Case Study

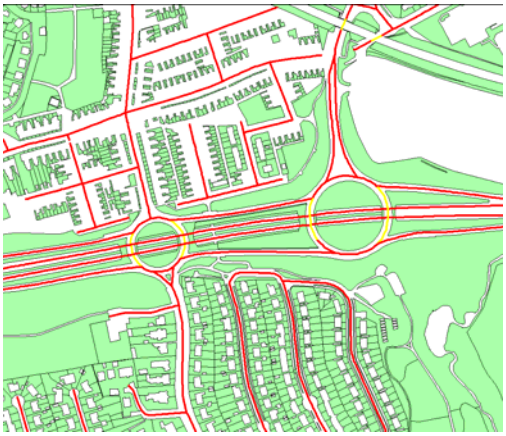
Landmark Helps DEFRA Noise Map Roads in England

Landmark Solutions, the UK's leading provider of geospatial information, solutions and services, was selected by DEFRA as the prime contractor to carry out noise mapping for the Potteries area of the West Midlands. This work forms part of the Government's National Ambient Noise Strategy (NANS), part of which is focused on mapping noise levels from roads, railways, aircraft and industrial sites across England.

Due to be completed by 2007, the first stage in the development of NANS is the Noise Mapping of Roads which involved DEFRA's Central Data Service (CDS) collating and compiling noise information taken from England's major roads and 21 towns and cities.

Landmark Solutions was responsible for the processing of CDS noise data for the Potteries area of Staffordshire, one of the largest regions covering an area of 96,620km^2. Outputs included the creation of a Noise Barrier dataset, a noise model, and both calculating the noise levels and subsequently mapping them.

Working closely with DGMR from the Netherlands, and UK based Hepworth Acoustics, who are experts in noise prediction and modelling, Landmark used DGMR's Predictor software to produce noise maps which identify where people are affected by traffic noise, how many are affected, and to help identify the source of the noise impact as well as help plan to reduce noise levels.



Original Ground Cover Layer

Optimised Ground Cover Layer

The objective was to bring together several datasets containing data for buildings, ground cover and roads, and to carry out detailed analysis to simplify and economise the data in order to make the noise model calculation process efficient and maintain a degree of accuracy consistent with that of the original datasets . This was amalgamated with a dataset of noise barriers

collected during a field survey of the Potteries' Motorways and 'A' roads.

The challenges

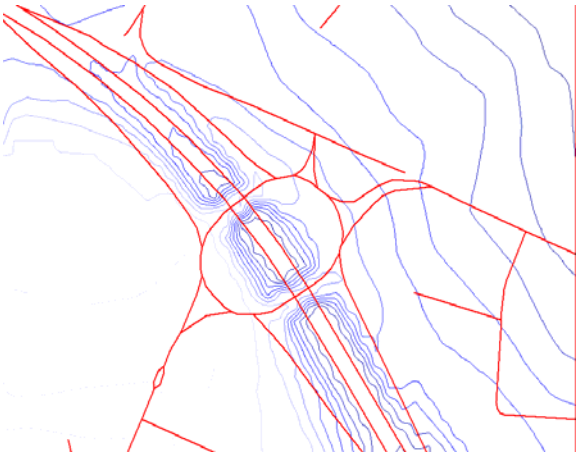
DEFRA's Central Data Service supplied Landmark with several large and detailed datasets which required rationalization to render them suitable for noise modeling calculations. Therefore a method was defined to review the supplied CDS datasets from both a GIS and acoustic perspective, develop a metadata structure for the datasets produced during the project and process the datasets into a suitable form for direct import into the Predictor software and documented in a definitive Technical Specification specifying the approach Landmark and its Subcontractors would take.

The next challenge was to gather the requisite noise barrier data which would form part of the final modified data inputs with the data supplied by CDS. In order to achieve this Landmark partnered with the environmental and engineering consultancy Entec UK to undertake a field survey to collect the noise barrier data.

The final challenge was modifying the road network data. It required the least optimisation but proved to be the most sensitive dataset in terms of difficulty in getting it into an appropriate format. The development of bridges, tunnels and underpass networks and the associated acoustic impact model, illustrated to the right, was the most time consuming and challenging element of this component.

Finding the bridges, tunnels and underpasses in the dataset could not be automated fully as it tends to be an issue of subjective interpretation and bridges over main roads were interpreted as very small tunnels which meant they were handled in the same way as any other tunnel is handled in Predictor.

After several iterations a useable dataset was created, and along with the other optimised datasets, were split into motorway and non-motorway categories for delivery to DGMR.



The solution

The CDS data was successfully transformed to a data format which could be loaded into the Predictor software. The datasets were improved and optimised to speed up the noise calculations and management of the data whilst still meeting the requirements of the contract.

The input datasets were QA checked within a GIS environment and test loads performed to check the data in relation to test models and noise calculation parameters. The resulting model input datasets and parameters were used by DGMR in the Predictor model to produce the final noise level results which subsequently were used by Landmark to create the final noise level GIS datasets and maps. Landmark used the ESRI GIS environment extensively to perform all the processing of output, including calculations to adhere to UK and EU noise level standards.

Notwithstanding the complex processes involved and the large data sets, Landmark delivered this contract to time, budget and with a high level of client satisfaction.

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