

1                   **IDENTIFICATION OF NON-ROUTINE TOURS IN EVERYDAY TRAVEL**  
2   **BEHAVIOR**

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## 1 **ABSTRACT**

2 This paper deals with the distinction between everyday and tourism related travel. As no objective  
3 definition exists to differentiate between these two, surveys usually focus only on one aspect. In  
4 particular, this does not provide an overall picture of tourism related travel as some tourism  
5 activities are also embedded in everyday life, such as day excursions. However, it is of high  
6 relevance to distinguish these types of travel as policy measures may influence these aspects of  
7 travel differently and motivations and backgrounds to perform such travel are different. According  
8 to the World Tourism Organization (UNWTO), tourism activities take place outside the usual  
9 environment of people. In this paper, we approach this subjective definition of a personal  
10 environment using data of the German mobility panel. Analyzing the data of three reported weeks  
11 of everyday travel behavior per person, we calculate personal thresholds to approach an individual  
12 usual environment to decide which part of everyday travel behavior is outside of this environment  
13 and thus called non-routine. For this decision, we present a stepwise heuristic that finally  
14 distinguishes between routine and non-routine behavior for each tour of a person. Using one  
15 heuristic version for analysis, we identify 8.56% of all tours as non-routine. This corresponds to  
16 9.57% of all reported trips but accounts for 33.44% of distances travelled in our dataset. Young  
17 people and students have the lowest share of non-routine tours. The opposite was found among  
18 pensioners and older age groups who have the highest shares of non-routine behavior.  
19 **Keywords:** non-routine tours, tourism, everyday travel survey, usual environment

## 1 INTRODUCTION

2 In travel behavior research as well as in transport statistics distinctions between everyday travel  
3 and long-distance travel are usual. The definition and thus the differentiation of long-distance  
4 travel is generally given by a threshold, e.g., trips over 100 kilometers. Beside this distinction of  
5 everyday and long-distance travel by distance another break-up of travel can be made by the  
6 underlying purposes, backgrounds and motivations, e.g., distinctions between everyday travel and  
7 tourism related travel. This distinction is further important as motivations and backgrounds that  
8 generate trips are different for tourism and everyday travel. These types of travel also need a  
9 distinction when evaluating policy measures. Measures trying to reduce for example climate  
10 change effects usually target different causes. Impacts on optional activities such as tourism may  
11 differ from daily needs such as working activities. However, trying to distinguish these two types  
12 of travel raises a problem. There is no clear and objective definition to differentiate between the  
13 one and the other.

14 The World Tourism Organization (UNWTO) defines tourism as follows: “Tourism is a  
15 social, cultural and economic phenomenon which entails the movement of people to countries or  
16 places outside their usual environment for personal or business/professional purposes.” (1). A  
17 crucial aspect is the definition of a “usual environment for personal or business/professional  
18 purposes”. This is hard to establish for an appropriate distinction as this usual environment has a  
19 subjective dimension. Surveys trying to collect data about tourism usually focus on holiday trips  
20 or overnight stays. Thus, they are usually more related to the long-distance definition of trips and  
21 are not sufficient to provide an overall picture. Some events are also embedded in everyday life,  
22 such as day excursions or business trips.

23 According to the definition of the UNWTO, tourism has no minimum duration, but the  
24 maximum duration is one year. It includes activities in daily life, however, outside a usual  
25 environment and daily routines. Thus, to get a complete picture of tourism related travel, we  
26 suggest investigating everyday travel surveys as an additional data source. In the following, we  
27 investigate tours (chain of trips leaving and returning to a home location and/or another  
28 accommodation) and define tours outside the usual environment as “non-routine tours”. Using data  
29 of the German Mobility Panel (MOP) and a specific methodology, we try to answer the following  
30 questions: How can we distinguish everyday travel and tourism related travel? What share of travel  
31 captured by everyday travel surveys is tourism related?

32 Using the data of the MOP enables us to investigate three weeks of reported everyday travel  
33 behavior. We use the data of these three weeks of every participant to approach the definition of  
34 an individual usual environment. Combining this definition with some additional rules allows us  
35 to finally distinguish between non-routine tours, i.e., tourism related travel and routine tours that  
36 still belong to everyday travel.

37 The paper is structured as follows: First, we approach the definition of a usual environment  
38 investigating existing literature. Following, we present the data used and our methodology to  
39 define non-routine tours in an everyday travel survey. For the developed definition, we analyze  
40 the non-routine tours themselves and their amount for different groups of people in the results  
41 section. Finally, we draw a conclusion, discuss the limits of our approach and refer to further work.

## 42 LITERATURE REVIEW

43 As long-distance travel and tourism related travel account for a large part of total mileage travelled  
44 and the resulting greenhouse gas emissions, this issue became a focus of research. There are several

1 studies capturing different parts of tourism and long-distance travel, but all have their own  
2 definitions (2). Axhausen (3) described in 2003 in detail the problem of the differentiation between  
3 long-distance travel, tourism and daily mobility. He discusses the grey areas of the definition of  
4 tourism, among other things the difficulty of using a distance criterion to not capture the familiar  
5 i.e., usual environment.

6 According to the UNWTO definition, tourism activities on an individual level are  
7 characterized by the leaving of one's individual usual environment (1). In principle, the definition  
8 of the usual environment depends on an individual's subjective interpretation. A research study in  
9 Germany that is based on this subjective interpretation is "Tagesreisen der Deutschen" ("Day trips  
10 of the German population"), which analyses day trips only, i.e., trips without overnight stays (4).  
11 According to this study, the German population makes 2,947.6 million day trips (private and  
12 business purposes) a year, i.e., approximately 30 such activities per person and year. Day trips  
13 within the German territory cover in average a one-way distance of 72.8 km. However, as  
14 respondents subjectively evaluate if they leave their usual environment the variation of reported  
15 day trips is high: day trips of only 5 km one-way distance or of only 1 hour duration were also  
16 recorded. Another survey, that examines tourism and the German market for holiday travel is the  
17 annual holiday survey "Reiseanalyse" (5). From this, we obtain information on the number of trips  
18 with a minimum duration of 5 days (54.1 million, i.e., approximately 0.7 per person and year) and  
19 on the number of short holiday stays defined by a duration between 2 and 4 days (34.3 million) of  
20 the German population. Based on these studies it is not possible to identify tourism activities of  
21 short durations within everyday life. In order to capture this aspect of tourism, the analysis of  
22 appropriate data from everyday travel surveys is necessary. The problem is that such surveys do  
23 not capture whether an activity takes place within or outside the usual environment of an  
24 individual. For this reason, it is essential to develop a concept that allows the identification of such  
25 activities outside an individual's usual environment from the data of everyday travel surveys in an  
26 objective way.

