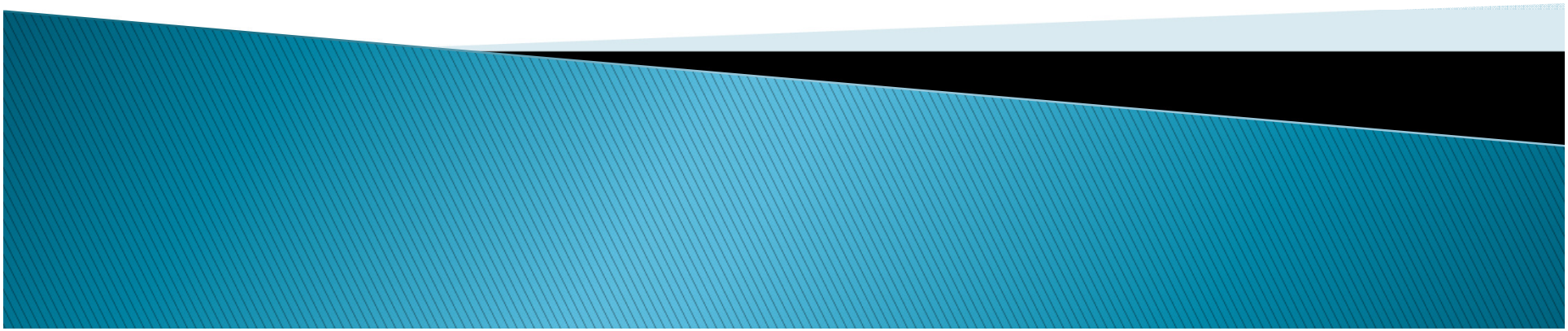
Idaho's Winter Operations Systems

Dennis Jensen
Idaho Winter Operations Coordinator



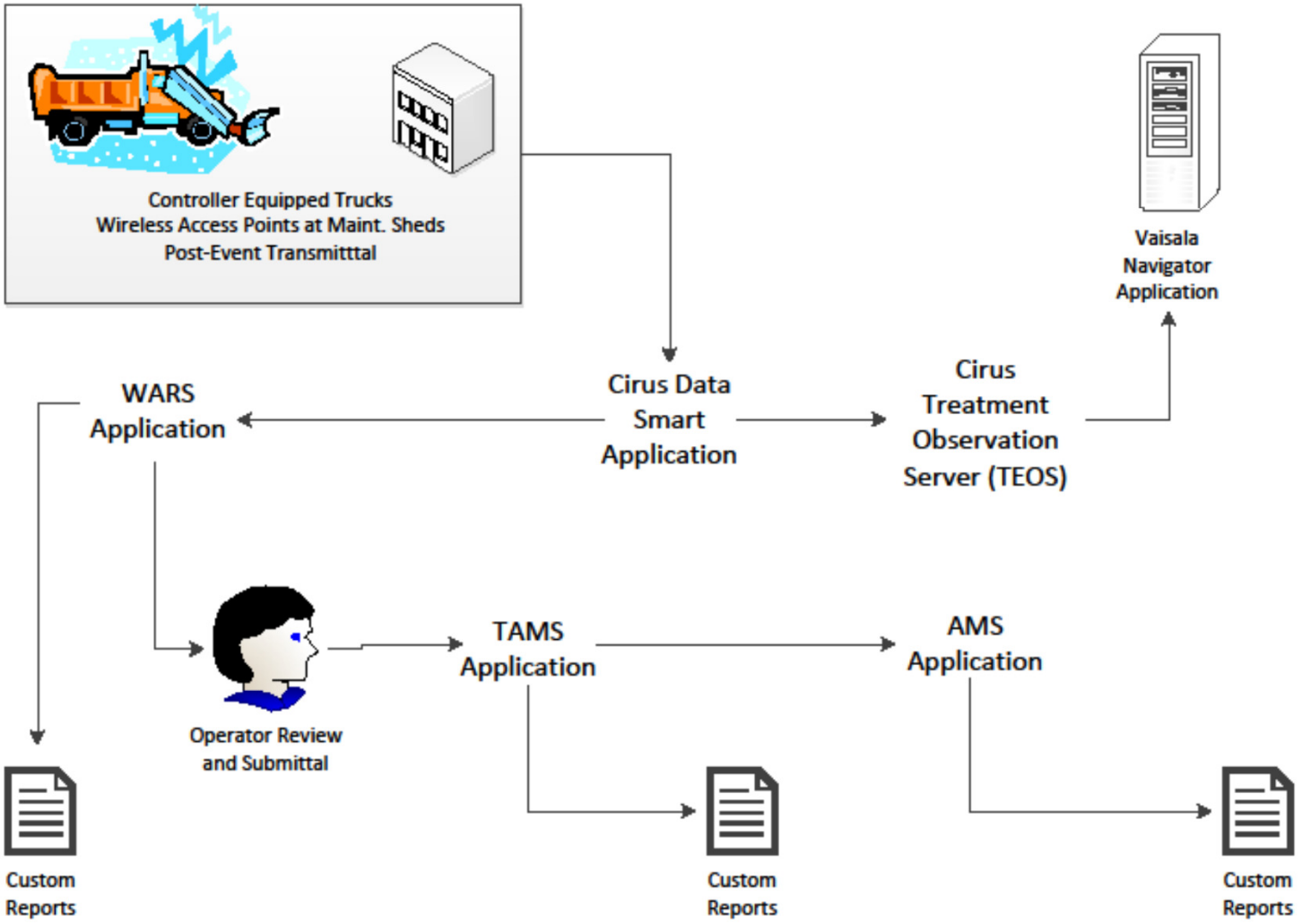
Overview

- Systems
- Data Collection
- Operations Analysis
- Performance Measures

Winter Operations Systems

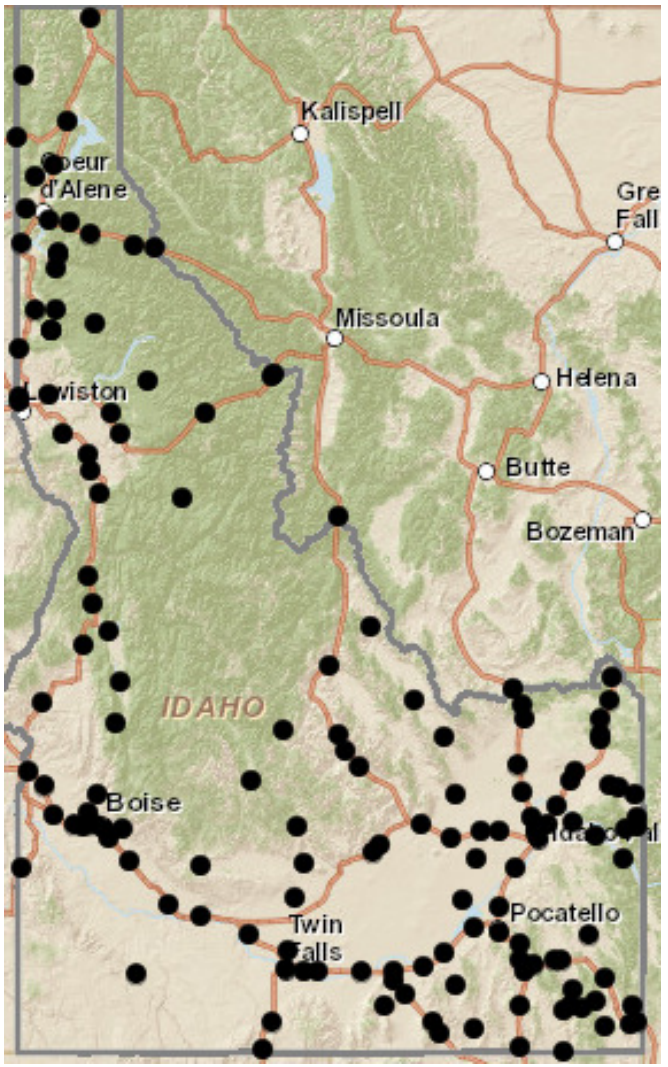
