

Key Issues in Pavement Preservation



Measuring
Performance

Buzz Powell – NCAT Pavement Test Track

Key Issues

- Assessing / predicting performance
 - Data collection unique to specific agencies
 - Collection and analysis processes evolve
- Pavement preservation strategies
 - Limited history with “new” technologies
 - Need to document long term performance
- Minimize life cycle cost of infrastructure

Performance Measures

- Ride quality
- Physical distresses
- Structural capacity
- Driver safety

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Ride Quality



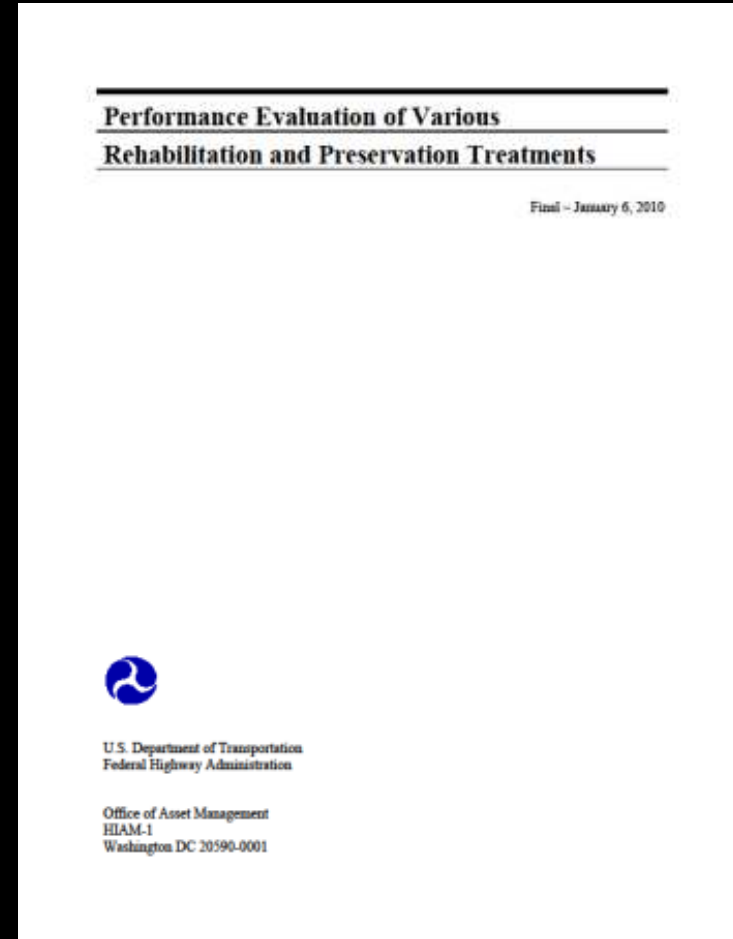
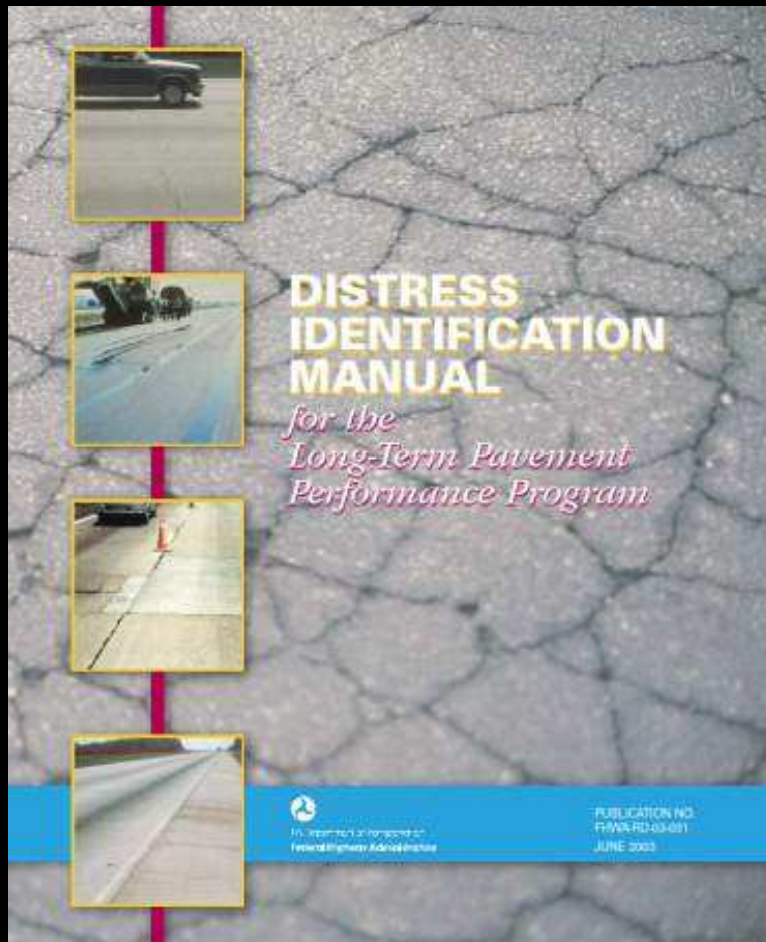
Performance Measures

