

Reducing response times

Ambulance services drive down response times through in-vehicle audible and visual route guidance based on the OS MasterMap® Integrated Transport Network™ (ITN) Layer

Case study



The challenge

Meeting ever-tightening response time standards

The Department of Health key standards for ambulance services include the requirement to respond to 75% of ambulance category A (life threatening) calls within eight minutes or less, and responding to 95% of Category A calls within 14 minutes in urban areas or 19 minutes in rural areas. Achieving these standards is no mean feat. New residential, commercial and industrial estates are springing up everywhere. Each month, new traffic management schemes bring in new one-way streets, closed streets and restricted turns. Not only that, the location of new schools and new hospitals has to be taken into account when route finding; and the refurbishment of town and city centres provides additional challenges for the emergency services.

From 1 April 2008 the response time will be measured from the time the call is connected to the ambulance control room. Ambulance trusts and primary care trusts will be assessed against this new standard from 2008–09 onwards. Only the most accurate and up to date mapping will suffice if ambulance services are to meet such ever-tightening standards. That is why so many ambulance services are turning to automatic vehicle location and routing solutions based on the OS MasterMap ITN Layer.



The solution

In-vehicle audible and visual route guidance based on the ITN Layer

To help ambulance services meet this challenge, Terrafix Limited developed a mobile computer system that used Ordnance Survey products as the basis for generating and displaying the optimum route to incident. Staffordshire-based Terrafix provides automatic vehicle location (AVL), GIS mapping and mobile data communication systems in situations

where security and fast response are critical. Terrafix Limited has been in business since 1983 and has built up a reputation as the world leader in this field, with numerous systems across a broad customer base. For example, both Royal Berkshire and Wiltshire Ambulance Services now use the Terrafix TMC 1450 ruggedised mobile computer to provide crews with intelligent statusing, two-way text messaging and in vehicle audible and visual route guidance based on ITN data.

Determining response times automatically

For a number of years ambulance services have used computer-based command and control systems to manage emergency ambulance calls. The introduction of mobile data terminal systems to handle control room/vehicle communications eliminated the delays inherent in voice systems and helped crews to meet the Department's response time standards. With a mobile data terminal ambulance crews press a button to time stamp the receipt of an incident dispatch message, then press a button to time stamp their arrival at the incident location. Accurate response times can then be determined automatically.

User preference for Ordnance Survey maps

The actual routing of vehicles to incidents was increasingly being carried out using off the shelf commercial satellite navigation units fitted to ambulances. Although this was an improvement on the map books in use at that time, there were a number of problems. The electronic maps used by these devices were not always kept up to date; nor were they always to Ordnance Survey's high standards of map representation. In addition, device storage space was often limited, restricting map coverage. Limited processing power, too, meant that route calculation and recalculation could actually be slower than the progress the ambulance may be making. This could result in turns being missed and vital seconds being lost. Dr Mike Woodward, Technical Advisor to Terrafix, explains, 'We developed our own routing software that used Ordnance Survey OSCAR® road centreline data, displaying the route against an Ordnance Survey map background. User feedback was excellent. Ambulance staff much preferred our solution because of the speed of route calculation and because of the clarity and comprehensiveness of the Ordnance Survey maps.'

Combining mobile data terminal and satellite navigation unit

Mike Woodward again: 'However, health and safety considerations and restricted space in the vehicle prompted the ambulance services to ask us to combine the mobile data terminal and the satellite navigation device.' He added, 'This we did, using a full touch screen ruggedised mobile computer with Ordnance Survey mapping and using the ITN Layer in place of OSCAR.' The complete Terrafix AVL system comprises unique combinations of navigation sensors, mobile data terminals, communications and base station mapping, messaging and interface functions. The base station displays vehicle data on high-resolution screens that can be networked across an organisation's offices or sites. Ordnance Survey map databases are installed to provide detail as required from a general overview of the user's operational area down to highly detailed street level mapping. Mapping tools allow zooming and movement around the maps, including postcode databases and user-defined objects.

