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Interaction between pedestrians and Wizard of Oz automated vehicles

Master of Science Thesis

TU Delft

SWOV
INSTITUTE FOR
ROAD SAFETY RESEARCH

Interaction between pedestrians and Wizard of Oz automated vehicles

Master of Science Thesis

By

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This thesis has been conducted in collaboration with SWOV (Institute for Road Safety Research).

Preface

Before moving to the Netherlands, when I applied for this Master program at TU Delft, I saw some courses regarding intelligent vehicles and I was looking forward to know more about it. Who would have told me back then that I would do my master thesis on that topic and that I would enjoy research so much?

This thesis would not have been possible without the opportunity that SWOV gave me and the support of various people. First of all, I would like to thank prof. Marjan Hagenzieker for her guidance and for placing her trust in me to develop this thesis. Moreover, I would like to thank my daily supervisor dr. ir. Haneen Farah for her advice, motivation and experience. I am also grateful to my external supervisor MSc Luuk Vissers for his support, guidance and feedback. I would also like to express my gratitude to dr. ir. Joost C.F. de Winter for his suggestions and for obtaining the speed data from the videos. I would really like to thank the four of them for all their suggestions during the meetings and for giving me the opportunity to write my first research paper. The paper was submitted to the Road Safety & Simulation International conference 2017.

I would not have been able to carry out the experiment without the support of the following group of people. Special thanks go to Sander van der Kint for all his support during the experimental sessions despite of weather conditions. I am also grateful to Edwin Scharp and Peter van Oossanen for all their work during the experiment and for handling the permissions. Finally, I would also like to express my appreciation to Pablo, Paul, Ritwik and Veronika who helped during the experiment and to all other people that somehow contributed.

This master thesis is the last step of my student life. I can certainly say that moving to Delft to continue my studies was a really good decision. But this experience would not have been the same without the friends from all over the world that I made here, especially Marianthi and Kai.

I am deeply thankful to Michael Ray Epke for his help during the experimental sessions and his support during the thesis. But most importantly for his immense patience and for always supporting me in the good and the bad moments.

I would like to finish the acknowledgments by thanking my parents Jesús and Maria Estrella and my sister Silvia for everything they have done for me. I would really like to thank them for their unconditional support, for always being by my side and for encouraging me to follow my dreams.

Ana Rodríguez Palmeiro

Delft, June 2017

Abstract

Automated Vehicles (AV) will be introduced on public roads in the near future. This would result in automated vehicles sharing the urban space with other road users including drivers of traditional vehicles and vulnerable road users. Pedestrians might be unable to distinguish the vehicle type (traditional or automated) they are interacting with and crossing situations might become confusing, possibly leading to dangerous encounters between pedestrians and vehicles. There is currently little knowledge about the interactions between pedestrians and AVs from the point of view of the pedestrian in a real life environment. The aim of this study is to determine whether pedestrians' crossing intentions differ when interacting with automated vehicles compared to when interacting with traditional vehicles. An experiment was developed on a closed road where participants encountered a Wizard of Oz automated vehicle and a traditional vehicle in a within-subject design. In the Wizard of Oz set-up, a fake 'driver' sat on the driver seat while the vehicle was driven by the passenger with a joystick. Different scenarios were studied regarding vehicle appearance ('driver' reading a newspaper, roof signs, hood/side signs) and approach direction (left vs. right). Results showed that the majority of participants reported that the vehicle was (sometimes) driven automatically, which indicates that the Wizard of Oz was credible. Moreover, most of the participants perceived the differences in vehicle appearance and reported to be influenced by these features. Despite of this, measurements of critical gaps and self-reported level of stress showed no significant differences between the different conditions of vehicle appearance.

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Introduction

1.1. Problem definition

Pedestrians are involved in about 26% of road fatalities in Europe (WHO 2015), with 68% of these fatalities occurring in urban areas (European commission 2016). Most of the fatalities in urban areas occur while pedestrians are crossing the road (Alhajyaseen, Asano et al. 2012), (SWOV 2010). Pedestrians are considered to be vulnerable road users because they are not protected by a shell like car or bus drivers. Therefore additional care should be taken when automated vehicles are introduced.

Automated vehicles are expected to reduce accident rates by eliminating driver error. However, the implementation of this type of vehicles on roads also has its drawbacks. For instance, during the first stages of the introduction of automated vehicles on roads, vehicles with different levels of automation will share the public space (Shladover 2016), deriving on a possible reduction of road safety (Sivak and Schoettle 2015). Therefore, pedestrian safety when interacting with automated vehicles should be assessed and guaranteed before those types of vehicles drive on public roads.

The behaviour of pedestrians at crossroads depends on whether the other road users behave in accordance with the priority rules (Houtenbos, De Winter et al. 2017). The interaction between pedestrians and vehicles is also dependent on the pedestrians' interpretation of the vehicle, such as vehicle speed, distance from the vehicle, and non-verbal cues (e.g., eye contact, driver gestures, and driver posture) (Habibovic, Malmsten Lundgren et al. 2016). One of the drawbacks of automated vehicles is that non-verbal communication is not always possible, because the driver of the automated vehicle may be performing other tasks and not pay attention to the road environment (Kitazaki and Myhre 2015), (Rothenbücher, Li et al. 2016). When encountering an automated vehicle, pedestrians might be overly trustful or hesitant, and may even test the limits of what the automated vehicle is capable of.

The driver of an automated vehicle will not have the same role as in a traditional vehicle, but rather more of a supervisory role. That is, the driver will be able to perform non-driving tasks while sitting in the automated vehicle and not pay attention to the road environment. There is currently little knowledge about how other road users will interpret the behaviour of a driver of an automated vehicle who appears to be distracted (e.g., reading a newspaper) and not aware of the traffic situation. This, additional to the fact that both traditional vehicles and automated vehicles will be sharing the road environment, can lead to confusing situations in which pedestrians are not able to assess whether they are interacting with an automated vehicle or a traditional vehicle. For example, crossing pedestrians might be unable to differentiate between a distracted driver in a traditional vehicle and a driver of an automated vehicle performing a non-driving task, because in both cases the driver would not be paying attention to the road. Pedestrians may expect that the vehicle containing the distracted driver is an automated vehicle and therefore decide to cross the street, assuming that the vehicle will stop. Here, it might turn out that the distracted driver was actually driving a traditional vehicle which would not stop automatically. Furthermore, pedestrians could identify a specific vehicle as an automated vehicle but decide not to cross because they are uncertain whether the automated vehicle has recognized them.

Thus, on the one hand pedestrians could accept shorter crossing gaps because they might assume that the vehicle, automated or not, will stop and yield in all cases. On the other hand, crossing gaps can also be larger in situations where pedestrians are uncertain whether the automated vehicle has recognized them or in case they do not trust the automated vehicle technology. In those cases, crossing situations may be stressful for pedestrians. Thus, it is important to analyse possible changes in pedestrians' crossing intentions when interacting with an automated vehicle, in terms of gap acceptance, stress level, and perceived safety.

Current research on the interaction between pedestrians and automated vehicles is mainly focused on the automated vehicle technology from the drivers' point of view (Toffetti, Wilschut et al. (2009); Weyer, Fink et al. (2014); Cunningham and Regan (2015); Seppelt and Lee (2015); Vlakveld, Vissers et al. (2015); Zeeb, Buchner et al. (2016). Research has also focused on public opinion regarding automated vehicles (Bazilinskyy, Kyriakidis et al. (2015); Kyriakidis, Happee et al. (2015); Madigan, Louw et al. (2016). However, research on the interactions from the point of view of pedestrians is crucial as well, because pedestrians will encounter and respond to automated vehicles and their behaviour can be unexpected. A small number of studies on the interaction between vulnerable road users and automated vehicles has been conducted so far (Blau (2015); CityMobil2 (2016); Clamann, Aubert et al. (2016); Habibovic, Malmsten Lundgren et al. (2016); Habibovic, Andersson et al. (2016); Hagenzieker, Kint et al. (2016); Rothenbücher, Li et al. (2016); Malmsten Lundgren, Habibovic et al. (2017). Some of the previous studies have used questionnaires, photo experiments or interviews (Blau (2015); Hagenzieker, Kint et al. (2016). At present there is a paucity of research regarding pedestrians' behaviour in real-life settings when interacting with automated vehicles, since only a few studies have been conducted so far.

Clamann, Aubert et al. (2016) examined pedestrians' response times to a Wizard of Oz automated vehicle carrying a forward-facing sign that provided a message (e.g., 'Walk', 'Do not walk'). But it is also important to analyse the effects of whether the vehicle is recognizable as an automated vehicle, because in the future vehicles with different levels of automation will be driving on the roads. Such recognisability may be achieved using an external sign, such as a sign stating 'self-driving vehicle' (Hagenzieker, Kint et al. 2016). Rothenbücher, Li et al. (2016) also used a Wizard of Oz set-up to assess the behaviour of pedestrians when interacting with an automated vehicle without a driver.

In sum, it is important to analyse possible changes in pedestrians' crossing behaviour when interacting with an automated vehicle, in terms of gap acceptance, stress level, and perceived safety. However, there is currently a lack of research on that field, especially in the case of studies in real-life settings.

1.2. Research objective and main research questions

The main aim of this master thesis is to analyse the impact of approaching automated vehicles on pedestrians' crossing intentions and perceived safety. More specifically, the current study investigates whether there are differences in pedestrians' crossing intentions when interacting with an automated vehicle as compared to a traditional vehicle. Moreover, possible effects of external vehicle recognition on pedestrians' intentions, stress and perceived safety are also assessed.

The present study aims to answer the following research questions to achieve the main study goal:

- Do pedestrians' crossing intentions differ when interacting with a Wizard of Oz automated vehicle compared with that of a traditional vehicle?
- Do different external features (vehicle recognisability) affect pedestrians' crossing intentions when interacting with a Wizard of Oz automated vehicle?
- Do pedestrians trust more automated vehicles or traditional vehicles?

1.3. Research approach

In order to obtain a better insight into this topic, a review of existing studies and data regarding traffic safety involving pedestrians was necessary. Furthermore, an experiment in a real crossing environment was designed in which participants (pedestrians) encountered both a traditional and a Wizard of Oz automated vehicle with different external features. The experiment consisted of a within-subject design.

Questionnaires post-experiment and interviews that were carried out, both during and after the experiment, were designed to obtain a better insight into the opinions of participants regarding automated vehicles.

1.4. Thesis outline

The current thesis report is structured as follows:

1. <u>Introduction:</u> in this chapter the problem leading to the current research study is defined. Moreover, the research objective and main research questions are specified and the research approach is described.
2. <u>Literature review:</u> consists of a description of current literature related to the study and the identified research gaps in the available studies until now.
3. <u>Two pilot studies:</u> the method used in the data collection phase of the two pilot studies is described. Furthermore, results are shown and lessons learnt from the two pilot studies to improve the methodology for the final experiment are explained.
4. <u>Final experiment:</u> the methods used for the data collection phase of the final experiment are described, after including improvements from the two pilot studies. Moreover, the results obtained from the collected data and from statistical analyses carried out are shown.
5. <u>Discussion:</u> main findings and concluding remarks are described. Answers to the research questions are given and results are critically assessed. Furthermore, limitations encountered during the performance of the study are described and recommendations for future research are given.

2

Literature review

The goal of this chapter is to provide an overview of the existing literature related to the current project. The existing literature has been used both to gain knowledge regarding the analysed topic and to define the main problem to be tackled. At the end of the chapter, research gaps and research hypotheses are described, including research sub-questions.

2.1. Background information on pedestrian safety

2.1.1 Pedestrian fatalities and serious injuries

- Worldwide and European data:

According to WHO (2016), 22% of people who die in traffic crashes worldwide are pedestrians. In Europe, that percentage is 26%, as it can be seen in Figure 1. However, data regarding crashes involving pedestrians might not be completely available in all countries, so the previous numbers could be even higher.

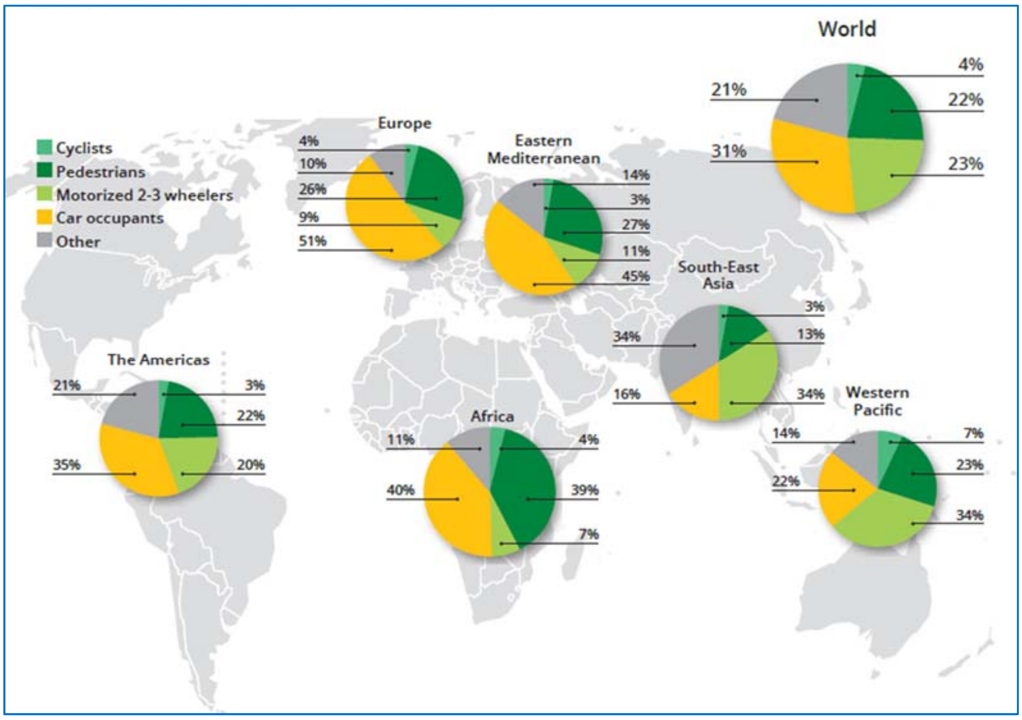


Figure 1: Deaths in road crashes by road user type (WHO 2015)

- Data in the Netherlands:

An important problem about accident data in the Netherlands is the fact that there is a poor registration of accidents. Some accidents are not registered and there are also sometimes differences between police data and hospital data.

In the case of the Netherlands, the number of fatalities involving pedestrians was 52 in 2015, representing the 8% of the total fatalities in the country during that year, as it is shown in Figure 2. The lower percentage with respect to other European countries could be due to the fact that in the Netherlands cycling is an important mean of transport for daily trips.

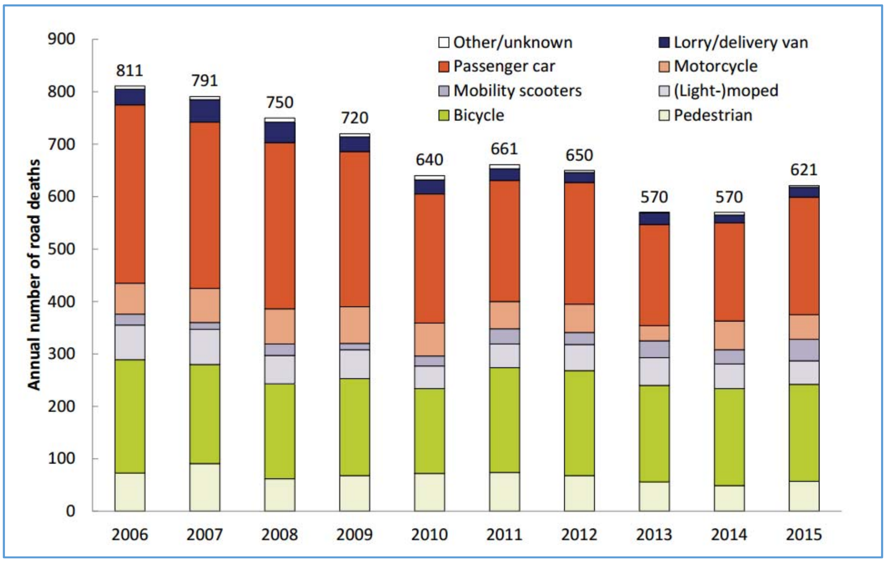


Figure 2: Fatalities in the Netherlands by transport mode (SWOV 2016)

In Figure 3, the number of serious road injuries in the Netherlands by transport mode is shown. That data is based on hospital registration. It can be seen that the percentage of serious road injuries involving pedestrians registered in the hospital data is less than 10%.

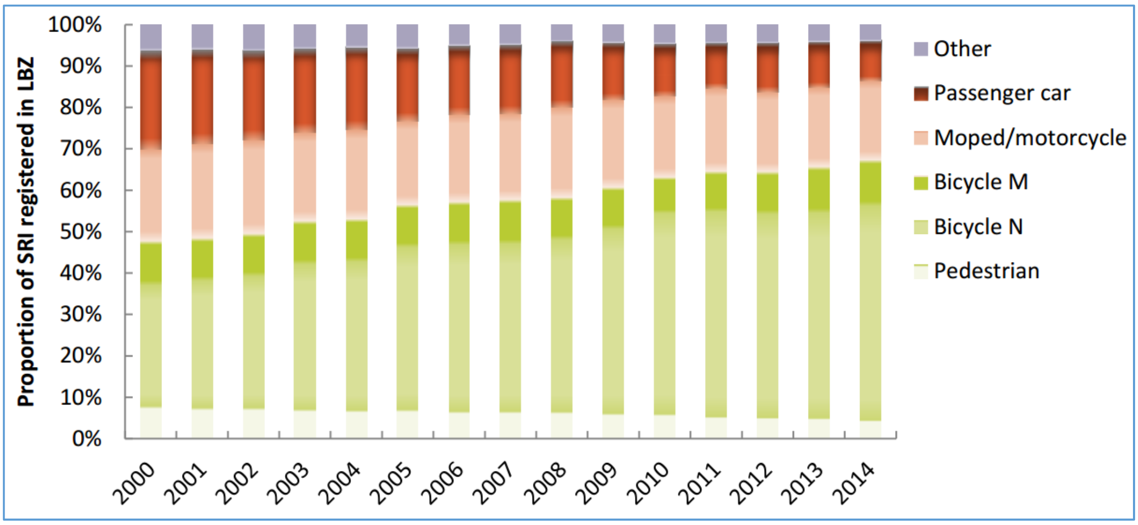


Figure 3: Total serious road injuries in the Netherlands by transport mode based on hospital registration (SWOV 2015)

2.1.2 Accident characteristics

- Influence of age and gender in accident risk:

Regarding the characteristics of the pedestrians involved in road accidents, male pedestrians are more often involved (WHO 2013). That is due to the fact that men are more prone to have a riskier behaviour than women (Antic, Pesic et al. 2016). Male pedestrians also tend to follow other pedestrians more than female pedestrians do (Jimenez Mejias, Martinez Ruiz et al. 2016).

Children under 14 years old and older pedestrians over 75 years old are considered to have a higher risk of injury. In the case of the children, that is due to the fact that they still have to mature and in the case of old pedestrians it is because of their physical limitations (Rosenbloom, Mandel et al. 2015).

In the case of the Netherlands, male pedestrians are predominant in number of pedestrians who died due to road accidents, as shown in Figure 4 and Figure 5. It can be seen from those figures that in 2015, 36 male pedestrian and 21 female pedestrians died in a road accident.

Moreover, in the case of fatalities involving male pedestrians in the Netherlands, the most common age group was 50-59 years old, while in the case of female pedestrians that group was 70-79 years old.

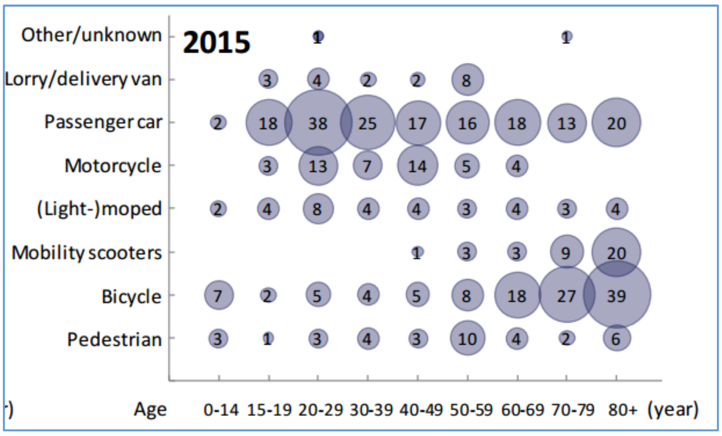


Figure 4: Total men fatalities in The Netherlands in 2015 according to age (SWOV 2016)

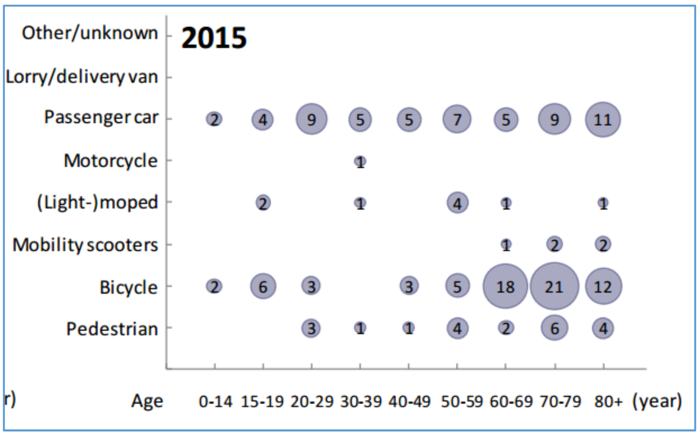


Figure 5: Total women fatalities in The Netherlands in 2015 according to age (SWOV 2016)

- Locations:

Most of the crashes between pedestrians and vehicles take place in urban areas. For instance, 68% of the road fatalities involving pedestrians in the European Union in 2014 happened in urban areas (European commission 2016).

Regarding the location within the urban areas, most of the crashes happen while pedestrians are crossing the road. That was the case for one third of the fatalities in 2009 (Alhajyaseen, Asano et al. 2012).

The majority of the casualties involving pedestrians in the Netherlands take place in urban areas. For example, between 2007 and 2009, the percentage of casualties in those locations was 86% (SWOV 2012). Moreover, according to SWOV (2010), 32% of the crashes in which pedestrians are involved take place in pedestrian crossings, and 41% of them occurred while pedestrians were crossing the road.

Furthermore, the number of pedestrians' deaths and serious injuries in the country vary per road type. Figure 6 shows the distribution of pedestrians' fatalities and serious injuries per vehicle type in the period between 2007 and 2009.

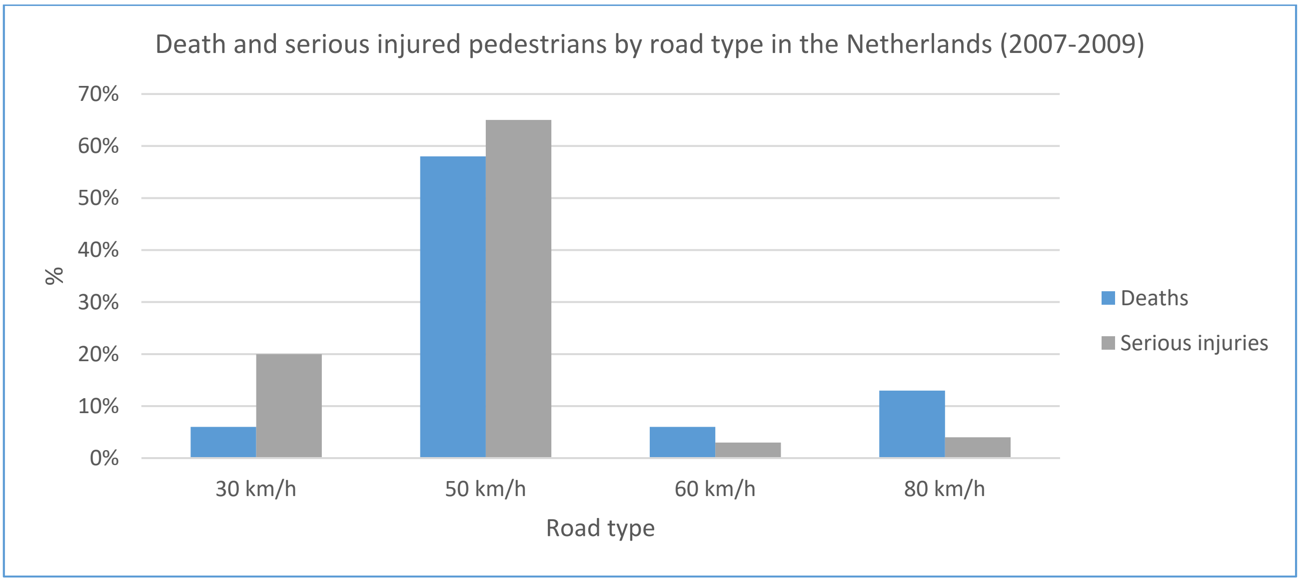


Figure 6: Death and serious injured pedestrians by road type in The Netherlands (2007-2009). Compiled by author (SWOV 2012)

- Risk factors:

There are different causes that can contribute to crashes between pedestrians and vehicles, such as factors regarding the road and the environment, the vehicle and the road user. In Figure 7 examples of risk factors for each of the three categories are shown.

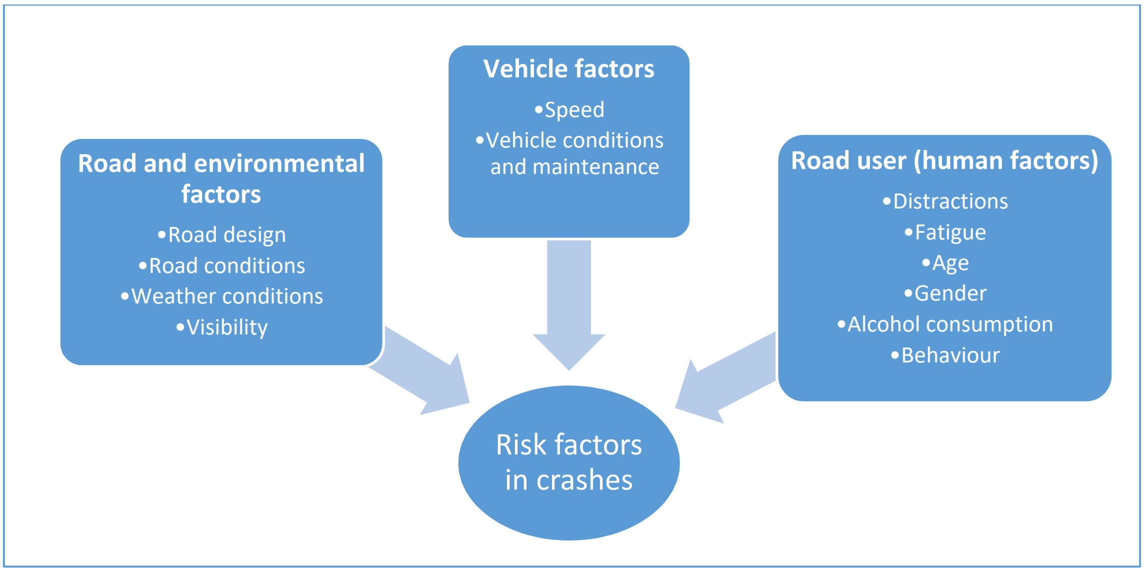


Figure 7: Risk factors in road accidents

Regarding the vehicle factors, vehicle speed is considered a risk factor, since the required distance for the vehicle to stop before hitting the pedestrian will vary depending on the driving speed. The risk of fatality also increases as the vehicle speed is higher in the moment of collision (Rosen, Stigson et al. 2010). The vehicle conditions and maintenance are also important since a vehicle with a mechanical problem can lead to accidents. For example in case of problems with the brakes or lights (WHO 2013).

Road and environmental factors can also lead to accidents. For instance, due to a poor road design with non-appropriate facilities for pedestrians, a road in bad conditions or bad weather conditions. Visibility is another important risk factor that can be avoided by implementing appropriate road lighting or improving road design (WHO 2013).

In the case of the risk factors regarding the road users, it is important to understand the behaviour of pedestrians and drivers. For instance, in Habibovic and Davidsson (2012) it was demonstrated that 70% of vulnerable road users made a wrong decision when interacting with the vehicle with which they crashed. Even though they were able to recognise that there was a vehicle approaching, they made the wrong decision. Oher factors that can lead to accidents are the age and gender of the road user. In the case of pedestrians, it has been demonstrated that older pedestrians suffer more accidents (SWOV 2016), since their reaction time and their walking speed are lower. Moreover, male pedestrians are more involved in road accidents, as they adopt riskier behaviours than women (Antic, Pesic et al. 2016). Alcohol consumption increases the probability of having a road accident, since it affects the capacity of making correct decisions, increases the reaction times and people under the effects of the alcohol can adopt riskier behaviours (WHO 2013). Other factors such as fatigue and distractions can also affect performance leading to accidents.

2.2. Information on automated vehicles

2.2.1 Definition of automated vehicles

Automated vehicles are often seen as the future in transportation, as its use can provide society with several advantages. However, according to Habibovic, Englund et al. (2014), there is not an agreement on how to call those type of vehicles. Some terms that are often used are: autonomous vehicles, automated vehicles, self-driving vehicles, self-piloted vehicles, robotic vehicles or driverless vehicles.

In spite of the specific terms, NHTSA (2013) defines automated vehicles as: “those vehicles in which at least some aspects of a safety-critical control function (e.g. steering, throttle or braking) occur without direct driver input.” Automated vehicles are provided with different technical measures such as sensors, cameras and GPS to be able to make the correct decisions.

2.2.2 Levels of automation

There are currently different levels of automation regarding intelligent vehicles, depending on the institution. There are currently three main different classifications:

- BASt (German Federal Highway Research Institute) (Kyriakidis, Happee et al. 2015):
  - **Driver only:** there is no aid for the driver. The driver performs all functions to drive the vehicle.
  - **Assisted:** assistance systems can help the driver perform his or her task, but the driver is performing all driving functions.
  - **Partly automated:** the vehicle system takes control over driving, but the driver has to monitor the traffic situations permanently and be ready to take control of the vehicle at any moment.
  - **Highly automated:** the vehicle system takes control of the driving tasks and the driver does not have to check permanently the road situation. In case the manual driving is required by the system (take-over request), the driver has time enough (7 seconds) to take control over the vehicle again.
  - **Fully automated:** the vehicle systems takes over all controls in a permanent way. The driver is not requested to take control of the vehicle.
- NHTSA (National Highway Traffic Safety Administration, in the USA) (NHTSA 2013):
  - **Level 0: No automation:** In this case the driver controls the vehicle in all situations and he or she is the responsible of understanding the road situation and adapting his or her behaviour to that concrete situation. This level includes vehicles with driving assistance systems but where the driver is the responsible of the main driving tasks (steering, braking…).
  - **Level 1: Function-specific automation:** this type of automation involves one or more control functions of the vehicle. The driver is still the only responsible of controlling the vehicle and driving safely but he or she can choose to give the vehicle limited control. An example of this situation is the Adaptive Cruise Control or the brake support in emergencies. So, the vehicle can help the driver operating primary controls but it cannot control the vehicle or judge traffic situations by itself. If the

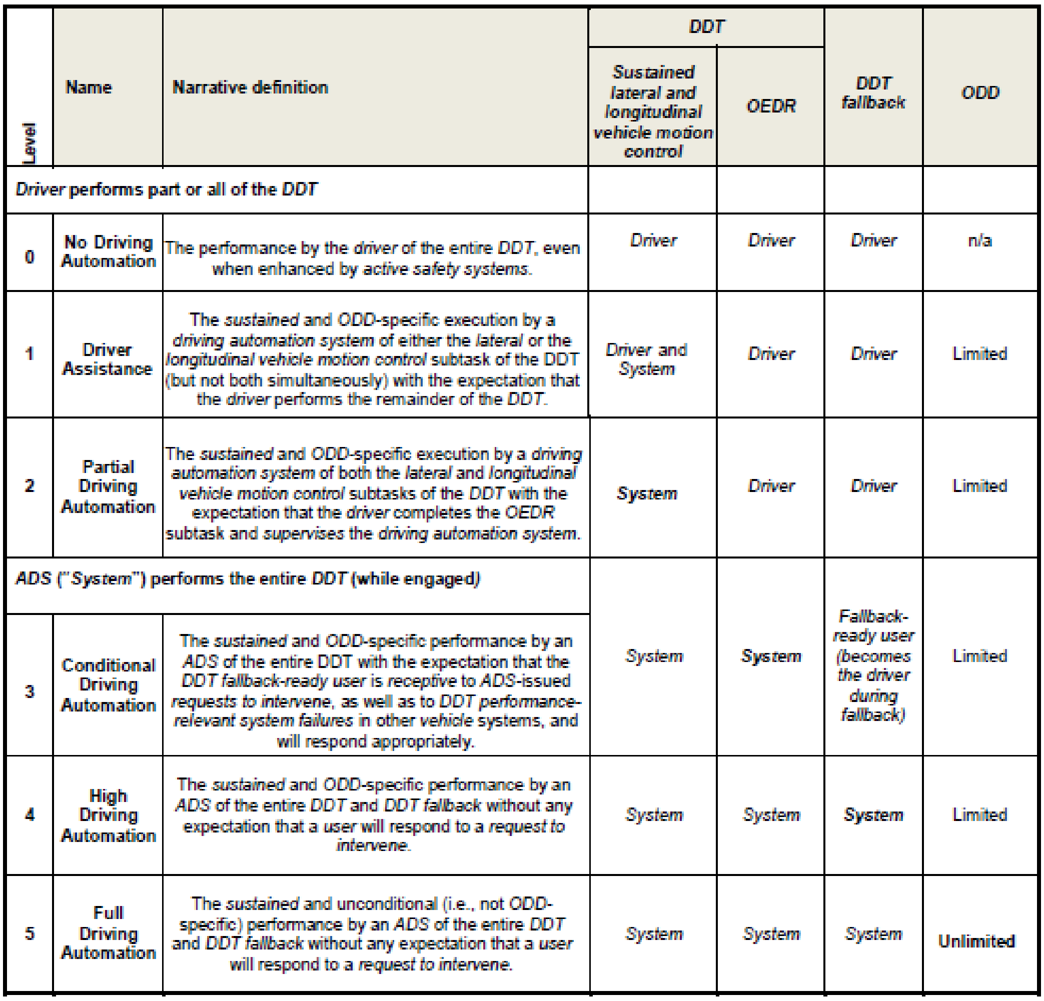
vehicle assists the driver by operating primary controls, just one control at the time can be used by the vehicle.

- **Level 2: Combined function automation:** in this level, there are at least two primary control functions that are automated. Those functions work at the same time, taking the control from the driver. However, the driver should always be ready to take control over the vehicle at any time, and he is responsible of analysing road situations and drive safely.

- **Level 3: Limited self-driving automation:** vehicles can take full control of the primary controls in certain traffic situations. The driver should be able to take over the control at certain times but with a sufficient transition time. In this case, the driver does not have to analyse the road situation constantly.

- **Level 4: Full self-driving automation:** the vehicle controls all the functions. The driver will not take control over the vehicle at any time. The vehicle systems are the responsible of assessing road situations and drive safely.

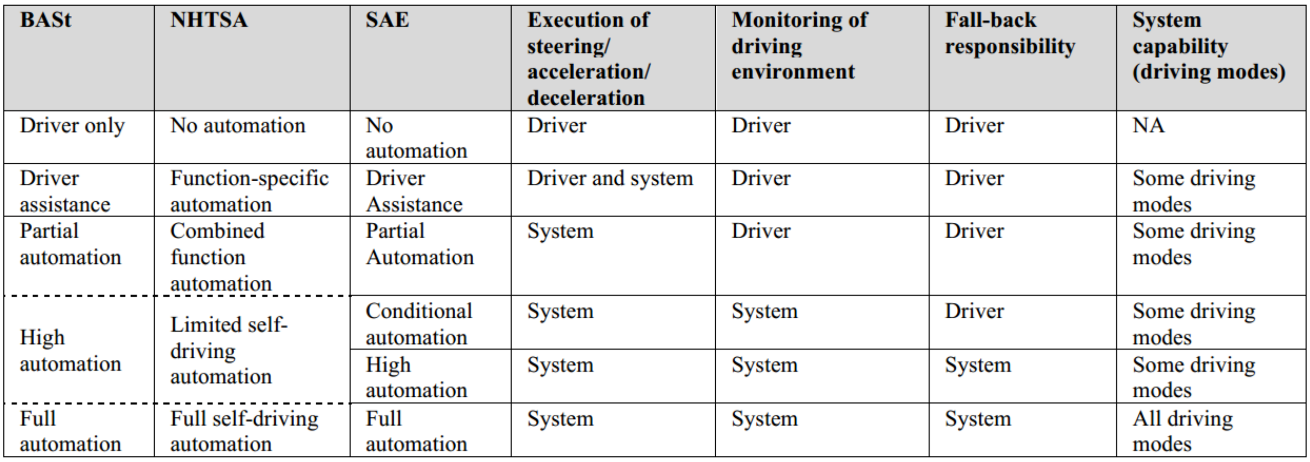
- SAE International: in this case, 5 different levels of automation are defined from no automation to fully automated vehicle (SAE 2016):



Level	Name	Narrative definition	DDT: Sustained lateral and longitudinal vehicle motion control	DDT: OEDR	DDT fallback	ODD
Driver performs part or all of the DDT						
0	No Driving Automation	The performance by the driver of the entire DDT, even when enhanced by active safety systems.	Driver	Driver	Driver	n/a
1	Driver Assistance	The sustained and ODD-specific execution by a driving automation system of either the lateral or the longitudinal vehicle motion control subtask of the DDT (but not both simultaneously) with the expectation that the driver performs the remainder of the DDT.	Driver and System	Driver	Driver	Limited
2	Partial Driving Automation	The sustained and ODD-specific execution by a driving automation system of both the lateral and longitudinal vehicle motion control subtasks of the DDT with the expectation that the driver completes the OEDR subtask and supervises the driving automation system.	System	Driver	Driver	Limited
ADS ("System") performs the entire DDT (while engaged)						
3	Conditional Driving Automation	The sustained and ODD-specific performance by an ADS of the entire DDT with the expectation that the DDT fallback-ready user is receptive to ADS-issued requests to intervene, as well as to DDT performance-relevant system failures in other vehicle systems, and will respond appropriately.	System	System	Fallback-ready user (becomes the driver during fallback)	Limited
4	High Driving Automation	The sustained and ODD-specific performance by an ADS of the entire DDT and DDT fallback without any expectation that a user will respond to a request to intervene.	System	System	System	Limited
5	Full Driving Automation	The sustained and unconditional (i.e., not ODD-specific) performance by an ADS of the entire DDT and DDT fallback without any expectation that a user will respond to a request to intervene.	System	System	System	Unlimited

Figure 8: Levels of automation. SAE classification (SAE 2016)

Summarizing, in the following figure the different classifications are shown.

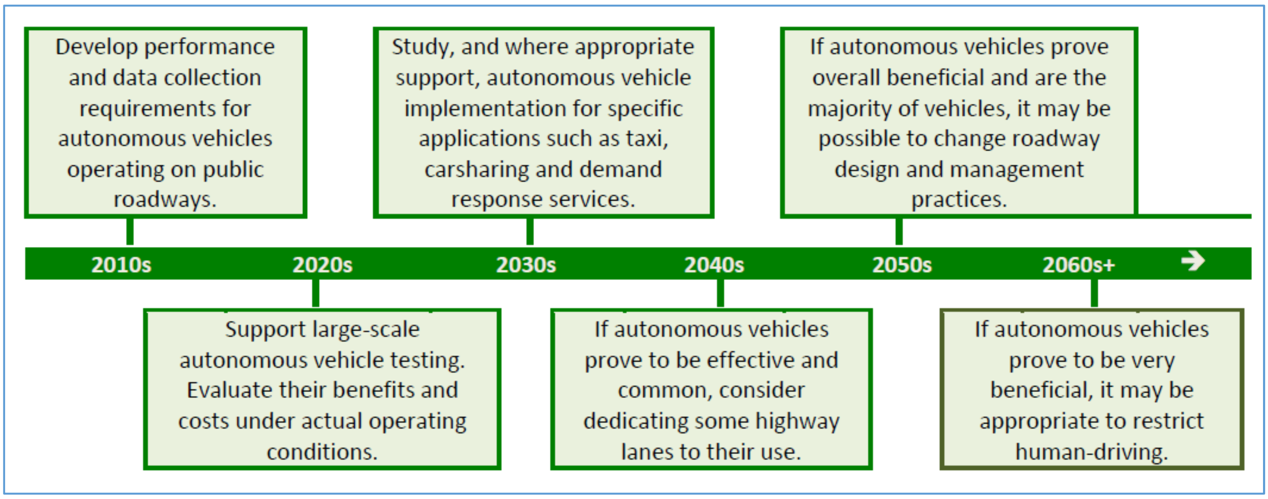


BASt	NHTSA	SAE	Execution of steering/ acceleration/ deceleration	Monitoring of driving environment	Fall-back responsibility	System capability (driving modes)
Driver only	No automation	No automation	Driver	Driver	Driver	NA
Driver assistance	Function-specific automation	Driver Assistance	Driver and system	Driver	Driver	Some driving modes
Partial automation	Combined function automation	Partial Automation	System	Driver	Driver	Some driving modes
High automation	Limited self-driving automation	Conditional automation	System	System	Driver	Some driving modes
		High automation	System	System	System	Some driving modes
Full automation	Full self-driving automation	Full automation	System	System	System	All driving modes

Figure 9: Summary of the different classifications according to organization (Habibovic, Englund et al. 2014)

It is important to mention that the previous classifications will probably be updating until the total implementation of automated vehicles. For instance, the classification from SAE was recently updated. It is now more similar to the BASt classification.

The introduction of automated systems in the market will be done gradually in the near future, since it is already being studied. The expected timeline for the introduction of those types of vehicles is shown in Figure 10.



Develop performance and data collection requirements for autonomous vehicles operating on public roadways.

Support large-scale autonomous vehicle testing. Evaluate their benefits and costs under actual operating conditions.

Study, and where appropriate support, autonomous vehicle implementation for specific applications such as taxi, carsharing and demand response services.

If autonomous vehicles prove to be effective and common, consider dedicating some highway lanes to their use.

If autonomous vehicles prove overall beneficial and are the majority of vehicles, it may be possible to change roadway design and management practices.

If autonomous vehicles prove to be very beneficial, it may be appropriate to restrict human-driving.

Figure 10: Expected timeline for the development of automated vehicles (Litman 2015)

As it is shown in Habibovic, Englund et al. (2014), an important number of car manufacturers are already working on building their own automated vehicles in the near future (Figure 11).

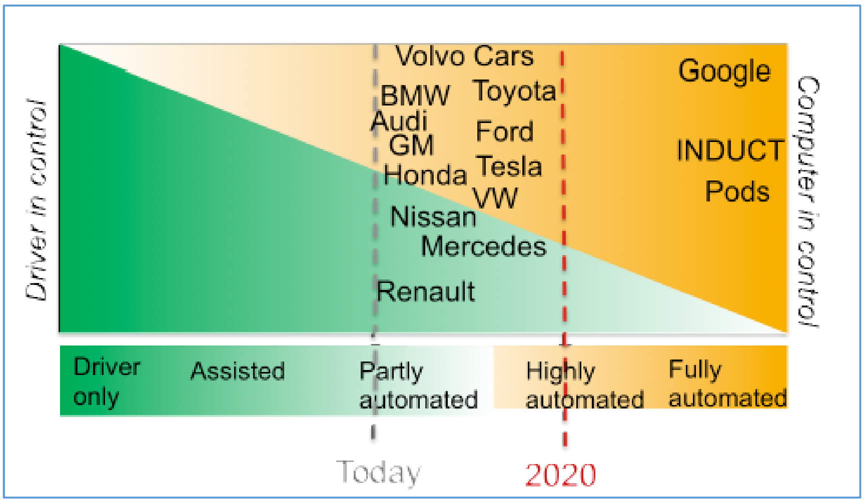


Figure 11: Summary of developments of automated vehicle by vehicle manufacturers in the near future

2.2.3 Implications of different levels of automation

As it has been detailed before, different levels of automation of vehicles will be present in the near future.

The distinction of different levels of automation is important since it can lead to confusing situations for road users. In the near future, vehicles with different levels of automation will be present on the roads, from traditional non-automated vehicles to fully automated vehicles. The higher the level of automation a vehicle has, the lower a driver will be involved on the driving task. That situation can create confusing and stressful situations for other road users, if they are not able to distinguish what is the vehicle type they are interacting with.

Situations in which other road users, such as pedestrians, are confused because they are not able to distinguish the vehicle type they are interacting with can be dangerous. Pedestrians can identify a specific vehicle as a fully automated vehicle, think that the vehicle will always yield and accept shorter crossing gaps. Moreover, pedestrians can be hesitant to cross when interacting with what they think it is an automated vehicle because they are not sure if the vehicle recognised them. Then, pedestrians will be less likely to accept shorter gaps.