- Ride quality
- **Physical distresses**
- Structural capacity
- Driver safety

Physical Distresses

- Flexible pavements
 - Trans, Long, Alligator & Block Cracking
 - Rutting, Raveling
 - Patching
- Rigid pavements
 - Joint Faulting, Spalling, Open
 - Cracked, Broken, Shattered, Faulted Panels
 - Punchouts

Physical Distress References



Physical Distress Data Collection

CLASS	DISTRESS	EQUIPMENT
Manual	Surface Defects	Paper forms Handheld data loggers Integrated systems (e.g., ROMDAS, Vizi-road)
Analog and Digital Image	Cracking and Surface Defects	Analog imaging: Pasco RoadRecon, Gerpho, Roadware Area scan digital image: Samsung SDS, PAVUE, Pasco Line scan digital image: Waylink, Roadware, EVASIVA, International Cybernetics Corp.
Profilers	Rut Depths	Laser profilers: Acuity, AMSKAN, ARRB TR, Dynatest, Greenwood, INO, Roadware, ROMDAS Ultrasonic Profilors: Roadware, ROMDAS Infrared Profilors: PRORUT, SIRST

Manual Data Collection



Manual Data Collection



Manual Data Collection

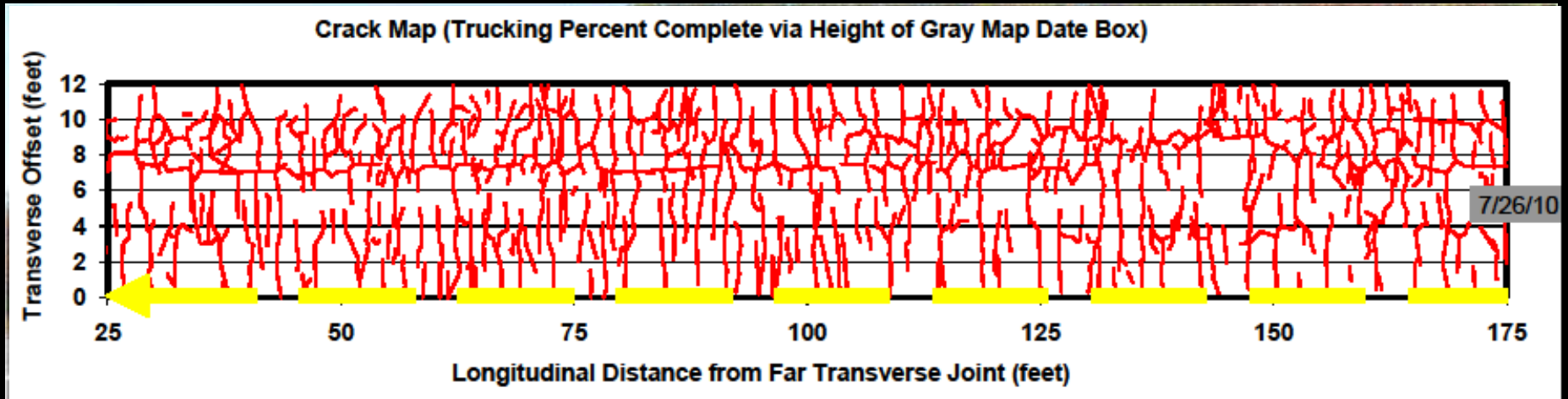


Image-Based Data Collection

- Camera(s) suspended over pavement
- Mounted on long arms for panoramic views
- Lights are sometimes used for illumination

