



A COMPARISON STUDY OF TRAFFIC SPEED DEFLECTOMETER AND FALLING WEIGHT DEFLECTOMETER ON TEXAS ROADS

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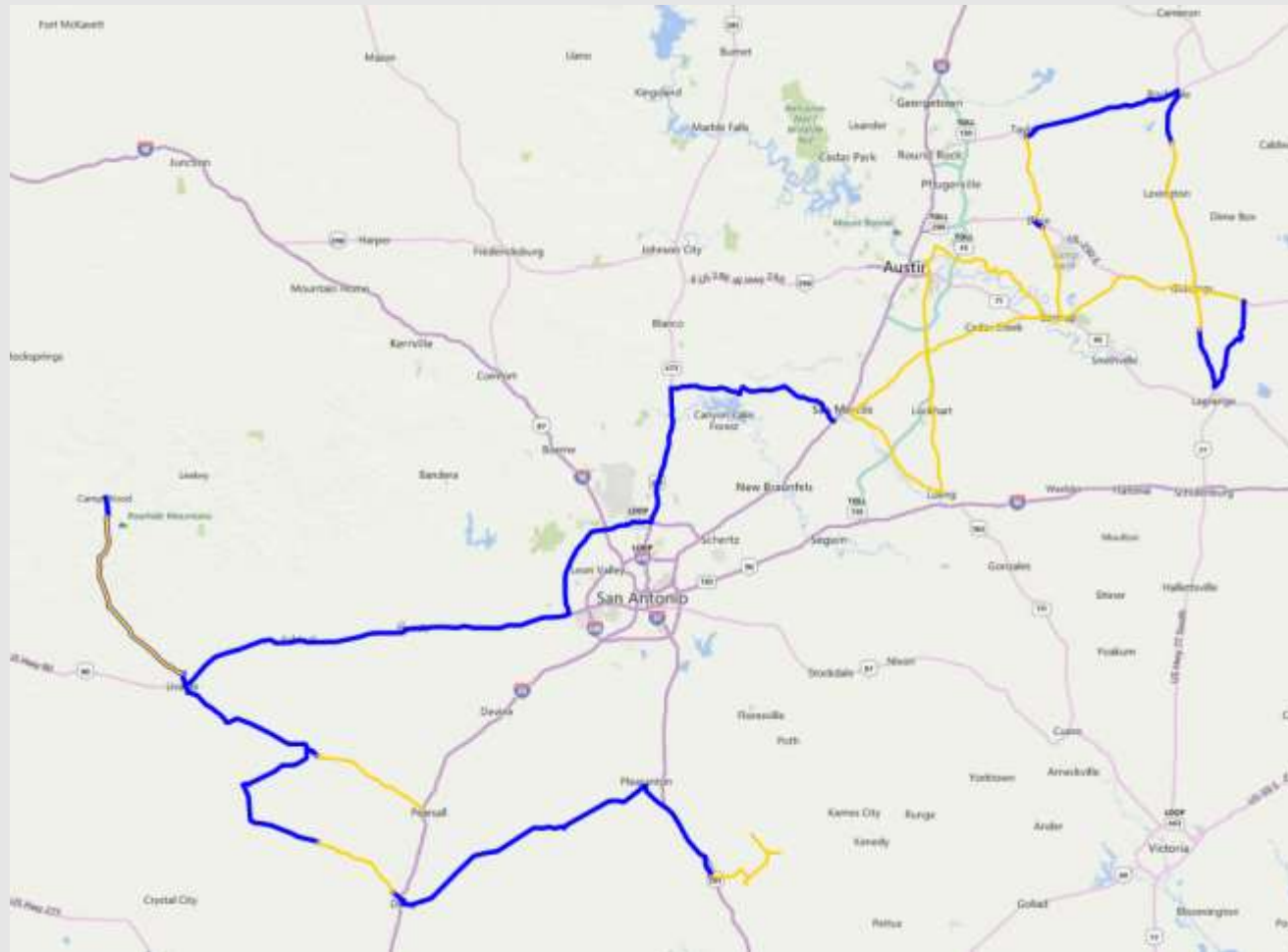


Outline



- Introduction
- Testing routes in Texas
- Testing Devices
- Data Components
 - Subsurface
 - Surface
- Analysis
- Summary

- Transportation pool fund study 385
 - Project: Pavement Structural Evaluation with Traffic Speed Deflection Devices (TSDDs)
 - Objective: establish a research consortium focused on providing participating agencies guidelines on how to specify collection and use data collected with TSDDs for network- and project-level (if feasible) pavement management applications.
 - Led by Virginia DOT
 - TxDOT: Pilot road testing conducted in 2019
 - Ongoing study

