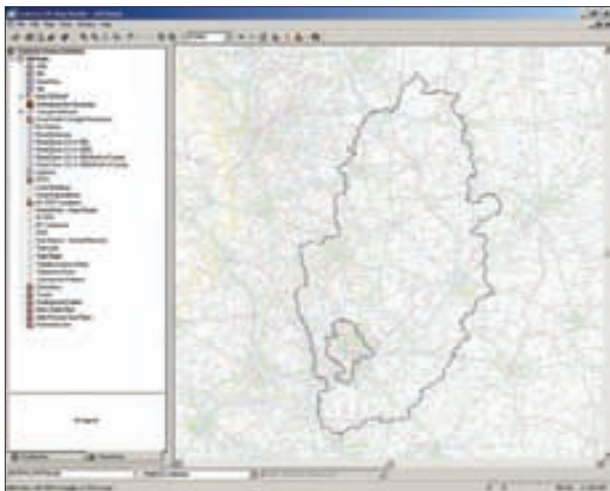


Case Study – Emergency Services

Cadcorp SIS in Control at Nottinghamshire Fire and Rescue Service

Since selecting Cadcorp SIS for its corporate GIS, Nottinghamshire Fire and Rescue Service has extended the system's deployment beyond its original use for incident and fire safety analysis, map management and distribution and operational CAD plans to include its use in the Control Room.

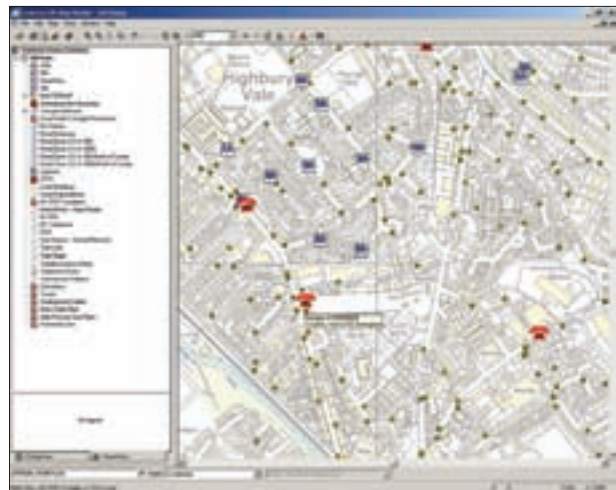
Covering an area of almost 835 square miles, Nottinghamshire Fire and Rescue Service serves a population of over 1 million. The service has 25 fire stations across the county and more than 1,150 staff, who work to make Nottinghamshire a safer community. They do this by responding to emergencies such as fires, road traffic collisions and incidents involving hazardous materials and performing rescues from water and from height. They also protect through the enforcement of legislation and by teaching local people how they can stay safe in their homes, at work and on the road.



Although the service already had GIS facilities, the decision was made in 2005 to acquire Cadcorp SIS as the basis of a new corporate-wide GIS. This enabled enhanced incident data analysis, planning, information presentation and data integration that the existing systems had not been able to provide.

Initially, the new Cadcorp software was used by the service's information systems team as the basis for a number of GIS-based applications, such as incident and fire safety analysis,

corporate Ordnance Survey MasterMap management and distribution and the development of computer-aided design (CAD) plans for operational use. An important aspect of the use of Cadcorp SIS, especially in the early days, was data conversion and interoperability. The software's built-in capabilities for on-the-fly reading and writing of a wide range of proprietary and industry-standard GIS, CAD and graphic data and database formats, without the need for additional translation software, was used to import data from and export data to the service's legacy systems. This enabled the service to maximise its existing investments in data from these systems.



Today, Cadcorp SIS-based information is distributed and used throughout the service. Paper maps are produced that display vast amounts of readily-understood information in a variety of ways, such as point data and thematic and hotspot mapping. Electronic maps are produced as Adobe PDFs and incorporated into Emergency Planning Manuals. And Cadcorp SIS Map Reader – a free viewer designed to open documents in Cadcorp SIS' native format for display, query and printing – is used to deliver and display information ranging from incidents to census data to the people within the service who need it, whether they are community safety advocates, fire-fighters or senior managers.