Illuminated Digital System



Non-Illuminated Digital System



Digital Image Analysis

- Manual
- Semi-Automated
- Fully-Automated

Automated Image Analysis

- Proprietary algorithms
- Reliable on development surfaces
- Mixed results on other surfaces
- Validation exercises are important

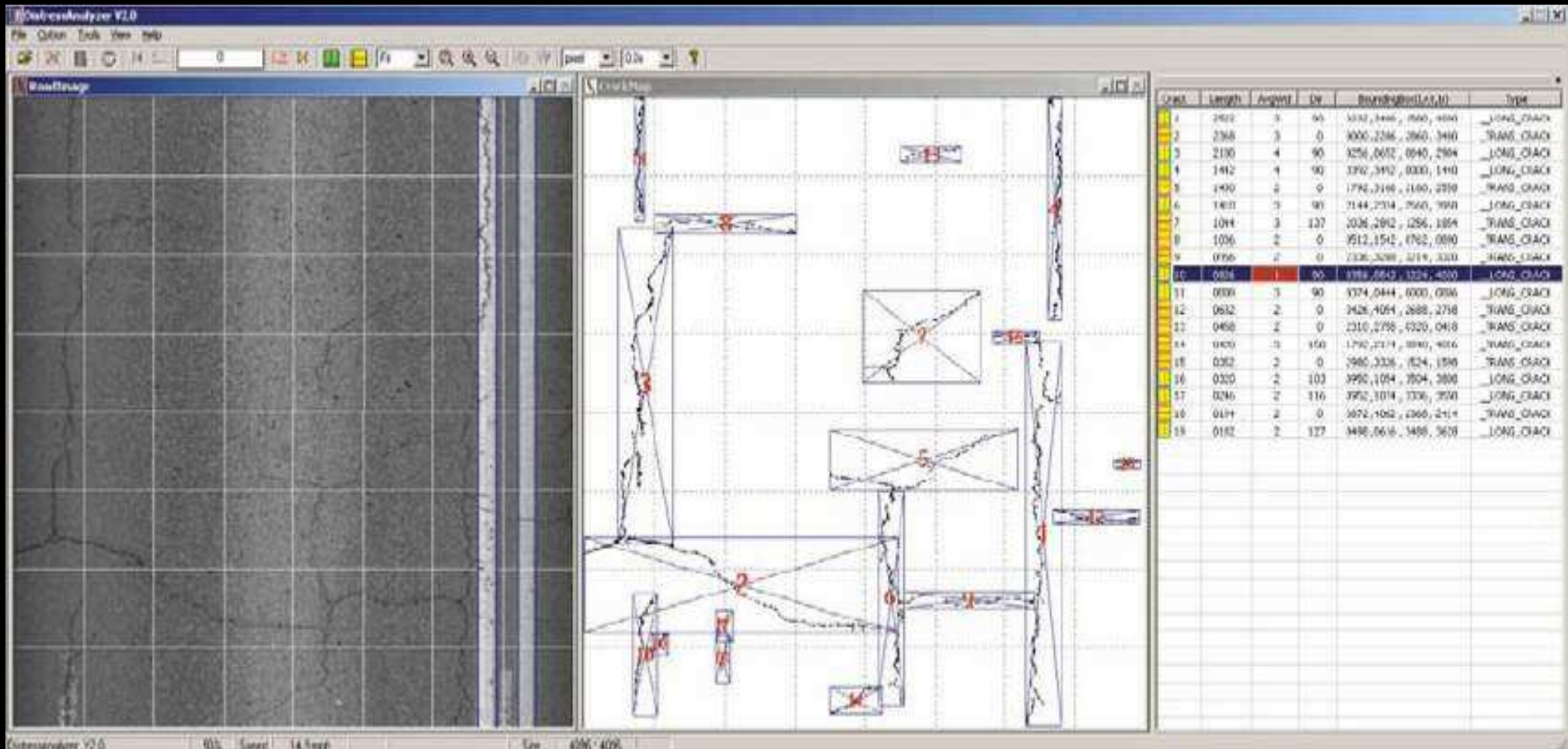
- Even visual inspections differ

FHWA-OR-RD-05-10

Index	Fugro	IMS	Pathway	Roadware	Rating Crew 1	Rating Crew 2	Rating Crew 3
Overall					*		
Fatigue					*	*	
No Load	*	*	*	*	*	*	*
Patching				*	*	*	*
Raveling	*	*	*	*	*	*	*
Rutting	*	*	*	*	*	*	*

* indicates a statistically significant correlation at or less than the .05 level.

