



Association of Directors of  
Environment, Economy, Planning & Transport

## ADEPT President's Awards 2022

### Entry form

<b>Award category:</b>	Digital innovation/technology
<b>Title:</b>	Increasing Gritting Efficiencies with Data and Technology
<b>Entrant:</b>	Surrey County Council
<b>Main contact name:</b>	Amanda Richards
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<b>Partner/s (if applicable):</b>	n/a
<b>Headline summary (150 characters, c. 20-25 words)</b> Use of road temperature sensors to enable significant environmental, cost and safety savings by moving to route-based forecasting (RBF) for winter gritting.	

Please note we need **at least one supporting image** per award submission.  
Supporting images should be attached separately as jpg or png files.

Please paste links to any supporting video evidence here

Link 1	<a href="https://urbandata.exchange/">UDX (urbandata.exchange)</a>
Link 2	



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**500-word project outline** (please ensure you do not exceed the word count and address all the judges' criteria – for more info see [here](#))

The Winter Service Team rely on twice-daily forecasts to determine areas that need to be gritted that night. A decision to grit is currently made on a per-domain basis. If a decision is made to grit, 80% of the time the decision is made to grit all five domains.

Modelling showed a targeted route-based forecasting (RFB) and gritting process could provide cost saving through reduction in fuel and salt, environmental benefits through reduction in carbon emissions and salt used and safety benefits through having fewer vehicles on the network.

Validation that forecasts were accurate was needed to justify the transition.

A validation mechanism was put into production from winter 2020-21. We determined that existing Weather Stations were too few to deliver validation, and road temperature sensors were needed to cover every gritting route.

The project also determined if opportunities to reduce expenditure by installing fewer replacement Weather Stations would be possible.

Ten types of sensors were reviewed, two were selected for trial.

In November 2020, the first sensors were installed. Initial findings in December 2020 showed that the sensors had the desired accuracy level and excellent communications capabilities. Additional sensors were deployed across the county in January 2021.

There were multiple early failures of sensors mainly caused by design defects that allowed water ingress into the sensors. Updated replacement sensors were installed. Despite the failures, a significant data set was created for winter 2020-21.

A major challenge was proving the accuracy of the sensors without an available benchmark. This was overcome by comparing the nightly lowest recorded temperature at a location and comparing it to the nightly forecast at that location. This variable was plotted against the corresponding variable from the nearest weather station. This demonstrated that the sensors variance from the forecast corresponded with that of nearby weather stations, and that the sensors were providing consistently accurate data in comparison to the weather stations.

The winter 2020-21 study concluded that a move to RBF was feasible, however further data was required to build confidence and confirm findings. The trial was extended and enhanced for winter 2021-22.

By the end of winter 2021-22, it is expected that the following conclusions will be drawn:

- SCC can move to RBF for winter 2022-23
- SCC need replace only two of nine end-of-life weather stations, saving £140,000 - £280,000 capital costs and approximately £35,000 operational costs per year



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The Project has made the data from all Surrey weather stations and road temperature sensors available on the Urban Data Exchange allowing neighbouring authorities to use data for free to aid their decision making.

The aims, method, results, and conclusions were presented to the Winter Maintenance – Cross Border Co-operation and Support forum in December 2021. Neighbouring local authorities are being supported as they investigate the use of road temperature sensors to drive their own efficiencies.

The Project Team comprised of both the Digital IoT Team and Highways Operational Team and demonstrated effective co-team working that is now delivering other digital projects.