The benefits

Much higher level of detail for ambulance crew

What are the advantages for Terrafix of using Ordnance Survey products and, in particular, OS MasterMap ITN Layer? Chris Green, Business Development Manager at Terrafix, says, 'With Ordnance Survey mapping our customers have a much more comprehensive mapping system, both in their vehicles and in their control rooms.' He continues, 'Some command-and-control providers don't use Ordnance Survey maps and in some of those cases we have supplied large-screen Ordnance Survey-based map displays to help improve their situation.' Chris adds, 'In addition, with Ordnance Survey maps ambulance crews have a much higher level of detail. They can identify individual buildings, whereas with a commercial satellite navigation unit they would normally just see area boundaries.' He points out, 'It's also allowed us to sell a single box solution. There is no need for a separate satellite navigation unit.'

The Scottish Ambulance Service

Ultimately, though, the patient benefits from the investment by ambulance services in reducing response times and, in 2002, Terrafix was selected by the Scottish Ambulance Service to provide an AVL



system covering the whole landmass of Scotland and associated islands. Some 1 100 frontline emergency vehicles are now fitted with AVL. Chris Green, Business Development Manager at Terrafix, takes up the story: 'Scottish Ambulance had rationalised the service from eight control rooms to three. They had an existing command-and-control system but needed a more comprehensive control room mapping system, which we provided using large plasma panel displays with Ordnance Survey mapping.' He continues, 'The second part of the project, the implementation of vehicle mounted touch screen mobile data terminals and electronic patient reports terminals has just come into operation.' Chris adds, 'Our routing software automatically generates the route to the incident location using ITN data.'

East Midlands Ambulance Service

Another major user is the Lincolnshire Ambulance Service (now integrated into the East Midlands Ambulance Service). Lincolnshire has been operating a service-wide Terrafix system for some three years. Chris Green again: 'We supplied vehicle-based touch screen mobile data terminals that bring the satellite navigation and mobile data functions together. We also supplied the communications systems back at base to allow all the operations to integrate.'

More accurate routing means shorter response times

For Mike Woodward, 'The ITN Layer is richer in information than OSCAR and so offers us potentially more value. The ITN Layer has a higher specification of road classifications, too, and contains road routing information such as directional and restricted turns.' He adds, 'Ordnance Survey issued updates for OSCAR once every six months. That is now down to six weeks with ITN data. Since Ordnance Survey also provides change-only updates, the whole map updating process is much quicker too. New roads, traffic-calming schemes, new estates, closed roads and bridges are now notified much more. This means we can generate more accurate routing, which in turn means shorter response times.'

Looking to the future

Looking forward, Mike says, 'The level of detail in OS MasterMap Topography Layer will be extremely useful for the ambulance services in meeting the new, tighter targets.' He adds, 'We are also looking into integrating speed-limit information and real-time traffic information into the navigation system. That is raising some interesting issues: for example, the ambulance generally needs to go to an incident rather than avoid it.'

The return on investment

Driving down response times

In Chris Green's opinion, 'You'd be surprised how much of the response time can be spent trying to find the exact property. With Ordnance Survey mapping and, in particular, the ITN Layer as an integral part of our ambulance systems, we believe that this time has been driven down significantly.' As evidence, Chris offers: 'We have recently won an order from the North East Ambulance Service to upgrade the whole of their 300-vehicle A&E and PTS (patient transport service) fleet to our touch-screen solution. True, we could have used mapping other than from Ordnance Survey. However, our use of Ordnance Survey products has been instrumental in us winning contracts that we might otherwise have lost.'

OS product portfolio

- OS MasterMap Integrated Transport Network™ Layer
- OS MasterMap Address Layer 2
- Points of Interest
- Meridian™ 2
- OS Street View®
- OS Net®

Links

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