

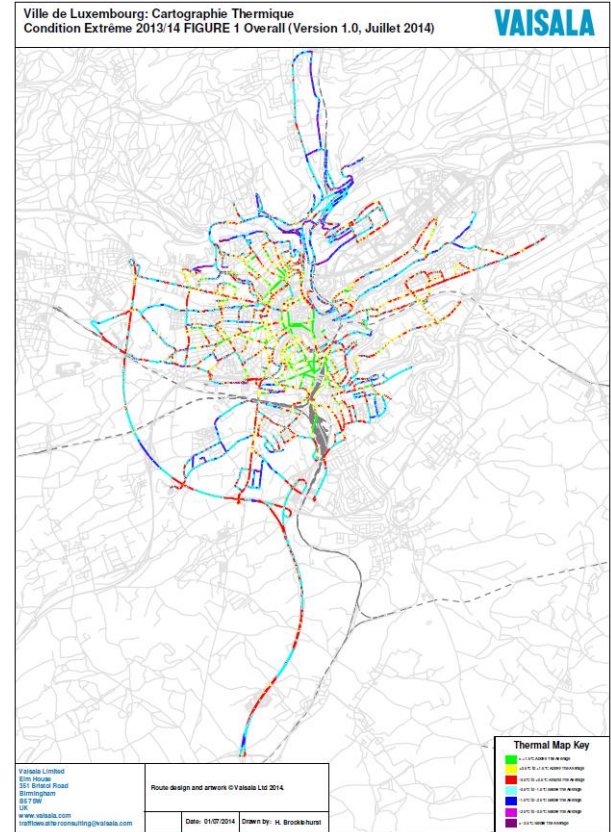
# Mobile Weather Collection

Daniel Johns – Roads Segment Manager, EMEA

**VAISALA**

# Vaisala – Thermal Mapping

- Thermal Mapping started over 20 years ago
- Clear learnings are that roads do behave in a similar fashion under similar conditions night after night
- Care must be taken with the conditions of the surface for repeatable readings.
  - Extreme – clear skies, most variation
  - Intermediate
  - Damped – cloud and wind, but dry
- Most useful for correct weather station locations
  - Forecast
  - Monitoring



# Vaisala – Surface Patrol

- Operational level road surface temperature data
- Used at the contractor level via integration into maintenance vehicles
- Used at the agency level for monitoring total network through multiple device deployment
- 10 readings per second - coldest reported.
- Valuable information for drivers to assess conditions
- Emphasises the need for robust design due to environmental conditions



# Vaisala – DSP310



- Trials at Helsinki airport in 2007/2008
- DSC111 – good results
- DST111 – poor results
- Development of limited system undertaken in late 2008
- Trials in France/UK during 2008/2009
- DSC111 – good results
- DST111 – poor results
- Continued development of during 2010/11

# Vaisala – DSP310

- Product combines best sensors for the job
  - Road Surface State: Dry, Moist, Wet, Snow, Slush, Ice (DSC111 with mobile firmware)
  - Layer thickness for Water, Snow and Ice (DSC111)
  - Road Surface Grip: Calculated index for friction, i.e. road slipperiness (DSC111)
  - Road Surface Temperature (DSP101, i.e. Surface Patrol temperature probe)
  - Dew Point measurement (HMP155 with chemical purge)
  - Air temperature measurement (HMP155)
  - Relative Humidity (HMP155)



# Case Study – BEAR, Scotland

- BEAR Scotland is a private company formed in 2000.
- It provides highway maintenance services to its customer,
- Vaisala is a service provider to BEAR Scotland
- BEAR Scotland is tasked with maintaining a bare driving surface (no ice, no snow).
- The company's first priority is SAFETY.
- The target is NO accidents or incidents on the network



# Case Study – BEAR, Scotland

## Transport Scotland – 3G



- Bespoke Operating Contract
- Schedule of Rates for works less than £250k
- Design & Supervision of works greater than £250k
- Schedule of Hourly Rates for Professional Services
- Lump Sums for Winter, Cyclic and Network Management
- Damage to Crown Property under £10k our risk
- Indemnify Transport Scotland from 3<sup>rd</sup> Party Claims
- Price Fluctuation Mechanism
- 28 Days payment period from Statement Delivery
- All aspects of performance audited by PAG-plus



experience that delivers

Winter 2010/11



experience that delivers

Winter 2010/11



experience that delivers

BEAR Slides: courtesy of Brian Gordon, MD, BEAR Scotland

# Case Study – BEAR, Scotland

## Additional Resilience 2011/12

Transport Scotland Measures delivered by BEAR



### Vaisala Mobile Road Surface Temperature Sensors

- Fitted to all Patrol Spreaders
- Road surface and air temperatures taken every second
- Instant feedback to the driver
- Instant feedback to the Central Control Room through Vaisala's web based road weather information system



experience that delivers

## Additional Resilience 2012/13

BEAR Scotland Measures



- Liquid de-icer sprayer
  - 10,000 litre capacity for alternative de-icer application
  - Ability to spray 12m
- Vaisala Mobile Surface condition Sensors
  - Giving real time temp. info back to control room
  - Live data for driver
- Winter Training DVD
  - Created by staff & operatives
  - Details practicalities of Winter Operations specific to BEAR Scotland



experience that delivers



# Case Study – BEAR, Scotland

Map Station Summary Station Wall Stations Forecast Alerts Reports Mobile Admin Tools Help

Map Table Pr Management Map Key 04/03/2015 13:14 English

Today History

January 2014

Mon	Tue	Wed	Thu	Fri	Sat	Sun
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

S. Registration Begin End

<input type="checkbox"/>		GN56 EUT (Keith)	01:41:51	09:00:05		
<input checked="" type="checkbox"/>		GN56 EUT (Keith)	08:17:59	09:00:05		
<input type="checkbox"/>		GN56 EUT (Keith)	07:47:32	08:10:50		
<input type="checkbox"/>		GN56 EUT (Keith)	05:44:20	06:51:38		

Temperature Grip Surface state Freezing risk Ice Water Frost / Snow

Surf. T

- < -5.0 °C
- 5.0 °C to -3.0 °C
- 3.0 °C to -1.0 °C
- 1.0 °C to +1.0 °C
- +1.0 °C to +3.0 °C
- > +3.0 °C

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Temperature Grip Surface state Freezing risk Ice Water Frost / Snow

Map Satellite

Grip

- Not used
- Not used
- Slippery (below 0.6)
- Monitoring advised (0.6-0.7)
- Good (above 0.7)

Map data ©2015 Google Terms of Use Report a map error

# Case Study – BEAR, Scotland

- Patrol vehicles used after treatment to check road conditions
- DSC111 has very early warning of ice formation
- Not usually used to decide treatment amounts and times
- Safety of decision is checked with re-treat mandatory if problems found on network by driver.
- Clearly mobile measurements form an important tool in the toolbox but our customers rarely use them in isolation.

**Thank you for your time**

**VAISALA**