TravelStyle: Berlin's First Geodemographic Profiling Tool

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1. Introduction

Berlin is under pressure to improve its economy, efficiency and effectiveness in public transport service delivery. Steer Davies Gleave and kcw were commissioned by Senatsverwaltung für Stadtentwicklung (SenStadt) Berlin as project coordinators in the preparation of their Nahverkehrsplan (NVP) 2006 – 2009. This document is similar to the Local Transport Plans produced by Local Authorities in England. It outlines a five-year integrated transport strategy, prepared in partnership with the community, seeking funding to help provide local transport projects. The plan sets out the resources predicted for delivery of the targets identified in the strategy.

In order to meet the aims of the NVP, primarily relating to social inclusion, we used our innovative geodemographic profiling tool – TravelStyle – unique in the transport sector. Steer Davies Gleave has long recognised the value of geodemographic profiling in that it was designed to differentiate people with different lifestyles and spending patterns. It also provides an alternative perspective on the general population since it incorporates different data sources (see **Figure 1**) and can be used at varying levels of geography. Our general approach is to take the existing geodemographic classification system which differentiates best between groups with differing travel behaviour on the dimensions of interest, then to add onto this relevant travel related data.

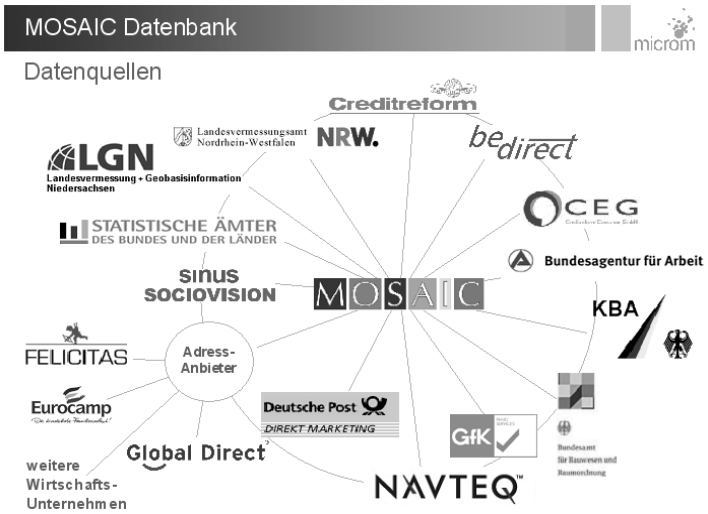

Figure 1: German MOSAIC Data Sources[1]

[1] Please refer to MOSAIC Data Source Glossary section at the end of this abstract for a description/English translation.

In Berlin we used MOSAIC as the base and added to this data on car ownership and some additional demographic data provided by SenStadt. In the UK we have also used MOSAIC, and ACORN and most recently have been looking at using the ONS's Output Area Classification (OAC) which is now freely available.

Evaluating schemes or service changes in terms of their social impacts poses considerable challenges when compared with evaluating accessibility or economic impacts because of the difficulty of measuring something which by its nature is hard to define in precise terms. We used TravelStyle to evaluate the impact of change to public transport services on social inclusion and on those that are particularly dependent on public transport. This enabled relative need to be assessed across Berlin, and for different service/timetable scenario options to be tested in terms of whether or not they provide a better or worse service to locations where the need is highest. At the same time, it can be used to help define options which addressed social needs more effectively.

2. Development of TravelStyle and the Transport Needs Index

TravelStyle is a way of classifying people and localities in terms of transport need. It is based on the microm/Experian MOSAIC geodemographic classification system for Germany. We then tailored it to reflect key transport-related and social inclusion dimensions. These variables were selected due to their importance within the NVP and also their influence on travel behaviour and public transport need.

The standard German MOSAIC system classifies the general population into 39 Types with only 25 of these having a significant representation in Berlin of at least 3,000 households. These 39 Types are then combined into 10 lifestyle Groups.

