Open Data /

Open Data Supplementing Information

Version: 1.0

Version date: 25.03.2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723051.

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Project funding

Horizon 2020
ART-02-2016 – Automation pilots for passenger cars
Contract number 723051
www.L3Pilot.eu

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Revision and history chart

Version	Date	Comment
1.0	25.03.2021	Initial Version

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1 Introduction

This document provides supplementing information to L3Pilot Open Data Set. In Short, the dataset consists of a subset of the dataset used for the evaluation in L3Pilot. Data consists of performance indicators derived for four driving scenarios analysed in L3Pilot and a subset of the questionnaire answers used in L3Pilot.

Driving data is shared for the driving scenarios:

- Free Driving
- Following a lead vehicle
- Driving in Traffic Jam
- Lane change

The data can be used to reproduce and analyse some further aspects more in detail than was done in the technical and traffic evaluation in L3Pilot. Certain performance indicators and driving scenarios were deemed not feasible for sharing as open data, as results from the technical and traffic analysis where mixed.

When working with the data, it is important to consider, that the data was gathered using pre-series vehicles in an experimental setup on public roads. Although the vehicles piloted can be considered quite mature when pilots were executed, they may deviate from behaviour of automated series vehicles, which could for instance depend on legislative changes on speeds and distance requirements. This may also affect the user-related analysis.

In the following, relevant excerpts out of Deliverable D7.3 – Pilot Evaluation Results are presented, which are required to understand how the data was derived.

1.1 Relevant Project Deliverables

This deliverable focuses on the evaluation of data acquired during the piloting activities within L3Pilot. To achieve this, several steps needed to be taken which have been described in several deliverables. All public deliverables can be found on https://l3pilot.eu/downloads.

- Research questions (RQs) L3Pilot set out to answer and resulting requirements for data logging are defined in **D3.1 – From research questions to logging needs** (Hibbert et al., 2018).
- As the vehicles operated in the Pilot were not yet market ready, the study design needed to be adapted to the maturity and the experimental nature of the vehicles. To harmonise the study design across the different Pilot sites, **D3.2 – Experimental Procedure** (Penttinen et al., 2019) was generated, which provided guidelines and recommendations for each Pilot, enabling a consistent merging of the data collected from different sites.

- A summary of the piloting activities executed in L3Pilot is given in **D6.5 – Reporting Outcomes** (Andreone et al., 2021), providing insight into the piloted systems, the implementation of the study design, and the data collected.
- The methods for the evaluation to be carried out in the Evaluation subproject were defined in **D3.3 – Evaluation methods** (Metz et al., 2019).
- Building up on the available methods, a specific plan was defined in **D3.4 – Evaluation Plan** (Innamaa et al., 2020), which also provided further details and updates on the methodology.
- For the implementation of the methodology, we used a selection of tools developed during L3Pilot as described in **D5.1 – Pilot Tools for L3Pilot** (Nagy et al., 2018) (*not public*). Signals were transformed into a common data format (Nagy et al., 2018 & Hiller et al., 2019) which allowed the creation of a common toolchain for all partners working with data from the piloted vehicles which is publically available at https://github.com/l3pilot/l3pilot-cdf.
- The experience gathered from the technical teams working on piloting data, quality checks, manipulation, and processing was also reflected in Deliverable **D5.2 – Guidelines and Lessons Learned** (Christen et al. 2021) - Guidelines and Lessons Learned on Pilot Tools and Data, where lessons learnt were gathered.
- Data for answering the project RQs is stored and shared via the consolidated database (CDB), which enables pseudonymised sharing of data not allowing the identification of individual Pilot side. This process is described in **D6.2 – Database for data Collection: Evaluation Format & common data set for future Research** (Bellotti et al., 2019).
- Data evaluation executed with the entire dataset collected is reported in **D7.3 – Pilot Evaluation Results** (Weber et al., 2021), which also provides the information presented in this document. The deliverable sums up all analysis that has been executed with the overall dataset from which the open dataset has been derived.

1.2 Evaluated Automated Driving Functions

SAE Level 3 automation does not require the driver to supervise the driving task, but the driver needs to be available as a fall-back layer for the system within a limited time span when the system issues a take-over request (TOR). If the driver does not respond properly to the TOR, the vehicle will perform a minimal risk manoeuvre.

In the following, the different ADF evaluated in L3Pilot for which open data is provided are described. These high-level descriptions of the evaluated systems depict the common bases of the systems. While all systems follow the description, the individual layout implementation and the resulting behaviour of the system may differ slightly. The detailed functionalities of the systems are undisclosed.

1.2.1 Motorway Chauffeur & Traffic Jam Chauffeur

L3Pilot considers two different ADF operated on motorways. One of them is an SAE Level 3 Traffic Jam Chauffeur, which allows the driver to hand over the driving task to the ADF without the need to supervise. The Traffic Jam Chauffeur operates on motorways (controlled access) and similar roads up to a speed of 60 km/h. Operation of the traffic jam ADF requires a leading vehicle to be present. In case a slow vehicle is in front of the ego-vehicle, the ADF can execute a lane change to a lane with faster flowing traffic.

In contrast, the SAE Level 3 motorway chauffeur covers a speed range of up to 130 km/h on motorways and similar roads. The motorway chauffeur may either follow a leading vehicle or keep a speed below the speed limit. Depending on the system design, the motorway ADF may execute lane changes in order to drive at its desired speed.

The evaluation in L3Pilot does not make a distinction between the Traffic Jam and Motorway ADF on a system level. Instead, if an evaluated system is currently in a driving situation which may be considered a traffic jam suitable for a Traffic Jam Chauffeur, the situation will be considered as a situation relevant for a Traffic Jam Chauffeur, even if the system would also allow for a full speed range operation on motorways. Hence, in the following no distinction will be made between these systems. Both are considered to be motorway ADFs, while a distinction between traffic jam situations and normal motorway driving is made on the driving scenario level (see Section 3.1)

1.2.2 Urban Chauffeur

The Urban Chauffeur targets stress-free driving in urban areas. With the Urban Chauffeur, the vehicle automatically follows the lane, starts and stops and handles lane changes – either for overtaking or to fulfil the navigation task – within cities. When coming to a crossing, the car handles right and left turns, recognises oncoming traffic and VRUs, and selects the correct crossing path, even if no lane marking is present.

2 Pilot Data Process

The sharing of data between partners piloting the ADF and researchers answering the selected RQs is the central element for a pilot study involving several vehicle manufacturers. In the following, the given constraints for setting up such data sharing and the implemented solution are discussed, which also apply to the provision of the open data.

2.1 Constraints

L3Pilot deals with systems enabling automated driving that have not yet been introduced to the market. At this stage, the systems are still confidential. Nevertheless, L3Pilot wants to ensure a data evaluation that is as thorough as possible to enable understanding of the effects automated driving will have on users, traffic and society already at this development stage. Consequently, certain measures need to be adopted to guarantee that no confidential information about the system is shared among the vehicle manufacturers and suppliers participating in the piloting or with third parties outside the project. Requirements for data sharing can be summarised as follows:

- The data shared should not facilitate benchmarking between the piloted systems.
- The data shared should not allow reverse engineering of ADF parameters.
- Data available for answering the RQs should not be linked to individual Pilot sites.
- For some PIs, special requirements of confidentiality might apply that restrict sharing information on a disaggregated level within the project.

For setting up the data evaluation process two options were considered, which are also described in Deliverable D3.3 – Evaluation Methods (Metz et al 2019): the first one involves “merging of results” and consists of applying statistical tests on data sets regarding the individual Pilot sites for which a meta-analysis is then carried out. In contrast, the second approach “merging of PIs” would combine the available PIs per RQ in a common database and apply the statistical test on this collective dataset.

As the harmonised study design applied at the individual Pilot sites allows for a merging of their data, Metz et al. (2019) recommended merging of PIs wherever possible. Merging of results was considered as a fall-back option in case certain constraints do not allow for the previous approach. For the User and Acceptance analysis, merging of PIs could be implemented by directly sharing the collected data, i.e., the individual participant’s answers to the questionnaire items. For the Technical & Traffic analysis, the requirements for data confidentiality led to the decision that no time-series data from the individual sites could be shared with the entire consortium. PIs thus needed to be derived from the time series data which aggregate information per defined segments of trips (driving scenarios) or entire trips. All the PIs considered in the project, as well as their relation to the RQs, are described in D3.4 – Evaluation plan (Innamaa et al., 2020).

2.2 Implemented Data Sharing Process

As recommended in Metz et al. (2019), merging of PIs was implemented for motorway and urban ADF, both for vehicle data and for questionnaire data.

The chosen approach for merging data across the different Pilot sites required establishing a data handling and sharing process that met the requirements for not making Pilot sites identifiable and not facilitating benchmarking and reverse engineering. In the data evaluation process three different roles were defined for the partners involved in the data acquisition and data evaluation process:

Pilot leaders are operators of Pilot sites who implement the study design, execute the pilots, and implement the recording of data from the piloted vehicles.

Pilot data processing partners are partners involved in the evaluation of data who have the dedicated role of working in close collaboration with one or multiple Pilot leaders, which allows the sharing of required disaggregated or time-series data. Between Pilot leaders and data processing partners, individual non-disclosure agreements may have been set up to meet requirements for personal data protection and confidentiality. In general, the task of the data processing partners is to process and aggregate the piloting data to a stage at which it could be shared with other partners involved in the evaluation.

Evaluation partners work with the aggregated data that has been merged across the different Pilot sites. They do not have access to any information that could reveal the identity of Pilot sites that contributed to individual entries in the general dataset.