27 Eurostat (6) gives an overview on the main aspects to identify tourism, since its objective  
28 is the harmonization of statistics in the European Union to ensure comparability between national  
29 data. According to this, the usual environment of individuals is dependent on the duration of the  
30 visit, the purpose and the frequency of the visit as well as the distance from the place of usual  
31 residence or the crossing of administrative borders. Although these criteria are mentioned, it is  
32 also pointed out that there is no strict framework to define the usual environment, as the subjective  
33 interpretation of the individual matters.

34 Given the data of traditional travel surveys, it is difficult to measure or record activities,  
35 which take place outside of the usual environment. A reasonable approach to this definition can  
36 be achieved by describing the usual environment of people by places where regular life routines  
37 take place (1; 6). This complex issue is dealt with in literature on activity spaces. Activity spaces  
38 can be defined as the part of the environment, where an individual participates in daily, i.e.,  
39 routinized and repeated activities. Studies that analyze activity spaces with geographical data based  
40 methods can directly transfer the behavior of individuals to the geographical area of daily activities  
41 (7; 8), which can be described by ellipses, kernel densities or shortest path networks (9). In those  
42 studies, trips to destinations that are likely to be not a part of routine behavior are excluded.  
43 However, for this paper, such destinations and points are of special interest to identify and describe  
44 tourism in everyday life. Dijst (10) describes the dependence of the use of time and space as  
45 delimiting factors for activity spaces and points out, that the place of residence and the place of  
46 work are the most important bases of the activity space of workers. Furthermore, he found, that

1 two-thirds of the activity spaces examined did not leave the borders of the municipalities. Another  
2 approach is done by Morency et al. (11), who use data from a origin-destination travel survey to  
3 calculate the distance travelled as a proxy for the activity spaces of individuals.

4 In context with the description of activity spaces from behavioral data, the distinction  
5 between stable or repetitious and variable behavior has to be considered. Findings of several  
6 studies show, that even activities that are on a regular basis, can be undertaken at different points  
7 in time (12; 13). A detailed overview of the literature on activity spaces is given by Hasanzadeh  
8 et al (14).

9 The continuous transition between long-distance travel and tourism related travel as  
10 already described above is also reflected in the literature. Similar influencing factors are identified  
11 for both spheres. Some person groups are more likely to perform long-distance trips and touristic  
12 activities than other person groups. This applies, for example, for business trips. Especially  
13 sociodemographic characteristics such as level of education, sex, age and income are important  
14 influencing factors both for long-distance and tourism related travel (2; 15; 16). In addition, the  
15 spatial characteristics of the place of residence is directly related to the amount of long-distance  
16 events. Persons who live in urban areas with access to intercity rail and airports show more long-  
17 distance travel for leisure purposes than persons do who live in rural areas (2; 17). In this paper,  
18 we investigate if these influencing factors are also important in non-routine tours, which we  
19 identify with a specific heuristic applied to the data of an everyday travel survey. Furthermore, we  
20 analyze if the participation in non-routine tours are unequally distributed in the population as it  
21 was found for the case of long-distance trips in previous research (18), where a small proportion  
22 of the population (10%) produced more than 43% of all long-distance trips.

## 23 **METHODOLOGY**

24 As seen above, the definition of a usual environment is not trivial and there is no common  
25 definition. In this section, we develop a methodology to define non-routine tours and thus the usual  
26 environment of persons according to the UNWTO definition of tourism. Therefore, we use a  
27 subsample of the German Mobility Panel (MOP). This everyday travel behavior survey provides  
28 data of three weeks of participants and may be suitable to distinguish between routine and non-  
29 routine behavior. We first present the dataset itself and the subsampling process. Further, we  
30 approach the definition of the usual environment and thus routine and non-routine tours by a  
31 stepwise data processing. Since there are no well-established criteria for the identification of non-  
32 routine tours, we also present and discuss a sensitivity analysis dealing with different thresholds  
33 and possibilities to define such tours.

