

Achieving Interoperability at Staffordshire County Council using the Digital National Framework



This document has been prepared by Staffordshire County Council and 1Spatial on behalf of the DNF Expert Group.

For more information on this case study please contact:

Wyn Jenkins, Corporate Property Information Manager,
Staffordshire County Council.

Email: wyn.jenkins@staffs.gov.uk

Phone: 01785 277733

Chris Wright, Managing Consultant, 1Spatial.

Email: chris.wright@1Spatial.com

Phone: 01223 420414

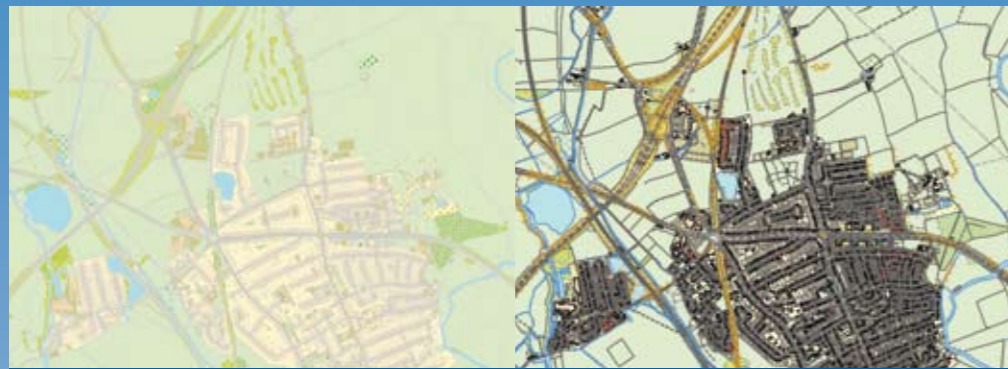
For more information on DNF or the DNF Expert Group
please email info@dnf.org

Ordnance Survey, the OS Symbol and OS MasterMap are registered trademarks of Ordnance Survey, the national mapping agency of Great Britain.

ArcIMS and ESRI are registered trademarks of Environmental Systems Research Institute, Inc. AutoCAD and Autodesk are registered trademarks and DWG is a trademark of Autodesk, Inc. MapInfo is a registered trademark of MapInfo Corporation. Oracle is a registered trademark of Oracle Corporation. The 1Spatial logo and Radius Topology are trademarks of 1Spatial Ltd.

D05760 1107





'We have invested nearly £1m in GIS over the years yet all it seems to do is produce lots of pretty maps.'

'I never seem to be able to get hold of the right data at the right time, even though I know we have it somewhere.'



'Wouldn't it be great if all the County Council's spatial data could be viewed or edited in a variety of applications?'

**(user comments from a Staffordshire County Council internal GIS survey undertaken in 2004)*

The challenge

The solution

Benefits

Local authorities are increasingly required to share data efficiently within departments, between departments and with external organisations and the general public. Staffordshire County Council has a number of departments using geographic information systems (GIS) and each maintains its own data and uses different GIS tools to manipulate that data. This can result in duplication of effort and may lead to inconsistencies between datasets. Staffordshire County Council is tackling these problems by enabling interoperability throughout the organisation.

Using Digital National Framework (DNF) principles, Staffordshire County Council worked with spatial data experts 1Spatial to prove and achieve an open and interoperable solution to data management. By sharing regional mapping data across the organisation, a single repository was created for business and spatial data to be stored together, which meets Staffordshire County Council's initial business requirement of improved spatial data access and sharing.

Such a shared environment lays the foundation for a DNF approach to be taken for the creation and management of spatially based business data across the organisation.



Staffordshire County Council was faced with the challenge of achieving interoperability without a corporate GIS or strategy. Its IT staff had little or no knowledge of spatial data. Data was held in various systems, producing the classic multi-vendor applications situation (ESRI, MapInfo, 1Spatial etc. all used in different departments); a situation that makes DNF principles difficult to implement.

Staffordshire County Council experienced several problems relating to data access handling:

- Inconsistencies between datasets – datasets were maintained independently with no regard to how they related. Users were unknowingly introducing inconsistencies such as gaps and overlaps.
- Inefficiency – data was often duplicated across several departments. Valuable time was spent making the same updates to several versions of the same dataset, with no guarantee that these versions would remain synchronised.
- No interoperability between data formats – Staffordshire County Council's data was maintained in a number of proprietary formats. To share data, departments would have to export/import to a standard known format, meaning that real-time data sharing was impossible.

