Aiming for Peak Performance

CDR Group has developed a new software application for MapInfo Professional® to assist Highway Authorities to optimise the spreading of rock salt for winter maintenance.

The Issue

Budgetary constraints and the need to provide value-for money services are key issues for UK Local Authorities. For Highway Authorities, Winter Maintenance (salting) presents particular challenges due to **…**

- the running costs of salting vehicles and crews
- cost of salt
- changeable weather conditions
- high public demand for clear and safe roads
- the investment cost of holding large stocks of salt

Recognising these issues, in 2009 Derbyshire County Council embarked on a major project to increase the efficiency and cost-effectiveness of their Winter Maintenance operations.

The Challenge

Derbyshire County Council is responsible for some 5,500Km of road, of which some 2,500 Km are currently designated as requiring salting. These include some of the most challenging and weather affected roads in England across the Peak District. The Authority currently operates 47 front line vehicles with a team of 140 drivers based at five strategically located depots.

The aim for them, is to ensure that all designated routes are speedily salted, salt is not wasted by salting routes already covered or not designated for salting, whilst ensuring that at least 65% of each salting route should involve salting rather than 'dead running'. With a cost of around £30,000 every time the Winter Maintenance fleet swings into action, efficiency is paramount.

The Solution

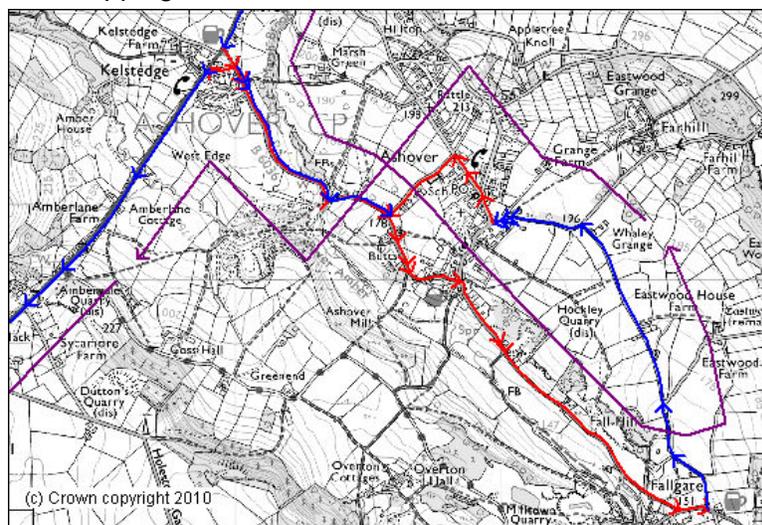Derbyshire County Council's approach to this challenge is based on three key features:

- Equipping all Winter Maintenance vehicles with a GPS based control system supplied by TMS2 of Abingdon in Oxfordshire that not only provides routing directions to the vehicle operator, but also instructs the operator when to salt
- The use of the Authority's MapInfo Professional corporate GIS system to prepare detailed, accurate routes for a wide range of weather scenarios
- A software solution to facilitate the rapid creation of routes, and to generate for each route the requisite waypoints and control points for input to in-vehicle control system

CDR's Contribution

Derbyshire County Council turned to their GIS provider CDR Group to provide the software solution to form the vital link between the route planners and the vehicle operators.

To this end, CDR has worked closely with the County Council, to develop, test and commission MISalt. This is an application developed in MapBasic (MapInfo's programming language) to run within MapInfo Professional providing the following key functionality:

- Enabling the route planner to rapidly develop detailed route plans for each depot based upon data such as Street Gazetteers or Ordnance Survey's ITN data.
- Enabling the route planner to designate each part of the route as either 'salting' or 'dead running'
- Ensuring full route connectivity and logical sequencing giving warnings of any errors in the route such as small gaps or wrong direction, etc.
- Warning when sections of a route are being salted more than once (This can actually be necessary on some wider sections of the highway)
- Reporting key statistics such as route length, salting length, sections being salted more than once, route efficiency, etc.
- Enabling the route planner to quickly lay down the necessary waypoints to provide navigational instructions to the vehicle operator, along with the control points that will instruct the vehicle operator to start or stop salting, together with more sophisticated instructions such as to salt all the way around an approaching roundabout or to salt after the roundabout.
- Providing a detailed validation of each route and its associated control points ensuring that the instructions being given are in a logical sequence
- Enabling the route planner to easily edit / update existing routes or transfer a route from one depot to another
- Providing full validation after every edit.
- Outputting the file of waypoints and control points that is then input to the TMS2 in-vehicle control system.
- Facilitating the display of all routes from a single depot, and indeed the aggregation of all routes from all depots across the whole County, to help identify any shortfalls where part of a designated highway is not being covered.
- Easily configured to give flexibility in file naming, directory structures, types of background mapping used etc.

Summary

The severe winter weather at the start of 2010 has thrust the issue of winter maintenance into the public and political spotlight, amply demonstrating Derbyshire County Council's foresight in taking steps to improve the flexibility and efficiency of their Winter Maintenance operations.

The availability of a GPS system for salting operations that gives the driver route directions and instructions on when to salt or not, will certainly help the County to deliver the winter service accurately and more efficiently. The system will also reduce the time spent in training drivers that are new to routes not travelled by them before.

CDR Group is pleased to have been able to play a part in this significant project.

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For more information about CDR Group visit their website at www.cdrgroup.co.uk or phone 01433 621 282.

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Details about Derbyshire County Council can be found at www.derbyshire.gov.uk . The contents of this article have been approved by the Council for release.