- Vaisala Navigator/RWIS
- Snowplow Mobile Data Collection (MDC)
  - Cirus Data Smart
  - Winter Automated Reporting System (WARS)
- Agile Assets Transportation Asset Management System (TAMS) – Fleet Module

Winter Operations System Integration



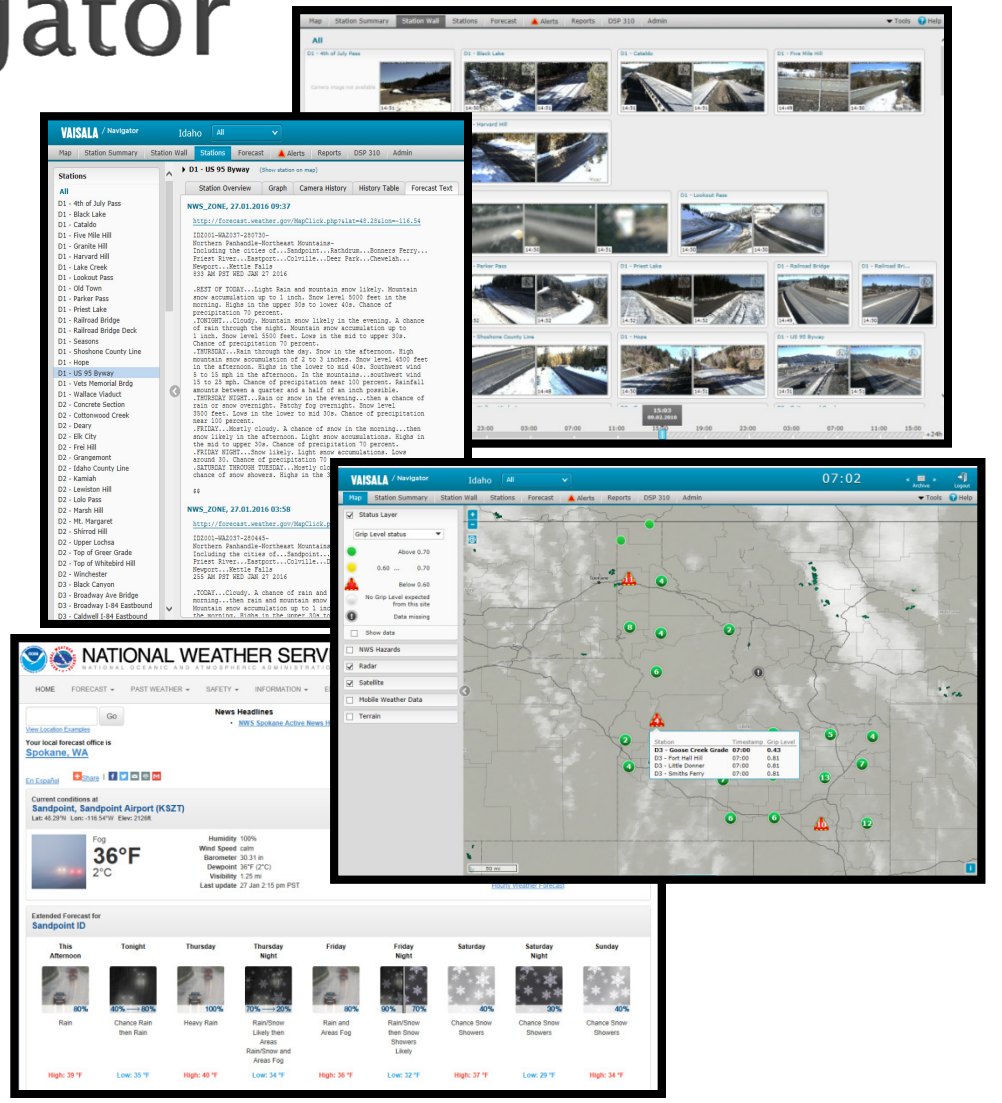
Road Weather Information System (RWIS) Data Collection