Between these roles, a data sharing and a merging process was established. A central tool for this process was the consolidated database, which allowed for controlled merging of data while at the same time hiding the identity of the individual Pilot sites to the evaluation partners. The structure and interfaces for the consolidated database are described in D6.2 – Database for data collection: evaluation format & common data set for future research (Bellotti et al., 2019) and (Hiller et al., 2019). Nearly all partners involved in the evaluation took the role of a Pilot data processing partner for a limited number of Pilot leaders and of evaluation partner working with the data available in the consolidated database.

The data processing and evaluation process can be summed up as shown in Figure 2-1. The start of the process is the acquisition of the raw vehicle data at the different Pilot sites. For the data acquisition, the individual Pilot sites implement the study design considerations elaborated by Pentinnen et al. (2019), which allows the merging of data across Pilot sites. The data gathered can be split into two items: vehicle data logged from the CAN-bus and other data communication between subsystems of the piloted vehicles, as well as video data, and questionnaire data consisting of the participants' answers to the questionnaire items. All Pilot site questionnaires are reported in Deliverable D3.3 – Evaluation Methods (Metz et al., 2019).

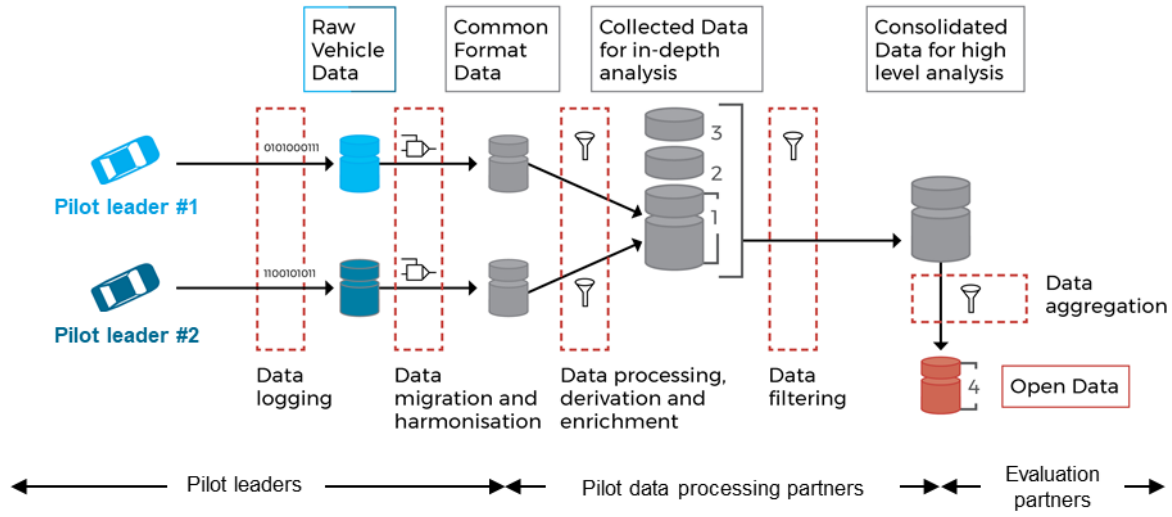

Figure 2-1: Stages for data processing in L3Pilot

At this stage, vehicle data is recorded in formats that are proprietary to the individual Pilot sites, as the data is directly logged from the automated driving function. Data management is handled based on the internal processes at the Pilot leader. Before handing over the collected data to the data processing partner, it is converted to a common data format (CDF). Using the same data format for all Pilot sites allows for more harmonised processes between the data processing partners, as well as an easier interpretation of the results by the evaluation partners. The CDF for data logged from the piloted vehicles is described in D5.1 – Pilot tools for L3Pilot (Nagy et al., 2018) and by Hiller et al. (2019). Questionnaire data is handled in tabular format. Conversion from the proprietary format to CDF is done by Pilot leaders, who also apply initial quality checks to the data delivered to the data processing partner. A second check of the data quality is then applied by the data processing partner, who examines whether the data can be successfully processed by the evaluation toolchain.

The evaluation toolchain consists of a collection of MATLAB scripts hosted in a shared code repository. The initial version of the scripts was prepared by a dedicated team in L3Pilot. Since by the end of the initial tool development phase the entire toolchain had not been extensively tested with data from the different Pilot site, development was continued within the Evaluation subproject.

The data uploaded to the CDB could then be queried by evaluation partners either via a graphical user interface or an application programming interface (API). The queried datasets contained the relevant PIs for vehicle data and questionnaire answers for user data. Based on these, the defined RQs could be answered.

As urban ADF have only been piloted by three Pilot sites and the chosen study designs resulted in considerable differences in the amount of data to be merged, which created a risk of an imbalanced dataset for evaluation as well as a greater risk of exposing the individual

systems, a further step for obfuscating data ownership by means of bootstrapping was introduced. This process is further described in Section ●.

Lessons learnt from the data sharing processes established are reported in D5.2 – Guidelines and lessons learned (Christen et al., 2021).

2.3 Available Piloting Data

Piloting efforts in L3Pilot resulted in a unique and extensive basis for the evaluation of L3 ADFs. Piloting operations were executed at 14 Pilot sites operating in seven different European countries and recording data from more than 750 test subjects testing 70 vehicles. Some Pilot sites also tested cross-border operation of the evaluated ADF. An overview of the Pilot sites is shown in Figure 2.2.

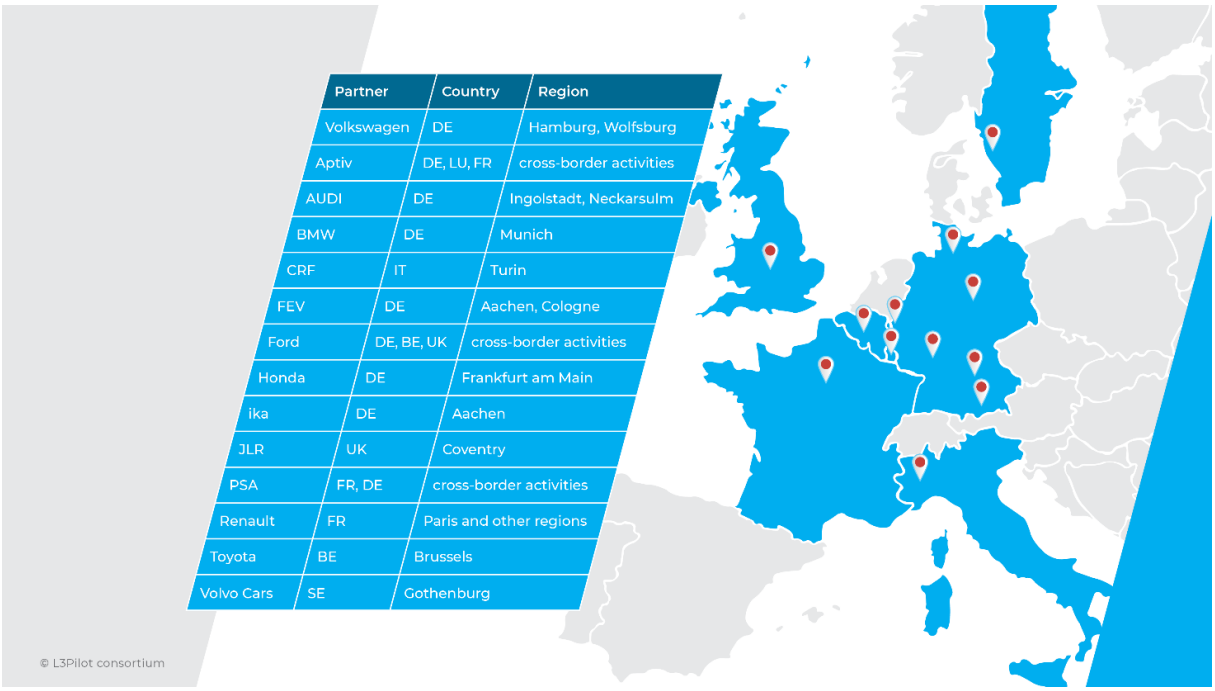

Figure 2.2: Pilot sites within L3Pilot

The resulting data set can be characterised by the following statistics for the different piloted systems:

Table 2-1: Vehicles and users per type of ADF

	Motorway ADF	Urban ADF	Parking ADF
Piloted vehicles	**70**	**6**	**8**
Test subjects *of which:*	**481**	**177**	**92**
Professional & safety drivers	143	17	4
Ordinary drivers	338	0	85
Users in a passenger seat	0	160	3

- The piloting efforts for Motorway ADF comprise 400,000 km driven on motorway, roughly half in as baseline.
  - This data includes kilometres driven on motorways for data acquisition for dedicated traffic jam systems. (Especially, given that most of the piloting was done during the COVID-19 pandemic, which resulted in overall lower traffic levels, traffic jam events were difficult to find for data acquisition.)
  - Data collection executed with traffic jam-only systems could not contribute to the baseline dataset, as the sensors and system setups were made specifically for low speed scenarios.
  - This exclusion of data resulted in 2267 h of motorway data that could be delivered from the Pilot leaders to the data processing partners.
  - From this data, 1808 h could be processed for upload to the CDB. Data was either not uploaded because it was out of the ODD of the piloted ADF, or issues with data quality did not make it possible to derive the required PIs.
- For **Urban ADF**, 1120 h were driven within urban environments, including 130 h of baseline data collection
  - The delivered dataset comprised 638 h of data which were used for data evaluation.
  - An additional step for data processing was implemented, which ensured that all Pilot sites with urban ADF where weighted equally in the evaluated dataset, even though one of the Pilot sites contributed a significantly larger part of the overall dataset (see Section ●).

