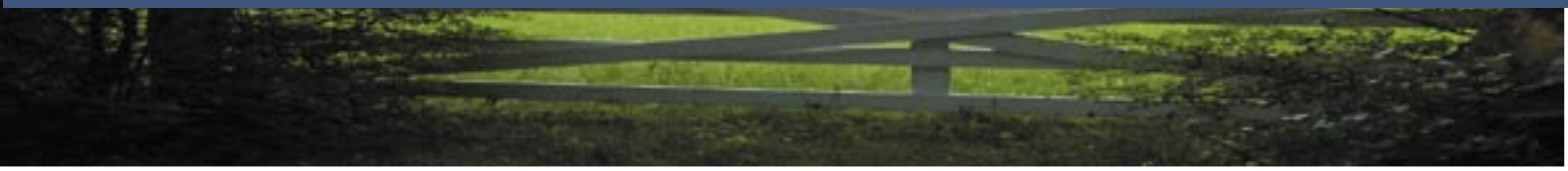
1Spatial

CASE STUDY

Radius Topology



PAI adjustment at Dartford Borough Council

Dartford Borough Council (DBC) started to amend its GIS data due to the Positional Accuracy Improvement (PAI) programme undertaken by the Ordnance Survey (OS). The Council has over 200 digital map datasets with the largest two being the property boundaries (BLPU extents) and the Planning Application boundaries.

The Challenge

DBC has had a corporate GIS system for over ten years. Nearly all the required data had been captured onto an old UNIX ArcInfo workstation. This data was captured using software that was considered state of the art at the time; subsequently the data capture tools within GIS have improved but DBC has not migrated accordingly.

There were a number of errors within the data that meant that if the layer was shifted using PAI software, the errors within the layer would just be propagated to the shifted information and possibly made worse. The errors in the data can be broadly defined as:

- Snapping errors. Data had not been snapped to the original OS Land-Line® data
- Overshoots, undershoots, spikes and slivers. Small errors in the data could not be easily identified and needed to be removed
- Overlapping data. In the BLPU boundary data some of the boundaries overlapped each other
- Duplicate points and self-intersecting polygons

If these errors were not corrected within the data, and the information was shifted to the PAI-adjusted map base, the errors would cause significant problems to the Council. The use of BLPU boundaries will become essential to the running of the Council. A polygon that had been badly drawn can result in wrong land registrations being shown on a search or the wrong planning application information being shown on a property.

An example can be seen in Figure 1: the old BLPU boundary is located in red while the Land-Line mapping is in black. If the BLPU boundary was used as the basis of a land search it would select registrations on the neighbouring property.

These errors within the data were not restricted to the PAI areas. Improvements were required through the geographic layers. The effect of PAI on the data was a side issue. Real world change had been affecting DBC for years, in many areas the Ordnance Survey map had moved significantly, but the GIS information had not altered accordingly. It was therefore felt that the whole dataset should be cleansed and improved.

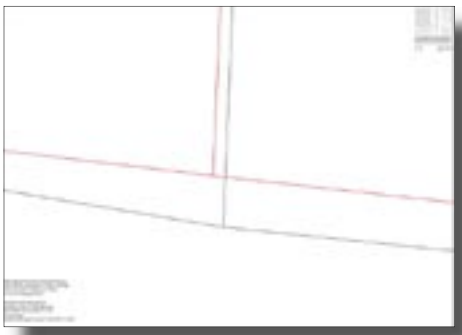


Figure 1: Discrepancies between BLPU data and OS Land-Line data can lead to errors in building registration.

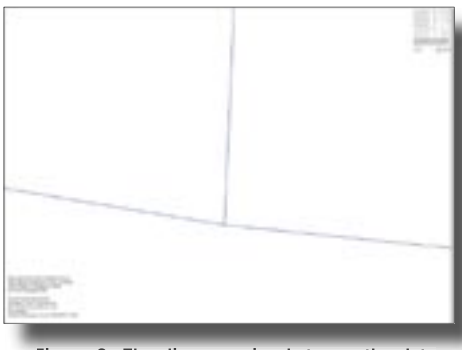


Figure 2. The discrepancies between the data shown in Figure 1 have been corrected; the Land-Line data and BLPU data are now co-incident.

The Solution

1Spatial's Radius Topology™ product offered a quick solution to a number of the errors outlined above. DBC was not in a position financially or technologically to purchase the full product, instead they opted to use a number of consultancy days for 1Spatial to run the GIS layers through its Radius Topology software. It was hoped that the majority of the common errors in the data could be corrected.

1Spatial's consultants returned the data correctly aligned to the Land-Line data and structured so that co-incident polygons shared the same co-ordinates. An example of the change made to the data can be seen in Figure 2.

The BLPU extents were successfully matched with the pre-PAI Ordnance Survey mapping. This meant that when DBC came to shift the data the link files would be more effective as the co-ordinates being shifted, in many cases, would be co-incident with the link file co-ordinates supplied by the Ordnance Survey. Figure 3 shows the cleaned but unadjusted data against the OS base data.

Figure 3: New OS base data has been positionally improved, resulting a mis-match with the BLPU boundary data.

The GIS data was processed through the ESRI PAI tools using ArcGIS 8.3. These tools were freely downloaded from the ESRI website. The results can be seen in Figure 4.

Figure 4: The ESRI tool has shifted the data according to the shift vectors. The shift appears roughly correct.

The output files from 1Spatial have helped to provide information on where problems might occur when shifting the data. Where part of a polygon is not co-incident to the Ordnance Survey base data, those areas were flagged for checking. This information has been used to see how the data has shifted and to flag possible errors in the data that might have resulted as part of the shift. See Figure 5.

Figure 5. Radius Topology can show the user which BLPU boundaries do not completely line up with the Ordnance Survey mapping.

The process has improved the current data and helped to reduce the number of errors that have occurred during the shift. This has reduced the number of 'easy' polygons that require further checking. The output files have helped DBC to focus on areas within the data that need further improvement and should allow the Property Information team to release PAI-adjusted data to the users more quickly than expected.

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