The descriptive information from microm was summarised on a number of key attributes by assigning a simple five-point ordinal scale: well below average, below average, average, above average, well above average. The focus was on attributes relating to the two dimensions of interest: wealth and age/life-stage. In practice, ratings were given for income, presence of people aged 65+ and presence of children (ratings were also given for car ownership, presence of students and presence of non-Germans, but these factors were not used in the initial allocation of MOSAIC Types to segments).

What we have done to create the Berlin TravelStyle is to combine these Types in a unique way based on a common spatial geography – in our case a network of hexcells i.e. interlocking grid of hexagons. This enabled us to compare street-level MOSAIC data with census data at housing block level with an appreciation of attribute differences between central and outer Berlin. Types with particular combinations of attributes (e.g. low income + high senior citizens) were grouped together in an initial "first cut" of the segmentation. Remaining Types were then allocated to their nearest segment, with income taking priority to avoid having segments that included too wide a range of incomes (this also reflected greater variation in terms of age / life-stage within the MOSAIC Types than in terms of income). Segments which ended up being too small (less than 5%) were scrapped and the constituent Types reallocated.

TravelStyle provides a way of linking lifestyle and demographic segmentation – useful during validation process - although there is no direct correspondence because lifestyle segmentation has more dimensions and is more "fuzzy" whilst demographic segmentation has fewer dimensions but is more precise.

Figure 2 illustrates the perceptual map and clearly demonstrates that there is greater diversity within the segments in terms of age/life-stage than in terms of income.

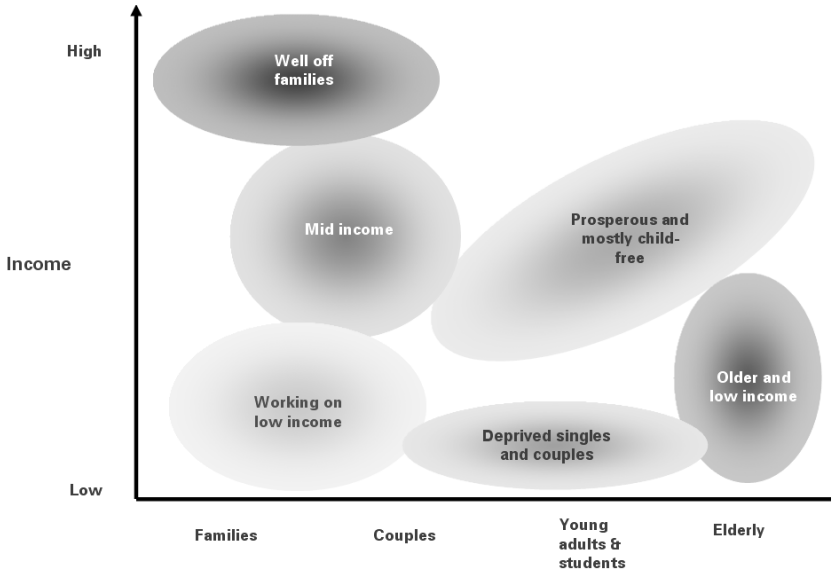

Figure 2: Perceptual Map for Berlin TravelStyle Segments

The aim of the transport needs index is to reflect the relative need for public transport for each TravelStyle segment. **Table 1** illustrates how these indices were derived. The weights used are to a degree a matter of judgement, informed by the aims of the NVP and by our knowledge of what drives the need for public transport services. Wealth, car ownership and presence of children are all important factors and therefore given a weight of 1. Senior citizens have been identified in the NVP as a key group, and therefore given twice the weight. This counter-balances the fact that car ownership and income are closely related and when combined also produce a double weight. In other words, someone who is a senior citizen has been given the same level of transport need as someone on a low income without a car. Students and non-Germans have both been allocated a weight of 0. It is considered that these factors do not generate an extra need for public transport over and above car ownership, wealth and presence of children.