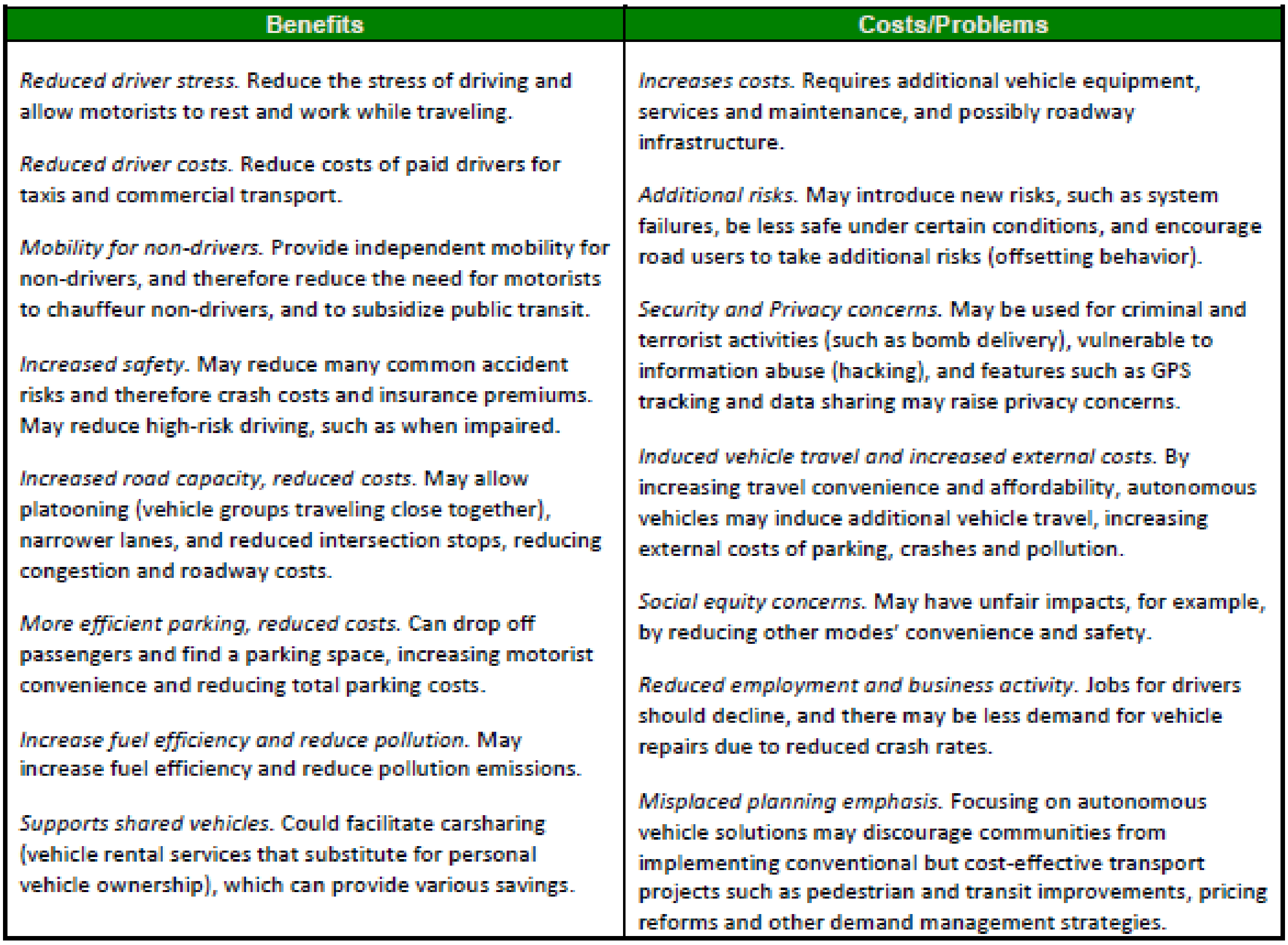
It is also possible that pedestrians consider that the vehicle that they are interacting with is a fully automated vehicle while the vehicle is a traditional vehicle where the driver is distracted or a partially-automated vehicle. That can lead to an unsafe situation if the pedestrian accepts a shorter crossing gap thinking that the vehicle is fully-automated and it will always stop.

In the case of partially automated vehicles, the driver still has to take control of the vehicle in certain situations when it is not possible for the vehicle to drive autonomously.

Therefore, not all the vehicles on the road will be either traditional or fully-automated, and that can be a problem for other road users, that can behave differently depending on the vehicle type they are interacting with.

2.2.4 Benefits and problems of automated vehicles

Figure 12 shows the potential costs and benefits of automated vehicles (Litman 2015)



Benefits	Costs/Problems
Reduced driver stress. Reduce the stress of driving and allow motorists to rest and work while traveling.	*Increases costs.* Requires additional vehicle equipment, services and maintenance, and possibly roadway infrastructure.
Reduced driver costs. Reduce costs of paid drivers for taxis and commercial transport.	*Additional risks.* May introduce new risks, such as system failures, be less safe under certain conditions, and encourage road users to take additional risks (offsetting behavior).
Mobility for non-drivers. Provide independent mobility for non-drivers, and therefore reduce the need for motorists to chauffeur non-drivers, and to subsidize public transit.	*Security and Privacy concerns.* May be used for criminal and terrorist activities (such as bomb delivery), vulnerable to information abuse (hacking), and features such as GPS tracking and data sharing may raise privacy concerns.
Increased safety. May reduce many common accident risks and therefore crash costs and insurance premiums. May reduce high-risk driving, such as when impaired.	*Induced vehicle travel and increased external costs.* By increasing travel convenience and affordability, autonomous vehicles may induce additional vehicle travel, increasing external costs of parking, crashes and pollution.
Increased road capacity, reduced costs. May allow platooning (vehicle groups traveling close together), narrower lanes, and reduced intersection stops, reducing congestion and roadway costs.	*Social equity concerns.* May have unfair impacts, for example, by reducing other modes' convenience and safety.
More efficient parking, reduced costs. Can drop off passengers and find a parking space, increasing motorist convenience and reducing total parking costs.	*Reduced employment and business activity.* Jobs for drivers should decline, and there may be less demand for vehicle repairs due to reduced crash rates.
Increase fuel efficiency and reduce pollution. May increase fuel efficiency and reduce pollution emissions.	*Misplaced planning emphasis.* Focusing on autonomous vehicle solutions may discourage communities from implementing conventional but cost-effective transport projects such as pedestrian and transit improvements, pricing reforms and other demand management strategies.
Supports shared vehicles. Could facilitate carsharing (vehicle rental services that substitute for personal vehicle ownership), which can provide various savings.	

Figure 12: Potential benefits and costs of automated vehicles (Litman 2015)

The implementation of automated vehicles can provide society with large benefits, but it has also its drawbacks. There are still some gaps that should be studied further before implementing those systems. For instance, understanding how the control of the vehicle changes from manual driving to self-driving. That includes the study of the interaction of the automated vehicle with other road users like vulnerable road users (Habibovic, Englund et al. 2014).

Sivak and Schoettle (2015) concluded that the use of automated vehicles will not derive in zero road fatalities. Furthermore, during the first stages of the introduction of automated vehicles on roads, vehicles with different levels of automation will share the public space (Shladover 2016) deriving on a possible reduction of road safety (Sivak and Schoettle 2015).

2.3. Pedestrians' interaction with (automated) vehicles

2.3.1 Non-verbal communication between drivers and pedestrians

During the interaction between different road users, non-verbal communication is used (Habibovic, Malmsten Lundgren et al. 2016). In the case of pedestrians interacting with motorized vehicles, the non-verbal communication between the pedestrian and the driver is important to make decisions (Keferbock and Riener 2015). For example, the pedestrian looks at the driver to check if he or she is aware of the crossing intention. In that situation, the pedestrian can also realize if the driver is distracted so it is not safe to cross. In that way, the non-verbal communication related to looking behaviour is important to make the decision to cross or not to cross the road.

Sometimes, the driver communicates with the pedestrian with arm signals or other signals, to indicate he or she is yielding.

As it has been demonstrated by Ren, Jiang et al. (2016), Guéguen, Meineri et al. (2015), eye contact can also influence the behaviour of the driver regarding speed reduction and yielding behaviour. Ren, Jiang et al. (2016) showed that eye contact with the driver is important for deceleration. In that study it was also shown that eye contact is more effective for male drivers than for female drivers. While 50% of men drivers increased the stopping distance after eye contact with the pedestrian, in the case of female drivers the percentage was 30%. Therefore, it was concluded that if pedestrians make eye contact with the driver, he or she will decelerate.

In Guéguen, Meineri et al. (2015), two different situations were analysed:

- The pedestrian making eye contact with the driver
- The pedestrian looking just above the driver

It was concluded that if pedestrians stared at drivers (both male and female), more drivers stopped to let them cross the street. It was also shown that the percentage of male drivers stopping when the pedestrian staring at them was a male was larger (30.1%) than when the pedestrian was a female (20.2%).

In a different study from the same author, the effect of a smile on yielding behaviour of the drivers was analysed. It was concluded that when pedestrians smiled to the drivers, more drivers stopped to let them cross the road. Regarding the driver's gender, women stopped more often (26%) than men (20.4%) and men were more prone to stop when the pedestrian smiling was a woman (Guéguen, Eyssartier et al. 2015).

As explained in Kitazaki and Myhre (2015), one of the drawbacks of automated vehicles is the fact that non-verbal communication with other road users is not possible. The study proposes different recommendations for the implementation of automated vehicles. For instance, provide the vehicle with a system to communicate its intentions to other road users (e.g. inform that the vehicle is yielding for the pedestrian). Another recommendation is to make clear to other road users that they are interacting with an automated vehicle, by using some type of identification.

Malmsten Lundgren, Habibovic et al. (2017) concluded that perceived safety of pedestrians might be worsened if pedestrians cannot communicate with the driver as it is currently done in the case of traditional vehicles. Moreover, the study showed that eye contact with the driver led to a crossing situation in which pedestrians were more calmed. It was observed that all participants would be willing to cross the road when they had eye-contact with the driver. However, most of the participants would not cross the road when the driver was holding a newspaper or when there was no driver in the vehicle. Therefore, the authors suggest the use of external vehicle features that inform other road users about the vehicle intentions to increase perceived safety.

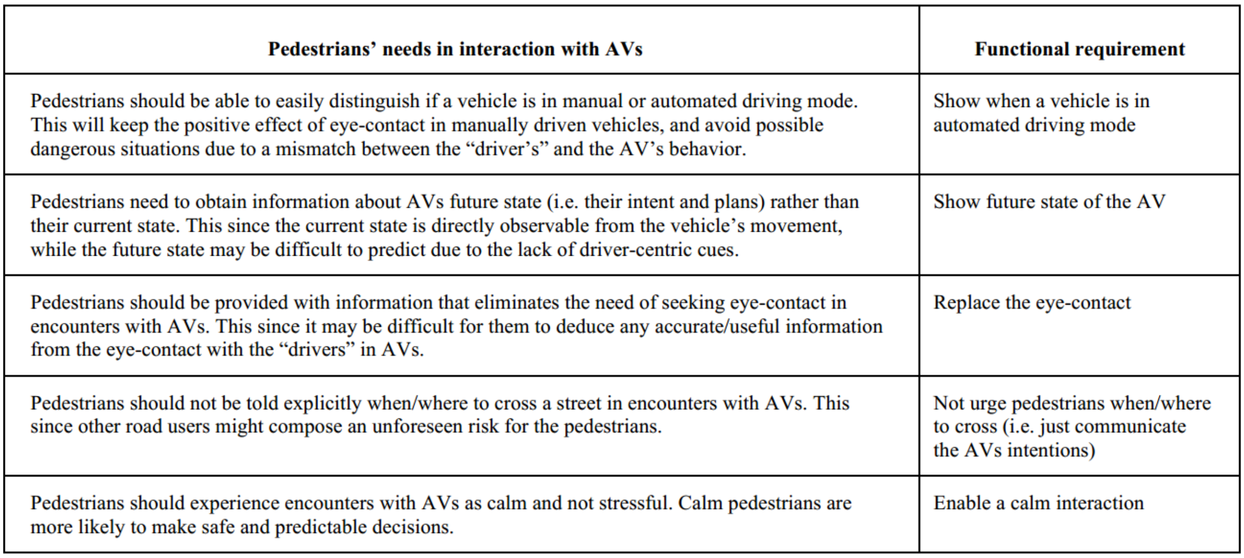
2.3.2 Relationship between pedestrians’ crossing behaviour and automated vehicles

When crossing a road, pedestrians use different cues to interact with the vehicle. In the case of traditional vehicles, there is an important interaction between the driver of the vehicle and the pedestrian. As it has been explained before, non-verbal communication between the pedestrian and the driver is important and it has an influence on the crossing behaviour of the pedestrian. According to several studies (Habibovic, Malmsten Lundgren et al. 2016), (Keferbock and Riener 2015), the interaction between pedestrians and vehicles is done by an interpretation of vehicle and driver characteristics. For instance: vehicle speed, distance from the vehicle, eye contact with the driver, gesture or posture. That communication allows both the driver and the vulnerable road user to understand the road situation when interacting.

However, since the role of the drivers in automated vehicle will be different and they will be able to perform other activities while sitting in the vehicle, that interaction driver-pedestrian will be lost. So, it is still not clear how will vulnerable road users communicate, understand and negotiate with the vehicle if there is no driver. Therefore, current studies are showing alternatives to create an interaction vehicle-pedestrian.

Moreover, during a probably large period of time both self-driving vehicles and vehicles driven manually will coexist. That can create confusion to pedestrians since the reactions of a driver and of an automated system might differ, even if the traffic situation is the same. So maybe it is important to make both vehicle types be distinguished by other road users (Keferbock and Riener 2015).

Habibovic, Malmsten Lundgren et al. (2016) showed the needs of pedestrians when interacting with an automated vehicle (Figure 13).



Pedestrians’ needs in interaction with AVs	Functional requirement
Pedestrians should be able to easily distinguish if a vehicle is in manual or automated driving mode. This will keep the positive effect of eye-contact in manually driven vehicles, and avoid possible dangerous situations due to a mismatch between the “driver’s” and the AV’s behavior.	Show when a vehicle is in automated driving mode
Pedestrians need to obtain information about AVs future state (i.e. their intent and plans) rather than their current state. This since the current state is directly observable from the vehicle’s movement, while the future state may be difficult to predict due to the lack of driver-centric cues.	Show future state of the AV
Pedestrians should be provided with information that eliminates the need of seeking eye-contact in encounters with AVs. This since it may be difficult for them to deduce any accurate/useful information from the eye-contact with the “drivers” in AVs.	Replace the eye-contact
Pedestrians should not be told explicitly when/where to cross a street in encounters with AVs. This since other road users might compose an unforeseen risk for the pedestrians.	Not urge pedestrians when/where to cross (i.e. just communicate the AVs intentions)
Pedestrians should experience encounters with AVs as calm and not stressful. Calm pedestrians are more likely to make safe and predictable decisions.	Enable a calm interaction

Figure 13: Pedestrians' needs when interacting with an automated vehicle

Therefore, vehicle manufacturers are already developing systems to allow the automated vehicle communicate its intentions to the pedestrian. Some examples are:

- Concept model from Mercedes: when the vehicle is going to stop to let the pedestrian cross, it projects a zebra crossing on the road (Figure 14).

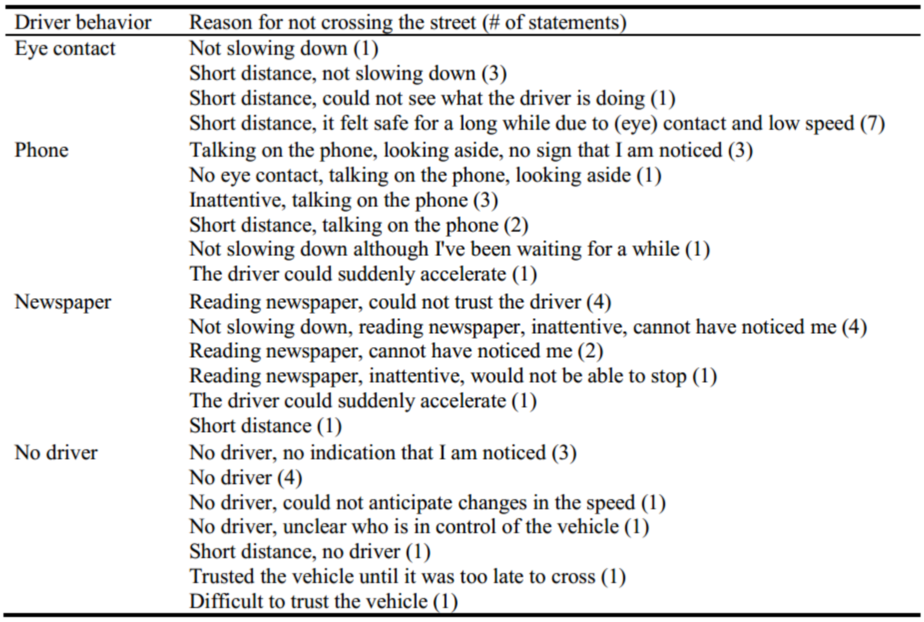
Figure 14: Ideas to improve interaction between automated vehicles and vulnerable road users (Keferbock and Riener 2015)

- Nissan: the yielding behaviour of the vehicle is shown by using lights and messages in the vehicle.
- Mitsubishi: yielding behaviour and directions of the vehicle are shown by using projections on the road.

In Habibovic, Malmsten Lundgren et al. (2016), an Automated Vehicle Interaction Prototype (AVIP) consisting on informing the pedestrians about the vehicle intentions by using lights signals in the windshield of the vehicle was analysed. It was concluded that the use of the AVIP system increased the number of pedestrians that were willing to cross the road before the vehicle stopped. Regarding perceived safety, it was demonstrated that pedestrians felt calmer when interacting with an automated vehicle if the AVIP system was present.

In Malmsten Lundgren, Habibovic et al. (2016), a field experiment was developed with different scenarios regarding the vehicle type, simulating an automated vehicle (Wizard of Oz Method). In that study, it was shown that pedestrians decided to not cross the road when a vehicle was approaching in the following situations:

Table 1: Main reasons for pedestrians to not cross the road when interacting with a moving vehicle (Malmsten Lundgren, Habibovic et al. 2016)



Driver behavior	Reason for not crossing the street (# of statements)
Eye contact	Not slowing down (1) Short distance, not slowing down (3) Short distance, could not see what the driver is doing (1) Short distance, it felt safe for a long while due to (eye) contact and low speed (7)
Phone	Talking on the phone, looking aside, no sign that I am noticed (3) No eye contact, talking on the phone, looking aside (1) Inattentive, talking on the phone (3) Short distance, talking on the phone (2) Not slowing down although I've been waiting for a while (1) The driver could suddenly accelerate (1)
Newspaper	Reading newspaper, could not trust the driver (4) Not slowing down, reading newspaper, inattentive, cannot have noticed me (4) Reading newspaper, cannot have noticed me (2) Reading newspaper, inattentive, would not be able to stop (1) The driver could suddenly accelerate (1) Short distance (1)
No driver	No driver, no indication that I am noticed (3) No driver (4) No driver, could not anticipate changes in the speed (1) No driver, unclear who is in control of the vehicle (1) Short distance, no driver (1) Trusted the vehicle until it was too late to cross (1) Difficult to trust the vehicle (1)

From the previous table it can be seen how important the interaction between the driver and the pedestrian is, and how the performance of other activities by the driver can influence crossing behaviour.

Recently, Clamann, Aubert et al. (2016) examined pedestrians' response times to a Wizard of Oz AV carrying a forward-facing sign that provided a message (e.g., 'Walk', 'Do not walk'). These authors concluded that legacy behaviors, such as gap distance, are more important for pedestrians in deciding whether to cross than the actual message displayed on the AV.

It is not only important to assess the effects of external messages, but also to assess the effects of whether the vehicle is clearly recognizable as an AV, because in the future vehicles with different levels of automation will be driving on the roads. Such recognisability may be achieved using an external sign, such as a sign stating 'self-driving vehicle' (Hagenzieker, Kint et al. 2016).

Rothenbücher, Li et al. (2016) also used a Wizard of Oz set-up to assess the behaviour of pedestrians when interacting with an AV without a driver. The authors concluded that the patterns taken into account when interacting with an AV were similar to patterns that are currently considered in a crossing situation.

2.3.3 Expectations in traffic situations

As explained in Jagtman (2004), road users make decisions regarding different traffic situations by anticipating events or behaviours of other road users in the near future. That is done as a result of their expectations. Those expectations can be long term expectations or short term expectations. The first type is based on education and experience, while the second type also considers information regarding a specific situation (Houtenbos, Jagtman et al. 2005). Traffic behaviour is, then, affected by expectations about the behaviour of other road users (Houtenbos 2008) and on whether they behave in accordance with priority rules (Houtenbos, De Winter et al. 2017).

In the case of the future interaction between pedestrians and automated vehicles expectations are important. Behaviour of pedestrians can differ when interacting with traditional vehicles or automated vehicles according to their expectations. For instance, if a pedestrian expects to interact with an automated vehicle (short term expectation) he can behave differently as if he is expecting to interact with a traditional vehicle.

2.3.4 Gap acceptance

When a pedestrian crosses a road, he or she analyses the traffic situation and makes the decision to cross or to wait. One of the features affecting that decision is gap availability between the pedestrian and the approaching vehicle. That gap can be measured in terms of distance and time. Therefore, the gap between a pedestrian and an approaching vehicle is the space between the pedestrian and the front of the vehicle when measuring distance gap. For the time gap, that feature is measured in seconds. The time gap depends, thus, on the approaching speed of the vehicle since it is the time between the vehicle and the pedestrian at the moment the pedestrian decides to cross or not to cross.

Three different types of gaps can be defined (Brewer, Fitzpatrick et al. 2005):

- Accepted gap: it is the gap when the pedestrian has decided to cross the road.

- Rejected gap: it is the gap when the pedestrian has decided to not cross the road.

- Critical gap: it is defined by the Highway Capacity Manual as: *“the time in seconds below which a pedestrian will not attempt to begin crossing the road.”* So, the critical gap can be defined as the minimum gap that a pedestrian would accept to cross the road. This critical gap cannot be measured directly in real life and it has to be obtained from the observed accepted and rejected gaps, applying different statistical methods. However, nowadays there are around 20 or 30 different methods to estimate critical gaps, which results are not the same (Brilon, Koenig et al. 1999). In a field experimental environment, critical gaps can be measured directly without having to apply any statistical method.

Pedestrians will accept a gap (and cross the road) when it is larger than the critical gap and they will reject it (and not cross the road) when it is shorter than the critical gap. Thus, the critical gap is a value between the accepted and the rejected gap.

Gap acceptance is not unique. It depends on different factors and it varies between different road users and different situations. There are pedestrians who accept more risks accepting shorter gaps, while some others are more conservative and prefer to accept larger gaps. Hence, pedestrians choose to accept a gap according to their perceived safety (Demiroz, Onelcin et al. 2015). Moreover, the crossing behaviour is also affected by environmental and human factors, road and vehicle features and demography (Kadali and Vedagiri 2013).

According to Brewer, Fitzpatrick et al. (2005), there is a relationship between gap acceptance and crossing distance, since accepted gaps are larger as the distance to cross increases.

Regarding the age of the pedestrians, accepted gaps are larger for old people than for young people (Demiroz, Onelcin et al. 2015). In the same study, it was concluded that the decision to cross is mainly based on the distance gap and the waiting time before crossing a road makes pedestrians accept shorter gaps, due to impatience.

Crossing the street in a group also influences gap acceptance. When a pedestrian platoon is crossing, shorter gaps are accepted (Kadali and Vedagiri 2013).

Gap acceptance also depends on the speed of the approaching vehicle. The higher the approaching speed, the larger is the accepted gap (Kadali and Vedagiri 2013), although Yannis, Papadimitrou et al. (2013) concluded that the distance between pedestrians and the approaching vehicle is the main factor considered when making a crossing decision.

Das, Manski et al. (2005) found that the minimum critical gaps that pedestrians accepted had a value of 2 seconds and the accepted gaps were mostly less than 11 seconds. Brewer, Fitzpatrick et al. (2005) showed most of the accepted gaps had a value between 5.3 and 9.4 seconds.

Transportation Research Board (2000) defines the critical gap for a single pedestrian as a function of the average walking speed of the pedestrian, the road length and a decision time, as seen in the following formula.

$$t_c = \frac{L}{S_p} + t_s$$

Where,

t_c *= pedestrian critical gap (s)*

L*= road length (ft)*

S_p *= mean pedestrian walking speed (3.5 ft/s as default)*

t_s *= start-up time of the pedestrian (3 s as default)*

2.3.5 Stress level

Personal and psychological factors of each individual can also affect their crossing behaviour. For instance, stress can influence their decisions.

Different definitions have been given to stress along the years, focusing in the three following aspects (Mesken 2003), (Butler 1993):

- In the past, the environment was considered the main reason of stress. The stress is caused by a pressure put on the subject.

- Later, stress was studied focusing just on the subject who reacted to external stimuli, developing physiological reactions to the stimuli.

- Nowadays, stress is considered a combination of the environment and the subject, so stress is considered from a dynamic approach. That is due to the fact that different subjects can react in a different way to the same external stimulus (environment). Moreover, the reaction of an individual to different stimulus can also differ (subject reaction).

Stress is defined by the Cambridge English dictionary as: “great worry caused by a difficult situation or something that causes this condition”. It can be seen from that definition that the third approach, involving environment and the subject is more appropriate.

The Autonomic Nervous System (ANS) of human bodies is the responsible for controlling the organs. That system is divided in two different sub-systems (Kurniawan, Maslov et al. 2013), (Zhai and Barreto 2006):

- The sympathetic nervous system: this system is activated when potential threats are perceived, by activating organs and glandes to defend the body. When this system is activated due to a perceived threat, body reactions arise. For instance, heart rate increases, sweat glands activate, etc.

- The parasympathetic nervous system: this system acts in normal situations. It calms the nerves and makes the body and all the organs return to a regular situation.

Therefore, when the subject perceives a threat the sympathetic systems acts and physiological reactions appear. That makes possible to measure stress levels of individuals and analyse what the stressors are in certain situations. For instance, pedestrians can feel stress when crossing the road or in certain traffic situations that involve a high workload from them.

In fact, according to the Yerkes-Dodson law, there is a relationship between the arousal level and the performance of individuals. That relationship follows an inverted U curve, as it can be seen in Figure 15. It can be derived from the figure that, for low levels of arousal, the performance increases until a maximum is reached. After that point, the performance decreases (for high arousal levels).

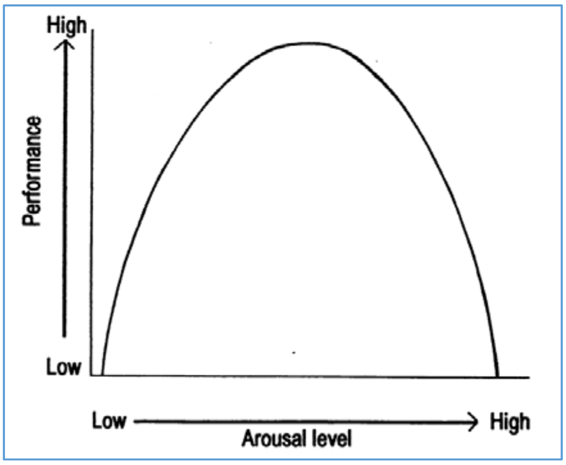


Figure 15: Relationship between performance and arousal level (Butler 1993)

Due to the physiological reactions of the body when being under stress situations, it is possible to measure stress levels. Several studies, such as Dang and Tapus (2014), de Santos Sierra, Sánchez Ávila et al. (2011), Kurniawan, Maslov et al. (2013), have measured stress levels of individuals by measuring heart rate and skin response. The benefit of using those parameters is the fact that the used technique is not intrusive and not invasive for the subject. In fact, de Santos Sierra, Sánchez Ávila et al. (2011) concluded that stress can be measured by using heart rate and skin response during 10 seconds with 99.5% accuracy.

The changes in skin under stress situations are caused by sweat produced, that generates alterations of skin conductivity. However the values of heart rate and skin response are different for each individual and they should be compared with their values under relax situations (de Santos Sierra, Sánchez Ávila et al. 2011).

On the other hand, it has been demonstrated that decision making is influenced by emotions (George and Dane (2016); Xie, Wang et al. (2011). High levels of arousal lead to higher risk taking (George and Dane 2016). Negative emotions derive in the perception of higher levels of risk, whereas positive emotions lead to a decrease in the perception of risk (Xie, Wang et al. 2011). Therefore, positive emotions can lead to and underestimation of risks.

2.3.6 Perceived safety

Perceived or subjective safety is defined by SWOV (2012) as “the personal feelings of being unsafe in traffic experienced by people or, more generally, as the anxiety regarding hazardous traffic situations for themselves and/or others”.

If a road user feels unsafe while performing a trip, his mobility can be affected, limiting his activities. Different changes in mobility can be done such as taking an alternative route or using an alternative transport mode. Moreover, if road users feel too safe, it is also possible that they will be more relaxed and their behaviour will be less safe.

Subjective safety differs for different road users, depending on their fear. This can affect the gap acceptance and the crossing behaviour. Clamann, Aubert et al. (2016) studied subjective data of pedestrians after participating on an experiment where they had to interact with a simulated automated vehicle. It was shown that 56% of the participants considered the distance to the vehicle as the most important feature to take the decision to cross safely or not to do it.

In Malmsten Lundgren, Habibovic et al. (2016), willingness to cross of pedestrians was investigated to study perceived safety of pedestrians towards automated vehicles. It was concluded that pedestrians' perceived safety is influenced by the interaction with the driver of the vehicle they are interacting with.

Lagström and Lundgren (2015) showed that the perceived safety of pedestrians decreases when a driver is not controlling the vehicle. They also showed that pedestrians perceive automated vehicles as more dangerous if they are not aware that they are interacting with an automated vehicle.

Hagenzieker, Kint et al. (2016) concluded that cyclists participating on a photo experiment where more confident when interacting with a traditional vehicle than when doing it with an automated vehicle.

2.4. Wizard of Oz concept

When a certain technology has not been implemented yet, it is often important to test it to assess its feasibility and other features such as the risks that will derive from its implementation.

Since the technology has not been implemented yet, simulation can be used instead of the real system/technology. In the Wizard of Oz technique, a person simulates the behaviour or response of the interface or system that has not been implemented yet. (Dahlbäck, Jönsson et al. 1993).

2.5. Weather conditions and pedestrian behaviour

Weather conditions can have an impact on pedestrians' crossing behaviour. For instance, Li and Fernie (2010) showed that adverse weather conditions increase the risk pedestrians take when crossing a signalised intersection. The study concluded that in adverse weather conditions (low temperature, snow), pedestrians were more likely to not obey traffic signals when crossing.

Moreover, Sun, Zhuang et al. (2015) concluded that pedestrians' estimation of speed and distance of the vehicles approaching them depend on weather conditions. Pedestrians were able to accurately estimate the approaching speed of the vehicle when the speed was lower than 40 km/h in sunny conditions and lower than 45 km/h in rainy conditions. However, for higher speeds, participants underestimated the real speed of the vehicle.

2.6. Conclusions

In the current chapter, information regarding different aspects that are relevant for the present study has been reviewed.

First of all, information regarding road crashes involving pedestrians was shown. It is important to know where most of the road accidents involving pedestrians take place in order to design the experiment. As it was shown, urban areas are the most common locations, especially while pedestrians cross the road.

Regarding the influence of gender on the risk of having an accident, male pedestrians are more involved in crashes and they are more prone to have riskier behaviours than women. Risk factors can be divided in three different types: road and environmental factors, vehicle factors and human factors. Some of those factors are road and weather conditions, speed, vehicle maintenance, distractions, age, gender, alcohol consumption and road user behaviour.

Next, information about automated vehicles was shown. It was clear from the existing literature that there is not a single term to refer to those vehicle types. Some terms that are often used are: autonomous vehicles, automated vehicles, self-driving vehicles, self-piloted vehicles, robotic vehicles or driverless vehicles. In the present study the term automated vehicle will be adopted. There are also different classifications for the level of automation of vehicles. Different levels of automation involve different performance of the driver. From non-automated vehicles, where the driver has all the control over the vehicle, to fully-automated vehicles, where the driver is not requested to take control of the vehicle. In the current study the high automation has been considered. In the near future, when vehicles with different levels of automation share the public space, a classification will be important, since that can lead to confusing situations for other road users that do not know what type of vehicle they are interacting with.

The introduction of automated vehicles on the urban space is something that will happen in the near future, since different car manufacturers have already developed automated vehicles. Large-scale tests with automated vehicles are already expected in the near future (2020s).

Focusing on pedestrians' crossing behaviour, it was seen that currently pedestrians rely on non-verbal communication with drivers to make decisions on crossing behaviour. Non-verbal communication with the driver is important for the pedestrian to understand the crossing situation and make a safe decision. Once automated vehicles are implemented in the near future, the interaction between pedestrians and drivers will differ since the driver will not always be in control of the vehicle as in the case of a traditional vehicle. Moreover, pedestrians might not be aware that they are interacting with an automated vehicle or a traditional one. That can lead to confusing and unsafe situations. In order to avoid this, some studies have proposed to study a way to show the vehicle's intentions when an automated vehicle is interacting with a pedestrian. Another solution is to distinguish automated vehicles from traditional vehicles with some type of external feature, so the pedestrian will always be aware about what vehicle type he is interacting with.

A review of current studies regarding the relationship between pedestrians' crossing behaviour and automated vehicles was also done. When interacting with vehicles, pedestrians take into account different characteristics of the vehicle and the driver. For instance vehicle speed, distance from the vehicle and non-verbal communication with the driver of the vehicle. In the case of automated vehicles, the interaction between pedestrians and the driver will not be always possible since the driver will no longer be in control of the vehicle. That situation and its consequences have to be studied, and possible solutions to create an interaction between automated vehicles and pedestrians should further develop to improve safety of all road users.

Next, information regarding the importance of expectations in traffic situations has been given. Road users base their decisions on expectations about the behaviour of other road users in a specific situation. The expectations can be long term expectations (based on education and experience) or short term expectations (including information about a specific situation). Expectation is an important feature to consider when implementing automated vehicles, since the behaviour of pedestrians can differ when interacting with that type of vehicles. For instance, if the pedestrian expects to interact with a traditional vehicle he can behave differently compared to when he expects to interact with an automated vehicle.

Gap acceptance is often studied when analysing pedestrian crossing behaviour. An accepted gap is the space (or time) between the pedestrian and the front of the approaching vehicle when the pedestrian decides to cross the road. Rejected gaps are the ones considered when the pedestrian decides not to cross. And the critical gap is the minimum gap for which a pedestrian would be willing to cross the road. Gap acceptance depends on the situation and the road user, age and gender and the speed of the approaching vehicle.

Stress can also have an influence on crossing behaviour. It also causes physiological reactions that can be measured to analyse the stress level of a pedestrian in a specific situation. Situations in which a pedestrian is interacting with an automated vehicle can be considered stressful as these are new situations.

Regarding the perceived or subjective safety, it is described as “the personal feelings of being unsafe in traffic experienced by people or, more generally, as the anxiety regarding hazardous traffic situations for themselves and/or others”. Perceived safety can affect pedestrians’ behaviour and it is different for every road user, depending on their fear for a specific situation. It has shown in different studies that pedestrians and cyclists perceive automated vehicles as less safe than traditional vehicles, especially if they are not aware that the vehicle is automated.

In the end, the definition of the Wizard of Oz concept was given and the possible impact of weather conditions on pedestrians’ crossing behaviour was described.

2.7. Research gaps

The interaction between pedestrians and automated vehicles has not been studied in detail yet. It is an important field that should be studied in a relatively short term before the implementation of automated vehicles on the roads. In that way, safety of all road users will be guaranteed in the near future.

Until now, research on the interaction between pedestrians and automated vehicles has mainly focused on the automated vehicle technology from the point of view of the driver (Toffetti, Wilschut et al. (2009); Weyer, Fink et al. (2014); Cunningham and Regan (2015); Seppelt and Lee (2015); Vlakveld, Vissers et al. (2015); Zeeb, Buchner et al. (2016). Research has also focused on public opinion regarding automated vehicles (Bazilinskyy, Kyriakidis et al. (2015); Kyriakidis, Happee et al. (2015); Madigan, Louw et al. (2016). However, research that is focused on the pedestrians’ point of view is crucial as well, because pedestrians may alter their behavior in response to automated vehicles.

A small number of studies on the interaction between vulnerable road users and automated vehicles have been conducted so far (Blau (2015); CityMobil2 (2016); Clamann, Aubert et al. (2016); Habibovic, Malmsten Lundgren et al. (2016); Habibovic, Andersson et al. (2016); Hagenzieker, Kint et al. (2016); Rothenbücher, Li et al. (2016); Malmsten Lundgren, Habibovic et al. (2017). Some of the previous studies have used questionnaires, photo experiments or interviews (Blau (2015); Hagenzieker, Kint et al. (2016), others have focused on providing with a state of the art on that field. They have also focused on defining the main problems that can arise during the future interaction between vulnerable road users and automated vehicles (Martens, Schieben et al. 2011), (Habibovic, Englund et al. 2014).

Other studies have analysed the effect of a possible communication between pedestrians and the vehicle when non-verbal communication with the driver is not possible. For instance by using signs showing the vehicle intentions (Clamann, Aubert et al. 2016), (Lagström and Lundgren 2015), (Habibovic, Malmsten Lundgren et al. 2016).

At present there is a paucity of research regarding pedestrians' behaviour in real-life settings when interacting with automated vehicles.

After analysing current literature, it has been noticed that there is a lack of research regarding pedestrian behaviour in real situations (field experiment) to assess pedestrian crossing behaviour in terms of gap acceptance and stress level when interacting with automated vehicles. Moreover, the main focus has mainly been on studying how to place signs on automated vehicles to show its intentions to pedestrians and the consequences of that. But, it is also important to analyse the effects of physical recognisability of automated vehicles, since in the future vehicles with different levels of automation will be present on the public space. That recognisability can be achieved by using external signs on the vehicle with messages such as self-driving vehicle, to make other road users aware of the vehicle type they are interacting with. This has also been studied in Hagenzieker, Kint et al. (2016) through a photo experiment from the point of view of cyclists.

Because of all the above-mentioned research gaps, the present study will focus on the analysis of pedestrian crossing intentions when interacting with a simulated automated vehicle in a real life situation (field study). The interaction will be assessed by focusing on gap acceptance, stress level and perceived safety for different external vehicle features.

2.8. Research hypotheses and research questions

2.8.1 Research hypotheses

The implementation of automated vehicles from the point of view of the pedestrian has not been studied extensively yet. Most of the current studies have focused on the vehicle and the driver. Therefore, there is not a wide knowledge about what will happen in the near future when automated vehicles interact with pedestrians.

However, after analysing the current literature and preparing the planning for the present study, the following hypotheses are considered regarding the expected results of the field study:

- There will be a statistically significant difference between the crossing behaviour when interacting with a traditional vehicle and when interacting with an automated vehicle. This is due to the fact that pedestrians are used to interact with the driver and they might be hesitant on trusting technology. As it has been explained before, according to Houtenbos (2008) traffic behaviour of road users is affected by expectations about the behaviour of other road users. Moreover, nowadays, pedestrians rely on non-verbal communication with the driver to make the decision to cross or not cross the road (Habibovic, Malmsten Lundgren et al. 2016). That communication will not always be possible with the driver of a fully automated vehicle.

- Pedestrians will feel less comfortable when interacting with an automated vehicle, since it is something new that they do not expect and they will need a learning process to get used to them in the future. That can be due to the fact that long term expectations are based on education and experience (Houtenbos, Jagtman et al. 2005).

- Vehicle recognition is expected to have an effect on pedestrians' behaviour. In a non-recognisable automated vehicle, the driver will perform another task, avoiding eye contact with the pedestrian. In that case, the pedestrian might be confused about the situation. In the case that some signs show that the specific vehicle is a self-driving vehicle, the same situation can be clearer. If no distinction is made, the pedestrian might think that the driver is using a traditional vehicle but he is not paying attention to the road, so that can be confusing for the pedestrian. There can be different preferences regarding the signal type. Hagenzieker, Kint et al. (2016) showed that in the case of a photo experiment of cyclists interacting with both traditional and automated vehicles, while female cyclists preferred lateral signs, men cyclists preferred roof signs.

- Pedestrians will put more trust in traditional vehicles than in automated vehicle since the intentions of the automated vehicle are not clear. However, the intentions of a driver can be assumed from non-verbal communication. That is shown in Hagenzieker, Kint et al. (2016), where it was demonstrated through a photo experiment that cyclists were more confident when interacting with a traditional vehicle than when doing it with an automated vehicle.

2.8.2 Research questions

As described in the introduction, the present study aims to answer the following research questions to achieve the main study goal:

- Do pedestrians' crossing intentions differ when interacting with a Wizard of Oz automated vehicle compared with that of a traditional vehicle?

- Do different external features (vehicle recognisability) affect pedestrians' crossing intentions when interacting with a Wizard of Oz automated vehicle?

- Do pedestrians trust more automated vehicles or traditional vehicles?

In order to answer the previous main research questions, different sub-questions should be answered as well:

- Gap acceptance:
    - Are there any statistically significant differences in the critical crossing gap when pedestrians interact with a traditional vehicle, a non-recognisable Wizard of Oz automated vehicle or a recognizable Wizard of Oz automated vehicle with different external features?
- Perceived stress level:
    - Are there any statistically significant differences regarding perceived stress level of pedestrians when interacting with a traditional vehicle, a Wizard of Oz non-recognisable automated vehicle or a Wizard of Oz recognisable automated vehicle with different external features?
- Perceived safety:
    - Are there any differences regarding perceived safety when pedestrians interact with a traditional vehicle, a Wizard of Oz non-recognisable automated vehicle or a Wizard of Oz recognisable automated vehicle with different external features?

3

Two pilot studies

The data collection phase of this thesis was based on an experiment in a real crossing environment performed in a closed location at the TU Delft campus, including an interview and a questionnaire. During the experiment, participants (pedestrians) encountered a Wizard of Oz automated vehicle with different behaviour and external features and a traditional vehicle. Participants interacted with both traditional and Wizard of Oz automated vehicles in a within-subject design.

The aim of the design was to analyse the possible differences in pedestrians' crossing intentions, stress level and perceived safety when interacting with an automated vehicle as compared to a traditional vehicle.

The data collection process was comprised of three different phases. The first two phases consisted of two small scale pilot studies performed in November 2016 and January 2017. Those two pilot studies were carried out as a try-out to evaluate the feasibility of the study set-up and the measurement procedures and achieve an appropriate experimental design. The last stage of the data collection was, therefore, the final experiment including the improvements from the try-out sessions and it was performed in March 2017.

The main objective of this chapter is to provide a description of the methods that were used to collect the data during the two pilot studies. Moreover, the results are shown and the lessons learnt from the performance of the two pilot studies are described.

3.1. Data collection

The two pilot studies were performed on the 24th of November of 2016 and on the 26th of January of 2017. Each pilot was comprised of only one experimental session (one day).

3.1.1 Location

Since safety of all people involved in the experiment and other road users should be guaranteed, a part of a road at the TU Delft campus was closed during the performance of the experiments.

After consultation with Parkmanagement at TU Delft, none of the proposed locations in the thesis proposal was accepted. However, permission was given to perform the experiment at the Heertjeslaan, between Huismansingel and Molengraaffsingel. That part of the road was closed to other traffic during the experimental sessions. A time restriction was also given, so the road could only be closed between 10:00 h and 15:00 h during the two pilot studies.

The road blockages were created by placing fences and signs. Moreover, a security guard was present during the experiment to prevent other road users from accessing the road during the experiments.

Figure 16 shows the location of the experiment on a map. As it can be seen, the location is at the edge of the TU Delft campus. The road consisted of two driving lanes and two parking lanes. Pedestrian infrastructure was available on one side of the road and pedestrian crossing facilities were not available, as shown in Figure 17.

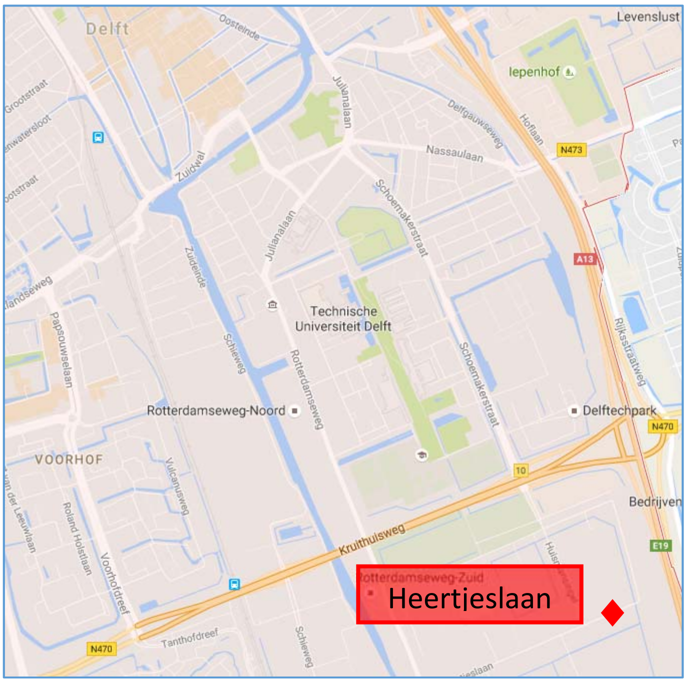


Figure 16: Experiment location map (Heertjeslaan West, between Huismansingel and Molengraffsingel)

Figure 17: Experiment location (Heertjeslaan West, between Huismansingel and Molengraffsingel)

As it can be seen in the previous image, there was space enough for the vehicle to turn around after the interaction with the pedestrian.

3.1.2 Participants

Four and two participants were tested during the first and the second pilot study, respectively. The recruitment was carried out by posting announcements (see appendices A and D) in social media, in groups related to TU Delft. The participants received a 10 € gift coupon as a compensation for their collaboration on the study.

As it can be seen in the posters (appendices A and D), during the recruitment for the first pilot study, it was explained to the participants that they were going to participate in a study to analyse the interactions between pedestrians and self-driving vehicles. During the recruitment for the second pilot study, however, participants were not informed in advance that Wizard of Oz automated vehicles were involved in the experiment.

More information regarding the composition of these data samples will be given in sections 3.2 and 3.3.

3.1.3 Experimental design

- Variables and scenarios

In Table 2 and Table 3 the independent and dependent variables of the experiment are shown, specifying the variables tested in each pilot study.

