Seminar: Accessibility

Understanding Accessibility: what does it really mean?

Session Number: 1, 10:30 - 12:30

An intermodal accessibility tool: explaining accessibility to stakeholders and decision-makers

M Bohnet, C Gertz, M Winkler, Hamburg University of Technology, DE; H Mühlhans, Integriertes Verkehrsmanagement Region Frankfurt Rhein-Main, GmbH, DE

Improving accessibility is an important objective not only of transport infrastructure schemes. Other policy fields are also facing the challenge to provide access to jobs and public services in urban, suburban and rural areas in the face of increasing congestion, oil prices and demographic changes with an aging population. However, accessibility is rarely clearly defined in policy documents in Germany and, if so, does not go beyond very simple measures like distance to motorway exit or travel time to town centre. As new spatial pattern like the Zwischenstadt (in-between city, Sieverts 1997) emerged during the last decades, planners need more sophisticated indicators to analyse and assess the interrelated shift of land use and transport system in these regions.
However, the complex indicators developed in the scientific literature (see Geurs / Ritsema van Eck 2001) like inverse balancing factors or utility based measures are difficult to communicate to stakeholders and decision makers at regional and local level. In addition, some municipalities, that are facing a fierce competition for residents and investors, have concerns that accessibility studies might weaken site attractiveness by revealing accessibility deficits of their community. For these reasons, a communicative and transdisciplinary approach is needed, which combines scientific and local knowledge.
This paper presents a project that develops a GIS-based tool to analyse and assess accessibility for different purposes and at different spatial resolutions in a polycentric German metropolitan region. It focuses on three points affecting the tools utilisability: user needs, data requirements and appropriate indicators.
First, the accessibility issues that face decision makers in regional and local institutions, will be highlighted and needs of (potential) users of an accessibility tool revealed.
Second, it will be demonstrated, how data from regional sources like the regional transportation model can be used for accessibility analysis and how it can be combined with local data at a higher spatial resolution of specific local purposes.
Third, indicators, that are adapted for the different purposes at regional and local level are discussed and ways to illustrate complex accessibility issues to decision makers presented.

References:

Geurs, K. T. / Ritsema van Eck, J. R. (2001): Accessibility measures: review and applications. Evaluation of accessibility impacts of land use transport scenarios, and related social and economic impacts. RIVM Report 408505 006. National Institute of Public Health and the Environment. Bilthoven

Sieverts, T. (1997): Zwischenstadt: zwischen Ort und Welt, Raum und Zeit, Stadt und Land. Braunschweig.

How far is too far? Exploring people's willingness to travel: time-travel ratio analysis of non-work activities in the Netherlands

O Yusak, Susilo Centre for Transport and Society, University of the West of England, UK; M Dijst, Department of Human Geography & Planning, Utrecht University, NL

It is widely believed that providing activity locations close to residential locations would reduce the travel time of residents. However, it has not been clear how close the location should be from the residents house. In this paper, using the Dutch National Travel Survey, a TTR (time travel ratio) index is used to measure the

acceptable travel time for individuals in relation with activity duration for various types of maintenance and leisure activities.

The basic idea of this TTR index is based on the theory that our daily activity-travel pattern is limited by our activity schedule (both in-home and out-home) and our availability of time. Whether an individual will decide to do travel and to engage in a certain activity is depended on the available travel time to reach an activity location and an acceptable time to carry out the activity. Although these constraints play significant role in shaping our daily activity and travel pattern, it has not received enough attention in the past.

The understanding of individuals TTR behaviour for each activity will helps planners to improve projections of spatial choices and the interplays of urban space, socio-demographics and travel behaviour. This will aid the planners to provide an efficient and effective infrastructure planning and management that account for the needs and the behaviours of the residents.

The aims of the paper are to explore the TTR for different type of non-work activities, to explore variations in TTR for different activity durations, and to analyze the influence individuals socio-demographic variables, built environment and travel parameters to the TTR values.

The preliminary results show that different activity has different TTR values. Moreover, the individual socio-demographic factors significantly influence whether he/she are willing to travel further to do a certain type of activity.

Identifying accessibility problems and appropriate solutions for socially disadvantaged groups

P Jones, Centre for Transport Studies, UCL, UK

Existing accessibility tools, such as Accession in the UK, focus mainly on the spatial dimension of disadvantage, by identifying groups that have to travel for excessive periods of time to reach a given service or facility. There is less understanding of the other kinds of constraint that poorer people without access to a car may face, including fear of travel, costs and timing constraints.