- 128 RWIS sites Statewide
  - Non-invasive pavement sensors
  - Atmospheric & roadway data
- Data polled every 15 minutes
- Data and images are displayed on the Vaisala Navigator

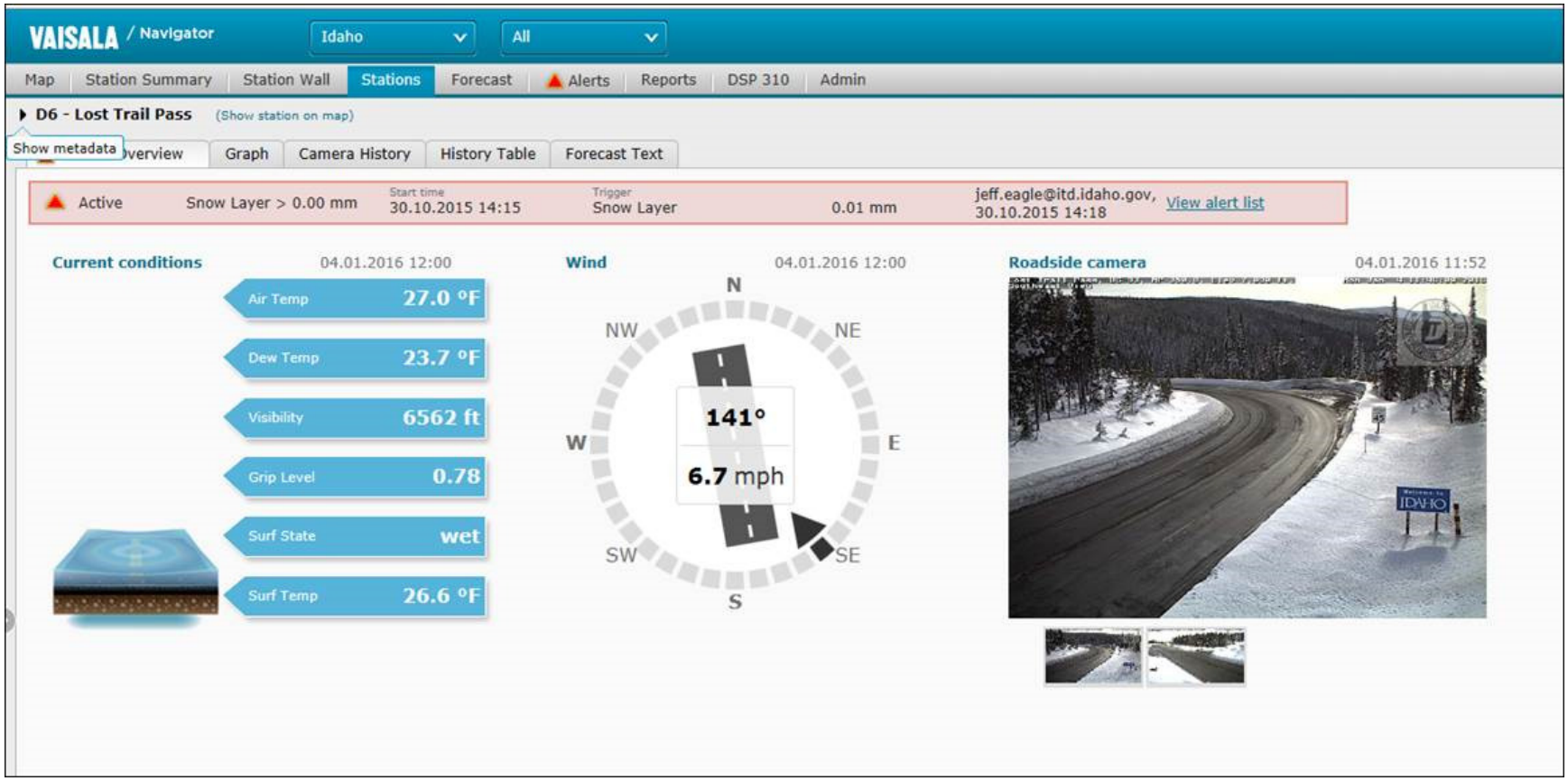


Vaisala / Navigator

- Direct observation of roadway by operators
- Weather trends
- Establish schedules
- Improves operations
- Continuous evaluation of winter operation Best Management Practices (BMPs)