Table 1. Transport Needs Indices for Each TravelStyle Segment

TravelStyle Segment	Average Weight	Wealth	Car Ownership	Senior Citizens	Children	Students	Non-Germans
Weight given to attribute		1	1	2	1	0	0
Older and Low Income	1.45	2	1	2	0.25	0.25	0.5
Working on Low Income	1.00	1.5	1.5	0.5	1	0.5	1.5
Mid Income	0.90	1	1	0.5	1.5	1	2
Prosperous and Mostly Child-free	0.95	0.5	0.25	1.5	1	0.25	0.25
Well-off Families	0.80	0.25	0.25	1	1.5	0.5	0.25
Deprived Singles and Couples	1.10	2	2	0.25	1	2	1

We investigated a number of alternative weighting systems but the one selected performed well in terms of passing a basic "sense test"; being relatively simple to understand and apply, and having an appropriate range of values and degree of difference between the segments.

Nevertheless, there are some limitations with MOSAIC (exaggerated by the unique history of Berlin) that we have looked to minimise by using other data sources to help calibrate our TravelStyle segments. These limitations are:

- In categorising the population into just six segments, a degree of simplification is inevitable, and
- There is an underlying assumption of homogeneity within a single housing block that in some cases can be an over-simplification (though this effect is reduced with the size of area being investigated).

3. TravelStyle Segment Descriptions

Table 2 shows the main neighbourhood characteristics exhibited by each of the TravelStyle segments.

	Description	***First Most Important MOSAIC Type***	***Second Most Important MOSAIC Type***
Older and low income	Mainly older people and pensioners, often living on their own and generally living on a low income.	Urban areas of ordinary ribbon development (61%)	Common single pensioners (29%)
Working on low income	Predominantly comprised of people on fairly low incomes and middle-aged, often without a car. Includes quite a high proportion of non-Germans.	Urban areas of ordinary ribbon development (83%)	Areas of social focus (13%)
Mid income	Includes quite a broad age range but all in the mid-income bracket. Includes some families with children and quite a high proportion of non-Germans.	Older social housing (45%)	Well-off seniors in suburbs (25%)
Prosperous and mostly child-free	Professionals and other groups on good incomes, generally without dependent (young) children living at home. Includes some well-off pensioners.	Attractive city centre buildings (36%)	Older families in the suburbs (18%)
Well-off families	Professionals, managers and self-employee people on high incomes, generally middle aged and married, often with children.	Solid older detached houses (35%)	Ordinary houses in the country (32%)
Deprived singles and couples	Younger people on low incomes and often single with some couples. Includes students and some non-Germans. Characterised by very low car ownership.	Blocks of flats of lower standard (69%)	Multi-cultural inner city areas (15%)

Table 2: Summary Profile for Each TravelStyle Segment

Figures 3 and 4 clearly illustrate that Berlin has a high proportion of disadvantaged residents with 73% being either deprived or on low income. The most dominant in this group needing public transport accessibility are the elderly with a significantly higher transport needs index of 1.45 (1.0 being average). Therefore, ensuring that their public transport needs are met and maintained is an important consideration in the next NPV.