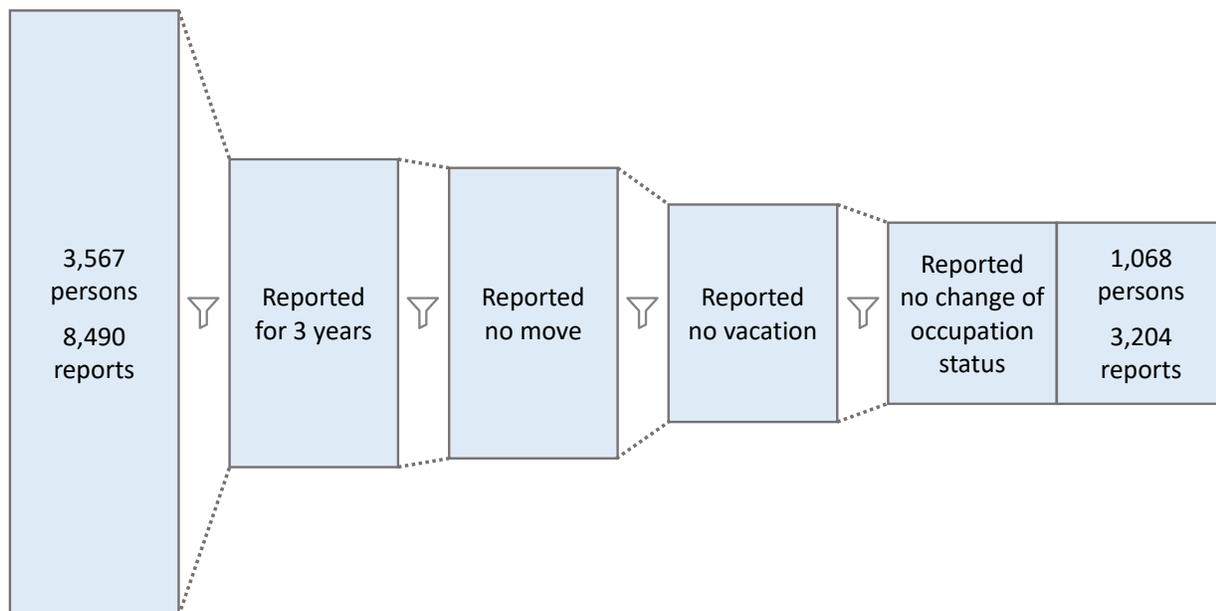
### 34 **The German Mobility Panel**

35 The German Mobility Panel (MOP) is a national household travel survey that has been conducted  
36 each year since 1994. It is carried out on behalf of and funded by the German Federal Ministry of  
37 Transport and Digital Infrastructure. The market research firm KANTAR TNS is responsible for  
38 the field work (i.e., recruitment and data collection) and the Institute for Transport Studies of the  
39 Karlsruhe Institute of Technology is in charge of the survey's design and scientific supervision.  
40 The data collection of the MOP takes place in autumn every year and the survey weeks are meant  
41 not to contain any school or bank holidays ("everyday travel"). The participants are asked to fill  
42 in a trip diary for one week. The diary provides information about all trips during one week  
43 (distances, means of transport, trip purposes and departure and arrival times). Furthermore,

1 sociodemographic information about the participants and the availability of cars, bicycles and  
 2 transit passes are questioned.  
 3 The overall sample size is 1,500-1,800 households with 2,600-3,100 persons (aged ten years and  
 4 older) reporting each year. The MOP is designed as a rotating panel meaning that the participants  
 5 are asked to report their travel behavior for three consecutive years. Every year a new cohort of  
 6 first year reporters replaces a portion of the sample that retires.

## 7 Study sample

8 The sample used for the analyses is based on data from people started reporting between 2014 and  
 9 2016 (see Figure 1 for illustration of subsampling). As they are asked to report up to three  
 10 consecutive years, the respective data is collected between 2014 (cohort of 2014 first report) and  
 11 2018 (cohort of 2016 third and last report). This data contains information of 3,567 distinct  
 12 participants and 8,490 reports, i.e., one-week trip diaries, containing 195,045 trips. Since we aim  
 13 to identify non-routine tours, i.e., to allow for their distinction from routine behavior, it is necessary  
 14 to have data on time periods with a certain number of repetitions and routines. Therefore, we  
 15 selected only people who participated in the survey for three years. Additionally, to avoid  
 16 methodological artefacts, we selected only people that reported no moves, and no change of  
 17 occupation status during these three years, as such life events may cause major changes in travel  
 18 behavior (19). Furthermore, we selected only persons who had not reported any vacation days in  
 19 all three travel diaries. This is due to our research objective, since we focus on tourism related  
 20 travel that occurs in everyday life. After this filtering process, 1,068 participants, who reported  
 21 3,204 one-week trip diaries containing 73,557 trips, stay relevant. Table 1 shows additional  
 22 information about this subsample. The presented sociodemographic variables describe  
 23 characteristics at the personal as well as at the household level. When interpreting the following  
 24 results, the quite high proportion of people living in urban areas (65.99%) and the low proportion  
 25 of people in the younger age groups should be considered.



26

27 **Figure 1 Study sample to investigate non-routine tours**

1 **Table 1 Sample composition**

<i>Category / variables</i>		<i>Share of persons [%]</i>
Gender	Male	49.78
	Female	50.22
Occupation	Employed (full time / half time)	50.19
	Education (school, university, others)	9.08
	Other	3.37
	Pensioner	37.36
Age	10 to 19	7.87
	20 to 29	2.78
	30 to 39	6.74
	40 to 49	13.67
	50 to 59	24.41
	60 to 69	21.38
	70 and older	23.16
Car availability	Regularly	62.89
	Occasionally by arrangement	11.95
	No availability / no information	25.16
Living area	Urban area	65.99
	Rural area	34.01
Household	Small household with employed person(s) (1-2 persons)	37.48
	Small household with non-employed person(s) (1-2 persons)	36.00
	Household with children aged 17 or younger	18.74
	Household without children, 3 and more adults	7.78

2 **Identification of non-routine tours**

3 As mentioned in the literature overview, our idea of the identification and definition of non-routine  
4 tours bases on the assumption that these tours leave the usual environment of people. To identify  
5 non-routine tours in an individual's reported behavior, the approach is based on a heuristic by  
6 which we distinguish between tours within the usual environment (routine) and non-routine in  
7 multiple steps. Therefore, we define the usual environment on an individual level. As we have no  
8 geographical data (geo-coded locations) of the places where the participants of the MOP carry out  
9 their activities, we determine the usual environment of the persons from the reported trip distances,  
10 trip purposes and durations of the out-of-home activities. We use the diary data of individuals from  
11 the three consecutive years to have a robust base for the identification of routines both temporally  
12 and spatially. This is superior to an approach based on data of only one week. An identification  
13 would be impossible with data covering only a few days.

14 *Grouping trips to tours*

15 In the first step, we aggregate trips to tours out of the reported trips in the three weeks of travel  
16 diaries. A tour starts with a trip from home or another overnight accommodation such as a hotel  
17 and ends with the trip back home or to another accommodation. It thus describes the chain of all  
18 trips and activities a person undertakes between the two fix locations home or other overnight

1 accommodation. An exemplary tour may consist of the trip from home to work in the morning and  
 2 going to the gym in the afternoon before returning home. The duration of a tour is the span between  
 3 the time of leaving the house until the time arriving back at home. The distance of the tour is the  
 4 sum of all distances of trips undertaken within this tour. Additionally, we are interested in the  
 5 purpose of a tour. In the data of the MOP purposes are distinguished between work, education,  
 6 leisure, shopping and service (i.e., picking someone up or dropping someone off). For further  
 7 analyses, we determine for each tour whether a work or education activity takes place.

#### 8 *Calculating tour information*

9 With the objective to approach quantitatively the definition of a personal usual environment, we  
 10 calculate and aggregate relevant figures about each tour. Both the distances travelled within a tour  
 11 and the duration of the tour serve as indicators for a temporal as well as for a spatial definition of  
 12 the usual environment. As we have no geographical data, we define the radius of a tour by dividing  
 13 both the distance travelled and the overall tour duration in half. We further call these two figures  
 14 *spatial* and *temporal radius* of a tour.