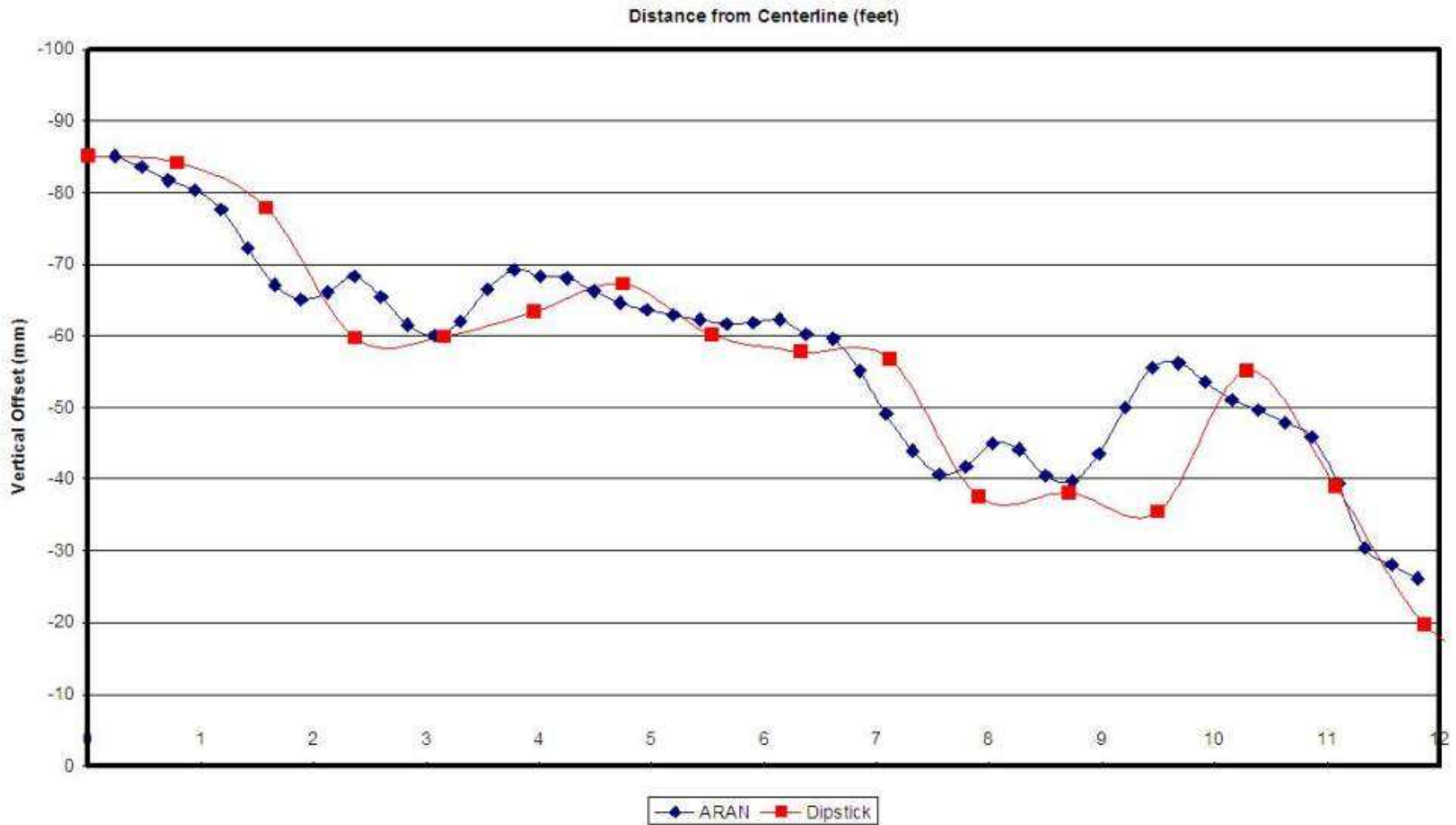
Automated Image Analysis



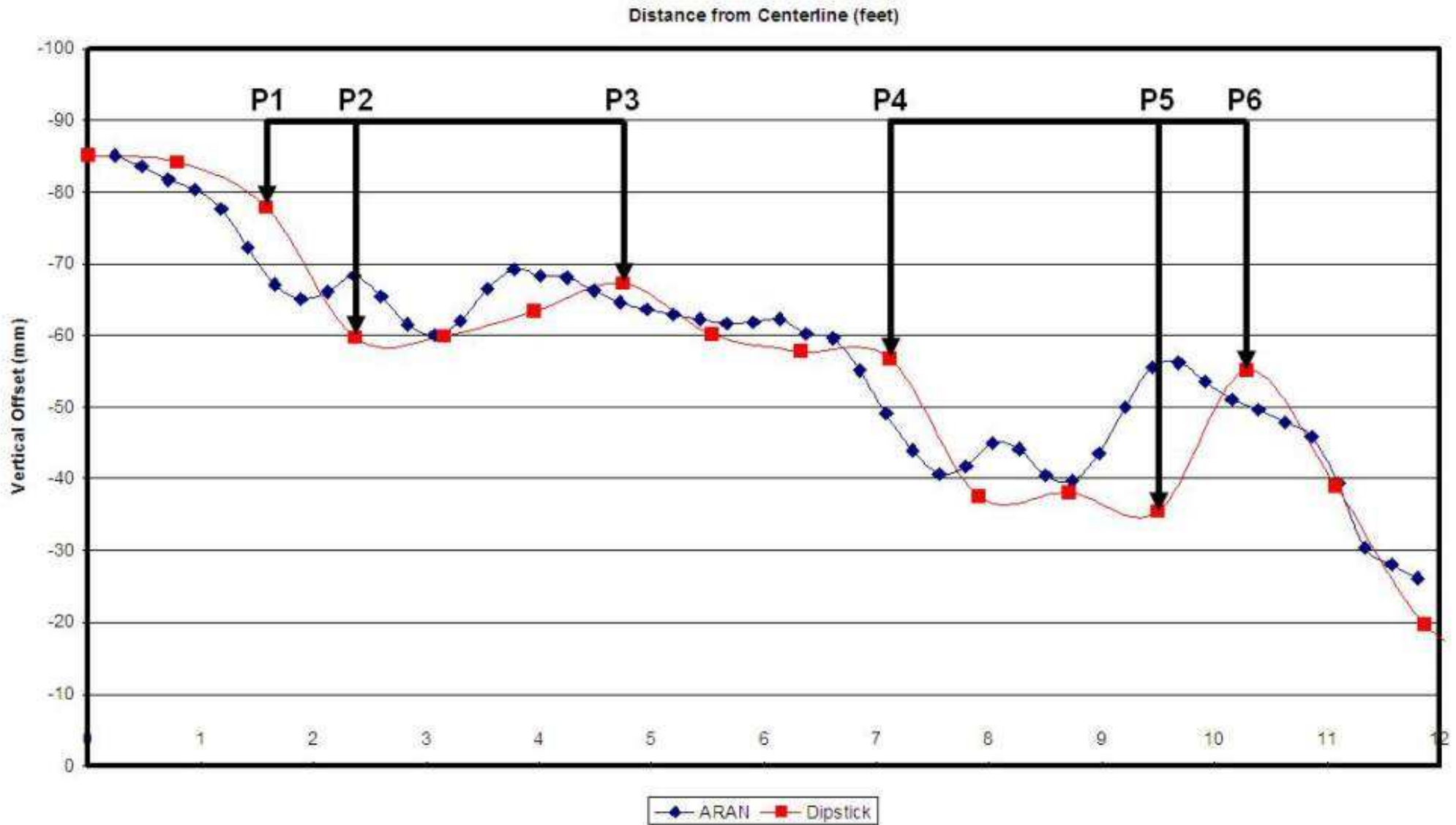
Rut Depth Measurement



