**Evaluation of Mobile Advanced Road Weather Information Sensor (MARWIS) by Lufft for Indiana Winter Road Operations**
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**MARWIS Overview**
100 measurements per second – Aggregated to 1 second in the cloud. Measurements taken by MARWIS:
• Road Condition
• Road Surface Temperature
• Water Film Height
• Dew Point Temperature
• Friction
• Relative Humidity Above Road Surface
• Ice Percentage

**Road Condition Evaluation from Wheel Track Sensor**
![Cross-Section 1](Run 5 Before Salt Application)
![Cross-Section 2](Run 8 After Salt Application)
![Cross-Section 3](Run 11 After Aggressive Salt Application)

**Temperature Evaluation**
![Run 10](Probe Readings - MARWIS Readings - Lane Center - MARWIS Readings - Wheel Track)
![Run 11](Probe Readings - MARWIS Readings - Lane Center - MARWIS Readings - Wheel Track)

**Friction Evaluation**

**Test Bed Prep, Layout, and Procedure**
- Day Before Testing: Dry Section – Zone A
- Day of Testing: Dry Section – Zone A
- Removing the Tarps: Brine Applied Day Before – Zone B
- After Salt (10 gallons) – Zone A
- Driving Route and Location of Test Site
- Start
- End
- Test Strip Setup

**Screen Captures from Live MARWIS Site**
- Drive to Lafayette – Road Conditions (Wheel Track)
- Run 7 – Road Conditions (Lane Center)
- Run 9 – Surface Temperature (Lane Center)
- Run 10 – Friction (Lane Center)

**Observations**
- Systematic temperature offset of -4°F compared to probe readings
- Skid test empirical results consistent with MARWIS friction readings
- Wheel track friction > lane center friction
- "Chemically wet" not consistently observed by MARWIS where expected