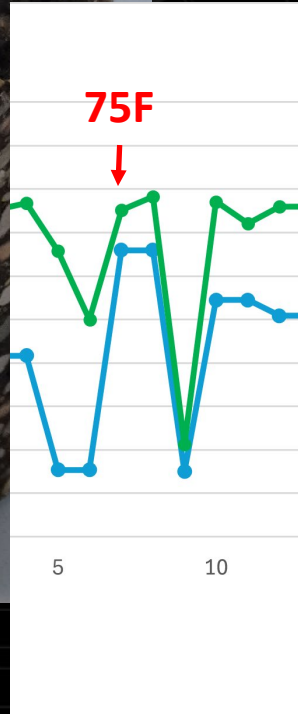


# Texture Signature Performance Index

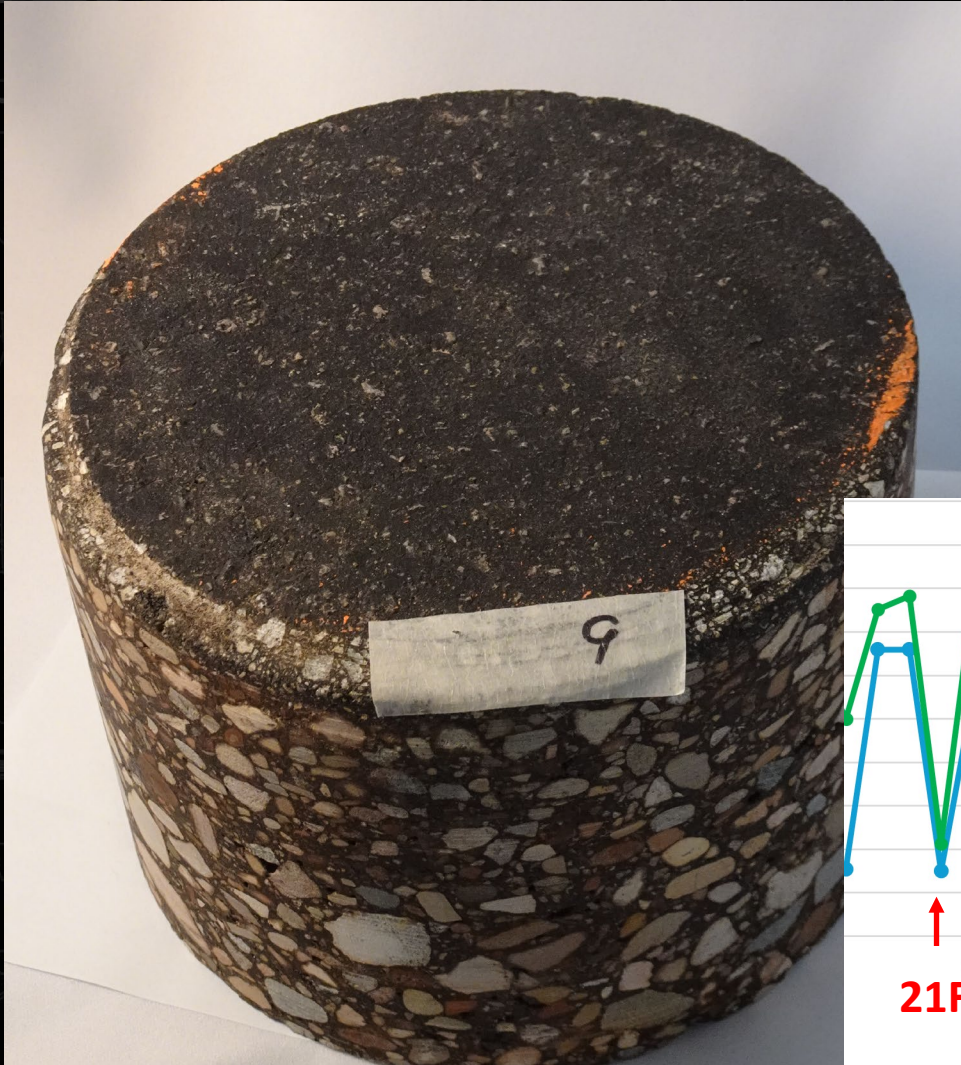




# Texture Signature Performance Index



*Example: 75F*  
*Moderate friction, poor*  
*water displacement*

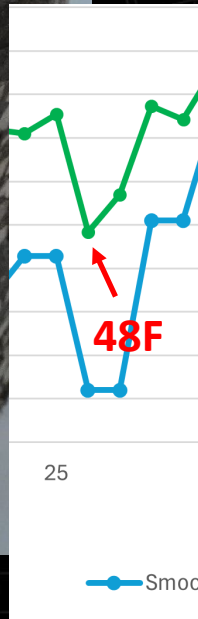


