I-81 Corridor Coalition | Virginia Tech Transportation Institute | fathym | TruWeather Solutions

Autonomous Vehicles and Hyper Local Weather Data:
PILOT PROJECT ON INTERSTATE 81 IN VIRGINIA
April 25th, 2018
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Project
Microscale Winter Weather and Automated Vehicles

Subject: Unexpected changes in microscale winter weather events can impact safety and confidence in deploying automated vehicles with limited human driving responsibilities.

Objective: Demonstrate ability to detect and communicate microscale winter road weather hazards in near real-time on I-81 to mile marker resolution.

Key Parameters:

- Road Temperature at or below 32 degrees
- Is it precipitating or is there a threat for black ice?

Our Framework
I-81 Proof of Concept

Concept of Operations:

- Focus: Road snow and ice accumulation
- Period: January – April 2018
- Deploy 14 sensors on VDOT maintenance vehicles.
- Issue advisories and alerts between Front Royal, VA and Christiansburg, VA.
- Disseminate via SMS and email.
- District decision makers, dispatchers, and operators receive advisories and alerts.
- Hold weekly telecon with participants.

Partners: VDOT, VTTI, Fathym

I-81 Proof of Concept
Methods and Processes

Key Observation Sources

- Fathym Mobile Road Weather Sensors
- TrafficLand Traffic Cameras
- Radar
- Waze
- Surface Observations

Processes

- Detect and notify
- Generate advisories for threatening events within 24-hrs
- Mix of automated and human processes
- Issue near real-time alerts upon evidence of potential ice/snow accumulation

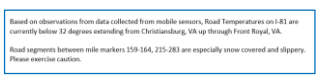
I-81 Proof of Concept
Results

Overview:

- 10 winter storm events impacted different I-81 road segments
- Issued **30** road temperature alerts when there was evidence for ice/snow accumulation
- 22 Verified

Metrics:

- Probability of Detection: 100%
- False Alarm Rate: 27%



I-81 Proof of Concept
User Feedback

Christopher McDonald, VDOT Regional Operations Engineer of the Southwest Region

"I received the alert for I-81 pavement temperatures this afternoon and I can see where it would be helpful."

Mike King, VDOT Southwest Region Safety Service Patrol Manager (Parsons Corp.)

"I drove through this area right before the alert went out. Spot on and very impressive."

I-81 Proof of Concept
Conclusions

- ✓ *For successful automated vehicle deployment, granular road temperature measurements are key to capturing surprise winter road weather events.*
- ✓ *Granular road weather data sets will improve nowcasting and prediction of microscale road weather events, making automated driving safer.*

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Thank you!