

### Detailed and accurate data from Ordnance Survey

RouteSmart was developed as an ArcGIS application and requires detailed, accurate GIS data on road centrelines, drive restrictions and service locations. 'That is why,' says Nick, 'we chose to work with OS MasterMap.' The ITN Layer offers an accurate, detailed and up-to-date digital map for Great Britain's road structure. The ITN Layer contains all navigable roads across Great Britain, from motorways to alleyways. Each road link has a unique reference number – or TOID® – to which feature and statistical data can be attached to aid location management, asset management and analysis.

RRI has comprehensive restriction and advisory route information, which may influence the choice of route. Network features and attribution includes nine road classifications, from motorway through to private roads with restricted access. There are seven road types, from dual carriageway through to enclosed traffic areas. The routing information classes include no turn, mandatory turn, no entry, access prohibited to (specified vehicle types), access limited to (specified vehicle types), bridge height, weight and width restrictions, mini roundabouts, traffic calming, gates, through route and severe turn.

According to Nick, 'We were very comfortable working with Ordnance Survey data and we were familiar with the technology. The economics of the Mapping Services Agreement were important, too, which meant that the Councils could use ITN and RRI with no additional licence costs.'



**DDC Refuse Collection - Daventry 101**  
Urban rounds based on 8 vehicles - 40 rounds per week



**DDC Recycling - Daventry NE (Round 407)**  
Recycling rounds based on 7 vehicles - 35 rounds per week

### The return on investment

The return on investment for the project is impressive, with overall savings already identified being far in excess of the sum of the contract value and authority time. Jo Gilford, Daventry's Corporate Manager for Public Space and project manager on behalf of the Northamptonshire Waste Partnership sums up, 'OS MasterMap ITN Layer and RRI has made it possible for us to meet our challenges of increasing efficiency, planning for growth, reducing landfill. In Daventry alone we are on target to achieve savings of around £100 000 per year, with much greater savings expected for the whole county.'



# Optimising waste collection using OS MasterMap® Integrated Transport Network™ Layer

## Case study

**Ordnance Survey product portfolio**  
OS MasterMap Topography Layer  
OS MasterMap Integrated Transport Network Layer

### Links

[www.daventrydc.gov.uk](http://www.daventrydc.gov.uk)  
[www.wyg.com](http://www.wyg.com)  
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## Daventry District Council uses OS MasterMap Integrated Transport Network Layer with Road Routing Information to generate efficiency savings of over £100 000 per annum

### Executive summary

As part of the first stage of a county-wide programme, the Northamptonshire Waste Partnership has enabled Daventry District Council to rationalise the number of domestic waste collection routes from nine to eight, reducing diesel costs by 12%, increasing spare capacity by 14% and eliminating overtime costs. The project was carried out by Integrated Skills Limited using OS MasterMap Integrated Transport Network (ITN) Layer with Road Routing Information (RRI) – which includes detailed road routing and drive information such as width, height and weight restrictions.

Jo Gilford is Daventry's Corporate Manager for Public Space and project manager on behalf of the Northamptonshire Waste Partnership Feasibility Study of a countywide integrated waste and recycling collection service. She says, 'OS MasterMap ITN Layer and RRI have made it possible for us to optimise existing waste collection procedures and minimise the requirement for new routes. We are on

target to achieve savings of around £100 000 per year.'

### The challenge

#### Increasing efficiency, planning for growth, reducing landfill.

Under the European Union Waste Management Directive, by 2010 the UK will be required to have reduced the amount of waste going to landfill to 75% of that produced in 1995. Not only that, with waste management as the third largest area of local government expenditure after construction and adult social care, councils are making strenuous efforts to improve the efficiency of waste collection services.

All this, too, at a time when strong housing and population growth is resulting in significant additional demand for services. For example, the county of Northamptonshire has been experiencing steady growth in population and an additional 20 000 inhabitants are expected in the Daventry District Council alone over the next 10 years.

The Northamptonshire Waste Partnership (NWP) brings together the waste management expertise of Northamptonshire County Council and the seven district and borough councils to drive the achievement of the Northamptonshire Joint Waste Management Strategy. In 2006 NWP successfully bid for project funding from the East Midlands Centre of Excellence, the lead government change agency for the public sector on efficiency. The NWP then commissioned White Young Green, an international multi-discipline consultancy practice, to advise on the development of waste management strategies, including improving existing recycling services, siting new recycling centres, and optimising procedures.

