The value of Geodemographics in a Recession

While the recession may be over, the fall-out will be here for some years to come in terms of the pressure on public finances. The intelligent use of geodemographics is one way in which local authorities can look to reduce costs while minimising the negative social impacts.

First, a brief introduction to what we mean by geodemographics. Here we are talking about the analysis of small areas (full postcodes or census Output Areas) in terms of the type of people that live there and hence their demand or need for different services or facilities. Our analysis makes use of classification tools developed by the likes of Experian (MOSAIC), CACI (ACORN) and the ONS (Output Area Classification) using large databases and sophisticated analysis.

The application of geodemographics as a tool for social policy making goes back to 1902-3 and Charles Booth's Index Map of London, which was based on a multivariate analysis of the 1891 Census. More recently, commercial applications like direct marketing and store location have dominated their use, but the approach is as valid as ever for the public sector.

When money is tight, geodemographics can be a highly valuable tool for targeting spending on where it will be the most beneficial, or conversely on identifying where cuts will have the least impact. Often this involves combining geodemographic analysis with accessibility analysis. Accessibility analysis identifies locations which are affected by cuts, whilst geodemographic analysis characterises the people affected by a loss of access to services, and the extent to which they are likely to suffer. The process is best understood by considering the following two practical examples.

Minimising the social impact of public transport cuts in Berlin

In 2007 Berlin had to review its excellent public transport services and consider how services could be reduced without undue negative social impacts on specific groups like the elderly and low paid. To help, Steer Davies Gleave developed a tool (called 'Adept') which enabled changes to public transport provision to be evaluated in terms of their relative impact on particular population groups who have a greater reliance on public transport. A key element of this was our 'Transport Need Index' which was based on four factors: wealth, car ownership, presence of senior citizens and children.

The data sources used came from a combination of German census attributes and MOSAIC which we then combined to create a Transport Need Index – one each for the six geodemographic ('TraveStyle') segments.

Berlin was then divided into 200m diameter equal sized hexagon cells, with approximately 15,000 cells covering the whole city. The relative need for public transport was calculated based on the MOSAIC profiles of the population within each cell. This is illustrated in Figure 1. The red areas are those with the greatest need for public transport and therefore where services should be maintained whilst the blue areas are where there is less need because of higher car ownership, higher incomes, fewer senior citizens or fewer children.

In fact, since in planning public transport provision it is useful to understand the nature of the need as well as the extent, information on the mix of segments living in a locality complements the simpler needs index. This is illustrated in Figure 2 (which is the same 'zoom-in' area used in Figure 1). This highlights the point that the reason there is a substantial need for public transport in the neighbourhood is that there are many students and young people on low incomes

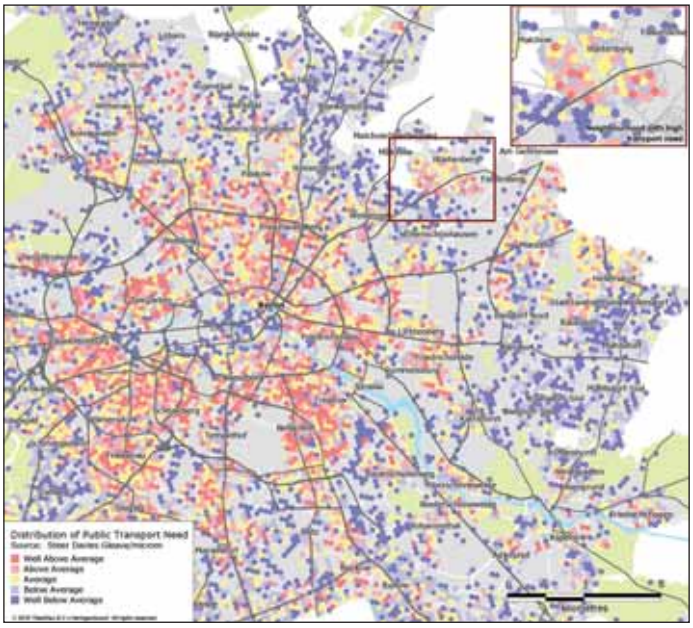

Figure 1: Transport Need across Berlin

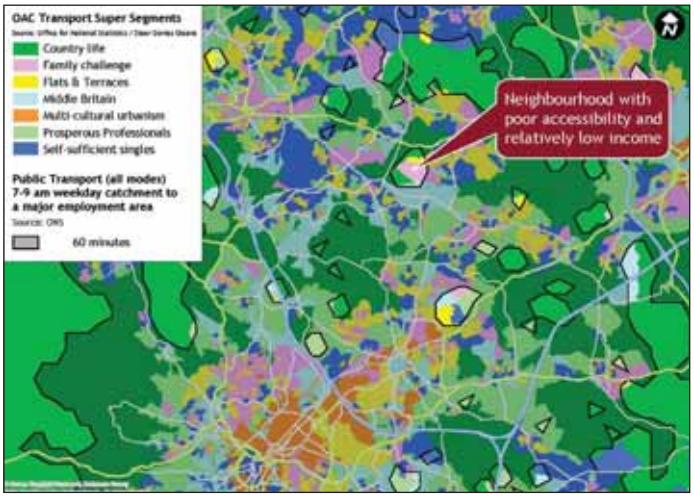

Figure 3: Accessibility analysis combined with Geodemographic profiling

living there (the size of the circles reflects the number of people living in a housing block while the colour reflects the segment).