Table 2: Summary of independent variables used in both pilot studies

	First pilot study (24/11/2016)	**Second pilot study (26/01/2017)**
Independent variables	**Values**	**Values**
Vehicle appearance	-Traditional vehicle (TV) -Non-recognisable Wizard of Oz automated vehicle (AV) -Recognisable Wizard of Oz automated vehicle with signs on the hood and the front door (AVM) -Recognisable Wizard of Oz automated vehicle with roof sign (AVR)	-Traditional vehicle (TV) -Non-recognisable Wizard of Oz automated vehicle (AV) -Recognisable Wizard of Oz automated vehicle with signs on the hood and the front door (AVM) -Recognisable Wizard of Oz automated vehicle with roof sign (AVR)
Vehicle kinematic profile	- Vehicle stopping before pedestrian crossing: the vehicle starts at 30 km/h from a distance of 100 m, reduce to 15 km/h, reduce further to 5 km/h and stop before pedestrian crossing - Vehicle not stopping before pedestrian crossing: the vehicle starts at 30 km/h from a distance of 100 m, reduce to 15 km/h, reduce further to 10 km/h and it does not stop before pedestrian crossing	- Vehicle starting to drive 70 m from the participant, with speed 30 km/h and reduce to 10-15 km/h to stop before the crossing - Vehicle starting to drive 50 m from the participant, with speed 25 km/h and reduce to 10 km/h to stop before the crossing
Vehicle approaching direction	The vehicle is always approaching the participant from his left side (just one lane of the road is used)	-Vehicle approaching from the left of the participant -Vehicle approaching from the right side of the participant

Table 3: Summary of dependent variables used in both pilot studies

	First pilot study (24/11/2016)	Second pilot study (26/01/2017)
Dependent variables	**How/what to measure**	**How/what to measure**
Pedestrian gap acceptance	Measurement of critical crossing gap using video recording	Measurement of critical crossing gap using video recording
Pedestrian stress level	Analysis of pedestrians' stress level by measuring heart rate and skin response and by using interviews	Analysis of pedestrians' stress level by using interviews post-interaction and think aloud protocol
Pedestrian looking behaviour	Measurement of pedestrian looking behaviour using an eye-tracker	Measurement of pedestrian looking behaviour using an eye-tracker
Perceived safety and further improvements	Analysis of perceived safety and further improvements using interviews and a questionnaire post-experiment	Analysis of perceived safety and further improvements using interviews and a questionnaire post-experiment

It can be seen that some variations were used regarding the independent variables in each pilot study. Therefore, there were different scenarios depending on the independent variables:

- **Vehicle appearance:** the same four different scenarios were analysed in both pilot studies, depending on the type of vehicle interacting with the participant. In all the scenarios, just one vehicle was used. That was the automated vehicle under development at the CITG faculty at TU Delft.

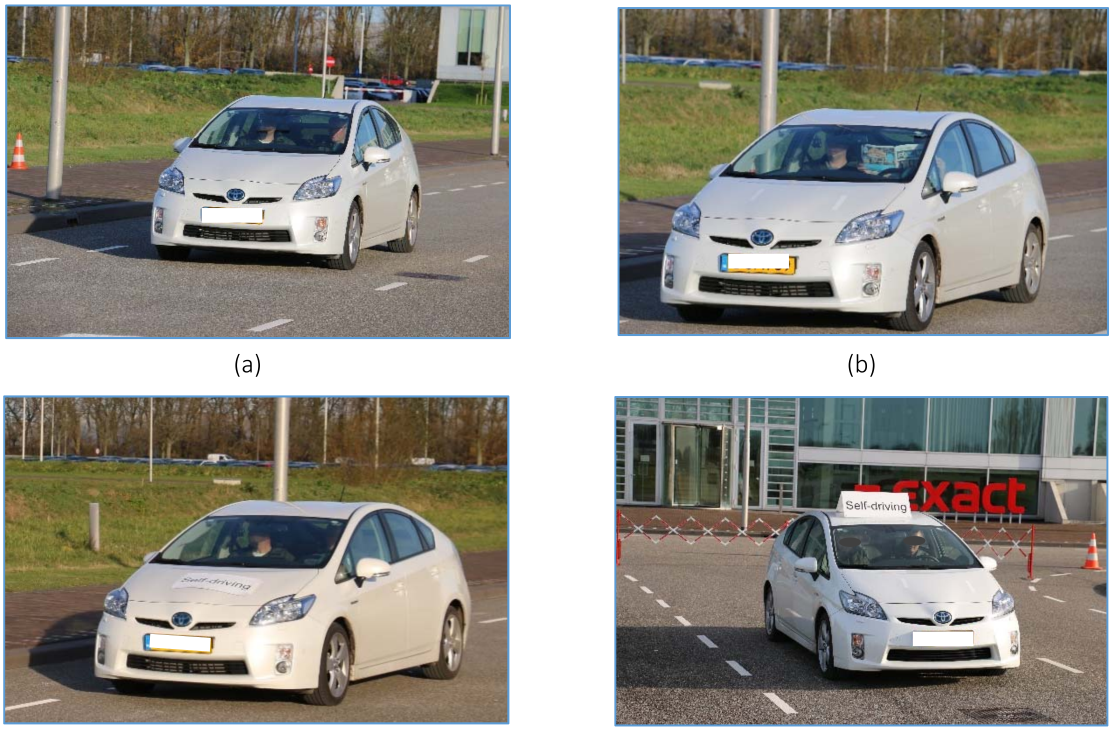
    1. Traditional vehicle (TV): the vehicle was driven manually, the driver was paying attention to the road and he kept his hands on the steering wheel. (Figure 18 a)

    2. Non-recognisable Wizard of Oz automated vehicle (AV): the vehicle was driven with a joystick by the passenger sitting next to the 'driver'. Meanwhile, the 'driver' was holding a newspaper in front of him as if he would be reading it. The vehicle was not equipped with external signs. (Figure 18 b)

    3. Recognisable Wizard of Oz automated vehicle with signs on the hood and the front door (AVM): the vehicle was driven with a joystick by the passenger next to the 'driver'. The 'driver' was intentionally not making eye-contact with the participant, as if he would not be paying attention to the traffic situation and he did not have his hands on the steering wheel. The vehicle was equipped with magnets on the hood and the front door with the text 'self-driving'. (Figure 18 c)

    4. Recognisable Wizard of Oz automated vehicle with roof sign (AVR): the vehicle was driven with a joystick by the passenger next to the 'driver'. The 'driver' was intentionally not making eye-contact with the participant, as if he would not be paying attention to the traffic situation and he did not have his hands on the steering wheel.

The vehicle was equipped with a roof sign on top with the message ‘self-driving’. (Figure 18 d)



(a) (b)

(c) (d)

Figure 18: Used scenarios regarding vehicle appearance (see text for explanation)

In order to ensure safety of all persons involved in the experiment, in all the scenarios the person sitting in the driver’s seat could immediately take (manual) control over the vehicle in case of emergency or in case of problems with the joystick. However, such situations did not occur.

- **Vehicle kinematic profile:** the kinematic profile of the vehicle varied from the first pilot study to the second.

In the first pilot study, two different scenarios were tested:

1. Vehicle stopping before the pedestrian: the vehicle started driving at a speed of 30 km/h at a distance around 100 m from the participant. When the vehicle was close to the pedestrian, the speed was reduced to 15 km/h and to 5 km/h afterwards to stop before the pedestrian crossing.

2. Vehicle not stopping before the pedestrian: the vehicle started driving at a speed of 30 km/h at a distance around 100 m from the participant. When the vehicle was close to the pedestrian, the speed was reduced to 15 km/h and to 10 km/h afterwards. The vehicle continued driving at 10 km/h without stopping before the pedestrian.

During the second pilot study, two different scenarios were tested:

1. Vehicle starting to drive at a distance of 70 m from the participant: the vehicle started driving at a speed of 30 km/h and reduced the speed to 10-15 km/h when it was close to the participant to stop before him.

2. Vehicle starting to drive at a distance of 50 m from the participant: in this case the initial speed of the vehicle was 25 km/h. When the vehicle was close to the participant, the speed was reduced to 10 km/h to stop before the pedestrian.

- **Vehicle approaching direction:** the scenarios regarding the approaching direction of the vehicle were different from the first to the second pilot study.

  During the first pilot study the vehicle was always approaching the participant from his/her left side, so just one lane of the road was used to drive.

  However, in the second pilot study, both lanes of the road were used, leading to two different scenarios regarding the approaching direction of the vehicle:

  1. Vehicle approaching from the left of the participant

  2. Vehicle approaching from the right of the participant

The different independent variables led to 8 scenarios per participant tested during the first pilot study and 16 scenarios in the case of the second pilot study. All the scenarios were randomized as it can be seen in appendices B and E.

In the following figures a summary of the different variables and scenarios tested in each pilot study are shown.

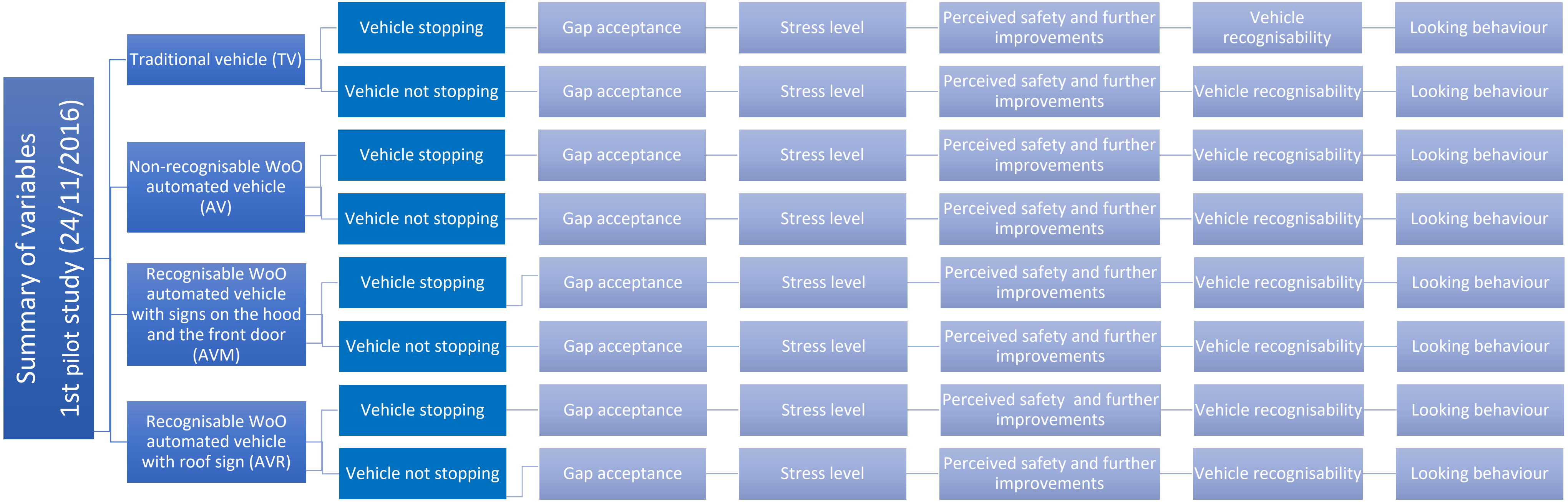


Figure 19: Summary of scenarios and variables for the first pilot study (24/11/2016)

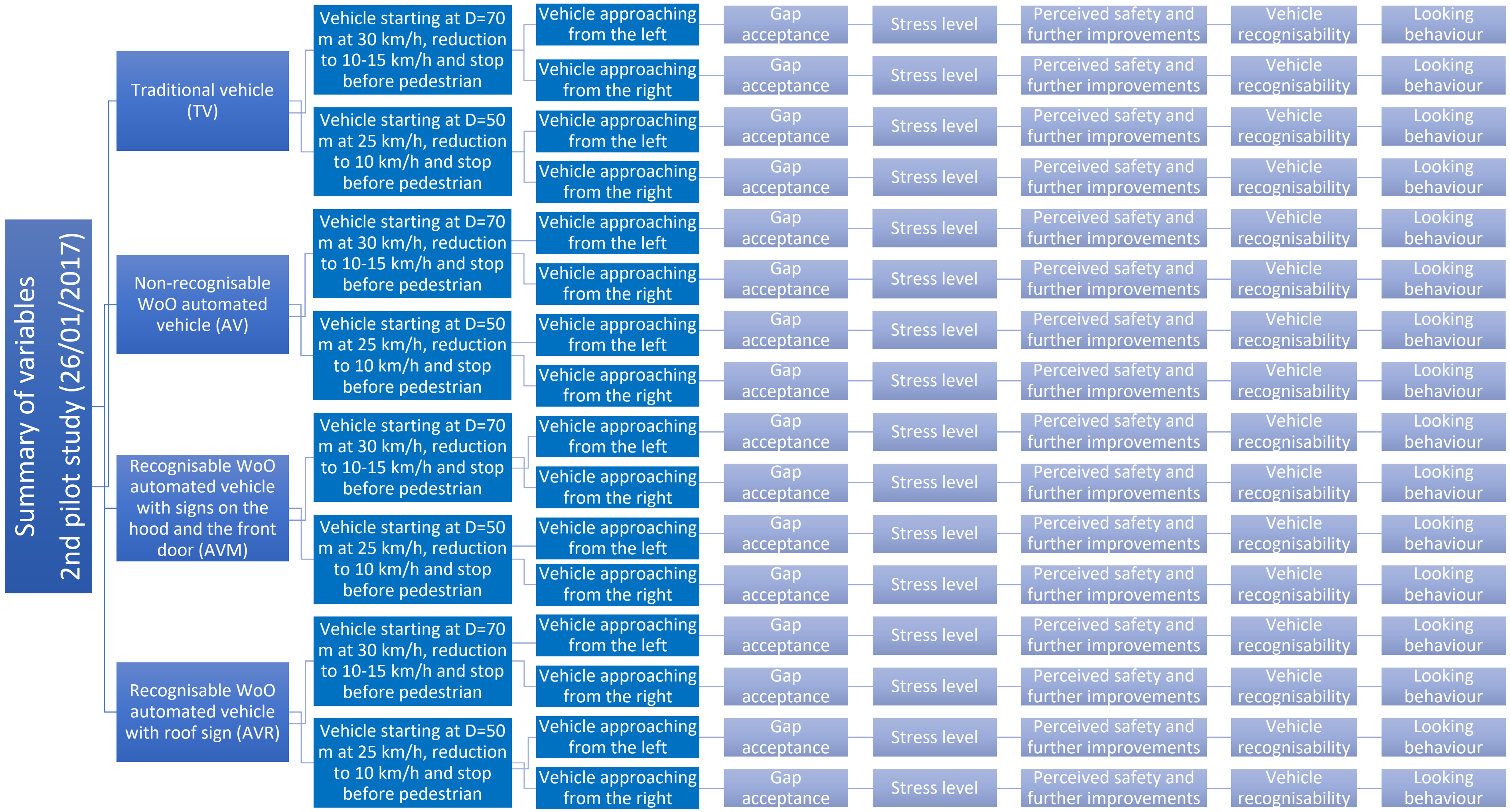


Figure 20: Summary of scenarios and variables for the second pilot study (26/01/2017)

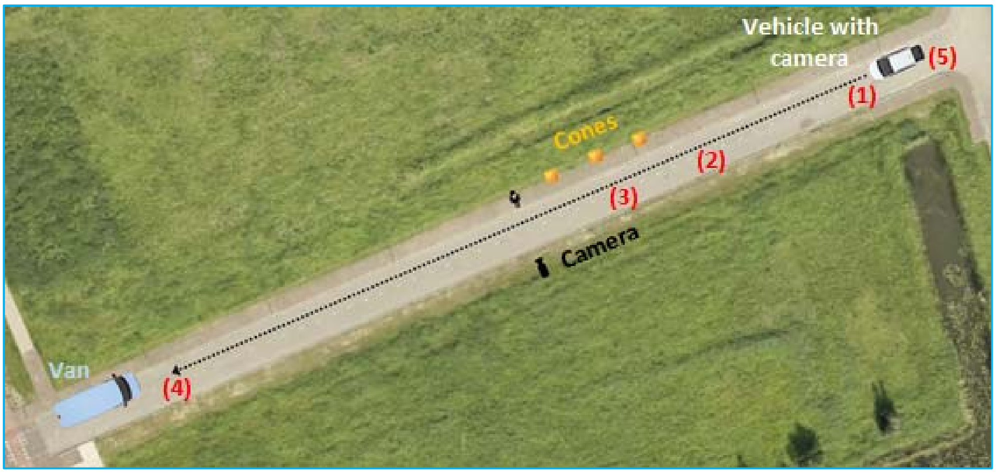
In both pilot sessions the structure of the experiment was the same, although some instructions of scenarios varied. That is due to the fact that, after analysing the results of the first pilot study, some more situations wanted to be tested or improved in the second pilot study.

The booklets with all the detailed information regarding the experimental sessions that were given to all the assistants involved in the pilot studies can be seen in the appendices B and E.

- Experiment set-up and method:

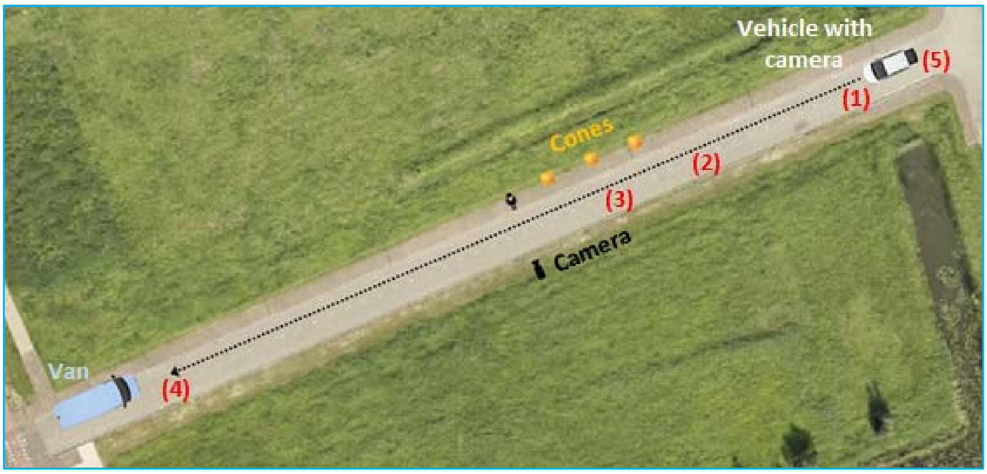
A. First pilot study:

During the first pilot session (24/11/2016), the set-up shown in the following figures was used. The dashed arrow indicates the vehicle trajectory. The van was used as an office to receive the participants and give them the forms, the equipment and the questionnaire.



(1) *Start driving at 30 km/h;* ***(2)*** *Reduce speed to 15 km/h;* ***(3)*** *Decelerate further (to 5 km/h) to stop just before the participant;* ***(4)*** *Drive back to initial position;* ***(5)*** *Change vehicle signs*

Figure 21: Set-up of the first pilot study (scenario with vehicle stopping)



(1) *Start driving at 30 km/h;* ***(2)*** *Reduce speed to 15 km/h;* ***(3)*** *Decelerate further (to 10 km/h) and do not stop before the participant;* ***(4)*** *Drive back to initial position;* ***(5)*** *Change vehicle signs*

Figure 22: Set-up of the first pilot study (scenario with vehicle not stopping)

When participants arrived to the experiment location, they were asked to read and sign an informed consent in which the experiment instructions were described as follows:

"You will be asked to stand on the sidewalk of the road while vehicles with different characteristics will drive on the road towards your direction. You will be asked to raise one of your hands in the last moment you would cross the road. However, you are explicitly requested ***NOT to cross the road*** *under any circumstances. Different scenarios will be studied and you will not be informed in advance on what vehicle type you will be interacting with in each case. During the experiment you will wear a galvanic skin response device in one of your hands and an eye-tracker. That equipment is non-intrusive and it will not cause you any harm. The galvanic skin response device consists of three sensors placed on three of your fingers with Velcro and a device inside a backpack you will wear. The eye-tracker consists of glasses with an integrated camera connected to a source that will be placed in the backpack you will wear.*

Video recording will be used during the experiment to facilitate the data analysis afterwards.

After the experiment you will be asked to answer some questions and fill in a short questionnaire regarding your impressions about the experiment."

After signing the informed consent, participants were equipped with an eye-tracker and a Galvanic Skin Response device. After calibration of those devices, participants were requested to stand on a specific location on the sidewalk with their back to the road. Then, the interaction vehicle-pedestrian took place and all the different scenarios that can be seen in the appendix were tested. The methodology used during and after the interactions with the vehicle differed from one participant to the other as follows:

- Participant 1: she was requested to raise her hand in the last moment she would cross the road. After the interaction with the vehicle, the experimenter asked her to turn around with her back to the road again until the next interaction.

  After testing all the scenarios, the participant returned to the van where the eye-tracker and the GSR device were removed. Moreover, a short interview regarding the experiment was performed and recorded and the participant was asked to fill in a short digital questionnaire.

- Participant 2: during the first 4 scenarios he was requested to raise his hand in the last moment he would cross the road. However, in the last 4 scenarios he was requested to take a step forward instead of raising his hand. After each interaction with the vehicle, he was requested to turn around again with his back to the road until the next interaction. He also answered a short interview at the end of the experiment and he filled in a digital questionnaire.

- Participant 3: the instructions during the interaction with the vehicle were the same than in the case of participant 2 (first 4 scenarios with hand raising and 4 last scenarios step forward). However, in this case there was a short interview after every interaction that was also recorded a part from the interview post-experiment and the questionnaire.

- Participant 4: he was requested to raise his hand in the last moment he would cross the road during the first 4 scenarios and to take a step backwards in the last 4 scenarios. In this case there was also an interview post-interaction, an interview post-experiment at the end and a digital questionnaire.

At the end of the experiment, a debriefing form and compensation was given to all the participants.

The previous methodology was designed to obtain data regarding the dependent variables that were described in Table 3, as follows:

- Gap acceptance: by raising a hand, taking a step forward or taking a step backward in the last moment participants would cross the road, the critical gap was obtained. The video recording and the cones behind the participant were used to obtain that critical gap as the distance between the vehicle and the pedestrian in the last moment the participant would cross the road.

- Pedestrian stress level: it was measured in terms of galvanic skin response, heart rate and by the interview post-interaction or post-experiment.

- Perceived safety and further improvements: data was collected through the interviews and the questionnaire.

- Vehicle recognisability: analysed from the answers to the questionnaire.

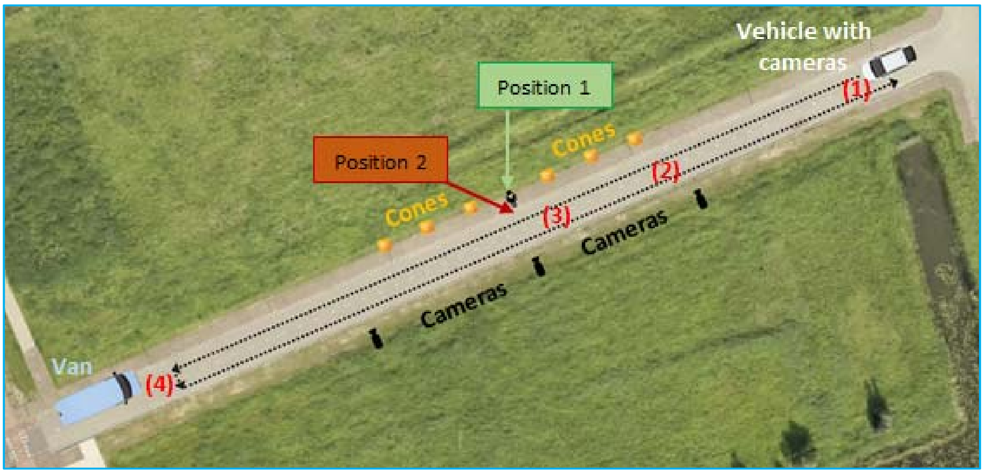
- Pedestrian looking behaviour: an eye-tracker was used to collect data regarding the looking behaviour of the participants. It is important to mention that this equipment is really sensitive to sunlight. A good calibration of the equipment was not possible during the first pilot study due to problems with sunlight. So not useful data was collected.

The following images show different phases of the first pilot session:

Figure 23: Different phases of the first pilot study

B. Second pilot study:

In the case of the second pilot study (26/01/2017), the set-up and methodology were slightly different than the ones described for the first pilot session. Figure 24 shows an example of the experiment set-up in the case the vehicle approached the participant from the left. It can be observed that, as mentioned before, in the second pilot study both lanes of the road were used.



(1) *Start driving at 25 km/h from 50 m or 30 km/h from 70 m (depending on scenario);* ***(2)*** *Reduce speed to 10-15 km/h;* ***(3)*** *Stop before the participant;* ***(4)*** *Change vehicle signs and turn around to start driving on the opposite lane*

Figure 24: Set-up of the second pilot study (example for vehicle approaching from the left side of the participant)

The previous figure shows the set-up in the case of the vehicle approaching the participant from his left side. Therefore, the same kinematic profile was applied in the case of the vehicle approaching from the opposite lane. It is important to notice that this time 3 cameras were placed in front of the pedestrian to obtain a better angle in the video.

During the second pilot session, both participants received the same instructions. First, they signed an informed consent with the following instructions:

"You will be asked to stand on the sidewalk of the road while vehicles with different characteristics will drive on the road towards your direction. You will be asked to take a step forward in the first moment you would cross the road and one step backward in the last moment you would cross the road (last moment you think it is safe to cross). However, you are explicitly requested ***NOT to cross the road*** *under any circumstances. Different scenarios will be studied and you will not be informed in advance on what vehicle type you will be interacting with in each case. During the experiment you will wear an eye-tracker and a microphone. That equipment is non-intrusive and it will not cause you any harm. The eye-tracker consists of glasses with an integrated camera connected to a source that will be placed in the backpack you will wear. The microphone will be used to record your impressions while interacting with the vehicle, since you will be asked to think aloud to show your impressions.*

Video recording will be used during the experiment to facilitate the data analysis afterwards. After every interaction you will be asked to answer some short questions that will be recorded. At the end *of the experiment you will be asked to fill in a short questionnaire regarding your impressions about the experiment."*

After signing the informed consent, the participants were equipped with the eye-tracker and it was calibrated. This time the GSR device was not used due to the fact that during the first pilot study it was seen that its use was causing some problems and it was time consuming. Participants were also equipped with a headset microphone to record their answers to the interviews and apply a think aloud protocol during the interactions with the vehicle.

Once the eye-tracker was calibrated, participants walked with the experimenter and stood at position 1 on the sidewalk (see Figure 24) with their back to the road. There, the experimenter gave the participants the instructions one more time. They were requested to turn around when the experimenter told them (at the moment the vehicle started driving) and walk to position 2 on the sidewalk. At position 2, they had to take a step forward in the first moment they would cross the road and one step backwards in the last moment they would cross it. Participants were asked to think aloud during the whole interaction, the instruction was to say aloud everything that went through their minds.

After every interaction with the vehicle, the participants went back to position 1 and stood there with their back to the road until the next interaction. During that time, a short interview post-interaction was performed and recorded.

After testing the 16 different scenarios with the vehicle, participants went back to the van where the equipment was removed, they answered a post-experiment interview and they filled in the digital questionnaire.

The detailed information about the second pilot study is shown in appendix E, in the booklet that was given to all the assistants involved. The following images show different phases of the second pilot study.

Figure 25: Different phases of the second pilot study

- Equipment and assistants

Some equipment and other assistants were needed to perform the pilot studies. The list of assistants and their tasks is shown in the booklets with information regarding the performance of the pilot studies that can be seen in appendices B and E.

In order to collect data about critical gap, three cameras were placed in front of the pedestrian and one inside the vehicle. That way, gap acceptance could be measured afterwards through video analysis. To measure distances during the video analysis, orange cones were placed at the edge of the sidewalk, behind the participant with a distance of 1 m and 5 m between them during the first and the second pilot study, respectively.

The following equipment was also needed during the experiment:

- Automated vehicle under development at the CITG faculty at the Delft University of Technology (a white Toyota Prius that was driven both manually and with a joystick connected to a laptop).
- Van: Since the location of the experiment was not central and no other buildings or facilities were available, a van was used as an office place to welcome the participants. The van is property of the Delft University of Technology and it was placed at the end of the road to avoid interference during the vehicle-pedestrian interaction.
- Phone to record the interviews.
- Laptop with wireless internet connection to fill in the digital questionnaire in Google Forms.
- Vehicle signs (magnets and roof sign).
- Eye-tracker and NUC.
- Device to measure the galvanic skin response and the heart rate during the first pilot study and microphone during the second pilot study.

During the pilot studies, five people were needed to perform the following tasks:

- 2 Drivers
- One person with the participant during the interactions with the vehicle
- One person welcoming the participants, providing the informed consent, the debriefing form, the questionnaire and the compensation
- One person placing the equipment on the participant

During the first pilot study, the drivers also changed the vehicle signs after every scenario. However in order to gain time, during the second pilot study an extra assistant was the one changing the vehicle signs.

3.2. Results first pilot study

3.2.1 Data set

During the first pilot study, the data set was comprised of 4 participants (two men and two women). Their ages were comprised between 19 and 29 years old (M=23.75, SD=3.3775). Two of the participants were from Germany, one from Spain and one from the Netherlands. All participants are students or PhD students at the Delft University of Technology.

The following figure shows the demographic data of the sample analysed during the first pilot study.

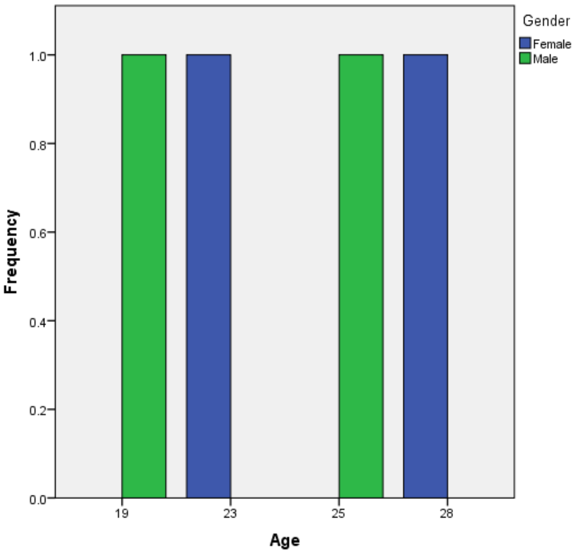


Figure 26: Demographic data distribution (1st pilot study)

3.2.2 Critical gap

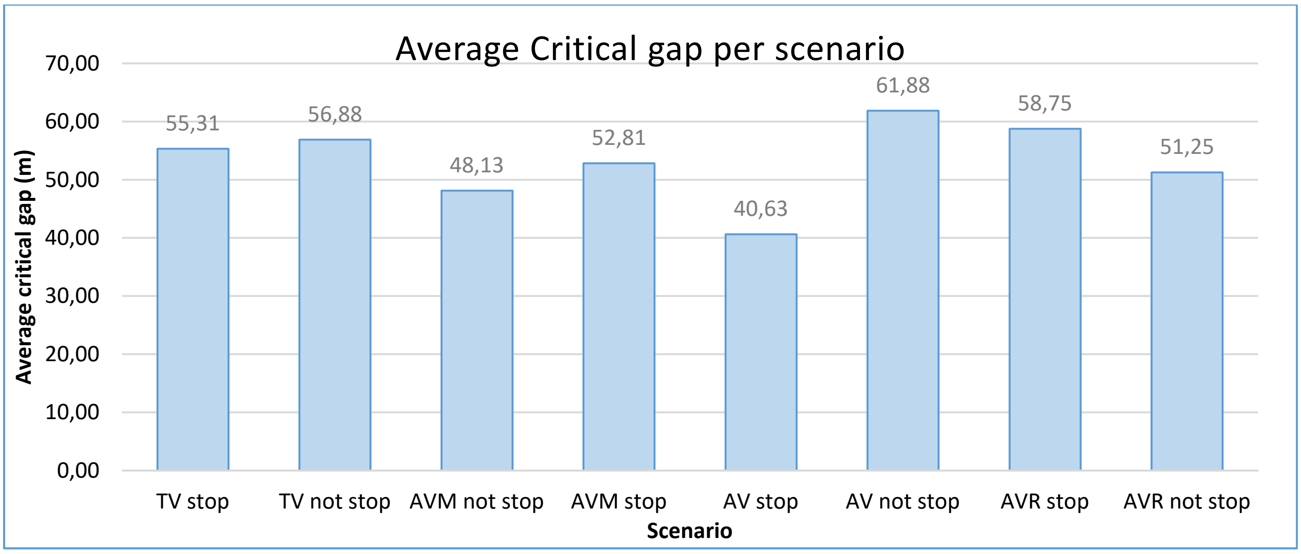
During the first trial session, the following 8 scenarios regarding the interaction participant – vehicle were tested. A code was assigned to each scenario so if the experimenter next to the participant and the driver had to discuss about a specific scenario, the participant would not know in advance what type of vehicle they would interact with.

Table 4: List of scenarios with codes (1st pilot study)

Scenario code	Scenario
A	Traditional vehicle (stopping)
B	Traditional vehicle (Not stopping)
C	Recognizable Wizard of Oz automated vehicle with magnets on the hood and on the door (Not stopping)
D	Recognizable Wizard of Oz automated vehicle with magnets on the hood and on the door (stopping)
E	Non-recognizable Wizard of Oz automated vehicle (driver reading newspaper) (stopping)
F	Non-recognizable Wizard of Oz automated vehicle (driver reading newspaper) (Not stopping)
G	Recognizable Wizard of Oz automated vehicle with roof sign (stopping)
H	Recognizable Wizard of Oz automated vehicle with roof sign (Not stopping)

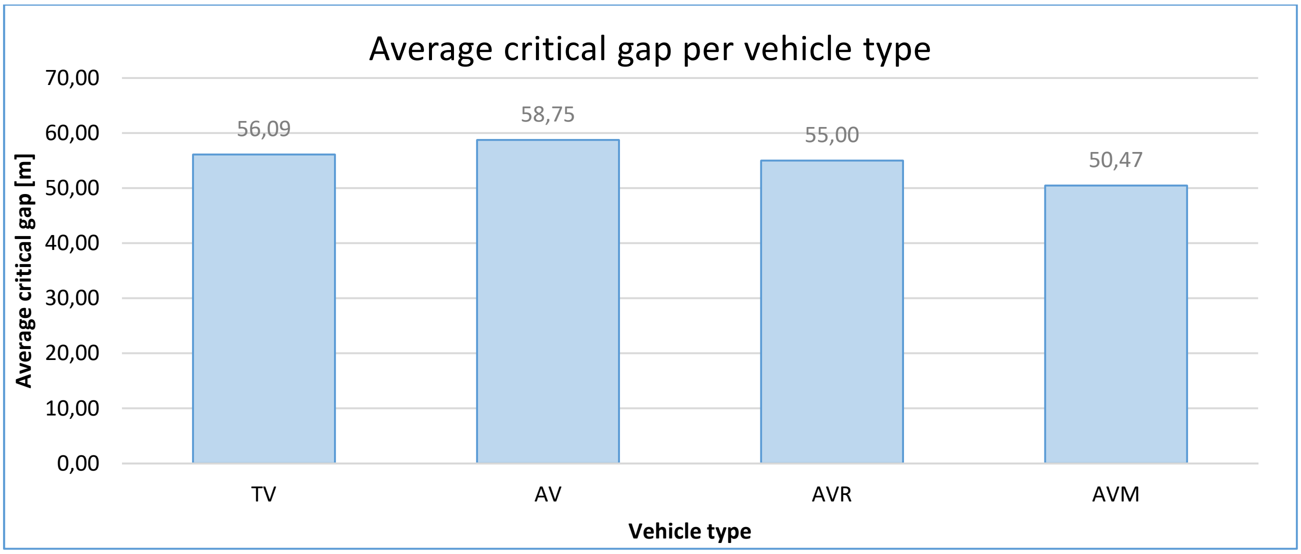
As explained before, the critical gap was obtained from the videos recorded by the cameras in front of the pedestrian. The critical gap is the distance between the participant and the vehicle at the moment the participant raised his/her hand (or took a step forward/backward). The complete list of critical gaps per participant and scenario with the specific times can be seen in appendix C. Results show that the lowest critical gap is 30 m whereas the largest is 100 m.

Figure 27 and Figure 28 show the average critical gaps for all the participants per scenario and vehicle type.



TV: *traditional vehicle;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 27: Average critical gap per scenario (all participants, 1st pilot study)



TV: *traditional vehicle;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 28: Average critical gap per vehicle type (all participants, 1st pilot study)

From the previous results it can be observed that the critical gap is large in all the scenarios (higher than 40 m). Those results seem unrealistic in relation to the speed at which the vehicle was driving during the interaction with the pedestrian.

3.2.3 Perceived level of stress

The level of stress was measured with a device with sensors attached to the fingers of the participants that collected data regarding their skin response and heart rate. However, due to technical problems, the device could only be used in two of the four participants and no useful data was obtained.

Moreover, the level of stress participants felt was assessed trough the question “How stressed were you on a scale from 0 to 10?” on the interviews.

As explained in the methodology, participants 1 and 2 had the interview at the end of the experiment, after all the interactions with the vehicle. Their perceived level of stress, at the end of the experiment, is shown in the following figure.

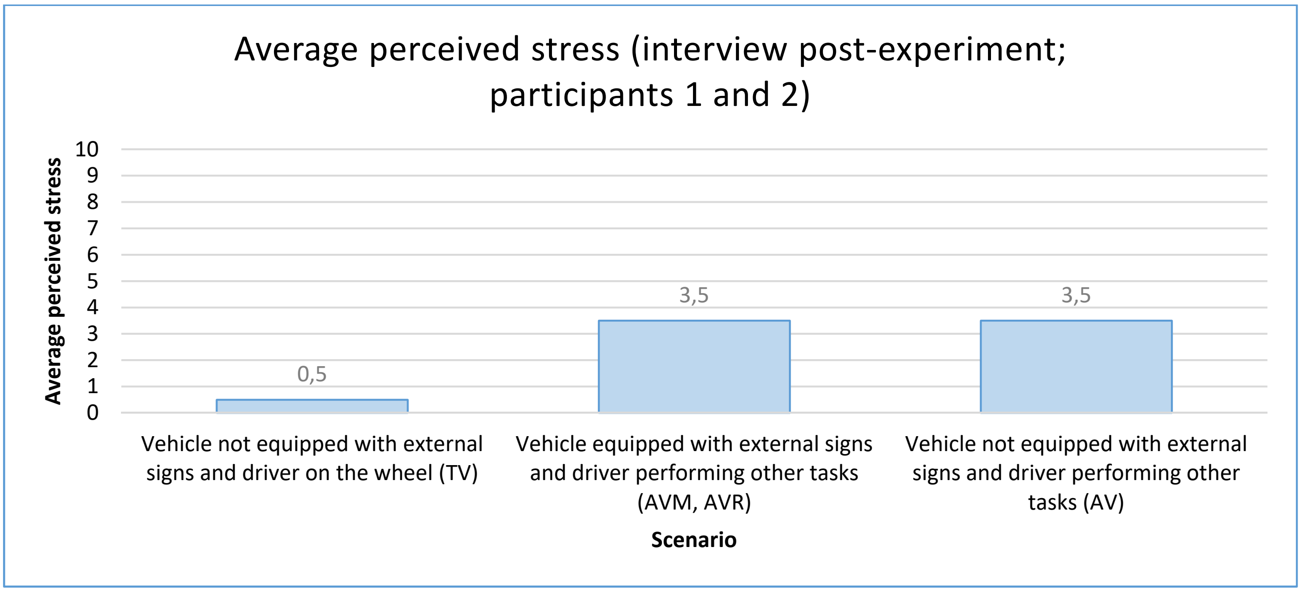
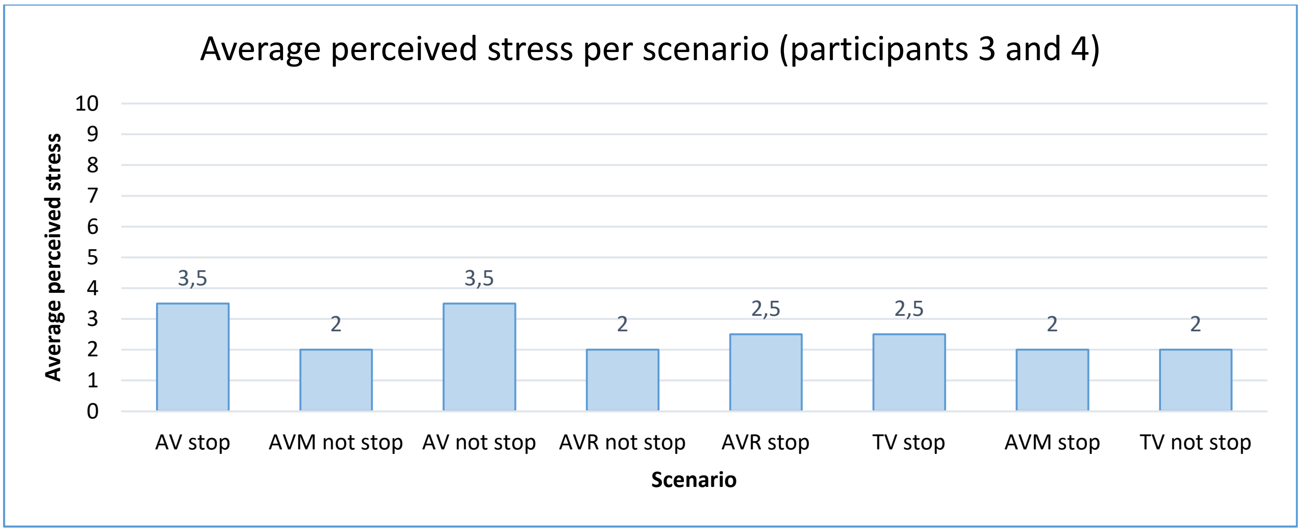


Figure 29: Average perceived stress level after all interactions with the vehicle for participants 1 and 2 (stated at the end of the experiment, Likert scale from 0 to 10, 1st pilot study)

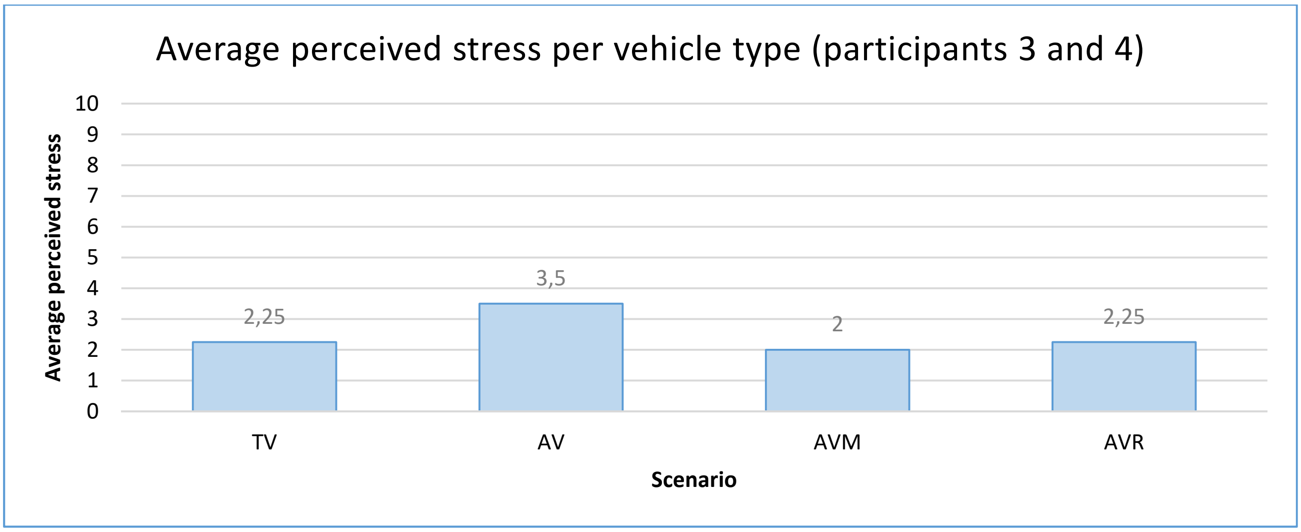
It can be observed that the reported perceived level of stress was quite low in all the three given situations. However, participants reported to be more stressed in the cases involving an automated vehicle than in the case involving a traditional vehicle.

Participants 3 and 4 had an interview post-interaction. Thus, the question regarding the stress level they felt was asked after every interaction with the vehicle, leading to the following results.



TV: *traditional vehicle;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 30: Average perceived stress level per scenario for participants 3 and 4 (stated after every interaction, Likert scale from 0 to 10, 1st pilot study)



TV: *traditional vehicle;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 31: Average perceived stress level per vehicle type for participants 3 and 4 (stated after every interaction, Likert scale from 0 to 10, 1st pilot study)

The perceived stress level of participants 3 and 4 was quite low in all the scenarios. However, participants reported to feel more stressed when the vehicle was not equipped with external signs and the driver was reading a newspaper. Some participants explained that they felt that the driver was not paying attention to them because he was reading the newspaper.

3.2.4 Vehicle recognisability

Through the interview post-interaction, post-experiment and the questionnaire, the vehicle recognisability could be assessed.

During the interviews, participants were asked whether they perceived something different than what they normally see when interacting with a vehicle in real life. Figure 32 shows the results for participants 1 and 2 (interview post-experiment) and Figure 33 shows the results for participants 3 and 4 (interview post-interaction).