# *Example: 21F*

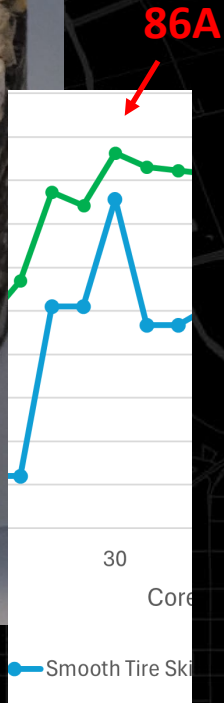
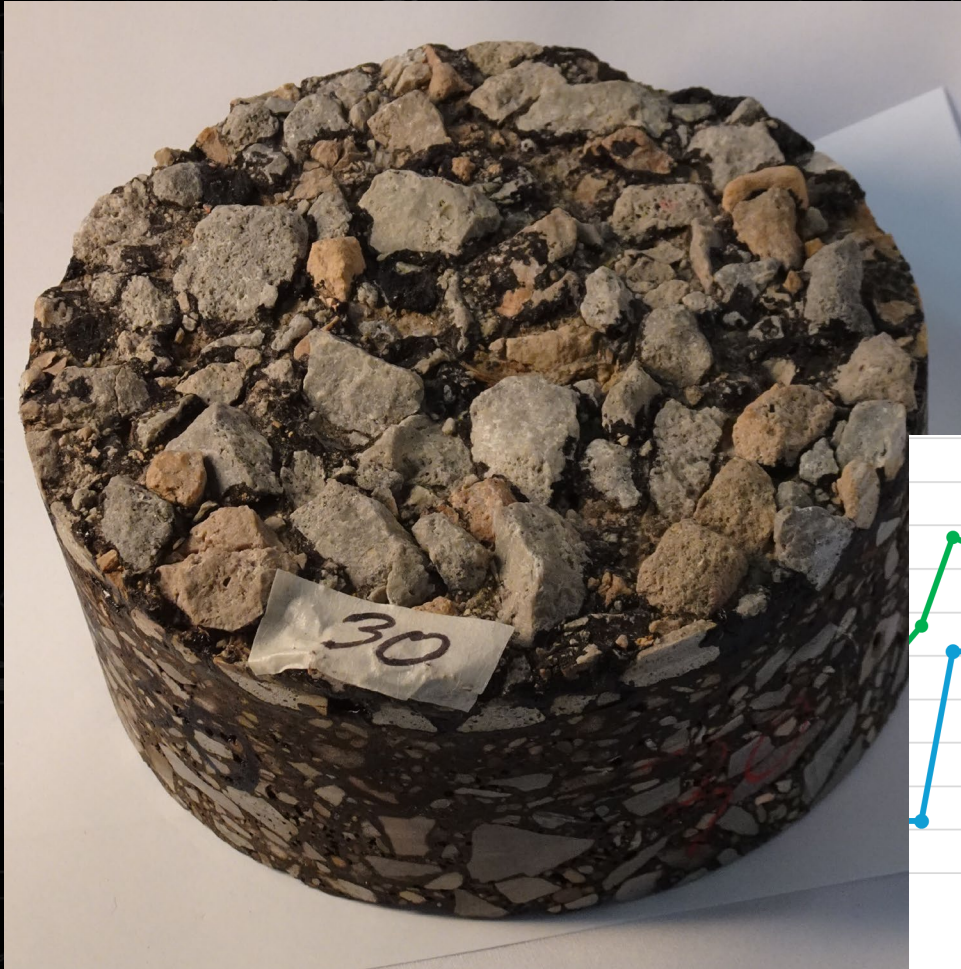
*Poor friction, poor water displacement*



*Example: 48F*  
*Poor friction, poor water displacement*

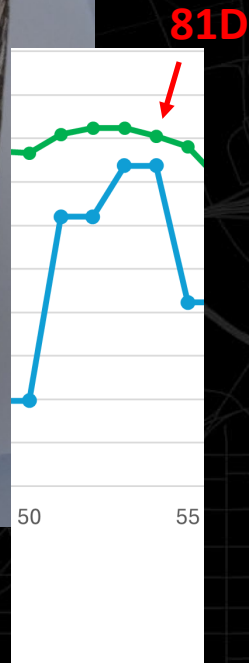
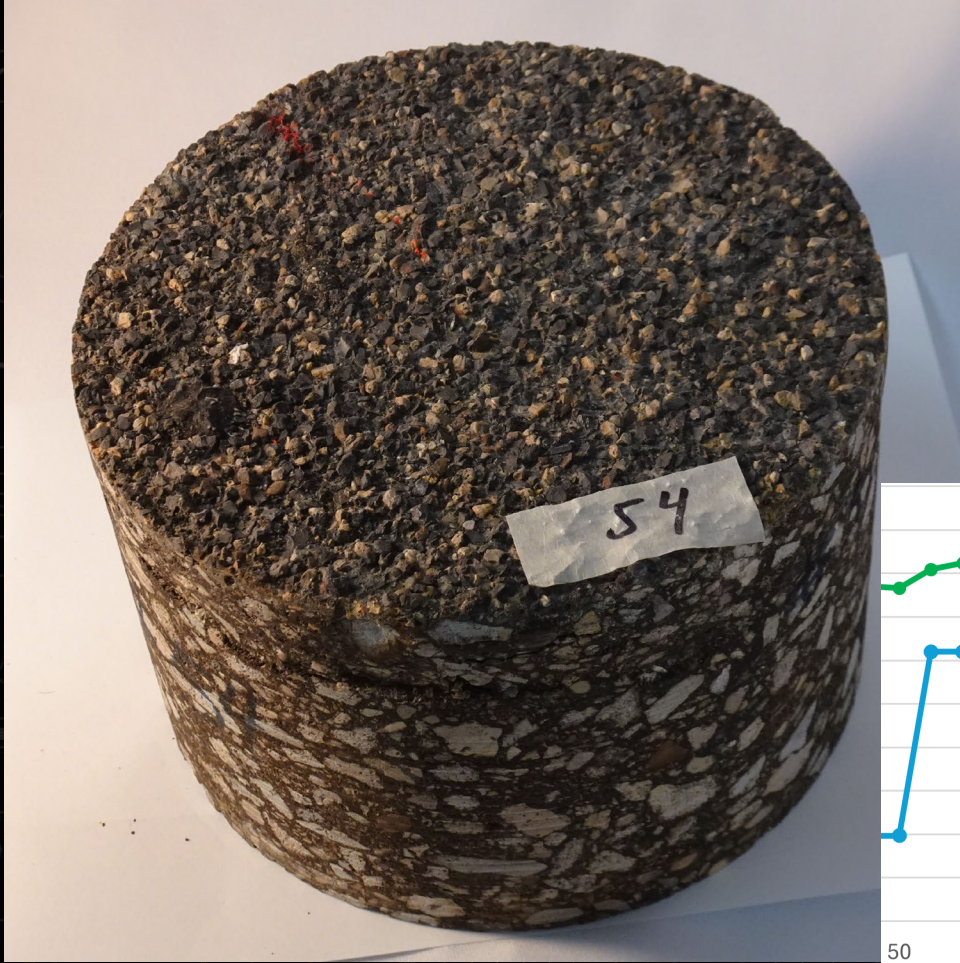