In turn, White Young Green contracted Integrated Skills, specialists in the provision of high-quality environmental advisory and management services to government and industry, to advise on making the best practical use of the various vehicle fleets and resources in each authority. Daventry District Council volunteered as project manager (supported by

Wellingborough) and was the first authority to go through the exercise.

### The solution

#### Four-stage project.

The overall project, managed by White Young Green, is in four distinct stages:

- Stage one: generate new waste collection routes in all seven districts and determine the possible savings.
- Stage two: investigate the benefits of cross-border working.
- Stage three: evaluate more specific joint working opportunities.
- Stage four: evaluate the opportunity for county-wide working.

Explaining his company's part in stage one, Nick Crick, Director of Integrated Skills, says, 'We created a solution specifically for the optimisation of refuse collection routing. We carried out the project with RouteSmart, using OS MasterMap Integrated Transport Network (ITN) Layer with Route Restriction Information (RRI) augmented with local knowledge and the weight restriction layer for Daventry District Council highways'.

He continues, 'Working with Simon Hume, the GIS Technical Officer at Daventry District Council, we generated the routes for the councils, identifying the resulting savings and advising on how they may be realised'.

Nick comments, 'The system calculates the routes taking account of delays from left and right turns and intersections, weight restrictions and time windows. Each route is optimised by balancing the workload between routes on a daily or on a weekly basis'. He adds, 'To identify residential properties, we asked the councils to match their Local Land and Property Tax records with their Council Tax records. In future, though, with OS MasterMap Address Layer 2, the process will be considerably quicker and easier since OS MasterMap Address Layer 2 identifies commercial properties and it associates each house location with a street segment.'



Individual Travel Paths in Daventry

Nick points out, 'None of this would have been possible with off-the-shelf satellite navigation systems. RouteSmart is not merely a network analyser. It is a comprehensive high-density, high-performance GIS-based routing solution.'

Explaining progress to date, Nick says, 'Our work on stage one is almost complete. We have handed over the routes to all of the seven districts and in the future the Northampton Waste Partnership, who have acquired a RouteSmart licence and associated ESRI® ArcGIS software, will update them.' He continues, 'Daventry has already trialled the routes and in fact implemented them in August. The other councils are at various stages of consideration, approval and implementation.'

### The benefits

#### What benefits have been identified so far?

Stage one benefits include reduced mileage, resulting in fuel savings and a reduced carbon footprint. There is a reduction in the number of routes within an authority, and the solution can help the NWP to evaluate impact

of different disposal locations and can help compare different collection methodologies. The solution can also provide definitive identification of fleet requirements, highlighting, for example, the possibility for smaller vehicles on some routes. It can show how growth in the number of properties to be served may be absorbed and can help with cross-boundary working.

How the savings can be realised depends on a number of factors. Jo confirms, 'In Daventry we've identified savings of over £100 000 in a full year. And savings for the remainder districts and boroughs are expected.' She continues, 'The actual bottom-line savings depend on vehicle and route numbers – it may not always be possible to convert savings into whole routes saved or complete vehicles saved, for example. However, the savings can still be realised by postponing expenditure. For example, towns in Northamptonshire are planned to grow significantly in coming years. Each 1 000 new properties a year represent at least one day's work for one vehicle. You don't need many of those to justify an extra truck. Now, however, such acquisitions can be deferred.'



## The savings

### Daventry

There are several factors contributing to the overall savings in Daventry. By adding an already-planned additional vehicle, capacity can be increased by 14% without increasing labour hours. Overtime can be largely eliminated and vehicle washing can be carried out without incurring premium payments. Overall, the value of the savings has been calculated at over £100 000 per annum. Initial indications of savings in the other authorities, subject to confirmation include:

### Wellingborough

- Rebalancing routes results in mileage savings of around 10%.

### Corby

- Spare capacity of three vehicle days identified, enough to serve over 4 000 new properties.
- Very rapid housing growth in the district will absorb this capacity within two years.

### East Northamptonshire

- Spare capacity to be retained for housing growth, currently running at 600 new properties a year.

### Kettering

- Reducing routes from 28 to 26 should generate a saving equivalent to £30 000 per annum.
- New routes have been accepted by management.

### South Northamptonshire

- Rapid housing growth is planned, with 10 000 new properties in 10 years.
- Spare capacity to be redistributed to growth hot spots.

### Northampton

- One whole vehicle may be eliminated, resulting in total savings of £125 000 per annum.