Control Room information

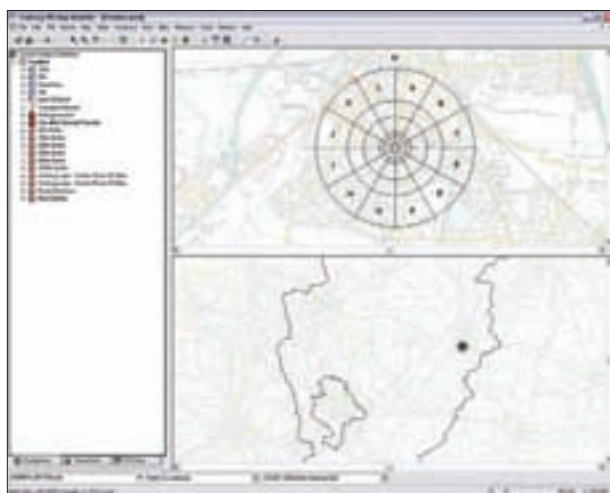
A similar capability is being developed for use in the Control Room at Nottinghamshire. The GIS used by the Control Room

staff is the same as can be found in many fire and rescue service control rooms in the UK because it was developed specifically for the role. Unfortunately, little further development has gone into it in recent years to bring it up to date in terms of user friendliness, reliability and the ability to handle data from other systems.

However in Nottinghamshire's view, the advent of regional control centres meant replacing their existing control room GIS was not a financially viable proposition. It was therefore decided to use Cadcorp SIS to develop tools that could be used by the control room staff alongside their existing system.

The first Cadcorp product to be used here was Cadcorp SIS Map Reader. Installed on a Citrix server, Map Reader retrieves data from two servers, enabling it to be displayed, queried or printed throughout the area covered by the service. Incident data and point data, such as fire hydrants, tram stops, CCTV cameras etc., are stored in a SQL data warehouse while base maps and geo-referenced data layers, such as flood zones or Sites of Special Scientific Interest (SSSIs), are stored on another server.

In the Control Room environment, Map Reader is accessed in the Incident Support Room which is attached to the Control Room and is used for major incidents or during extremely busy periods.



Assessing the value

The initial file created for the Control Room Map Reader facility was set up to replicate the layers on the existing Control Room GIS. It was also decided to add a few more data layers that would bring additional benefits. The idea behind this activity was to test out new data layers that could be useful to control room staff at the same time as demonstrating Map Reader's ease-of-use. The scroll wheel on the mouse allows a user to quickly zoom in and out through the base maps and to drag the map around the screen. Data layers are simply activated by clicking on the appropriate icon in the workspace window.

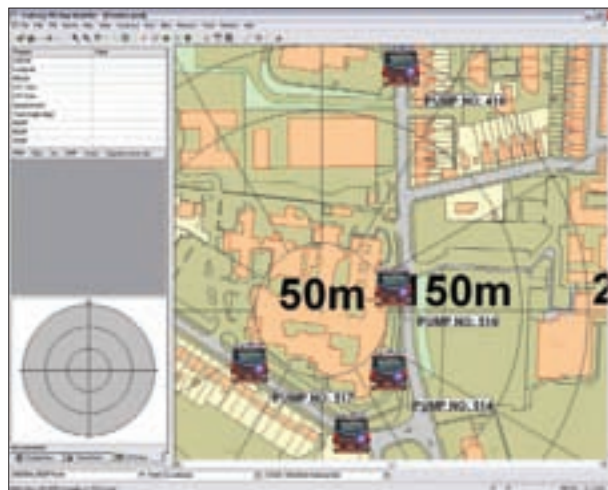
The start-up window for this initial file displayed the county boundary together with a list of all the map bases and data layers. Among these layers was the Integrated Transport Network (ITN), which was themed to allow road information such as one-way streets and no-entry points to be viewed, along with road width and height restriction information. It also contained flood zone information from the Environment Agency and enabled a number of different data-sets to be displayed at the same time, such as CCTV cameras, telephone kiosks and fire hydrants. Hovering over the symbol for a telephone kiosk, for example, displayed its location and telephone number.

"With Cadcorp SIS it is extremely easy to add new layers, as and when needed," says Richard Martin, GIS analyst, Nottinghamshire Fire & Rescue Service. "For example, road works on the M1 in Nottinghamshire meant that the marker posts had been covered up and temporary CCTV cameras had been installed. Within minutes we created a new layer displaying the information the way we wanted it. We also added a new layer for a data-set we received from the East Midlands electricity supplier that enabled us to display all the underground cables and sub-stations, etc. Control Room staff could then assess whether or not the new information would assist them and if so, have it transferred to the Control GIS."