# Texture Signature Number



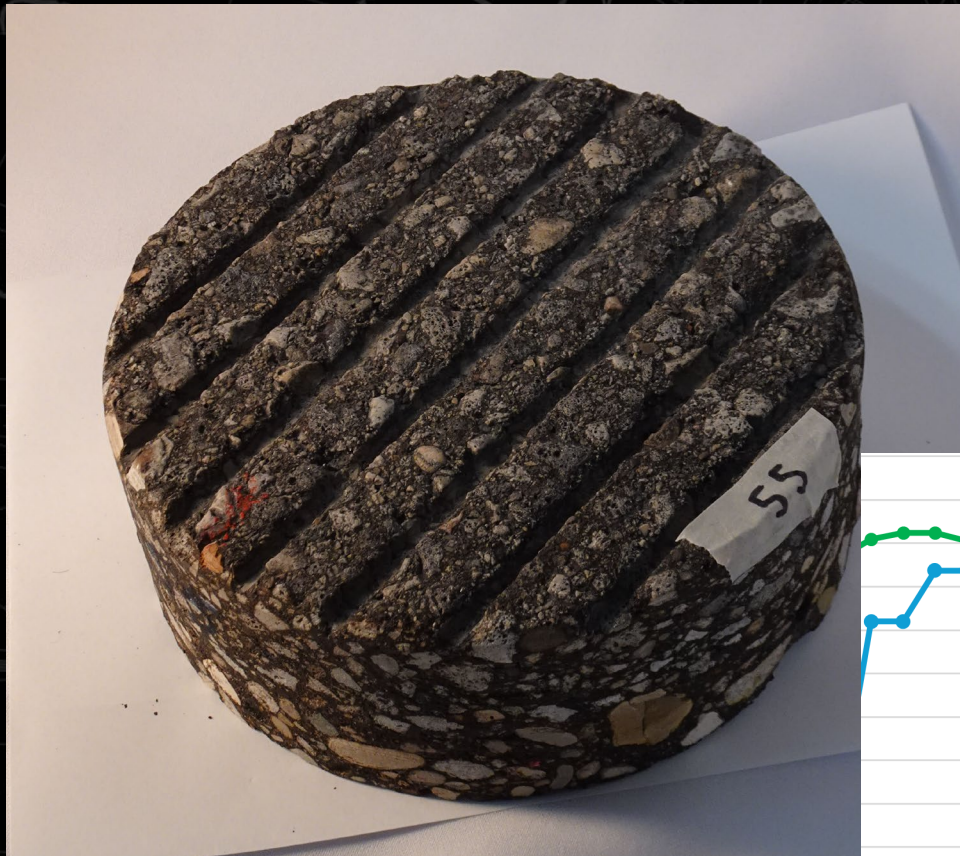
*Example: 86A*  
*Good friction, Excellent*  
*water displacement*