The first part of the paper describes the use of qualitative methods and the development of various stimulus materials, used to encourage local residents to identify and articulate the kinds of accessibility problems they faced in their everyday lives. Among other things, this identified problems arising from gaps in responsibilities between agencies with people falling through the cracks. Many of the key results of this exercise were subsequently embodied in a spreadsheet, where typical timing and other constraints experienced by different groups have been codified.

As a further development of this work, a second tool was developed to help agencies identify the potential wider knock-on effects, on the areas of responsibility of other agencies and ultimately the wider public, of decisions that they might take that serve their own interests. For example, the amalgamation of two schools might be intended to increase the quality of education, but might lead to less sustainable travel patterns, reductions in physical exercise and increases in anti-social behaviour.

The second part of the paper describes a series of methods that were developed to encourage the generation of more open, innovative and joined-up solutions to the various problems identified in the first part of the paper. These were applied both among groups of residents and groups of professionals representing agencies with an involvement in service provision. These include role playing, gap analysis and brainstorming. From this work two spreadsheet tools have been developed, one of which suggests known solutions to particular kinds of problems, while the other seeks to stimulate outside the box thinking by presenting people with random sets of pictures that are designed to encourage new thought patterns.

This work was carried out as part of the UK Engineering and Physical Sciences sponsored DISTILLATE project, with additional support from Yorkshire Forward, SYPTE and Barnsley MBC.

The impact of commuting duration on family lifestyles: the London and Paris regions

P Jones, Centre for Transport Studies, UCL, UK; J-P Orfeuil, IUP, Universite de Paris XII, FR

The study sets out to determine what effects longer distance commuting distances and times have on the life styles of regular commuters in the London and Paris regions, and on other members of their households. This is achieved by comparing the travel, activities and time use patterns of people making short (less than 30 minutes) and long (over 60 minute) one-way commutes.

A variety of data sources are used, including a one-day travel diary in the Paris region (including additional weekend data for a sub-sample of the respondents), the relevant sub-sample of the UK National Travel Survey (using both one day and seven day data) and the National Time Use Survey in the UK, together with 15-20 in-depth household interviews in each city region. Efforts have been made to make the data sets as compatible as possible, in terms of spatial coverage, household screening criteria and behavioural definitions.

The quantitative analysis compares trip rates, non-home stop rates and time budget allocations for the different commuters and their households, both during the week and at weekends. Differences are examined by a range of socio-economic characteristics (e.g. income, occupation, gender).

At the time of writing, the main analysis is underway. Very preliminary results show a higher propensity for the French sample to make longer commutes than their English counterparts, but for the implications of long commuting (in terms of other travel and activity patterns) to be broadly comparable in the two countries, with some specific differences.

The study is being funded by the FIA Foundation.

Information for Transport Users

Session Number: 2, 13:30 - 15:30

Common information platform for traffic data: merging data from different sources

T Giæver, R Wahl, T Moen, SINTEF, NO

Technological development opens up for increased communication between vehicles in motion and between vehicles and infrastructure. The CALM standard (Continuous Air Interface for Long and Medium range) will enable such communication. Thus, CALM could also contribute to increased traffic safety and efficiency by enabling increased dynamic traffic information to the drivers and to the driving assistance systems. This opens up for improvement of existing products and for developing new products. Real time updating of input data in products like navigation tools and ISA products (Intelligent Speed Adaptation) is a challenging task, which has not been solved yet. CALM will represent a significant technological shift toward solving this task, and utilizing results from the CVIS project is essential in obtaining this.

Developing and utilizing wireless communication solutions are essential in order to refine existing products and develop new ones. For the Norwegian situation, an additional essential factor is to develop a dynamic traffic information database, which is available for product and service suppliers. Product examples are: Driver training products, E-learning products, CALM products, Location based services, Intelligent Speed Adaptation products and Infotainment products.

A common information platform which integrates traffic data with information relevant for traffic safety will be developed in the Norwegian research project WiseCar. This platform should be available for both private and public partners in order to support product and service development and refinement. Several national databases will be of importance; databases which cover static information about the infrastructure, dynamic information about incidents, digital maps with point of interests, etc. Two main challenges will be to provide access to the information platform for SMEs and including data from numerous small information suppliers.

The requirement specification of the information system will be carried out during spring 2008. The first step is to define which data will be requested from the product and service providers, and which corresponding data sources could be utilized for establishing a database covering these data. It will be considered whether for instance navigation tools themselves can provide input data for the database.

