A survey-based analysis of traffic behaviour of short vacationers and same-day visitors

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Abstract

Traffic performance of leisure traffic has increased over the last years. Leisure traffic can be distinguished into common and uncommon leisure traffic. Common leisure traffic includes regular and routinised mobility whereas uncommon leisure traffic, for example, is represented by day trips or (short-time) vacations. The performance of uncommon leisure traffic is harmful to the environment due to its high share of motorised private transport (MPT) in the transport mode for the trip to the vacation destination as well as for the mobility during the vacation, is harmful to the environment. Thus, the inspection of uncommon leisure traffic is gaining importance to achieve environmental and climate change objectives. Therefore, traffic concepts targeting visitors become more important.

The current empirical database for holiday traffic required for optimal adopted concepts has limitations. This article relates to uncommon leisure traffic. Essential characteristics of traffic behaviour of visitors, such as choice of transport mode for the trip to the vacation destination and the mobility during vacation, preferences for innovative tariffs and causes regarding choice of transport mode, are presented based on a survey conducted in 2013.

Keywords: Uncommon leisure traffic; traffic behaviour; sustainable mobility; traffic concepts for vacation destination
1. Term: uncommon leisure traffic

Leisure time can be negatively defined as the time that does not include time for work, study or regeneration (sleep, eat, disease). What remains is the spare time of a person that can be further divided into bound and unbound leisure time. The unbound leisure time is not used for shopping, trips to work or household chores (Freyer 2011).

According to the German Institute for Economic Research (DIW), leisure traffic comprises all journeys or routes for passenger traffic which are not allocated to commuter traffic, school traffic, business traffic, shopping traffic or traffic due to escort (DIW 2011). Leisure traffic includes routes without a direct target like short leisure rides. Leisure traffic can be just a short ride or vacations of up to several weeks.

With leisure traffic, a distinction can be made into common and uncommon leisure traffic (Jain 2006). Common leisure traffic is characterised by behavioural routines, which means that transport mode and route are often chosen habitually without reflection. Common leisure traffic includes, for instance, frequent sports activities or cultural activities as well as frequent private visits to family or friends. Uncommon leisure traffic, by contrast, includes sporadic private visits or leisure events as part of short vacations or same-day visits. It should be noted that this definition is not distinct. Even frequent tours at weekends with different destinations might reveal habitualised behaviour. Tourism is usually part of uncommon leisure traffic (Freyer 2011). This paper concentrates on uncommon leisure traffic with a focus on short vacations and same-day visits.

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<th>Nomenclature</th>
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<td>MPT</td>
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<tr>
<td>NMPT</td>
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<tr>
<td>PT</td>
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<td>pkm</td>
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2. Importance of leisure traffic for an environment friendly traffic management

In essence, the environmental compatibility of uncommon leisure traffic depends on:

- modal split,
- specific traffic volume of vehicle traffic, flight performance in the aviation sector and
- automotive technology and drive system of the vehicle and aircraft.

According to ifmo (2014), uncommon leisure traffic accounts for about one third of the traffic volume in Germany. In view of the long travel distances, the car and the airplane are the preferred transport mode for sv and pdat.

For their (main) vacations, the German population uses the airplane for more than 70% of the transport performance (arrival and departure). On the other hand, private cars are used for approximately 60% of transport performance for short vacations and day trips. Cars and airplanes have a higher specific energy consumption compared to busses and trains and cause more air pollution and CO2 emissions. For an environment friendly traffic management, a shift in transport performance to environmental alliance is necessary.