# Texture Signature Number

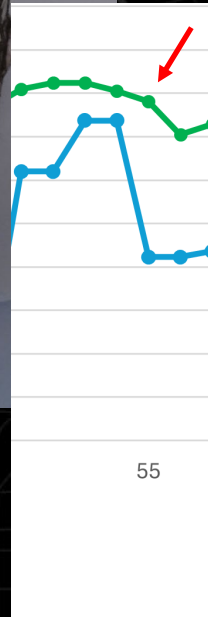


*Example: 81D*  
*Good friction, Poor water displacement*

# Texture Signature Number



78B

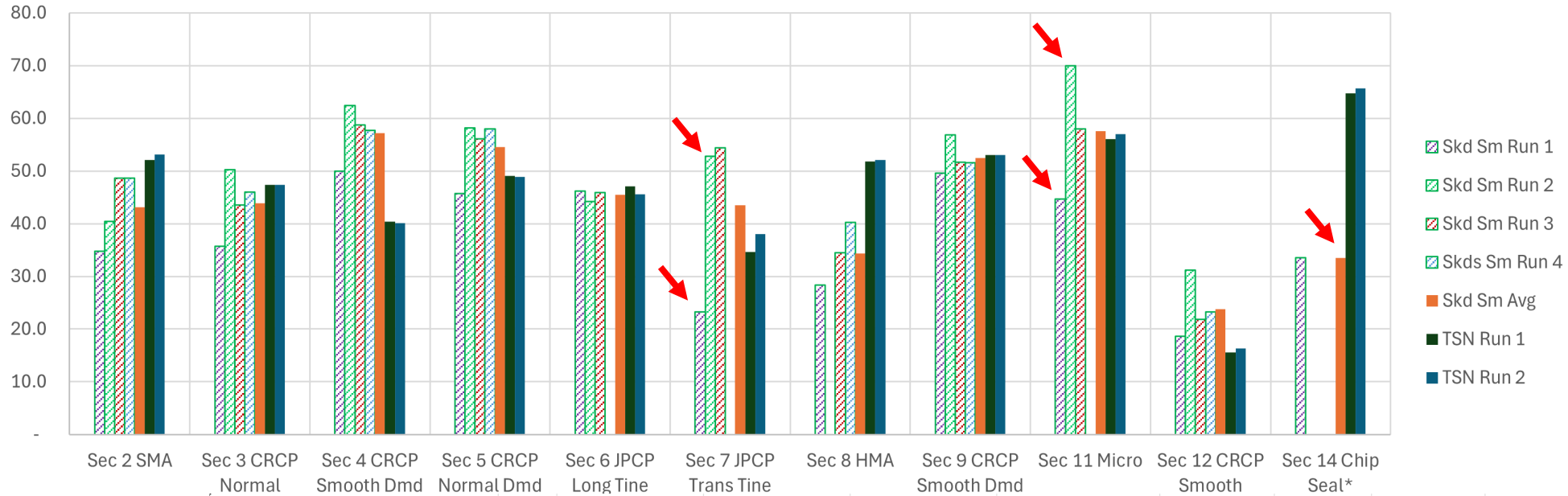


*Example: 78B*  
*Fair friction, Good water displacement*

*Test track results...*

# Texture Signature Performance Index

ICART Skid Data vs TSN



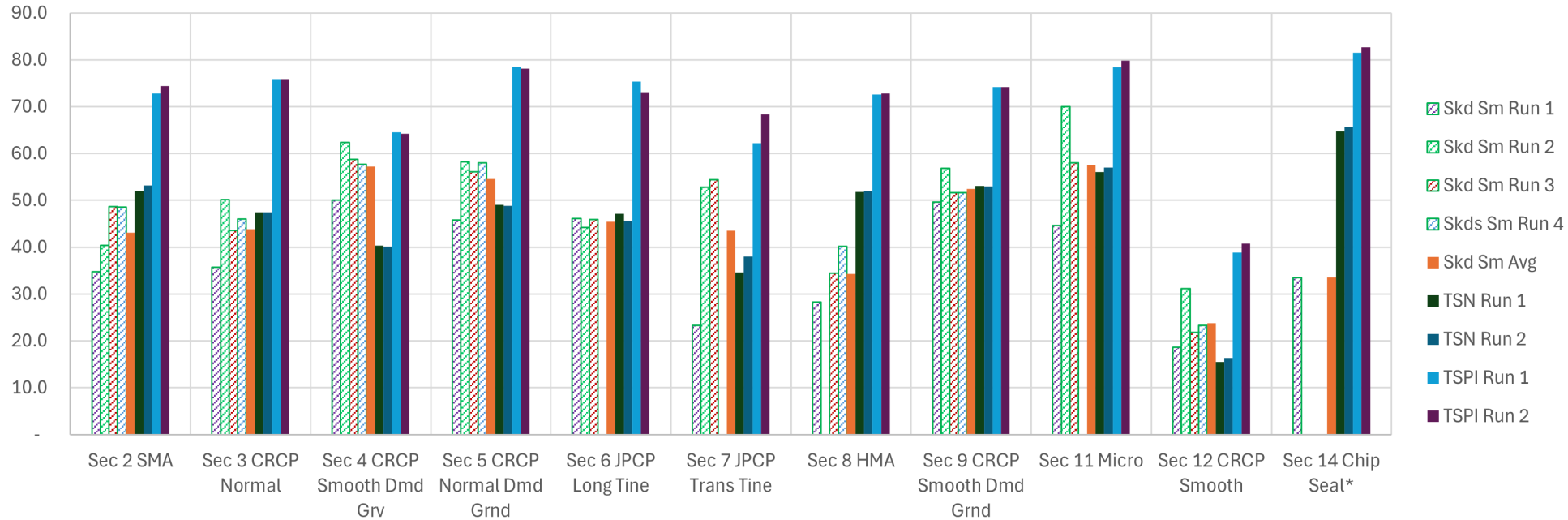
Section No.	Smooth SN (40MPH) RWP				
	Skd Sm Run 1	Skd Sm Run 2	Skd Sm Run 3	Skds Sm Run 4	Skd Sm Avg
Sec 2 SMA	34.8	40.4	48.7	48.6	43.1
Sec 3 CRCP Normal	35.7	50.2	43.5	46.0	43.9
Sec 4 CRCP Smooth Dmd Grv	50.0	62.4	58.7	57.7	57.2
Sec 5 CRCP Normal Dmd Grnd	45.8	58.2	56.1	58.0	54.5
Sec 6 JPCP Long Tine	46.2	44.2	45.9	-	45.4
Sec 7 JPCP Trans Tine	23.3	52.8	54.4	-	43.5
Sec 8 HMA	28.3	-	34.5	40.2	34.3
Sec 9 CRCP Smooth Dmd Grnd	49.6	56.8	51.7	51.6	52.4
Sec 11 Micro	44.7	70.0	58.0	-	57.6
Sec 12 CRCP Smooth	18.7	31.2	21.8	23.3	23.7
Sec 14 Chip Seal*	33.5	-	-	-	33.5

TSN RWP	
TSN Run 1	TSN Run 2
52.0	53.1
47.4	47.4
40.3	40.1
49.1	48.8
47.1	45.6
34.6	38.0
51.8	52.0
53.0	53.0
56.1	57.0
15.5	16.3
64.7	65.7