Navigator Site Overview



Vaisala Navigator/Cirus Display

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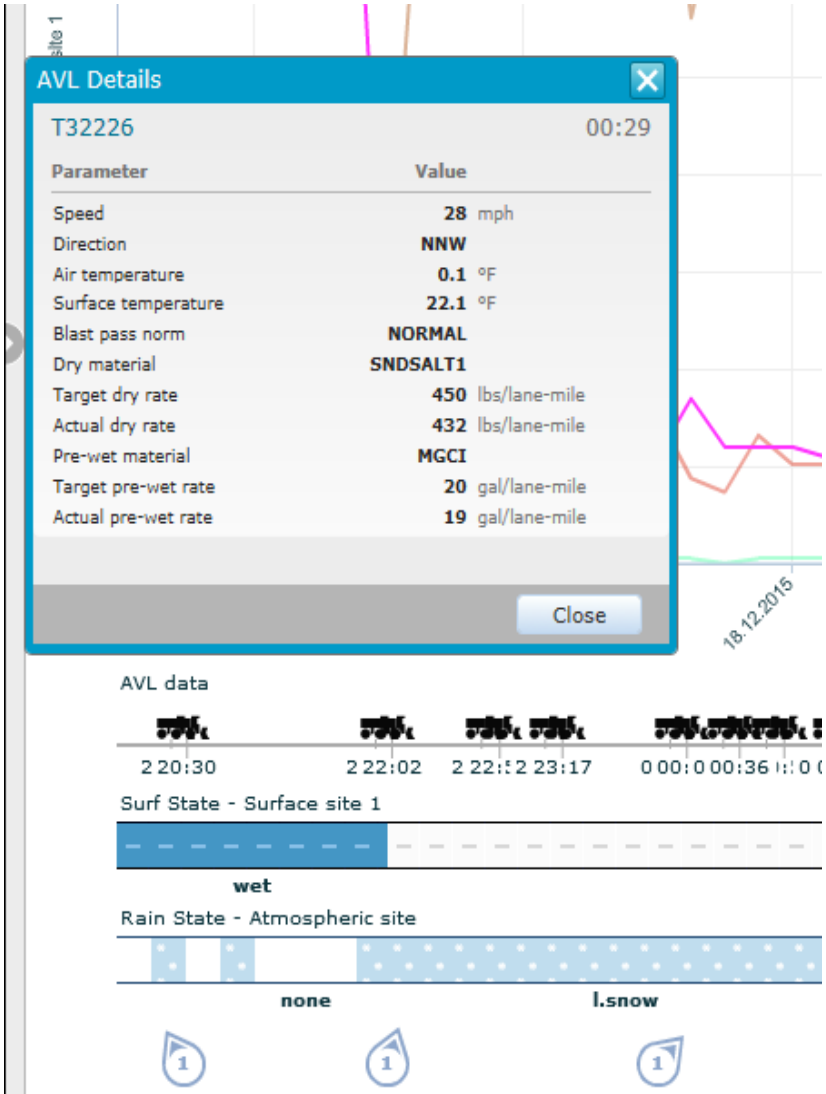
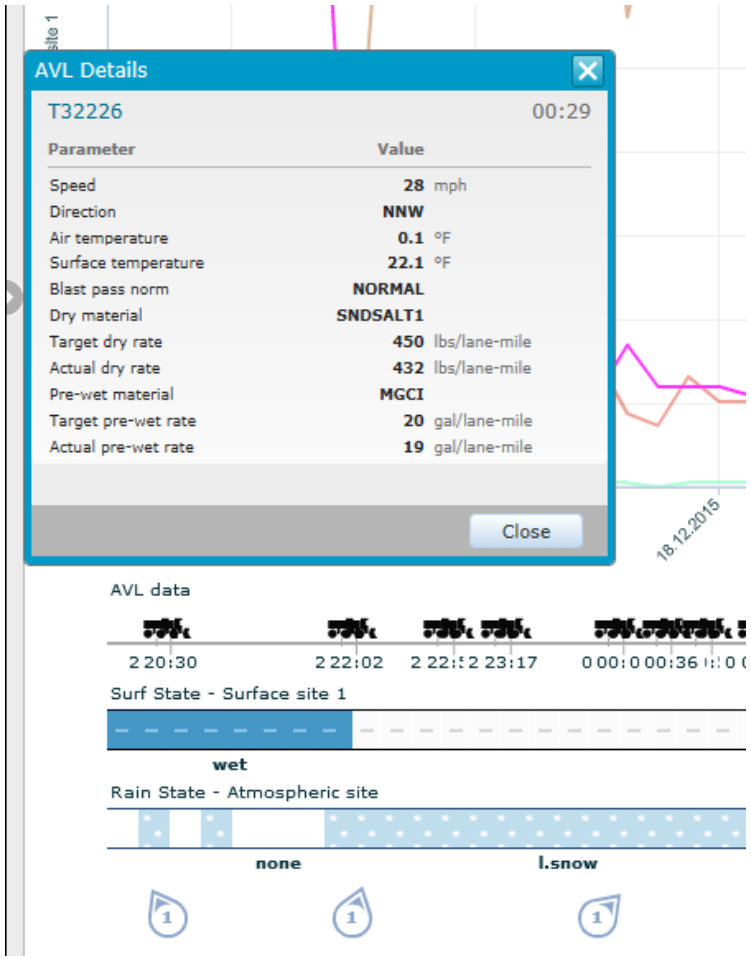
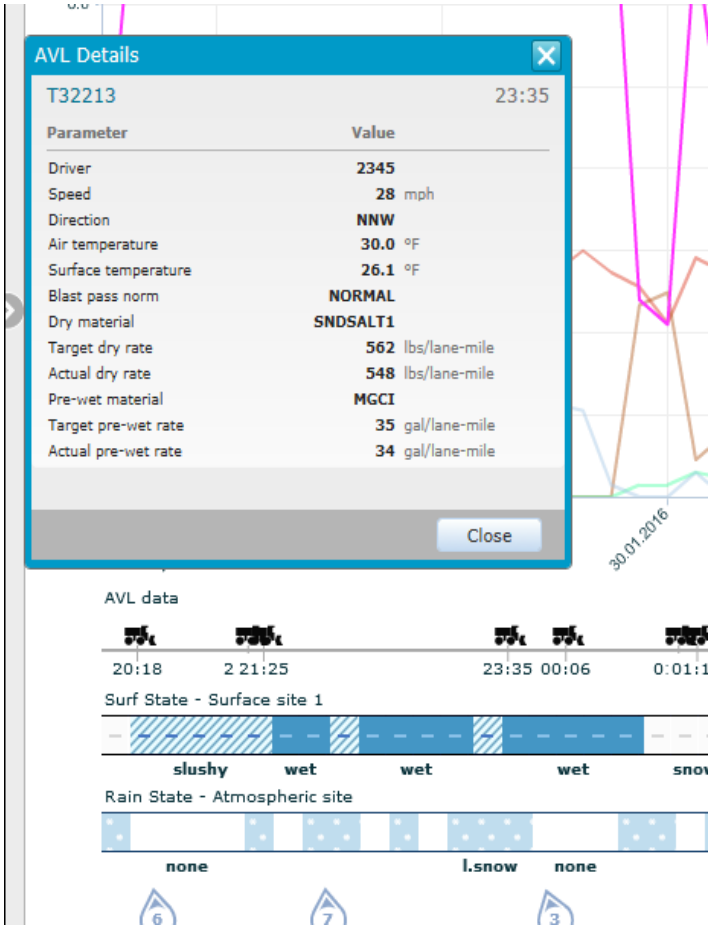