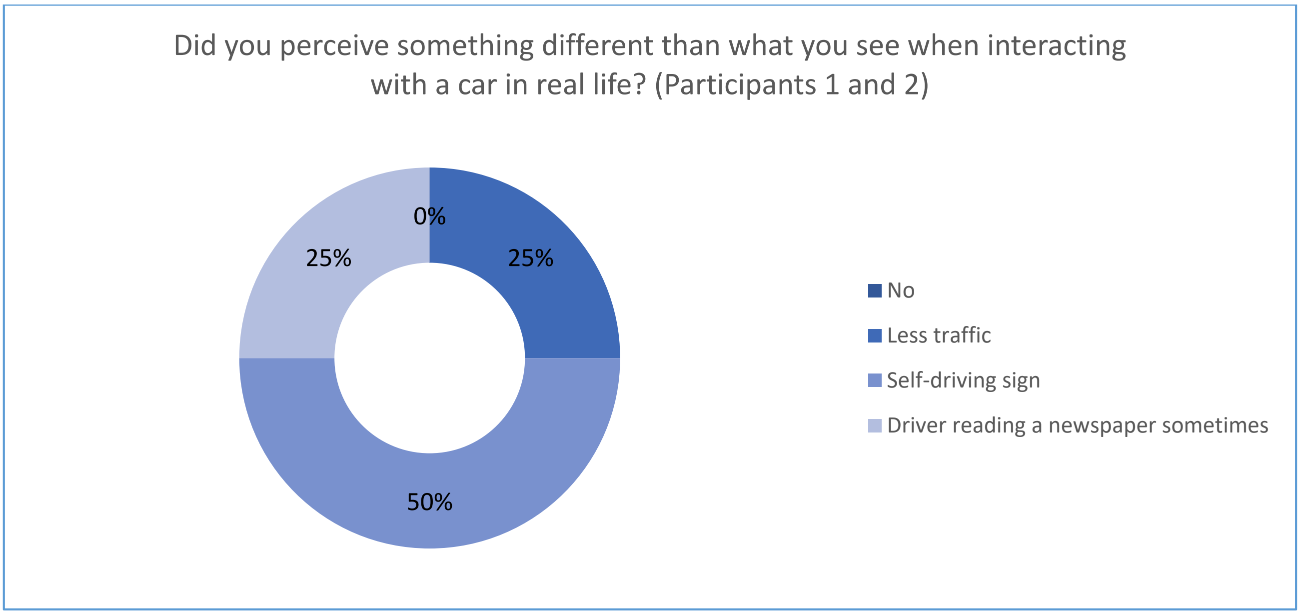


Figure 32: Perception of different features than what observed in real life when interacting with a vehicle (participants 1 and 2, 1st pilot study)

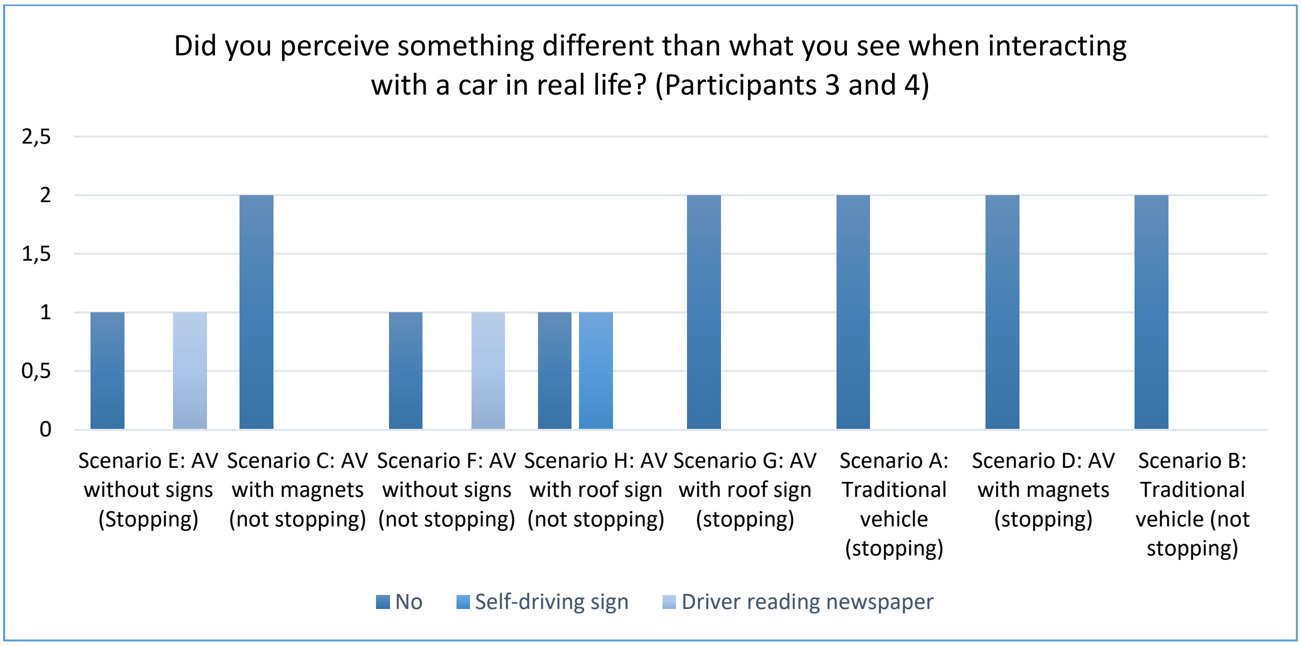


Figure 33: Perception of different features than what observed in real life when interacting with a vehicle (participants 3 and 4, 1st pilot study)

Both participants 1 and 2 reported as a main difference with a real-life interaction that in the case of the experiment the vehicle had a sign with the message self-driving. Also, participant 2 noticed that in some cases the driver was reading a newspaper. Participant 1 also noticed it, as it can be seen in the results of the digital questionnaire, even though she did not mention it during the interview. Participant 1 also considered that the fact that there was just one vehicle on the road and no other road users was a main difference with an interaction in real life.

In the case of participants 2 and 3, one of them was able to see that the driver was reading a newspaper and that the vehicle was equipped with a roof sign with the message self-driving. None of the two participants reported the magnets on the side and the hood of the vehicle with the message self-driving.

Analysing the data from the digital questionnaire it can be concluded that just two out of the four participants were able to see, *before* they made the decision to cross the road, that in some cases the vehicle was equipped with a sign with the message self-driving.

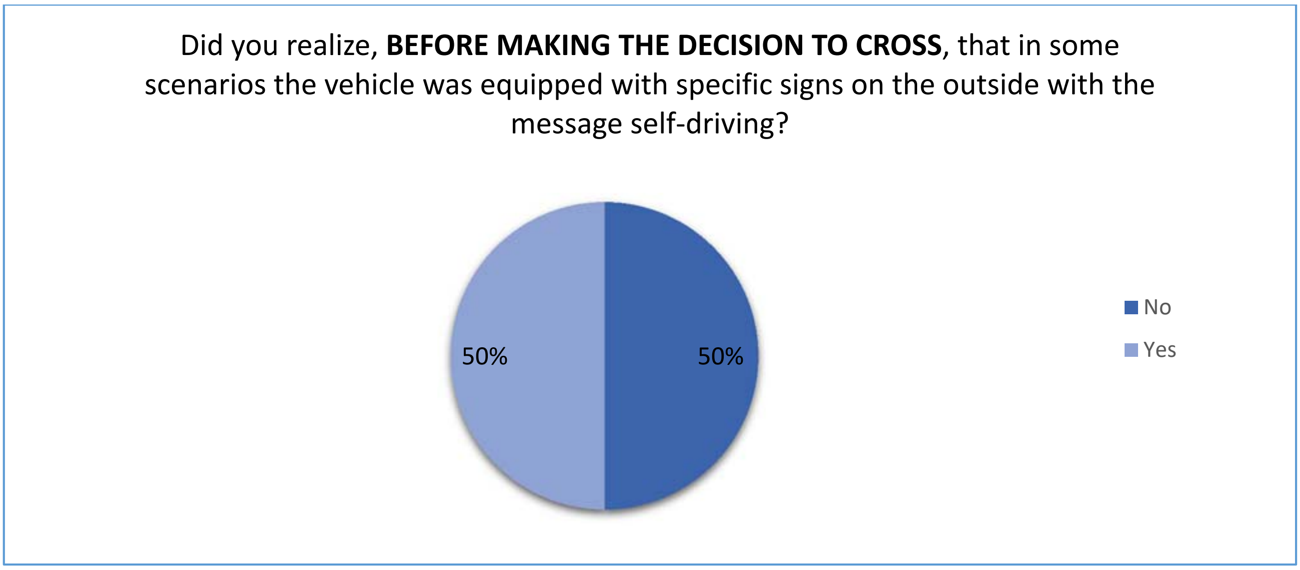


Figure 34: Visibility of vehicle signs before making the decision to not cross the road (1st pilot study)

From the two participants that did notice the signs before making the decision to cross the road, one of them was influenced by them when making his decision. She revealed that the sign on the roof of the vehicle made her feel more trusting so she decided to not cross later.

In the questionnaire participants were also asked about the type of sign that was clearer for them. Participants who did see the signs, reported as the clearest sign the one placed on the roof of the vehicle.

Three out of the four participants did realize, before making the decision to cross, that in some scenarios the driver was performing other tasks (reading the newspaper).

Two of those participants explained that the fact that the driver was reading a newspaper made them be more cautious and decide not to cross earlier.

3.2.5 Perceived safety and further improvements

Before making the decision to not cross the road, participants took the following factors into account:

- Speed
- Distance from the vehicle

- Driver performing other tasks (reading a newspaper)
- Self-driving sign
- Way the driver was driving

The main factors considered by the participants to make a decision were the speed and the distance from the vehicle. Moreover, in the scenario in which a roof sign was used, the sign was also considered as a factor. Participants also considered the driver reading the newspaper as an important factor.

In order to improve the set-up of the experiment different questions about the experiment were asked to the participants.

- <u>Experiment realism:</u>

Participants were requested to evaluate the realism of the experiment set-up on a scale from 0 to 10. The results show that the experiment set-up was quite realistic (M=6.5, SD=1.915). However, the majority of participants explained that it was less realistic due to the reduced traffic flow (just one vehicle was used at the time). Moreover, the fact that they had to take decisions without crossing the road was considered to reduce realism.

- <u>Variations on instructions:</u>

Some of the participants had some variations on the given instructions (e.g.: from hand raising to step forward).

Participants 2 and 3 had a variation from hand raising to step forward. Both of them explained that they preferred to take a step forward, since that was a more realistic behaviour and they found the hand raising to be a bit unnatural.

Participant 4 had a variation from hand raising to step backward and he stated that his preferred option was hand raising, giving the following explanation: *"Taking a step backwards is more like a reaction, like when you are scared and that was not really the situation now"*

- <u>Perception of vehicle driving mode:</u>

At the end of the experiment, the experimenter asked the participants how they thought the vehicle was driving (e.g. manually, autonomously). One participant was not sure, but two of them believed that in some cases the vehicle was driving autonomously (without a driver).

- <u>Interview post-interaction vs interview post-experiment:</u>

During the first pilot study half of the participants had an interview post-experiment and the other half also had an interview after every interaction with the vehicle. The objective of that approach was to assess whether the interview-post interaction could influence their decisions in the next interaction.

Participants that had the interview post-interaction stated that they did not think the interview influenced their decision making for the next interaction.

However, participants who just had the interview at the end of the experiment were asked how clearly they could remember how they felt after every interaction with the vehicle on a scale from 0 to 10. One of them said 2 and the other one 8. Therefore, not the two of them were sure whether they could remember, at the end of the experiment, how they felt after every interaction with the vehicle.

Since the interview post-interaction gives more accurate information on how participants feel after every interaction with the vehicle, it was decided that it should remain in the methodology for the second pilot study.

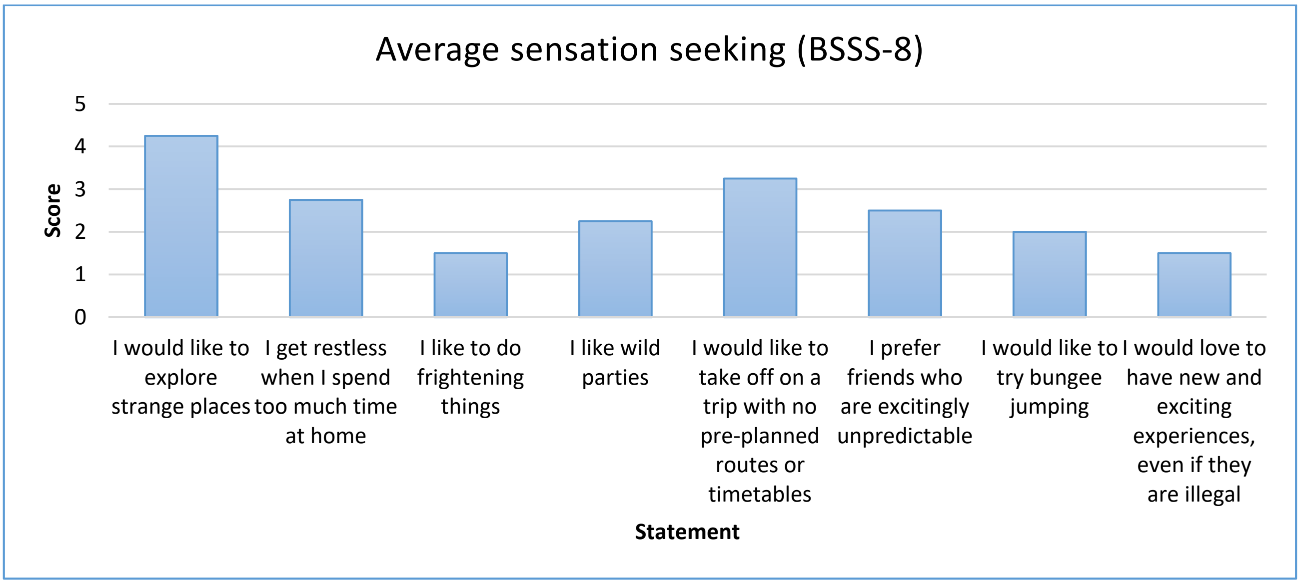
3.2.6 Looking behaviour

As mentioned before, the eye-tracker calibration was not possible due to the fact that the light conditions were not appropriate (sunlight affects the eye-tracker accuracy). Therefore, the measurements were not accurate enough to analyse. So in the case of the first pilot study the looking behaviour cannot be assessed.

3.2.7 Sensation seeking and trust in self-driving technology

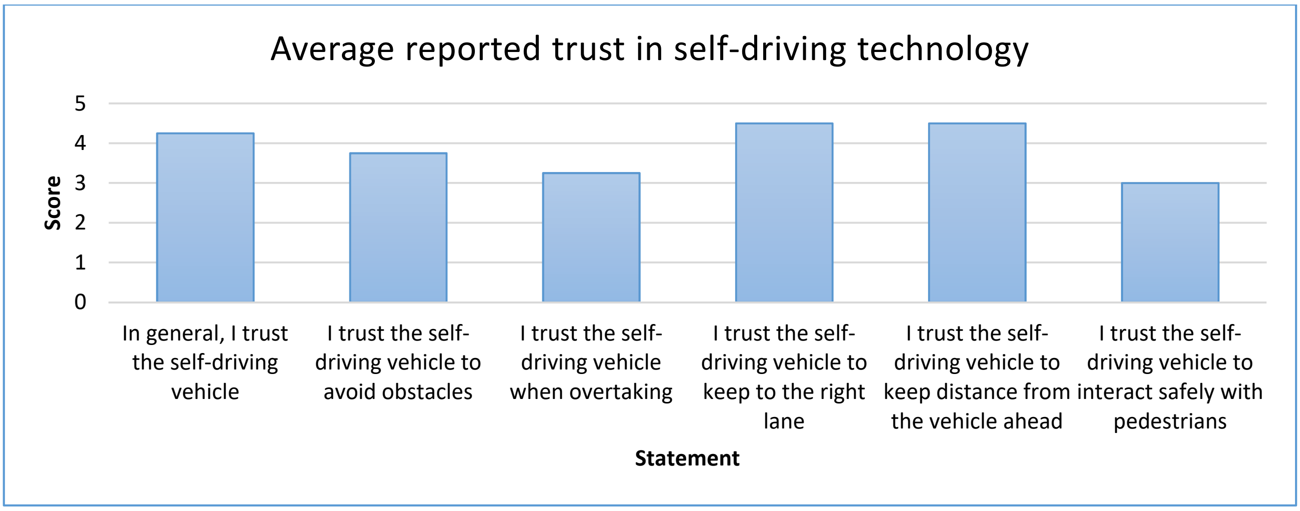
As the last part of the questionnaire participants had to answer some questions to analyse their sensation seeking and trust in automated vehicles.

The results for all the participants are shown in the following figures.



***1:** Strongly disagree; **2:** disagree; **3:** neither agree nor disagree; **4:** agree; **5:** strongly agree*

Figure 35: Average sensation seeking using BSSS-8 (5 point Likert scale, all participants, 1st pilot study)



1: *Strongly disagree;* ***2:*** *disagree;* ***3:*** *neither agree nor disagree;* ***4:*** *agree;* ***5:*** *strongly agree*

Figure 36: Average reported trust in self-driving technology (5 point Likert scale, all participants, 1st pilot study)

It can be observed that participants trust self-driving vehicles in general. However, half of the participants were not sure whether they would trust self-driving vehicles to interact safely with pedestrians.

3.3. Results second pilot study

3.3.1 Data set

During the second pilot study, the data set was comprised of 2 participants (one woman and one man). Their ages were 32 and 23 years old (M=27.5, SD=6.364). One of the participants was from Iran and the other from South Africa.

The following figure shows the demographic data of the sample analysed during the first pilot study.

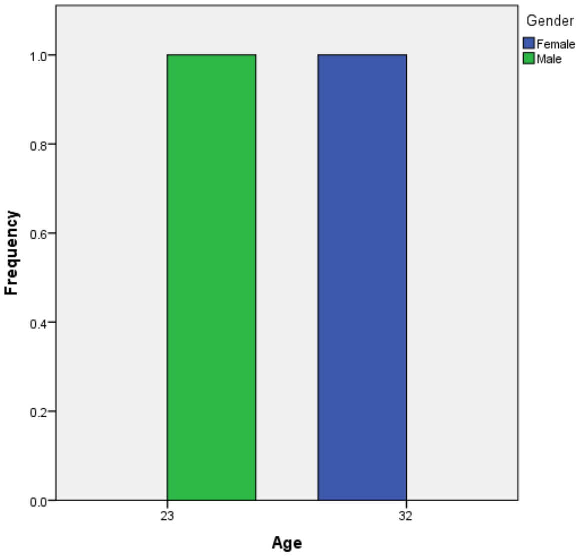


Figure 37: Demographic data distribution (2nd pilot study)

3.3.2 Critical gap

The following 16 scenarios were tested during the second pilot study. As in the first trial session, a code was assigned to each scenario.

Table 5: List of scenarios with codes (2nd pilot study)

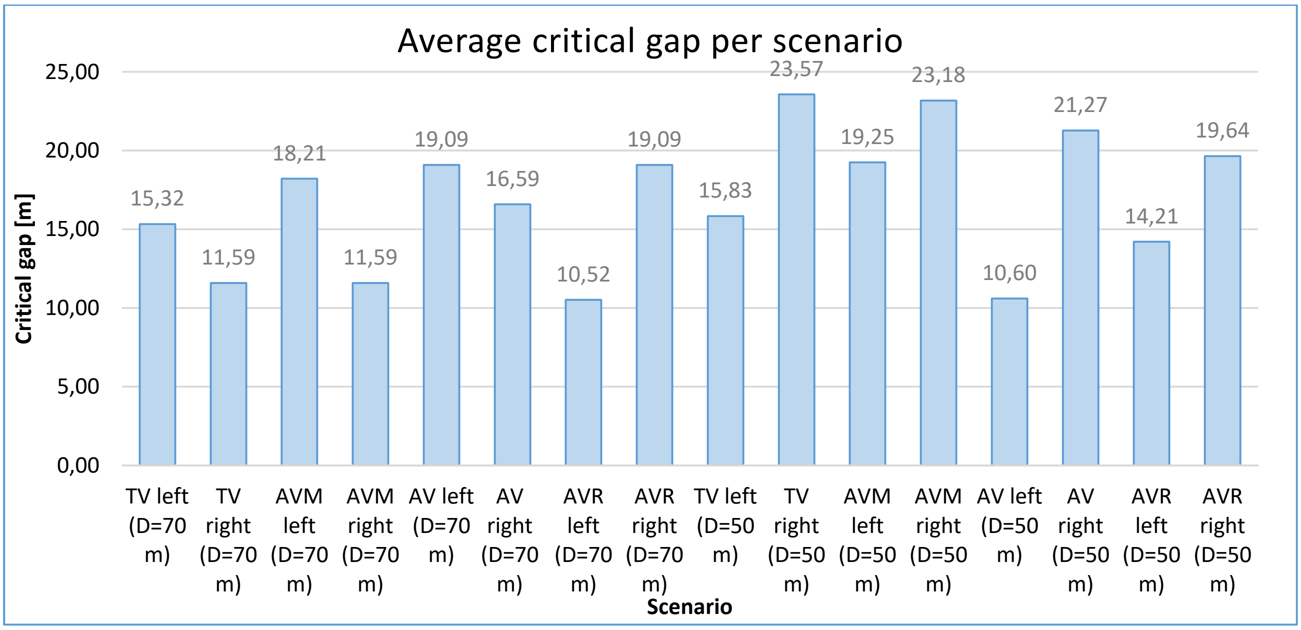
Scenario code	Scenario
A	Traditional vehicle approaching pedestrian from his left (D=70 m, V=30 km/h)
B	Traditional vehicle approaching pedestrian from his right (D=70 m, V=30 km/h)
C	Recognizable Wizard of Oz AV with magnets on the hood and on the door approaching pedestrian from his left (D=70 m, V=30 km/h)
D	Recognizable Wizard of Oz AV with magnets on the hood and on the door approaching pedestrian from his right (D=70 m, V=30 km/h)
E	Non-recognizable AV (driver reading the newspaper) approaching pedestrian from his left (D=70 m, V=30 km/h)
F	Non-recognizable AV (driver reading the newspaper) approaching pedestrian from his right (D=70 m, V=30 km/h)
G	Recognizable Wizard of Oz AV with roof sign approaching pedestrian from his left (D=70 m, V=30 km/h)
H	Recognizable Wizard of Oz AV with roof sign approaching pedestrian from his right (D=70 m, V=30 km/h)
I	Traditional vehicle approaching pedestrian from his left (D=50 m, V=25 km/h)
J	Traditional vehicle approaching pedestrian from his right (D=50 m, V=25 km/h)
K	Recognizable Wizard of Oz AV with magnets on the hood and on the door approaching pedestrian from his left (D=50 m, V=25 km/h)
L	Recognizable Wizard of Oz AV with magnets on the hood and on the door approaching pedestrian from his right (D=50 m, V=25 km/h)
M	Non-recognizable AV (driver reading the newspaper) approaching pedestrian from his left (D=50 m, V=25 km/h)
N	Non-recognizable AV (driver reading the newspaper) approaching pedestrian from his right (D=50 m, V=25 km/h)
O	Recognizable Wizard of Oz AV with roof sign approaching pedestrian from his left (D=50 m, V=25 km/h)
P	Recognizable Wizard of Oz AV with roof sign approaching pedestrian from his right (D=50 m, V=25 km/h)

The critical gap was obtained from the videos recorded by the cameras in front of the pedestrian. The critical gap is the distance between the participant and the vehicle at the moment the participant took a step backward. The complete list of critical gaps per participant and scenario with the specific times can be seen in appendix F.

It is important to mention that two of the scenarios are not considered in the case of the first participant because she had problems understanding the instructions and she wanted to step onto the road. Some of the critical gaps of participant 2 are also not visible on the video recorded by the three cameras in front of the participant or in the camera inside the vehicle, since the camera inside was recording an angle to just one side of the vehicle. Thus, in those cases the critical gap is an approximate value. Moreover, the three cameras in front of the participant were not exactly synchronized; there was a difference of some seconds, so the overlap had to be calculated to obtain the correct data.

The critical gaps are comprised between 10 m and more than 22 m. That is a more realistic critical gap than the one obtained during the first pilot study.

The following figure shows the average critical gap per scenario for all participants.

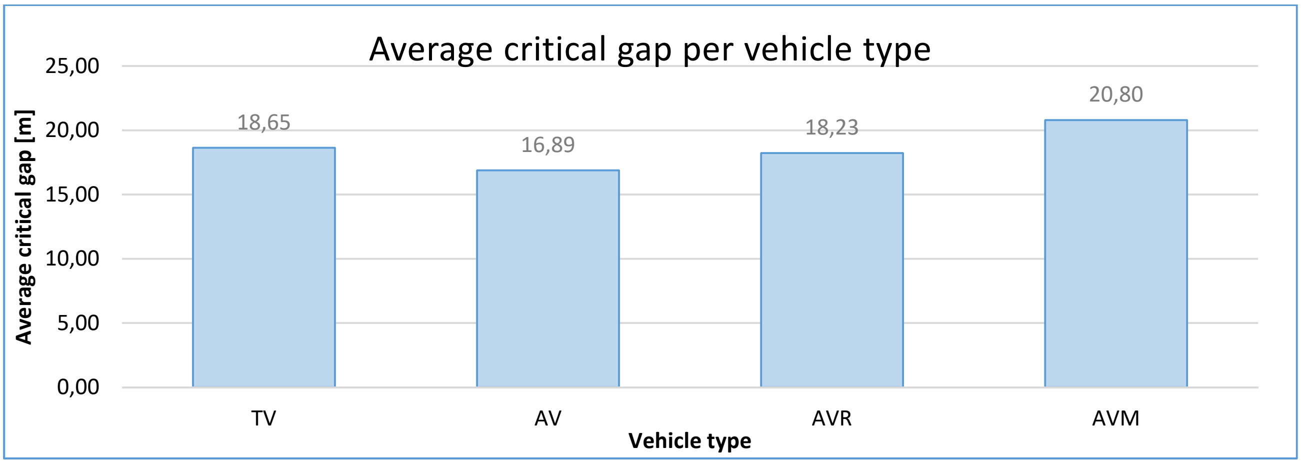


TV: *traditional vehicle;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 38: Average critical gap per scenario (all participants, 2nd pilot study)

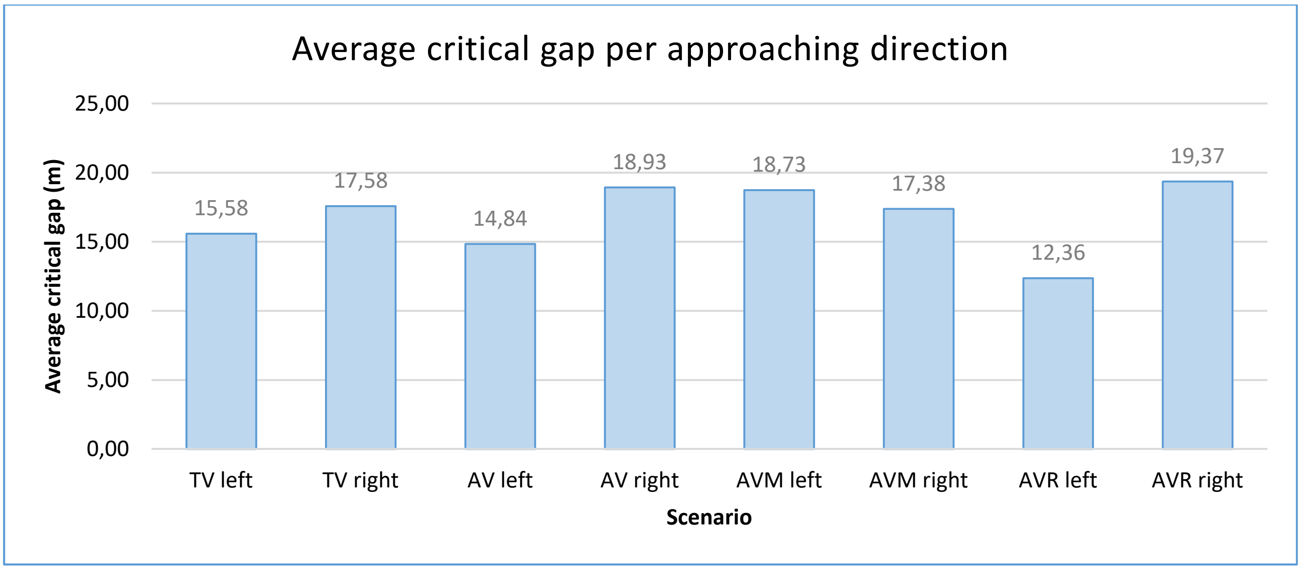
It can be observed that in the case of the first 8 scenarios (Distance=70 m, initial driving speed = 30 km/h) the critical gap is larger in the case the vehicle is approaching the pedestrian from his left. However, in the last 8 scenarios (Distance = 50 m, initial driving speed = 25 km/h), the opposite happens. That can be due to the fact that participants feel the vehicle is approaching too fast when it is driving at 30 km/h.

The following figures show the average critical gap, for all participants, per vehicle type, per approaching direction and per initial distance of the vehicle. It is observed that there is not a large difference between the critical gaps when interacting with different vehicle types. It can be due to the fact that the measurement was not accurate due to a desynchronization of the cameras and that one out of the two participants had problems with the instructions so her data could not be used.



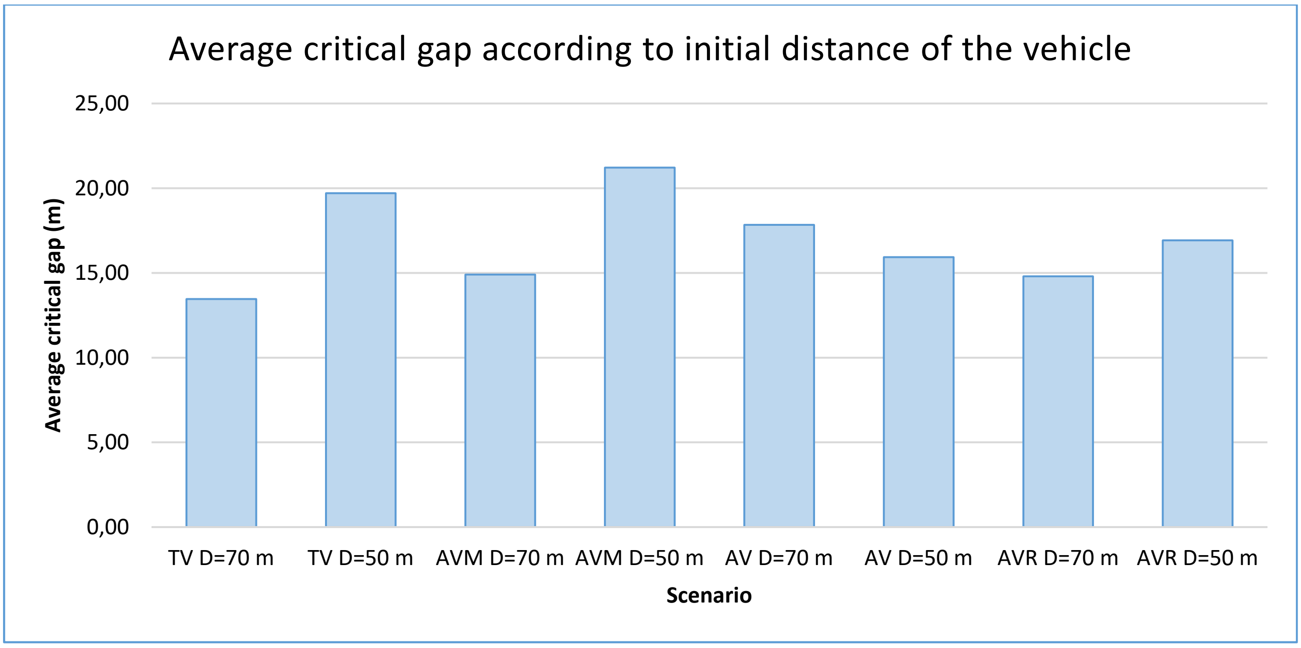
TV: *traditional vehicle;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 39: Average critical gap per vehicle type (all participants, 2nd pilot study)



***TV:** traditional vehicle; **AV:** non-recognizable Wizard of Oz automated vehicle; **AVM:** recognizable Wizard of Oz automated vehicle with magnets on the hood and the door; **AVR:** recognizable Wizard of Oz automated vehicle with roof sign*

Figure 40: Average critical gap per approaching direction (all participants, 2nd pilot study)



***TV:** traditional vehicle; **AV:** non-recognizable Wizard of Oz automated vehicle; **AVM:** recognizable Wizard of Oz automated vehicle with magnets on the hood and the door; **AVR:** recognizable Wizard of Oz automated vehicle with roof sign*

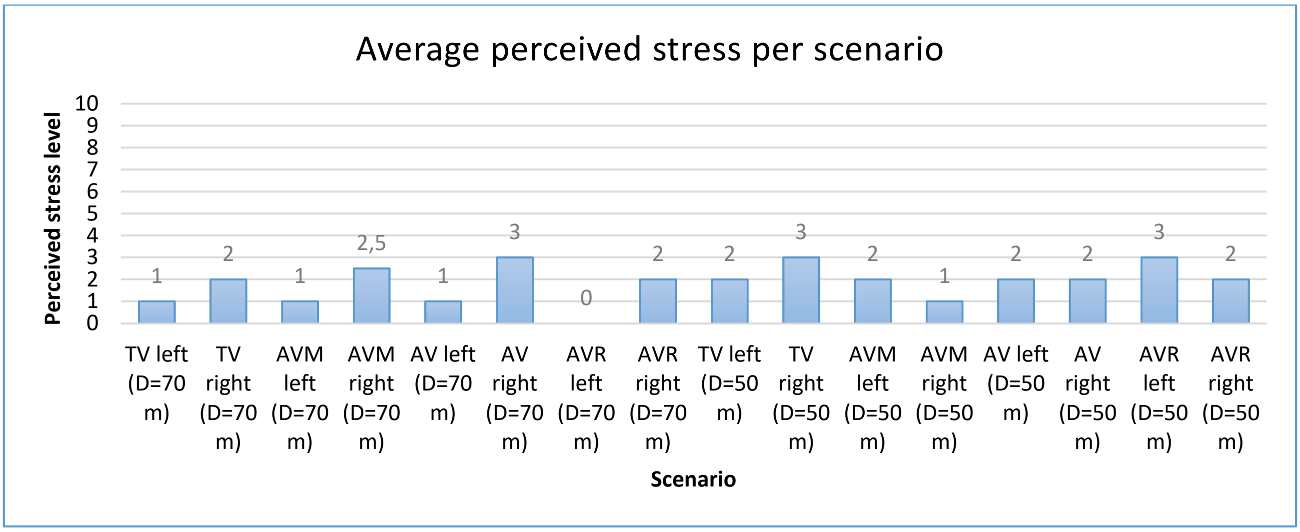
Figure 41: Average critical gap per initial distance of the vehicle (all participants, 2nd pilot study)

3.3.3 Perceived level of stress

During the second pilot study, the device to measure galvanic skin response and heart rate was not used due to the problems that it caused during the first pilot study, leading to a loose of time during the experiment performance.

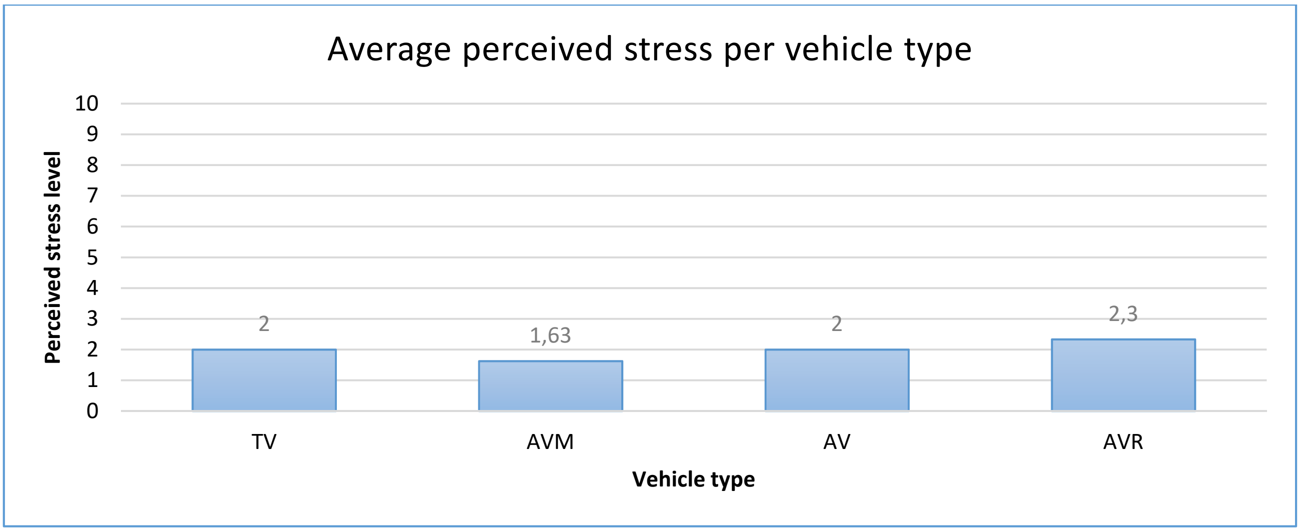
In this case, the stress level was only assessed through the interview post-interaction. It is also important to mention that during the experiment performance with participant 1, a break of around 15 minutes had to be taken because she had problems with the cold weather conditions. Moreover, her answers to the interview post-interaction were inconsistent. Because of that, after the break the interview post-interaction had to be skipped to guarantee that all the scenarios could be tested before the next participant arrived.

The following figure shows the levels of stress per participant after every interaction in different cases: per scenario, per vehicle type, per approaching direction and per initial distance of the vehicle relative to the participant. Because of the problems explained before, data regarding stress level of participant 1 was collected for the first 4 scenarios only.



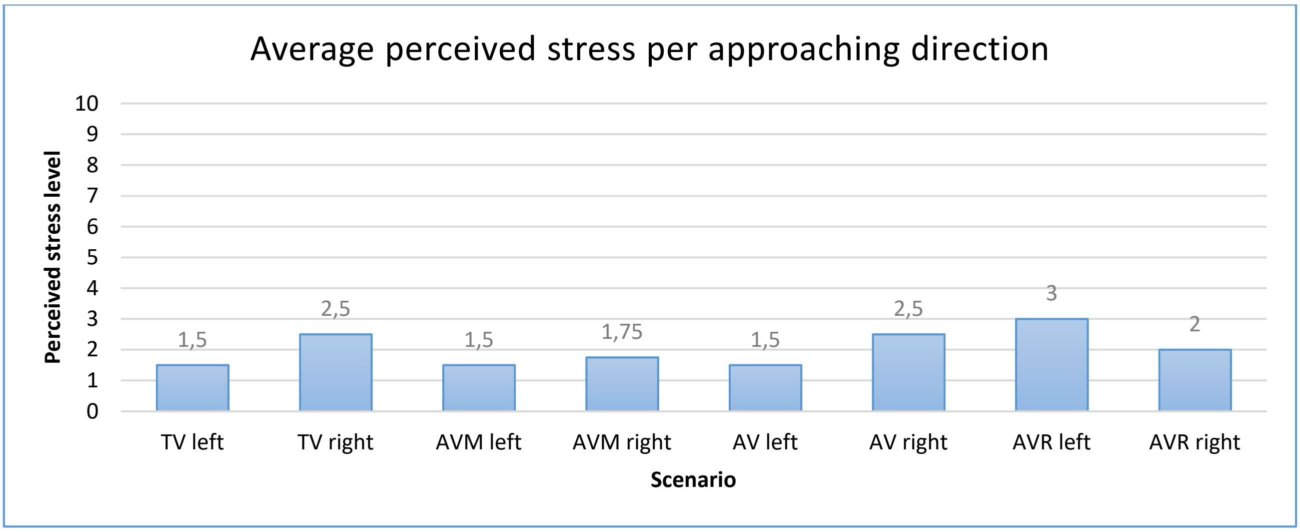
TV: *traditional vehicle;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 42: Average perceived stress per scenario (all participants, Likert scale from 0 to 10, 2nd pilot study)



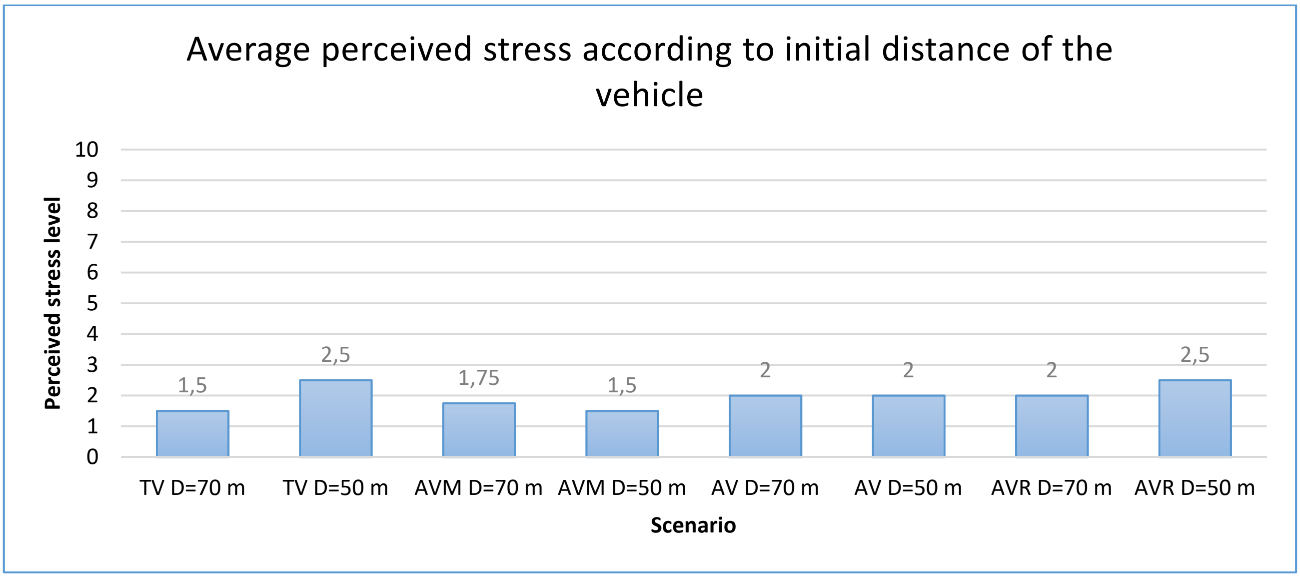
TV: *traditional vehicle;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 43: Average perceived stress per vehicle type (all participants, Likert scale from 0 to 10, 2nd pilot study)



TV: *traditional vehicle;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 44: Average perceived stress per approaching direction (all participants, Likert scale from 0 to 10, 2nd pilot study)



TV: *traditional vehicle;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 45: Average perceived stress per initial distance of the vehicle (all participants, Likert scale from 0 to 10, 2nd pilot study)

It is noticeable that the stated stress level by the participants was quite low (maximum 3). The stress level was slightly higher in some cases in which the driver was reading a newspaper or when the vehicle was approaching the participant from his right (furthest lane) starting to drive from a shortest distance.

3.3.4 Vehicle recognisability

When participants were asked, after every interaction, if they perceived something different than in a crossing situation in real life they stated:

- Participant 1: she was surprised about the camera in front of her in the case of the first interaction. She mentioned as a difference that the vehicle had some letters on the outside in the scenario 'Recognizable Wizard of Oz automated vehicle with magnets'. However, she explained that she was not able to read the message because she was focused on making the decision to cross or not. As explained before, the rest of the scenarios could not be assessed due to the fact that the interview post-interaction had to be skipped with this participant.

- Participant 2: This participant mentioned as a difference with a real-life interaction that the passenger was reading a newspaper. Moreover, he also noticed the roof sign with the message self-driving. It is important to mention that this participant comes from a country where drivers sit on the right side, so every time the driver was reading the newspaper he stated it was the passenger the one doing it.

When asked if they perceived that the vehicle was equipped with signs with the message self-driving, both participants stated that they did notice the signs. However, just the first participant reported that the signs influenced her decision making. She explained that in the case of the sign on the roof of the vehicle, that reminded her that the driver was more cautious. That could be due to the fact that she associated the roof sign to the vehicles used during driving lessons.

Both participants agreed that the sign that was clearer for them was the one on the roof of the vehicle.

One of the participants realized before making the decision to cross that the driver was performing other tasks than driving. That participant reported to be influenced by that fact. She reported that she decided to not pass when she saw the driver was not looking at her because it made her feel like the driver did not see her. The other participant did not report that the driver was performing other tasks. However, that participant came from a country where the driver sits on the right side and he reported during the interview that the passenger next to the driver was reading a newspaper.

3.3.5 Perceived safety and further improvements

During the interview post-interaction participants were asked about the factors that they took into account before making the decision to not cross the road.

As it was already explained, the interview post-interaction was not performed in all the scenarios in the case of participant 1.

The factors that participants reported to take into account before making the decision to not cross the road were:

- Speed
- Distance from the vehicle
- Self-driving sign on the roof of the vehicle
- Eye-contact with the driver
- Vehicle driving on the furthest lane

- Vehicle with letters (magnets with the message self-driving)
- Passenger reading a newspaper

The most common reported factors considered before making the decision to not cross the road were the speed of the vehicle and the distance from it.

Participant 1 also considered as important factors the eye-contact with the driver in some scenarios and the fact that the vehicle was equipped with messages in the case of the scenario AV with magnets. However, she was not able to read the messages, but she explained that the messages were the first feature she saw and then she forgot about it to focus on making a decision.

In the case of participant 2, it is important to notice that he considered that the person reading the newspaper was the passenger and not the driver. That is due to the fact that he comes from a country were the driver sits on the other side. He explained the same in the case of the scenarios with the self-driving sign on the roof of the vehicle, saying that when he looked inside he could see the driver.

In order to improve the set-up of the experiment different questions about the experiment were asked to the participants.

- Experiment realism:

Participants were requested to evaluate the realism of the experiment set-up. They considered that it was quite realistic, giving it a grade of 6 on a scale from 0 to 10. Their main reason for the first participant was that she could see the cameras in front and the cones on the sidewalk. The reasons that the second participant stated were that there was just one vehicle on the road and that he could not cross the road, which made him feel that it was less dangerous and less realistic.

- Instructions:

During the second pilot study participants had to take a step to the front in the first moment they would cross the road and a step to the back in the last moment they would do it. Both participants stated that those instructions felt natural for them and that it is the procedure that they normally use in real life when interacting with a vehicle.

- Perception of vehicle driving mode:

The two participants thought that the vehicle was manually driven. In the case of the second participant, that can be due to the fact that in his country the driver sits on the other side of the vehicle.

3.3.6 Looking behaviour

Although the eye-tracker calibration was complicated, eventually a good calibration was obtained.