In recent years Nottinghamshire has experienced an increase in flooding, both from rivers and streams bursting their banks and from excess surface water during heavy rainfall. To assess the value to Control Room staff of flood-related information a file was created that, in addition to the base mapping, contained data layers for Environment Agency Flood Zones, At-Risk Communities – this layer displays the towns and villages at risk when the River Trent floods, based on historical data – and a contours data-set from Nextmap. Because Cadcorp SIS can read digital terrain models (DTMs), a model from Nextmap was provided and themed to show low-lying areas of the county. This enabled areas lying outside the Environment Agency Flood Zones but that could still experience flooding during prolonged periods of heavy rain to be identified and displayed.

Hazardous materials incidents – Cadcorp FireMet

On occasion, Nottinghamshire's fire-fighters are called upon to deal with hazardous material (HazMat). When this happens it is essential that they are safely mobilised to the incident. The GIS team therefore created a file comprising a number of layers containing information appropriate to such an incident in order for Control Room staff or the Hazardous Materials and Environmental Protection Officer (HMEPO) to be able to dynamically risk assess the situation and pass information to the appropriate people.



Among the functionality required in this FireMet application was the ability, for example, to create and move buffers, to analyse the ITN layer and to track specific fire and rescue service appliances. This is beyond the capabilities of Map Reader. However, it is well within the capabilities of Cadcorp SIS Map Modeller, which is used elsewhere within Nottinghamshire Fire & Rescue Service. But a lot of other functionality that they didn't need, such as 3D and advanced drawing capabilities, also comes with Map Modeller. Cadcorp's answer was to develop a plug-in that displayed just those tools within Map Modeller that Nottinghamshire specified. The

others remained hidden so as to keep the application as simple and user-friendly as possible.

With the latest information on weather conditions, wind speed and wind direction from the FireMet section of the Meteorological Office web site, the HMEPO can then use the Cadcorp FireMet application to plan a response to an incident and to marshal and direct the required resources. The officer can quickly navigate to a particular point in the county and locate the incident. The screen can be split into two to give a close-up view and a view of the surrounding area. Buffers can be created on the map and new layers can be easily created and the drawing tools used to draw a contaminated plume fall-out area, for example, based on the latest weather conditions.

In addition, the ITN layer of the file can be used to establish the quickest route to the incident from the nearest fire stations. Isochrones can be created based on user-specified time intervals from selected stations so that in the event that a station becomes cut-off from the incident the quickest alternative can be selected. And should the public need to be evacuated, the HMEPO can highlight the nearest - or safest - rest centres from the rest centres data layer.

On-going work on this application includes creating a 'Risk Community' layer that will display information relating to the location of hospitals, schools and nursing homes, etc.

Although the initial Cadcorp FireMet application was designed for major incidents, it has proven to be invaluable in smaller HazMat incidents. Group manager and HMEPO, Clive Gannon, used the application for a fire involving various chemicals at an industrial plant.

"Forecast changes in wind direction meant that potential fall-out from a fire plume would cover a changing area", he explains. "This predicted area was identified and a map was created with this detail on it. The map was then used at the incident for the safe deployment of personnel and for the evacuation of appropriate premises. The information was also shared with other agencies, such as the Environment Agency and the Health Protection Agency, to enable them to make more informed decisions."

"These new applications of Cadcorp SIS Modeller and Map Reader in our

Control Room are a good example of the way the software can be further and readily developed to provide real benefits to core aspects of Nottinghamshire Fire & Rescue Service's day-to-day activities", Martin concludes.



Cadcorp | Computer Aided Development Corporation Ltd

Sterling Court, Norton Road, Stevenage, Hertfordshire.
SG1 2JY. UK

T 01438 747996 | F 01438 747997

Cadcorp Inc. | North America

1420 Boston-Providence Hwy, Suite #257, Norwood,
MA 02062 USA

T +1 (781) 551 2727 | F +1 (781) 551 3404

Visit www.cadcorp.com | Email cadcorp@cadcorp.com

Cadcorp is a trading name of Computer Aided
Development Corporation Ltd