Staffordshire County Council needed to enhance the underlying spatial data quality and remove errors. It needed a single database across the organisation to centralise data storage and a link between business data and spatial data. Staffordshire County Council required real-time access to maps and plans, for the data to be available for sharing internally and externally and a secure and scalable platform. With up-to-date, high-quality data Staffordshire County Council could then use its spatial data for business analysis and decision making instead of simply as a backdrop. In addition, this would allow consistently referenced business data to be created and maintained to DNF principles.

Staffordshire County Council was faced with the option of moving to a single GIS platform or choosing an enterprise solution based on interoperable principles.

As Staffordshire County Council had 10 years of investment in various systems with bespoke applications and solutions, a single GIS platform option was not favoured by GIS users. A single GIS would not necessarily provide the link for data sharing with partners such as district councils and other public bodies, thereby falling short of several DNF principles related to the sharing and structuring of data.

The second option was interoperability. By moving to storing data centrally, Staffordshire County Council could ensure access to the information by all systems/applications. Data could be opened up for sharing and duplication of effort could be avoided. Spatial data could be viewed in standard browsers and access to spatial data outside the GIS department could be achieved. Overall, an interoperable solution appeared to provide the most promising platform for the future, something very important to Staffordshire County Council.

By sharing regional base reference mapping data across the organisation, a single repository was created for business and spatial data to be stored together. This met Staffordshire County Council's initial requirements and provided the foundation for a DNF based architecture. An Oracle9i database was installed and data uploaded from an area around central Stafford. Initially OS MasterMap® data of the area was loaded.

Foreground data belonging to Staffordshire County Council was loaded and topologically structured against the OS MasterMap data using 1Spatial's Radius Topology™ product. Once configured, Autodesk MapGuide® 6.3 was installed so that data could be viewed in a web browser. The data can now be viewed using a variety of other web viewers, e.g. ESRI ArcIMS® 4.1.

All Staffordshire County Council's GIS applications will work alongside each other reading from an Oracle9i database. These applications include:

- Autodesk MapGuide®
- ESRI ArcIMS
- MapInfo Professional®

1Spatial's Radius Topology provides a persistent, server-side solution for ensuring ongoing data quality management; it works with all desktop and web editors that can read/write the Oracle® spatial data type [SDO_Geometry].

In order to improve usability, Staffordshire County Council wanted to link foreground data to DWG™ floor plans that had been created in AutoCAD®. Linking foreground data to floor plans allows Staffordshire County Council to easily store and access information such as asbestos and asset location. All the information relating to the asbestos can be stored, including type, composition, amount and removal cost. To have attempted to locate all the asbestos areas in the Stafford region manually would have been an impossible task. This interoperable initiative also saved a considerable amount of time and cost by automating most of this effort.

- Base layer OS MasterMap linked to data layers of all groups (e.g. education, property, development) via TOIDs.
- Reusable spatial data certified to be of a consistent quality standard.
- Reduced duplication of effort by separate departments.
- Spatial data available for sharing both internally and externally, in real time and not solely in GIS applications.
- Successful link between spatial and business data for quicker analysis and decision making.
- Secure and scalable platform to support information transfer, both now and in the future.
- Quick and simple report production, e.g. for asbestos locations, as all that is required is a standard Internet browser.

By implementing open and interoperable centralised data management, Staffordshire County Council has achieved its original objectives and has developed a system providing a foundation for DNF principles:

- Definitive – Radius Topology was used to move the Council's data on top of OS MasterMap to provide a definitive reference layer.
- Inclusive – By migrating to a centralised Oracle database, Staffordshire County Council is creating an open and inclusive environment.
- Structured – By linking to OS MasterMap using TOIDs, Staffordshire County Council reference its features through unique identifiers and maintain its data effectively.
- Reliable – Staffordshire County Council has one consistent dataset; everyone has access to the same high-quality data that underpins important business decisions.
- Cost-effective – The central database needs only to be updated once, but the data is used many times in different departments.
- Flexible – The Oracle database uses open standards; Staffordshire County Council can use many different applications to exploit its data.