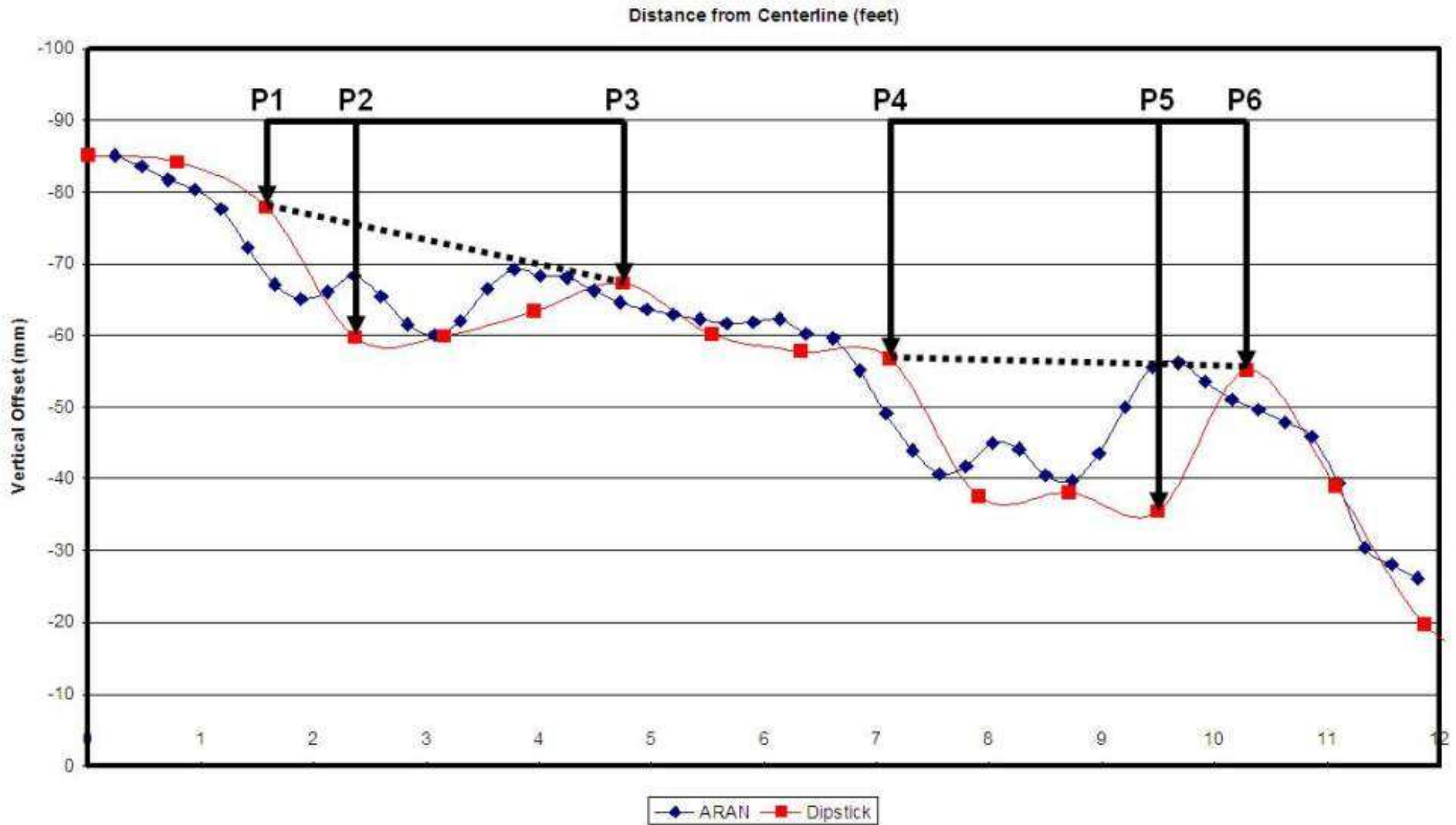
Profile Comparison 6/9/08



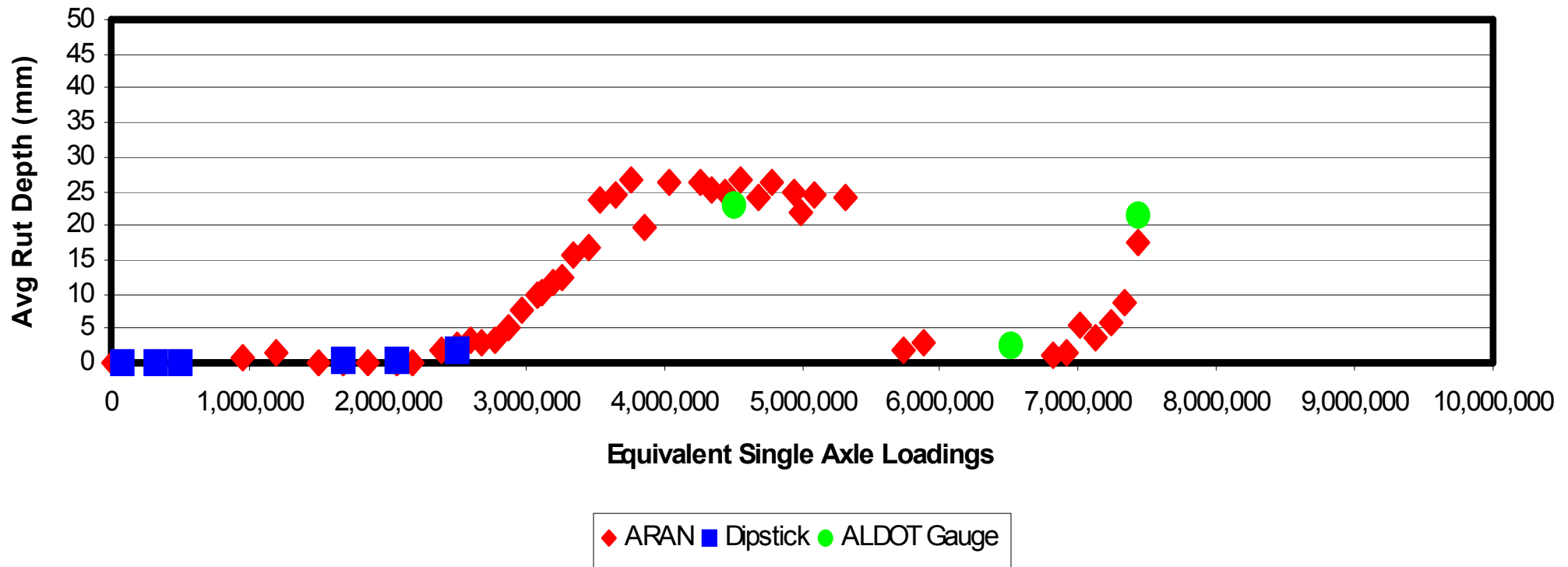
Profile Comparison 6/9/08



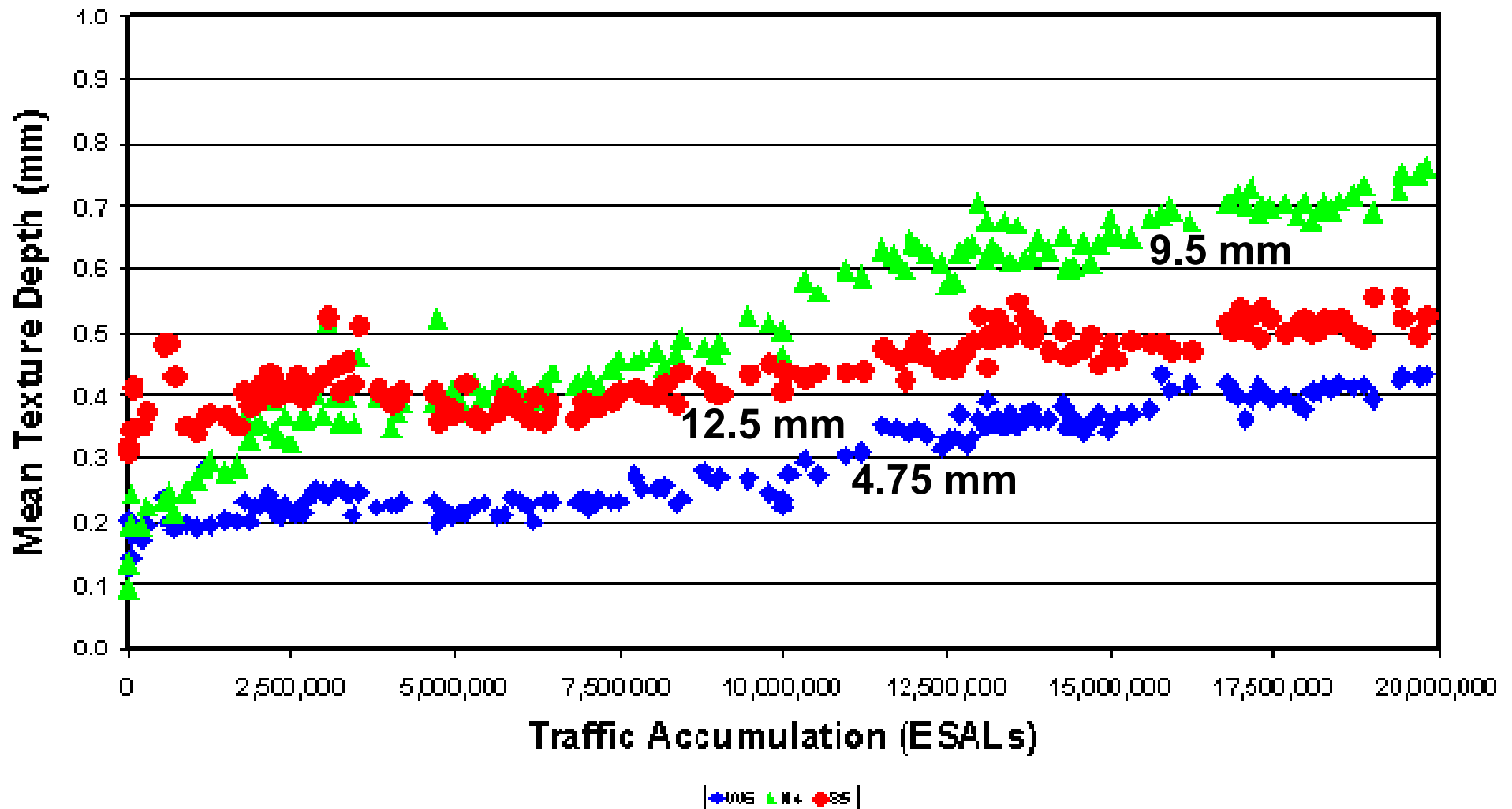
Profile Comparison 6/9/08



~1% VTM Rutting Performance



Raveling via Macrotexture



Performance Measures

- Ride quality
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- **Structural capacity**
- Driver safety

Falling Weight Deflectometer



Ground Penetration Radar



Destructive Sampling



Pavement Performance Measurements

- Ride Quality
- Physical Distress
- Structural Capacity
- Driver Safety

Surface Friction in Wet



Questions ?