3 Vehicle Data

Due to the piloting setup with experimental vehicles, most significant findings have been made about stable driving states. Data contained in the dataset are thus published for the following scenarios:

Table 3-1: Published driving scenarios for motorway and urban ADF

	Motorway	Urban
Free Driving	•	•
Following a lead vehicle	•	•
Driving in Traffic Jam	•	
Lane change	•	

In the urban setting, lane changes were not executed at all of the three pilot sites, such that data on this could not be merged without disclosing which data belongs to which pilot site.

3.1 Definition of Scenarios

Lead object scenarios are dependent on detecting the lead object in the ego-vehicle lane and then assessing the distance to and speed of the lead object. Depending on the time headway (THW) (the distance to an object divided by the speed of the ego-vehicle), the following definitions are important for understanding the difference between the scenarios:

1. A *Close* object is when the THW is less than 2 seconds between the two objects.
2. An *In-between* object is when THW is between 2 s and 3.5 s.
3. A *Distant* object when THW is more than 3.5 s.
4. No lead object detected.

In addition, the following definitions are set:

1. *Speed tolerance* is set to 1.4 m/s.
2. *Minimum duration* of the scenarios is set to 2 seconds (not applicable to *Approaching a static object*).
3. *Minimum speed* of the ego-vehicle is set to 5.56 m/s (not applicable to *Approaching a lead or static vehicle*).

The definitions stated above are made to reflect actual driving but there is a risk of having long periods not qualified for any scenario, since the *minimum duration* can be quite restrictive when the scenario is switching between *following a lead object* and *approaching a lead object.* If an *approaching a lead object* scenario is between two *following a lead object* scenarios and the distance does not decrease more than 30% from the start until the end of

the scenario, then the *approaching a lead vehicle* is replaced by a consecutive *following a lead object* scenario.

Variable definitions:

- THW Close: <2 s
- THW In-between: >= 2 s and < 3.5 s
- THW Distant: 3.5 s
- Speed tolerance: 1.4 m/s
- Minimum duration: 2 s
- Maximum drop out: 0 s
- Minimum speed: 5.56 m/s
- Minimum longitudinal distance decrease: 30%
- Static object speed: 1 m/s

These scenarios are then applying the *Mutually Exclusive Scenario Algorithm* (cf. 3.2) described below.

3.1.1 Uninfluenced Driving

Uninfluenced driving is classified if no object is detected, if a detected object is *Distant,* or if a lead object is *In-between* and travelling faster than the ego-vehicle by more than the *Speed tolerance*. The ego-vehicle must travel faster than *Minimum speed* and the consecutive duration of the criteria must be longer than *Minimum duration*.

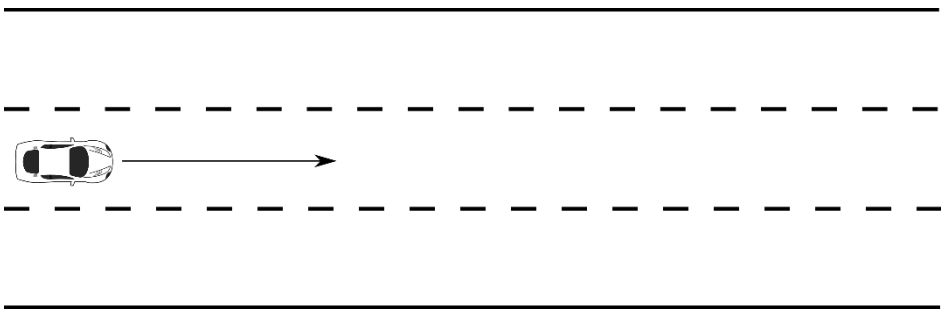

Figure 3-1: Uninfluenced driving scenario

3.1.2 Following a Lead Object

If a *Close* lead object is detected, then the scenario is classified as *following a lead object* as long as the speed difference does not qualify for an approaching scenario, i.e., less than *Speed tolerance*. If the relation between the two objects has a THW of *In-between,* then Following a lead vehicle is classified when the speed difference between the two objects are +- *Speed tolerance*.

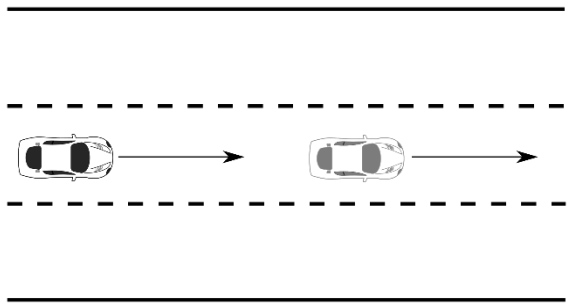

Figure 3-2: Following a lead object scenario

3.1.3 Driving in a Traffic Jam

The ego-vehicle is travelling in a traffic jam. This is determined by a speed below 60 km/h over a period of at least 180 s.

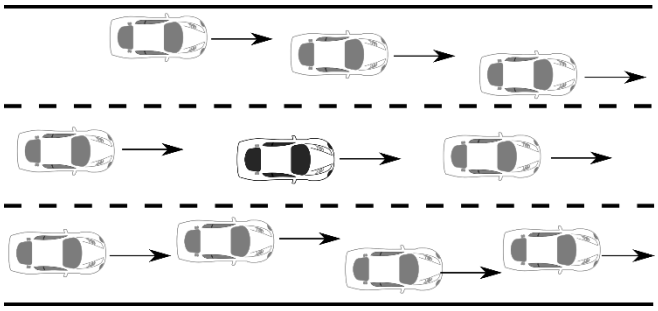

Figure 3-3: Driving in a traffic jam scenario

3.1.4 Lane Change

Lane changes of the ego-vehicle are derived from the lateral position of the ego-vehicle with respect to the position of the lane markings. When a left or right marking is crossed, a lane change is detected and its start- and endpoint are determined. The starting point of the lane change is the point at which the car starts moving in the direction of the lane marking before crossing the marking. The end point of the lane change is the point where the car stops moving away from the lane marking after crossing the marking. A maximum window size of 10 s before and after crossing the marking is set to limit the start- and endpoint, respectively. Left and right lane changes are coded separately.

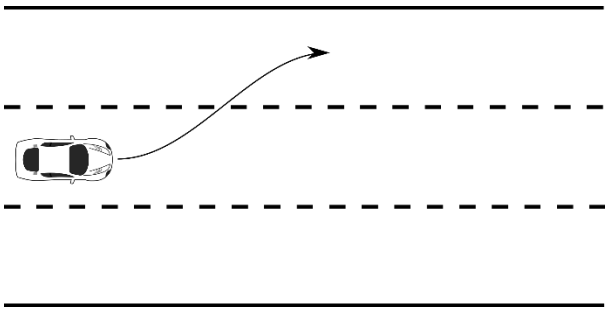

Figure 3-4: Lane change scenario

3.2 Mutually Exclusive Scenario Algorithm

Due to signal noise and smoothing, it can occur that the independent scenario extraction pipelines simultaneously report the presence of otherwise mutually exclusive scenarios. To enforce the mutual exclusivity defined within *D3.3 Evaluation Methods (Metz et al., 2019)* in a deterministic fashion, an algorithm based on weighted directed acyclic graphs (DAG) was developed.

As input, the algorithm requires the scenario detections for each time step, a list of which transitions from one scenario to another are allowed between time steps, and a minimum duration for each scenario to filter out false positive detections. With these inputs, it can still occur that two simultaneously detected scenarios are deemed valid. In that case, to achieve a deterministic result, a prioritisation must be assigned to each scenario to decide which scenario is chosen over the other. The basic principle of the algorithm is that the nodes represent the time step, the scenario, and the remaining required duration of the scenarios. The validity of transition is indicated through the presence of an edge, and the prioritisation is depicted through weighting of the edges. Finally, the deterministic selection of scenario detections without any overlap of mutually exclusive scenarios is acquired through the shortest path through the graph from start to end.

More information on this Algorithm can be found in D7.3 Annex A 2.1.6 and in Schuldes et al. (2021).

3.3 Performance Indicators Contained in Dataset and Available Files

Table 3-2 lists the performance indicators provided in the open dataset. Furthermore, each row contains an indication of the condition:

- Condition = 3 indicates driving scenarios with ADF active
- Condition = 0 indicated driving in baseline

Table 3-2: Performance indicators contained in open data

Item	Name	Symbol	Unit
Min_ax	Minimum longitudinal acceleration	$\min(a_x)$	m/s^2
Max_ax	Maximum longitudinal acceleration	$\max(a_x)$	m/s^2
SD_ax	Standard deviation of longitudinal acceleration	$sd(a_x)$	m/s^2
Max_abs_ay	Maximum absolute lateral acceleration	$\max(\lvert a_y \rvert)$	m/s^2
SD_ay	Standard deviation of lateral acceleration	$sd(a_y)$	m/s^2
Mean_v	Mean speed	$m(v)$	m/s

Max_v	Max speed	$\max(v)$	m/s
SD_v	Standard deviation of speed	$sd(v)$	m/s
SD_Positio_in_lane	Standard deviation of position in lane	$sd(Pos\ in\ lane)$	m
Mean_Position_in_lane	Mean position in lane	$m(Pos\ in\ lane)$	m/s
Number_Of_Samples	Number of samples	$n(Samples)$	–
Condition	3 = ADF active, 0 = baseline	-	–
Mean_v_Norm	Mean normalized speed	$m(v_{norm})$	
Max_v_Norm	Max normalized speed	$\max(v_{norm})$	
Mean_THW	Mean time headway	$m(THW)$	s
SD_THW	Standard deviation of time headway	$sd(THW)$	s
Mean_LongDist_LeadVeh	Mean longitudinal distance to lead vehicle	$m(d_{long,lead})$	m
SD_LongDist_LeadVeh	Standard deviation of distance to lead vehicle	$m(d_{long,lead})$	m
Mean_v_LeadVeh	Mean speed of lead vehicle	$m(v_{lead})$	m/s