Figure 1 illustrates the current transport performance as well as its future development in different segments of long-distance mobility. Long-distance mobility covers trips with a length of at least 100 km. Transport performance in uncommon leisure traffic (vacations, short vacations, other private overnight trips, private day trips) has grown in the period from 2000 to 2010 – private day trips even disproportionally. In the future, a further growth of transport performance is expected.
The increase in traffic performance is partly due to the increasing proportion of regularly travelling persons among the group of all travellers, while the proportion of rarely travelling persons declines. Thus, the average number of trips per person increases (Figure 2). Moreover, Larsen (2008) and LaMondia and Bhat (2010a) indicate that long-distance leisure trips have become commonplace for many people over the past decade. Thus, households increasingly consider tourism travel as an extension of people’s daily activities making them part of their everyday life. In addition, studies have shown that the average duration per trip decreases. A trend towards city trips and short vacations can be determined in Germany. City trips and short vacations frequently occur inland. The transport mode is primarily based on private cars (FUR 2014b). The significance of the car as transport mode is not limited to Germany but is also found in studies from Great Britain, Scotland or the USA (Thompson & Ferguson 2006, Guiver, Lumsdon & Weston 2008, Buehler 2010). Other studies do support the fact that the number of short vacation close to home is increasing due to less expenditure, less pre-planning and particularly less time investment (LaMondia, Snell & Bhat 2009, LaMondia & Bhat 2010b).

Especially agglomeration areas experience difficulties in complying with the stipulated limits for air polluting emissions (annual average). The report for the resolution of the European Commission (2013) identifies traffic as the main cause of pollution in several German agglomeration areas leading to high concentrations of NO2. Opaschowski indicated in 1999 that leisure and holiday traffic is responsible for about half of the air pollution produced by passenger cars (Opaschowski 1999). Due to their importance, visitor attractions generate a huge volume of traffic, and thus, cause a negative impact on the environment.

It has been shown that an analysis of negative environmental effects of the whole traffic sector due to uncommon leisure traffic is gaining importance to achieve environmental and climate change objectives. For that matter, visitors realise their responsibility as consumers and take a closer look at aspects of sustainability and climate protection before and during their trip. Furthermore, from their point of view the nation has to create a sustainable offer that meets the needs of visitors for sustainable vacations. According to the results of an FUR study, visitors are willing to travel more environment friendly in their vacations (FUR 2014b, WWF 2009). There is a huge potential for protecting the cultural and natural heritage as well as increasing the quality of stay and leisure value by influencing uncommon leisure traffic in terms of environment friendliness.
3. Traffic behaviour in uncommon leisure traffic

In order to develop measures regarding the environmental compatibility of uncommon leisure traffic, knowledge of the existing traffic behaviour of visitors as well as the determinants and backgrounds of their behaviour is essential. However, as Haberl et al (2012) state, leisure trips in general are heterogeneous and show a high variability, which makes leisure traffic difficult to handle. Tourism travel in particular has a high complexity, since individuals tend to combine activities to a greater extent (LaMondia and Bhat 2010b). Furthermore, visitor attractions undertake little activity in monitoring the traffic behaviour of their visitors since it is considered peripheral to their core activity of maintaining or increasing the number of customers. At the same time, only those site-based activities for changing the traffic behaviour can be concerned, which do not interfere with their core activity (Guiver, Lumsdon, Weston 2008).

Therefore, the Chair of Transportation Planning and Traffic Systems of the University of Kassel carried out several visitor surveys in Kassel as part of the FREE research project. By interviewing a total of 797 randomly selected visitors at their place of activity (Bergpark Wilhelmshöhe), various kinds of data were gathered, including mode of transport for the trip to the vacation destination, mobility during vacation, everyday mobility, attitude towards electric mobility and socio-demographic data of visitors. The survey provides a cross section of visitors.

The objective of the FREE research project is to make sustainable mobility services available from a single provider. With the additional option of using electric vehicles and pedelecs as a means of transport, overnight visitors can arrive in Northern Hesse without their own car and still remain flexible. Under these conditions, public transport can form the backbone of mobility. To simplify the use of the new services, a provider-wide information and booking system will be established, integrated ticket solutions will be developed and the charging infrastructure expanded. The german federal ministry of transport and digital infrastructure funds the project. NOW GmbH Nationale Organisation Wasserstoff- und Brennstoffzellentechnologie is responsible for coordinating the programme.

The choice in favour of or against a destination is based on available leisure activities. The city of Kassel is a popular destination for short vacationers and same-day visitors due to its wide range of cultural activities. Especially Bergpark Wilhelmshöhe (World Heritage Site) as the most important and famous destination attracts many visitors. The visitors surveyed can be classified based on their duration of stay in overnight guests (visitors who stay overnight) and same-day visitors (visitors who do not stay overnight). Same-day visitors are, in terms of their permanent
residence, further distinguished into residence-trippers and same-day visitors whose permanent residence is outside the city of Kassel.