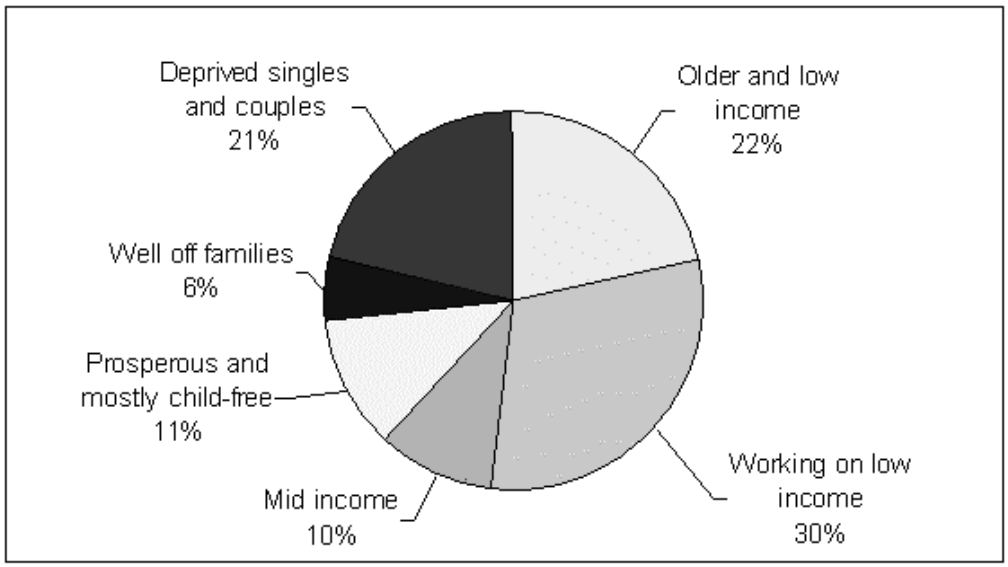

Figure 3: Constituents and Size of TravelStyle Segments

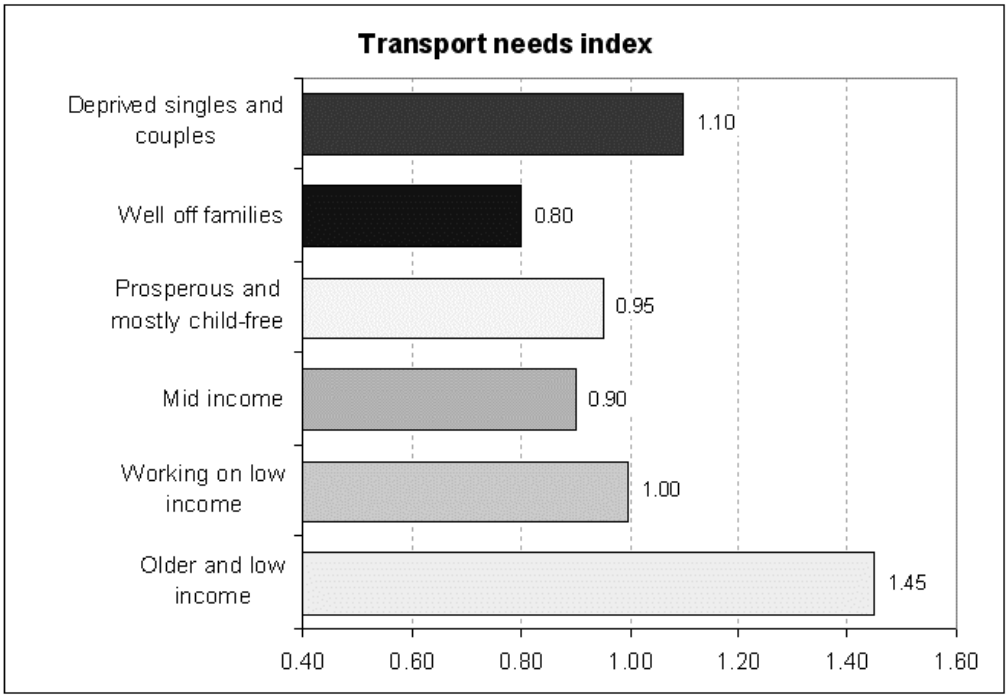

Figure 4: Transport Needs Index across TravelStyle Segments

Summary pages were derived for each TravelStyle segment, detailing brief description, how their characteristics based on selected attributes (income, car ownership, age (senior citizens) and presence of children) varied from the Berlin average and photographs showing typical housing types.

4. Application of TravelStyle

We have applied the Berlin TravelStyle for:

- Planning – help specify timetable/service options that aim to improve the level of service in places where there is greatest need (or reduce the level of service where there is less need) and
- Evaluation – assess the impact of timetable options in terms of whether they improve the level of service in places where there is greatest need.