The dataset for vehicle data consists of the following files:

Table 3-3: Files for vehicle data

File	Contents
L3Pilot_OpenData_Following.csv	PIs derived from non-chunked *Following a lead vehicle* scenario instances
L3Pilot_OpenData_Following_Chunked.csv	PIs derived from chunked *Following a lead vehicle* scenario instances
L3Pilot_OpenData_Following_Norm.csv	Normalized PIs from non-chunked *Following a lead vehicle* scenario instances
L3Pilot_OpenData_Following_Chunked_Norm.csv	Normalized PIs from chunked *Following a lead vehicle* scenario instances
L3Pilot_OpenData_FreeDriving.csv	PIs derived from non-chunked *Free driving* scenario instances
L3Pilot_OpenData_FreeDriving_Chunked.csv	PIs derived from chunked *Free driving* scenario instances
L3Pilot_OpenData_FreeDriving_Norm.csv	Normalized PIs from non-chunked *Free driving* scenario instances
L3Pilot_OpenData_FreeDriving_Chunked_Norm.csv	Normalized PIs from chunked *Free driving* scenario instances
L3Pilot_OpenData_DrivingInTrafficJam.csv	PIs from non-chunked *Driving in Traffic Jam* scenario instances

L3Pilot_OpenData_LaneChange.csv	PIs from non-chunked *Lane change* scenario instances
L3Pilot_OpenData_Urban_Following.csv	PIs from non-chunked *Following a lead vehicle* scenario instances for urban ADF
L3Pilot_OpenData_Urban_FreeDriving.csv	PIs from non-chunked *Free Driving* scenario instances for urban ADF

3.4 Chunking

The scenarios *Uninfluenced driving* and *Following a lead vehicle* have the potential to vary substantially in their duration. Theoretically, the duration of uninfluenced driving can range from a few seconds up to more than an hour on an empty highway. There are several reasons why unwanted side effects of this wide range of scenario duration on the results should be avoided in the analysis:

- As shown by Dozza et al. (2013), there is a direct impact of the duration of an analysed sequence on PIs measuring variation of a measure.
- Without controlling for the duration, a scenario of a few seconds would have the same impact on the overall results as a scenario of a few hours.
- It might be that the scenario duration varies systematically between conditions; in that case impacts due to changes in scenario duration and direct impacts on the indicators could not be differentiated.

To ensure that the impact of scenario duration on the results is minimised, a process called chunking is applied: uninfluenced driving and car following scenarios are divided into sections of 10 seconds' duration and indicators are calculated per section. Figure 3.5 shows how instances of uninfluenced driving are cut-into several chunks with the same duration. In the end one piece remains, the duration of which differs in size from the other chunks. However, this difference is small and is therefore not expected to have an impact on the calculated PIs.

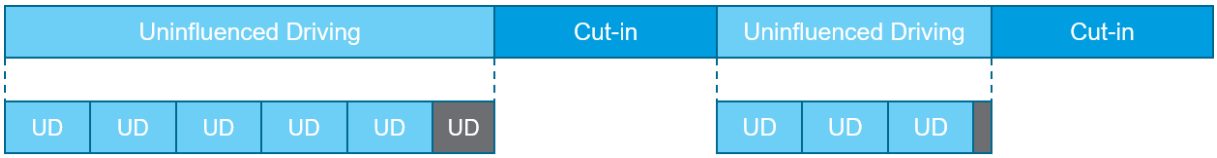

Figure 3.5: Example of an applied chunking procedure

The open dataset provides two files for the scenarios *Uninfluenced driving* and *Following a lead vehicle:* one with chunked scenarios and one with non-chunked scenarios. The files are not sorted such that chunked scenarios do not corresponds non-chunked scenarios.

3.5 Median-shifted Driven Speeds

Initial explorative analyses showed that, as expected, there was a strong influence of the speed limit on the average speed as well as on the maximum speed. Ignoring this would incorporate a lot of noise in the data. On the other hand, explicitly including speed limit as a factor in the analysis was not a straightforward way to go either. First of all, in more than 40% of the observations, the speed limit was hidden (because it would have made it possible to link entries in the database with a single Pilot site.) or it was unlimited (as can happen on German motorways). Second, separating the analysis by speed limit would introduce the risk of revealing the origin of certain parts of the data, for instance because some limits only occur on certain test sites.

To use as much of the data as possible, and at the same time stay close to the analysis method used for the other PIs, the following approach was used. First, the data was separated by speed limit. For each speed limit, the distribution of the PI was derived, for Baseline (BL) as well as for ADF. Also, the median of the combined distribution (pooled over BL and ADF) was determined. This is illustrated in Figure 3.6.

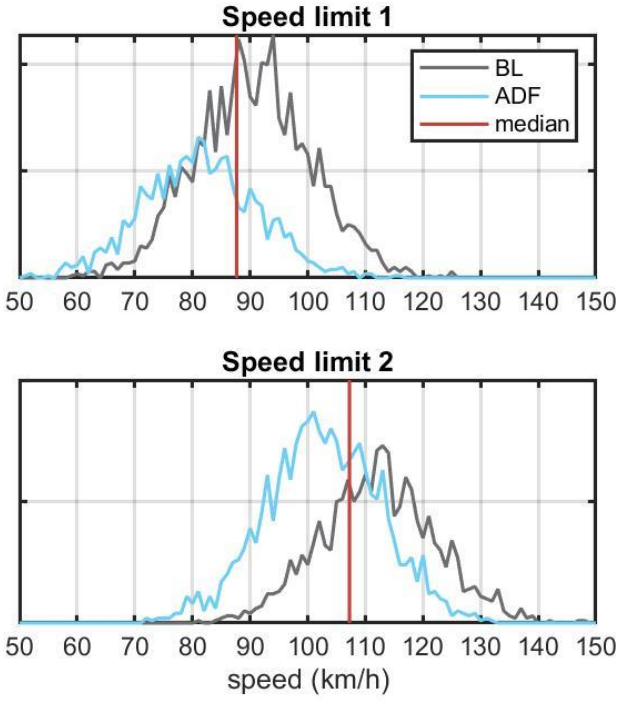

Figure 3.6: Distribution of average speeds as a function of speed limit and experimental condition (artificial data)

Next, all distributions were shifted, such that for each speed limit the median was 0. This is illustrated in Figure 3.7: the shape of the entire distribution remains unchanged, as well as any difference that might exist between BL and ADF.

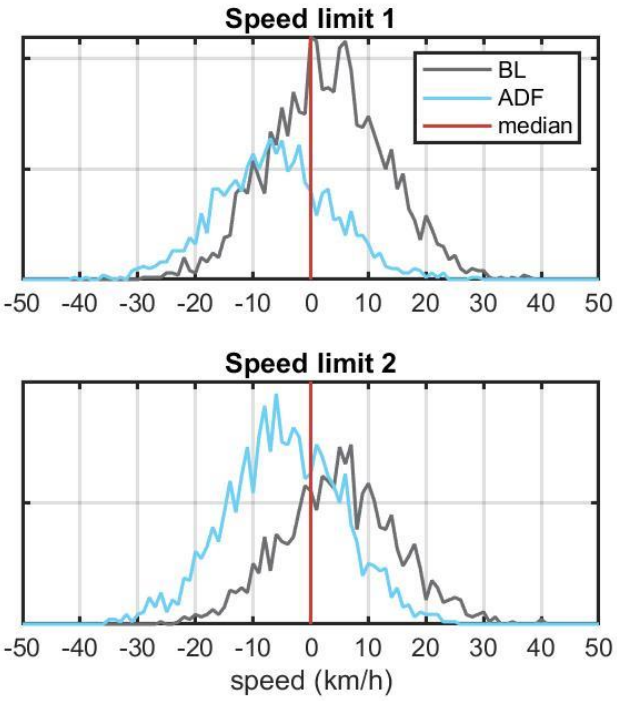

Figure 3.7: Distribution of average speeds as a function of speed limit and experimental condition (artificial data)

As the final pre-processing step, the data were pooled over all speed limits, ending up with two distributions: one for BL and one for ADF (see Figure 3.8). After this, the same non-parametric test could be applied as for the other PIs. In that process, the Cohen effect size could be calculated as well. Only the effect size in % could not be calculated, because the original absolute values of the speeds were lost in the alignments of the medians.

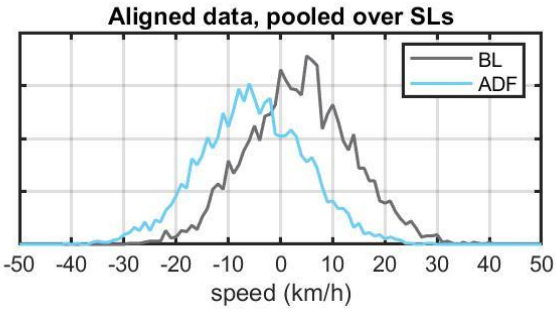

Figure 3.8: Distribution of average speeds as a function experimental condition, after aligning the medians and then pooling over all speed limits (artificial data)

The PIs derived by this method are contained as *Mean_v_norm* and *Max_v_norm* in the datasets.

3.6 Available Data and Data Filtering

All the results are based on data collected at various Pilot sites, pre-processed by the Pilot data processing partners and uploaded to the CDB.

Table 3-4 gives an overview of the dataset used for the analyses and provided as open data.

