Graphic description of travel behavior using the multiweek Mobidrive travel diary

Author(s):
König, Arnd

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Graphic description of travel behavior using the multiweek Mobidrive travel diary

A König
Abstract
This working paper contains a collection of figures showing results of the analysis of a six-week travel diary survey realised within the research project Mobidrive. The survey was conducted in the German cities Karlsruhe and Halle/Saale during spring and autumn 1999. In addition to the overall survey description and the descriptive data guide, this collection provides an overview of relevant characteristics of the behavior of the respondents.

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1 Introduction

This working paper contains a collection of figures showing results of the Analysis of a six-week travel diary survey realised within the research project Mobi
drive. The survey was conducted in the German cities Karlsruhe and Halle/Saale during spring and autumn 1999. In addition to the overall survey description (König, A. et al 2000) and the descriptive data guide (König, A., Schlich, R. and Axhausen K. 2000), this collection provides an overview of the sample structure and relevant characteristics and groups of persons.

The figures concentrate on the themes modal split, purposes of trips, activities, by contemplating on different types of days and characteristics of person circles. The Rhythms of travel behavior are shown in the different categories of time, daily, weekly, over six weeks and the whole reporting period.
2 Number of trips

The following boxplot shows the distribution of the reported number of trips for the two study areas Karlsruhe (KA) and Halle (HA) and by the two waves of the survey.

- Start/End of the reporting period first wave in Karlsruhe: 20.9.-31.10.1999
- Start/End of the reporting period first wave in Halle: 13.9.-24.10.1999
- Start/End of the reporting period second wave in Karlsruhe: 4.10.-14.11.1999
- Start/End of the reporting period second wave in Halle: 4.10.-14.11.1999

The boxes represent the range from 25% to 75% of the distribution. The line indicates the median. All values out of this range are shown by a separate symbol.

Figure 2.1: Number of trips by survey waves
3 Modal Split

The following figures show the modal split of all respondents by different categories across all trips reported during the six week survey period. Each dot or circle represents one person.

- Public Transport (PT): Bus, tram/LRT, railway
- Car: Motorbike, car as driver or passenger
- Nonmotorized: Pedestrian, bike

For an example, take the dot in the left corner in Figure 3.1. This person had a modal split of about 7% nonmotorized, 7% car and 86% public transport trips.

Figure 3.1: Modal Split, all persons, all days
Figure 3.2: Modal Split, all persons, all days by sex

Figure 3.3: Modal Split, all persons, all days by age
Figure 3.4:  Modal Split, all persons, all days by a work status

![Modal Split, all persons, all days by a work status](image)

Figure 3.5:  Modal Split, all persons, all days by ownership of driving licence

![Modal Split, all persons, all days by ownership of driving licence](image)
Figure 3.6: Modal Split, all persons, all days by vehicle ownership

Figure 3.7: Modal Split, all persons, all days by household location
Figure 3.8: Modal Split, all persons, all days by number of trips

Figure 3.9: Modal Split, all persons by type of day
Figure 3.10: Modal Split, all persons, weekdays by type of work

Figure 3.11: Modal Split, all persons, weekends by type of work
4 Trip purposes

The following figures show the distribution of the trip purposes of all respondents by different categories across all trips reported during the six week survey period. Each dot or circle represents one person.

- Household related: Shopping, private business, pick up/drop off someone
- Compulsory: Education, work, professional business
- Leisure: Leisure

For an example, take the left dot on the bottom line in Figure 4.1. This person is obviously not working, because he never reported a trip with the purpose compulsory. 82% of his trips are in the category leisure and 18% are household related trips.

