RWIS – Runway Weather Information System

- Surface Temperature
- Surface State
- Freeze Point
- Chemical presence & amount
- Black Ice
Non-invasive pavement sensors

- Measure:
  - Pavement Temperature
  - Pavement State (dry, moist, wet, frost/snow, ice
    - Layer thickness of above
  - Grip
Grip – measuring slipperiness

- DSC111 measures independently
  - Snow/Frost (crystalline ice)
  - Ice
  - Water
- Different combinations have been correlated to actual friction conditions
- A single index is output which is termed GRIP
- A simple way of expressing all that complexity with one number

This is what DOT folk have learnt from years of observing the grip readings…….

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Lost Trail Pass, Idaho: Guess the driving (landing!) conditions on the following days?
Did you get them right? The weather sensors did!

- Air Temp: 25ºF
  - Road Temp: 30ºF
  - Road State: Slush
  - Grip: Good

- Air Temp: 20ºF
  - Road Temp: 28ºF
  - Road State: Ice
  - Grip: Poor

- Air Temp: 36ºF
  - Road Temp: 39ºF
  - Road State: Dry
  - Grip: Excellent

- Air Temp: 25ºF
  - Road Temp: 50ºF
  - Road State: Dry
  - Grip: Excellent

- Air Temp: 23ºF
  - Road Temp: 43ºF
  - Road State: Wet
  - Grip: Good

- Air Temp: 24ºF
  - Road Temp: 28ºF
  - Road State: Ice
  - Grip: Very poor

- Air Temp: 14ºF
  - Road Temp: 21ºF
  - Road State: Dry
  - Grip: Excellent
How can Non-intrusive sensors be used at airports?
DSP310 Components

- Vaisala Database
- Smart Phone
  - In-vehicle Display
- Surface Condition
  - Friction/Grip
  - Layer Thickness
- Air Temperature
- Dew Point
- Pavement
- Temperature
- Viewing Data
  - Over the Internet
- Interface Unit
- Vaisala Database
  - Viewing Data
    - Over the Internet
- Interface Unit
How Does Non-intrusive Sensor compare with ‘regular’ friction testing systems?

• Index of grip, is scaled to the value of friction of a typical road surface and a car tire
• Tests with FINRA using a decelometer in all types of slippery conditions
• RMS error in friction units is 0.07
  ▪ Nuebert Aero Corp tested DSC111 with trailer based friction system – results unknown
Integrated into RoadDSS Navigator
Grip Forecasts

- Planning made easy by introducing a call to action level of grip
- Clear period of concern from forecasts of Grip

Multiple weather reasons for a slippery road condensed into one Grip reading
Grip based winter maintenance/operations system

- Remote sensing network
- Continuous improvement
- Quality control
- Maintenance program
- Grip forecasts
- Performance monitoring
- Reporting
- Real time logging of actions
- Action Planning based on grip forecast
Thank You