TSD Routes in Texas

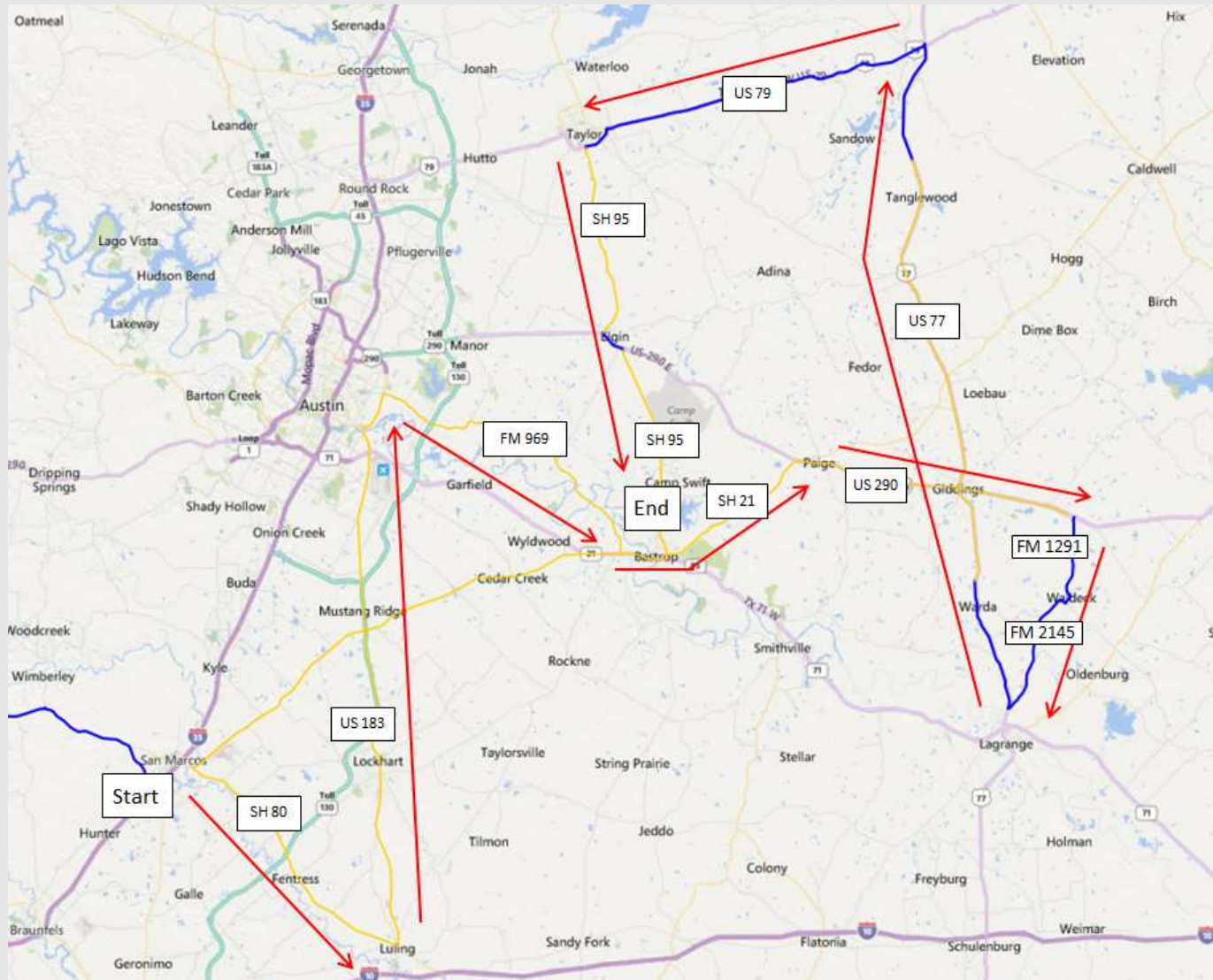


All Routes

-  Primary Routes in Yellow
-  Connecting Routes in Blue

Route	Total Mileage
All routes	757
Primary routes	362
Connecting routes	395

TSD Routes in Texas: Austin Area



Austin Area

- Primary Routes in Yellow
- Connecting Routes in Blue

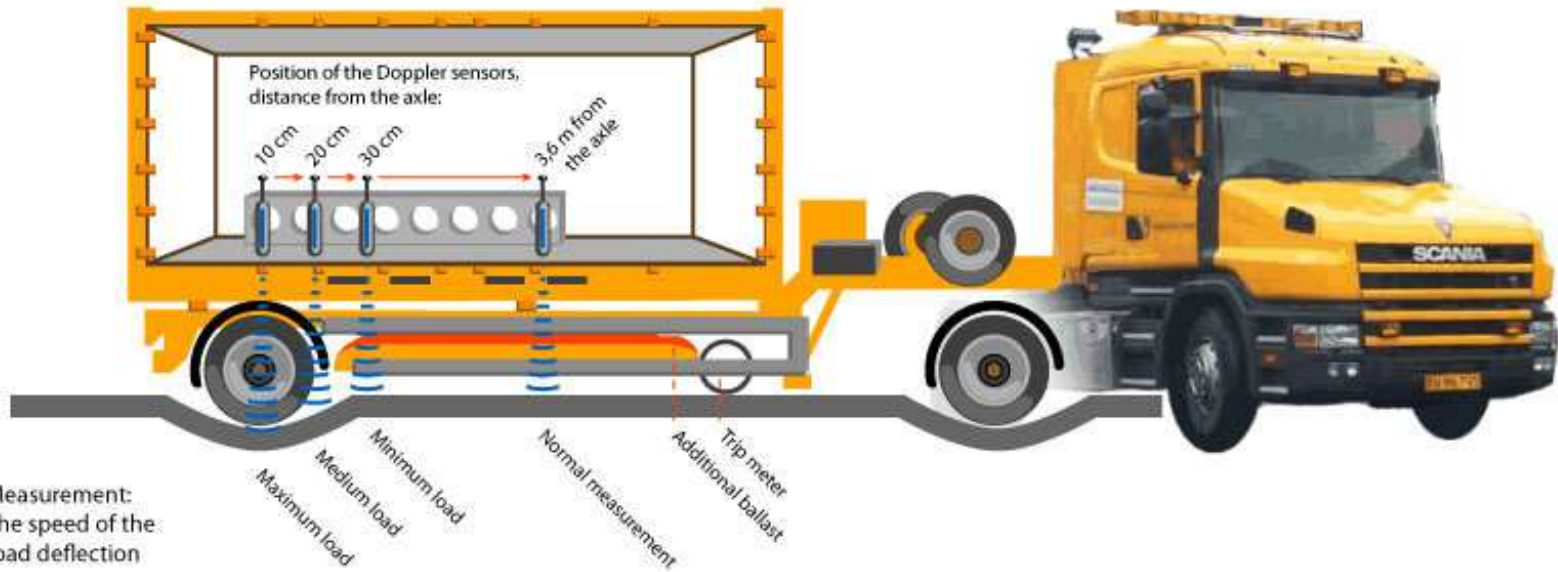
Route	Total Mileage
All routes	253
Primary routes	186
Connecting routes	67

iPAVe Data Collection



TSD Device (Cont'd)

How the High Speed Deflectograph works:



Measurement:
The speed of the
road deflection

Axle load:
10 t

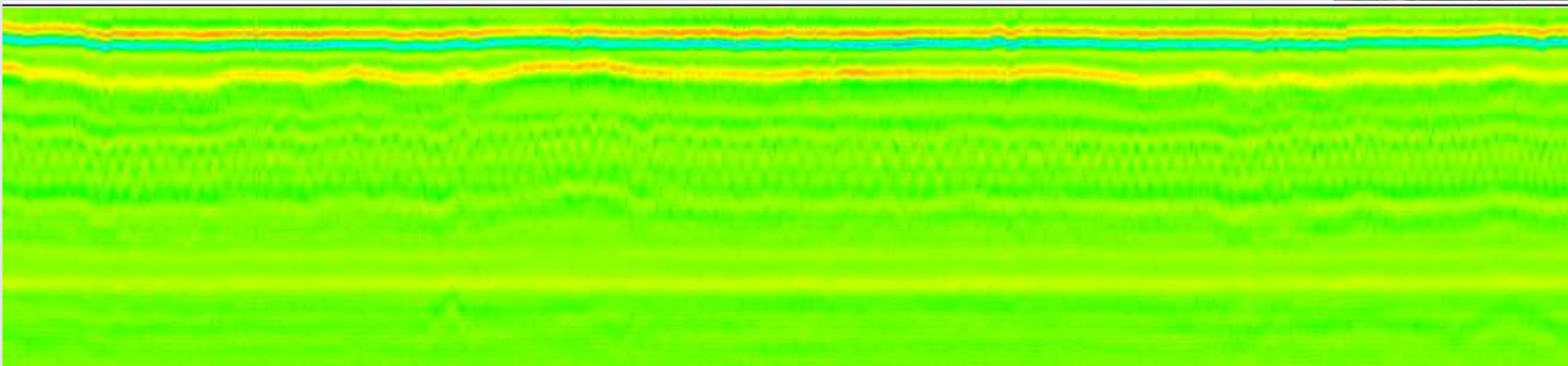
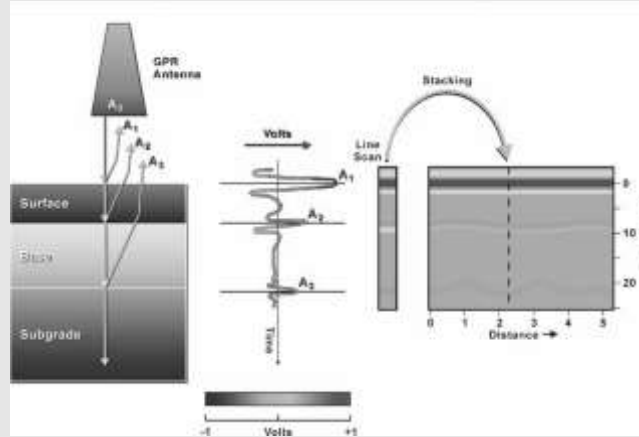
Speed:
50 - 80 km/h