#### 15 *Identification of non-routine tours*

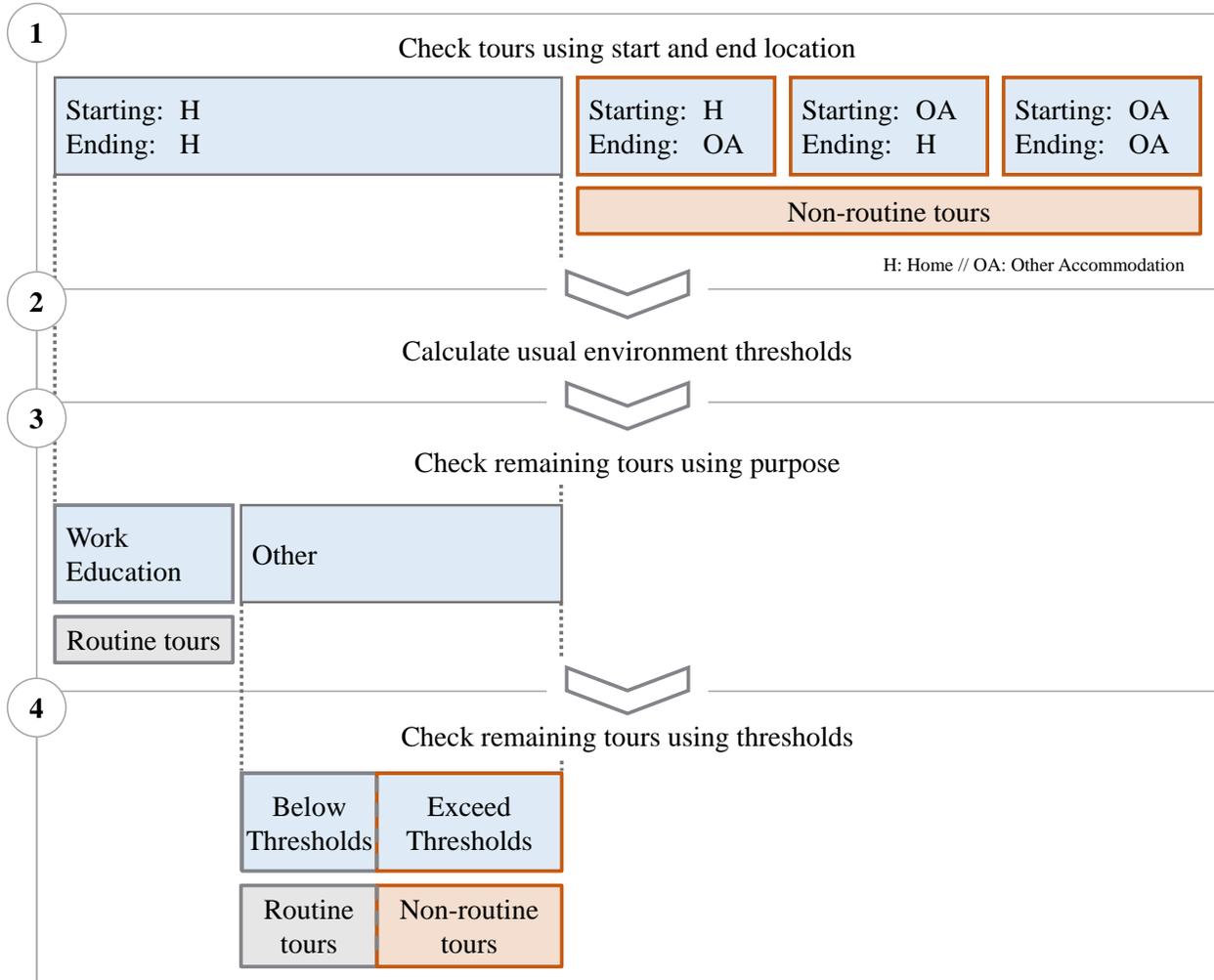
16 For the identification of non-routine tours, we use a set of decision rules that are passed step by  
 17 step. These rules are illustrated in Figure 2. We first check tours using the start and end locations.  
 18 Tours starting or ending not at home are not suitable to define a usual environment of a person.  
 19 Thus, they are directly tagged as non-routine tours.

20 In the second step, we approach the definition of usual environments calculating thresholds  
 21 on an individual level. To get from the (single) tour level to the level of an individual, we consider  
 22 all remaining tours (i.e., only those starting and ending at home) of each person and calculate the  
 23 *mean spatial radius*, the *mean temporal radius* as well as the *median of the spatial radius* and the  
 24 *median of the temporal radius*. This results in four figures for each person to further describe and  
 25 characterize the usual environment. As there are no hints from literature and no well-established  
 26 ways to define usual environments, we carry out a sensitivity analysis to show different  
 27 possibilities for the definition of these thresholds (see also Table 2). All possibilities have one idea  
 28 in common: tours that are exceeding a personal *spatial and temporal threshold* (i.e., the usual  
 29 environment limit) may be characterized as non-routine tours. Keeping this idea and the calculated  
 30 thresholds in mind, we further follow our decision rules.

31 In the third step, we check remaining tours by their *purpose*. As shown, work and education  
 32 tours are directly tagged as routine tours (assuming these activities to be performed at fixed places).  
 33 The remaining tours moving on to the fourth step.

34 The fourth step processes the tours still remaining. The mentioned *individual temporal and*  
 35 *spatial thresholds* are the first two criteria to define tours as non-routine or routine tours. We  
 36 further use a third criterion, called *minimum threshold*. This is an absolute value, independent from  
 37 the individual figures, which the duration radius of a tour must exceed to be considered as potential  
 38 non-routine tour. We applied this additional threshold to face the issue that personal thresholds  
 39 may be unstable and sensitive when people perform only very few tours during their reporting  
 40 periods. To finally identify non-routine tours of these remaining tours in step four, tours need to  
 41 exceed all three thresholds, i.e.,