The paper will present results from this research task, covering Data content, Data providers, Merging data sources, Data accessibility, Dynamic versus static data and Data quality

The WiseCar project will be carried out by a Norwegian consortium consisting of partners from industry, research institutes and public sector.

Improved access to cities through travel information a full colour information panel

M Dicke-Ogenia, Goudappel Coffeng, NL; K A Brookhuis, Delft University of Technology and University of Groningen, NL

During rush hour periods, and particularly during special events such as concerts, soccer matches, or annual fairs, there is always a considerable risk of congestion. As a result of peak congestion, accessibility of towns is decreased. Peaks in congestion can be reduced through an optimal distribution of cars over the available routes. To facilitate such optimal distributions, travellers need to be informed about travel conditions and alternative travel options. However, even if an alternative route or travel mode may be beneficial for travellers in terms of travel time or travel costs, travellers may ignore the information or may be reluctant to change their behaviour. Therefore, the provision of travel information should aim at encouraging the traveller to change route or mode.

The municipality of The Hague (the Netherlands) installed a Full Colour Information Panel (FCIP) above the A12, where this motorway enters The Hague. An FCIP can be seen as a next-generation of Graphical Route Information Panel (GRIP). Just like the GRIP, an FCIP can display the travel network's structure graphically including dynamic travel time and information on traffic congestion (colour coded according to severity). In addition, by using an FCIP, the information (including the presentation of the road network) can be adapted at any time.

We examined how information should be presented by means of a Full Colour Information Panel (FCIP) in order to be more persuasive and to improve accessibility of the city. Therefore, we developed a design for persuasive travel information that helps change route or travel mode. This design was based on two assumptions. First, each step during information-processing should be completed successfully in order to result in a change of behaviour. Second, the probability that a traveller completes an information-processing step successfully may be increased by taking into account cognitive ergonomic guidelines and social psychological principles (e.g. habit, uncertainty, attitudes) on decision making. For example, uncertainty concerning the destination of an alternative route may be reduced by presenting graphically on an FCIP that both routes lead to the same destination.

A series of experiments was conducted to develop and test a successful design for an FCIP. We started with cognitive ergonomic experiments in the laboratory to test the form of a road map and methods of displaying congestion on the road map by means of colour. Furthermore, we tested how the design could take into account social psychological principles. In each subsequent experiment, participants were placed in a setting reflecting a situation closer to reality. For example, various FCIP designs were incorporated into a movie shot from a moving vehicle. As a result, participants watching the movie had the same view as car drivers on a motorway, seeing the FCIP as they would a normal traffic sign. In a subsequent experiment, an improved version of an FCIP was shown while participants were driving in a driving simulator. A final design for an FCIP was tested twice in a real setting throughout a four-day fireworks festival that was held in the suburb of Scheveningen.

Our results show that the FCIP succeeded in attracting the attention of drivers, who found it easy to read and understand. The type and quantity of information provided did not lead to any confusion or misunderstanding. In that sense, this study has resulted in a suitable standard for this type of information provision.
Concerning the social psychological principles we integrated in our design, we found that our design may decrease the negative effects of uncertainty. However, habit was difficult to break.
The FCIP had a modest effect on route choice. It was shown that around 10% of the travellers changed their route. Although this seems a relatively small number, the effects on traffic flow may be relatively large.

Travellers who changed their route were mostly those who left home without a travel plan. Subsequently, travellers who have planned their trip towards an event rarely change their plan. Furthermore, travellers who made use of the Park and Ride (P+R) facility indicated that they were not influenced by the information on the FCIP but had chosen this option before they left home. The FCIP was helpful for them as it provided information concerning the position of the P+R facility.

The research reported in this abstract was conducted within the AMICI-project, part of the Dutch program Verkeer en Vervoer (Traffic and Transport) funded by Connekt/NWO.

New strategy options for bus priority at traffic signals in London

N B Hounsell, B P Shrestha, TRG, University of Southampton, UK; S Palmer, T Bowen, C D'Souza, Bus Priority Unit, Transport for London, UK

Providing fast, frequent and reliable bus services is considered as the way forward for sustainable transport operations in many cities. As a part of achieving this goal, many cities and bus operators are implementing Automatic Vehicle Location (AVL) system to support comprehensive public transport management, real time passenger information and bus priority at traffic signals. In London, Transport for London (TfL) has recently procured a GPS (Global Positioning System) based AVL system known as iBUS for this purpose. For bus priority at traffic signals, iBUS uses detector locations configured in the on-bus computer (known as virtual detectors) to detect buses. In addition to the flexibility in detecting buses, iBUS also has the facility to monitor buses continuously from the control centre to assess their locations. This provides a real opportunity for Tfl to implement more targeted priority to buses. In this context, current research being carried out by the Transportation Research Group (TRG) for TfL is exploring different priority strategies.