As with every survey, survey design and interview situation have to be taken into consideration when interpreting the data. Visiting the water games in Bergpark Wilhelmshöhe (Kassel, Germany) is a time-consuming activity.

It is therefore often the only activity of same-day visitors since they have to arrive and depart as well. On the other hand, there are overnight visitors who do not arrive and depart on the day of their visit to the water features. Hence they have more time for further activities on the key date. As expected, overnight visitors (3.16 trips per day) conduct more trips per day than same-day visitors (2.85 trips per day). Furthermore, only ways by foot in Bergpark Wilhelmshöhe that lead to an activity in addition to that of visiting the water feature (e.g. museum, gastronomy) were surveyed.

A typical visitor to Kassel can be described as follows: age of over 40 years, a high level of education and a high income, mostly travelling accompanied by a partner. Thus, adult couples and seniors can be identified as primary target groups in Kassel. They are characterised by a high purchasing power and high demands for service and quality of offers.

Representative surveys have already characterised different subgroups of (short) vacationers. Examples are the joint INVENT project (Öko-Institut e.V. 2005), funded by the German federal ministry of education and research as well as the manual of target groups prepared by the federal state of North Rhine-Westphalia (Tourismus NRW e.V. 2009). The target groups mentioned in these reports are used by various other cities and regions and were slightly adapted (Thüringer Tourismus GmbH 2011, Sauerland Tourismus e.V. 2013). (Short) Vacationers are summarised by demographic and socioeconomic attributes, preferences, likings and behaviour. The above mentioned target groups can also be applied to visitors of Kassel. Depending on their age and travel companions, the interviewees were assigned to the target groups: “Young singles and couples”, “Families”, “Adult couples”, “Seniors” and “Adult single travelers”.

About 66% of all visitors use MPT for their trip to Kassel and their local mobility. Only about one in five uses public transport to get to Kassel. Figure 3 and Figure 4 show the modal split of overnight visitors and same-day visitors for their trip to Kassel and the local mobility. Since residence trippers do not belong to the target group of the investigation they are not considered.

Figure 3 reveals that 79% of the overnight visitors use MPT as the mode of transport for their trip to Kassel, whereas only every fifth overnight visitor uses PT. Overnight visitors arriving by MPT also show an MPT-oriented traffic behaviour for their local trips. On the other hand, overnight visitors arriving by PT mainly use PT for their trips during vacation.

Further analysing the data, the Chi-square test of independence was used to assess the probability of association or independence of facts. The Chi-square test of independence is a nonparametric statistical analysing method, which determines the relation of two attributes (Zibran 2012). Since the data do not meet the requirements of an analysis of variance – homoscedasticity in particular – the analysis is based on the Chi-square test of independence. The test shows whether attributes are stochastically independent or not. The test confirms with high significance that the choice of transport mode for the trip to the vacation destination affects the choice of transport mode for the trips during vacation. Overnight visitors who choose PT as transport mode for their trip to Kassel have a five times higher probability of using PT in Kassel (> 50% of ways in Kassel) in comparison to overnight visitors choosing MPT.

Trends are similar for same-day visitors (Figure 4). 85% of same-day visitors arrive at their vacation destination by MPT and mainly use MPT for their local mobility. In contrast, 14% arrive by PT and primarily use PT at their place of destination as well.
Moreover, the analysis of the whole group of visitors reveals highly significant correlations between everyday mobility and choice of transport mode for the trip to the vacation destination. Figure 5 demonstrates that the higher frequency of using public transportation, the higher the probability of choosing public transport as transport mode for vacations. Regular and occasional users of PT are seven times more likely to use the bus or train than rare and non-users of PT.
Further research aims at the determinants of the choice of transport mode. The causes for the choice of transport mode for the trip to Kassel were surveyed by an open question and the option of multiple answers (Table 1). Since open questions induce a wide range of answers, the answers had to be categorised afterwards. Table 1 shows the percentage share of the respective category in relation to all answers given. Categories with very few entries (< 10% of the specific target group) are not mentioned in this table. Flexibility describes the possibility for spontaneous activities, independence or unrestricted mobility by the visitors. Transport offer, on the other hand, describes mainly benefits of travel time as well as accessibility, and the quality of public transport connections (e.g. switchover).