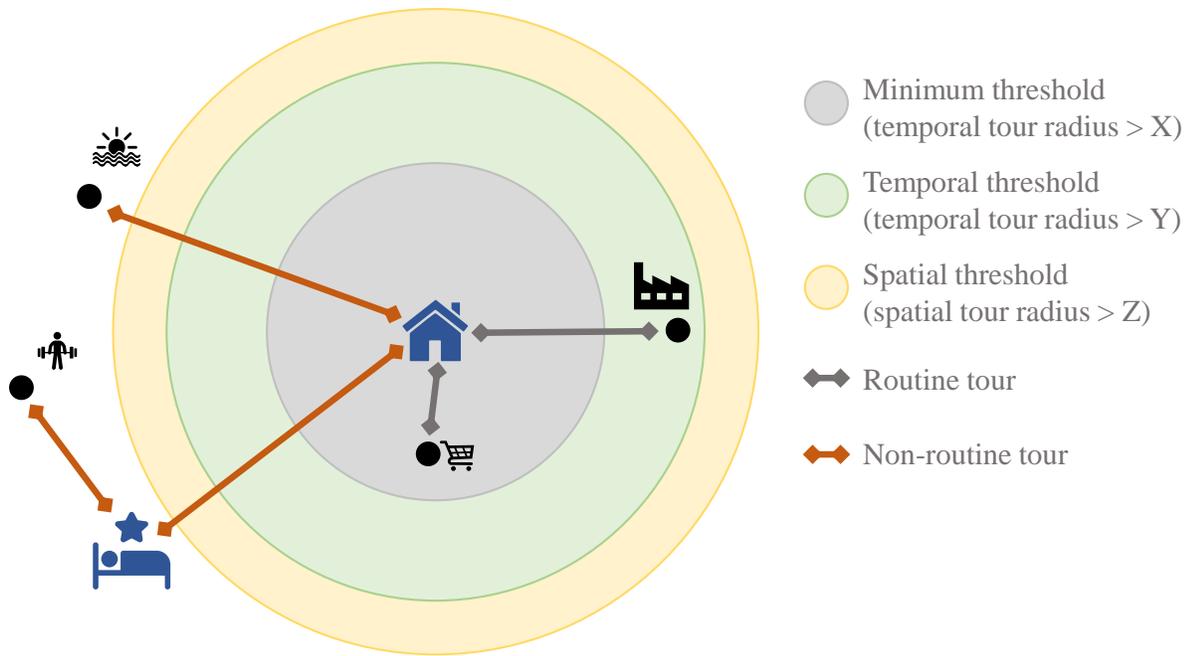
- 42 • the temporal tour radius exceeds the *minimum threshold* (value X) and
- 43 • the temporal tour radius exceeds the personal *temporal threshold* (value Y) and
- 44 • the spatial tour radius exceeds the personal *spatial threshold* (value Z).



1

2 **Figure 2 Illustration of non-routine tour identification // decision rules**

3 Another illustration of these rules using some example tours is shown in Figure 3. It shows, how  
 4 the selected thresholds apply. Tours that take place within the *minimum threshold* are classified as  
 5 routine tours. In this example, this is true for the shopping tour. Tours including work are also  
 6 routine tours, by definition. Tours that include another accommodation than home are defined as  
 7 non-routine tours. An interesting case is given by the tour with the leisure activity in Figure 3  
 8 (upper left side). This tour exceeds all three thresholds, i.e., the tour has a duration longer than the  
 9 *minimum and temporal threshold* and exceeds the *spatial threshold* with the sum of travelled  
 10 distances as well. Hence, this tour takes place outside the individual usual environment and is a  
 11 non-routine tour according to our heuristic.



1  
2 **Figure 3 Illustration of non-routine tour identification // example tours**

3 Table 2 shows the share of identified non-routine tours using the decision rules from above. Since  
4 the identification is of great importance for the following analyses and there are no hints from  
5 literature, we carry out a sensitivity analysis. For the *minimum threshold*, we differentiate between  
6 120 and 150 minutes. The personal *thresholds both spatial and temporal* differentiate between 1.0  
7 and 2.0 times of the personal mean or median value. If the median or mean is directly adapted, the  
8 decision rules identify a rather large share of non-routine tours for each person. In the process of  
9 the sensitivity analysis, we add a "buffer" to approximate the usual environment and therefore use  
10 the 1.5 and 2.0 times median respectively mean as further differentiation values. All these  
11 differentiations result in other shares of non-routine tours.

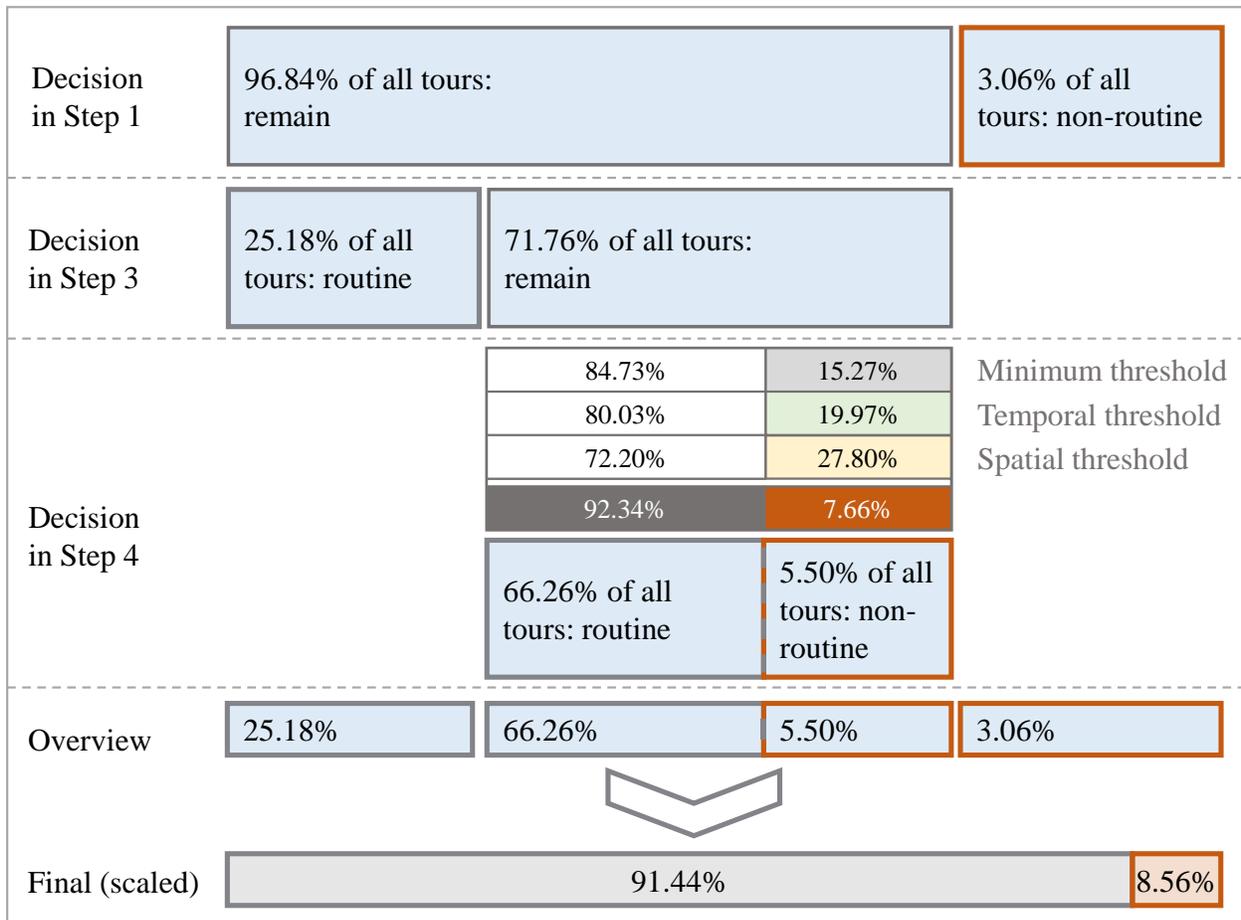
12 **Table 2 Sensitivity analysis of the identification of non-routine tours**