Table 3-4: Available data per driving scenario before and after filtering

	N instances Baseline			N instances ADF			N instances Total		
	Before filtering	After filtering	% kept	Before filtering	After filtering	% kept	Before filtering	After filtering	% kept
Uninfluenced driving	122,234	99,757	**81.6**	232,517	190,979	**82.1**	354,751	290,736	**82.0**
Following	78,995	64,740	**82.0**	178,247	150,066	**84.2**	25,7242	214,806	**83.5**
Lane change	30,288	26,732	**88.3**	27,151	25,141	**92.6**	57,439	51,873	**90.3**
Driving in traffic jam	487	390	**80.1**	2,968	1,976	**66.6**	3,455	2,366	**68.5**

As described earlier, the process for scenario detection and PI calculation for motorway and urban ADF is completely automatised. On the highest level and for all analyses, the complete dataset is filtered in such a way that only the relevant road category (motorway or urban area) and the conditions (baseline and ADF active) are included.

Furthermore, filtering criteria are implemented at the level of the driving scenario to avoid including obviously unreliable scenario instances. The main inclusion and exclusion criteria are set, first based on the duration of the detected scenarios, allowing unrealistically short instances to be excluded. Table 3-4 lists the different scenarios, used inclusion / exclusion criteria, and the number of instances remaining after filtering. The number of scenario instances listed in the result sections can be lower than the number shown in Table 3-4 because not all PIs are available for every scenario instance (e.g., TTC is not always defined).

Throughout the analysis, unrealistically short scenario instances are excluded from the data. For this, the following filter criteria are used:

- Trip-based indicators: minimum overall duration of included trip sections is 5 minutes.
- Cut-in scenarios: minimum duration of included scenario instances is 0.9 seconds.
- Approaching a traffic jam and driving in a traffic jam: minimum duration of included scenario instances is 20 seconds.

- All other scenario types: included scenario instances have a duration of at least 2.0 seconds.

Similar filtering criteria were applied for the urban use case and analysis. The following criteria were used:

Table 3-5: Impact of applied filter criteria on the database for urban ADF

	N instances Baseline			N instances ADF			N instances Total		
	before filter	after filter	% kept	before filter	after filter	% kept	before filter	after filter	% kept
Following a lead object	5,517	55,17	**100**	1,157	1,155	**99.8**	6,674	6,672	**99.9**
Lane change	21,301	17,217	**80.8**	16,085	14,125	**87.8**	37,386	31,342	**83.8**
Uninfluenced driving	19,219	19,219	**100**	15,136	15,136	**100**	34,355	34,355	**100**

- All other scenario types: minimum duration of included scenario instances is 2 seconds.

3.7 Bootstrapping for Urban Data

In the urban Technical and Traffic Evaluation there were three Pilot sites. One of them contributed a large number of driving hours compared to the others. Consequently, also the number of scenario instances was considerably higher for one Pilot site, for many scenarios. This posed a challenge to the data analysis, because simply pooling the data would mean that results from a single Pilot site would dominate the results. This would have compromised the aim to evaluate urban ADFs in general. To balance the contribution of all the urban Pilot sites an additional bootstrapping step was performed before the data was uploaded to the CDB.

In technical terms, the urban Technical and Traffic Evaluation had a class imbalance problem, meaning that the majority class had more data points than the minority class(es). Consequently, the statistical model based on the data might not capture the properties of the minority class and would not generalise to new data well. A straightforward solution to address a class imbalance problem is to either undersample the majority class or oversample the minority classes. Undersampling means that samples smaller than the original data are drawn with replacement to represent the majority class. In oversampling, samples larger than the original data are drawn with replacement to represent the minority class.

In the present case, 50 sampling rounds were performed. In each round, the largest Pilot site was undersampled and for the two smaller sites the sample size was the same as their original data. The samples obtained in each sampling round was pooled and uploaded to the

CDB with an extra variable indicating the sampling round. In effect, this created 50 datasets representing the original data in a more balanced way. In other words, the process was similar to using bootstrapping to estimate statistical indicators.

An alternative to the bootstrapping process would have been to create synthetic data based on the minority classes. However, these procedures are potentially complex, and the validity of the data would have needed to be ensured. Another alternative would have been to make the analysis separately for each Pilot site and then weight the results. However, this would have required complex procedures to ensure the confidentiality of the Pilot sites and no data could have been shared.

3.7.1 Noise

This bootstrapping step creates another challenge for data confidentiality. The data points at smaller sites are more likely to be sampled in multiple rounds. Consequently, the data from minority sites were more likely to be repeated multiple times and, at least in theory, it would be possible to distinguish larger Pilot sites from the others. To make the identification of data sources less feasible, a small amount of normal noise was added to the variables of interest. This procedure, also called smooth bootstrapping, ensured the uniqueness of data points. The added noise also had the effect of smoothing the distributions.

3.7.2 Implications for Statistical Inference

In a typical bootstrapping process, a large number of samples are drawn with replacement from the original data. Based on the samples, the statistical indicators for the original data such as mean or median and their variance can be estimated based on the samples. In short, the bootstrap-based estimation is performed by calculating the statistical indicator for each sample and then deriving the variance estimates based on the distribution of the sample indicators.

Bootstrapped variance estimates are unbiased when the bootstrap sample size is equal to the original data size (Efron & Tibshirani, 1986). Using a different sample size influences the variance estimated. In case of undersampling the variance estimates become larger, and with oversampling smaller.

To illustrate the effect of the under- and oversampling, a simulation was performed. Two datasets were generated, one representing “baseline” and another “treatment”. Both datasets had a variable of interest y. For the baseline, the 100 data points were drawn from a normal distribution N(1, 4). For the treatment, also 100 data points values were drawn from N(1.5, 4). The resulting datasets had M=1.14 and M=1.85 respectively.

Next, both datasets were sampled at different sample sizes. The term *sampling factor* is used to represent that size of the sample relative to the original data size. A sampling factor of one means that the bootstrapped sample size was equal to the original number of data points. Sampling factors of less than one represent undersampling (e.g., 0.2 = 20% of the

original data size), and larger than one oversampling (e.g., 2 = 200% of the original data size). In the simulation, 50 sampling rounds were done.

Figure A3-9 shows how the sample means and their 1.96 * standard error for the baseline and treatment groups change with the sampling factor. The standard error of the mean increases when the sampling factor decreases (undersampling) and decreases when the sampling factor increases (oversampling).

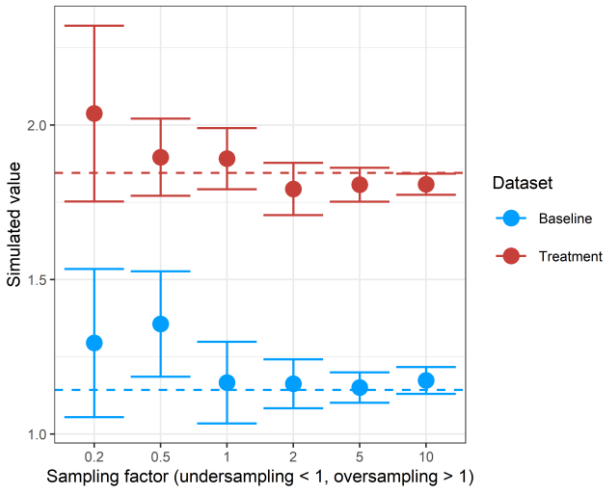

Figure A3-9: Sample means (dots) and their 1.96 standard errors as a function of the sampling factor for simulated baseline and treatment datasets. The true means of the simulated are data shown as dashed lines.

The implications for the statistical inference are clear. Undersampling increases the risk of type II error (false negative), while oversampling increases the risk of type I error (false positive). Consequently, undersampling of the majority site makes statistical inference based on the confidence intervals more conservative as the confidence intervals increase.

Trip PIs and scenario instances were composed of multiple values. Consequently, the bootstrapping procedure preserved the correlations between the different values, e.g., speed and acceleration, within the scenario instances and trips. However, as scenario instances and Trip PIs were treated as independent observations, correlations between different types of scenarios are not preserved.

3.7.3 Algorithm

The bootstrapping step was implemented in the data_sampler.py script. For each file type (scenarios and Trip PIs) the following steps were performed:

1. The sample sizes were determined manually for each Pilot site and file type so that data would be in balance.
2. The data files generated by the urban tool chain were read into a data frame.

3. Variables which could not be shared were filtered out.
4. A single scenario instance was represented by a single row in the data. Scenario instances were first divided into baseline and ADF conditions (*System_available* and *System_unavailable* were not used).
5. Random samples with replacement were drawn from the baseline and ADF scenarios. Sample sizes for the baseline and ADF could be different.
6. Steps 4 and 5 were repeated 50 times to generate 50 datasets.
7. To make it difficult to infer which observations were repeated in the sampling process, a small amount of noise was added to all the measurement variables and to certain index-based variables (*Scenario_Start_Index*, *Number_of_Samples*). For measurement variables, the noise was generated from normal distribution with the mean at zero, and the standard deviation set to be equal to 1% of the standard deviation in the original data. For the index-based variables, a single integer between -3 and 3 was drawn from a uniform distribution.
8. The resulting datasets were stored with new unique *TripID*s generated based on the original ID, sampling round, and Pilot site-specific salt key. Information on the sampling round was preserved.

4 Subjective Data

In order to carry out the User and Acceptance Evaluation for the three different ADF considered for the evaluation in L3Pilot (see section 1.2), three Pilot site questionnaires were designed, one for each environment, with function-specific questions for ADF operating in each environment. This method allowed us to collect responses that are context and ADF specific.

The questionnaire was in two parts (included as Annex in D3.4 – Evaluation Plan (Innamaa et al. 2020), the first of which was administered before the Pilot drives commenced. The first part included questions related to socio-demographic factors (age, gender, country of residence, education level, employment status, income, and family size), vehicle use and purchasing decisions, driving history, in-vehicle system usage, activities while driving, trip choices, and mobility patterns. The data was then used to create different user groups for the evaluation, and to understand the impact of various socio-demographic factors on participants' acceptance and perception of the ADFs.