# Texture Signature Performance Index

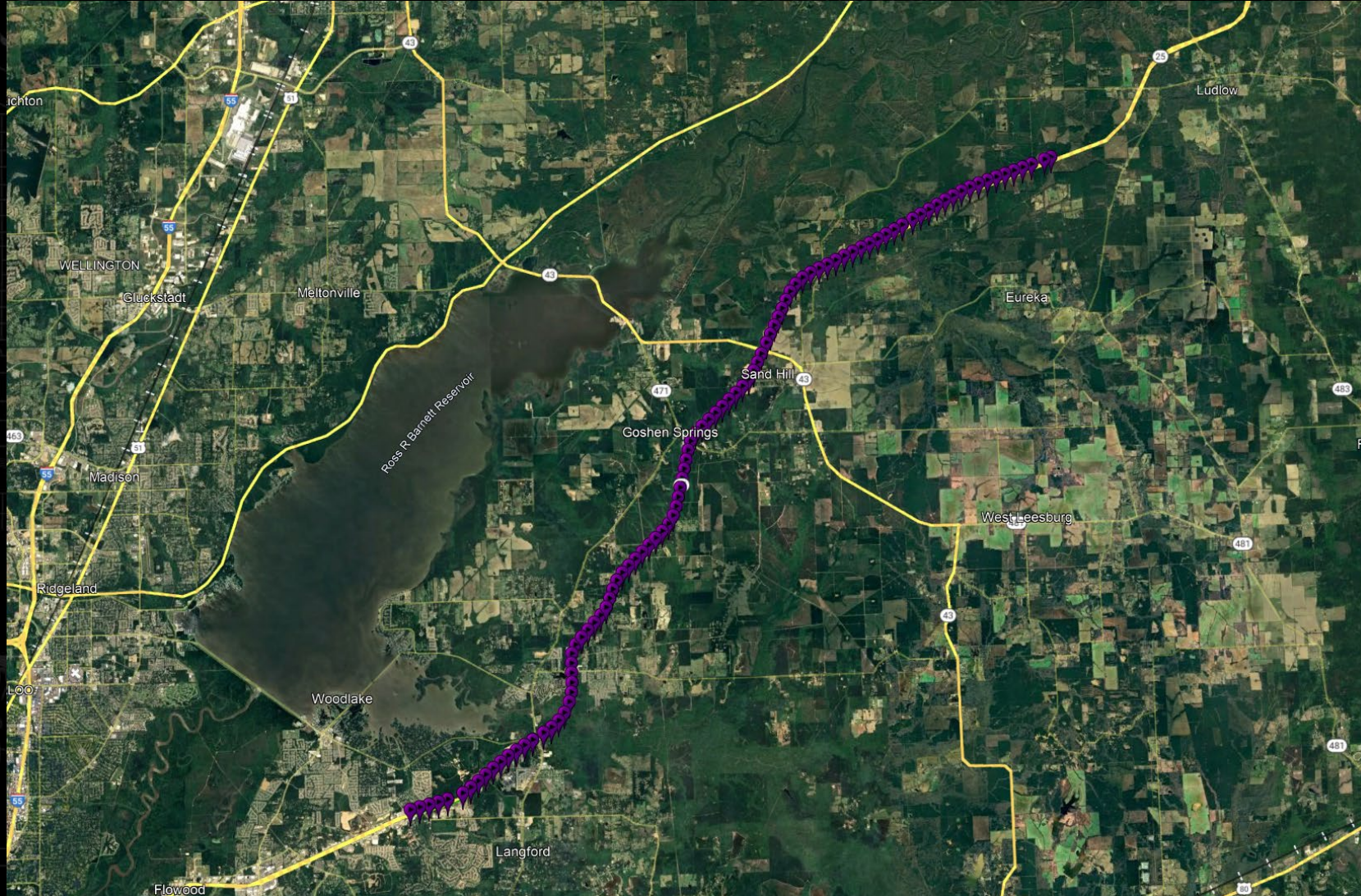
ICART Skid Data vs TSN



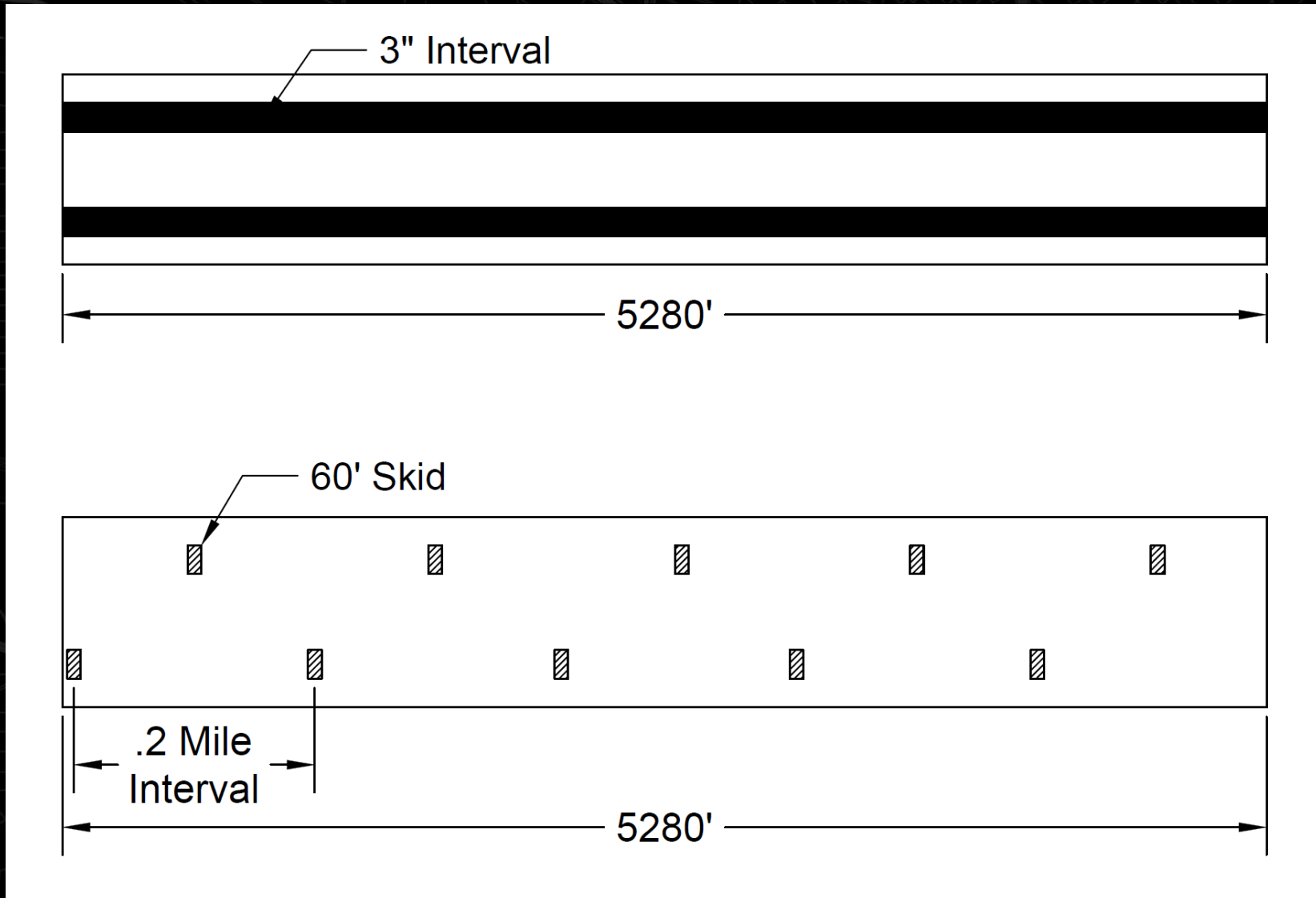
Section No.	Smooth SN (40MPH) RWP					TSN RWP		TSPI RWP	
	Skd Sm Run 1	Skd Sm Run 2	Skd Sm Run 3	Skds Sm Run 4	Skd Sm Avg	TSN Run 1	TSN Run 2	TSPI Run 1	TSPI Run 2
Sec 2 SMA	34.8	40.4	48.7	48.6	43.1	52.0	53.1	73 C	74.4 C
Sec 3 CRCP Normal	35.7	50.2	43.5	46.0	43.9	47.4	47.4	76 F	75.8 F
Sec 4 CRCP Smooth Dmd Grv	50.0	62.4	58.7	57.7	57.2	40.3	40.1	65 C	64.2 C
Sec 5 CRCP Normal Dmd Grnd	45.8	58.2	56.1	58.0	54.5	49.1	48.8	78 C	78.1 B
Sec 6 JPCP Long Tine	46.2	44.2	45.9	-	45.4	47.1	45.6	75 B	73.0 B
Sec 7 JPCP Trans Tine	23.3	52.8	54.4	-	43.5	34.6	38.0	62 B	68.4 B
Sec 8 HMA	28.3	-	34.5	40.2	34.3	51.8	52.0	73 F	72.9 F
Sec 9 CRCP Smooth Dmd Grnd	49.6	56.8	51.7	51.6	52.4	53.0	53.0	74 D	74.2 D
Sec 11 Micro	44.7	70.0	58.0	-	57.6	56.1	57.0	78 F	79.8 F
Sec 12 CRCP Smooth	18.7	31.2	21.8	23.3	23.7	15.5	16.3	39 F-	40.7 F-
Sec 14 Chip Seal*	33.5	-	-	-	33.5	64.7	65.7	82 B	82.7 B