Threshold factor	Threshold using median			Threshold using mean		
	1.0	1.5	2.0	1.0	1.5	2.0
Share of non-routine tours [%] (minimum threshold = 120min)	10.42	8.56	7.19	9.37	7.02	5.41
Share of non-routine tours [%] (minimum threshold = 150min)	8.27	7.08	6.25	7.74	6.17	5.05

13 Through the sensitivity analysis, we present different approaches to describe the usual environment  
14 and thus to identify non-routine tours. The maximum value of identified non-routine tours is  
15 10.42% for the median (1.0 times) and the *minimum threshold* of 120 min. The minimum value is  
16 5.05% for the 2.0 times mean in combination with the *minimum threshold* of 150 min.

17 So far, we showed with which approach the usual environment can be assessed on an  
18 individual level and thus non-routine tours are determined. In the following, we perform analyses  
19 to describe the characteristics of non-routine tours and to investigate how such non-routine tours  
20 are distributed in the given sample. For this purpose, we chose one of the above-mentioned

1 scenarios. Since the mean is sensitive to outliers, the median is a more robust indicator (20).  
 2 Having regard to this aspect, we use the 1.5 times *median of both spatial and temporal thresholds*  
 3 in combination with the *minimum threshold* of 120 minutes in all of the following analyses. The  
 4 implementation of this option is to be seen as exemplary. Among the points already discussed  
 5 above, this is the most appropriate approach from the authors' point of view. According to Table  
 6 2, the share of non-routine tours of all tours equals 8.56% in the chosen scenario. To show the  
 7 necessity of the complex procedure with the various decision rules to obtain a solution that is as  
 8 robust as possible, Figure 4 illustrates the entire process. In Step 1 already 3.06% of the tours are  
 9 identified as non-routine, because these tours do not start/end at home. In step 4 the selected  
 10 thresholds are used to identify the other non-routine tours. Each of the three thresholds filters a  
 11 different number of non-routine tours. However, if all three thresholds must apply at the same  
 12 time, we receive 5.50% of all tours as non-routine tours. This means that some tours only exceed  
 13 one of the thresholds, but very few exceed all three criteria. The final share of 8.56% non-routine  
 14 tours of all tours is used for more detailed analyses and results.



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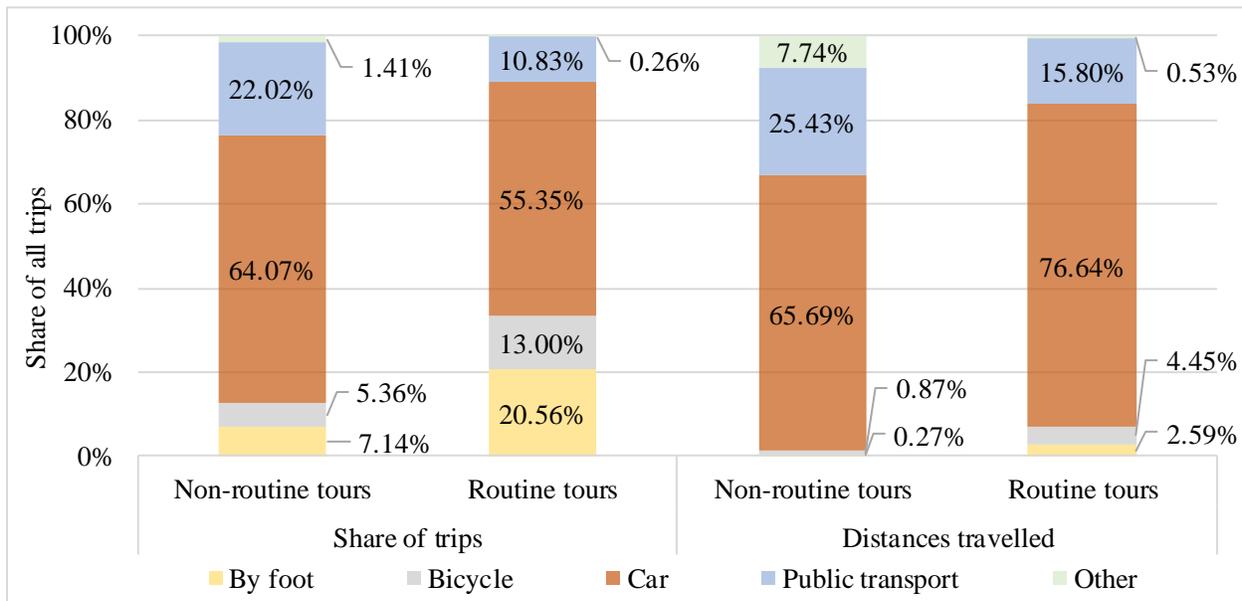
16 **Figure 4 Share of tours according to decision rules**

## 1 RESULTS

2 In the following section, detailed aspects in the context of the identified non-routine tours are  
 3 shown. We focus on the exemplary scenario with the *minimum threshold* of 120 minutes and the  
 4 1.5 times median as *spatial* and *temporal threshold*, which identifies 8.56% of all tours as non-  
 5 routine. The presented results refer to the different levels of tours, persons and trips. The use of  
 6 modes on routine tours and non-routine tours, the share of persons with different  
 7 sociodemographic characteristics that have at least one non-routine tour as well as the share of  
 8 trips and share of distances travelled in non-routine tours are investigated and discussed.