Photography: Susanne Baltzer, Graphics: Ditte Kilsgaard Møller (dkm@vd.dk), The Danish Road Institute

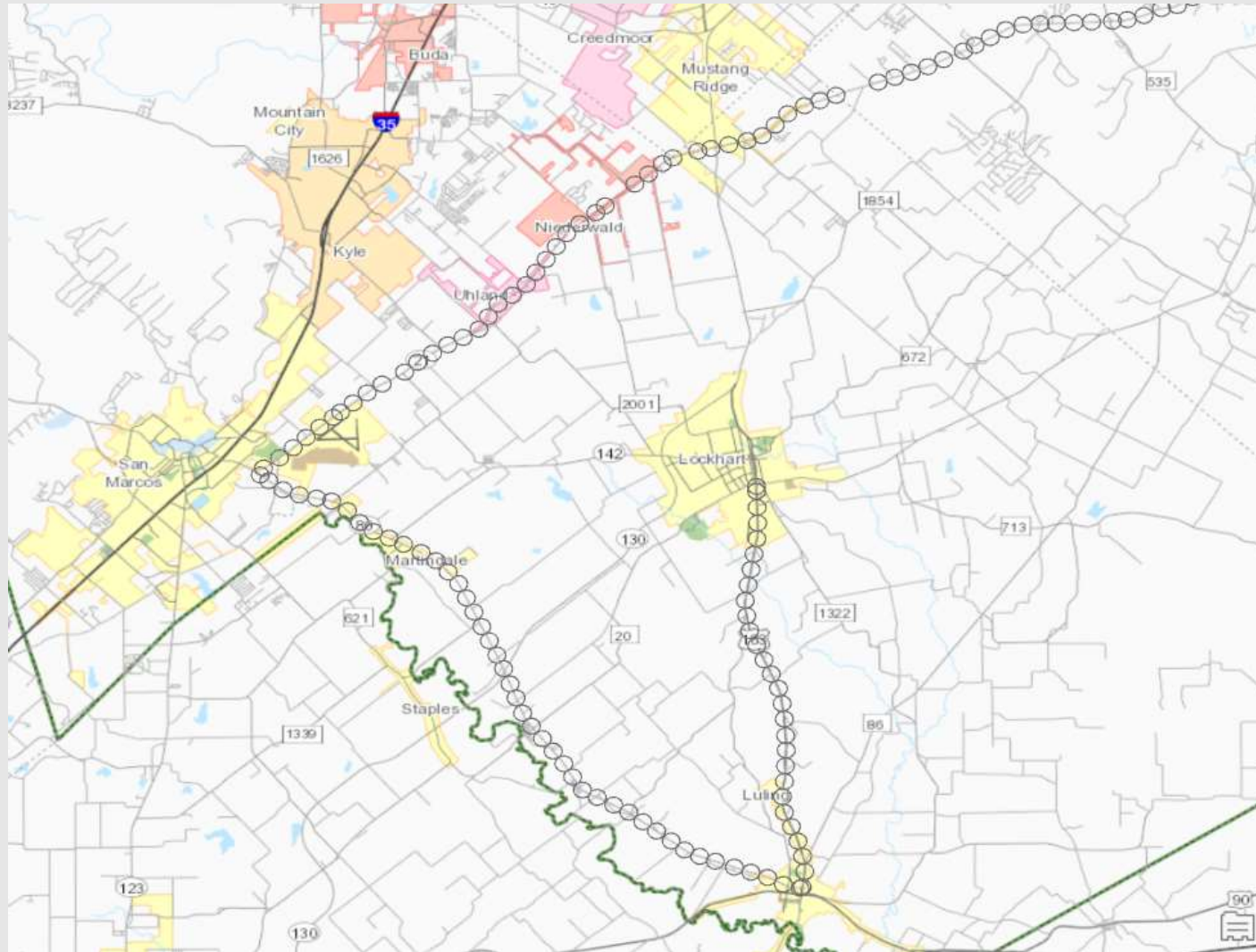


GPR Data Collection

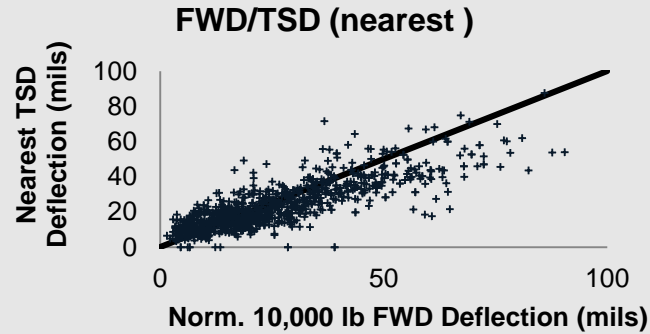
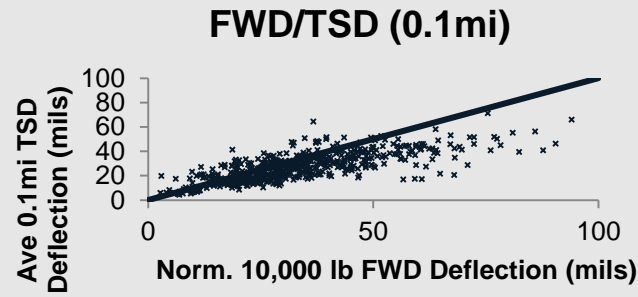
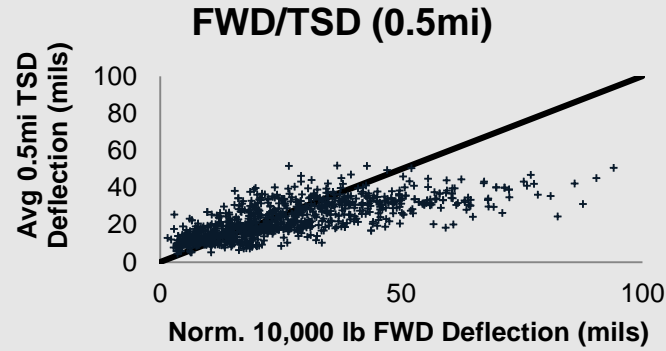
- TxDOT 1 GHz air-launched GPR