*Real world results...*

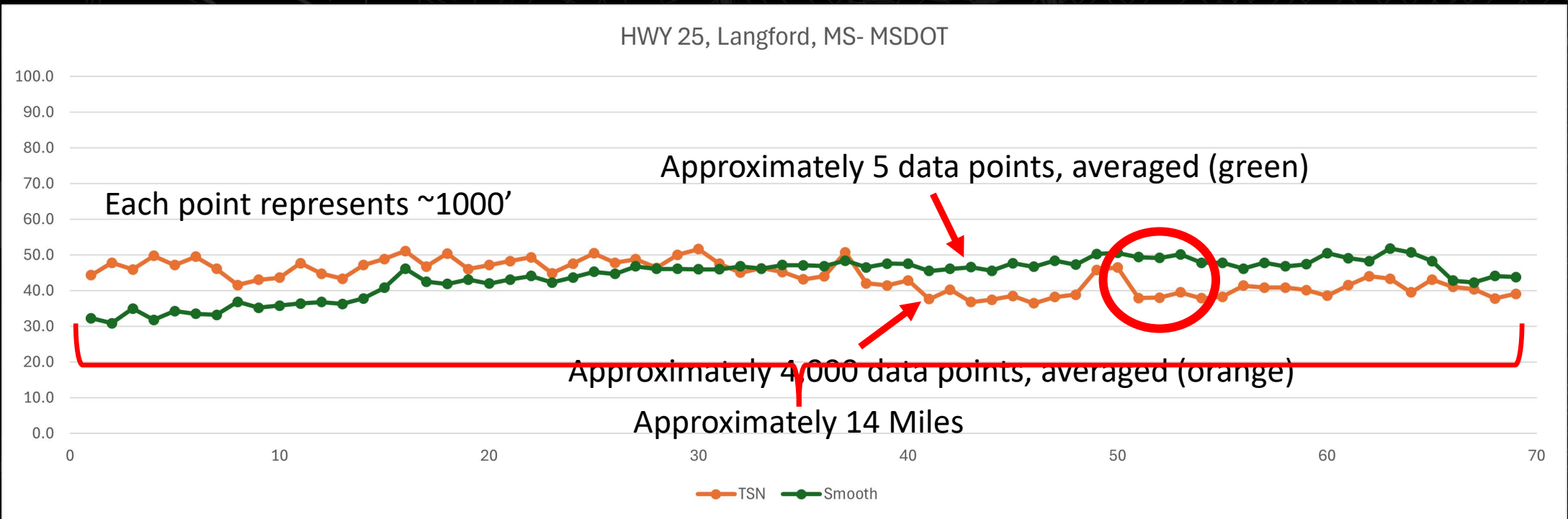
# Texture Signature Performance Index



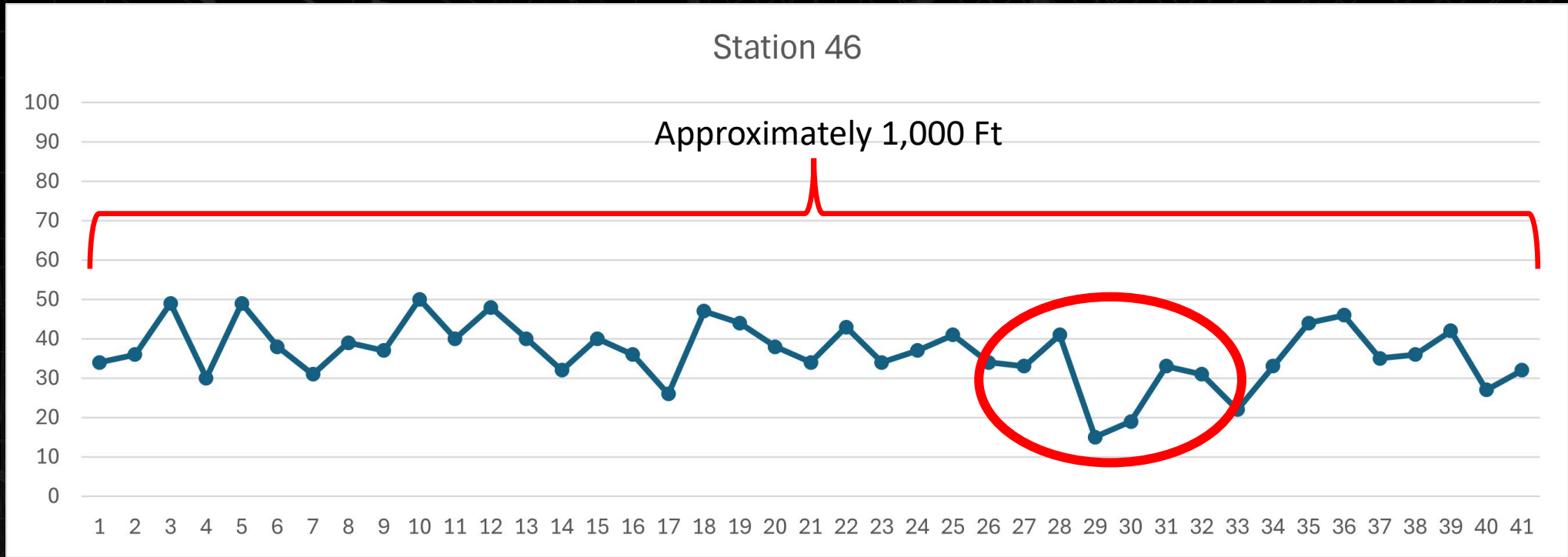
# Texture Signature Performance Index



# Texture Signature Performance Index



# Texture Signature Performance Index



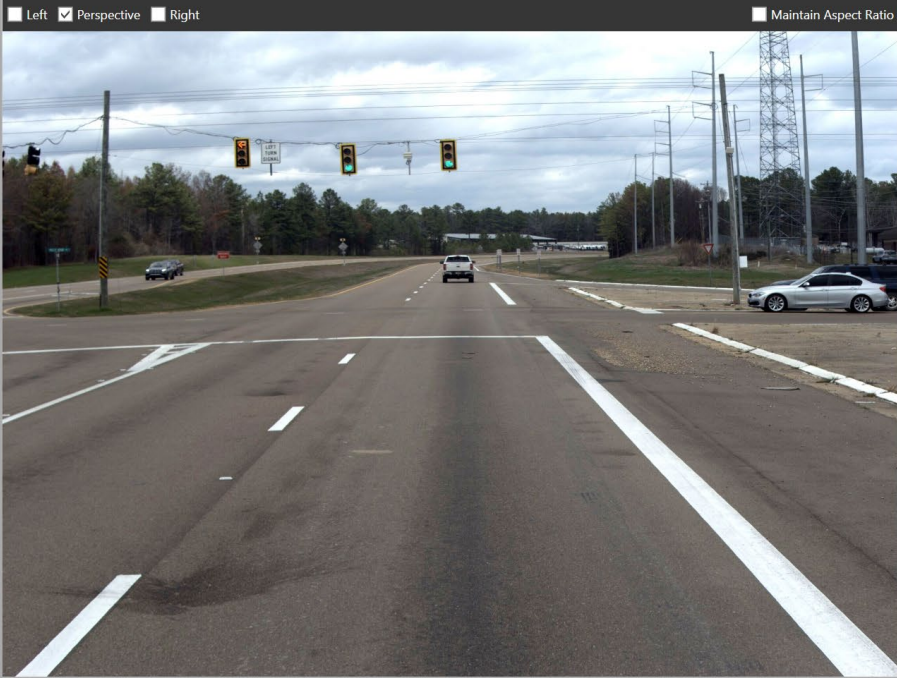
# Texture Signature Performance Index

PathView (v. 7.0.7) D:\MS\_2024\_TextureData\MS\_2024\_FrictionDemo.sec