### 9 Mode use on routine and non-routine tours

10 To identify differences between routine and non-routine tours, we calculate the modal split.  
 11 Therefore, we include all tours of all persons. For a better comparison with other statistics, the  
 12 following analyses are based on the trip level. 9.57% of all trips are undertaken on non-routine  
 13 tours, which corresponds to 33.44% of all travelled distances. Figure 5 shows the modal split as  
 14 the share of trips as well as the share of distances travelled undertaken with each mode.



15

### 16 Figure 5 Modal split of non-routine tours and routine tours

17 The results are differentiated according to the trips on routine and non-routine tours. The share of  
 18 trips by car (64.07%) and public transport (22.02%) are higher in non-routine tours compared to  
 19 routine tours with 55.35% car use and 10.83% public transport use. We observe an opposite result  
 20 analyzing the share of distances travelled. The plane as mode plays only a minor role in our  
 21 analyses, as the data is from an everyday travel survey and participants with vacation days reported  
 22 were excluded. However, the plane is included in the category “Other” and accounts for a share of  
 23 distances travelled of 7.74% in non-routine tours. Further, trips by foot (0.27%) or bicycle (0.87%)  
 24 are negligible regarding the share of distances travelled. Looking at routine tours, these values are  
 25 comparatively higher at 2.59% (by foot) and 4.45% (bicycle). The results demonstrate the

1 necessity to analyze such non-routine tours, since we see variations in mode use in the two types  
 2 of tours. These differences between routine and non-routine tours should be taken into account,  
 3 especially with regard to resulting emissions and the possibilities of influencing mode use.

#### 4 **Characteristics of persons having non-routine tours**

5 In a further analysis, the share of persons who perform non-routine tours in their reported three  
 6 weeks is determined. Furthermore, it is interesting to see whether there are differences in  
 7 sociodemographic characteristics. For this, we conducted the analysis on the level of persons. This  
 8 means, we differentiated between persons with at least one non-routine tour and persons with  
 9 routine tours only. Table 3 shows the split between these person groups. If the entire sample is  
 10 considered, we see that 66.01% of the persons have undertaken at least one non-routine tour.  
 11 Accordingly, 33.99% did not leave their usual environment.

12 **Table 3 Share of persons with and without non-routine tours within different**  
 13 **sociodemographic groups**

<i>Category / variables</i>		<i>Share of persons having routine tours only [%]</i>	<i>Share of persons having at least one non-routine tour [%]</i>
All persons		33.99	66.01
Gender	Male	33.67	66.33
	Female	34.31	65.69
Occupation	Employed (full time / half time)	47.20	52.80
	Education (school, university, others)	51.55	48.45
	Other	16.67	83.33
	Pensioner	13.53	86.47
Age	10 to 19	54.37	45.63
	20 to 29	37.08	62.92
	30 to 39	37.96	62.04
	40 to 49	48.40	51.60
	50 to 59	42.20	57.80
	60 to 69	25.40	74.60
	70 and older	16.31	83.69
Car availability	Regularly	36.43	63.57
	Occasionally by arrangement	27.42	72.58
	No availability	24.25	75.75
Living area	Urban area	32.71	67.29
	Rural area	36.41	63.59
Household	Small household with employed person(s) (1-2 persons)	45.27	54.73
	Small household with non-employed person(s) (1-2 persons)	12.24	87.76
	Household with children aged 17 or younger	42.24	57.76
	Household without children, 3 and more adults	44.65	55.35

1 The results indicate only a little difference regarding the gender of the persons. Comparing the age  
2 groups, we find the lowest share of persons with non-routine tours in the youngest group. The  
3 highest share is found in the oldest age groups. The same tendency is observable in the occupation  
4 status. 86.47% of all pensioners in the sample have at least one non-routine tour, but it is only  
5 48.45% of all students in the sample. One possible reason for this could be that pensioners do not  
6 have to undertake compulsory activities and are therefore more variable in the way they organize  
7 their everyday life. The everyday life of students is strongly influenced by their education and  
8 therefore by routines. However, at least for pensioners the definition of the usual environment  
9 based on the presented approach might be somewhat too strict. At least the amount of information  
10 per individual to derive the usual environment might not be sufficient. On the other hand, this  
11 underlines the need of longitudinal data for the definition of individual usual environments and  
12 non-routine tours respectively.

13 The differentiation into different household types shows another interesting result. 87.76%  
14 of the participants that live in small households and only non-employed persons has at least one  
15 non-routine tour. This is the highest share in all of the characteristics examined. Again, from our  
16 point of view, the everyday life of people in such households is rather variable and less constrained  
17 by obligations. In addition, social contacts take place outside their home, which are likely to lead  
18 to non-routine tours.

19 As an additional statistical indicator to identify the differences between persons with and  
20 without non-routine tours, the coefficient of variation (CV) was calculated. Therefore, all reported  
21 tours for each person are taken into account. First, the variation was considered in terms of the  
22 distances travelled. The calculated mean CV of the distances of all persons with routine tours only  
23 is 0.99, whereas the value of persons with non-routine tours is 1.52. The same general outcome is  
24 observed in the evaluation of tour durations. The mean CV of the durations of persons undertaking  
25 routine tours only is 0.64. The CV of the durations of persons who perform non-routine tours is  
26 0.81. Summarizing, on both dimensions, distance and duration, persons with non-routine tours  
27 show higher variations in their reported trip diaries.

## 28 **Further aspects of non-routine tours in everyday life**

29 The first results indicate that the majority of people carry out non-routine tours according to our  
30 definition at least once during the three weeks reported. It is observable that such non-routine tours  
31 are of great importance and can be found across the sample examined. To obtain further and  
32 detailed information about the extent and structure of such non-routine tours, we only consider in  
33 the following analysis the behavior of such persons who have left their usual environment (66.01%  
34 of the sample). To describe the amount of non-routine tours, we no longer consider the tour level,  
35 but instead return to the level of the individual reported trips. This is helpful for comparison with  
36 other statistics that consider travel volume. More precisely, a non-routine tour that describes the  
37 trip from home to a leisure activity and the trip from this leisure activity back to home, enters as  
38 two trips in the calculation. We calculated the share of trips undertaken within non-routine tours  
39 of all trips that a participant reported. The same was applied to distances travelled within non-  
40 routine tours compared to all reported distances travelled. Table 4 shows the resulting mean  
41 proportions for all identified persons that have at least one non-routine tour. The mean share of the  
42 number of trips within non-routine tours compared to the total number of reported trips is relatively  
43 low at 14.52%. In comparison, the proportion of distances travelled is high at 40.44%. This again  
44 indicates that leaving one's usual environment is combined with many kilometers of travel.