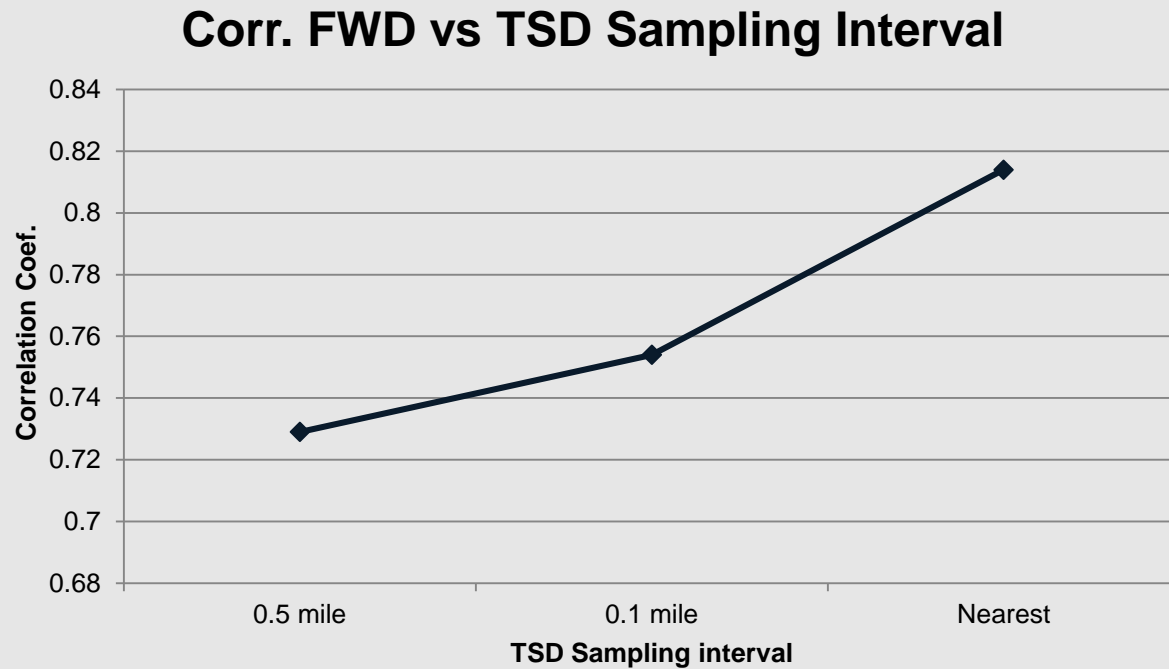
TSD Deflection Data Spatial Sampling



Deflection: FWD vs TSD Sampling

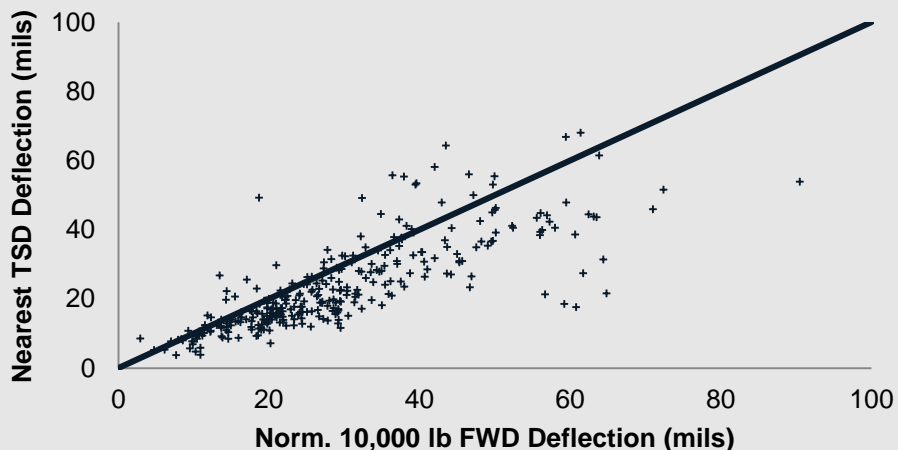


Deflection: Correlation between FWD and TSD Sampling



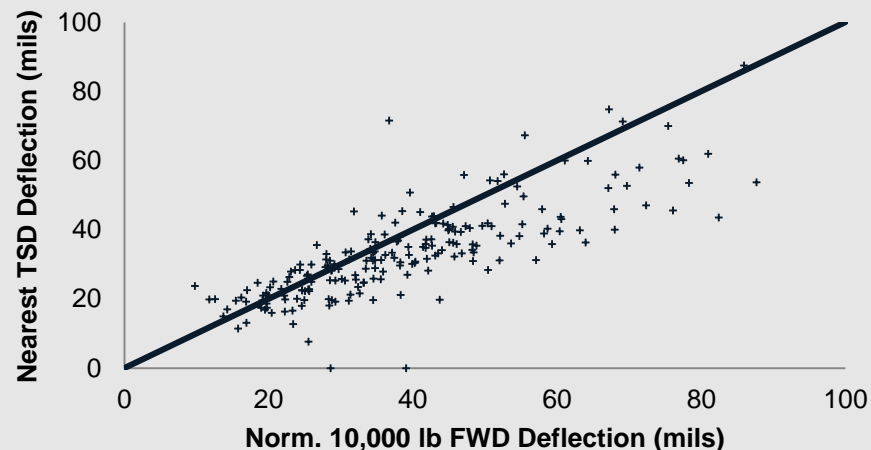
Deflection: FWD vs TSD, Highway specific