Table 1. Determinants of choice of transport mode of overnight and samy-day visitors differentiated by transport mode for the trip to Kassel; Source: Bieland 2015 (data basis: visitor survey Bergpark Wilhelmshöhe 2013).

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<tr>
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<th>Overnight visitors</th>
<th>Same-day visitors</th>
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<tr>
<td></td>
<td>MPT (n = 124)</td>
<td>PT (n = 33)</td>
</tr>
<tr>
<td></td>
<td>MPT (n = 336)</td>
<td>PT (n = 58)</td>
</tr>
<tr>
<td>Convenience</td>
<td>31%</td>
<td>24%</td>
</tr>
<tr>
<td>Transit</td>
<td>9%</td>
<td>0%</td>
</tr>
<tr>
<td>Flexibility</td>
<td>23%</td>
<td>0%</td>
</tr>
<tr>
<td>Costs</td>
<td>14%</td>
<td>33%</td>
</tr>
<tr>
<td>Transport offer (e.g. travel time)</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>Need to transport luggage</td>
<td>13%</td>
<td>0%</td>
</tr>
<tr>
<td>Travelling in company</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>Attached to a mode of transportation</td>
<td>2%</td>
<td>21%</td>
</tr>
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It is remarkable that convenience is stated by interviewees getting to Kassel by MPT as well as by PT. Transport offer is stated regardless of the choice of transport mode. While visitors arriving by MPT name flexibility, the need to transport certain luggage and transit as decision regarding the transport mode, PT is primarily chosen because of costs.

In total, same-day visitors use MPT more often (Figure 3 and Figure 4). Costs are stated less often in comparison to overnight visitors. Therefore, the transport offer gains importance. Since same-day visitors arrive, depart and do their activities in just one day, depending on the distance travelled, they primarily need these attributes (flexibility,
(temporal) short ways) to save time. The PT offer is often not sufficient to cover this demand, especially where and when there is a generally a low demand for public transport.

A supplementary survey (n = 121) was conducted at the tourist office of Kassel (city center). In addition to the features mentioned above, the tariff preferences of the interviewees were surveyed. The study implies that the interviewees do not just look for a place to stay during their vacation, but prefer a comprehensive offer, composed of accommodation, transport service and leisure activities (Figure 6). Visitors are willing to pay larger amounts of money for these additional services, for example the use of local public transport on-site. Merely 11% of the visitors would choose a simple and cheap hotel accommodation. The majority of respondents, however, prefer higher-priced all-inclusive offers, such as the KONUS Guest Card (Hochschwarzwald Tourismus GmbH 2015). Accordingly, 61% would most likely opt for a hotel offering an all-inclusive card without electromobile transport offers. Yet, another 12% of the respondents favour the addition of electric vehicles (e-car sharing and pedelec) to the all-inclusive offer.

The advance of electric mobility seems to be well on its way. Even though the general public is not familiar with electric vehicles, there is a fundamental interest in using electric traffic offers during vacation. As a result, appropriate models have been developed to combine the basic hotel accommodation with traffic and leisure offers. Ideally, these models combine the use of PT for arrival and departure since this offers the greatest potential to influence the choice of transport mode for the trip to the vacation destination. Such an offer is already available in Garmisch-Partenkirchen (Germany) (Garmisch-Partenkirchen Tourismus 2014).

![Tariff preferences of visitors](image)

Fig. 6. Tariff preferences of visitors; Source: Bieland 2015 (data basis: visitor survey Touristeninformation Kassel 2013, n = 120).

Integrated services, including hotel accommodation and the use of traffic and leisure offers, have become popular among customers. Models that offer all services at a flat rate are preferred. Similar to the choice of transport mode for the trip to the vacation destination, visitors put great emphasis on a simple and convenient access to local leisure and traffic offers.

