



Association of Directors of
Environment, Economy, Planning & Transport

ADEPT President's Awards 2022

Entry form

Award category:	Category 2: Digital innovation/technology
Title:	Kent Gritting Route Optimisation
Entrant:	Amey Consulting
Main contact name:	Mark Fisher
Email address:	Mark.fisher@amey.co.uk
Partner/s (if applicable):	Kent County Council
Headline summary (<u>150 characters</u>, c. 20-25 words) Optimisation of KCC's winter gritting operations through cutting edge data science techniques, operationalised through a central digital integration platform for fleet monitoring and compliance.	

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	
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 Challenge

Authorities need to find ways to reduce the significant cost of winter operations, whilst still assuring safety by maintaining full gritting coverage of impacted roads. Kent Council recognise this industry challenge, and have partnered with Amey to drive the development of new IoT and data-driven solutions that, by bringing data to the centre of the decision-making process, improve efficiency of its winter service operations.

The Solution

The foundation of these new innovations is a first-of-its-kind 'Smart Winter' machine learning model. This AI model uses a range of geographical, traffic and weather data to predict road surface temperature (RST) to a 90% accuracy, with target temperatures provided by a network of over 100 RST sensors installed across Kent's estate. This achieved industry recognition at the PIARC World Winter Service Resilience Congress 2021, where it also won the 'Best Paper' award in presenting a practical approach to balancing efficiency ('precision') against coverage ('recall') to ensure that gritting can be reduced without unduly compromising safety.

This new AI model further enabled a wholesale redesign of Kent's gritting domains to maximise the consistency of route icing behaviour and hence improve the effectiveness of Kent's nightly gritting decisions, by minimising 'surplus' gritting of un-frozen roads, minimising unnecessary travel time, and thus reducing labour costs. These new domains are now being trialled operationally by Kent.

Additionally, to accommodate these new domains, an adaptive 'rural postman' optimisation method was applied to re-formulate all gritter routes within each new domain to minimise idle travel (non-gritting) time. This has enabled Kent to plan to eliminate one gritter vehicle from its fleet, and these new optimal routes are now undergoing operationalisation in coordination with gritting fleet management provider ExacTrak using in-cab digital navigation technology.

All the above innovative work has been built around a new digital HADMS (Highways Asset Data-Led Management Solution) platform which serves to integrate internal (asset) and external services such as Street Manager and ExacTrak gritter fleet telemetry, providing insights and decision support tooling. HADMS has been pivotal to enabling winter service managers to now actively monitor performance of the gritting operation as these new innovations are embedded into BAU.

HADMS has also been important for managing gritting compliance, as it allows gritter movements to be rapidly checked against assigned routes and dependencies (such as street works). It also provides a digital record of compliance which can later be used to deliver insights and as evidence in defence of claims raised by the public, offering much improved transparency for external regulators and users.

As a result of this range of data-led initiatives, winter maintenance in Kent has now seen a radical overhaul in how it is delivered and managed, with multiple ground-breaking innovations aligned to deliver a transformed service for operators and customers. These innovations now pave the



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way for further phases of development such as dynamic route-based programming through which the Kent County Council winter services team are at the cutting edge of the sector demonstrating techniques which we expect to see adopted more widely