FWD/TSD Comparison, SH55



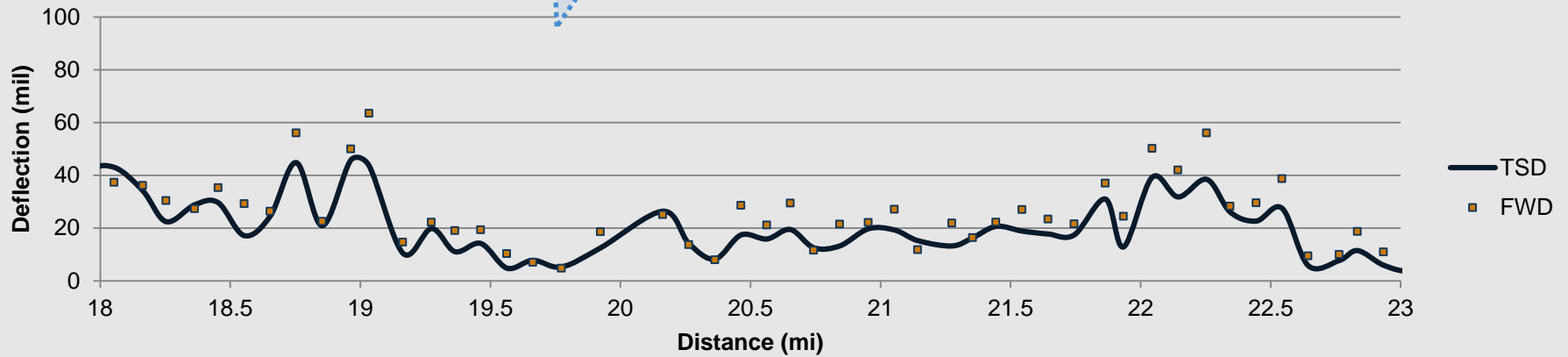
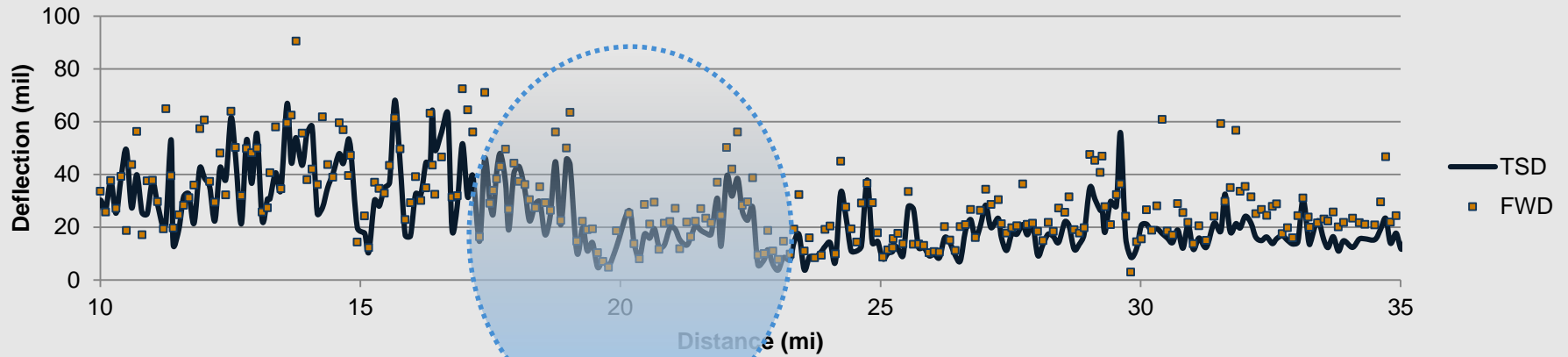
	FWD stats	TSD stats
AVG	29.570	23.800
STDEV	15.377	12.984
COV	0.520	0.546
MAX	123.329	68.050
MIN	2.917	3.750
CORR	0.793	

FWD/TSD Comparison, FM140

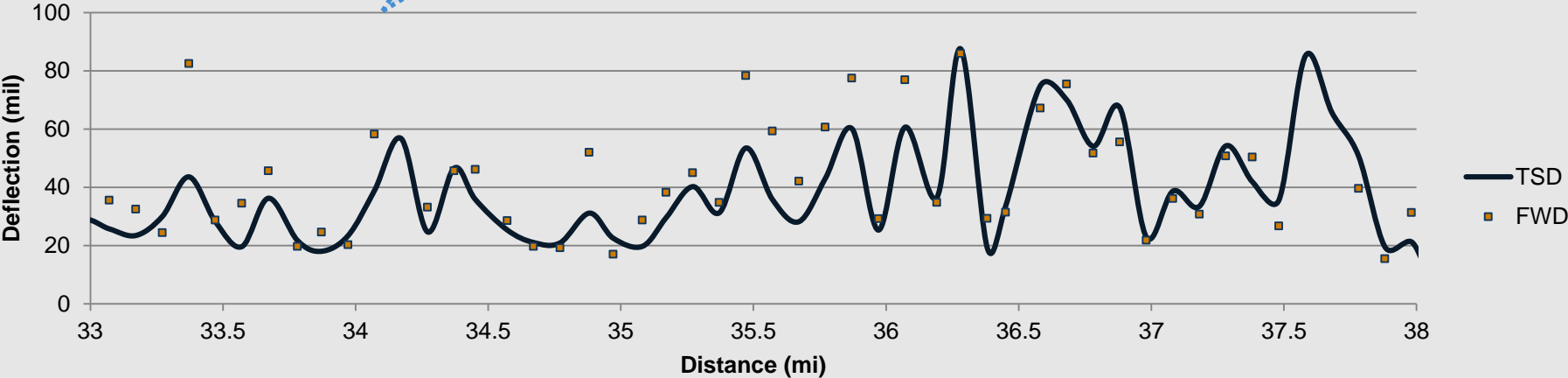
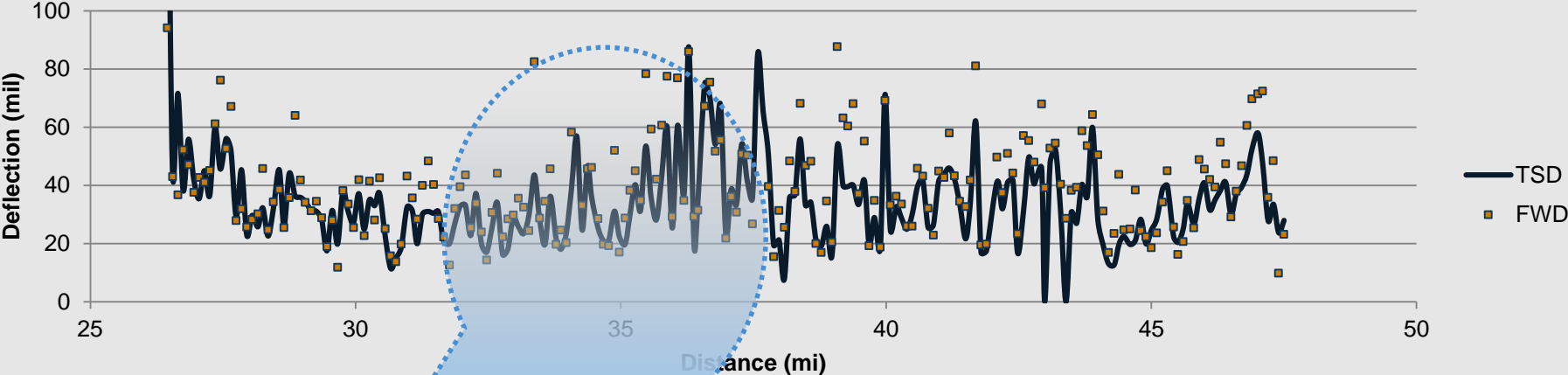


	FWD stats	TSD stats
AVG	25.381	23.317
STDEV	19.437	16.050
COV	0.766	0.688
MAX	134.800	190.700
MIN	1.536	0.000
CORR	0.842	