Figure 4.1: Distribution of trip purposes, all persons, all days
Figure 4.2: Distribution of trip purposes, all persons, all days by sex

Figure 4.3: Distribution of trip purposes, all persons, all days by age
Figure 4.4: Distribution of trip purposes, all persons, all days by status of work

Figure 4.5: Distribution of trip purposes, all persons, all days by ownership of vehicles
Figure 4.6: Distribution of trip purposes, all persons, all days by household location

Figure 4.7: Distribution of trip purposes, all persons by type of day
Figure 4.8: Distribution of trip purposes, all persons, weekdays by type work

Figure 4.9: Distribution of trip purposes, all persons, weekends by type work
5 Activities

The following figures show the activity engagement of the respondents. The base is the sum of all durations of the activities within each interval. Each activity share is its share of the durations of all activities. The bar for each interval add to 100%. There are different aggregation levels are:

- Week day: 30 minute intervals
- Weekend: 30 minute intervals
- Week: 3 hour intervals
- Whole survey period: 3 hours intervals

5.1 Week day activity

Figure 5.1: Week day activity engagement by type and time-of-day (All respondents)
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6 Rhythms

6.1 Individual activities

Figure 6.1 and Figure 6.2 show the activities of one selected person over a period of time.

Figure 6.1: Activities of one person on one day

Figure 6.2: Activity rhythms of one person across the whole reporting period
6.2 Departure times of first trips of the day

Figure 6.3 to Figure 6.12 show the frequencies of respondents’ first trip in the same interval within one working week (Monday to Friday). The base are all first trips a day of the sampled persons. The interval range is 1 hour. The intervals overlap by 45 minutes.

Example:

A person leaves his home in one week three times at 7:50 and twice at 8:20. This week is counted in the intervals 7:00-8:00, 7:15-8:15, 7:30-8:30 and 7:45-8:45 in the category “3 frequencies” and it is counted in the intervals 7:30-8:30, 7:45-8:45, 8:00-9:00 and 8:15-9:15 in the category “2 frequencies”.

Figure 6.3: Frequencies of all respondents’ first trip in the same interval over the working day of one week (One hour intervals starting every 15 minutes)
Figure 6.4: Frequencies of pupils’ first trip in the same interval over the working day of one week (One hour intervals starting every 15 minutes)

Figure 6.5: Frequencies of university or similar students’ first trip in the same interval over the working day of one week (One hour intervals starting every 15 minutes)
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Figure 6.7: Frequencies of housemakers' first trip in the same interval over the working day of one week (One hour intervals starting every 15 minutes)
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Figure 6.9: Frequencies of unemployed persons’ first trip in the same interval over the working day of one week (One hour intervals starting every 15 minutes)
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Figure 6.12: Frequencies of self-employed persons' first trip in the same interval over the working day of one week (One hour intervals starting every 15 minutes)
7 Lorenz-Curves

The following figures show Lorenz-Curves. The data base consists of all respondents by different categories. The Lorenz-function compares graphically the observed distribution of one characteristic with the uniform distribution. The cumulated frequencies of a variable on the vertical axis are assigned to the corresponding value of the other variable on the horizontal axis. A diagonal would mean that the cumulative frequencies of observed values always match the cumulative frequency of the values of the other variable. The stronger the deviation from this diagonal is, the more unequal is the distribution. The distance between the Lorenz-Curve and the diagonal is calculated as the Gini-coefficient that can vary between 0 (uniform distribution) and 1 (maximum concentration) and is a measure of the disparity (Herz, Schlichter und Siegener 1992).

7.1 Total trip distances

Figure 7.1: Lorenz-Curve of total trip distance over the reporting period by sex
Figure 7.2: Lorenz-Curve of total trip distance over the reporting period by age

Figure 7.3: Lorenz-Curve of total trip distance over the reporting period by working status
Figure 7.4: Lorenz-Curve of total trip distance over the reporting period by vehicle ownership

Figure 7.5: Lorenz-Curve of total trip distance over the reporting period by household location
7.2 Number of trips

Figure 7.6: Lorenz-Curve of the number of trips over the reporting period by sex

Figure 7.7: Lorenz-Curve of the number of trips over the reporting period by age
Figure 7.8: Lorenz-Curve of the number of trips over the reporting period by working status

Figure 7.9: Lorenz-Curve of the number of trips over the reporting period by vehicle ownership
Figure 7.10: Lorenz-Curve of the number of trips over the reporting period by household location

![Lorenz-Curve of the number of trips over the reporting period by household location]
8 Literature


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