The second part of the questionnaire was administered immediately after the Pilot drive concluded, or the final Pilot drive if a participant participated in more than one drive. It examined participants' initial reactions to a given ADF, including acceptance, safety and comfort. To examine whether participants felt they would change any of their behaviours should they have access to that ADF in their daily life, they were re-asked questions about vehicle use and purchasing decisions, driving history, in-vehicle system usage, engagement with non-driving tasks, trip choices, and mobility patterns. The questions in this section were phrased to address the specific ADF under investigation, the only exception being motorway and traffic jam ADF, which utilise the same questions, because they have similar ODD.

As an optional additional section, where feasible, users' controllability and performance during and after a take-over was evaluated mid-drive, following any need to resume manual control from the ADF. For this analysis, drivers were asked immediately after a take-over scenario to rate the criticality of the preceding situation as a whole on a ten-point scale, ranging from harmless (1) to uncontrollable (10). The scale is based on that by Neukum et al. (2008) and allows a direct comparison of drivers' own evaluation of the take-over and the post-drive evaluation by expert raters. This data was collected for ordinary drivers and at Pilot sites where the safety protocol permitted mid-drive evaluations.

4.1 Questionnaire Methodology

In total, data from 354 unique drivers was collected for the Motorway Pilot Site Questionnaire from the CDB. The data was further tabulated into three groups. Table 4-1 lists the demographic details of the participants in the three driver and test type groups: professional drivers from the Pilot sites, ordinary drivers from the Pilot sites (some including Wizard-of-Oz studies conducted on test tracks), and ordinary drivers from simulator studies. In total, data from 175 participants was collected for the Urban Pilot Site Questionnaire from the CDB. The data consisted of 15 professional drivers and 160 passengers; the data was analysed without separating it into different groups. Table 4-1 shows the demographic information of the participants of the Urban Pilot Site Questionnaire.

Table 4-1: Demographic details of participants in the motorway and urban Pilot site questionnaires

	Professional Drivers from Motorway Real Pilot Site (N = 58)	Non-Professional Drivers from Motorway Real Pilot Site (N = 236)	Non-Professional Drivers from Motorway Simulator Studies (N = 60)	Urban Pilot Site Questionnaire (N = 175)
Gender	• 47 Male (81%) • 9 Female • 1 Other • 1 Prefer not to say	• 171 Male (72%) • 48 Female • 1 Other • 16 missing data	• 31 Male (52%) • 29 Female	• 115 Male (78%) • 60 Female (22%)
Age	• Range: 23-57 years • M = 40.11 • SD = 11.26	• 22-70 years • M = 40.72 • SD = 11.28 • 16 missing data	• 22-62 years • M = 39.25 • SD = 11.88	• 20-68 years • M = 39.47 • SD = 11.29
Driving Experience (years)	• < 1 year (0%) • 1-2 years (0%) • 2-10 years (28%) • > 10 years (72%)	• < 1 year (0%) • 1-2 years (0%) • 2-10 years (18%) • >10 years (82%)	• < 1 year (0%) • 1-2 years (2%) • 2-10 years (23%) • >10 years (75%)	• < 1 year (1%) • 1-2 years (1%) • 2-10 years (25%) • > 10 years (74%)
Driving Experience (distance in km)	• < 2000 (3%) • 2000-5000 (3%) • 5000-10000 (22%) • 10000-15000 (12%) • 15000-20000 (14%) • 20000-50000 (34%) • > 50000 (10%)	• < 2000 (4%) • 2000-5000 (8%) • 5000-10000 (14%) • 10000-15000 (20%) • 15000-20000 (30%) • 20000-50000 (21%) • > 50000 (2%)	• < 2000 (8%) • 2000-5000 (18%) • 5000-10000 (18%) • 10000-15000 (17%) • 15000-20000 (17%) • 20000-50000 (18%) • > 50000 (3%)	• < 2000 (6%) • 2000-5000 (16%) • 5000-10000 (18%) • 10000-15000 (17%) • 15000-20000 (21%) • 20000-50000 (21%) • > 50000 (2%)

As shown in the previous section, there were five RQs related to User's Acceptance and Awareness. To answer each of these RQs, questions were administered using a six-point scale, unless otherwise stated, whereby 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree and 6 = Don't know.

4.2 Questionnaires Data for Motorway and Traffic Jam ADF

Table 4-2: Questionnaire items for Motorway and Traffic Jam ADF

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
Supplement Questions	ADF_Type	i. What is the ADF type that the test participant has experienced for which the following questionnaire responses have been collected?	"1"="TJ" "2"= "Motorway" "3"="Urban" "4"="Parking"	1	4
	Participant_ID_Token	ii. What is the participant ID token whose responses are following?	(It is a random generated 8 digit code?)	NA	NA
	Participant_Type	iii. What is the participant type for whom the following responses are uploaded?	"1"= "Professional (test) driver" "2"= "Non-professional driver" "3"= "Passenger"	1	3
	Test_Type	iv. What test type has the participant experienced?	"1"= "Real Pilot road test" "2"="Test track" "3"="Driving Simulator" "4"="Wizard-of-Oz"	1	4
Questionnaire Questions Items- Pre-piloting questions	TJM1	1. What year were you born?	YEAR	1929	2001
	TJM2	2. What is your gender?	"1"= "Male" "2"= "Female" "3" ="Other" "4" ="Prefer not to say"	1	4
	TJM6	6. Could you do part of your job whilst on transportation e.g. travelling on a bus, train or plane?	"1"= "Yes" "2"= "No"	1	2
	TJM7	7. Do you have a car available for your use?	"1"= "Yes, (nearly) always" "2"= "Yes, sometimes"	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			"3"= "No or hardly ever"		
	TJM10	10. How many children under 19 years old live in your household?	"1"= "none" "2" ="1" "3"= "2" "4"= "3" "5"= "4" "6" ="more than 4"	1	6
	TJM16_SQ001	[Highly familiar|Highly Unfamiliar] 16. Today you will be operating with ...How familiar are you with this type of systems you will be using today?	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	5
	TJM17	17. How many years of driving experience do you have?	"1" ="less than one year" "2"= "1-2 years" "3"= "2-10 years" "4" ="more than 10 years"	1	4
	TJM18	18. On average, how often do you drive a car?	"1" ="(Nearly) Every day" "2"= "3-5 days / week" "3" ="1-2 days / week" "4"= "Less often or never"	1	4
	TJM19	19. Approximately how many kilometres did you drive in the last 12 months?	"1" = less than 2 000 km "2"= 2 000- 5 000 km "3"=5 000- 10 000 km "4"=10 000- 15 000 km "5"=15 000- 20 000 km "6"= 20 000- 50 000 km "7"=more than 50 000 km	1	7

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM20_SQ001	[Parking Assist System: (A system that provides a camera view and/or auditory beeps to indicate how close you are to an object, while you are parking).] 20. Please state if your current vehicle is equipped with the following systems:	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	TJM20_SQ002	[Self-parking Assist System (A system that controls the vehicle for parallel parking or reverse parking. Some of these systems control both steering and the throttle; others only control the steering and the driver presses the brake and throttle).] 20. P	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	TJM20_SQ003	[Cruise Control (CC) or Adaptive Cruise Control (ACC) (A system that maintains vehicle speed while driving (CC), or also automatically slows down or speeds up to keep a safe distance from a vehicle ahead (ACC)).] 20. Please state if your current vehicle	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	TJM20_SQ004	[Blind spot monitoring (A system that monitors the driver's left and right blind spots for other vehicles. Often, drivers receive a visual or audio alert whenever a vehicle is present).] 20. Please state if your current vehicle is equipped with the fol	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	TJM20_SQ005	[Lane departure warning systems (A system that provides assistance with lane-keeping, by sounding warnings when the vehicle travels outside of the lane markings/boundaries).] 20. Please state if your current vehicle is equipped with the following systems	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM20_SQ006	[Lane keeping assistance (A system that helps motorists to avoid inadvertently moving out of the intended driving lane).] 20. Please state if your current vehicle is equipped with the following systems:	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	TJM20_SQ007	[Forward Collision Warning systems (A system that provides warnings for potential collisions with the vehicle in front).] 20. Please state if your current vehicle is equipped with the following systems:	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	TJM21_SQ002	[Music, radio, audiobooks] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	TJM21_SQ003	[Interact with a passenger] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	TJM21_SQ004	[Eating or drinking] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM21_SQ005	[Calling] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	TJM21_SQ006	[Smoking] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	TJM21_SQ010	[Navigation] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	TJM21_SQ012	[None] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	TJM22_SQ001_A1	[Commuting] [Passenger car] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Exclude	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM22_SQ001_A2	[Commuting] [Public transport] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Excl	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ001_A3	[Commuting] [Taxi] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Exclude trips ma	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ001_A4	[Commuting] [Motorbike or scooter] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable).	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ001_A5	[Commuting] [Bicycle or walking] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Ex	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ001_A6	[Commuting] [I don't take such trips] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicab	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ002_A1	[Business travel] [Passenger car] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). E	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ002_A2	[Business travel] [Public transport] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the	1 = one most used, 2 = second most used (if	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
		one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable)	applicable), 3 = third most used (if applicable), -1 otherwise		
	TJM22_SQ002_A3	[Business travel] [Taxi] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Exclude tr	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ002_A4	[Business travel] [Motorbike or scooter] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applica	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ002_A5	[Business travel] [Bicycle or walking] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicabl	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ002_A6	[Business travel] [I don't take such trips] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if ap	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ003_A1	[Leisure/social] [Passenger car] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Ex	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ003_A2	[Leisure/social] [Public transport] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable).	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM22_SQ003_A3	[Leisure/social] [Taxi] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Exclude tri	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ003_A4	[Leisure/social] [Motorbike or scooter] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicab	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ003_A5	[Leisure/social] [Bicycle or walking] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ003_A6	[Leisure/social] [I don't take such trips] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if app	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ004_A1	[Errands (incl. groceries)] [Passenger car] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if appl	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ004_A2	[Errands (incl. groceries)] [Public transport] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if a	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ004_A3	[Errands (incl. groceries)] [Taxi] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the	1 = one most used, 2 = second most used (if	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
		one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable).	applicable), 3 = third most used (if applicable), -1 otherwise		
	TJM22_SQ004_A4	[Errands (incl. groceries)] [Motorbike or scooter] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ004_A5	[Errands (incl. groceries)] [Bicycle or walking] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM22_SQ004_A6	[Errands (incl. groceries)] [I don't take such trips] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most u	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	TJM23_SQ001	[Lack of time greatly affects my daily travel choices.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	TJM23_SQ002	[I tend to select the cheapest mode of transport, even if it would take more time.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	TJM23_SQ003	[I tend to select the quickest mode of transport, even if it would cost me more.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM23_SQ004	[I would travel more in my daily life if travelling was easier.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	TJM23_SQ005	[I tend to select the most comfortable mode of transport.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	TJM23_SQ006	[Traffic jams affect my choice of mode.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	TJM23_SQ007	[Traffic jams affect my choice of route in the car.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	TJM23_SQ008	[Traffic jams affect the time that I choose to take my trips.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	TJM23_SQ009	[Weather conditions affect my decision to drive.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM23_SQ010	[Darkness affects my decision to drive.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	TJM23_SQ011	[Fatigue affects my decision to drive.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	TJM24_SQ002	[Driving on a motorway] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days / week" "5"= "Less often or never"	1	5
	TJM24_SQ003	[Driving on a congested motorway] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days / week" "5"= "Less often or never"	1	5
	TJM24_SQ004	[Driving on rural roads] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days / week" "5"= "Less often or never"	1	5
	TJM24_SQ005	[Driving on urban streets] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days	1	5