Differential priority is a common term used to describe the strategy where different levels of priority are given to buses at traffic signals according to their need. Differential priority can allow a higher level of priority to be given to some buses (e.g. those which are late) and a lower level or no priority to others. The objective of this form of differential priority is generally to produce improved punctuality for low frequency time-tabled services, or improved regularity for higher frequency, headway-based services. Although this type of strategy can help make buses more punctual and reduce passenger waiting time, it gives lower journey time savings compared to the strategy giving priority to all buses. Clearly passengers waiting for a bus gain from improved punctuality, whilst those on board benefit from reduced journey times.

Implementation of a priority strategy depends on the policy objective of the respective authority. Unless the policy is only concentrated on improving passenger waiting time, a strategy giving a more balanced benefit in terms of passenger waiting time as well as the journey time savings could be more appropriate. This could be assessed in terms of economic value of the benefits from a strategy. The outcome of such strategy may be influenced by the route characteristics such as density of bus stops and traffic signals along the route. For example, if there are many signals and very few bus stops, then the balance could be towards journey time savings. Another important issue could be the bus location on its route. For example, punctuality/reliability of an individual route may not be a problem in the location where many services converge (e.g. near city centre). There may also be a possibility of combining strategies of giving priority to all buses or priority to late buses only. Furthermore, a priority strategy taking account also of the headway of the bus behind could be beneficial. This paper will report on the progress and results of research into these options being undertaken by TRG for TfL, and include issues of implementation.

Will Improved Travel Information Change Travel Behaviour?

Session Number: 3, 16:00 - 18:00

Assessing the demand for travel information: do we really want to know?

G Lyons, E Avineri, S Farag, Centre for Transport & Society, University of the West of England, UK

Transport policy and practice in many European countries has placed increasing importance on influencing peoples travel decisions in terms, especially, of which means of travel they use and which routes they take. Accordingly, there has been a continued growth in the provision of travel information services. For the last decade in the UK, for example, the Government has pursued the development of a national public transport information service (Traveline) and subsequently the development of a multimodal integrated door-to-door national web-based journey planner (Transport Direct).

Such initiatives have been driven by a goal of empowering people to make more fully informed travel choices with greater awareness of the options available to them. As the travel information marketplace has evolved and matured a key consideration has become the extent to which and in what circumstances people are in fact making use of such services. This paper examines this issue drawing upon two key sources. The first is a recently completed strategic review of travel information for the UK Department for Transport which has examined the latest international literature between 2001 and 2007. The second is an ongoing study in the UK which is examining, from a social-psychological perspective, the barriers to information use.

The paper explores: levels of awareness of travel information services; empirical evidence on levels of information use; journey contexts and person types associated with greater demand for information services; and preferences for different channels of information provision. The paper also introduces insights from decision-theory and the Extended Model of Goal Directed Behaviour drawn from social psychology to further highlight factors which influence peoples propensity to seek travel information. It is revealed that demand for information is lower than might be assumed from the perspective of all individuals being taken to be utility maximisers in the travel choice domain. In practice it is becoming increasingly clear that many people for much of the time do not seek new information to support their travel decisions. Nevertheless, it is argued that the aggregate level of demand that does exist is substantial and that meeting that demand is of value.

Creating social epidemics and curing car addiction - a new model for achieving travel behaviour change

B Pinkett, Peter Brett Associates, UK

My paper will consider current travel behaviour change methodologies from the perspective of achieving mass behavioural change, rather than by aggregating individual and unconnected actions. It is my proposition that by focussing on how to influence an individuals propensity to change the potentially greater impact of social networks and community relationships are being significantly undervalued.

As behavioural sciences and market research increasingly return to the study of group dynamics and community behaviour it is possible that the emphasis on the individual rational decision maker in personalised travel planning (in its current form) takes travel behaviour change in the opposite direction. This may become a methodological dead end, because it can not be effectively scaled to achieve sufficient volume change.