Deflection on SH55: TSD vs FWD



Deflection on FM140: TSD vs FWD



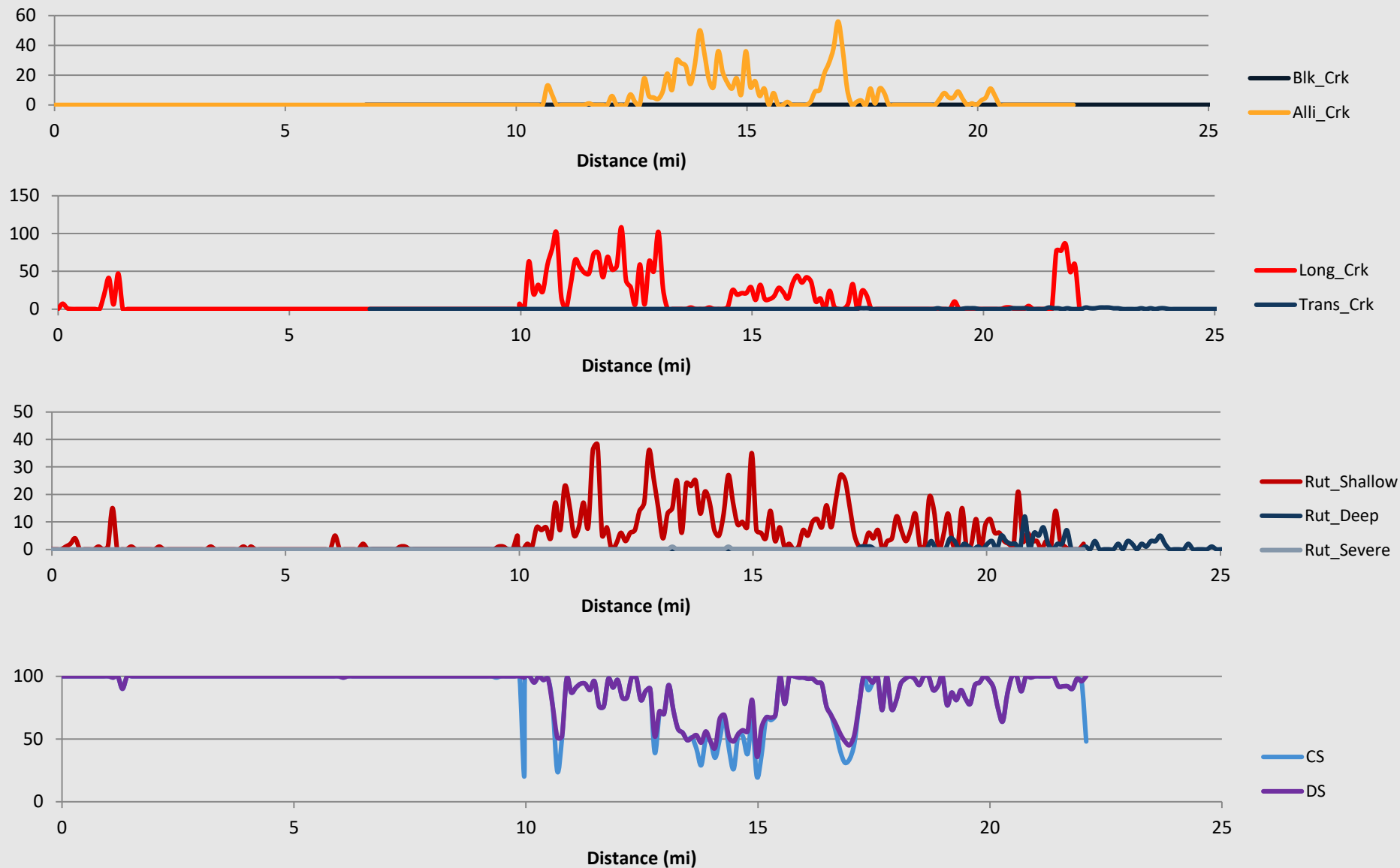
More In-Depth Study: FM969

- Length about 22 miles
- Pavement:
 - Flexible pavement
 - Structure varies
- Dataset
 - Surface condition data
 - Subsurface
 - TSD deflection
 - FWD deflection
 - GPR imaging