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			/ week" "5"= "Less often or never"		
	TJM24_SQ006	[Driving at night] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days / week" "5"= "Less often or never"	1	5
	TJM24_SQ007	[Driving fatigued] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days / week" "5"= "Less often or never"	1	5
	TJM25_SQ001	[Driving on motorways is stressful] 25. Below is a list of statements on driving on motorways. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	TJM25_SQ002	[Driving on motorways is difficult] 25. Below is a list of statements on driving on motorways. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	TJM25_SQ003	[Driving on motorways is demanding] 25. Below is a list of statements on driving on motorways. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			agree" "6" ="Don't know"		
	TJM25_SQ004	[Driving on motorways is fun] 25. Below is a list of statements on driving on motorways. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	TJM27_SQ001	[ ] 27. When it comes to trying a new technology product I am generally....	"1"= "mong the last" "3"= "in the middle" "2" ="mong the first"	1	3
	TJM31_SQ001	[Useful|Useless] 31. I think that the tested motorway pilot system was ...	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	TJM31_SQ002	[Pleasant|Unpleasant] 31. I think that the tested motorway pilot system was ...	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	TJM31_SQ003	[Bad|Good] 31. I think that the tested motorway pilot system was ...	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	TJM31_SQ004	[Nice|Annoying] 31. I think that the tested motorway pilot system was ...	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	TJM31_SQ005	[Effective|Superfluous] 31. I think that the tested motorway pilot system was ...	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM31_SQ006	[Irritating|Likeable] 31. I think that the tested motorway pilot system was ...	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	TJM31_SQ007	[Assisting|Worthless] 31. I think that the tested motorway pilot system was ...	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	TJM31_SQ008	[Undesirable|Desirable] 31. I think that the tested motorway pilot system was ...	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	TJM31_SQ009	[Raising alertness|Sleep-inducing] 31. I think that the tested motorway pilot system was ...	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	TJM33_33a	[I would use this system if it was in my car.] 33. Below is a list of statements on the system you used today. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	TJM33_33n	[I would use the time the system was active to do other activities.] 33. Below is a list of statements on the system you used today. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	TJM33_33p	[I would use the system during my everyday trips.] 33. Below is a list of statements on the system you used today. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			"6" ="Don't know"		
	TJM33_33v	[I would make MORE trips if I had the function in my car.] 33. Below is a list of statements on the system you used today. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	TJM33_33w	[I would select destinations further away if I had the function in my car] 33. Below is a list of statements on the system you used today. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	TJM34_SQ001	[Texting] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ002	[Music, radio, audiobooks] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM34_SQ003	[Interact with a passenger] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ004	[Eating or drinking] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ005	[Calling] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ006	[Smoking] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ007	[Personal hygiene/Cosmetics] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			infrequently" "6" ="Never		
	TJM34_SQ008	[Smart phone apps] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ009	[Social Media] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ010	[Navigation] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ011	[Browsing the internet] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM34_SQ012	[Sleeping] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ013	[Watching movies] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ014	[Office/work tasks] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM34_SQ015	[None] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	TJM35	35. Imagine that you have a partly self-driving car which is able to drive by itself on motorway. While the car is driving by itself, you can focus on other activities (reading news or email, watching videos, eating, etc.). You have a flexible schedule	None	Not applicable	Not applicable

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	TJM36	36. Imagine that you have a partly self-driving car which is able to drive by itself in congestion. You have a trip that takes 30 minutes of driving. You have scheduled it to avoid the peak of congestion. How much additional time would you be willing to	None	Not applicable	Not applicable

4.3 Questionnaires Data for Urban ADF

Table 4-3: Questionnaire items for Motorway and Traffic Jam ADF

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
Supplement Questions	ADF_Type	i. What is the ADF type that the test participant has experienced for which the following questionnaire responses have been collected?	"1"="TJ" "2"= "Motorway" "3"="Urban" "4"="Parking"	1	4
	Participant_ID_Token	ii. What is the participant ID token whose responses are following?	(It is a random generated 8 digit code?)	NA	NA
	Participant_Type	iii. What is the participant type for whom the following responses are uploaded?	"1"= "Professional (test) driver" "2"= "Non-professional driver" "3"= "Passenger"	1	3
	Test_Type	iv. What test type has the participant experienced?	"1"= "Real Pilot road test" "2"="Test track" "3"="Driving Simulator" "4"="Wizard-of-Oz"	1	4
Questionnaire Questions Items- Pre-piloting questions	U1	1. What year were you born?	YEAR	1929	2001
	U2	2. What is your gender?	"1"= "Male" "2"= "Female" "3" ="Other" "4" ="Prefer not to say"	1	4
	U6	6. Could you do part of your job whilst on transportation e.g. travelling on a bus, train or plane?	"1"= "Yes" "2"= "No"	1	2
	U7	7. Do you have a car available for your use?	"1"= "Yes, (nearly) always" "2"= "Yes, sometimes" "3"= "No or hardly ever"	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	U10	10. How many children under 19 years old live in your household?	"1"= "none" "2" ="1" "3"= "2" "4"= "3" "5"= "4" "6" ="more than 4"	1	6
	U16_SQ001	[Highly familiar|Highly Unfamiliar] 16. Today you will be operating with ...How familiar are you with this type of systems you will be using today?	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	5
	U17	17. How many years of driving experience do you have?	"1" ="less than one year" "2"= "1-2 years" "3"= "2-10 years" "4" ="more than 10 years"	1	4
	U18	18. On average, how often do you drive a car?	"1" ="(Nearly) Every day" "2"= "3-5 days / week" "3" ="1-2 days / week" "4"= "Less often or never"	1	4
	U19	19. Approximately how many kilometres did you drive in the last 12 months?	"1" = less than 2 000 km "2"= 2 000- 5 000 km "3"=5 000- 10 000 km "4"=10 000- 15 000 km "5"=15 000- 20 000 km "6"= 20 000- 50 000 km "7"=more than 50 000 km	1	7
	U20_SQ001	[Parking Assist System: (A system that provides a camera view and/or auditory beeps to indicate how close you are to an object, while you are parking).] 20. Please state if your current vehicle is equipped with the following systems:	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't	1	4

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			know if I have it"		
	U20_SQ002	[Self-parking Assist System (A system that controls the vehicle for parallel parking or reverse parking. Some of these systems control both steering and the throttle; others only control the steering and the driver presses the brake and throttle).] 20. P	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	U20_SQ003	[Cruise Control (CC) or Adaptive Cruise Control (ACC) (A system that maintains vehicle speed while driving (CC), or also automatically slows down or speeds up to keep a safe distance from a vehicle ahead (ACC)).] 20. Please state if your current vehicle	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	U20_SQ004	[Blind spot monitoring (A system that monitors the driver's left and right blind spots for other vehicles. Often, drivers receive a visual or audio alert whenever a vehicle is present).] 20. Please state if your current vehicle is equipped with the fol	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	U20_SQ005	[Lane departure warning systems (A system that provides assistance with lane-keeping, by sounding warnings when the vehicle travels outside of the lane markings/boundaries).] 20. Please state if your current vehicle is equipped with the following systems	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	U20_SQ006	[Lane keeping assistance (A system that helps motorists to avoid inadvertently moving out of the intended driving lane).] 20. Please state if your current vehicle is equipped with the following systems:	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't	1	4