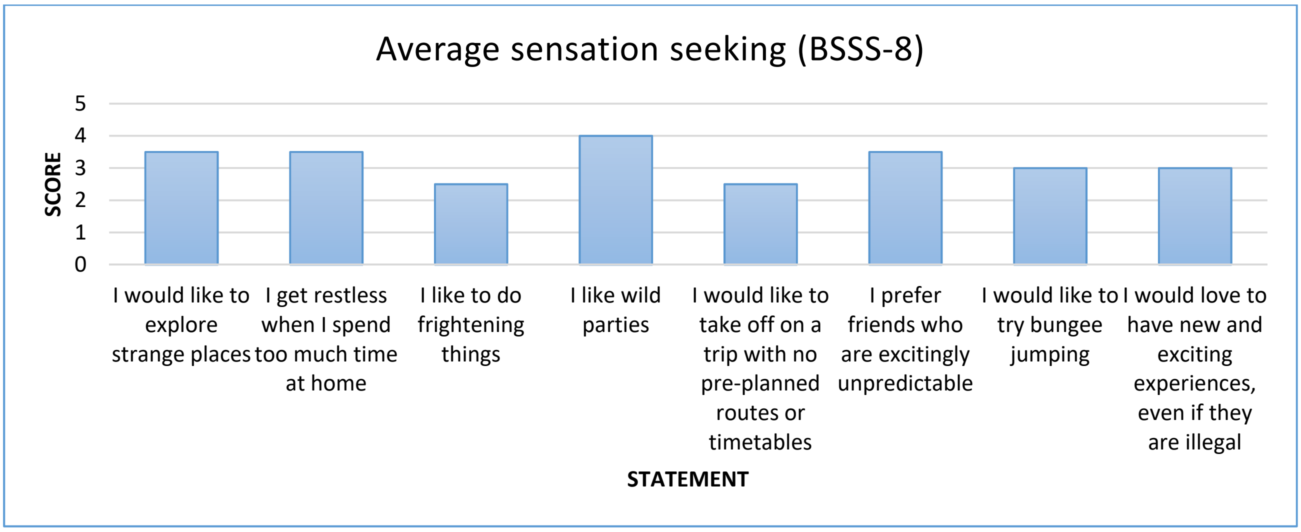
However, when interacting with the vehicle, no fixations were obtained on the vehicle itself. Short fixations were either on the road or non-existent. That could be due to the fact that the participant received direct sunlight when turning around to interact with the vehicle and that sunlight could have affected the eye-tracker measurement. Since on the opposite side of the road there are not pedestrian facilities (no sidewalk), it is not possible to avoid sunlight.

3.3.7 Think aloud protocol

The think aloud protocol was tested during the second pilot study. However, it was not effective because participants did not say anything. This can be due to the fact that the workload was high in a short period of time. They had to turn around, walk, look at the vehicle and the road, take a step to the front and decide when to take a step back. And all of that had to be done in seconds, so that is probably the reason why they did not say aloud what went through their minds.

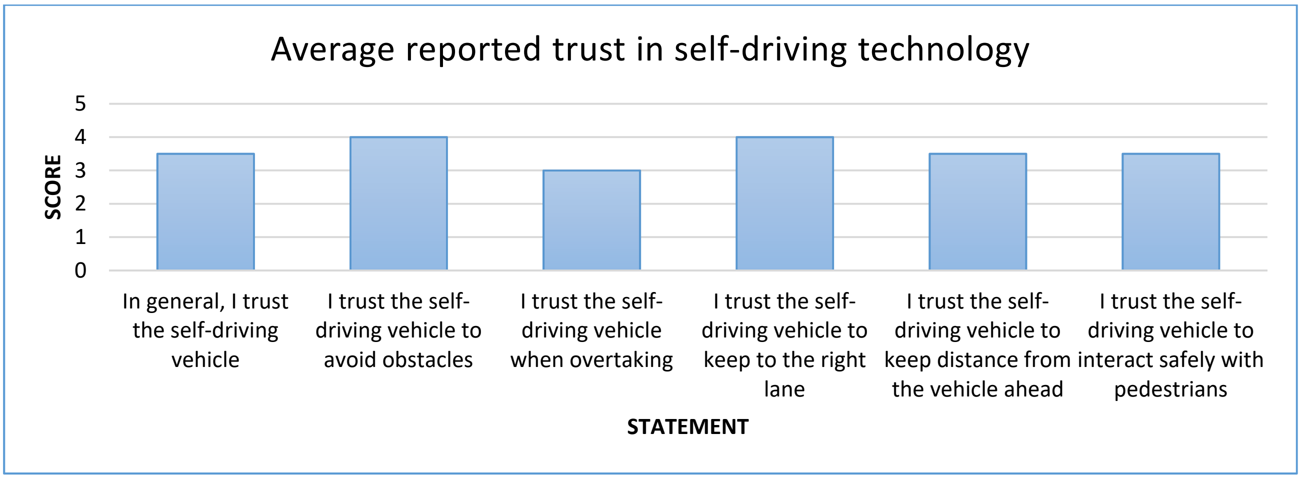
3.3.8 Sensation seeking and trust in self-driving technology

In the following figures, the average results of the sensation seeking scale and the trust in self-driving technology are shown.



***1:** Strongly disagree; **2:** disagree; **3:** neither agree nor disagree; **4:** agree; **5:** strongly agree*

Figure 46: Average sensation seeking using BSSS-8 (5 point Likert scale, all participants, 2nd pilot study)



***1:** Strongly disagree; **2:** disagree; **3:** neither agree nor disagree; **4:** agree; **5:** strongly agree*

Figure 47: Average reported trust in self-driving technology (5 point Likert scale, all participants, 2nd pilot study)

It can be observed from the results that the average trust in self-driving technology was relatively high.

3.4. Lessons learnt from the two pilot studies

As explained before, the main goal of the two pilot studies was to test the feasibility of the experiment methodology to make improvements for the final experiment. After carrying out the two pilot studies, the following aspects were considered to improve the methodology of the experiment:

- During the first pilot study, the vehicle started driving at a distance of 100 m relative to the participants. Results showed large critical gaps in all the tested scenarios. Those critical gaps (higher than 40 m) were considered unrealistic in relation to the speed that the vehicle was driving. Therefore, during the second pilot study different driving speeds and start driving distances were chosen aiming to obtain more realistic results. During the second pilot study the vehicle started driving at a distance of either 70 m or 50 m from the participant (instead of 100 m as in the first pilot study). Similar distances were used in Clamann, Aubert et al. (2016). These distances resulted on more realistic critical gaps. Thus, a distance of 70 m was chosen for the final experiment.

- Originally, only one of the two road lanes was used. Therefore, the vehicle always approached the participants from the same side (left side). Participants reported that condition to reduce realism of the experiment because they expected the vehicle to always approach them from the same side. Therefore, in the second pilot study and in the final experiment both road lanes were used.

- The instruction to stand on the sidewalk and raise the hand (or take a step backwards) in the last moment participants would cross the road was considered unnatural by some of the participants. However, the step backwards was considered more natural than the hand raising. Moreover, the fact that participants were facing the road the whole time to decide the last moment they would cross the road was not a natural behaviour. Thus, in the second pilot study participants were requested to stand on the sidewalk with their back to the road. When the vehicle was already driving at a certain speed from a certain distance, the experimenter told participants to turn around. At that moment participants had to take some steps forward until a certain location on the sidewalk marked with a cross. There, they had to take one step to the front in the first moment they would cross the road and one step to the back in the last moment they would do it. That way, the instructions were more natural and the decision making was more realistic since participants already took one step to the front as if they would cross the road.

- An eye-tracker was used during the two pilot studies to assess the looking behaviour of participants. However, no accurate results were obtained due to light conditions (e.g. sunlight) and a large time was required to use the equipment. Thus, the eye-tracker was not used during the final experiment.

- The use of a device to measure Galvanic Skin Response and heart rate to assess the level of stress of the participants was not feasible. There were problems with the equipment and it was considered that it could have affected the behaviour of participants because they had cables and sensors on their arms/fingers. Moreover, as in the case of the eye-tracker, the use of this equipment was time consuming. This device was not used during the second pilot study or the final experiment.

- Participants reported to not be influenced by the interview post-interaction. Therefore, both the post-interaction and the post-experiment interviews were kept in the methodology.

- During the second pilot study, a think aloud protocol was tested. However, no results were obtained because participants did not say anything during the interactions with the vehicle. The main reason for the think aloud protocol not working might have been a high workload in a short time period for participants. The think aloud protocol was not introduced in the final experiment methodology.

- In the second pilot study, one of the participants reported that the passenger was reading a newspaper in the scenarios in which the driver was reading a newspaper. This was due to the fact that the participant came from a country where vehicles drive on the left hand side (steering wheel on the right), contrary as it is done in the Netherlands. This result led to a new requirement during the recruitment of participants for the final experiment: participants had to come from a country where vehicles drive on the right hand side (steering wheel on the left).

- The absence of pedestrian crossing facilities were reported by participants as a factor to reduce realism of the experiment set-up.

- It was suspected that in the case of scenarios where the vehicle was driven with the joystick, the kinematic profile and approaching speed was lower than for the traditional (manually driven) vehicle scenarios. Therefore, the inclusion of a fifth scenario in the final experiment methodology in which the traditional vehicle is also driven with the joystick was considered important.

4

Final experiment

This chapter focuses on the final experiment carried out in March 2017. Its goal is to provide a description of the methods used during the data collection phase after including the improvements from the two pilot studies explained in the previous chapter. Furthermore, final results are shown and statistical analyses are carried out.

4.1. Data collection

The final experiment was performed on the 22nd of February and on the 1st, 2nd, and 8th of March.

4.1.1 Location

The final experiment took place at the same location as the two pilot studies. The road was also closed to traffic during the experiment performance. A time restriction was also given, so the road could be closed only between 09:30 h and 15:30 h. Thus, it was allowed to close the road during one more hour every day with respect to the pilot studies, when the restricted time was from 10:00 h to 15:00 h.

A pedestrian crossing was designed on a banner format to place it on the road during the final experiment. However, due to weather conditions, the use of that pedestrian crossing was not possible during the experiment.

4.1.2 Participants

Twenty-four people participated in the experiment during the four experimental sessions, with a maximum of seven participants per day. It was aimed to test twenty-eight participants but the recruitment was difficult and two of the participants who signed up to participate did not show up on the day of the experiment.

The recruitment of participants was carried out by:

- Placing posters in different faculties and main campus locations of the Delft University of Technology and the Haagse Hogeschool.
- Posting announcements in social media, in groups related to TU Delft and the Haagse Hogeschool.
- Handing out flyers.
- Individual recruitment.

- Distributing flyers in the mailboxes of student buildings both inside and outside the TU Delft campus.

- Contacting people that participated in other experiments performed by SWOV.

The poster used to recruit participants can be found in appendix G. This poster was also used for the announcements in social media and the flyers.

The requirements to be a suitable participant for the study were:

- Aged older than 18 years.

- Good knowledge of the English language because that was the language used during the experiment.

- Come from a country where vehicles drive on the right hand side (steering wheel on the left). This was required due to the experimental design, because it was important that participants saw the driver. Eventually, four participants from countries where vehicles drive on the left hand side were included in the experiment, because they were already used to interact with vehicles that drive on the right hand side after living in the Netherlands for some years.

As it can be seen in the poster (appendix G), during the recruitment it was explained to the participants that they were going to participate in a study to analyse the interactions between pedestrians and vehicles. Thus, they were not informed in advance that Wizard of Oz automated vehicles were involved in the experiment.

At the end of the experiment, all the participants were rewarded with a gift coupon with a value of €10 as a compensation for their collaboration in the study.

More information regarding the composition of this data sample will be given in chapter 4.2.

4.1.3 Experimental design

- Variables and scenarios final experiment:

In Table 6 and Table 7 the independent and dependent variables of the experiment are shown.

Table 6: Summary of independent variables used in the experiment

Independent variables	Values
Vehicle appearance	-Traditional vehicle (TV) -Traditional vehicle driven with joystick (TVJ) -Non-recognisable Wizard of Oz automated vehicle (AV) -Recognisable Wizard of Oz automated vehicle with signs on the hood and the door (AVM) -Recognisable Wizard of Oz automated vehicle with roof signs (AVR)
Vehicle kinematic profile	- Vehicle starting to drive while increasing its speed till 25 km/h relative to the participant, reducing its speed to 10 – 15 km/h when it reaching a distance of about 20 m from the participant and finally stop or not stop before the participant depending on the scenario.
Vehicle approaching direction	-Vehicle approaching from the left side of the participant -Vehicle approaching from the right side of the participant

Table 7: Summary of dependent variables used in the experiment

Dependent variables	How/what to measure
Pedestrian gap acceptance	Measurement of critical crossing gap using video recording
Pedestrian perceived stress level	Analysis of pedestrians’ stress level by using interviews post-interaction.
Perceived safety and further improvements	Analysis of perceived safety and further improvements using interviews and a questionnaire post-experiment

There were different scenarios depending on the independent variables:

- **Vehicle appearance:** during the final experiment, five different scenarios were tested depending on the type of vehicle interacting with the participant. As in the case of the pilot studies, only one vehicle was used. That was the automated vehicle under development at the CITG faculty at TU Delft. The five different scenarios consisted of the four scenarios tested during the pilot studies (TV, AV, AVM, AVR) and an extra scenario.

  The fifth scenario was introduced because it was suspected that differences in driving behaviour might appear due to the use of the joystick. The fifth scenario was:

  5. <u>Traditional vehicle driven with joystick (TVJ):</u> In this scenario, the vehicle was driven with the joystick by the passenger but the vehicle looked as a traditional vehicle from the outside (i.e., the ‘driver’ had his hands on the steering wheel, he was intentionally

making eye-contact with the participant and he was aware of the traffic situation). (Figure 18 a)

As in the case of the pilot studies, the person sitting in the driver's seat could immediately take (manual) control over the vehicle in case of emergency or in case of problems with the joystick. However, emergency situations did not occur during any of the experimental sessions.

- **Vehicle kinematic profile:** the kinematic profile of the vehicle was the same for all the interactions, as explained in Table 6.

- **Vehicle approaching direction:** both lanes of the road were used, leading to two different scenarios regarding the approaching direction of the vehicle:

    1. Vehicle approaching from the left side of the participant
    2. Vehicle approaching from the right side of the participant

The different independent variables led to 20 scenarios tested per participant. All the scenarios were randomized as it can be seen in appendix H.

In the following figure, a summary of the variables and the resulting scenarios that were tested regarding the independent variables is shown.

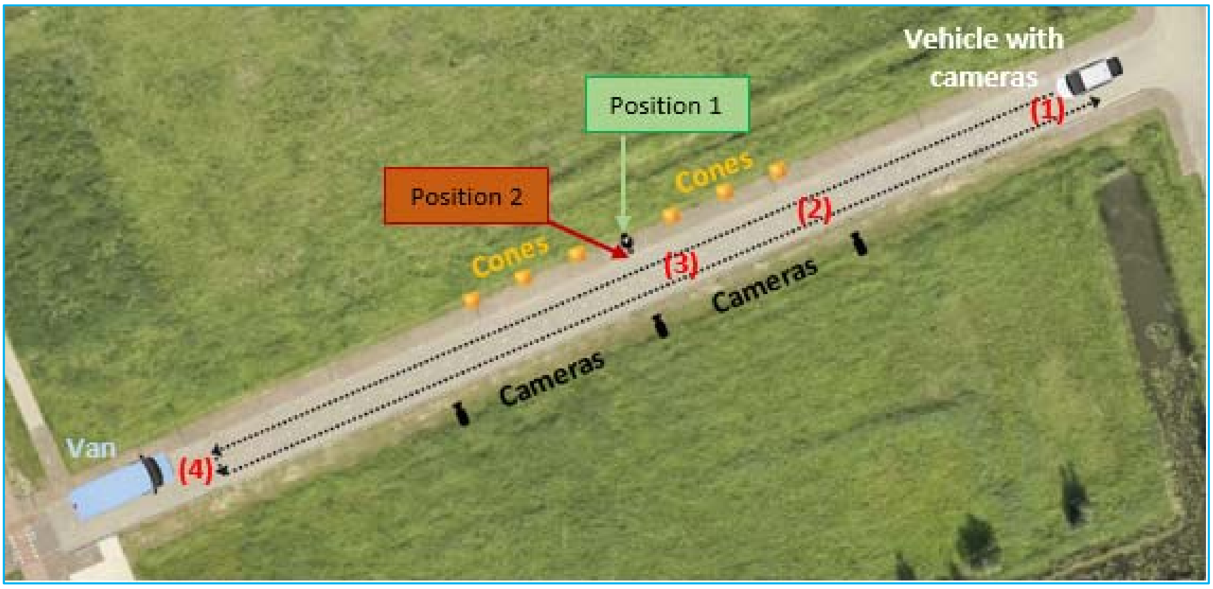
Figure 48: Summary of scenarios and variables for the final field study

A booklet with all the detailed information regarding the experimental sessions was given to all the assistants involved in the experiment (Appendix H).

- Experiment set-up and method:

As described above, the experiment took place over four days (22/02/2017, 01/03/2017, 02/03/2017 and 08/03/2017), each day between 09:30 h and 15:30 h. A maximum of seven participants took part in the experiment per day. Different researchers were involved in the experiment per day. The independent variables led to twenty different scenarios tested per participant that were randomized and are shown in appendix H.

The set-up of the experiment in the case of a scenario in which the vehicle approached the participant (pedestrian) from the left is shown in Figure 49. The dashed line shows the vehicle trajectory.



*(**1)** Start driving at 25 km/h (70 m from the participant); **(2)** Reduce speed to 10-15 km/h (around 20 m from the participant); **(3)** Stop/not stop before the participant (depending on scenario); **(4)** Change signs and turn around to start driving on the lane corresponding to the next scenario*

Figure 49: Set-up of the experiment (vehicle approaching from the left side of the participant)

During all the experimental sessions the same protocol was followed for all the participants:

- When the participant arrived at the experiment location, one of the researchers welcomed him/her at the van that was used as an office place and asked the participant to read and sign an informed consent form on which all the instructions for the experiment were described as follows:

  "You are about to participate in a field study as a part of a research project (MSc thesis) to analyse the interaction between pedestrians and vehicles.

  You will be asked to stand on the sidewalk of the road while vehicles with different characteristics will drive on the road towards your direction. You will be asked to take a step forward in the first moment you would cross the road and one step backward in the last *moment you would cross the road (last moment you think it is safe to cross). However, you are explicitly requested NOT to cross the road under any circumstances. Different scenarios will be studied and you will not be informed in advance on what vehicle type you will be interacting with in each case.*

Video recording will be used during the experiment to facilitate the data analysis afterwards. After every interaction you will be asked to answer some short questions that will be recorded. At the end of the experiment you will be asked to fill in a short questionnaire regarding your impressions about the experiment.

Carrying out the experiment will take around 60 minutes for you and at the end you will receive a 10 euro gift voucher as a compensation for your participation".

The complete informed consent can be found in appendix I.

- After that, another experimenter picked up the participant at the van and walked with him/her to position 1 on the sidewalk (Figure 49). There, the experimenter repeated the instructions orally to the participant as follows: *"You will stand here (position 1) with your back to the road. When I tell you, you should turn around and walk until here (position 2). Vehicles with different characteristics will approach you and you should take one step to the front in the first moment you would cross the road and one step backwards in the last moment you would cross the road. It is really important that you do not step onto the road. After that I will tell you to come back here (position 1) and I will ask you some short questions that I will record".*
- After the instructions were given to the participant, the 20 different scenarios were tested including an oral interview ('post-interaction') after every scenario. At the end of the experiment, an oral interview ('post-experiment') was performed and recorded and the researcher took the participant back to the van.
- Back in the van, the experimenter who welcomed the participant also requested him/her to complete the questionnaire and provided him/her with a debriefing form and the gift coupon.

In each interaction, the vehicle started driving and gave a light sign (high beams) to the experimenter who was with the participant when the speed was 25 km/h at 70 m from the participant. That way, the experimenter could tell participants to turn around always at that specific moment.

As mentioned above, an interview post-interaction and an interview post-experiment were used during the field study. Both interviews were voice recorded for further analysis.

The interview post-interaction was performed after every interaction between the participant (pedestrian) and the vehicle. This interview consisted of three questions:

1. Which factors did you take into account before making the decision to take a step backwards?
2. Did you perceive something different than what you would see when interacting with a car in real life? (In case of affirmative answer: Did that influence your decision making and how?)

3. How stressed were you on a scale from 0 to 10 where 0 is ‘not stressed at all’ and 10 is ‘extremely stressed’?

After testing all the scenarios, the interview post-experiment was performed. This interview consisted of the following questions:

1. How realistic do you think the set-up of this experiment was on a scale from 0 to 10? Do you think it was similar to a crossing situation in real life? (Why/why not?)

2. Was it natural for you to take a step forward in the first moment you would cross the road and a step backwards in the last moment you would do it? (Why/why not?)

3. How do you think the vehicle was driving, do you think the vehicle was driving manually or autonomously?

A short digital questionnaire was created in Google forms and participants were requested to complete and submit it at the end of the experiment using a laptop with Wireless internet connection. This questionnaire was divided into four different parts:

- Part 1: Personal data: age, gender, and country of origin were asked

- Part 2: Interaction with the vehicle during the experiment: the aim of this part was to assess whether participants realized, before making the decision to ‘cross’ the road, the presence of external features on the vehicle (‘self-driving’ signs) and the ‘driver’ performing other tasks than driving. Moreover, participants were asked whether the previous aspects affected their decision making and how. Participants who did notice the external signs were asked about their preference between the lateral and the roof signs in terms of clarity.

- Part 3: Personal opinion and trust in self-driving vehicles: sensation seeking of participants was assessed using a Brief Sensation Seeking Scale (BSSS-8) (Hoyle 2002). Participants reported their level of agreement with statements such as “I would like to explore strange places”, using a 5-point Likert scale from ‘Strongly disagree’ to ‘Strongly agree’. The trust in self-driving vehicles was assessed using questions in which participants had to show their agreement with statements such as “I trust the self-driving vehicle to interact safely with pedestrian” on a 5-point Likert scale. This technique was also used by Hagenzieker, Kint et al. (2016).

- Part 4: Feedback and further improvements: an opportunity was given to participants to provide feedback about the experiment and to offer suggestions.

A copy of the interviews post-interaction and post-experiment and the questionnaire can be found in the booklet in appendix H.

It is important to mention that the experimental sessions were planned for different days, two weeks earlier that the date the experiment was finally performed. However, bureaucratic problems (no permission given to close the road in the proposed dates) and bad weather conditions (wind storm) delayed the performance of the experiment in two weeks.

Furthermore, during the last two experimental sessions weather conditions were not good. On the 2nd of March there was strong wind and on the 8th of March it rained during the whole session.

Thus, weather conditions might have affected the results of the experiment since, for example, rain could have influenced visibility.

- Equipment and assistants final experiment:

The list of assistants and their tasks is shown in the booklets with information regarding the performance of the experiment that can be seen in appendix H.

In order to collect data about critical gap, three cameras were placed in front of the pedestrian and two of them inside the vehicle. That way, gap acceptance could be measured afterwards through video analysis. To measure distances during the video analysis, orange cones were placed at the edge of the sidewalk, behind the participant with a distance of 5 m between them.

Since no crossing facilities were available in the experiment location and alternatives such as using chalk sprays or white tape were not feasible (as seen during the pilot studies), a pedestrian crossing was printed to place it on the road. However, weather conditions made it impossible to use that pedestrian crossing during the experiment. Therefore, no pedestrian crossing facilities were available during any of the experimental sessions.

Other equipment was also needed during the experiment:

- Automated vehicle under development at the CITG faculty at the Delft University of Technology (a white Toyota Prius that was driven both manually and with a joystick connected to a laptop).
- Van: Since the location of the experiment was not central and no other buildings or facilities were available, a van was used as an office place to welcome the participants. The van is property of the Delft University of Technology and it was placed at the end of the road to avoid interference during the vehicle-pedestrian interaction.
- Phone to record the interviews.
- Laptop with wireless internet connection to fill in the digital questionnaire.
- Vehicle signs (magnets and roof sign)

Since 24 participants were tested and there was a time restriction from Parkmanagement, more assistants were needed to guarantee an overlap of tasks between participants and be able to test all the participants during the four experimental sessions. For example, while one participant was filling in the questionnaire the next one was reading the informed consent.

Therefore, six people were needed to perform the following tasks:

- 2 Drivers
- One person with the participant during the interactions with the vehicle
- One person welcoming the participants, providing the informed consent, the debriefing form, the questionnaire and the compensation

- One person changing the vehicle signs (this person was sitting in the back seat of the car).
- One person for communication between the drivers and the researcher next to the participant and helping to change the vehicle signs.
- Planning:

Considering 2:15 minutes per scenario and 20 scenarios to be tested, 45 minutes were planned to test all the scenarios.

10 minutes were reserved to the welcoming of the participant and the signature of the informed consent. At the end of the experiment, 10 more minutes were reserved to fill in the questionnaire and provide the participants with the debriefing form and compensation.

Therefore, a total time of 65 minutes per participant was planned to perform the experiment, as it is shown in the following figure.

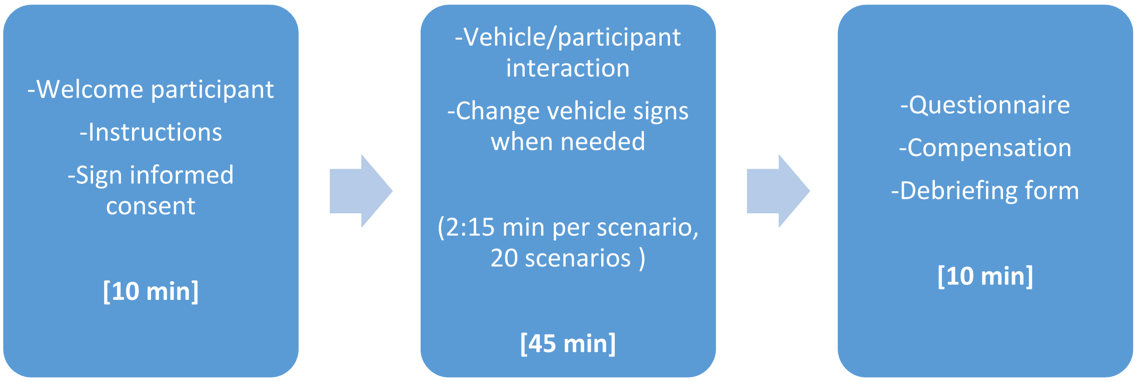


Figure 50: Estimation of the needed time per participant to perform the experiment

As mentioned above, tasks were combined between participants so the total time for the experiment was reduced and 24 participants could be tested despite of the time restrictions from Parkmanagement. For instance, while one participant was doing the interactions with the vehicle, the next participant could already be signing the informed consent. Table 8 shows the times per participant to start every phase of the experiment.

Table 8: Schedule during the experiment per participant

	Arrival time	Start interactions with the vehicle	Start questionnaire + interview + debriefing form	Finish experiment
Participant 1	9:45:00	9:55:00	10:40:00	10:50:00
Participant 2	10:30:00	10:40:00	11:25:00	11:35:00
Participant 3	11:15:00	11:25:00	12:10:00	12:20:00
Participant 4	12:00:00	12:10:00	12:55:00	13:05:00
Participant 5	12:45:00	12:55:00	13:40:00	13:50:00
Participant 6	13:30:00	13:40:00	14:25:00	14:35:00
Participant 7	14:15:00	14:25:00	15:10:00	15:20:00

4.2. Preliminary results

4.2.1 Data set

The data set was comprised of 24 participants (15 men and 9 women). Their ages were comprised between 19 and 30 years old (M=24.5, SD=2.949). There were participants from different countries, as seen in Table 9.

Table 9: Number of participants per country of origin

Country of origin	Number of participants
Germany	2
Belgium	2
Colombia	1
Italy	2
Mexico	1
Nicaragua	1
Spain	1
Suriname	1
The Netherlands	8
Greece	1
Indonesia	2
United Kingdom	1
India	1

All the participants were students at the Delft University of Technology.

The following figure shows the demographic data of the sample analysed during the experiment.

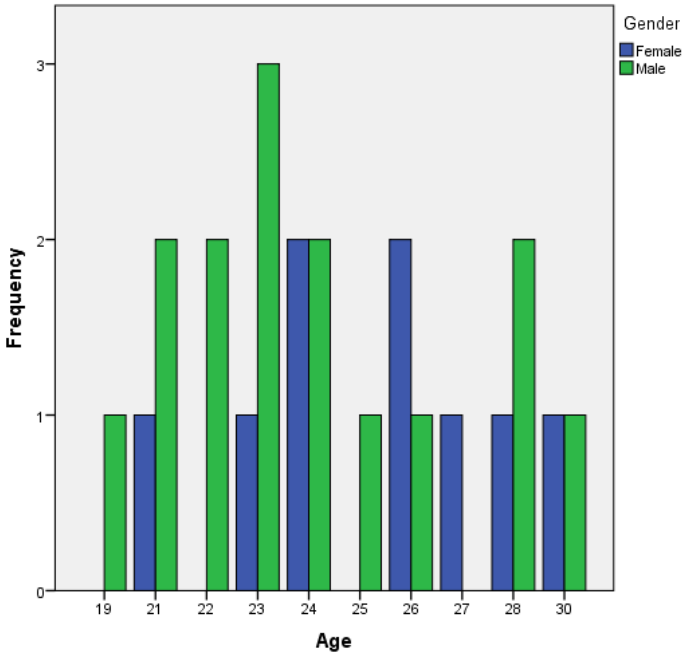


Figure 51: Demographic data distribution (final experiment)

4.2.2 Critical gap

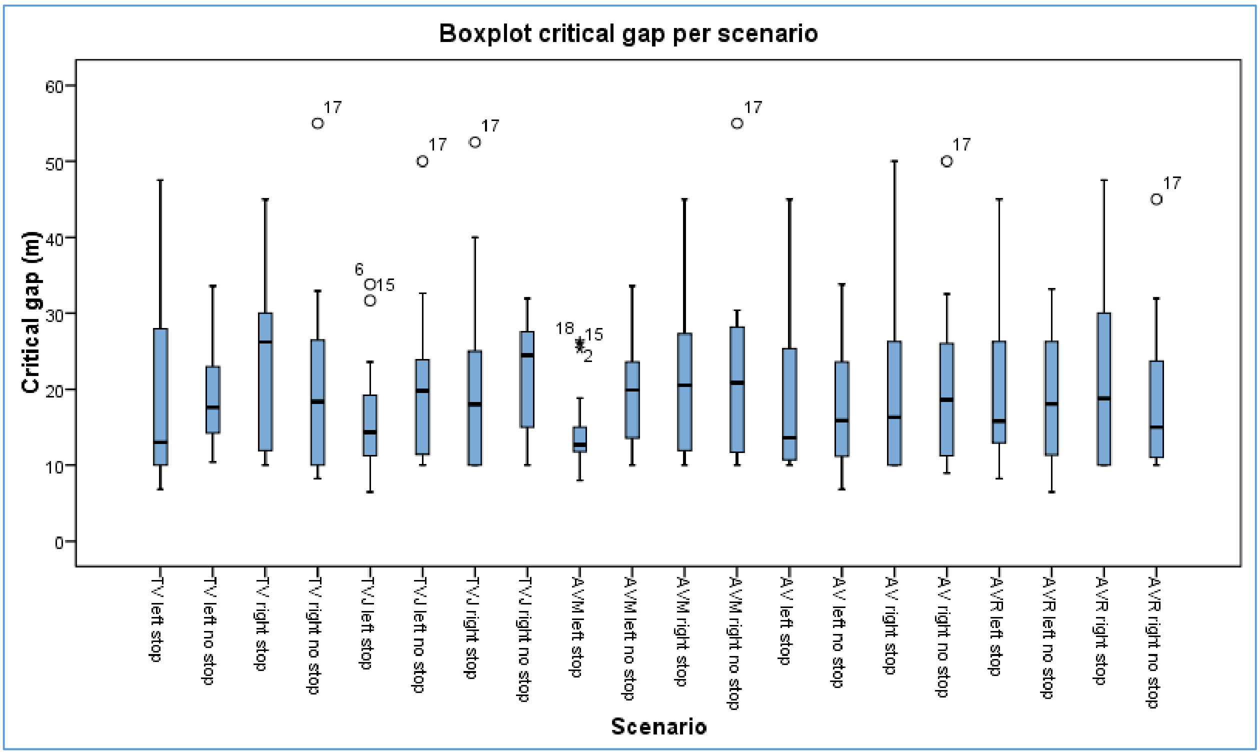
During the final field study the following 20 scenarios were tested. As done during the two pilot studies, a code was assigned to each scenario. That way, if the experimenter next to the participant and the driver had to discuss about a specific scenario, the participant would not know in advance what type of vehicle they would interact with.

Table 10: List of scenarios with codes (final experiment)

Scenario code	Scenario
A	Traditional vehicle from the left stopping
B	Traditional vehicle from the left not stopping
C	Traditional vehicle from the right stopping
D	Traditional vehicle from the right not stopping
E	Traditional vehicle driven with joystick from the left stopping
F	Traditional vehicle driven with joystick from the left not stopping
G	Traditional vehicle driven with joystick from the right stopping
H	Traditional vehicle driven with joystick from the right not stopping
I	Recognisable Wizard of Oz AV with signs on the hood and the front door from the left stopping
J	Recognisable Wizard of Oz AV with signs on the hood and the front door from the left not stopping
K	Recognisable Wizard of Oz AV with signs on the hood and the front door from the right stopping
L	Recognisable Wizard of Oz AV with signs on the hood and the front door from the right not stopping
M	Non-recognisable Wizard of Oz AV from the left stopping
N	Non-recognisable Wizard of Oz AV from the left not stopping
O	Non-recognisable Wizard of Oz AV from the right stopping
P	Non-recognisable Wizard of Oz AV from the right not stopping
Q	Recognisable Wizard of Oz AV with roof sign from the left stopping
R	Recognisable Wizard of Oz AV with roof sign from the left not stopping
S	Recognisable Wizard of Oz AV with roof sign from the right stopping
T	Recognisable Wizard of Oz AV with roof sign from the right not stopping

The critical gap was obtained from the videos recorded by the cameras in front of the pedestrian. The critical gap is, as explained before, the distance between the participant and the vehicle at the moment the participant took a step backward. The complete list of critical gaps per participant and scenario can be seen in appendix K.

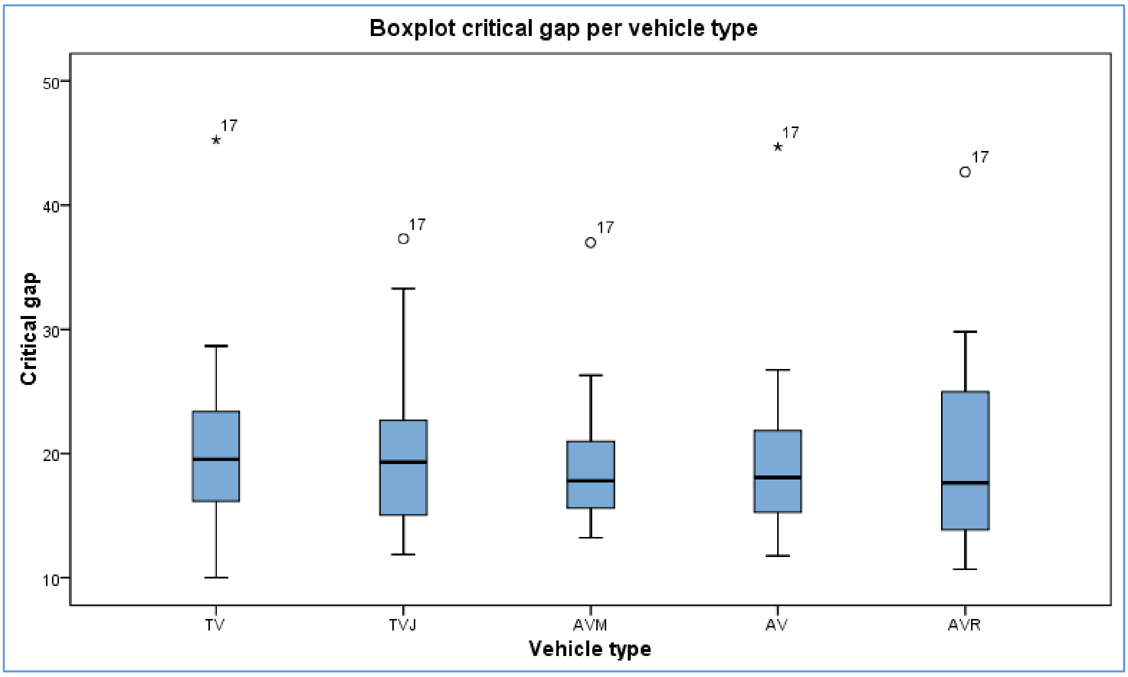
The boxplot for the critical gaps for all participants per scenario are shown in Figure 52. It can be observed from this figure that the minimum median critical gap corresponds to the scenario AV with magnets on the hood and the door approaching the participant from the left and stopping. The maximum median of the critical gap is reached in the scenario with the traditional vehicle approaching the participant from the right and stopping.



TV: *traditional vehicle;* ***TVJ:*** *traditional vehicle driven with joystick;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 52: Boxplot critical gap per scenario (all participants, final experiment)

Figure 53 shows the boxplot for critical gap per vehicle type for all the participants.

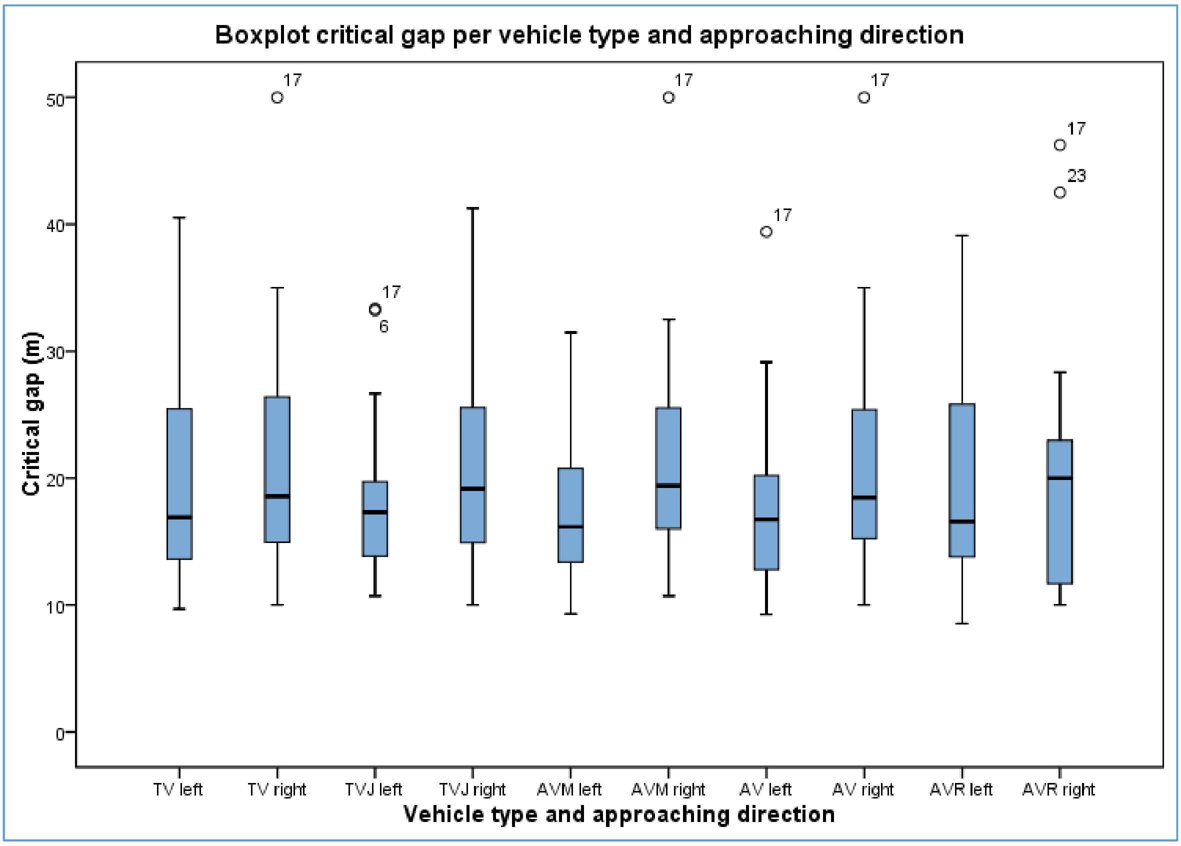


TV: *traditional vehicle;* ***TVJ:*** *traditional vehicle driven with joystick;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 53: Boxplot critical gap per vehicle type (all participants, final experiment)

It can be observed that the median of the critical gap per vehicle type considering all the participants is similar for all vehicle types. The scenario in which a traditional vehicle was used shows the largest median of the critical gap, whereas the scenarios involving an automated vehicle resulted in lower critical gaps.

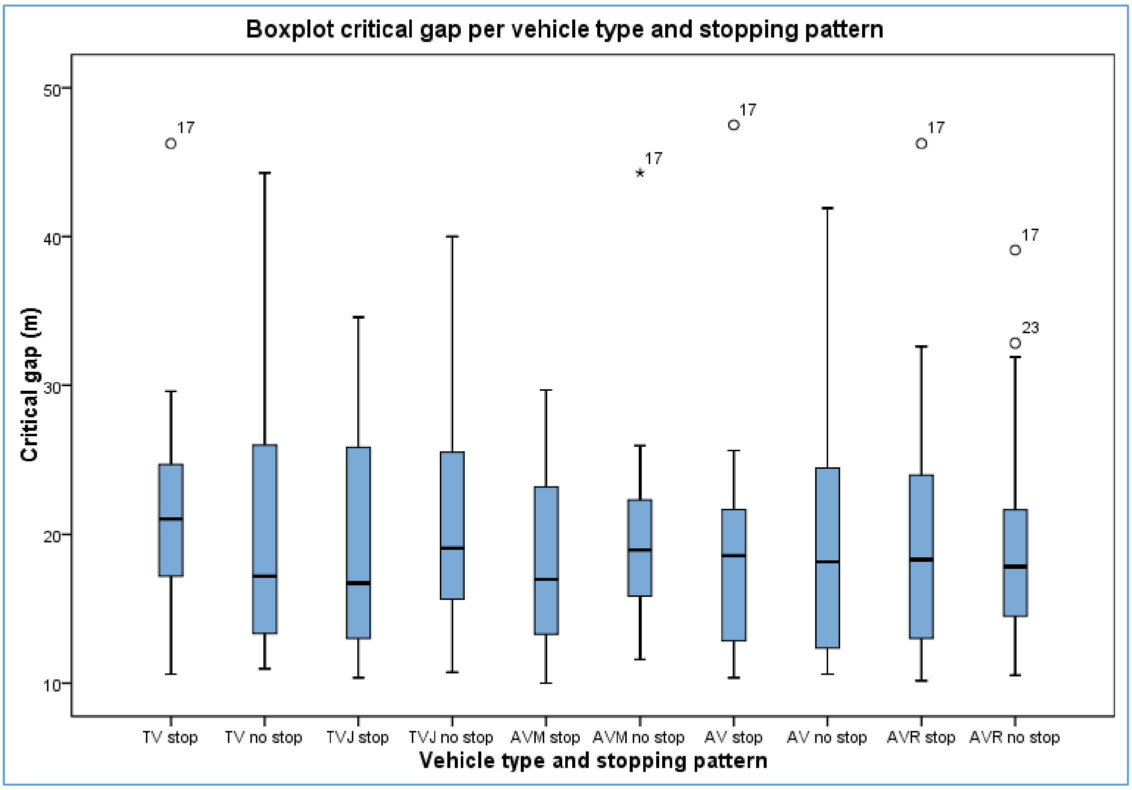
Focusing on the approaching direction of the vehicle, different average critical gaps were found that can be observed in the following boxplot.



__TV:__ traditional vehicle; __TVJ:__ traditional vehicle driven with joystick; __AV:__ non-recognizable Wizard of Oz automated vehicle; __AVM:__ recognizable Wizard of Oz automated vehicle with magnets on the hood and the door; __AVR:__ recognizable Wizard of Oz automated vehicle with roof sign

Figure 54: Boxplot critical gap per vehicle type and approaching direction (all participants, final experiment)

Critical gaps are somehow larger in the case the vehicle was approaching from the right side, except for the case of the recognizable Wizard of Oz automated vehicle with roof sign. This is in line with the expectations because when the vehicle approaches a pedestrian from the opposite lane the critical gap is larger. However, statistical analyses will be used to see whether the differences are significant.



TV: *traditional vehicle;* ***TVJ:*** *traditional vehicle driven with joystick;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 55: Boxplot critical gap per vehicle type and stopping pattern (all participants, final experiment)

In Figure 55 the boxplot for critical gaps per vehicle type considering if the vehicle stopped or not before the participant are shown. As expected, critical gaps are somehow larger in the scenarios in which the vehicle did not stop before the pedestrian. Statistical tests will be performed to assess the differences in critical gap.

Tables with the critical gaps per participant and graphs with the critical gap distribution per participant are shown in appendix K and L.

Figure 56 shows the distribution of the mean critical gap for all participants per order of appearance of the scenarios. It can be observed that there are not large differences between the critical gap in the first scenarios and the one in the last scenarios. The complete critical gap distribution per participant and order of appearance of scenarios can be found in the appendix L.

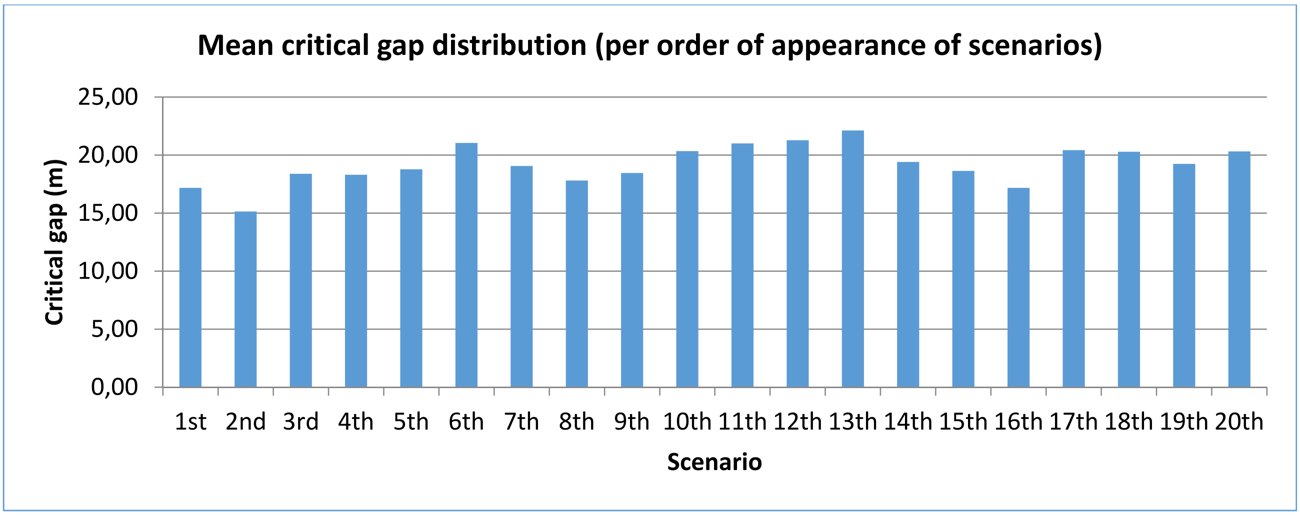


Figure 56: Mean critical gap distribution for all participants per order of appearance of scenarios

Critical gaps can also be obtained in terms of time, as the time between the moment participants took the step backwards (last moment they would cross the road) and the moment the vehicle arrives to the position of participants. The times have been obtained from the videos recorded by the dashcams. Table 11 shows the average critical gaps in seconds per vehicle type.

