



Comprehensive support for safer roads

Maximize the efficiency of your operations

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The UK is notorious for its changeable weather conditions, and it is not unusual for many different types of weather to be experienced at a single location during the course of a day.

Winters tend to be characterized by these changeable conditions, with night time temperatures often hovering around freezing. Whilst rarely experiencing the severe winters found in other parts of the world, the UK commonly experiences short-term winter weather events, each having the potential to cause localized or regional disruption.

This poses a particular problem to highway engineers, who are tasked with ensuring that their highway infrastructure remains accessible and safe at all times. The UK has a dense highway network and high volumes of traffic on many of its roads. It is therefore vital that these winter weather events are not allowed to disrupt the safety and economic viability of the network.

However, precisely because these winter weather events are often localized, of a relatively short duration and difficult to forecast more than a few days in advance, it is imperative that highway engineers use their limited resources wisely and in the most efficient way possible. The most effective way of achieving this is by employing a precautionary treatment regime, where actions are taken in advance of the occurrence of the weather event.

Right action taken at the right time

If undertaken successfully, precautionary treatment will ensure that salt is spread in advance of anticipated accumulations

of frost, ice or snow on the highway. However, the timing of such a treatment regime is crucial to its success, and requires supplementing the local knowledge and experience of the highway engineer with accurate forecast interpretation and awareness of the current and expected road surface conditions.

By utilizing Vaisala's range of products and services to ensure they have the best possible information about conditions across their network, highway engineers are able to deploy appropriate resources at the correct time to provide peace of mind both to themselves and the general public.

Vaisala helps Staffordshire County Council reach their goals

Staffordshire County Council has chosen Vaisala as their long-term partner in helping them meet their winter service responsibilities. For over a decade, Staffordshire's highway team and Vaisala have worked together to develop the optimum solution for their specific needs.

"Our key challenge is to keep our network safe without incurring any unnecessary expenditure," says Paul Boss, Highways Asset Manager of Staffordshire Highways. "To do this requires not only accurate forecasts, but crucially the interpretation of this forecast information. We rely on Vaisala to provide this support and deliver this information in a format which helps us decide on the appropriate course of action."

Staffordshire is a county in the centre of England which, although relatively small in size (2713 km²) has a dense

highway infrastructure and encompasses a range of environments, from urban centers such as Stafford, Lichfield and Tamworth to exposed rural areas such as Cannock Chase and the National Forest. The southern limits of the Peak District national park also fall within Staffordshire's boundaries.

Good information produces significant cost-savings

Staffordshire County Council applies salt to approximately 2480km (43%) of its highway network when wintry conditions are forecast. Each salting action costs approximately £27,500 (€39,285), amounting to a total expenditure of around £2,800,000 in an average winter (€4,000,000).

The above figures are valid assuming salt is spread across the whole of Staffordshire's 2480 km precautionary network. However, Staffordshire have recognized that uniform weather conditions do not always occur across the whole of the county. Additionally, local differences in topography, land use, surface construction materials and sky-view factor can lead to certain stretches of highway being more or less at risk of ice formation than others. If these variations can be identified, quantified and predicted, then it is possible for efficiency gains and cost savings to be made by targeting resources in the areas most at risk.

To meet this objective requires Staffordshire knowing where on its network minimum road surface temperatures are likely to occur, and at what time any adverse weather effects are likely to start affecting the road surface in these locations. Only by knowing

this information for the whole of their network can duty officers mobilize the appropriate resources in a timely fashion and target their treatment operations for the areas most at risk. This crucial information is provided by Vaisala.

Successful long-term partnership

Paul Boss is happy with the range of products, services and support which Staffordshire receives from Vaisala. "We're extremely satisfied. Not only does it allow us to fulfill our published aims, but it also allows us to achieve financial savings. One such example is through the recent Route Optimization exercise which Vaisala conducted during 2007. By redesigning our treatment routes with respect to the Thermal Mapping results and topographical constraints within Staffordshire, it is now possible for us to confidently mobilize individual routes on the basis of their forecast minimum temperature. If we issue a full turnout across our total network, 57 treatment routes are required. However, on occasion we have mobilized as few as 10



routes to treat only the coldest sections of our network, and this obviously has a significant impact on our annual costs."

Staffordshire County Council's successful partnership with Vaisala helps to deliver tangible ongoing cost benefits, and a safer road network to the motorist

through the more efficient use of targeted treatment resources.

Vaisala's comprehensive range of services is used by over 200 traffic weather customers around the world. For further information please contact trafficweather.uk@vaisala.com. ■

Staffordshire County Council benefits from Vaisala's comprehensive services

Vaisala supplies the following products and services to allow Staffordshire to achieve their goals:

- The installation of a network of ROSA road weather stations allows accurate real-time reports of atmospheric and road surface weather data at locations across Staffordshire. Vaisala Birmingham's Field Maintenance team are responsible not only for the initial site installation, but also the ongoing annual calibration and maintenance services which ensure continual product support throughout the life-cycle of these stations.
- ROSA atmospheric and road surface weather data are collected and stored at the Birmingham Data Centre. The data is quality checked to ensure reliability, before being forwarded to the forecasting agent for use in generating road surface temperature forecasts. Forecasts are then returned to the Data Centre and displayed to the client, along with the verified ROSA data. Vaisala's Birmingham Help Desk support the system and its end-users, providing 24/7 assistance throughout Staffordshire's operational season.
- Thermal Mapping surveys have been conducted by Vaisala Birmingham's Observation Services team across Staffordshire's entire 2480km precautionary treatment network. The results of these surveys are integrated with site-specific data and forecast information to generate color coded maps of predicted minimum road surface temperatures, quickly and clearly providing duty officers with an overview of the conditions likely to occur across their network.
- Staffordshire's treatment routes have been redesigned by Observation Services Route Optimization team. By designing routes on the basis of topographical and Thermal Mapping information, mobilization decisions can be made based upon the forecast minimum temperatures for each route. This can allow partial treatment of the network to be made on marginal nights when temperatures are forecast to fall close to freezing.
- Maximum flexibility for viewing this information is provided by Vaisala's IceView and IceNet display software, which allows information to be accessed by multiple users, either through dedicated workstations or over the internet. All operational decisions and actions are recorded in Vaisala's IceMan software, which acts as a centralized winter service management tool.
- To ensure that Staffordshire receive the maximum benefit from the wealth of information at their disposal, Vaisala offers a variety of training modules not only in specific software application but also, through a variety of simulated weather scenarios, the correct interpretation of the data available to the end user.