4. Conclusions regarding traffic offers of holiday regions

The investigations have shown highly significant correlations between traffic behaviour in everyday life and the choice of transport mode for the trip to Kassel. Moreover, the transport mode chosen for the trip to Kassel largely determines the choice of local transport. These findings are not limited to the city of Kassel nor to Germany. As seen above, other studies demonstrate the significance of the private car as transport mode for the trip to and trips within the vacation destination, too. The use of private cars, combined with an increasing number of travellers and vacations per person can lead to increased emissions and air pollution as well as destruction of natural environment due to infrastructure development in any city or region with tourism. Therefore uncommon leisure traffic may influence
living conditions negatively. There are different (theoretical) chances in order to remedy these negative impacts on the environment, for example modal shift in favour of environmental friendly transport modes or reducing the traffic volume of private cars.

As the findings suggest, there are two options for an environment friendly traffic management of uncommon leisure: Influencing everyday mobility or influencing the transport mode for the trip to the vacation destination. Vacation destinations have – if any – only a marginal impact on everyday mobility of visitors. Besides, the core activity of visitor attractions is to increase the number of visitors as well as offering a convenient accessibility, whereas the choice of transport mode of visitors is secondary. Measures that restrict the accessibility or restrict certain transport modes, such as parking management, are only supported by the visitor attractions, if they do not interfere with the primary goal of increasing the number of visitors. Thus, the provider at the vacation destinations should focus on developing offers and measures that influence the choice of transport mode of the visitors for their trip to the vacation destination.

Offers combining the arrival, accommodation and traffic and leisure offers hold a great potential in terms of environmental benefits. Offers including the trip to the vacation destination by PT with the accommodation – which is what is available in Garmisch-Partenkirchen (Germany) – may contribute to an effective influence on the traffic behaviour of visitors. This shall presume a target-oriented product design and pricing. The preference of customers for integrated offers suggests that there is actually such a demand. For developing and communicating these offers in Germany it is not only important to cooperate with stakeholders in the tourist sector, but also with railway and long-distance bus companies as well as tour operators.

The survey results as well as findings from other holiday destinations show that visitors expect simple, convenient and flexible offers. The static offer of public transport with timetable for arrivals and departures plus fixed routes is often not sufficient. Points of interest of leisure activities beyond the core area of PT are difficult to reach. This means that the possibilities for activities of visitors arriving by PT are limited. Moreover, it should be noted that using PT in regions away from home is especially difficult for persons who are MPT-affine since they have to face cognitive and practical challenges.

Including bicycles, pedelecs and (e-)cars for rent in the public transportation offer ensures flexible mobility of the visitors even when travelling without their own car. The extended service offers visitors the possibility to easily reach points of interest also during times and in areas with poorly developed connections to public transport. In this context, a simple distribution, an integrated customer medium and an integrated tariff, which is oriented towards the above mentioned model of an all-inclusive-card, is important.

Communicating these offers increases the visitors’ awareness. An information and booking system, which points out these integrated offers before the trip to the vacation destination, can contribute to this objective. In particular, regular and occasional customers of PT show a great potential for using integrated offers based on PT. Cooperation partnerships between holiday destinations and various transport companies can therefore be regarded as highly promising marketing strategies. As described above, the likelihood of sustainable mobility at the vacation destination is higher among regular and occasional customers of PT than among rare and non-users.

5. Summary

Developing new mobility concepts requires specific knowledge of the mobility behaviour of visitors. Due to the high share of MPT upon arrival and departure as well as local mobility, uncommon leisure traffic is not environment friendly so far. With an increasing traffic volume, the importance of uncommon leisure traffic increases in terms of environmental and climate protection objectives. Measures to change the transport mode for the trip to the vacation destination of visitors in favour of public transportation have a great potential to influence local mobility as well.

Integrated offers that combine traffic and touristic services can make a considerable contribution to environment friendly uncommon leisure mobility. Not only the local public transport should be considered, but especially PT offers for arrival and departure. Furthermore, the whole integrated service should be developed regarding the needs of the visitors (simplicity, convenience, flexibility), from information to booking and payment.
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Europäische Kommission (2013): BESCHLUSS DER KOMMISSION vom 20.2.2013 betreffend die Mitteilung der Bundesrepublik Deutschland über die Verlängerung der Frist für das Erreichen der NO2-Grenzwerte in 57 Luftqualitätsgebieten, Brüssel.