Progress from Data Analysts

Continuous process improvement through critiques



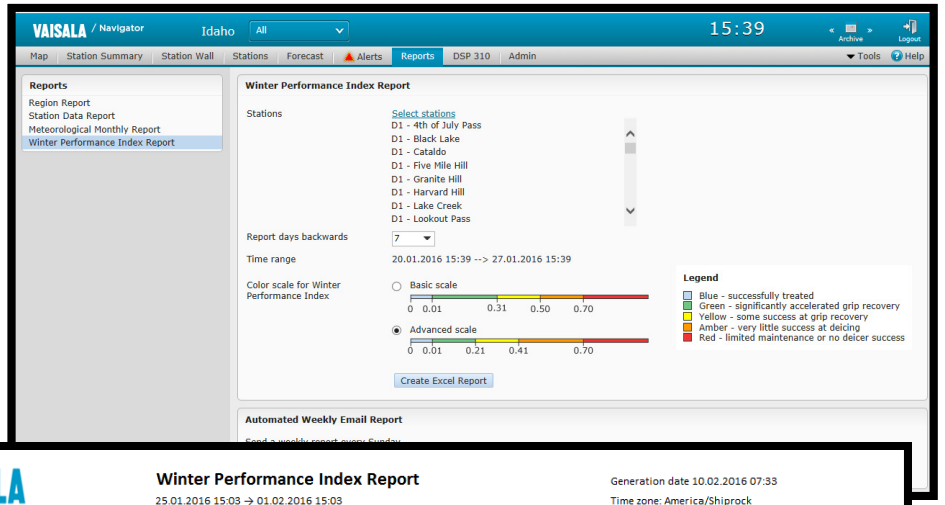


Performance Measures

- Winter Mobility Index (*Ice/Snow Prevention*)
  - Percent of time road condition is safe to drive on
- Winter Performance Index (*Ice/Snow Reduction*)
  - How well treatment was at restoring the hazardous road condition to safe condition

Vaisala Navigator

- Provides individual storm details
- Identifies the Mobility and Performance Index levels
- Tracks State Wide progress



VAISALA

Winter Performance Index Report

25.01.2016 15:03 → 01.02.2016 15:03

Generation date 10.02.2016 07:33

Time zone: America/Shiprock

Winter Performance Index Legend (Advanced scale)

0.0	Successfully treated
0.00 - 0.20	Significantly accelerated grip recovery
0.21 - 0.40	Some success at grip recovery
0.41 - 0.69	Very little success at deicing
0.70 -	Limited maintenance or no deicer success
	Observation data / parameter missing or temp is below thre