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			know if I have it"		
	U20_SQ007	[Forward Collision Warning systems (A system that provides warnings for potential collisions with the vehicle in front).] 20. Please state if your current vehicle is equipped with the following systems:	"1"= "I have it and I use it" "2"= "I have it but I don't use it" "3"= "I don't have it" "4"= "Don't know if I have it"	1	4
	U21_SQ002	[Music, radio, audiobooks] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	U21_SQ003	[Interact with a passenger] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	U21_SQ004	[Eating or drinking] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	U21_SQ005	[Calling] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	U21_SQ006	[Smoking] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	U21_SQ010	[Navigation] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	U21_SQ012	[None] 21. While driving on the motorway, how often do you engage in the following activities:	"1"= "Very frequently" "2" ="Frequently" "3"= "Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never"	1	6
	U22_SQ001_A1	[Commuting] [Passenger car] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Exclude	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	U22_SQ001_A2	[Commuting] [Public transport] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Excl	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ001_A3	[Commuting] [Taxi] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Exclude trips ma	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ001_A4	[Commuting] [Motorbike or scooter] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable).	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ001_A5	[Commuting] [Bicycle or walking] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Ex	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ001_A6	[Commuting] [I don't take such trips] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable)	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ002_A1	[Business travel] [Passenger car] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). E	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			applicable), -1 otherwise		
	U22_SQ002_A2	[Business travel] [Public transport] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable)	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ002_A3	[Business travel] [Taxi] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable).	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ002_A4	[Business travel] [Motorbike or scooter] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable)	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ002_A5	[Business travel] [Bicycle or walking] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable)	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ002_A6	[Business travel] [I don't take such trips] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable)	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ003_A1	[Leisure/social] [Passenger car] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if	1 = one most used, 2 = second most used (if applicable), 3 = third most	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
		applicable), 3 for the third most used (if applicable). Ex	used (if applicable), -1 otherwise		
	U22_SQ003_A2	[Leisure/social] [Public transport] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable).	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ003_A3	[Leisure/social] [Taxi] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable). Exclude tri	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ003_A4	[Leisure/social] [Motorbike or scooter] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable)	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ003_A5	[Leisure/social] [Bicycle or walking] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ003_A6	[Leisure/social] [I don't take such trips] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if app	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ004_A1	[Errands (incl. groceries)] [Passenger car] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2	1 = one most used, 2 = second most used (if applicable), 3	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
		for the second most used (if applicable), 3 for the third most used (if applicable)	= third most used (if applicable), -1 otherwise		
	U22_SQ004_A2	[Errands (incl. groceries)] [Public transport] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if a	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ004_A3	[Errands (incl. groceries)] [Taxi] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if applicable).	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ004_A4	[Errands (incl. groceries)] [Motorbike or scooter] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ004_A5	[Errands (incl. groceries)] [Bicycle or walking] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most used (if	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3
	U22_SQ004_A6	[Errands (incl. groceries)] [I don't take such trips] 22. What mode of transport do you typically use for the following trip types? Choose 1-3 often used modes: 1 for the one most used, 2 for the second most used (if applicable), 3 for the third most u	1 = one most used, 2 = second most used (if applicable), 3 = third most used (if applicable), -1 otherwise	1	3

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	U23_SQ001	[Lack of time greatly affects my daily travel choices.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	U23_SQ002	[I tend to select the cheapest mode of transport, even if it would take more time.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	U23_SQ003	[I tend to select the quickest mode of transport, even if it would cost me more.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	U23_SQ004	[I would travel more in my daily life if travelling was easier.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	U23_SQ005	[I tend to select the most comfortable mode of transport.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	U23_SQ006	[Traffic jams affect my choice of mode.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	U23_SQ007	[Traffic jams affect my choice of route in the car.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	U23_SQ008	[Traffic jams affect the time that I choose to take my trips.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	U23_SQ009	[Weather conditions affect my decision to drive.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	U23_SQ010	[Darkness affects my decision to drive.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	U23_SQ011	[Fatigue affects my decision to drive.] 23. Please state your agreement with the following statements:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	5
	U24_SQ001	[Driving on a motorway] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days / week" "5"= "Less often or never"	1	5

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	U24_SQ002	[Driving on rural roads] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days / week" "5"= "Less often or never"	1	5
	U24_SQ003	[Driving on urban streets] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days / week" "5"= "Less often or never"	1	5
	U24_SQ004	[Driving at night] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days / week" "5"= "Less often or never"	1	5
	U24_SQ005	[Driving fatigued] 24. How often do you experience the following driving situations?	"1" ="Everyday" "2"= "Nearly every day" "3"= "3-5 days / week" "4" ="1-2 days / week" "5"= "Less often or never"	1	5
	U25_SQ001	[Driving in urban areas is stressful] 25. Below is a list of statements on driving in urban areas. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	U25_SQ002	[Driving in urban areas is difficult] 25. Below is a list of statements on driving in urban areas. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	U25_SQ003	[Driving in urban areas is demanding] 25. Below is a list of statements on driving in urban areas. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	U25_SQ004	[Driving in urban areas is fun] 25. Below is a list of statements on driving in urban areas. Please indicate how strongly you agree or disagree with each statement:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	U27_SQ001	[ ] 27. When it comes to trying a new technology product I am generally....	"1"= "mong the last" "3"= "in the middle" "2" ="mong the first"	1	3
Questionnaire Questions Items- Prost-piloting questions	U31_SQ001	[Useful|Useless] 31. I think that the tested partly self-driving system was …	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	U31_SQ002	[Pleasant|Unpleasant] 31. I think that the tested partly self-driving system was …	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	U31_SQ003	[Bad|Good] 31. I think that the tested partly self-driving system was …	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	U31_SQ004	[Nice|Annoying] 31. I think that the tested partly self-driving system was …	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	U31_SQ005	[Effective|Superfluous] 31. I think that the tested partly self-driving system was …	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	U31_SQ006	[Irritating|Likeable] 31. I think that the tested partly self-driving system was …	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	U31_SQ007	[Assisting|Worthless] 31. I think that the tested partly self-driving system was …	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	U31_SQ008	[Undesirable|Desirable] 31. I think that the tested partly self-driving system was …	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	U31_SQ009	[Raising alertness|Sleep-inducing] 31. I think that the tested partly self-driving system was …	"1"= "1" "2"= "2" "3"= "3" "4"= "4" "5"= "5"	1	5
	U33_33a	[I would use this system if it was in my car.] 33. Below is a list of statements on the system you use today. Please imagine how strongly you would agree or disagree with each statement from the point of view of a driver:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	U33_33n	[I would use the time the system was active to do other activities.] 33. Below is a list of statements on the system you use today. Please imagine how strongly you would agree or disagree with each statement from the point of view of a driver:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree"	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			"6" ="Don't know"		
	U33_33p	[I would use the system during my everyday trips.] 33. Below is a list of statements on the system you use today. Please imagine how strongly you would agree or disagree with each statement from the point of view of a driver:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	U33_33u	[I would make MORE trips if I had the function in my car.] 33. Below is a list of statements on the system you use today. Please imagine how strongly you would agree or disagree with each statement from the point of view of a driver:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	U33_33v	[I would select destinations further away if I had the function in my car.] 33. Below is a list of statements on the system you use today. Please imagine how strongly you would agree or disagree with each statement from the point of view of a driver:	"1"= "Strongly disagree" "2" ="Disagree" "3" ="Neutral" "4" ="Agree" "5" ="Strongly agree" "6" ="Don't know"	1	6
	U34_SQ001	[Texting] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	U34_SQ002	[Music, radio, audiobooks] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ003	[Interact with a passenger] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ004	[Eating or drinking] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ005	[Calling] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ006	[Smoking] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			infrequently" "6" ="Never		
	U34_SQ007	[Personal hygiene/Cosmetics] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ008	[Smart phone apps] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ009	[Social Media] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ010	[Navigation] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
	U34_SQ011	[Browsing the internet] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ012	[Sleeping] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ013	[Watching movies] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ014	[Office/work tasks] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very infrequently" "6" ="Never	1	6
	U34_SQ015	[None] 34. Imagine your vehicle was equipped with the function you experienced today, how often would you engage in the following activities while the system is active?	"1" ="Very frequently" "2" ="Frequently" "3" ="Every now and then" "4" ="Infrequently" "5" ="Very	1	6

Section	Question ID	Label	Code Based Text Information Interpretation	Lower limit	Upper limit
			infrequently" "6" ="Never		
	U35	35. Imagine that you have a partly self-driving car which is able to drive by itself in urban areas. You have a trip that takes 30 minutes of driving. You have scheduled it to avoid the peak of congestion. How much additional time would you be willing t	None	Not applicable	Not applicable
	U36_SQ001	[I would use public transport ….] 36. If a partly self-driving car was available to you, how do you think it would affect your choice of travel mode?	"1" ="less often" "2" ="..." "3" ="..." "4" ="..." "5" ="as often as today"	1	5
	U36_SQ002	[I would use a motorbike/scooter] 36. If a partly self-driving car was available to you, how do you think it would affect your choice of travel mode?	"1" ="less often" "2" ="..." "3" ="..." "4" ="..." "5" ="as often as today"	1	5
	U36_SQ003	[I would walk or use a bicycle ….] 36. If a partly self-driving car was available to you, how do you think it would affect your choice of travel mode?	"1" ="less often" "2" ="..." "3" ="..." "4" ="..." "5" ="as often as today"	1	5
	U36_SQ004	[I would use a taxi service ….] 36. If a partly self-driving car was available to you, how do you think it would affect your choice of travel mode?	"1" ="less often" "2" ="..." "3" ="..." "4" ="..." "5" ="as often as today"	1	5

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List of abbreviations and acronyms

Abbreviation	Meaning
ADF	Automated driving function
ADAS	Advanced Driver Assistance Systems
API	Application Programming Interface
CDB	Consolidated Database
CDF	Common Data Format
PI	Performance Indicator
RQ	Research Question
THW	Time headway
TOR	Take-over request
TTC	Time-to-collision