1 **Table 4 Share of number of trips and distances travelled undertaken in non-routine tours**

<i>Category / variables</i>		<i>Mean share of trips on non-routine tours per person [%]</i>	<i>Mean share of distances travelled on non-routine tours per person [%]</i>
All persons		14.52	40.44
Gender	Male	15.77	42.05
	Female	13.28	38.84
Occupation	Employed (full time / half time)	14.65	38.17
	Education (school, university, others)	11.19	30.29
	Other	13.17	34.59
	Pensioner	14.99	44.21
Age	10 to 19	9.53	29.43
	20 to 29	18.00	37.75
	30 to 39	13.48	37.25
	40 to 49	14.37	32.91
	50 to 59	14.81	39.16
	60 to 69	14.54	42.53
	70 and older	15.19	45.38
Car availability	Regularly	14.53	38.98
	Occasionally by arrangement	15.41	43.41
	No availability	15.06	45.30
Living area	Urban area	14.92	41.55
	Rural area	13.72	38.22
Household	Small household with employed person(s) (1-2 persons)	15.67	40.42
	Small household with non-employed person(s) (1-2 persons)	15.20	44.30
	Household with children aged 17 or younger	12.08	34.04
	Household without children, 3 and more adults	13.79	38.22

2 For more detailed information, we calculated the proportions differentiated by person and  
3 household characteristics. There are only small variations between the considered characteristics  
4 in the calculated proportions of the total number of trips (see Table 4). The proportions are within  
5 9.53% and 18.00%. Children and adolescents aged between 10 and 19 have the lowest percentage  
6 (9.53%), which is reflected in the low value in the occupation status “Education”. Considering the  
7 already small share of people in education who carry out at least one non-routine tour (see Table  
8 3), this person group carry out in all respects the lowest amount of non-routine tours.

9 There are only minor differences with regard to the share of travelled distances generated  
10 by non-routine tours (Table 4). The share is relatively high irrespective of certain person groups.  
11 It varies between 29.43% and 45.38%, whereby it is higher for older persons and thus for  
12 pensioners. Since the share of distances travelled is much higher than the share of number of trips,  
13 the importance of such rather seldom non-routine tours with long distances becomes clear. This in  
14 turn indicates a special consideration of non-routine tours, which are captured in everyday travel  
15 surveys, since they are relevant for the development of targeted policies and measures.

## 1 CONCLUSIONS

2 With this study, we aimed to differentiate between everyday and tourism related travel using data  
3 of everyday travel surveys. As there is no objective definition of tourism related travel, such  
4 activities are usually also surveyed by everyday travel surveys. However, the identification of  
5 tourism related travel is essential for the development and implementation of regulations and  
6 policies. Trips and activities generated by tourism may be easier to influence than trips generated  
7 by everyday obligations. Although there are some surveys that record touristic activities, they only  
8 refer to specific types of events, such as holiday trips with overnight stays. Using the tourism  
9 definition of the UNWTO, events that take place outside the usual environment also occur in the  
10 everyday life of a person. Such activities, e.g., daily excursions, are usually not considered in  
11 tourism surveys.

12 With our study, we show a methodology to approximate the usual environment of persons.  
13 Using data of the German Mobility Panel allows us to use three weeks of reported everyday travel  
14 behavior for the identification of an individual usual environment. By this identification of the  
15 usual environment in which the repetitive behavior of a person takes place, we can differentiate  
16 between non-routine and routine tours. This is achieved by using information about the purpose,  
17 the duration and the distances travelled of the tour. With the consideration of all these  
18 characteristics, we present a fairly stable and applicable heuristic. With the help of a sensitivity  
19 analysis, the possible range of non-routine tours in everyday life is shown from 5 to 10% of all  
20 tours in the sample.

21 One exemplary scenario of applied thresholds in the sensitivity analysis was selected for  
22 the further investigation. We show the characteristics of non-routine tours and groups of people  
23 performing such tours. In the selected scenario, 8.56% of all tours are non-routine, which  
24 represents 9.57% of all reported trips and 33.44% of distances travelled. 66.01% of all persons  
25 have non-routine tours which underlines the importance of the consideration of this research issue.  
26 When differentiating person groups, young people and students have the lowest share of non-  
27 routine tours in their daily lives (48.45%). Among the students who have at least one non-routine  
28 tour, the shares of number of trips (11.19%) and distances travelled (30.29%) by non-routine tours  
29 are also comparatively low.

30 For further research, we propose an integrated survey approach that captures an overall  
31 picture of tourism, long-distance and everyday travel behavior. This requires a detailed breakdown  
32 of trip purposes, in addition to the travel purposes usually identified in holiday and everyday  
33 surveys. The investigation of the extent to which everyday, long-distance and tourism related travel  
34 overlap is important. Our study shows that a considerable amount of tourism related travel takes  
35 place in the everyday life of persons and is captured in everyday travel surveys. The methodology  
36 presented might have its weaknesses, since the identification of the usual environment is not very  
37 reliable for a low number of trips per individual and if the reported travel is highly variable. To  
38 face this problem, further research could develop heuristics for specific groups of people.  
39 However, our presented approach is sufficient for a first assessment as well as for the identification  
40 of the research gap.

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43 German Federal Environmental Agency dealing with the environmental impacts of tourism and  
44 long-distance travel.

## 1 AUTHOR CONTRIBUTIONS

2 The authors confirm contribution to the paper as follows: literature review: Miriam Magdolen;  
 3 data preparation: Lisa Ecke, Tim Hilgert; data analysis: Lisa Ecke, Miriam Magdolen, Tim Hilgert;  
 4 interpretation of results: Miriam Magdolen, Lisa Ecke, Tim Hilgert, Bastian Chlond, Peter  
 5 Vortisch; draft manuscript preparation: Miriam Magdolen, Tim Hilgert. All authors reviewed the  
 6 results and approved the final version of the manuscript.

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