In addition, the derived "transport need index" can also be used to provide an overall understanding of the nature of different parts of Berlin and this is the aim of the TravelStyle Profile maps.

We have developed and refined TravelStyle over a number of years: applications of the technique have included understanding and reducing 'car dependency' for Transport for London and forecasting demand for new rail services. We are currently developing a version of TravelStyle to forecast take-up in travel behaviour change programmes for a local authority in Yorkshire.

5. Conclusions

It is very clear that different groups of people behave and think in different ways and segmentation allows population differences to be built into the thinking, planning and implementation processes. At the same time, it is clear that the fundamentals of a public transport system which people want to use (including safety, reliability, frequency and affordability) are consistent across the segments, although what does vary is the need and desire to travel by public transport.

Our TravelStyle profiling tool was developed primarily to explore how social dimensions influence people's transport needs in a relatively objective and consistent manner. Its main strengths are:

- It is multidimensional – taking into consideration income, age, lifestage/family circumstances and car ownership and is therefore able to differentiate some major interactions between these factors, such as distinguishing between types of people who do not have a car through a lifestyle choice from those who cannot afford a car. It has also reduced the need to examine effects on a relatively large number of individual variables, and
- It can be used at a very disaggregate level of geography and therefore assess the impact of very specific changes, down to the level of individual routes, stops and stations.

Our TravelStyle maps have proved to be a great success and an innovative concept solution to help rationalise Germany's largest city's public transport system.

6. Acknowledgements

We would like to acknowledge our client Senatsverwaltung für Stadtentwicklung (SenStadt) Berlin and kcw who have supported us in this project and have given permission for this work to be publicised.

Biography

Tony Duckenfield (Associate) leads our Market Research Team, providing advice on research methods with a particular interest in consumer decision-making and what underlies data on attitudes and behaviour. He is also on the Steering Group of ONS's Output Area Classification (OAC) User Group, suggesting initiatives to develop geodemographic analysis and applications.

Sheila Quan (Senior Consultant) is a very knowledgeable and experienced spatial analyst with over 12 years' experience using GIS technology throughout UK, Europe and worldwide. She assisted Tony in the development of our TravelStyle profiling tool, extracting the most from individual data sets as well as capitalising on inter-relationships between data sets.

Nicole Rudolf (Principal Consultant) has helped Steer Davies Gleave to expand into the German transport market. She has a broad skills-base since she is both a transport consultant as well as a German lawyer. Her main strengths lie in project management and in the fields of legal/policy, economics, financial modelling and passenger transport.

MOSAIC Data Source Glossary

Data Source	**Description/ English Translation**
Be direct	Direct mailing company
Bundesagentur für Arbeit	Federal Employment Agency
Bundesamt für Bauwesen und Raumordnung	Federal Bureau for Building Industry and Area Planning
CEG Creditreform Consumer GmbH, Creditreform	Credit rating and debt collection agency
Deutsche Post	Mail communication, dialog marketing and efficient outsourcing and system solutions for the mail business. Equivalent to Royal Mail (UK).
Eurocamp	Camping vacation company
Felicitas Direktwerbung GmBH	Direct advertising company
GfK Panel Services	Market research and consultancy company
Global Direct	Market research and consultancy company
KBA (Kraftfahrt-Bundesamt**)**	Federal Bureau of Motor Vehicles and Drivers
Landesvermessung + Geobasisinformation Niedersachsen (LGN)	Office for Land Surveying Niedersachsen
Landesvermessungsamt Nordrhein-Westfalen	Office for Land Surveying North Rhine-Westphalia
NAVTEQ	Provider of comprehensive digital map information for automotive navigation systems, mobile navigation devices and internet-based mapping applications.
sinus sociovision	Market research and consultancy company
Statistische Amter des Bundes und der Lander	Federal Statistics Office and the individual Landers Statistics Office