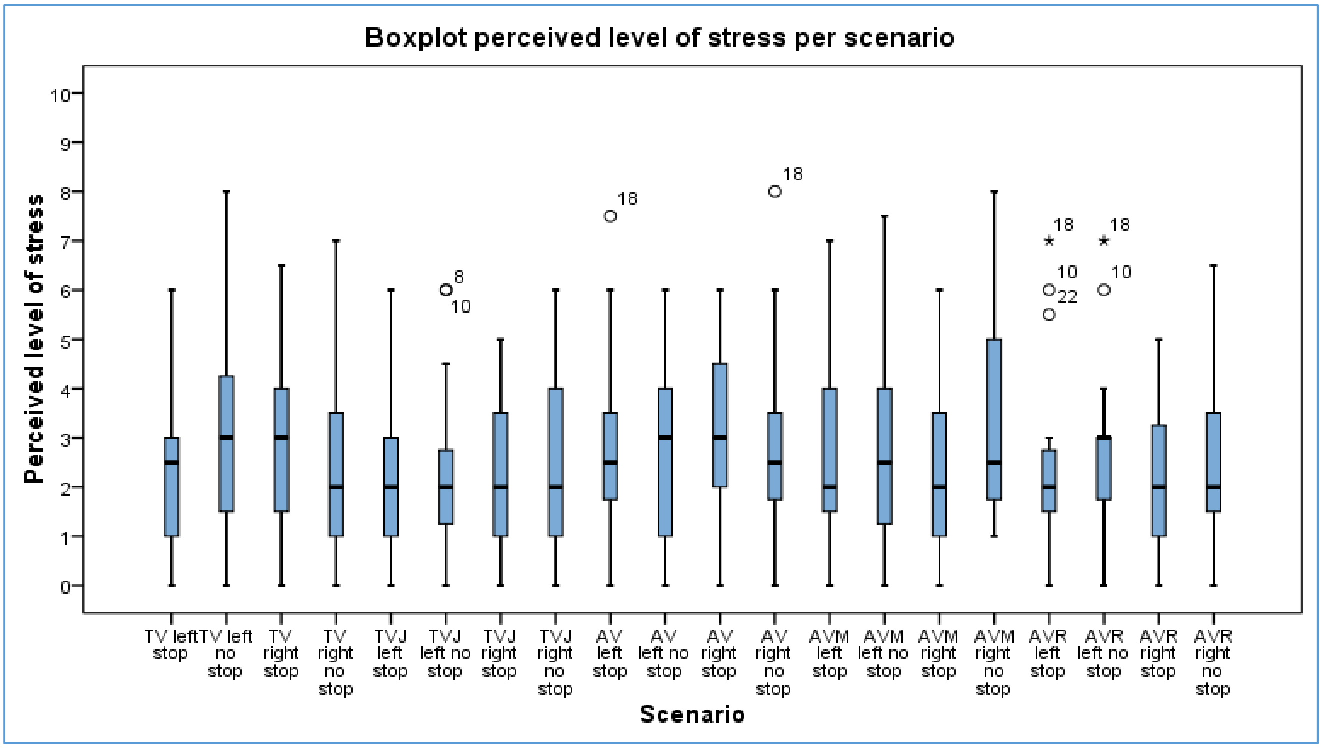
Table 11: Average critical gaps per vehicle type, in seconds

	Critical gap (s)		
Vehicle type	**N**	**Mean**	**SD**
Traditional vehicle	23	5.74	1.69
Non-recognizable Wizard of Oz automated vehicle	23	6.13	2.02
Recognizable Wizard of Oz automated vehicle with magnets on the hood and the door	23	6.14	2.04
Recognizable Wizard of Oz automated vehicle with roof sign	24	6.44	2.06
Traditional vehicle driven with joystick	22	6.17	1.87

4.2.3 Perceived level of stress

As described before, the level of stress participants felt was assessed trough the interview post-interaction, with the question “How stressed were you on a scale from 0 to 10, where 0 is ‘not stressed at all’ and 10 is ‘extremely stressed’?”.

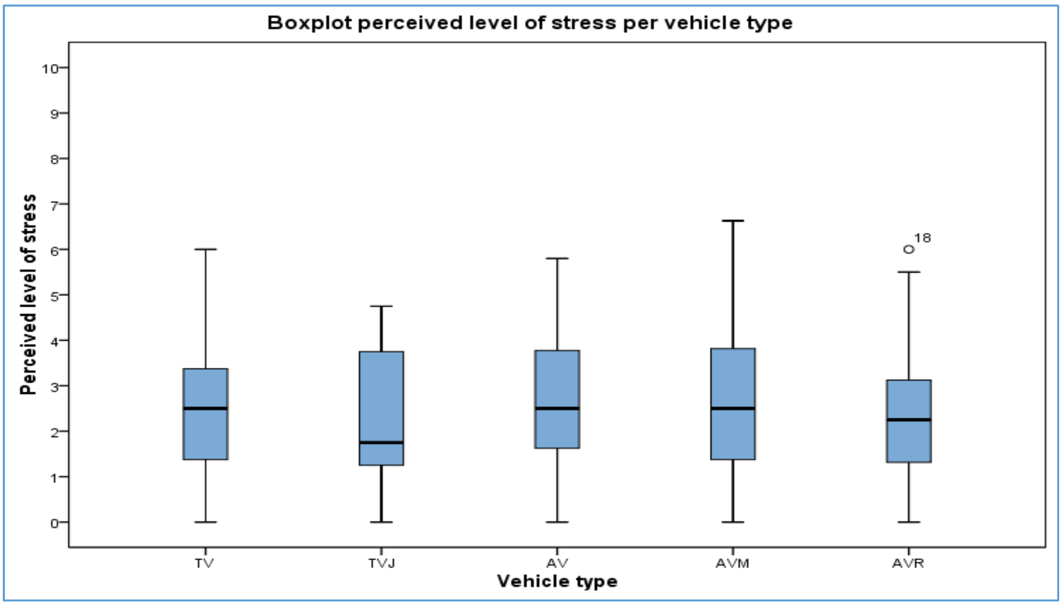
The boxplot of the perceived level of stress for each scenario is shown in Figure 57. It is observed that the perceived level of stress is very low in all cases.



TV: *traditional vehicle;* ***TVJ:*** *traditional vehicle driven with joystick;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 57: Boxplot perceived stress per scenario (all participants, Likert scale from 0 to 10, final experiment)

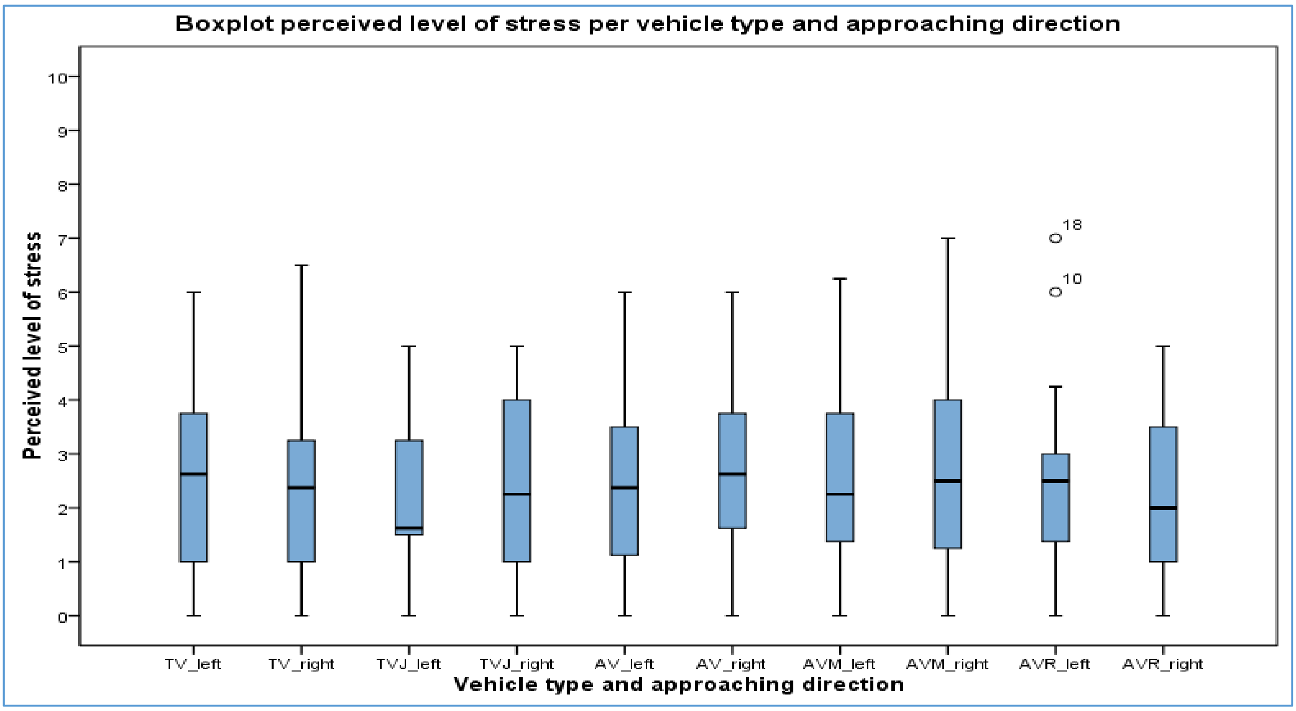
Regarding the vehicle type, no differences can be observed in perceived stress level between different types of vehicle, as it is shown in Figure 58.



TV: *traditional vehicle;* ***TVJ:*** *traditional vehicle driven with joystick;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 58: Boxplot perceived stress per vehicle type (all participants, Likert scale from 0 to 10, final experiment)

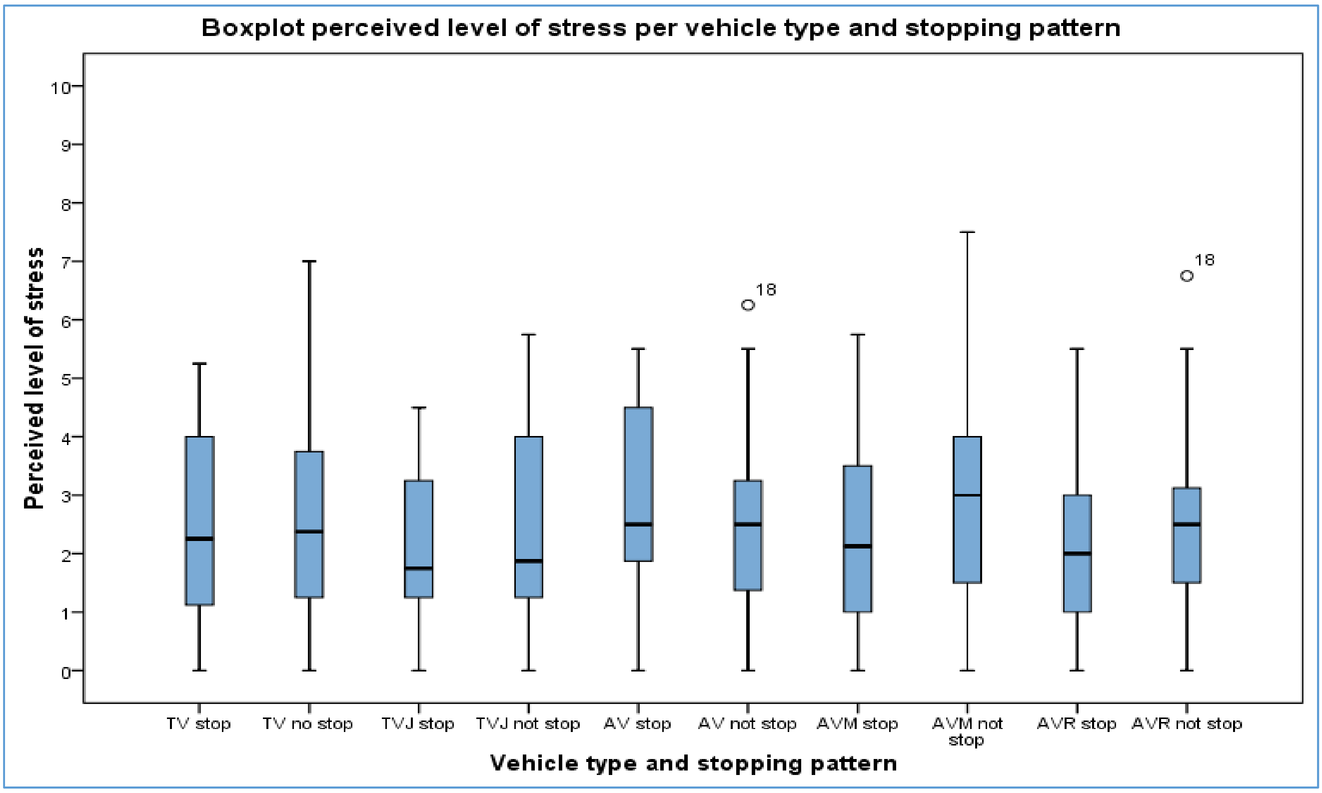
The following figure shows the boxplot for the perceived level of stress considering the two different approaching directions. There are almost no differences between the average stress perceived when the vehicle approached the participants from the left and when it approached them from the left.



TV: *traditional vehicle;* ***TVJ:*** *traditional vehicle driven with joystick;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 59: Boxplot perceived stress per vehicle type and approaching direction (all participants, Likert scale from 0 to 10, final experiment)

Finally, in Figure 60 the average perceived level of stress for all participants is detailed considering the stopping pattern. Slightly differences can be observed in some cases between the condition in which the vehicle stopped before the participant and the one when it did not. However, those small differences do not seem to be statistically significant. Thus, statistical tests will be performed to analyse significance.



TV: *traditional vehicle;* ***TVJ:*** *traditional vehicle driven with joystick;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 60: Boxplot perceived stress per vehicle type and stopping pattern (all participants, Likert scale from 0 to 10, final experiment)

4.2.4 Vehicle recognisability

Analysing the data from the digital questionnaire it can be seen that 83% of the participants (i.e., 20 out of 24) did realize, before making the decision to cross, that the vehicle was equipped with signs with the message ‘self-driving’ (Figure 61).

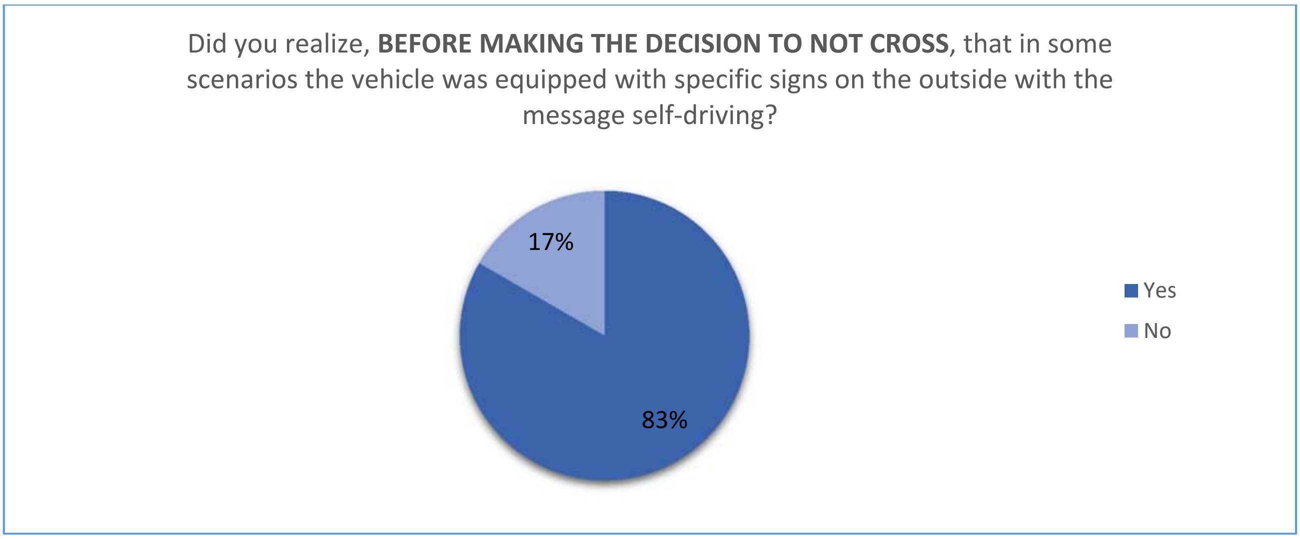


Figure 61: Visibility of vehicle signs before making the decision to not cross the road (final experiment)

From the 20 participants that did notice the signs, 14 (i.e., 70%) reported that the signs influenced their decision-making somehow. For example, there were 7 participants who stated that they were more uncertain/doubtful, less safe, or more careful as compared to a traditional vehicle. Three of 14 participants who reported that the signs influenced their decision making explained that they considered that the vehicle would stop for them and that the situation was safe.

Moreover, 19 out of the 20 participants (95%) who did perceive the signs reported that the roof sign was the clearest.

Regarding the driver, the majority of participants (83%; 20 out of 24) did realize that the driver was performing other tasks than driving in some scenarios, and all of these 20 participants identified the task as reading a newspaper or a map. 19 of the 20 participants (95%) who did see the driver reading a newspaper reported that this influenced their decision making. That situation was considered unsafe by some participants; they reported that they took a step backwards earlier, that they were more hesitant to cross, or that they preferred to have eye contact with the driver. However, one participant reported that he allowed the vehicle to approach him closer because he assumed that was a self-driving vehicle and it would always yield.

4.2.5 Perceived safety and further improvements

The main factors that participants reported as taken into account before making the decision to take a step backwards (i.e., to not cross the road anymore) were:

- Speed of the vehicle
- Distance from the vehicle
- Eye-contact with the driver
- Self-driving signs
- Driver reading a newspaper

- Seeing the hands of the driver on the steering wheel or not
- Weather conditions
- Vehicle stopping or not stopping
- Small vehicle lateral deviations (when driven with joystick)
- Vehicle approaching from the furthest road lane

These reported factors taken into account before making the decision to take a step backwards are detailed in appendix M for each tested scenario. Results show that the main factors were speed of the vehicle and distance between the vehicle and the pedestrian. However, in the case of scenarios involving automated vehicles, self-driving signs and the driver reading a newspaper were also important factors.

- <u>Experiment realism:</u>

At the end of the experiment, participants were requested to evaluate the realism of the experiment set-up on a scale from 0 to 10. The realism mean was 6.42 (SD = 1.83, N = 19) and the main reasons for that evaluation were mainly external reasons that could not be changed during the experiment due to ethical or logistic reasons. For instance, the fact that participants were not allowed to step onto the road to actually cross it, that there were no pedestrian crossing facilities or the influence of the weather conditions.

Figure 62 shows the assessment of experiment realism on a scale from 0 to 10 per participant. It is important to mention that there were no answers to this question from participants 1, 5, 15, 17 and 24.

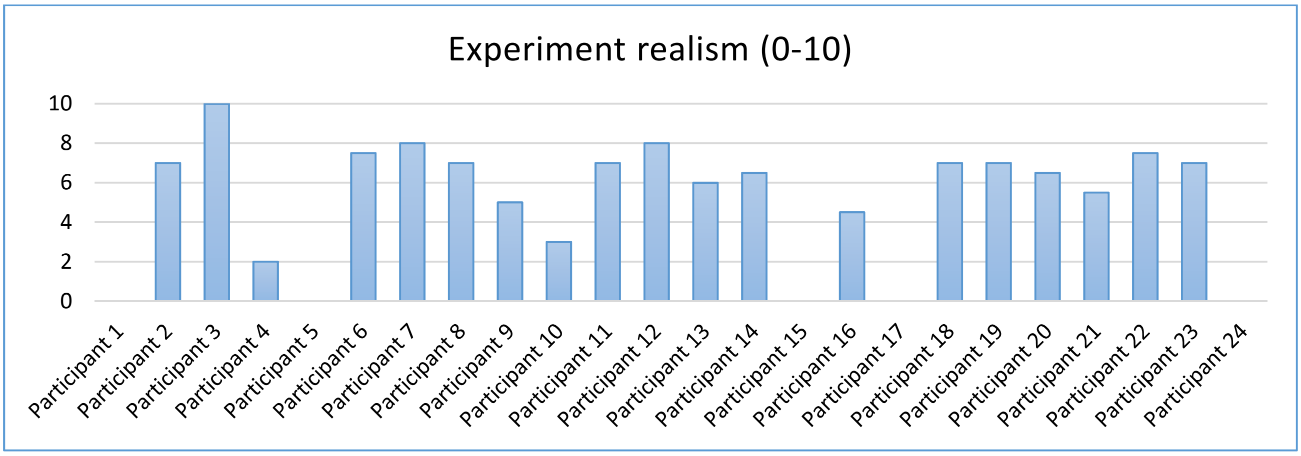


Figure 62: Assessment of experiment set-up realism (final experiment)

- <u>Instructions:</u>

During the interview post-experiment participants assessed whether the experiment instructions were natural for them. Figure 63 shows the results to the question *“was it natural for you to take a step forward in the first moment you would cross the road and a step backwards in the last moment you would do it?”*

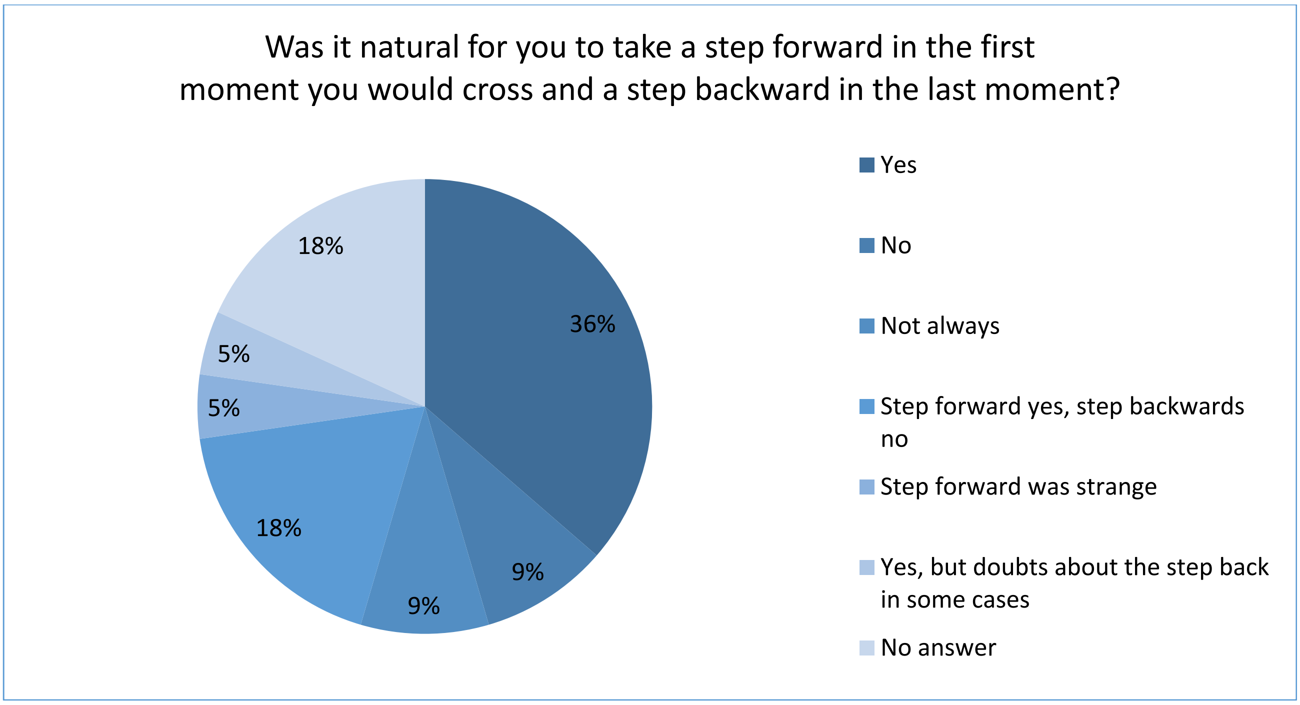


Figure 63: opinion regarding the experiment instructions (final experiment)

- <u>Perception of vehicle driving mode:</u>

Regarding the use of the Wizard of Oz automated vehicle, participants were asked during the interview post-experiment how they thought the vehicle was driven. As seen in Figure 64, 40% (i.e., 8 out of 20 participants who answered this question) of the participants thought the vehicle was driven both manually and autonomously depending on the scenario and 5% (1 participant) thought it was driven autonomously in all scenarios. 45% (9 participants) believed that the vehicle was driven manually in all cases and 10% of them were “not sure” about the driving mode.

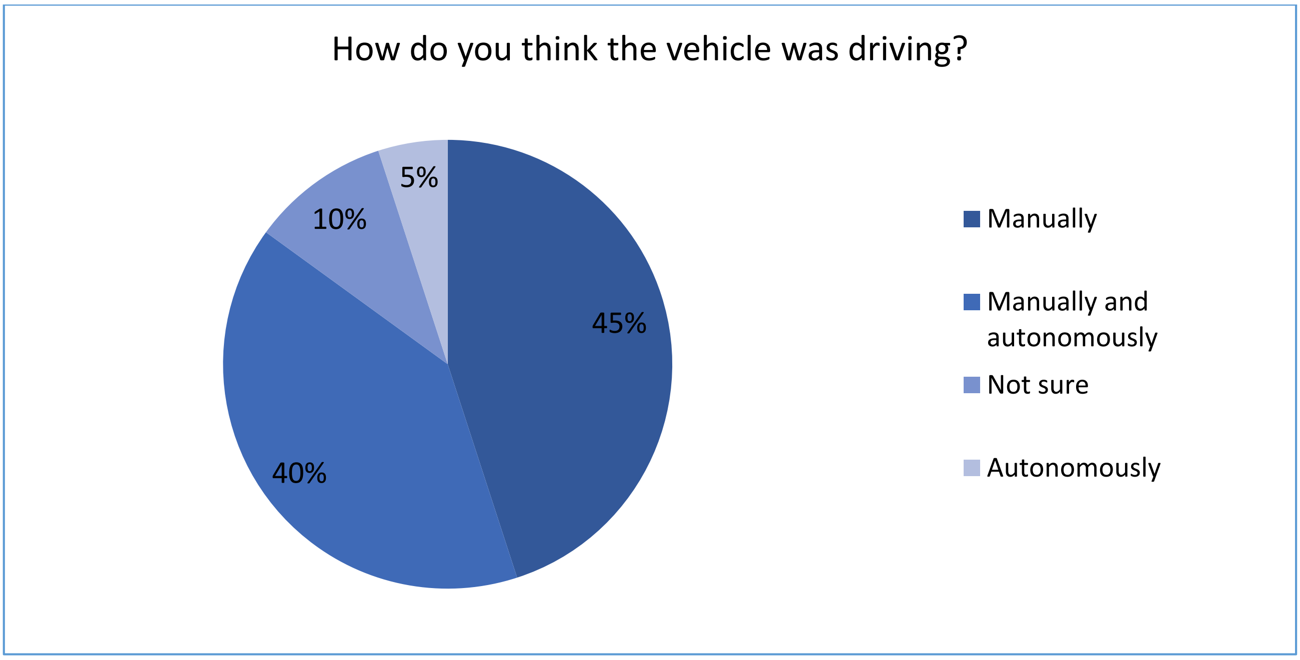
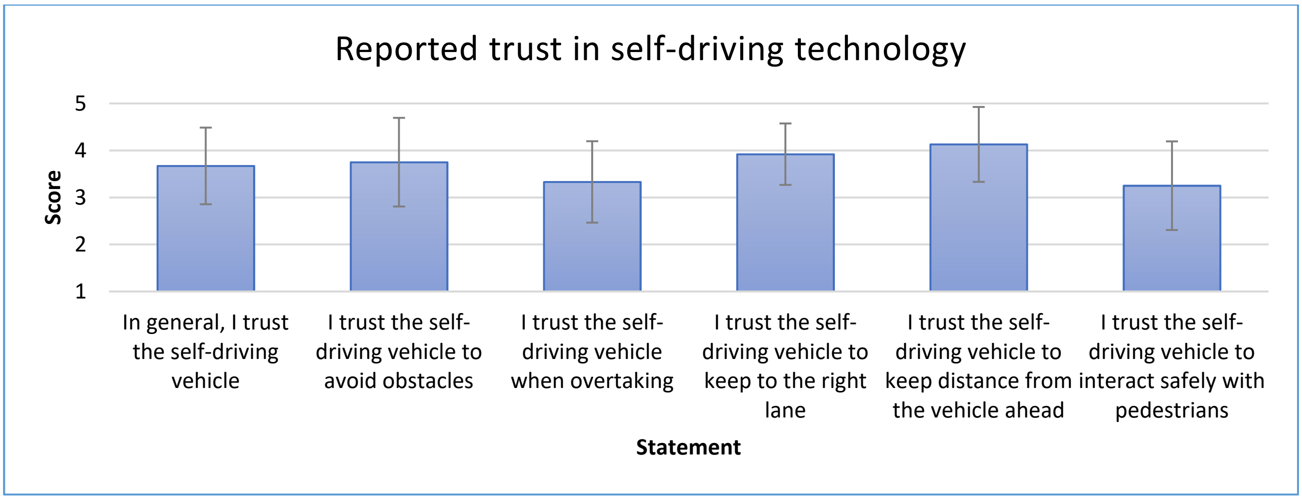


Figure 64: Perception of vehicle driving mode (final experiment)

4.2.6 Sensation seeking and trust in self-driving technology

As the last part of the questionnaire participants had to answer some questions to analyse their sensation seeking and trust in automated vehicles.

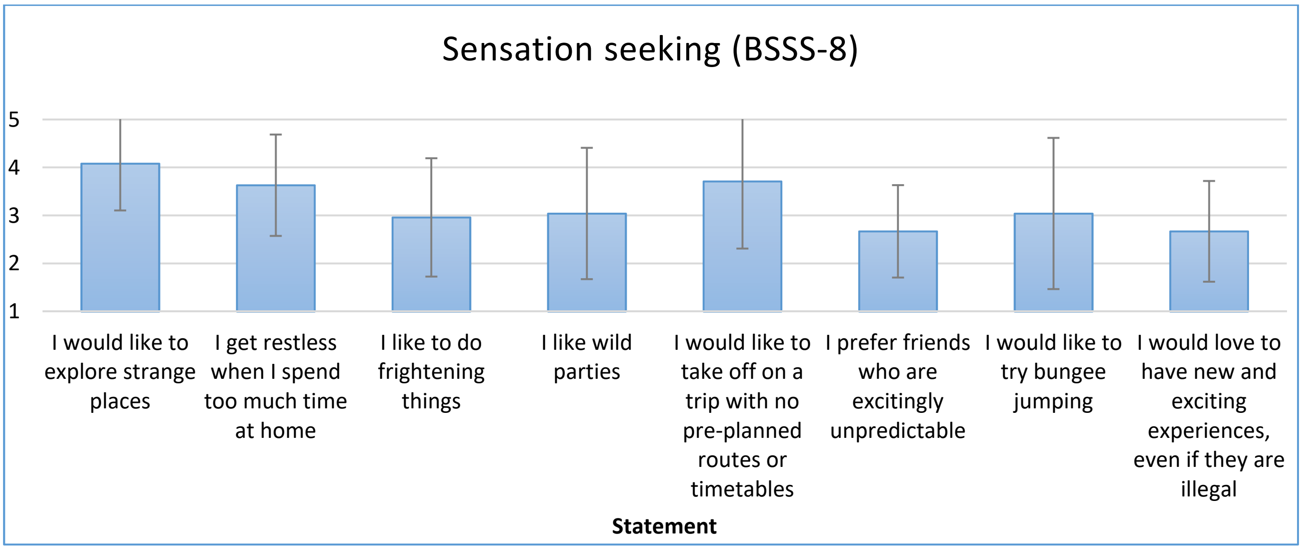
Figure 65 shows descriptive statistics for each of the questions used to assess the trust in self-driving technology. The bars indicate the mean score for each of the questions whereas the error bar is determined by the limits mean - SD to mean + SD. Trust with regard to the interaction of the AV with pedestrians seems to be lower than other trust aspects of the self-driving technology.



1: Strongly disagree; 2: disagree; 3: neither agree nor disagree; 4: agree; 5: strongly agree

Figure 65: Reported trust in self-driving technology; means and standard deviations (5 point Likert scale, final experiment)

Figure 66 shows the results in terms of means and standard deviations for the Brief Sensation Seeking scale used in the questionnaire to assess sensation seeking through 8 different questions. As above, the bars indicate the mean score for each of the questions and the error bar is determined by the limits mean - SD to mean + SD.



1: Strongly disagree; 2: disagree; 3: neither agree nor disagree; 4: agree; 5: strongly agree

Figure 66: Sensation seeking using BSSS-8; means and standard deviations (5 point Likert scale, final experiment)

4.2.7 Speed

The same kinematic profile was used in all the different tested scenarios. However, it was suspected that the scenario in which the vehicle was manually driven (TV) the driving speed was higher. Therefore, an analysis was needed to check that there were no differences in speed between the different scenarios and that the experiment results were not affected by speed differences.

The speed of the vehicle and kinematic profile were obtained by using a Matlab script that reads GPS and speed data from the daschcam recordings.

Figure 67 consists of a boxplot of the absolute speed at which the vehicle was driving at the moment the participant stepped back, for the five different scenarios.

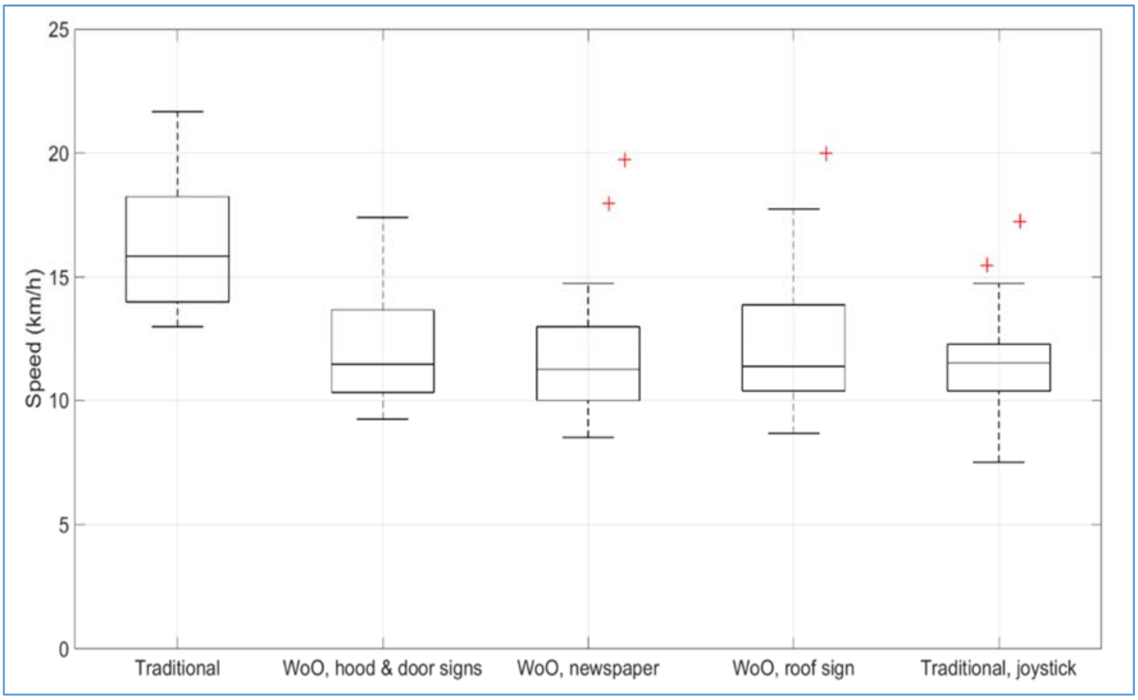


Figure 67: Boxplot absolute speeds of the vehicle at the moment the participant stepped back

In the previous figure it can be observed that the speed in the case of the scenarios involving a (manually driven) traditional vehicle is somehow higher than for the rest of scenarios.

In Figure 68 the average speed per vehicle type in relation with the distance between the vehicle and the participant is displayed. It can also be noticed here that the scenarios in which the vehicle was manually driven (TV), the speed was higher than for the rest of the scenarios.

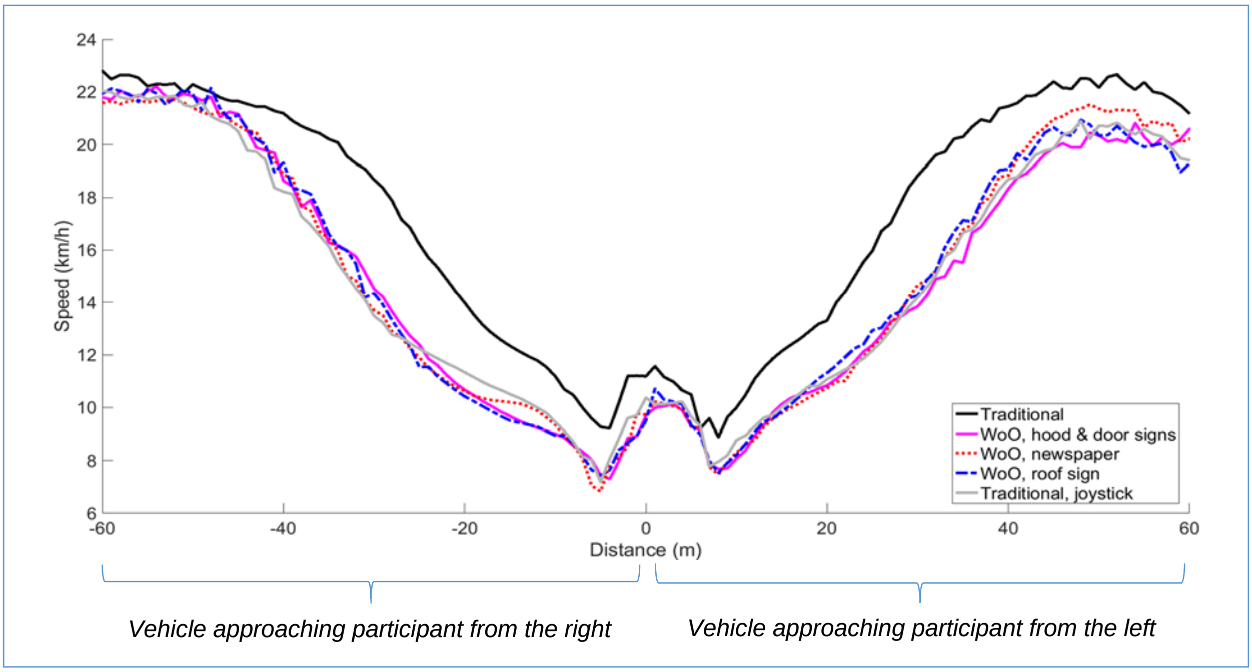


Figure 68: Mean speed per vehicle type

After performing a repeated measures ANOVA analysis, it was seen that at a distance of 30 m relative to the participants, there was a statistically significant difference in speed between different vehicle conditions (F(4,92) = 35.48, $p < 0.001$). That is visible in the following figure.

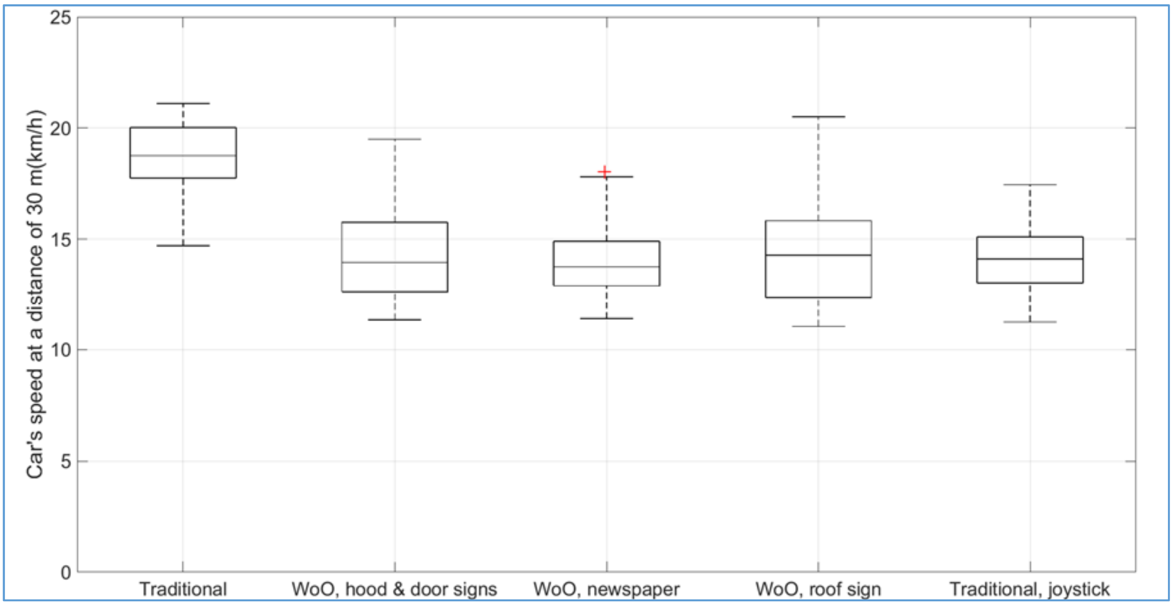


Figure 69: Boxplot of the vehicle's speed at a distance of 30 m relative to the participant

The results of paired t tests showed statistically significant differences on speed between the scenarios in which the vehicle was traditional manually driven and the other four scenarios. However, no statistically significant differences were found on speed between the traditional vehicle driven with the joystick and the three Wizard of Oz automated vehicles.

4.3. Data analysis and results

4.3.1 Critical gap analyses

- Traditional vs automated vehicle:

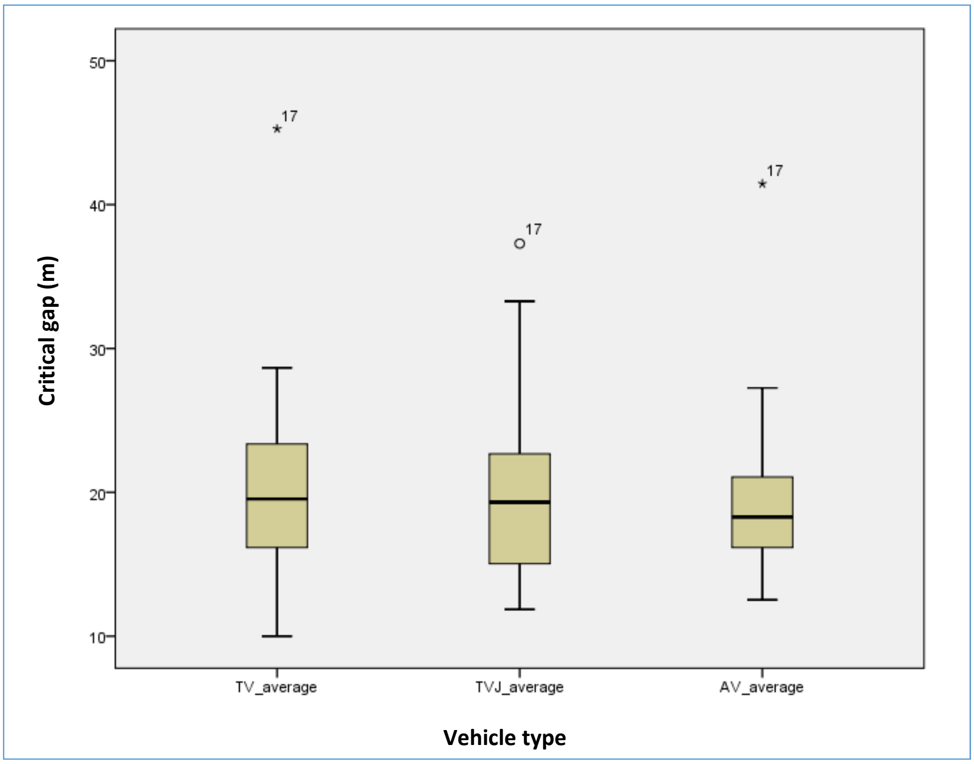
A one-way repeated measures ANOVA analysis has been carried out to assess whether there were differences in critical gap when participants interacted with a traditional vehicle compared to when they interacted with a Wizard of Oz automated vehicle.

This type of statistical analysis has been chosen due to the fact that the critical gap is a continuous dependent variable and the within-subject factor (or independent variable) is the vehicle type. The within-subject factor is comprised of three different levels: traditional vehicle (TV), traditional vehicle driven with the joystick (TVJ) and automated vehicle (AV). The three different types of Wizard of Oz automated vehicles (magnets, roof sign and driver reading a newspaper) have been included in the level "automated vehicle (AV)".

The following hypotheses have been considered to carry out the analysis:

- H_0: all critical gap means are equal for the different vehicle types.
- H_A: at least one critical gap mean is different.

Figure 70 shows that participant 17 can be considered an outlier since the critical gaps that he accepted were much larger than the critical gaps for the rest of participants.



TV: *traditional vehicle;* ***TVJ:*** *traditional vehicle driven with joystick;* ***AV:*** *automated vehicle (including all Wizard of Oz types)*

Figure 70: Boxplot of critical gaps per vehicle type (traditional vs automated vehicle)

The analysis has been performed both with and without the outlier as part of the data. That has been done to avoid criticism regarding the possible elimination of the outlier to obtain results in line with the expectations.

As seen in Table 12, analyses with and without considering the outlier lead to similar results. In both cases the null hypothesis cannot be rejected ($p>0.05$) and the alternative hypothesis cannot be accepted. Thus, there are not statistically significant differences in critical gap between traditional and automated vehicles.

Table 12: Results of the one-way ANOVA analysis for critical gap (traditional vs automated vehicle)

Results (Traditional vehicle vs automated vehicle)

Analysis without outlier 17	Analysis with outlier 17
F(2,42)=0.196, p=0.823>0.05	F(2,44)=0.254, p=0.777>0.05

Since the critical gap data violated the assumption of normality for some within-subject factors, the non-parametric Friedman test has been carried out to assess possible major differences in results due to the violation of normality. However, as it can be seen in Table 13, the Friedman test led to the same result, showing no statistically significant differences in critical gap between traditional and automated vehicles ($\chi^2(2) = 1.130$, $p = 0.568 > 0.05$).