Ensuring adequate access to essential facilities

Turning to the UK, the Department for Transport has recently instigated a number of 'DaSTS' studies; this stands for Delivering a Sustainable Transport Strategy. These have five goals: supporting the economy; tackling climate change; contributing to better safety, security and health; promoting equality of opportunity; and improving quality of life. Geodemographics are proving to be a vital tool for balancing these various goals while being realistic about future budgetary constraints.

A typical piece of analysis is to examine accessibility by public transport to a service or facility in combination with geodemograhic profiling of the population. Figure 3 illustrates an example based in the North of England that highlights gaps in the public transport network and the profile of people living in these areas with relatively poor access to services. In this instance, the profiling is based on UK's Output Area Classification (OAC). OAC is a geodemographic classification system similar to MOSAIC and ACORN but it is a freely-available open access system. It also differs from commercial systems in that it only uses census data. At Steer Davies Gleave, we aggregated the 54 OAC subgroups into 7 'Transport Super Segments' using additional travel behaviour data to create a transport specific version of the OAC classification system A summary of key indices for these segments is shown in Figure 4.

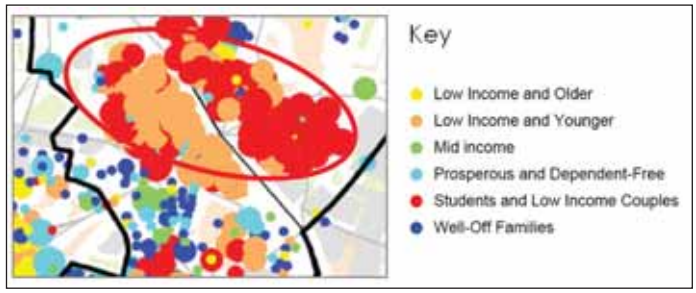

Figure 2: Geodemographic profiling using TravelStyle

Segment label	Overall Transport Need	Low access to car	Bus use	Low income	Ruralness
Flats & terraces	183	135	102	173	81
Multi-cultural urbanism	171	142	133	203	59
Family challenge	157	126	117	150	85
Self-sufficient singles	88	109	73	92	90
Middle Britain	60	99	72	77	81
Country life	38	62	0	45	133
Prosperous professionals	27	74	48	40	92

Figure 4: Key indices for OAC Transport Super Segments (100=England & Wales average)

The accessibility planning data came from Accession which is a DfT approved piece of software used to calculate journey times to specific destination types (such as employment, health, education). In our example, Accession was used to identify where the 'holes' in the public transport network are, and then these holes were profiled using the OAC Transport Super Segments to help understand the potential impact and importance of the poor provision. Figure 3 highlights a 'gap' in the network that is mainly comprised of people in the Family Challenge and Flats & Terraces segments, both of which have an above average need for affordable public transport since they have low incomes and relatively poor access to a car. Also shown are other gaps, though mainly in sparsely populated areas where car ownership is high (typically defined as Country Life).

In our example, it is apparent that the public transport network serves local people pretty well. However, in the context of the possibility that transport budgets may come under pressure in the future, this type of analysis indicates where services might be reduced with minimal impact on social exclusion. It can also be used to measure the relative impact of different options objectively with a view to selecting the most economic one (once the cost side of the equation is also taken into account).

Conclusions

Geodemographics in combination with other data sources can be used to enhance geospatial analysis thus providing valuable insights in our marketplace. Our examples illustrate how we have used the power of location to unlock spatial intelligence by fusing traditional analytical GIS with business intelligence and predictive analysis to help better inform decision making and bring substantial benefits to our clients – especially pertinent in our current economic climate.

Geodemographics are a highly valuable tool for helping with resource planning, which in the current climate seems particularly pertinent. Their power is even further enhanced when combined in innovative and intelligent ways with other geospatial analysis such as accessibility; and we have found that it is often these types of combinations from which insights are gained.

Tony Duckenfield is the Head of Research & Insight at leading transport consultants Steer Davies Gleave, Tony.Duckenfield@sdgworld.net ; Sheila Quan is the GIS Associate at Ramboll UK, UK division of the Ramboll Group - a leading design and structural engineering company, Sheila.Quan@ramboll.co.uk