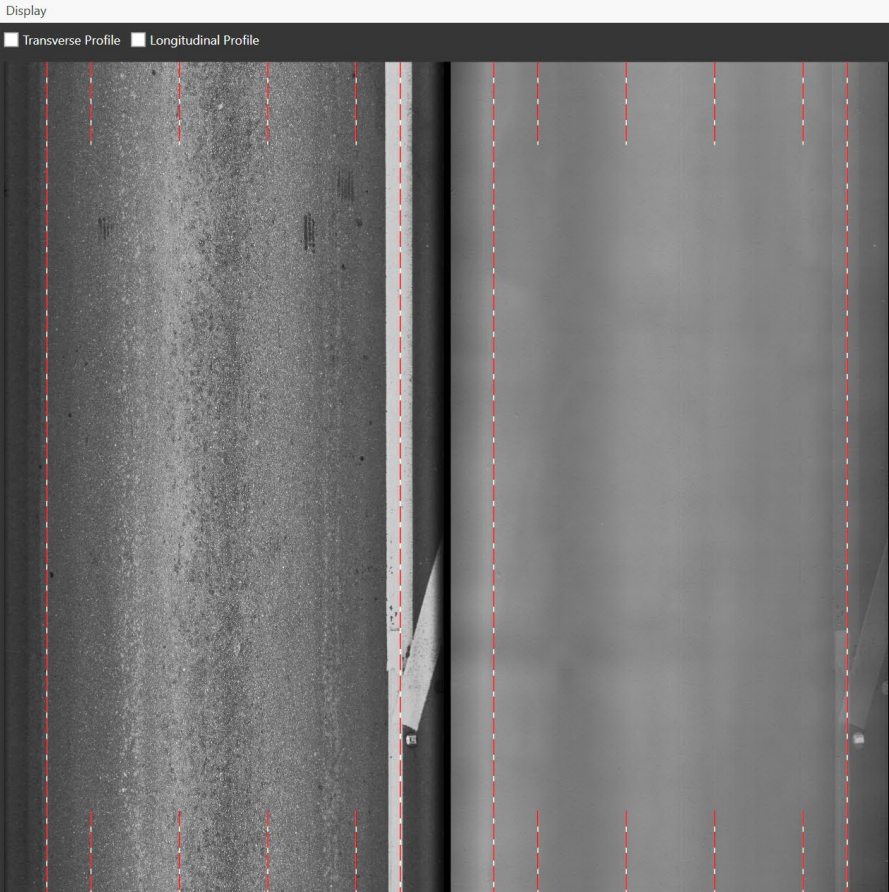
File View Processing Reports Assets Distresses Help

ft < > Set Number : 370 Frame : 95836.525 Timecode : 00:53:14:16 MP : 12.047 Distance : 48067.96 ft Latitude : 32.398984 Longitude : -89.953318 Speed : 49.32 Mph Direction : I Route Name : MS HIGHWAY 25  
Ref Post : 12.047