Table 13: Results of the Friedman test analysis for critical gap (traditional vs automated vehicle)

Test Statistics[a]

N	23
Chi-Square	1,130
Df	2
Asymp. Sig.	,568

a. Friedman Test

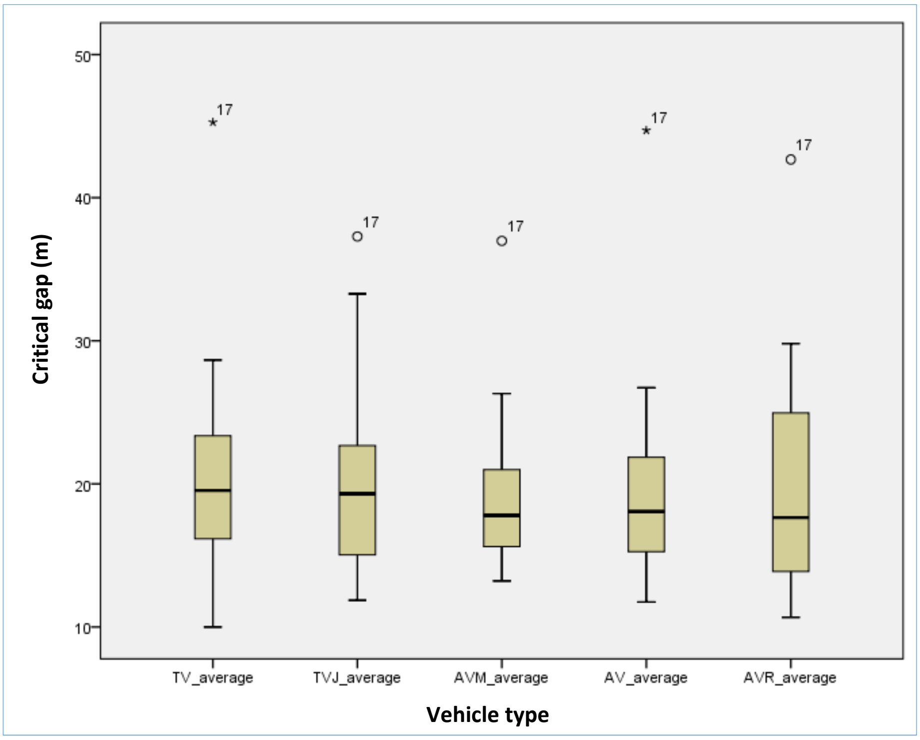
- Traditional vs different types of automated vehicles:

Possible differences in critical gap between scenarios involving a traditional vehicle and those involving different types of automated vehicles (magnets, roof sign and newspaper) have also been analysed.

In this case, a one-way repeated measures ANOVA analysis have been used considering critical gap as the dependent variable and the vehicle type as a within-subject factor (independent) factor. Repeated measures have been used because the independent variable has, in this case, 5 different levels: traditional vehicle (TV), traditional vehicle driven with joystick (TVJ), automated vehicle without signs (AV), automated vehicle with magnets (AVM) and automated vehicle with roof sign (AVR). The hypotheses considered are:

- H_0: all critical gap means are equal for the different vehicle types.
- H_A: at least one critical gap mean is different.

As in the previous section, in this case participant 17 was also considered an outlier due to his large critical gaps compared to other participants as seen in the following figure.



TV: *traditional vehicle;* ***TVJ:*** *traditional vehicle driven with joystick;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

Figure 71: Boxplot of critical gaps per vehicle type

Table 14 shows the results of the analysis both keeping the data from participant 17 and deleting it from the data sample. Both options lead to similar results showing no statistically significant differences in critical gap between different vehicle types.

Table 14: Results of the one-way repeated measures ANOVA analysis for critical gap (traditional vs different types of automated vehicle)

Results (traditional vehicle vs different types of automated vehicle)	
Analysis without outlier 17	**Analysis with outlier 17**
F(4,84)=0.172, p=0.952>0.05	F(4,88)=0.187, p=0.945>0.05

Since the data violated the assumption of normality in some cases, an additional Friedman test has been performed to check possible mistakes in the previous results due to the non-normality condition. However, as observed in Table 15, the Friedman test lead to the same results showing no statistically significant differences in critical gap between groups ($\chi^2(4) = 2.017$, $p = 0.733 > 0.05$).

Table 15: Results of the Friedman test analysis for critical gap (traditional vs different types of automated vehicle)

Test Statistics[a]

N	23
Chi-Square	2,017
Df	4
Asymp. Sig.	,733

a. Friedman Test

- Vehicle type and approaching direction:

During the experiment scenarios where the vehicle approached the participant (pedestrian) from different directions were tested. Therefore, statistical analyses have been performed to analyse the impact of approaching direction on critical gap.

A two-way repeated measures ANOVA analysis was carried out considering critical gap as dependent variable and vehicle type and approaching direction as within-subject factors (independent variables). Vehicle type has five different levels (TV, TVJ, AV, AVM, AVR) and approaching direction is comprised of two levels (left, right).

The following hypotheses have been considered when carrying out the analysis:

- H_0: all critical gap means are equal for the different vehicle types and approaching directions.
- H_A: at least one critical gap mean is different.

As in the previous sections, the analysis have been carried out both with and without the data from participant 17, who can be considered an outlier. Table 16 shows the results are similar in both cases, with no statistically significant differences in critical gap between different vehicle types and approaching directions.

Table 16: Results of the two-way repeated measures ANOVA analysis for critical gap (vehicle type and approaching direction)

Results (Vehicle type and approaching direction)

	Analysis without outlier 17	**Analysis with outlier 17**
	F(4,84) = 1.018, p = 0.403 > 0.05	F(4,88) = 1.193, p = 0.320 > 0.05
Vehicle type effect	F(4,84) = 0.208, p = 0.933 > 0.05	F(4,88) = 0.206, p = 0.934 > 0.05
Approaching direction effect	F(1,21) = 2.443, p = 0.133 > 0.05	F(1,22) = 3.454, p = 0.077 > 0.05

- Vehicle type and stopping pattern:

In some scenarios the vehicle stopped before the participant and in others the vehicle continued driving at a constant speed without stopping. The impact of these scenarios on critical gap has been assessed using a two-way repeated measures ANOVA analysis with the following hypotheses:

- H_0: all critical gap means are equal for the different vehicle types and stopping patterns.
- H_A: at least one critical gap mean is different.

As in the previous analyses, critical gap is the dependent variable and two different within-subject factors have been considered: vehicle type (with 5 levels) and stopping pattern (with 2 levels: stop/not stop).

The results of the analysis in the case the outlier (participant 17) is part of the data set and in the case it is not can be seen in Table 17.

Table 17: Results of the two-way repeated measures ANOVA analysis for critical gap (vehicle type and stopping pattern)

Results (Vehicle type and stopping pattern)		
	Analysis without outlier 17	**Analysis with outlier 17**
	F(4,80) = 0.254, p = 0.906 > 0.05	F(4,84) = 0.410, p = 0.801 > 0.05
Vehicle type effect	F(4,80) = 0.451, p = 0.771 > 0.05	F(4,84) = 0.549, p = 0.701 > 0.05
Stopping pattern	F(1,20) = 1.797, p = 0.195 > 0.05	F(1,21) = 2.034, p = 0.168 > 0.05

- Critical gap in terms of time:

As described in the literature review, the pedestrian critical gap can be calculated as follows according to Transportation Research Board (2000):

$$t_c = \frac{L}{S_p} + t_s = \frac{26.24}{3.5} + 1.9 = 9.40\ s$$

Where,

t_c = *pedestrian critical gap (s)*

L= *road length (ft)*

S_p = *mean pedestrian walking speed*

t_s = *start-up time of the pedestrian*

The road length in the section where the experiment took place was around 8 meters. Mean pedestrian walking speed has been considered as default, and start-up and clearance time has been set at 1.9 seconds. That start-up time has been considered because of the suggested times by the Highway Capacity Manual for young pedestrians, as it is the case in this experiment.

4.3.2 Perceived stress level analyses

- Traditional vs automated vehicle:

Since perceived level of stress was assessed during the experiment through a 5 point Likert scale, the data was ordinal. Thus, the non-parametric Friedman test has been performed to analyse possible differences in perceived level of stress between traditional and automated vehicles. The following hypotheses have been considered:

- H_0: the scores for the perceived level of stress is the same for all vehicle types.
- H_A: at least one of the scores for the perceived level of stress is different.

The test results in Table 18 show that there are not statistically significant differences in stress level between traditional and automated vehicles ($\chi^2(2) = 3.120$, $p = 0.210 > 0.05$). No post-hoc tests have been performed because there was not a statistically significant difference between groups.

Table 18: Results of the Friedman test analysis for perceived stress level (traditional vs automated vehicle)

Test Statistics[a]

N	20
Chi-Square	3,120
Df	2
Asymp. Sig.	,210

a. Friedman Test

- <u>Traditional vs different types of automated vehicles:</u>

The possible differences in perceived stress have also been analysed considering the three different types of automated vehicles (magnets, roof sign and newspaper). Therefore, a Friedman test has been carried out to assess differences in perceived level of stress between traditional vehicles and the different types of automated vehicles.

The hypotheses used during the analysis performance are:

- H_0: the scores for the perceived level of stress is the same for all vehicle types.
- H_A: at least one of the scores for the perceived level of stress is different.

The test results in Table 19 show that there are not statistically significant differences in stress level between traditional and different types of automated vehicles ($\chi^2(4) = 6.176$, $p = 0.186 > 0.05$). No post-hoc tests have been performed because there was not a statistically significant difference between groups.

Table 19: Results of the Friedman test analysis for perceived stress level (traditional vs different types of automated vehicle)

Test Statistics[a]

N	20
Chi-Square	6,176
Df	4
Asymp. Sig.	,186

a. Friedman Test

4.3.3 Impact of trust in self-driving technology on critical gap and perceived stress

The impact of trust in self-driving technology in critical gap and perceived level of stress has been assessed. In order to do that, the data set has been divided in three different groups:

- Participants with high level of trust in self-driving technology
- Participants with neutral level of trust in self-driving technology
- Participants with a low level of trust in self-driving technology

These groups have been obtained analysing the answers to the trust in self-driving technology question in the questionnaire. The current study focuses on the pedestrian point of view. Therefore, the score that participants gave to the statement "I trust self-driving vehicles to interact safely with pedestrians" has been taken into account for the group formation, instead of the overall trust in self-driving technology.

The answers to the questionnaire were given on a 5 point Likert scale. Participants giving a score lower than 3 to the above mentioned statement have been considered to have a lower level of trust in self-driving technology. Participants with reporting scores of 3 have been considered neutral and those reporting scores higher than 3 have been considered to have a high trust in self-driving technology.

The different groups of participants considered for the analysis are shown in Table 20.

Table 20: Groups of participants to assess impact of trust in self-driving technology

Participants with high level of trust in self-driving technology (score higher than 3)		**Participants with neutral level of trust in self-driving technology (score 3)**		**Participants with low level of trust in self-driving technology (score lower than 3)**	
Participant number	**Score**	**Participant number**	**Score**	**Participant number**	**Score**
1	4	4	3	9	1
2	4	5	3	11	2
3	4	8	3	14	2
6	4	10	3	15	2
7	4	12	3	18	2
13	4	17	3		
16	4	19	3		
21	4	20	3		
22	4				
23	4				
24	5				

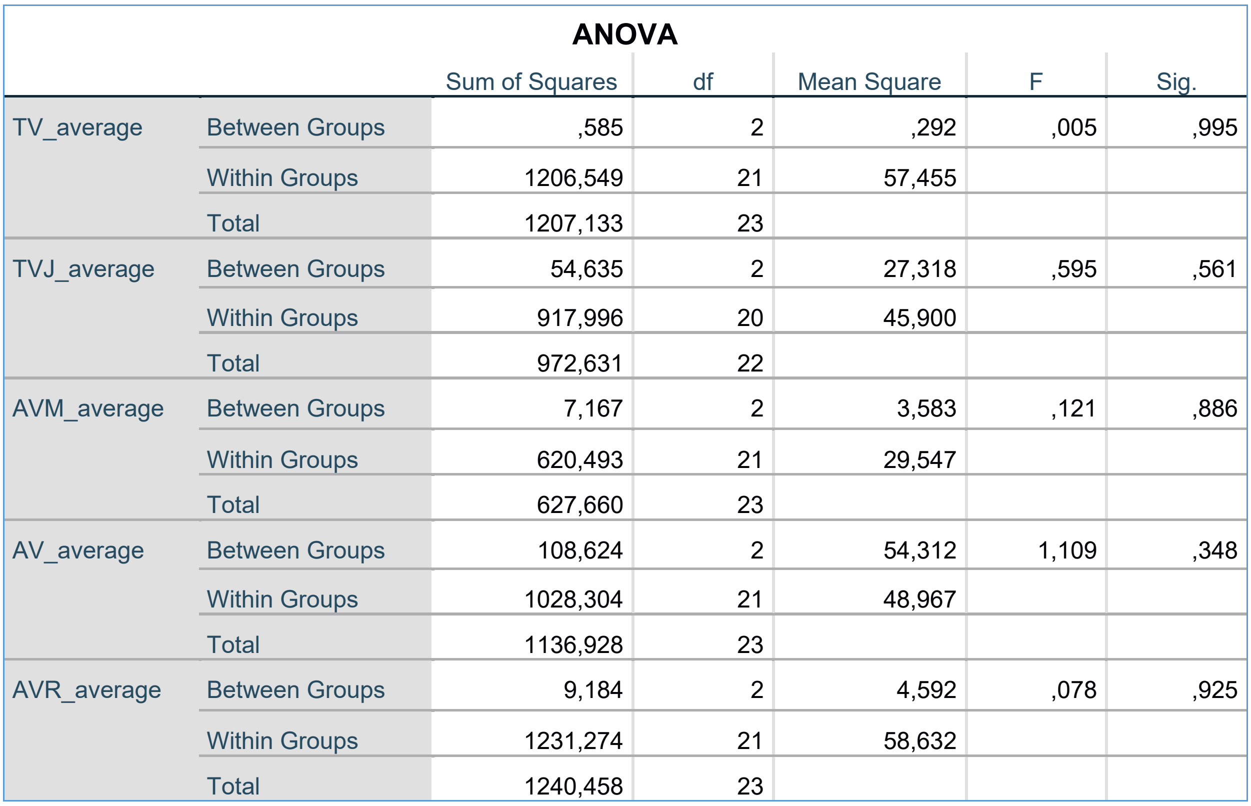
In order to assess the impact of level of trust in self-driving technology in critical gap, a one-way ANOVA analysis has been carried out. Critical gap has been considered as the dependent variable at a continuous level and level of trust in self-driving technology has been considered as the independent variable with three different independent groups (high trust, neutral and low trust).

The hypotheses considered for the analysis have been:

- H_0: all critical gap means are equal for all groups.
- H_A: the mean critical gap of at least one of the groups is different.

Table 21 shows the results of the analysis. As it can be observed, there are not statistically significant differences in average critical gap regarding the different groups of trust in self-driving technology (p>0.05 in all cases).

Table 21: Results of the one-way ANOVA analysis for critical gap regarding trust in self driving technology



ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
TV_average	Between Groups	,585	2	,292	,005	,995
	Within Groups	1206,549	21	57,455		
	Total	1207,133	23			
TVJ_average	Between Groups	54,635	2	27,318	,595	,561
	Within Groups	917,996	20	45,900		
	Total	972,631	22			
AVM_average	Between Groups	7,167	2	3,583	,121	,886
	Within Groups	620,493	21	29,547		
	Total	627,660	23			
AV_average	Between Groups	108,624	2	54,312	1,109	,348
	Within Groups	1028,304	21	48,967		
	Total	1136,928	23			
AVR_average	Between Groups	9,184	2	4,592	,078	,925
	Within Groups	1231,274	21	58,632		
	Total	1240,458	23			

__TV:__ traditional vehicle; __TVJ:__ traditional vehicle driven with joystick; __AV:__ non-recognizable Wizard of Oz automated vehicle; __AVM:__ recognizable Wizard of Oz automated vehicle with magnets on the hood and the door; __AVR:__ recognizable Wizard of Oz automated vehicle with roof sign

As described before, the perceived level of stress was assessed through a Likert scale. Therefore, that data is ordinal and a one-way ANOVA analysis cannot be used to analyse possible differences in stress with respect to the three different levels of trust in self-driving technology. Instead, the non-parametrical Kruskal-Wallis H test has been used.

The results of the previous analysis in Table 22 show no statistically significant differences in perceived stress level between the different levels of trust in self-driving technology.

Table 22: Results of the Kruskal-Wallis H analysis for perceived stress regarding trust in self driving technology

Test Statistics^{a,b}

	Perceived stress TV	Perceived stress TVJ	Perceived stress AV	Perceived stress AVM	Perceived stress AVR
Chi-Square	,041	,791	,317	,318	,104
Df	2	2	2	2	2
Asymp. Sig.	,980	,673	,853	,853	,949

a. Kruskal Wallis Test

b. Grouping Variable: Trust in self-driving technology

4.3.4 Influence of weather conditions on critical gap and perceived stress

As described in the literature review section, weather can influence crossing behaviour of pedestrians. Moreover, some participants reported during the interviews that the weather could have influenced their decision making. Therefore, weather conditions might have had an effect on the experiment results. In order to assess that, differences in critical gap and perceived stress between experimental sessions with different weather conditions have been studied.

The groups considered for the statistical analyses are summarized in the following table.

Table 23: Groups considered for analyses regarding influence of weather conditions in the experiment results

Experimental session	Weather condition	Participant number
1st and 2nd (22/02/2017 and 01/03/2017)	Good weather	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
3rd (02/03/2017)	Windy weather	14, 15, 16, 17, 18, 19
4th (08/03/2017)	Rain and really bad weather	20, 21, 22, 23, 24

A one-way ANOVA analysis has been carried out considering critical gap as the dependent variable at a continuous level and weather conditions as the independent variable with three different independent groups (good weather, windy weather, rain and really bad weather).

In Table 24 the results of the ANOVA are shown. As it can be observed, there are not statistically significant differences in average critical gap regarding weather conditions (p>0.05 in all cases)

Table 24: Results of the one-way ANOVA analysis for critical gap regarding weather conditions

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
TV_average	Between Groups	171,359	2	85,679	1,737	,200
	Within Groups	1035,775	21	49,323		
	Total	1207,133	23			
TVJ_average	Between Groups	9,123	2	4,562	,095	,910
	Within Groups	963,508	20	48,175		
	Total	972,631	22			
AVM_average	Between Groups	153,554	2	76,777	3,401	,053
	Within Groups	474,106	21	22,576		
	Total	627,660	23			
AV_average	Between Groups	167,997	2	83,999	1,821	,187
	Within Groups	968,931	21	46,140		
	Total	1136,928	23			
AVR_average	Between Groups	48,277	2	24,139	,425	,659
	Within Groups	1192,181	21	56,771		
	Total	1240,458	23			

TV: *traditional vehicle;* ***TVJ:*** *traditional vehicle driven with joystick;* ***AV:*** *non-recognizable Wizard of Oz automated vehicle;* ***AVM:*** *recognizable Wizard of Oz automated vehicle with magnets on the hood and the door;* ***AVR:*** *recognizable Wizard of Oz automated vehicle with roof sign*

As in the previous section, the Kruskal-Wallis H test has been carried out to analyse possible differences in perceived stress between the above mentioned groups regarding weather conditions.

The results of this analysis (Table 25) show no statistically significant differences in perceived stress regarding different weather conditions.

Table 25: Results of the Kruskal-Wallis H analysis for perceived stress regarding weather conditions

Test Statistics[a,b]

	Perceived stress TV	Perceived stress TVJ	Perceived stress AV	Perceived stress AVM	Perceived stress AVR
Chi-Square	,342	,182	,138	,086	,035
Df	2	2	2	2	2
Asymp. Sig.	,843	,913	,933	,958	,983

a. Kruskal Wallis Test

b. Grouping Variable: Weather conditions

4.3.5 Sensation seeking vs trust in self-driving technology

A Spearman’s correlation analysis has been used to assess whether there was a correlation between the reported trust in self-driving technology and sensation seeking of the participants. In order to apply the Spearman’s correlation analysis, the following hypotheses have been used:

- H_0: there is no association between trust in self-driving technology and sensation seeking of the participants.

- H_A: there is an association between trust in self-driving technology and sensation seeking.

The results of the analysis are shown in Table 26. Since r_s = -0.059, there is a really low negative correlation between the sensation seeking and the reported trust in self-driving technology. However, this correlation is not statistically significant.

Table 26: Results of the Spearman’s correlation analysis (trust in self-driving technology vs sensation seeking)

Correlation

			Sensation seeking	Trust self-driving
Spearman's rho	Sensation seeking	Correlation Coefficient	1,000	-,059
		Sig. (2-tailed)	.	,784
		N	24	24
	Trust self-driving	Correlation Coefficient	-,059	1,000
		Sig. (2-tailed)	,784	.
		N	24	24

4.3.6 Correlation matrix

A Spearman’s correlation analysis has also been used to assess possible correlations between the following variables: critical gap, perceived stress level, experiment realism, trust in self-driving technology and sensation seeking.

The correlation matrix for the above mentioned variables is shown in Table 27. There is a statistically significant negative correlation (r_s= -0.52, p= 0.015) between the perceived level of stress and the critical gap in the case of the scenario involving the non-recognisable Wizard of Oz automated vehicle (driver performing other tasks; AV) .

Table 27: Correlation matrix (Spearman's correlation)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Sensation seeking	-												
2. Trust self-driving	-0.06	-											
3. Experiment realism	0.45	-0.08	-										
4. Perceived stress TV	-0.09	0.14	0.08	-									
5. Perceived stress TVJ	0.03	0.11	0.16	0.73	-								
6. Perceived stress AV	-0.08	-0.05	0.16	0.72	0.90	-							
7. Perceived stress AVM	0.00	0.00	0.35	0.80	0.80	0.86	-						
8. Perceived stress AVR	-0.02	-0.09	0.16	0.70	0.79	0.91	0.77	-					
9. Critical gap TV	-0.26	-0.07	0.15	-0.12	-0.51	-0.46	-0.29	-0.39	-				
10. Critical gap TVJ	0.01	0.12	0.40	-0.06	-0.10	-0.10	-0.12	0.07	0.49	-			
11. Critical gap AVM	-0.19	-0.12	0.08	0.13	-0.127	0.00	0.10	-0.02	0.60	0.33	-		
12. Critical gap AV	-0.09	-0.21	-0.29	-0.35	-0.55	-0.52	-0.50	-0.44	0.51	0.41	0.30	-	
13. Critical gap AVR	-0.12	-0.16	-0.14	-0.12	-0.53	-0.37	-0.29	-0.27	0.67	0.55	0.62	0.53	-

Correlations of magnitude -0.44 or smaller and 0.49 or greater are statistically significant

TV: *Traditional vehicle;* ***TVJ:*** *Traditional vehicle driven with joystick;* ***AV:*** *Non-recognizable WoO AV;* ***AVM:*** *Recognizable WoO AV with hood and door signs;* ***AVR:*** *Recognizable WoO AV with roof sign*

5

Discussion

The aim of this chapter is to draw conclusions from the results obtained after carrying out the present study and discuss them critically. Moreover, limitations of the study and recommendations for future research on the topic are given.

5.1. Conclusion

5.1.1 Problem definition and research gaps

Automated vehicles will be introduced on the roads in the near future. Some authors suggest that there will be drawbacks derived from the use of those types of vehicles. During the first stages of the introduction of automated vehicles on roads, vehicles with different levels of automation will share the public space (Shladover 2016) deriving on a possible reduction of road safety (Sivak and Schoettle 2015).

Currently, pedestrians respond to approaching vehicles depending on their interpretation of vehicle features, such as speed and distance between the pedestrian and the vehicle (gap acceptance behaviour)(Habibovic, Malmsten Lundgren et al. 2016), as well as non-verbal cues such as eye contact, driver gestures, and driver posture (Keferbock and Riener (2015); Habibovic, Malmsten Lundgren et al. (2016). Thus, communication with the driver is important for pedestrians when crossing a road to assess the driver's intentions and whether it is safe to cross or not. Moreover, behaviour of road users is affected by how other road users are expected to behave (Houtenbos 2008). However, when interacting with automated vehicles, communication with the driver will not always be possible, because the driver may be performing non-driving tasks and not paying attention to the road (Kitazaki and Myhre (2015). Therefore, different authors suggest to replace communication with the driver by showing the intentions of the automated vehicle to the pedestrians they are interacting with or to inform other road users they are interacting with an automated vehicle (Kitazaki and Myhre (2015); Malmsten Lundgren, Habibovic et al. (2017).

In the case of automated vehicles, the drivers will be able to perform non-driving tasks and not be aware of the road environment. It has not been studied in depth how other road users will interpret the behaviour of drivers of automated vehicles that appear to be distracted because they are performing non-driving tasks. Additionally, the fact that traditional vehicles and automated vehicles with different levels of automation will be sharing the roads can lead to confusing situations. It can be difficult for pedestrians to assess whether they are interacting with a distracted driver in a traditional vehicle or a driver of an automated vehicle performing non-driving tasks. That is because in both cases the driver will not be paying attention to the road environment. Dangerous situations can derive from that confusion. For instance, pedestrians can decide to cross the road when interacting with a distracted driver in a traditional vehicle because they assume the approaching vehicle is an automated vehicle and it will always yield for them. Conversely, pedestrians can also decide not to cross the road because they are uncertain about whether the automated vehicle has recognized them. Crossing situations may become stressful for pedestrians. It has been demonstrated that decision making is influenced by emotions (George and Dane (2016); Xie, Wang et al. (2011). High levels of arousal lead to higher risk taking (George and Dane 2016). Negative emotions derive in the perception of higher levels of risk, whereas positive emotions lead to a decrease in the perception of risk (Xie, Wang et al. 2011). Therefore, positive emotions can lead to and underestimation of risks.

In sum, it is important to analyse possible changes in pedestrians' crossing behaviour when interacting with an automated vehicle, in terms of gap acceptance, stress level, and perceived safety. However, there is currently a lack of research on that field. Most of the studies have focused on the automated vehicles from the point of view of the drivers and on the opinion regarding automated vehicles. Only a small number of studies have focused on the interaction between vulnerable road users and automated vehicles. Nevertheless, the analysis of pedestrians' behaviour when interacting with automated vehicles in real-life setting has only been assessed by a few studies.

The objective of this thesis was to analyse the effect of approaching automated vehicles on pedestrians' crossing intentions and their perceived safety. The focus was on investigating the possible differences in pedestrians' crossing intentions when interacting with an automated vehicle as compared to a traditional vehicle. Also, possible effects of external vehicle recognition of pedestrians' intentions, stress and perceived safety were assessed.

The methodology used to fulfil the objective of this study was based on an experiment in a real-life crossing environment. The experiment consisted of a within-subject design in which participants (pedestrians) encountered both a traditional and a Wizard of Oz automated vehicle with different external features. Video analysis, post-interaction and post-experiment interviews and a questionnaire were used to obtain the relevant data. The collected data consisted of critical gap, perceived level of stress, perceived safety, vehicle recognisability, sensation seeking and trust in self-driving technology.

Prior to the performance of the final experiment, two small scale pilot studies were carried out in order to test the experiment set-up and instructions and achieve a proper experiment design for the final experiment.

5.1.2 Main findings

By analysing the collected data (chapter 4), the research questions can be answered. In order to answer the main research questions, the sub-questions should be assessed.

- *Are there any statistically significant differences in the critical crossing gap when pedestrians interact with a traditional vehicle, a non-recognisable Wizard of Oz automated vehicle or a recognizable Wizard of Oz automated vehicle with different external features?*

No statistically significant differences on critical gap between different vehicle types were found.

Moreover, possible differences were also analysed considering different approaching directions of the vehicle and stopping pattern. In those two cases, no statistically significant differences were found.

Focusing only on the traditional vehicle, the traditional vehicle driven with the joystick and the Wizard of Oz automated vehicle without considering different types for the last group, no statistically significant differences were found between groups.

- *Are there any statistically significant differences regarding perceived stress level of pedestrians when interacting with a traditional vehicle, a Wizard of Oz non-recognisable automated vehicle or a Wizard of Oz recognisable automated vehicle with different external features?*

There are not statistically significant differences on perceived level of stress between traditional and different types of automated vehicles.

If only three groups are considered regarding vehicle type (traditional manually driven, traditional driven with joystick and Wizard of Oz automated), there are also no differences in perceived level of stress between groups.

- *Are there any differences regarding perceived safety when pedestrians interact with a traditional vehicle, a Wizard of Oz non-recognisable automated vehicle or a Wizard of Oz recognisable automated vehicle with different external features?*

70% of the participants who did notice the signs with the message ‘self-driving’ in the case of the Wizard of Oz recognizable vehicle reported to be influenced by them. 7 of those participants stated that they felt more uncertain/doubtful, less safe or more careful when interacting with the vehicle as compared to a traditional vehicle. However, 3 other participants explained that they considered the scenarios involving the signs to be safe because they assumed the vehicle would always stop for them. For 95% of the participants who did notice the signs, the roof sign was clearer than the magnets on the hood and the door of the vehicle.

Regarding the scenarios in which the driver was reading a newspaper, 95% of the participants who realized the driver was performing other tasks reported to be influenced. Most of the participants considered those scenarios as unsafe situations, stating that they were more hesitant to cross, that they decided to not cross earlier or that they preferred to have eye contact with the driver. However, one of the participants explained that he allowed the vehicle to approach him closer because it was an automated vehicle that would always stop for him.

Therefore, it can be concluded that differences are found between participants in their reported perceived safety when interacting with a traditional vehicle or a Wizard of Oz automated vehicle with different characteristics. Most of the participants reported a lower perceived safety when interacting with Wizard of Oz automated vehicles.

However, the main factors that participants considered before making the decision to not cross the road were the approaching speed of the vehicle and the distance between the vehicle and the participant. Thus, those factors were more often considered by pedestrians than factors related to the automated vehicle. These results are in line with Clamann, Aubert et al. (2016) that showed no significant differences between different display types when pedestrians made the decision to cross. In that case, the main factors pedestrians considered before making the decision to cross were also approaching speed and distance from the vehicle.

5.1.3 Conclusions

After answering the sub-questions in the previous section, the main research questions can be answered:

- *Do pedestrians' crossing intentions differ when interacting with a Wizard of Oz automated vehicle compared with that of a traditional vehicle?*

It can be concluded that pedestrians' crossing intentions do not differ when interacting with a Wizard of Oz automated vehicle compared with that of a traditional vehicle. However, it was found that perceived safety is lower in case of encountering Wizard of Oz automated vehicles.

Similar results were obtained by Rothenbücher, Li et al. (2016), who demonstrated that most of the pedestrians appeared to have a normal behaviour when interacting with the automated vehicle and they were not shy to cross in front of that vehicle type.

- *Do different external features (vehicle recognisability) affect pedestrians' crossing intentions when interacting with a Wizard of Oz automated vehicle?*

Results show that different external features (vehicle recognisability) do not significantly affect pedestrians' crossing intentions when interacting with a Wizard of Oz automated vehicle. In the case of non-recognisable automated vehicles (driver reading a newspaper), there was a negative correlation between perceived stress level and critical gap.

- *Do pedestrians trust more automated vehicles or traditional vehicles?*

Results on reported trust in self-driving technology show that pedestrians have a relatively high level of trust, with an average of 3.7 on a scale from 1 to 5. Nevertheless, the reported perceived safety of participants towards automated vehicles would suggest that pedestrians are more trustworthy towards traditional vehicles. However, that is not shown in the obtained results regarding the crossing intentions of pedestrians, from which it can be concluded that there are no differences between different vehicle types.

It can be concluded that, although the reported trust in self-driving technology was relatively high, most of the participants reported a lower perceived safety when interacting with automated vehicles. Nonetheless, those results were not reflected on pedestrians' crossing intentions in terms of critical gap or perceived level of stress.

5.2. Discussion

5.2.1 Interpretation of results

Because different aspects were addressed in the present study, the results regarding the following topics can be discussed:

- Wizard of Oz set-up:

The results showed that most of the participants believed that the vehicle was driven in an automated mode in some (or all) scenarios, which confirms that the Wizard of Oz method was more or less correctly applied.

Focusing on the vehicle’s kinematic profile, the use of the joystick led to relatively low speeds. The suspicion that the (manually driven) traditional vehicle was driving at a higher speed than the scenarios involving a vehicle driven with the joystick was confirmed by the analysis of the speed. Thus, it was a good idea to include a fifth scenario involving a traditional vehicle driven with the joystick. However, even though the speeds of the manually driven traditional vehicle and the other 4 vehicle types were different, the experiment results were not affected by that difference. That could be due to the fact that the speed of the vehicle in all the scenarios was relatively slow.

- Experiment realism and instructions:

The realism of the experiment set-up was assessed by the participants with a mean of 6.42 on a scale from 0 to 10. The main reasons that, according to participants, lowered the experiment realism were that they could not cross the road, that there were no pedestrian crossing facilities, that only one vehicle was used or that no other road users were present during the experiment performance. The experiment instructions were considered natural by most of the participants.

- Communication vehicle-pedestrian and perceived safety:

Most of the participants perceived the signs with the message ‘self-driving’ on the vehicle and they reported to be influenced by those signs when making the decision to cross the road. The majority stated that they felt less safe and more doubtful than when interacting with a traditional vehicle. Those feelings can be due to the fact that during the interaction with the vehicle, there was no eye-contact with the driver as it occurs with a traditional vehicle and that is currently an important feature that pedestrians consider before making the decision to cross a road (Keferbock and Riener 2015).

Moreover, the fact that vehicles with the message ‘self-driving’ are currently not present on roads could have made pedestrians be confused because they did not know yet how that vehicle type would behave and, as shown by Houtenbos (2008), road users base their decisions on the expected behaviour of other road users.

The same can be applied to the results obtained in the case the driver was reading a newspaper. The majority of participants noticed the driver holding a newspaper and reported to be influenced by it. Most of the participants reported that they were more hesitant to cross or that they preferred to have eye contact with the driver.

These results are in accordance with Malmsten Lundgren, Habibovic et al. (2017) that concluded that perceived safety of pedestrians might be worsened if pedestrians are not able to communicate with the driver of the vehicle as it is currently done with traditional vehicles. That study also concluded that eye contact with the driver led to a more calmed crossing situation for pedestrians.

- Critical gap and perceived level of stress:

Results show low self-reported levels of stress and no significant differences in critical gap or perceived stress between the different vehicle conditions. This is explained by the fact that the main factors that pedestrians reported to take into account when making the decision to not cross the road were speed and distance from the vehicle. And the kinematic profile of the vehicle was the same in all scenarios. These results are in line with those of the small number of previous studies in this topic with a real-life setting. Both Clamann, Aubert et al. (2016) and Rothenbücher, Li et al. (2016) showed that current legacy behaviours such as distance or speed are more important for pedestrians when deciding to cross than features related to automated vehicles (e.g. external messages on the vehicle).

Critical gaps had values between 5.74 and 6.44 seconds. These values are lower than the value of 9.40 seconds calculated with the formula from Transportation Research Board (2000). A possible reason is that default values were considered in the formula for the pedestrian's walking speed and start-up time. Studies on gap acceptance found pedestrians' minimum critical gaps between 2 and 11 seconds (Das, Manski et al. 2005) or between 5.3 and 9.4 seconds (Brewer, Fitzpatrick et al. 2005). Thus, the results on critical gaps are within the values found in previous studies on gap acceptance.

The fact that pedestrians could not actually cross the road might have influenced the results of perceived stress and critical gap because participants knew from the very beginning they were not crossing and, thus, there was no real danger when interacting with the vehicle.

- Sensation seeking and trust in self-driving technology:

No correlation was found between sensation seeking and trust in self-driving technology as it was found by Hagenzieker, Kint et al. (2016). This could be due to the fact that their study was focused on cyclists instead of pedestrians, thus reactions of cyclists and pedestrians may differ.

Trust in self-driving technology resulted on an average of 3.67 on a scale from 1 to 5 meaning that pedestrians were neutral/slightly positive towards the technology of automated vehicles. However, trust in that technology decreased when interaction with pedestrians was involved in the question. A possible reason for that is that automated vehicles are still not driving on the roads so it is not known how they will behave when interacting with pedestrians. But more studies have been developed on the technology of the automated vehicles from the driver's point of view and it has also be present in the media.

Also, no correlation was found between sensation seeking or trust in self-driving technology and critical gap or perceived stress. As it has been described before, features related to automated vehicles resulted not to be the most important factors for pedestrians when deciding to cross the road. Consequently, that could explain why there is no correlation.

5.2.2 Limitations

It is important to mention that the study was successfully carried out, although various limitations and problems arose during the development of the experiment. Also, not a large literature was available due to the novelty of this type of study.

The following limitations have to be considered when assessing the results of this study:

- Restrictions from ethical committees had to be taken into account while carrying out the experiment. A main restriction was that participants were not allowed to step onto the road. Therefore, that was a limitation to simulate a real crossing situation correctly.

- There were some bureaucratic restrictions such as the location where the experiment could take place or the dates and times when it could be performed. Those restrictions led, in some cases, to a delay of some weeks on the experiment performance.

- Pedestrian crossing facilities were not available at the location where the experiment could take place. Alternatives such as using chalk sprays or placing a banner with a printed pedestrian crossing were tested and they resulted to not be feasible. That was due to weather conditions: the banner could not be placed properly on the road because of the wind. Chalk sprays could not be used because easy removable paint was not guaranteed.

  Therefore, the experiment had to be carried out without any type of pedestrian crossing facility.

  Moreover, since the proposed locations were not approved by Parkmanagement and this location was the only option to carry out the experiment, the road was not in urban environment.

  The previous limitations led to a reduction of experiment realism since it was aimed to simulate a crossing situation in an urban area.

- No real automated vehicle was available. Therefore, a Wizard of Oz technique was used instead. The first ideas were to use a vehicle with the steering wheel on the right or to use a vehicle from a driving school. The former idea resulted not possible after contacting several rental car companies in the Netherlands and the latter was not approved due to ethical reasons.

  Eventually, the Wizard of Oz automated vehicle was achieved by using a joystick to control the vehicle from the passenger's seat while someone was sitting in the driver's position acting as a fake 'driver'. The use of the joystick has drawbacks because the behaviour of the vehicle might vary compared to a vehicle that is driven manually. Additionally, it was sometimes difficult to keep the exact same speed when driving with the joystick, due to the small movements that had to be done to drive.

- The recruitment of participants was difficult and two of the participants did not show up on the day of the experiment. Also, participants were students from the Delft University of Technology with an age comprised between 19 and 30 years old.

- Weather conditions were also not always favourable and one of the experimental sessions had to be postponed due to adverse weather.

- It was not efficient to use the eye-tracker and the galvanic skin response device to measure looking behaviour and stress, as seen during the two pilot studies.

5.3. Recommendations

Due to the above mentioned limitations, the following recommendations could be used to improve the experiment in further research:

- It would be interesting to test the effect of age and gender because, as it was seen in the literature review chapter, those are factors that could influence pedestrian crossing behaviour.

- The current study was performed with a small data set (24 participants) and all of them were TU Delft students. It is recommended to carry out an experiment with a larger and more homogeneous data sample.

- The inclusion of pedestrian crossing facilities and the fact that pedestrians could step onto the road would increase the experiment realism and that could also lead to more realistic results.

- If the experiment is carried out on a two lane road, involving more traffic on the road is recommended to increase experiment realism.

- In this study only one road type was available to perform the experiment. It would be interesting to perform the experiment in different road types and locations (e.g. intersections, vehicle turning) to assess differences in the results. The same applies for the use of different speed patterns.

- The analysis of looking behaviour and objective level of stress is also important, because it can be difficult for participants to assess the level of stress they feel. Furthermore, the analysis of looking behaviour is interesting to assess how pedestrians react in the case there is no driver in the vehicle or the driver is performing other tasks than driving.

- A different Wizard of Oz technique in which all the scenarios would be driven with the exact same speeds/kinematic profiles is recommended to avoid variations in the results.

- This study focused on pedestrians but the analysis of the behaviour of other vulnerable road users such as cyclists is also important to guarantee safety of all road users when real automated vehicles are on the roads.

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Appendices

A

Poster recruitment first pilot study

PARTICIPANTS NEEDED

MSC THESIS RESEARCH

Interaction between pedestrians and self-driving vehicles

Are you willing to help in a research regarding the reactions of pedestrians when interacting with different types of vehicles? Do you have 50 minutes of spare time and would you like to get a gift voucher of 10 € while helping a student carrying out her MSc thesis? Then this might be interesting for you!

The experiment in which you would participate consists of a field study in a closed location at the TU Delft campus to study the reactions of pedestrians when interacting with vehicles. Different vehicle types with different characteristics will be present.

During the experiment you will be asked to show your reactions when interacting with a vehicle, while wearing some sensors in one of your hands and an eye-tracker. That equipment is non-invasive and non-intrusive. The experiment will be recorded in order to obtain more data. After the experiment you will be requested to fill in a short questionnaire.

Video data and all other collected (personal) data will be treated confidentially and anonymised so it cannot be traced back to individual persons.

The study is performed as a MSc thesis in collaboration with SWOV (Institute for Road Safety Research)

TU Delft Delft University of Technology

SWOV WETENSCHAPPELIJK ONDERZOEK VERKEERSVEILIGHEID

Important information

When? 24th of November

Where? At the Heertjeslaan between Huismansingel and Molengraaffsingel, next to the company Exact (Delft)

How long? Around 50 minutes

Compensation: a 10 € gift voucher

Who? People that are at least 18 years old and do not wear glasses (contact lenses are fine)

HOW TO SIGN UP?

Send an e-mail to ana.rodriguez@swov.nl

Please state the following information (it will remain confidential):

Name, gender, age and telephone number

B

Booklet first pilot study

MSc thesis: Interaction between pedestrians and Wizard of Oz automated vehicles

Pilot study

Experiment information

Ana Rodríguez Palmeiro
24th November 2016

CONTENTS

1) Program of the day and assistants (with tasks)

2) Detailed experiment procedure per participant (step by step, there are some variations in methodology for some participants)

3) List of scenarios per participant

4) Set-up of the experiment (with the two scenarios regarding approaching speeds and stop/not stop at pedestrian crossing)

5) Interview post-experiment

6) Interview post-interaction

7) Example of the questionnaire that will be filled in digitally

Pilot study Thursday 24th November 2016

MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles

Ana Rodríguez Palmeiro (06-/ For Whatsapp: +34)

-Program of the day:

- **8:30 h:**
  Meeting at the CITG faculty, room 4.30 (TU Delft)

- **8:30 h to 10:00 h:**
  Instructions, discussion, move equipment from CITG to the experiment location and set-up of the experiment (WITHOUT closing the road)

- **10:00 h:**
  Close the road

- **10:00 h to 10:15 h:**
  Test the “emergency” situation in which the vehicle stops responding to the joystick and the driver (that is at that moment “reading” a newspaper) has to take control over the vehicle and drive it manually.

- **10:15 h to 11:15 h:**
  Participant 1

- **11:15 h to 12:15 h:**
  Participant 2

- **12:15 h to 12:45 h:**
  Lunch break

- **12:45 h to 13:45 h:**
  Participant 3

- **13:45 h to 14:45 h:**
  Participant 4

- **14:45 h to 15:00 h:**
  Tidy up location (prepare to open the road)

- **15:00 h:**
  Open the road

- **15:00 h to 16:00 h:**
  Tidy up and return equipment to CITG

-Assistants:

- Edwin and Peter: vehicle drivers and TU equipment (Vehicle, van, cameras)
- Sander (SWOV supervision): stay with the participant during the interaction with the vehicle. Help, if needed, to place equipment on participant.
- Jonathan: Welcoming the participant and provide questionnaire
- Me: supervision, problem solving, place equipment on participant and calibrate it, stay with the participant during vehicle interaction, interview post-experiment or post-interaction.

Pilot study Thursday 24th November 2016

MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles

Ana Rodríguez Palmeiro (06-/ For Whatsapp: +34)

-Planning per participant:

- **Participant 1: hand raising, interview post-experiment at the end:**

  In the van:

  1. Welcome participant
  2. Sign informed consent
  3. Place sensors and test them (Participant ID= "number of participant" test)
  4. Take baseline measure of heart rate and skin response (tell the participant to sit down, relax, close their eyes and not talk for a minute) (Participant ID= "number of participant" baseline
  5. Place eye-tracker and calibrate it
  6. Unplug NUC from screen, keyboard and mouse and place it inside the backpack

  Outside the van:

  7. Let participant wear the backpack and go to the standing point on the sidewalk.
  8. Give instructions to the participant again: *"vehicles with different characteristics will approach you and you should raise your hand in the last moment you would cross the road (the last moment you think it is safe to cross). Please, just raise your hand, do* ***NOT*** *cross the road under any circumstance"*
  9. After every interaction with the car, make participant turn around with his back to the road until the car is again in the starting position for the next interaction. That way the participant cannot see how the vehicle is driven or how the signs are changed.

  In the van:

  10. After finishing the 8 different scenarios interacting with the car (see attached list), go back to the van and remove eye-tracker and GSR device. Connect NUC to the screen and check the data was recorded.
  11. Interview participant (use interview *post-experiment*)---Voice record the interview!
  12. Let participant fill in the digital questionnaire (check submission)
  13. Give debriefing form and compensation to the participant

- **Participant 2: Four first scenarios hand raising, 4 last scenarios step forward, interview post-experiment at the end:**

  In the van:

  1. Welcome participant
  2. Sign informed consent
  3. Place sensors and test them (Participant ID= "number of participant" test)
  4. Take baseline measure of heart rate and skin response (tell the participant to sit down, relax, close their eyes and not talk for a minute) (Participant ID= "number of participant" baseline
  5. Place eye-tracker and calibrate it
  6. Unplug NUC from screen, keyboard and mouse and place it inside the backpack

Outside the van:

7. Let participant wear the backpack and go to the standing point on the sidewalk.
8. Give instructions to the participant again: *“vehicles with different characteristics will approach you and you should raise your hand in the last moment you would cross the road (the last moment you think it is safe to cross). Please, just raise your hand, do **NOT** cross the road under any circumstance”*
9. After every interaction with the car, make participant turn around with his back to the road until the car is again in the starting position for the next interaction. That way the participant cannot see how the vehicle is driven or how the signs are changed.

