Codebook REM 2030 driving profiles database

2019-02-06

Description

The Fraunhofer Institute for Systems and Innovation Research has been collecting primary data of driving profiles in commercial traffic since June 2011. The REM 2030 driving profiles database currently contains 630 driving profiles of commercially licensed vehicles in Germany that were collected over a longer recording period and it is continuously extended. The following table provides a quick overview of the driving profiles in terms of vehicle size, the total number of trips and the average recording period.

Overview of the driving profiles

total number of driving profiles	630
small-sized vehicles	159
medium-sized vehicles	138
large vehicles	73
transporters/light commercial vehicles	154
special vehicles	6
total number of trips	91,422
average recording period	ca. 3 weeks

The database aims at being representative for different kinds of economic sectors and their use of vehicles. It contains information about the trips (incl. departure and arrival times, as well as the distance), the vehicle size and the economic sector (according to NACE Rev. 2), in which the vehicle is used. Moreover, data about the size of the community, where the vehicle is licensed, has been collected. If available, additional details concerning the size of the company and the use of the vehicle are provided. By means of this data and battery charging simulations, it is possible to determine the feasibility and profitability of an ecological alternative for the analyzed vehicles in the given economic sectors. Thus the REM

2030 driving profiles database is an instrument for evaluating the use of electric vehicles and the potential demand of battery charging infrastructure.

Structure of the datasets

The REM2030 driving profiles database is divided into two files: The name of the first file is "REM2030_XXXX_car_info.csv", the name of the second one is "REM2030_XXXX.csv" respectively. XXXX denotes the year of the version. "REM2030_XXXX_car_info.csv" contains data about the participating companies and vehicles. The data includes the economic sector, the size of the company and the community, where the vehicle is admitted, as well as details concerning the use of the vehicle. Furthermore, every vehicle obtains one unique key (ID – primary key). By means of this key, it is possible to relate routes from the dataset "REM2030_XXXX.csv" to exactly one vehicle from "REM2030_XXXX_car_info.csv". "REM2030_XXXX.csv" contains all the trips including their departure time, arrival time, duration and distance.

Data preparation

Due to GPS and radio communication dead spots, the data recording of some trips might be interrupted. For that reason, the plausibility of the collected data is verified and trips are, if necessary, adapted and inserted respectively. Moreover, the linear distance to the company's estate was inserted as additional information.

A trip is adapted, if the recorded distance is shorter than the linear distance between the recorded origin and destination of the trip. In this case, the recorded distance of the trip is replaced by the distance determined by Google Maps. This concerns 4,223 trips with a mean value for the recorded distance of 6.19 km and a standard deviation for the linear distance of 64.80 km. Incorrectly recorded trips with an average speed of less than 1 km/h or with a duration of less than 1 min are additionally adapted in terms of their arrival time at the destination (= departure time + trip duration determined by Google Maps). This concerns 4,072 trips with a mean value for the linear distance of 8.29 km and a standard deviation for the linear distance of 63.62 km.

Trips are inserted, if the destination of trip i and the origin of the trip i+1 differ. In this case, an additional trip that is determined by Google Maps is inserted in the dataset between the two recorded trips This concerns 5,599 trips with a mean value for the inserted trip of 8.16 km and a standard deviation for the inserted trip of 71.00 km. In this case, the

departure time of the inserted trip is equal to the recorded arrival time of trip i and the trip duration is determined by Google Maps.

Technical parameters

Features	Value
File format	CSV-File
Delimiter	„;"
Encoding	ISO 8859-1 (ANSI)
Decimal marker	„ . "

Structure

REM2030_2015_car_info.csv

Variable No.	Variable	Format	Description	*Example*/Options
1	**ID**	YYMMKKKKKK	Primary key, consisting of the year (YY), month (MM) and last 6 digits of the data logger ID (KKKKKK):	*1205510685*
2	**Vehicle_size**			- small (<1400 ccm) - medium (1400 to 2000 ccm) - large (>2000 ccm) - transporter (< 3,5 t)
3	**Economic_sector**		Economic sector of the company	According to NACE Rev. 2
4	**NACE_section**			
5	**Economic_segment**		Economic segment of the company	
6	**NACE_division**			
7	**Description_of_the_economic_sector_according_to_company**		Description of the economic sector of the company according to the company's statement	Free text
8	**City_size**			- under 20000 - 20000 to 100000 - over 100000
9	**Company_size**			- under 10

No.	Variable	Format	Description	Example
			- 10 to 50 - 51 to 250 - 251 to 1000 - 1001 to 5000 - over 5000	
10	**Comment**		Free comment section	Comment
11	**Vehicle_utilizatio n**			- fleet vehicle - company car
12	**Number_of_user s**			- several users - one user
13	**Parking_spot**			- own parking spot on company's estate - differing parking spots on company's estate - no own parking spot on company's estate
14	**Federal_state**		2 digits for the "Bundesland" according to ISO 3166-2:DE	BW
15	**Company_ID**		Consecutive and unique for each company	7

REM2030_2015.csv

No.	Variable	Format	Description	Example
1	**ID**	10 digits	Primary key, consisting of the year (YY), month (MM) and last 6 digits of the data logger ID (KKKKKK): YYMMKKKKKK	1205510685
2	**DepYear**		Year of departure	2012
3	**DepMonth**		Month of departure	5
4	**DepDay**		Day of departure	10
5	**DepHour**		Hour of departure	12
6	**DepMinute**		Minute of departure	1
7	**ArrYear**		Year of arrival	2012
8	**ArrMonth**		Month of arrival	5
9	**ArrDay**		Day of arrival	10
10	**ArrHour**		Hour of arrival	12
11	**ArrMinute**		Minute of arrival	8
12	**Distance**		Distance of the trip in km	2,9
13	**Distance_to_co mpany**		Linear distance to company's estate in km at arrival	3,75

Contact

For questions concerning the data collection, structure and data preparation, please contact

Till Gnann: till.gnann@isi.fraunhofer.de; +49 721 6809-460

For questions concerning the acquisition and utilization, please contact

Simon Funke: simon.funke@isi.fraunhofer.de; +49 721 6809-415