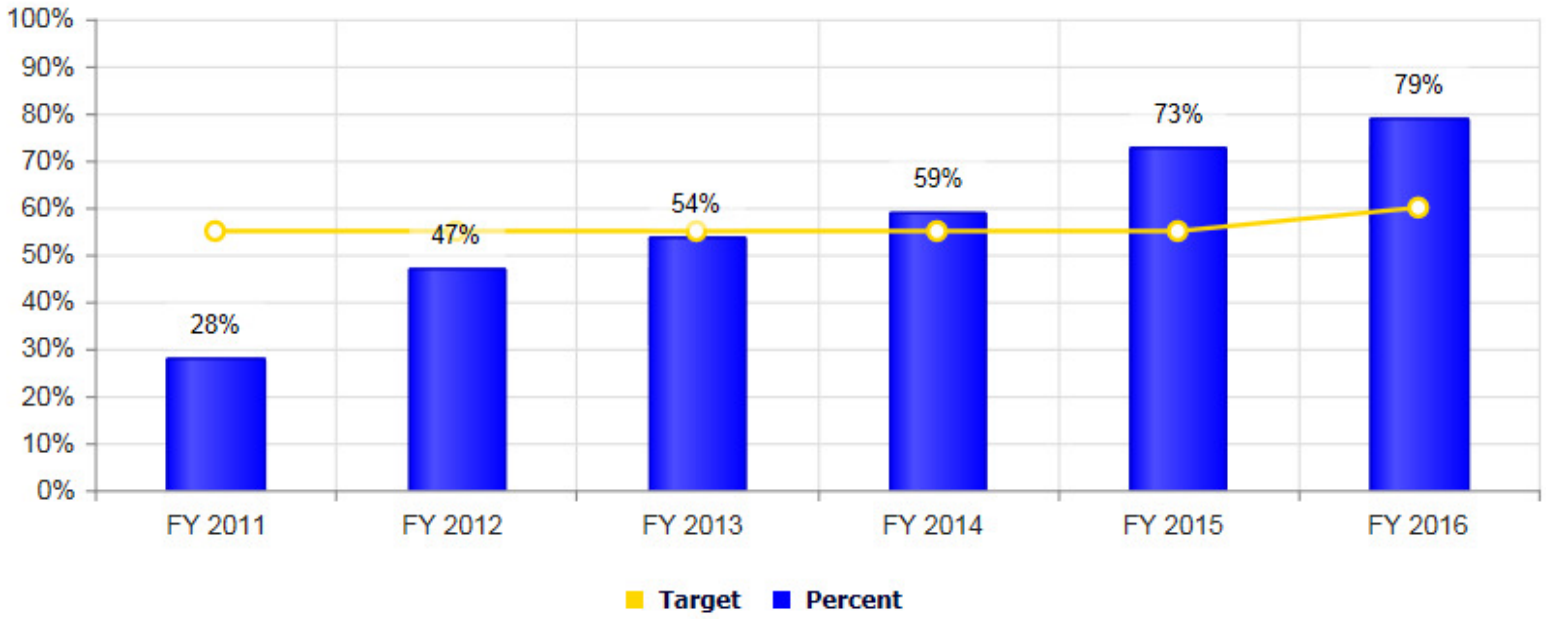
Station	Date	Time Range	Event	Duration (hours)	Max Wind Speed (mph)	Max Ice Layer (mm)	Max Snow Layer (mm)	Max Water Layer (mm)	Min Surface Temp (°F)	Severity Index	Performance Index	Mobility Index
D2 - Upper Lochsa												
	25.01.2016	15:03 - 15:16	DATA MISSING	96.22								
	29.01.2016	15:16 - 17:30	TREATED	2.23	6.49	0.04	0.00	0.46	29.48	17.12	0	
	29.01.2016	17:30 - 20:15	GRIP<.6	2.75	6.04	0.11	0.65	0.09	27.68	17.53	0.16	
	29.01.2016	20:15 - 00:45	TREATED	4.50	6.49	0.04	0.31	0.42	25.70	18.58	0	
	30.01.2016	00:45 - 05:15	GRIP<.6	4.50	5.59	0.04	0.50	0.35	23.54	18.84	0.24	
	30.01.2016	05:15 - 08:00	TREATED	2.75	2.68	0.04	0.18	0.25	24.26	15.30	0	
	30.01.2016	08:00 - 08:30	GRIP<.6	0.50	1.79	0.03	0.23	0.00	25.16	13.94	0.04	
	30.01.2016	08:30 - 10:30	TREATED	2.00	2.46	0.02	0.21	0.22	24.80	14.78	0	
	30.01.2016	10:30 - 11:30	GRIP<.6	1.00	2.91	0.07	0.68	0.03	24.08	16.05	0.06	
	30.01.2016	11:30 - 17:30	TREATED	6.00	6.49	0.08	0.05	0.32	25.34	18.65	0	
	30.01.2016	17:45 - 20:30	GRIP<.6	2.75	3.58	0.04	1.17	0.02	22.82	17.90	0.15	
	30.01.2016	20:30 - 04:00	TREATED	7.50	1.34	0.02	0.75	0.51	21.20	16.24	0	
	31.01.2016	04:00 - 04:45	GRIP<.6	0.75	0.67	0.02	0.93	0.00	22.28	15.07	0.05	74%
	31.01.2016	04:45 - 06:45	TREATED	2.00	1.12	0.04	0.46	0.42	20.84	15.97	0	
	31.01.2016	06:45 - 09:30	GRIP<.6	2.75	1.79	0.08	0.55	0.22	21.56	16.25	0.17	
	31.01.2016	09:30 - 16:15	TREATED	6.75	6.04	0.07	0.07	0.24	22.10	19.85	0	
	31.01.2016	16:15 - 17:30	FROST treated	1.25	3.58	0.00	0.00	0.03	25.88	15.20	0	
	31.01.2016	17:30 - 18:00	TREATED	0.50	1.79	0.00	0.00	0.05	26.78	13.04	0	
	31.01.2016	18:15 - 20:00	GRIP<.6	1.75	1.34	0.04	0.58	0.00	24.62	14.11	0.12	
	31.01.2016	20:00 - 23:15	TREATED	3.25	1.34	0.00	0.00	0.23	23.18	14.51	0	
	31.01.2016	23:15 - 01:00	FROST treated	1.75	0.89	0.00	0.00	0.03	22.82	14.07	0	
	01.02.2016	01:00 - 09:30	TREATED	8.50	1.34	0.05	0.41	0.09	21.74	15.55	0	
	01.02.2016	09:30 - 10:30	GRIP<.6	1.00	1.34	0.03	0.50	0.00	22.10	15.42	0.06	
	01.02.2016	10:30 - 14:15	TREATED	3.75	3.36	0.02	0.11	0.33	22.28	17.15	0	
	01.02.2016	14:15 - 14:45	GRIP<.6	0.50	2.24	0.02	0.47	0.00	25.34	14.55	0.03	

Percent of Time Mobility Not Significantly Impeded During Winter Storms

Target: Maintain at least 60% unimpeded mobility during winter storms.