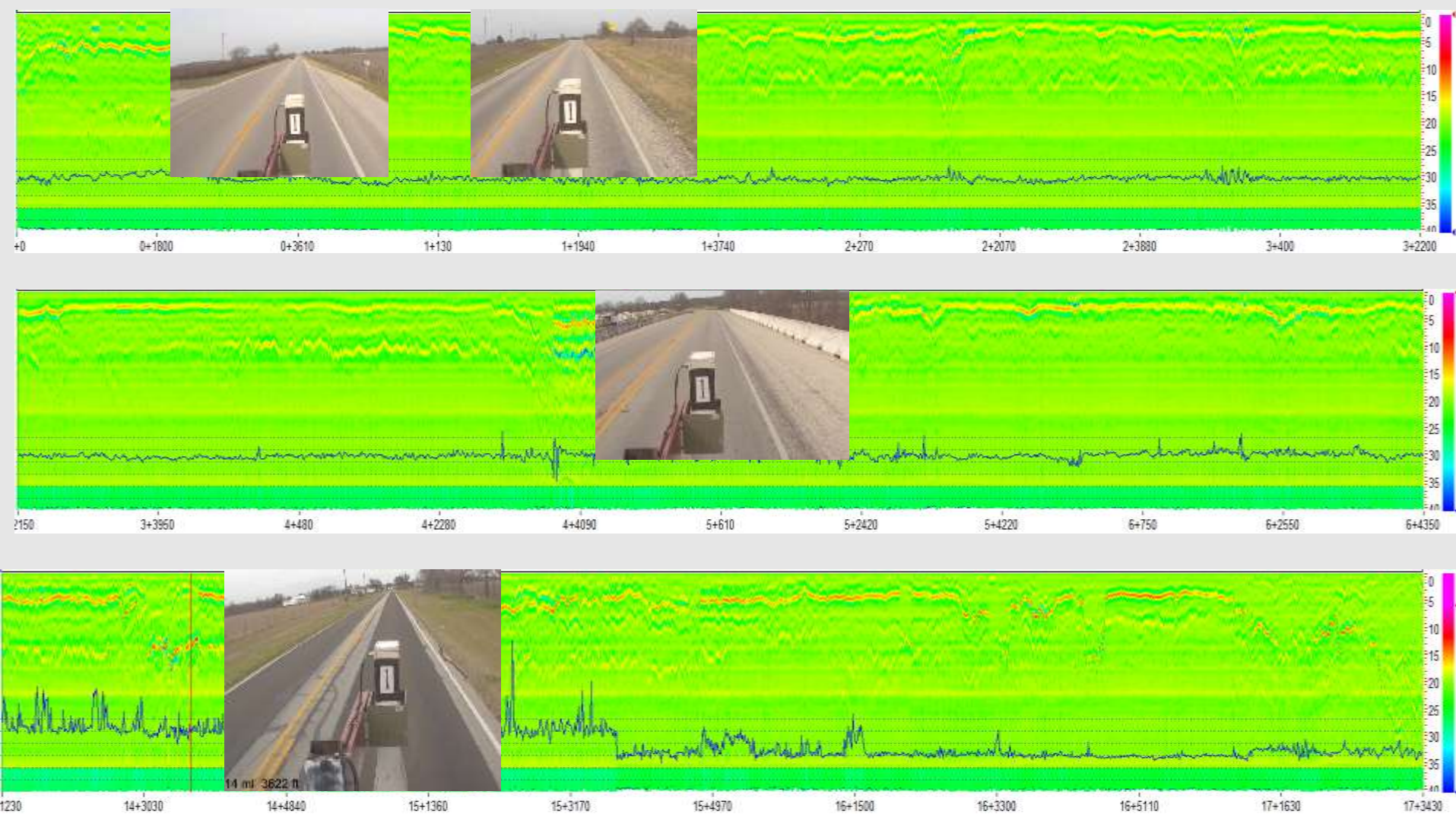
FM969: Surface Condition Overview



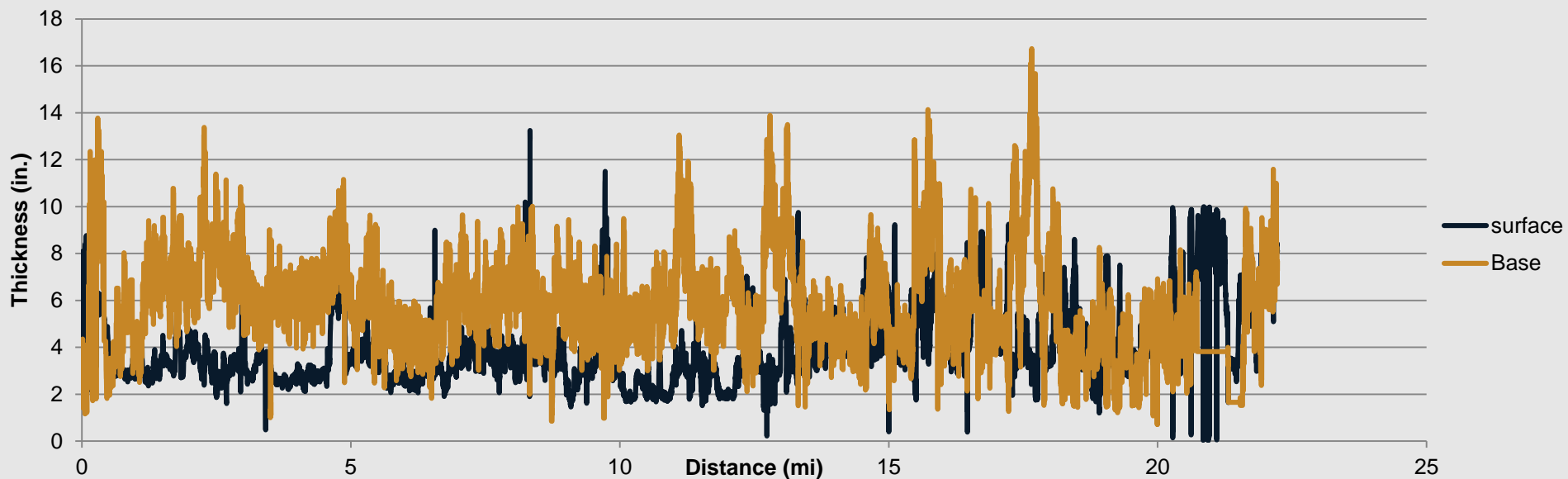
FM969: Surface Condition Evaluation



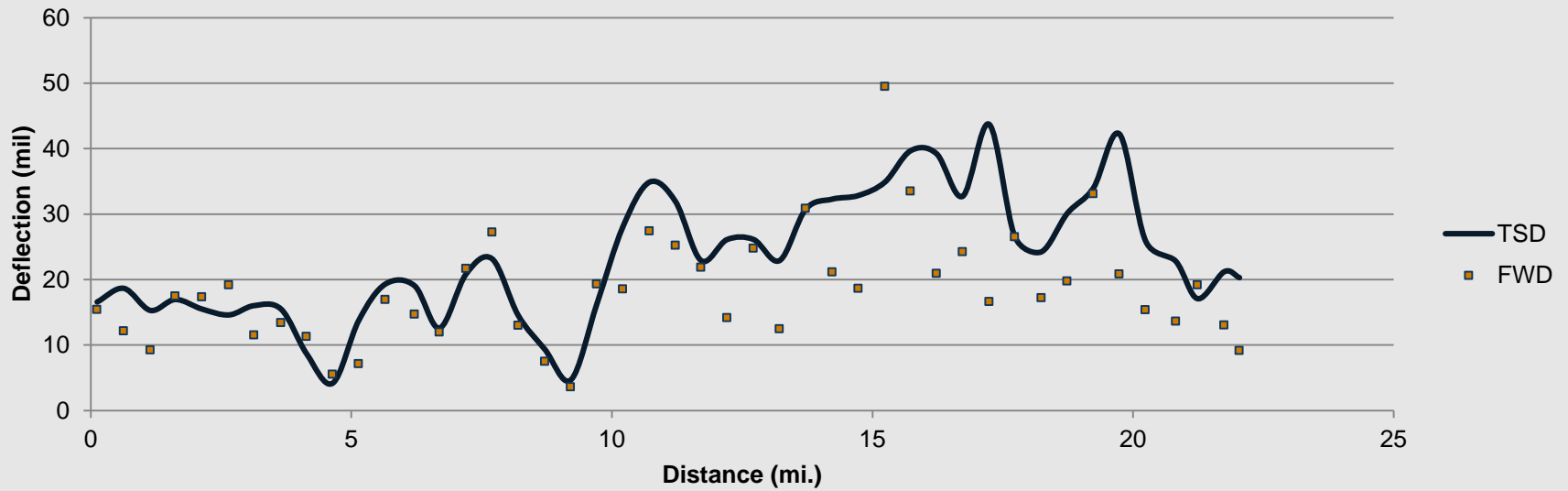
FM969: Subsurface Condition



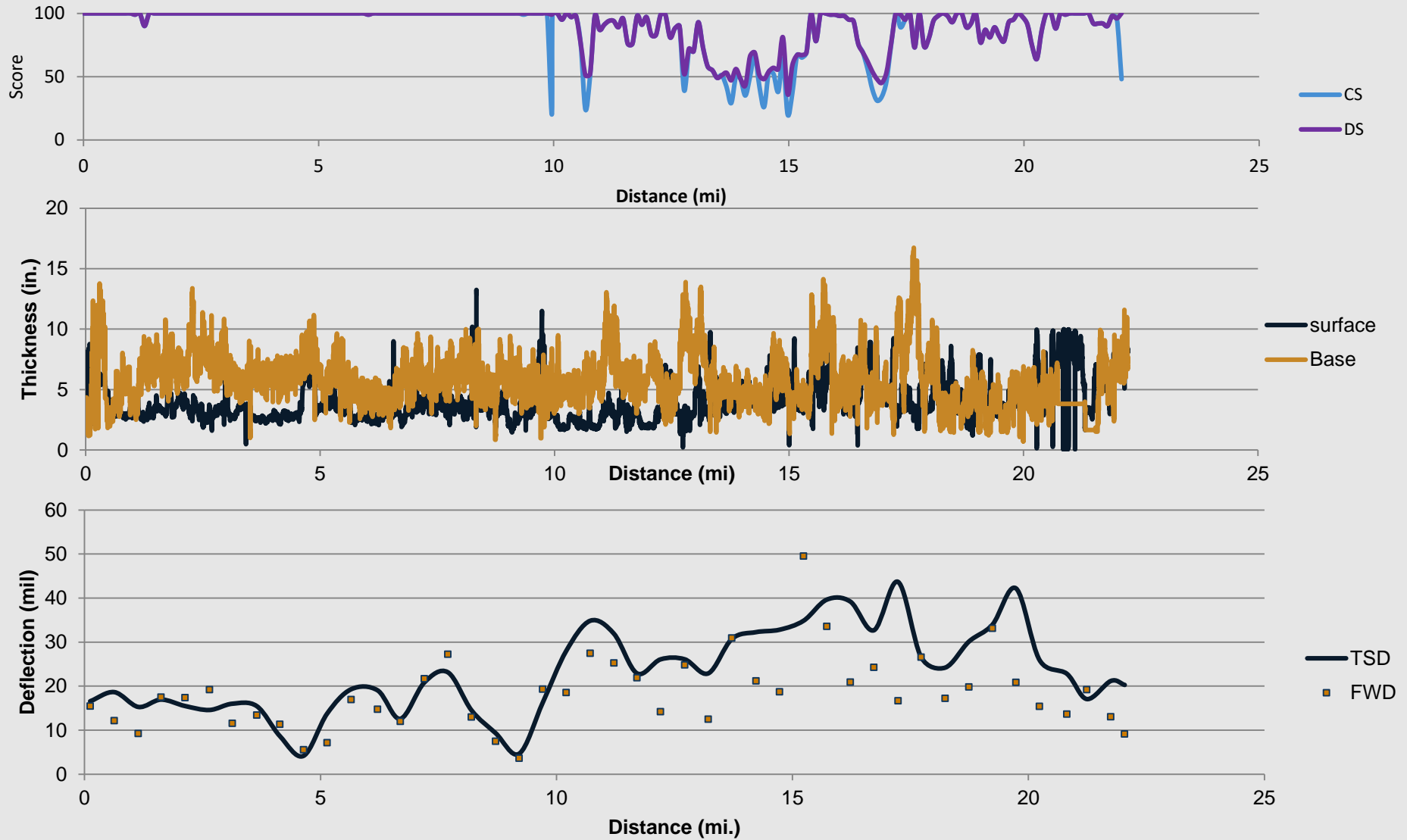
FM969: Pavement structure



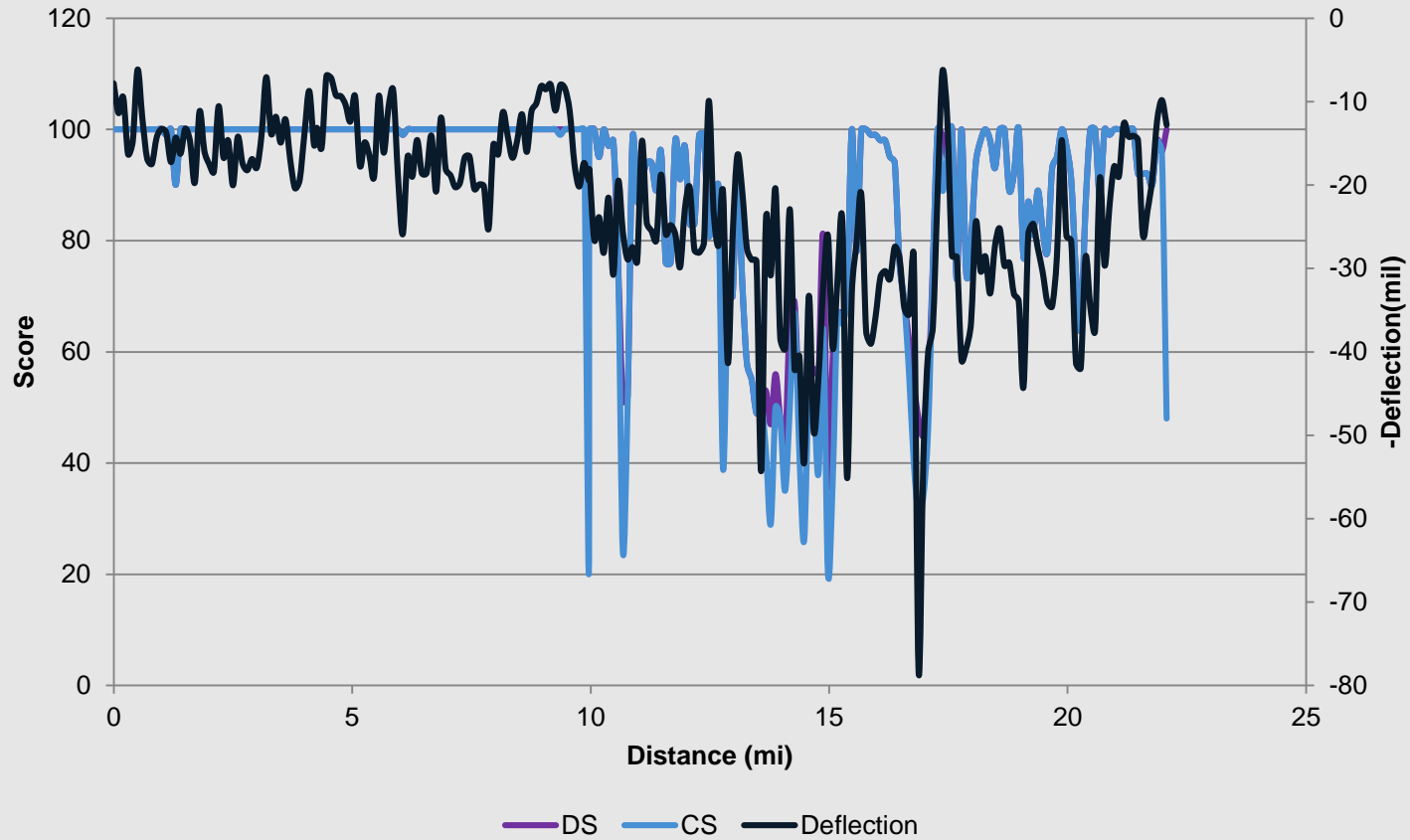
FM969: Load bearing capacity



FM969: Index Comparison



FM969: TSD deflection vs pavement scores



	CORR
DS vs Dflection	-0.64
CS vs Dflection	-0.58

Summary

- A preliminary study was done to evaluate pavements structural capacity under Transportation Pool fund study 385
- Data focus
 - Traffic speed deflectometer
 - Falling weight deflectometer
 - Ground penetrating radar
 - Pavement surface conditions
- Analysis approaches
 - Visual comparison
 - Statistics



THANK YOU