It is my view that personalised travel planning in the UK has failed to develop further than a number of trial projects because the results and success are predicated on achieving success with small groups of individuals switching modes (i.e. by identifying those with a propensity to change anyway), which then can not be replicated. This is not a model for influencing mass behaviour.

We are testing an approach which places much greater emphasis on communities of common interest, social networks and peer to peer relationships. The existing personalised travel planning models are invariably based on a traditional media and sales push approach, where information is passed down to passive audiences. No matter how personalised the information the opportunity to trigger change can only be limited (in the terms of the Transtheoretical Model of Change by Prochaska and DiClemente (1983) the individual would move from pre contemplation to contemplation, but not necessarily onto action).

The alternative pull model is based on the premise that individuals are much more likely to be influenced by personal intervention from friends, family and colleagues (people just like us) and where they actively seek information or advice. For example market research by Mediaedge/cia in 2004 suggests 76% of UK purchasing decisions are based on personal recommendation, while only 15% are influenced by advertising and information. Yet PTP projects are still driven by traditional advertising and marketing models, usually

delivered by external change agents.

Central to our approach is securing a critical mass in participation for example in Moonee Valley, Melbourne our travel behaviour change project achieved 40% participation from a 10,000 household group. This was delivered through embedding the programme in the community, with local influencers and networkers recruited to directly engage with people and interpreting the message to suit the environment. This approach echoes the Tipping Point theory as popularised by Malcolm Gladwell in 2000, who strongly emphasises the role of context in behaviour change.

In Melbourne we sought to create a tipping point for a social epidemic, encouraging a community desire for change and at the same time seeking a cure to the individual addiction to the private car. By using the behavioural change methodologies applied in health campaigns (smoking, drug addiction, HIV) we are potentially redefining the role of travel planners.

At the heart of our emerging approach are many of the tools of traditional individualised marketing methods information, incentives, etc. but they are used within the community rather than being external and alien interventions. The marketing world is recognising the importance of word of mouth (WOM) and particularly the difference between endogenous and exogenous WOM our approach seeks to generate endogenous (within the community) impacts rather than exogenous (externally generated) WOM, which is seen as disingenuous and ultimately less effective in the long term.

The climate change debate is indicative of the problems faced, with the equivalent of environmental fatigue developing for individuals faced with contradictory and strident messages from experts and the media. Increasingly personalised travel planning may be seen as hectoring and part of the nanny state which suggests a sizeable part of the community will be lost to the programme even before it starts.

Mark Earls, the marketing and communications expert, wrote in 2007:

We have to admit that we cannot make anyone or any group do anything. We cannot communicate with them in isolation or hope to persuade them (as the old advertising models would have it); they influence each other. Only by getting individuals and groups to choose to do something for their own reasons often largely social will change in behaviour come about.

In summary this paper will review theories of mass behaviour change in marketing and psychology, apply them to travel and transport, with examples provided from projects in Australia (2005) and UK (2008).

Personal journey plans - raising the benchmark in travel information and provision

D Halden, G Evans, DHC, UK

Todays consumers do not expect to have to search for information about goods and services. If information is not readily available about journey options then travellers will use the modes and services with which they are familiar. Information provision and modal dependence are therefore closely related.

Transport information has traditionally been provided in a form which suits the providers: a rail timetable, a bus timetable or a road map. However, most journeys are multi-modal (walk/car, walk/bus/rail, cycle/rail, etc.) and travellers with different preferences need information to help them navigate these multi-modal systems balancing cost, time, comfort and reliability.

This paper describes how the new generation of flexible internet, desktop and handheld journey planners are being used by employers, agencies and individuals to plan door to door journeys. Currently these new systems are only used regularly by 6% of the population in Scotland. The paper summarises the delivery of four separate projects in different parts of the country to mainstream the availability of door to door personal journey plans.

These projects cover personal journey planning to hospitals in Glasgow, personalised travel solutions for a retail site in Glasgow, inception packs for students across Scotland, and the use of local community networks to provide personalised support and advice in southern Scotland.

The personalised information from journey plans is also helping to provide feedback loops for accessibility and transport planning. Although network coverage may meet the needs of most people, the personalised approach identifies some types of trip, such as health journeys by patients, where there are no suitable shared or public transport options. For these high care or special needs trips, appropriate transport can then be provided to close the gaps in networks and complement other transport provision (e.g. door to door high care needs provision). The paper describes how micro and macro feedback loops are being developed from personalised journey planning to transport network planning to help manage integrated delivery of high care needs transport in central and southern Scotland.