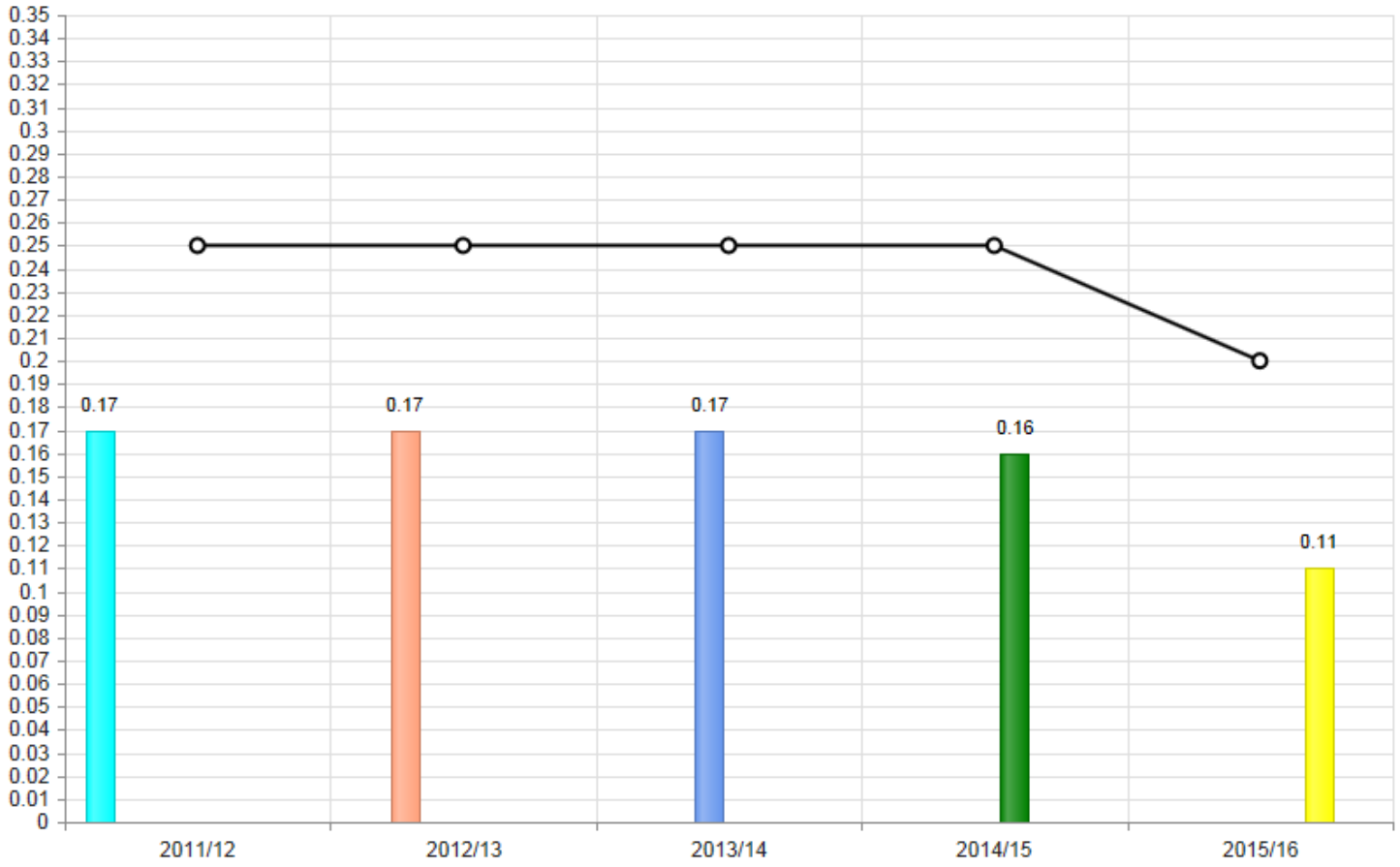
Updated 2/3/16

2,926 events recorded 2015-2016 Season



Statewide WPI annual results

FY 2015 the WPI goals were based upon typologies. FY 2016 all sites will be aggregated by foreman area and the goal will be 0.20 or less.