Roadway Images  Left  Perspective  Right  Maintain Aspect Ratio



Surface Image  Display  Transverse Profile  Longitudinal Profile



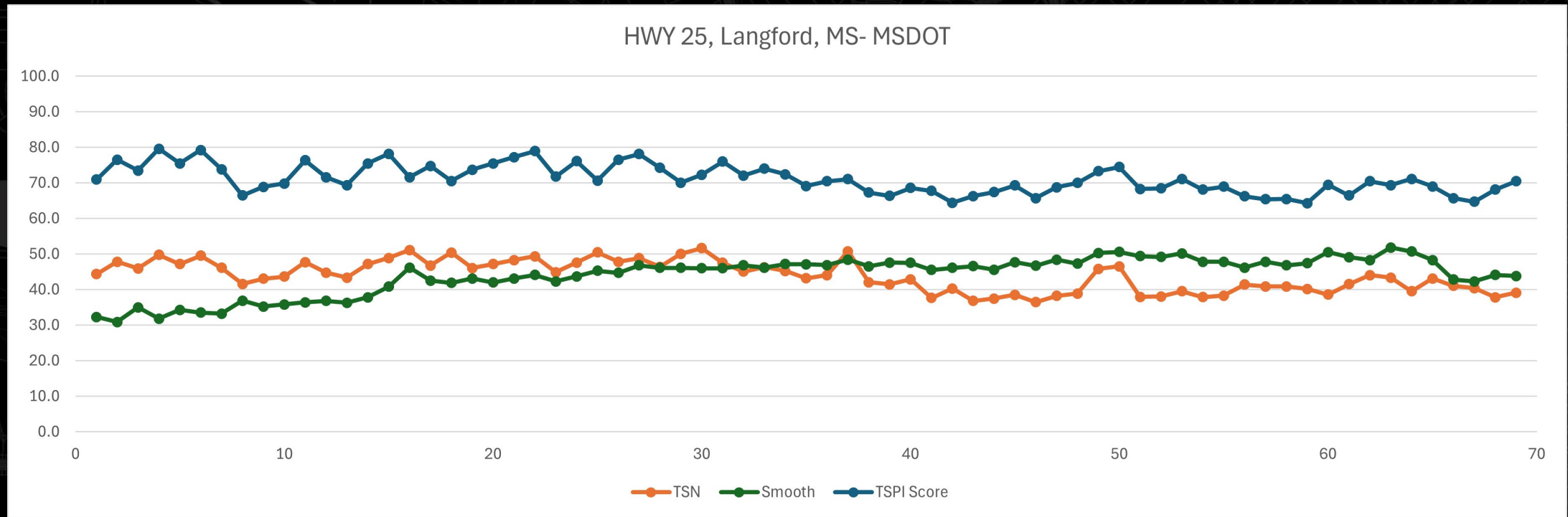
Surveys

TimeCode

Drag a column header here to group by that column

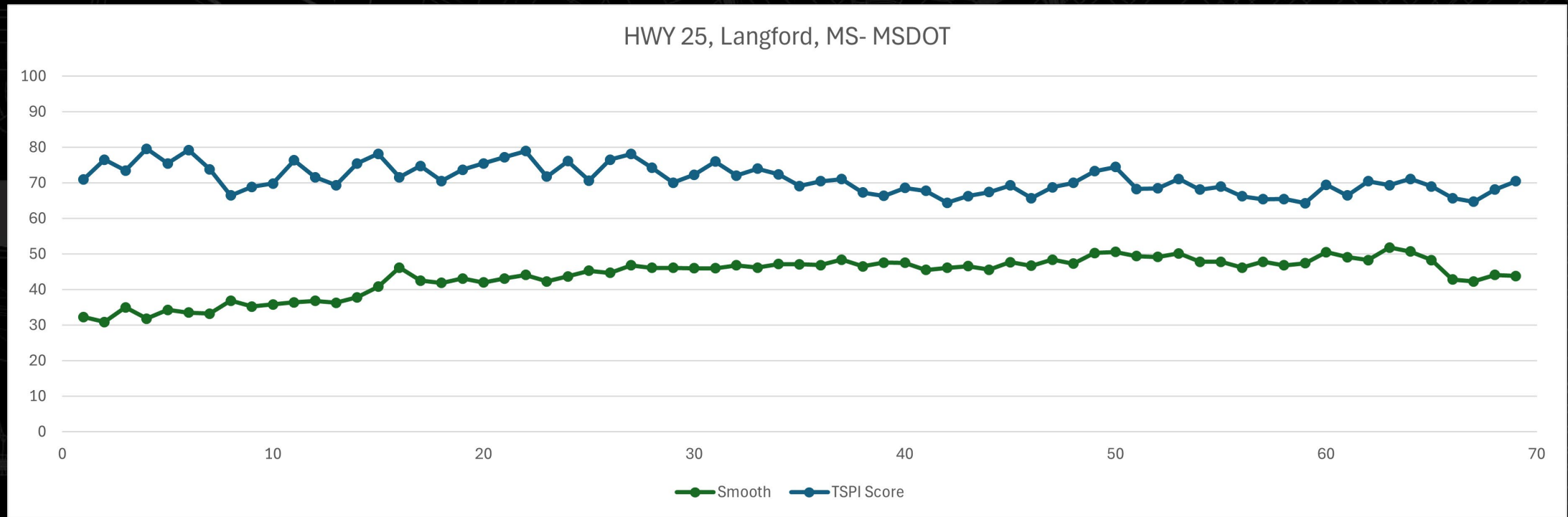
	RouteName	CountyNum	DistrictNum	Lane	TextId1	TextId2	TextId3
13	MS HIGHWAY 25	61		5	0	61_0025P1	RANKIN COMP

# Texture Signature Performance Index





# Texture Signature Performance Index



*Special Thanks to:*

*- MSDOT*

*- OHDOT*

*- ICART*



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April 29 - May 2



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FLORIDA

*New Technology For An Old World*

QUESTIONS?

COME BY THE PATHWAY  
SERVICES INC. BOOTH  
TO DISCUSS MORE...



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