Updated 2/3/16

2,925 events recorded

Snowplow Mobile Data Collection (MDC) Cirus/WARS TAMS

Snowplow MDC Objectives

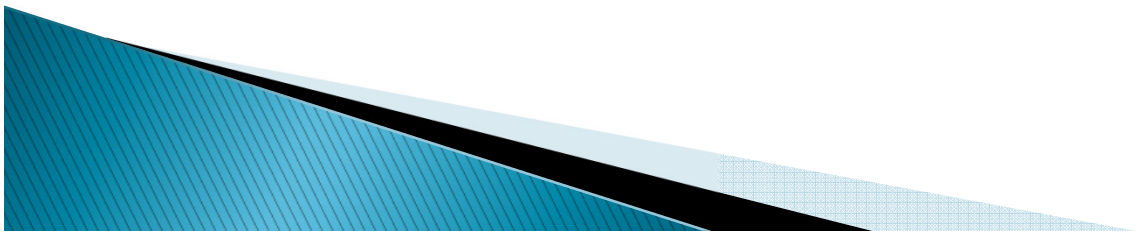
- Automate the collection of vehicle data for accurate reporting of materials, labor, equipment and location to a more granular level
- Reduce operator time for reporting by integrating data information entry once
- Increase operator productivity and reduce winter operation costs through efficiency and effectiveness

Snowplow MDC Systems

- Transportation Asset Management System (TAMS)
- Cirus Controls SpreadSmart RX™ Spreader Controllers
- Cirus GPS DataSmart™ System
- Winter Automated Reporting System (WARS)

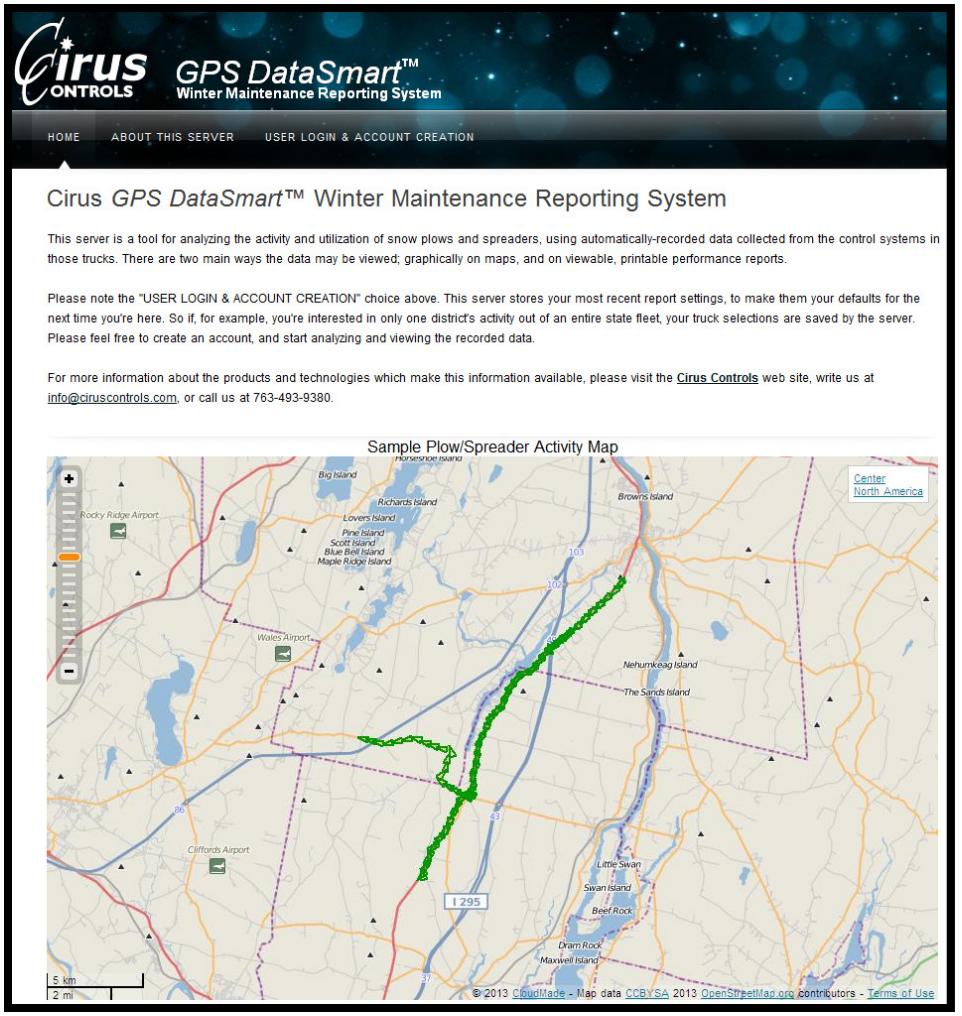
Transportation Asset Management System (TAMS), Road Maintenance Module

- Operational Data Warehouse
- Operations Cost Accounting System
- Provides Summary Reports of Winter Operations Efforts, (Can Only Report to the Quality of the Data Entered)
- Work Plans
- Asset Management Plans



Cirus GPS DataSmart™

- Collects Snowplow Truck Data
- Creates Data Files for Display within DataSmart™
- Data Files transferred to Navigator & WARS



- Converts Truck Sensor Data to TAMS Activities
- Converts GPS Coordinates to ITD's Linear Referencing System
- Accurately Processes, Calculates and Displays Winter Operations Efforts
- Employee Interface to the Calculated Data (Daily Summary)
- Electronically Generated Material Reports

Reporting

- Storm Summary Report
  - Summary of Pass Miles by Route
  - Summary of Plow Down Time by Route & Employee
  - Average Application Rate by Route
  - Total Applied by Route
- Lap Time Analysis
- Exception Reporting

Future of our work force

Staffing reduction moving from shifts to swarm the storm

- FY2015 ITD had 562 Transportation Tech Operators
- FY2016 ITD down sized to 498 TTO (attrition)

ITD was allowed to keep the salary savings

- Savings used to build career paths based upon improved value of the employee to the department
- TOTL program for supervisors implemented FY2017

Questions?