10. After the first 4 interactions with the vehicle, give participants *new instructions*: *“Now instead of raising your hand, you should take a **step forward** in the last moment you would cross the road (the last moment you think it is safe to cross). Like before, please just take a step forward but do **NOT** cross the road”*

In the van:

11. After finishing the 8 different scenarios interacting with the car (see attached list), go back to the van and remove eye-tracker and GSR device. Connect NUC to the screen and check the data was recorded.
12. Interview participant (use interview *post-experiment*) and ask him: which of the two options (hand raising or step forward) was better for you?---Voice record the interview!
13. Let participant fill in the digital questionnaire (check submission)
14. Give debriefing form and compensation to the participant

- **Participant 3: Four first scenarios hand raising, 4 last scenarios step forward, interview post-interaction after every interaction with the car and last questions at the end:**

In the van:

1. Welcome participant
2. Sign informed consent
3. Place sensors and test them (Participant ID= “number of participant” test)
4. Take baseline measure of heart rate and skin response (tell the participant to sit down, relax, close their eyes and not talk for a minute) (Participant ID= “number of participant” baseline
5. Place eye-tracker and calibrate it
6. Unplug NUC from screen, keyboard and mouse and place it inside the backpack

Outside the van:

7. Let participant wear the backpack and go to the standing point on the sidewalk.
8. Give instructions to the participant again: *“vehicles with different characteristics will approach you and you should raise your hand in the last moment you would cross the road (the last moment you think it is safe to cross). Please, just raise your hand, do **NOT** cross the road under any circumstance”*
9. After every interaction with the car, make participant turn around with his back to the road until the car is again in the starting position for the next interaction. That way the participant cannot see how the vehicle is driven or how the signs are changed.
10. After every interaction there will be, in this case, an ***interview post-interaction*** (Voice record interview)

11. After the first 4 interactions with the vehicle, give participants *new instructions*: *“Now instead of raising your hand, you should take a **step forward** in the last moment you*

*would cross the road (the last moment you think it is safe to cross). Like before, please just take a step forward but do **NOT** cross the road"*

In the van:

12. After finishing the 8 different scenarios interacting with the car (see attached list), go back to the van and remove eye-tracker and GSR device. Connect NUC to the screen and check the data was recorded.
13. Ask participant the last 2 questions of the ***interview post-interaction***---Voice record answers. And ask him: which of the two options (hand raising or step forward) was better for you?
14. Let participant fill in the digital questionnaire (check submission)
15. Give debriefing form and compensation to the participant

- **Participant 4: Four first scenarios hand raising, 4 last scenarios step backward, interview post-interaction after every interaction with the car and last questions at the end:**

In the van:

1. Welcome participant
2. Sign informed consent
3. Place sensors and test them (Participant ID= "number of participant" test)
4. Take baseline measure of heart rate and skin response (tell the participant to sit down, relax, close their eyes and not talk for a minute) (Participant ID= "number of participant" baseline
5. Place eye-tracker and calibrate it
6. Unplug NUC from screen, keyboard and mouse and place it inside the backpack

Outside the van:

7. Let participant wear the backpack and go to the standing point on the sidewalk.
8. Give instructions to the participant again: *"vehicles with different characteristics will approach you and you should raise your hand in the last moment you would cross the road (the last moment you think it is safe to cross). Please, just raise your hand, do **NOT** cross the road under any circumstance"*
9. After every interaction with the car, make participant turn around with his back to the road until the car is again in the starting position for the next interaction. That way the participant cannot see how the vehicle is driven or how the signs are changed.
10. After every interaction with the car there will be, in this case, an ***interview post-interaction*** (Voice record interview)

11. After the first 4 interactions with the vehicle, give participant *new instructions*: *"Now instead of raising your hand, you should take a step **backward** in the last moment you would cross the road (the last moment you think it is safe to cross). Like before, please just take a step **backward** but do **NOT** cross the road"*

In the van:

12. After finishing the 8 different scenarios interacting with the car (see attached list), go back to the van and remove eye-tracker and GSR device. Connect NUC to the screen and check the data was recorded.
13. Ask participant the last 2 questions of the ***interview post-interaction***---Voice record answers. And ask him: which of the two options (hand raising or step backward) was better for you?
14. Let participant fill in the digital questionnaire (check submission)
15. Give debriefing form and compensation to the participant

	Initial speed	Speed reductions
Stopping	30 km/h	1-Reduce to 15 km/h 2-Reduce to 5 km/h 3-STOP before crossing
Not stopping	30 km/h	1-Reduce to 15 km/h 2-Reduce to 10 km/h 3-DO **NOT** STOP before crossing

Pilot study Thursday 24th November 2016

MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles

Ana Rodríguez Palmeiro (06- / For Whatsapp: +34)

PARTICIPANT 1			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**A**	Traditional vehicle (Stopping) *(Manually driven)*
	2nd	**B**	Traditional vehicle (**NOT** Stopping) *(Manually driven)*
	3rd	**C**	Automated vehicle with magnets on the hood and on the door (**NOT** stopping) *(driven with joystick)*
	4th	**D**	Automated vehicle with magnets on the hood and on the door (Stopping) *(driven with joystick)*
	5th	**E**	Automated vehicle without signs (use newspaper) (Stopping) *(driven with joystick)*
	6th	**F**	Automated vehicle without signs (use newspaper) (**NOT** stopping) *(driven with joystick)*
	7th	**G**	Automated vehicle with roof sign (Stopping) *(driven with joystick)*
	8th	**H**	Automated vehicle with roof sign (**NOT** stopping) *(driven with joystick)*

	Initial speed	**Speed reductions**
Stopping	30 km/h	1-Reduce to 15 km/h 2-Reduce to 5 km/h 3-STOP before crossing
Not stopping	30 km/h	1-Reduce to 15 km/h 2-Reduce to 10 km/h 3-DO **NOT** STOP before crossing

Pilot study Thursday 24th November 2016
MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles
Ana Rodríguez Palmeiro (06- / For Whatsapp: +34)

PARTICIPANT 2

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1st	**C**	Automated vehicle with magnets on the hood and on the door (**NOT** stopping) *(driven with joystick)*
	2nd	**A**	Traditional vehicle (Stopping) *(Manually driven)*
	3rd	**E**	Automated vehicle without signs (use newspaper) (Stopping) *(driven with joystick)*
	4th	**D**	Automated vehicle with magnets on the hood and on the door (Stopping) *(driven with joystick)*
	5th	**H**	Automated vehicle with roof sign (**NOT** stopping) *(driven with joystick)*
	6th	**B**	Traditional vehicle (**NOT** Stopping) *(Manually driven)*
	7th	**F**	Automated vehicle without signs (use newspaper) (**NOT** stopping) *(driven with joystick)*
	8th	**G**	Automated vehicle with roof sign (Stopping) *(driven with joystick)*

	Initial speed	Speed reductions
Stopping	30 km/h	1-Reduce to 15 km/h 2-Reduce to 5 km/h 3-STOP before crossing
Not **stopping**	30 km/h	1-Reduce to 15 km/h 2-Reduce to 10 km/h 3-DO **NOT** STOP before crossing

Pilot study Thursday 24th November 2016

MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles

Ana Rodríguez Palmeiro (06- / For Whatsapp: +34)

PARTICIPANT 3			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**E**	Automated vehicle without signs (use newspaper) (Stopping) *(driven with joystick)*
	2nd	**C**	Automated vehicle with magnets on the hood and on the door (**NOT** stopping) *(driven with joystick)*
	3rd	**F**	Automated vehicle without signs (use newspaper) (**NOT** stopping) *(driven with joystick)*
	4th	**H**	Automated vehicle with roof sign (**NOT** stopping) *(driven with joystick)*
	5th	**G**	Automated vehicle with roof sign (Stopping) *(driven with joystick)*
	6th	**A**	Traditional vehicle (Stopping) *(Manually driven)*
	7th	**D**	Automated vehicle with magnets on the hood and on the door (Stopping) *(driven with joystick)*
	8th	**B**	Traditional vehicle (**NOT** Stopping) *(Manually driven)*

	Initial speed	**Speed reductions**
Stopping	30 km/h	1-Reduce to 15 km/h 2-Reduce to 5 km/h 3-STOP before crossing
Not stopping	30 km/h	1-Reduce to 15 km/h 2-Reduce to 10 km/h 3-DO **NOT** STOP before crossing

Pilot study Thursday 24th November 2016

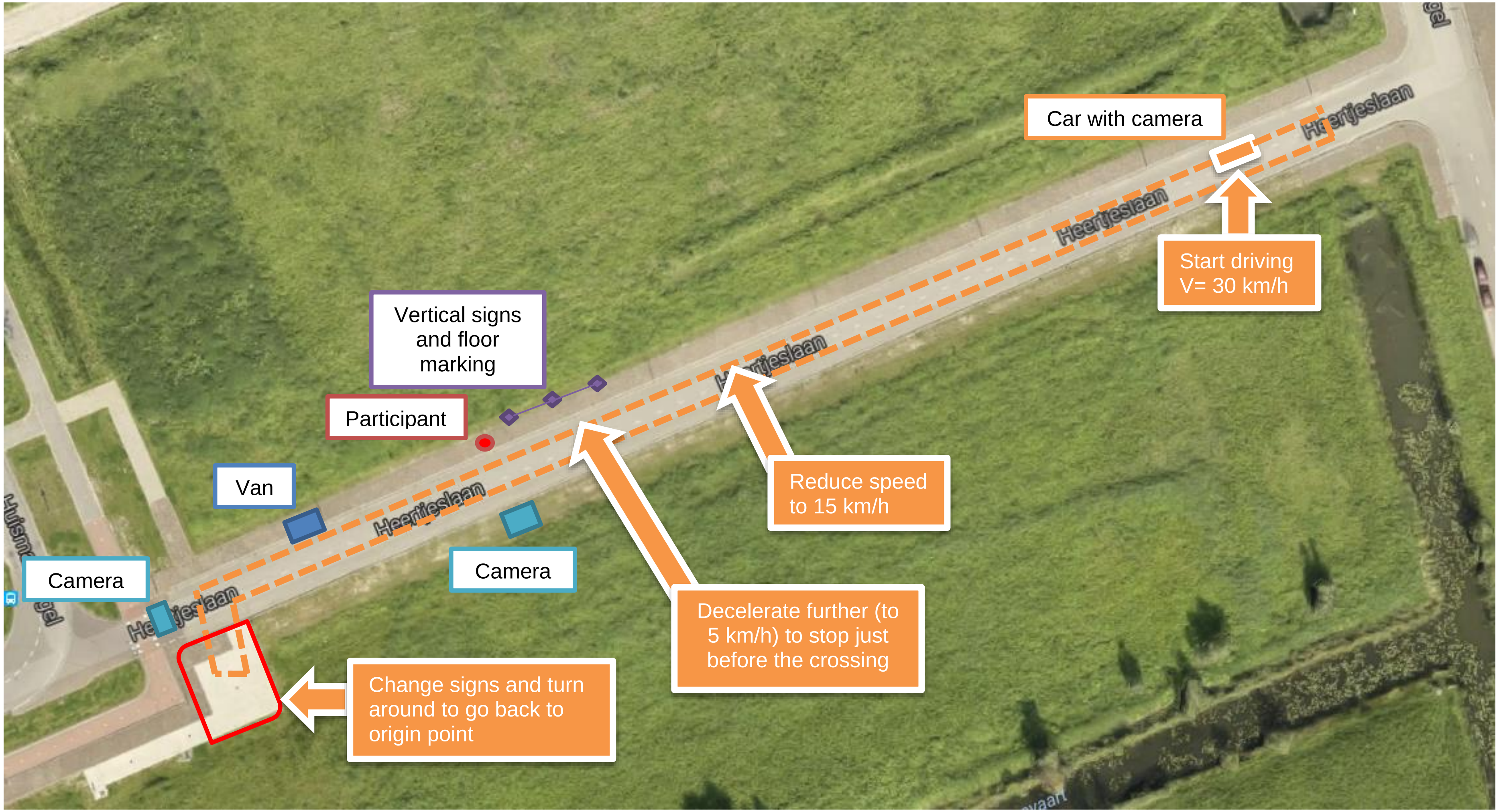
MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles

Ana Rodríguez Palmeiro (06- / For Whatsapp: +34)

PARTICIPANT 4

START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**H**	Automated vehicle with roof sign (**NOT** stopping) *(driven with joystick)*
	2nd	**C**	Automated vehicle with magnets on the hood and on the door (**NOT** stopping) *(driven with joystick)*
	3rd	**E**	Automated vehicle without signs (use newspaper) (Stopping) *(driven with joystick)*
	4th	**F**	Automated vehicle without signs (use newspaper) (**NOT** stopping) *(driven with joystick)*
	5th	**G**	Automated vehicle with roof sign (Stopping) *(driven with joystick)*
	6th	**D**	Automated vehicle with magnets on the hood and on the door (Stopping) *(driven with joystick)*
	7th	**B**	Traditional vehicle (**NOT** Stopping) *(Manually driven)*
	8th	**A**	Traditional vehicle (Stopping) *(Manually driven)*

SCENARIO 1 (Vehicle stopping)



Start driving V= 30 km/h

Reduce speed to 15 km/h

Decelerate further (to 5 km/h) to stop just before the crossing

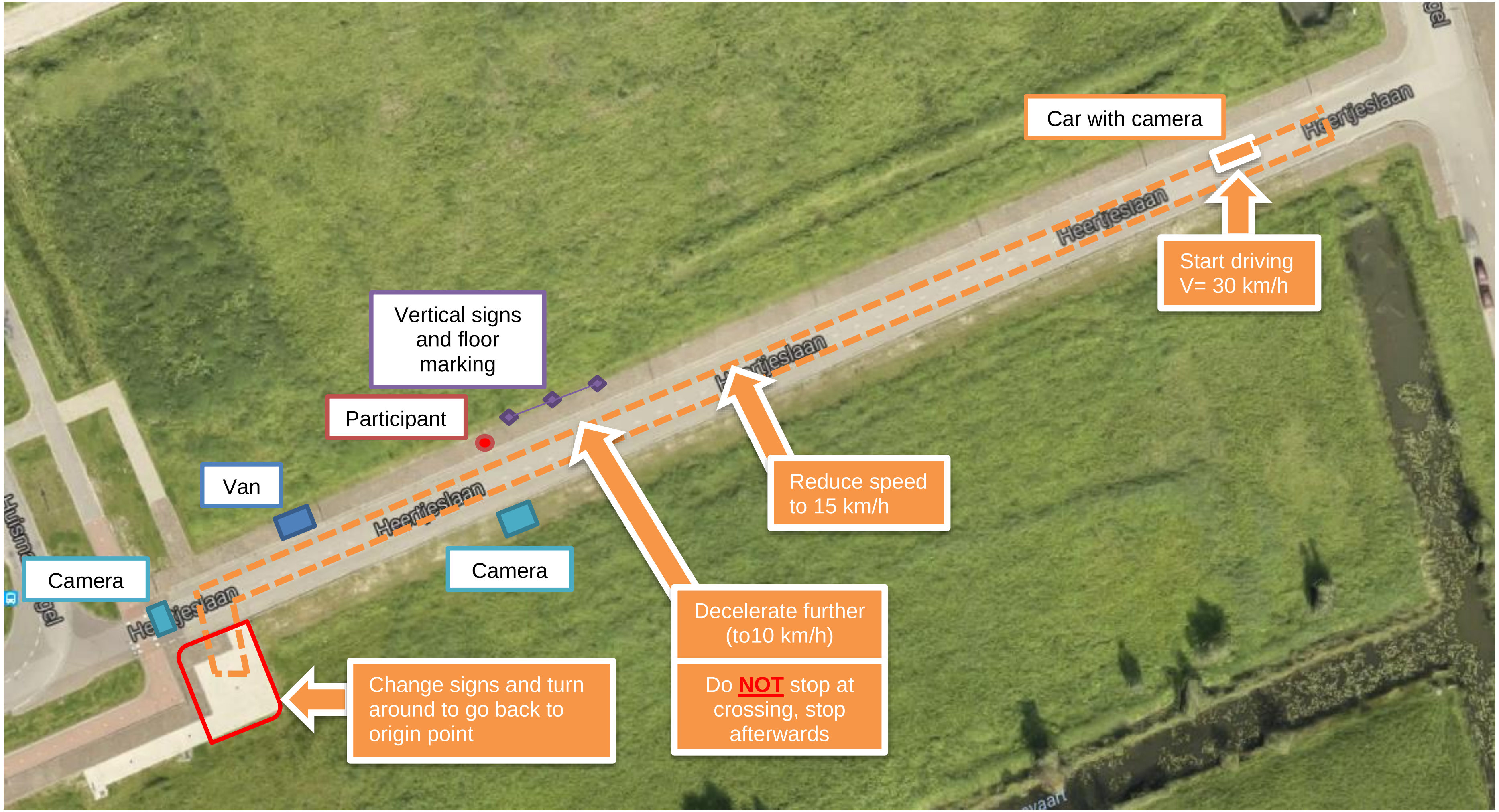
Change signs and turn around to go back to origin point

Pilot study Thursday 24th November 2016

MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles

Ana Rodríguez Palmeiro (06- / For Whatsapp: +34)

SCENARIO 2 (**Vehicle *NOT* stopping**)



Pilot study Thursday 24th November 2016

MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles

Ana Rodríguez Palmeiro (06- / For Whatsapp: +34)

Interview *post-experiment (at the end of the experiment, after ALL the interactions with the car)*: interaction between pedestrians and Wizard of Oz automated vehicles

1. Which factors did you take into account before making the decision to raise your hand (or take a step forward)?

2. Did you perceive something different than what you see when interacting with a car in real life? (In case of affirmative answer: how did that influence your decision making?)

3. How stressed were you on a scale from 0 to 10 in the following cases?

    a. The vehicle was not equipped with external signs and the driver was on the wheel.
    b. The vehicle was equipped with external signs and the driver was performing other tasks.
    c. The vehicle was not equipped with external signs and the driver was performing other tasks.

4. How clearly can you remember how you felt after every interaction with the car on a scale from 0 to 10?

5. How realistic do you think the set-up of the experiment was on a scale from 0 to 10? Do you think it was similar to a crossing situation in real-life? Why/why not?

In case of variations from hand raising to step forward (or backwards): Which of the two options (hand raising or step forward (or backwards)) was better for you?

Interview *post-interaction (after each interaction with the car)*: interaction between pedestrians and Wizard of Oz automated vehicles

1. Which factors did you take into account before making the decision to raise your hand (or take a step forward)?

2. Did you perceive something different than what you see when interacting with a car in real life? (In case of affirmative answer: how did that influence your decision making?)

3. How stressed were you on a scale from 0 to 10?

Last question at the ***END*** of the experiment (after finishing ***ALL*** the interactions with the vehicle):

Do you think the short interview after every interaction with the vehicle influenced your decision to cross in the next interaction?

How realistic do you think the set-up of the experiment was on a scale from 0 to 10? Do you think it was similar to a crossing situation in real-life? Why/why not?

In case of variations from hand raising to step forward: Which of the two options (hand raising or step forward) was better for you?

Questionnaire post-experiment: interaction between pedestrians and vehicles

Thank you for your participation in this study. As the last part of the experiment you are kindly requested to fill in the following questionnaire. The objective of this questionnaire is to obtain a better understanding of the interaction between vehicles and pedestrians and find out more about your opinion after participating in the field study you just completed.

This questionnaire will take approximately 10 minutes. All your answers will remain confidential and they will just be used for this study.

Part 1: Personal data:

1. What is your age?

2. Gender:
   - ○ Male
   - ○ Female

3. What is your country of origin?

Part 2: Interaction with the vehicle during the experiment:

4. Did you realize, *before making the decision to cross*, that in some scenarios the vehicle was equipped with specific signs on the outside with the message self-driving vehicle?

   - ○ Yes
   - ○ No

5. In case of affirmative answer to the previous question, did the signs on the outside of the vehicle influence your decision to cross?

   - ○ Yes
   - ○ No

   If yes, how did the signs influence your decision to cross?

6. Which of the different sign types was clearer for you? (The given pictures are an example of the possible scenarios you have seen during the experiment)

○ Signs on the side and on the front of the vehicle

○ Sign on the vehicle roof

7. Did you realize, *before making the decision to cross*, that in some scenarios the driver was performing other tasks than driving?

○ Yes
○ No

8. In case of affirmative answer to the previous question. Did the fact that the driver was performing other tasks than driving influence your decision to cross?

○ Yes
○ No

If yes, how did the driver performing other tasks influence your decision to cross?

Part 3: Personal opinion and trust in self-driving vehicles:

9. Please indicate how strongly you agree or disagree with the following statements:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I would like to explore strange places					
I get restless when I spend too much time at home					
I like to do frightening things					
I like wild parties					
I would like to take off on a trip with no pre-planned routes or timetables					
I prefer friends who are excitingly unpredictable					
I would like to try bungee jumping					
I would love to have new and exciting experiences, even if they are illegal					

10. Please indicate how strongly you agree or disagree with the following statements regarding trust in self-driving vehicles:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
In general, I trust the self-driving vehicle					
I trust the self-driving vehicle to avoid obstacles					
I trust the self-driving vehicle when overtaking					
I trust the self-driving vehicle to keep to the right lane					
I trust the self-driving vehicle to keep distance from a vehicle ahead					
I trust the self-driving vehicle to interact safely with pedestrians					

Part 4: Feedback and future improvements:

11. Please write any suggestion or comment you might have to improve the current experiment in the future.

Thank you for participating in this study!

C

Critical gaps per participant (First pilot study)

Scenario	**Critical gap [m]**				
	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Average**
A: Traditional vehicle (stopping)	62.5	55	62.5	41.25	55.3
B: Traditional vehicle (Not stopping)	67.5	57.5	57.5	45	56.9
C: AV with magnets on the hood and on the door (Not stopping)	55	30	70	37.5	48.1
D: AV with magnets on the hood and on the door (stopping)	45	47.5	62.5	56.25	52.8
E: AV without signs (driver reading newspaper) (stopping)	72.5	42.5	-	47.5	40.6
F: AV without signs (driver reading the newspaper) (Not stopping)	77.5	50	57.5	62.5	61.9
G: AV with roof sign (stopping)	100	42.5	45	47.5	58.8
H: AV with roof sign (Not stopping)	57.5	57.5	42.5	47.5	51.3

D

Poster recruitment second pilot study

PARTICIPANTS NEEDED

MSC THESIS RESEARCH

Interaction between pedestrians and vehicles

Are you willing to help in a research regarding the reactions of pedestrians when interacting with different types of vehicles? Do you have 70 minutes of spare time and would you like to get a gift voucher of 10 € while helping a student carrying out her MSc thesis? Then this might be interesting for you!

The experiment in which you would participate consists of a field study in a closed location at the TU Delft campus to study the reactions of pedestrians when interacting with vehicles. Different vehicle types with different characteristics will be present.

During the experiment you will be asked to show your reactions when interacting with a vehicle, while wearing an eye-tracker. That equipment is non-invasive and non-intrusive. The experiment will be recorded in order to obtain more data. After the experiment you will be requested to fill in a short questionnaire.

Video data and all other collected (personal) data will be treated confidentially and anonymised so it cannot be traced back to individual persons.

The study is performed as a MSc thesis in collaboration with SWOV (Institute for Road Safety Research)

TU Delft Delft University of Technology

SWOV WETENSCHAPPELIJK ONDERZOEK VERKEERSVEILIGHEID

Important information

When? 18th of January

Where? At the Heertjeslaan between Huismansingel and Molengraaffsingel, next to the company Exact (Delft)

How long? Around 70 minutes

Compensation: a 10 € gift voucher

Who? People that are at least 18 years old and do not wear glasses (contact lenses are fine)

HOW TO SIGN UP?

Send an e-mail to ana.rodriguez@swov.nl

Please state the following information (it will remain confidential):

Name, gender, age and telephone number

E

Booklet second pilot study

MSc thesis: Interaction between pedestrians and Wizard of Oz automated vehicles

Second pilot study

Experiment information

Ana Rodríguez Palmeiro

January 26th, 2017

CONTENTS

1) Program of the day and assistants (with tasks)
2) Detailed experiment procedure per participant (step by step) and example of set-up
3) List of scenarios per participant
4) Interviews post-interaction and post-experiment
5) Example of the questionnaire that will be filled in digitally

Pilot study Thursday 26th January 2017

MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles

Ana Rodríguez Palmeiro (06-/ For Whatsapp: +34)

-Program of the day:

- **8:30 h:**
  Meeting at the CITG faculty, room 4.30 (TU Delft)

- **8:30 h to 10:00 h:**
  Instructions, discussion, move equipment from CITG to the experiment location and set-up of the experiment (WITHOUT closing the road)

- **10:00 h:**
  Close the road

- **10:00 h to 11:00 h:**
  Finish set-up and try the different approaching speeds and distances.

- **11:00 h to 12:30 h:**
  Participant 1

- **12:30 h to 13:00 h:**
  Lunch break

- **13:00 h to 14:30 h:**
  Participant 2

- **14:30 h to 15:00 h:**
  Tidy up location (prepare to open the road)

- **15:00 h:**
  Open the road

- **15:00 h to 16:00 h:**
  Tidy up and return equipment to CITG

-Assistants and tasks:

Before the experiment starts	
Assistant	**Task**
Edwin and Peter	Car and cameras
Michael and Sander	Place pedestrian crossing and road markings to measure critical gap
Ana	Set computer, eye-tracker, battery, prepare questionnaire and all forms to give to the participant.

During the experiment	
Assistant	**Task**
Edwin and Peter	Drive the vehicle, TU equipment
Pablo (TU Delft)	Change the signs of the vehicle
Sander (SWOV supervision)	-Calibrate eye-tracker -Take pictures
Ana	- Stay with the participant, give instructions and interview post interaction. - Supervision of tasks
Michael (Volunteer)	Welcome participants, give them informed consent, questionnaire, debriefing form and gift coupon

Pilot study Thursday 26th January 2017

MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles

Ana Rodríguez Palmeiro (06-/ For Whatsapp: +34)

-Planning per participant:

In the van:

1. Welcome participant
2. Sign informed consent
3. Place microphone headset, attach it to the phone and test it.
4. Place eye-tracker and calibrate it (outside the van, in daylight)
5. Unplug NUC from screen, keyboard and mouse and place it inside the backpack with the battery.

Outside the van:

6. Let participant wear the backpack and go to the standing point on the sidewalk (position 1) with his back to the road.
7. Give instructions to the participant again:

   "When I tell you to turn around, you will need to walk until the cross on the floor (position 2) and vehicles with different characteristics will approach you. You should take a step forward on the first moment you would cross the road and a step backwards in the last moment you would do it, when you think it is not safe to cross anymore. Please, do ***NOT*** *cross the road under any circumstance. Also, from the moment I tell you to turn around you are requested to say aloud everything that goes through your mind"*

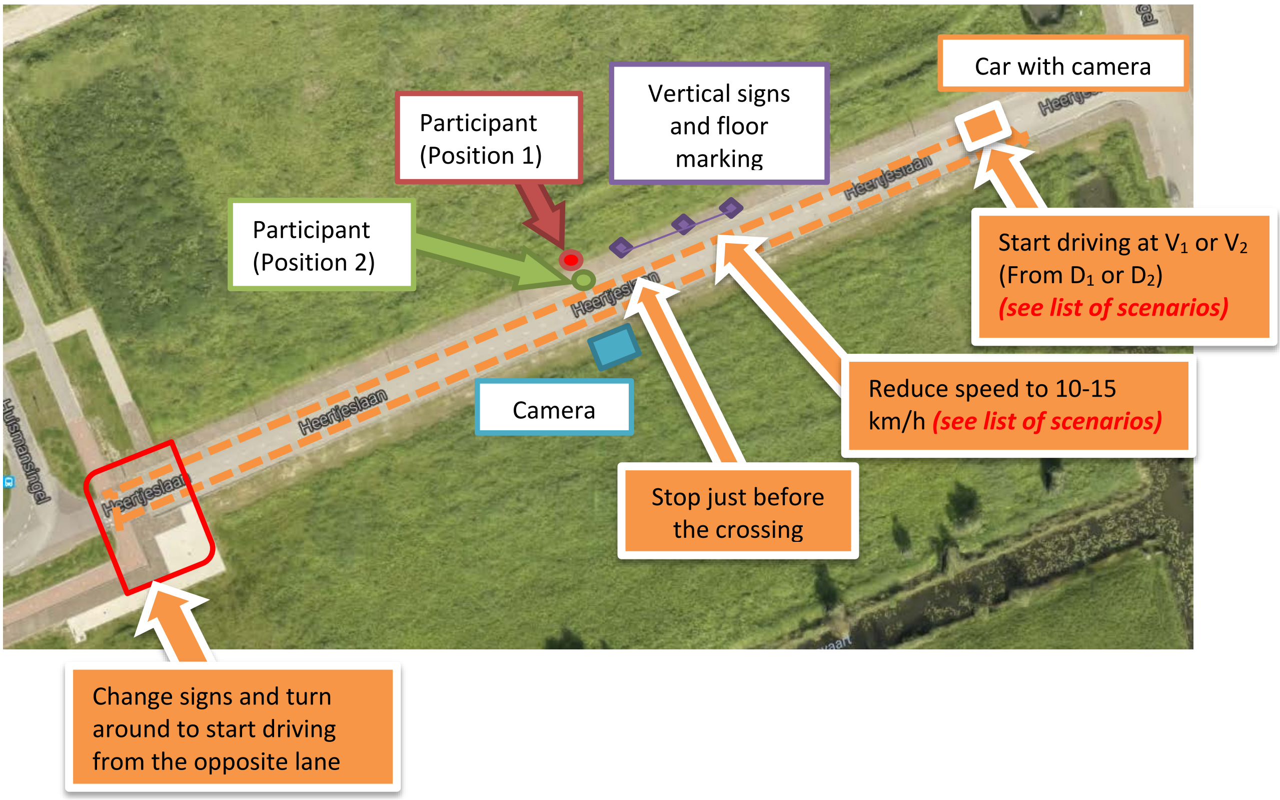
8. After every interaction with the car, make participant turn around and go back to position 1, with his back to the road until the car is again in the starting position for the next interaction. That way the participant cannot see how the vehicle is driven or how the signs are changed. During this time, ask questions from the interview post-interaction.

In the van:

9. After finishing the 16 different scenarios interacting with the car (see attached list), go back to the van and remove eye-tracker and microphone. Connect NUC to the screen and check the data was recorded.
10. Interview participant (use interview *post-experiment*)---Voice record the interview!
11. Let participant fill in the digital questionnaire (check submission)
12. Give debriefing form and compensation to the participant

-Example set-up:

In the following image, the set-up of the experiment is shown in the case the vehicle approaches the pedestrian from his left side.



PARTICIPANT 1 (Page 1 out of 3)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**A**	**Traditional vehicle-From the left of the pedestrian** *(Manually driven)* (Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2nd	**B**	**Traditional vehicle-From the right of the pedestrian** *(Manually driven)* (Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)
	3rd	**C**	**Automated vehicle with magnets on the hood and on the door -From the left of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4th	**D**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	5th	**E**	**Automated vehicle without signs (use newspaper)- From the left of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 1 (Page 2 out of 3)			
	6th	**F**	**Automated vehicle without signs (use newspaper)-From the right of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7th	**G**	**Automated vehicle with roof sign - From the left of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	8th	**H**	**Automated vehicle with roof sign - From the right of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	9th	**I**	**Traditional vehicle-From the left of the pedestrian** *(Manually driven)* (Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)
	10th	**J**	**Traditional vehicle-From the right of the pedestrian** *(Manually driven)* (Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)
	11th	**K**	**Automated vehicle with magnets on the hood and on the door -From the left of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*

PARTICIPANT 1 (Page 3 out of 3)			
	12th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*
	13th	**M**	**Automated vehicle without signs (use newspaper)- From the left of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*
	14th	**N**	**Automated vehicle without signs (use newspaper)-From the right of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*
	15th	**O**	**Automated vehicle with roof sign - From the left of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*
	16th	**P**	**Automated vehicle with roof sign - From the right of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*

PARTICIPANT 2 (Page 1 out of 3)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**A**	**Traditional vehicle-From the left of the pedestrian** *(Manually driven)* (Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2nd	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*
	3rd	**E**	**Automated vehicle without signs (use newspaper)- From the left of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4th	**D**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	5th	**I**	**Traditional vehicle-From the left of the pedestrian** *(Manually driven)* (Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)
	6th	**F**	**Automated vehicle without signs (use newspaper)-From the right of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 2 (Page 2 out of 3)			
	7th	**K**	**Automated vehicle with magnets on the hood and on the door -From the left of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*
	8th	**B**	**Traditional vehicle-From the right of the pedestrian** *(Manually driven)* (Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)
	9th	**C**	**Automated vehicle with magnets on the hood and on the door -From the left of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	10th	**H**	**Automated vehicle with roof sign - From the right of the pedestrian** *(driven with joystick)* *(Distance = 70 m; Start speed = 30 km/h; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	11th	**M**	**Automated vehicle without signs (use newspaper)- From the left of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*
	12th	**P**	**Automated vehicle with roof sign - From the right of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*

PARTICIPANT 2 (Page 3 out of 3)			
	14th	**J**	**Traditional vehicle-From the right of the pedestrian** *(Manually driven)* (Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)
	15th	**O**	**Automated vehicle with roof sign - From the left of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*
	16th	**N**	**Automated vehicle without signs (use newspaper)-From the right of the pedestrian** *(driven with joystick)* *(Distance = 50 m; Start speed = 25 km/h; Reduce to 10 Km/h; stop before pedestrian crossing)*

Interview *post-interaction (after each interaction with the car)*:

1. Which factors did you take into account before making the decision to raise your hand (or take a step forward)?

2. Did you perceive something different than what you see when interacting with a car in real life? (In case of affirmative answer: how did that influence your decision making?)

3. How stressed were you on a scale from 0 to 10?

Interview *post-experiment (at the end of the experiment)*:

Last question at the ***END OF THE EXPERIMENT*** (after finishing ***ALL*** the interactions with the vehicle):

1. *How realistic do you think the set-up of the experiment was on a scale from 0 to 10? Do you think it was similar to a crossing situation in real-life? Why / why not?*

2. *Was it natural for you to take a step forward in the first moment you would cross the road and a step backward in the last moment you would do it? Why / why not?*

3. *How do you think the vehicle was driving? Do you think the vehicle was driving manually?*

Questionnaire post-experiment: interaction between pedestrians and vehicles

Thank you for your participation in this study. As the last part of the experiment you are kindly requested to fill in the following questionnaire. The objective of this questionnaire is to obtain a better understanding of the interaction between vehicles and pedestrians and find out more about your opinion after participating in the field study you just completed.

This questionnaire will take approximately 10 minutes. All your answers will remain confidential and they will just be used for this study.

Part 1: Personal data:

1. What is your age?

2. Gender:
   - ○ Male
   - ○ Female

3. What is your country of origin?

Part 2: Interaction with the vehicle during the experiment:

4. Did you realize, *before making the decision to cross*, that in some scenarios the vehicle was equipped with specific signs on the outside with the message self-driving vehicle?

   - ○ Yes
   - ○ No

5. In case of affirmative answer to the previous question, did the signs on the outside of the vehicle influence your decision to cross?

   - ○ Yes
   - ○ No

   If yes, how did the signs influence your decision to cross?

6. Which of the different sign types was clearer for you? (The given pictures are an example of the possible scenarios you have seen during the experiment)

○ Signs on the side and on the front of the vehicle

○ Sign on the vehicle roof

7. Did you realize, *before making the decision to cross*, that in some scenarios the driver was performing other tasks than driving?

○ Yes
○ No

8. In case of affirmative answer to the previous question. Did the fact that the driver was performing other tasks than driving influence your decision to cross?

○ Yes
○ No

If yes, how did the driver performing other tasks influence your decision to cross?

Part 3: Personal opinion and trust in self-driving vehicles:

9. Please indicate how strongly you agree or disagree with the following statements:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I would like to explore strange places					
I get restless when I spend too much time at home					
I like to do frightening things					
I like wild parties					
I would like to take off on a trip with no pre-planned routes or timetables					
I prefer friends who are excitingly unpredictable					
I would like to try bungee jumping					
I would love to have new and exciting experiences, even if they are illegal					

10. Please indicate how strongly you agree or disagree with the following statements regarding trust in self-driving vehicles:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
In general, I trust the self-driving vehicle					
I trust the self-driving vehicle to avoid obstacles					
I trust the self-driving vehicle when overtaking					
I trust the self-driving vehicle to keep to the right lane					
I trust the self-driving vehicle to keep distance from a vehicle ahead					
I trust the self-driving vehicle to interact safely with pedestrians					

Part 4: Feedback and future improvements:

11. Please write any suggestion or comment you might have to improve the current experiment in the future.

Thank you for participating in this study!

F

Critical gaps per participant (Second pilot study)

Scenario	Critical gap [m]		
	Participant 1	Participant 2	Average
A: Traditional vehicle-From the left of the pedestrian (D=70 m, V=30 km/h)	15.65	15.00	15.32
B: Traditional vehicle-From the right of the pedestrian (D=70 m, V=30 km/h)	-	23.18	11.59
C: AV with magnets on the hood and on the door -From the left of the pedestrian (D=70 m, V=30 km/h)	21.03	15.40	18.21
D: AV with magnets on the hood and on the door-From the right of the pedestrian (D=70 m, V=30 km/h)	-	23.18	11.59
E: AV without signs - From the left of the pedestrian (D=70 m, V=30 km/h)	21.91	16.27	19.09
F: AV without signs -From the right of the pedestrian (D=70 m, V=30 km/h)	10.00	23.18	16.59
G: AV with roof sign - From the left of the pedestrian (D=70 m, V=30 km/h)	21.03	-	10.52
H: AV with roof sign - From the right of the pedestrian (D=70 m, V=30 km/h)	15.00	23.18	19.09
I: Traditional vehicle-From the left of the pedestrian (D=50 m, V=25 km/h)	10.00	21.67	15.83
J: Traditional vehicle-From the right of the pedestrian (D=50 m, V=25 km/h)	23.97	23.18	23.57
K: AV with magnets on the hood and on the door -From the left of the pedestrian (D=50 m, V=25 km/h)	21.59	16.91	19.25
L: AV with magnets on the hood and on the door-From the right of the pedestrian (D=50 m, V=25 km/h)	23.18	23.18	23.18
M: AV without signs - From the left of the pedestrian (D=50 m, V=25 km/h)	10.00	11.20	10.60
N: AV without signs -From the right of the pedestrian (D=50 m, V=25 km/h)	22.54	20.00	21.27
O: AV with roof sign - From the left of the pedestrian (D=50 m, V=25 km/h)	12.62	15.79	14.21
P: AV with roof sign - From the right of the pedestrian (D=50 m, V=25 km/h)	21.35	17.94	19.64

G

Poster recruitment final experiment

PARTICIPANTS NEEDED
MSC THESIS RESEARCH

Interaction between pedestrians and vehicles

Are you willing to help in a research regarding the reactions of pedestrians when interacting with different types of vehicles? Do you have 60 minutes of spare time and would you like to get a gift voucher of 10 € while helping a student carrying out her MSc thesis? Then this might be interesting for you!

The experiment in which you would participate consists of a field study in a closed road at the TU Delft campus to study the reactions of pedestrians when interacting with vehicles. Different vehicle types with different characteristics will be present.

During the experiment you will be asked to show your reactions when interacting with a vehicle. The experiment will be recorded in order to obtain more data. After the experiment you will be requested to fill in a short questionnaire.

Video data and all other collected (personal) data will be treated confidentially and anonymised so it cannot be traced back to individual persons.

The study is performed as a MSc thesis in collaboration with SWOV (Institute for Road Safety Research)

Delft University of Technology

SWOV
WETENSCHAPPELIJK ONDERZOEK VERKEERSVEILIGHEID

Important information

When? 22nd or 23rd of February or 1st or 2nd of March

Where? At the Heertjeslaan between Huismansingel and Molengraaffsingel, next to the company Exact (Delft)

How long? Around 60 minutes

Compensation: a 10 € gift voucher

Who? People that are at least 18 years old and come from countries where vehicles are left-hand drive (as in The Netherlands, driver sitting on the left side)

HOW TO SIGN UP?

Send an e-mail to ana.rodriguez@swov.nl

Please state the following information (it will remain confidential):

Name, gender, age and telephone number

H

Booklet final experiment

MSc thesis: Interaction between pedestrians and Wizard of Oz automated vehicles

Final field study

Experiment information

Ana Rodríguez Palmeiro

February 22nd, 23rd, March 1st and 2nd, 2017

CONTENTS

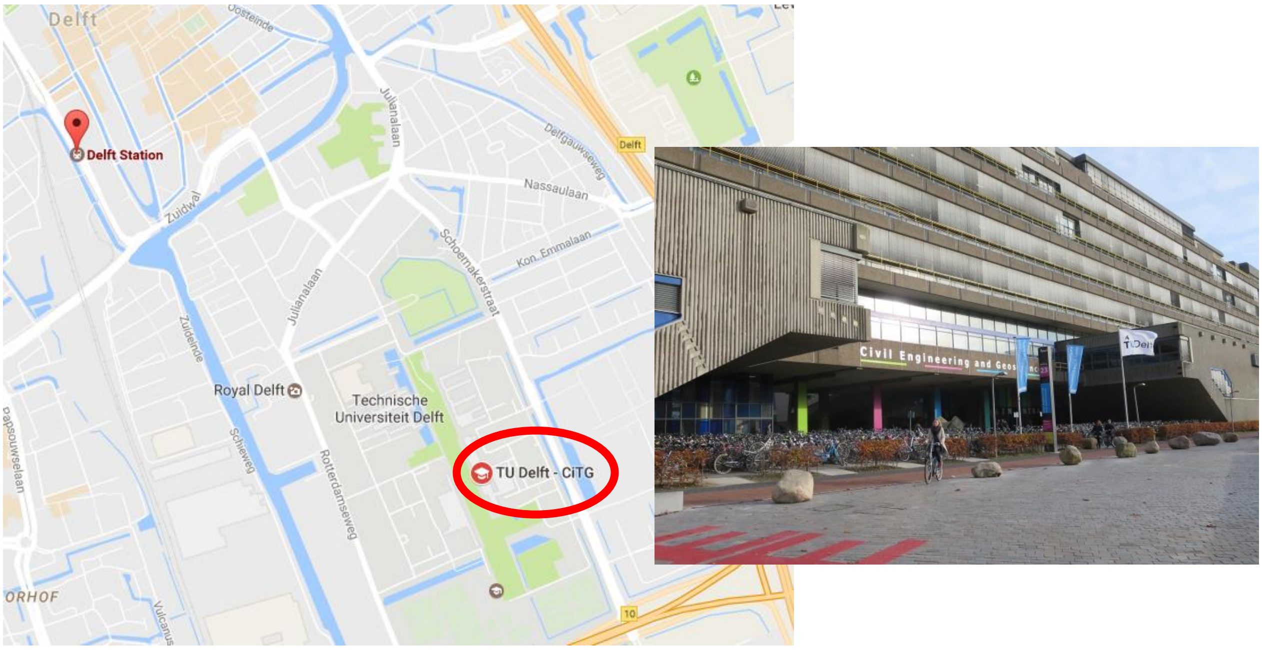
1) Program of the day and assistants (with tasks)
2) Detailed experiment procedure per participant (step by step) and example of set-up
3) List of scenarios per participant
4) Interviews post-interaction and post-experiment
5) Example of the questionnaire that will be filled in digitally

Final field study 22nd and 23rd of February and 1st and 2nd of March 2017

MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles *Ana Rodríguez Palmeiro (06-/ For Whatsapp: +34)*

-Program of the day:

- **8:30 h:**
  Meeting at the CITG faculty, room 4.30 (TU Delft)



Faculty of Civil Engineering and Geosciences (Stevinweg 1, 2628 CN, Delft). Room 4.30 is on the 4th floor

- **8:30 h to 9:30 h:**
  Instructions, discussion, move equipment from CITG to the experiment location and set-up of the experiment (WITHOUT closing the road)

- **09:30 h:**
  Close the road

- **9:30 h to 09:45 h:**
  Finish set-up

- **9:45 h to 10:50 h:**
  Participant 1

- **10:30 h to 11:35 h:**
  Participant 2

- **11:15 h to 12:20 h:**
  Participant 3

- **12:00 h to 13:05 h:**
  Participant 4

- **12:45 h to 13:50 h:**
  Participant 5

- **13:30 h to 14:35 h:**
  Participant 6

- **14:15 h to 15:20 h:**
  Participant 7

- **15:30 h:**
  Open the road

- **15:30 h to 16:30 h:**
  Tidy up and return equipment to CITG

-Assistants and tasks:

Before the experiment starts	
Assistant	**Task**
Edwin and Peter	Car and cameras
Sander, Ritwik, Ana	Place pedestrian crossing and road markings to measure critical gap
Veronika and Ana	Set computer, prepare questionnaire and all forms to give to the participants

During the experiment	
Assistant	**Task**
Edwin and Peter	Drive the vehicle, TU equipment
Ritwik	Change the signs of the vehicle
Sander	-Communication pedestrian-vehicle (Walkie-talkie) -Stay with the participant if needed
Ana	– Stay with the participant, give instructions and interview post interaction. – Supervision of tasks
Veronika	Welcome participants, give them informed consent, questionnaire, debriefing form and gift coupon

Final field study

MSc thesis: interaction between pedestrians and Wizard of Oz automated vehicles *Ana Rodríguez Palmeiro (06-/ For Whatsapp: +34)*

-Planning per participant (step by step):

In the van:

1. Welcome participant and provide him with the informed consent
2. Sign informed consent
3. Try to prevent participant looking at the experiment set-up or at how the previous participant realizes the interactions with the vehicle.

Outside the van:

4. Let participant go to the standing point on the sidewalk (position 1) with his back to the road.
5. Give instructions to the participant again:

   "When I tell you to turn around, you will need to walk until the cross on the floor (position 2) and vehicles with different characteristics will approach you. You should take a step forward on the first moment you would cross the road and a step backwards in the last moment you would do it, when you think it is not safe to cross anymore. Please, do ***NOT*** *cross the road under any circumstance. After that you can turn around and come back to this position (position 1) and I will ask you some questions".*

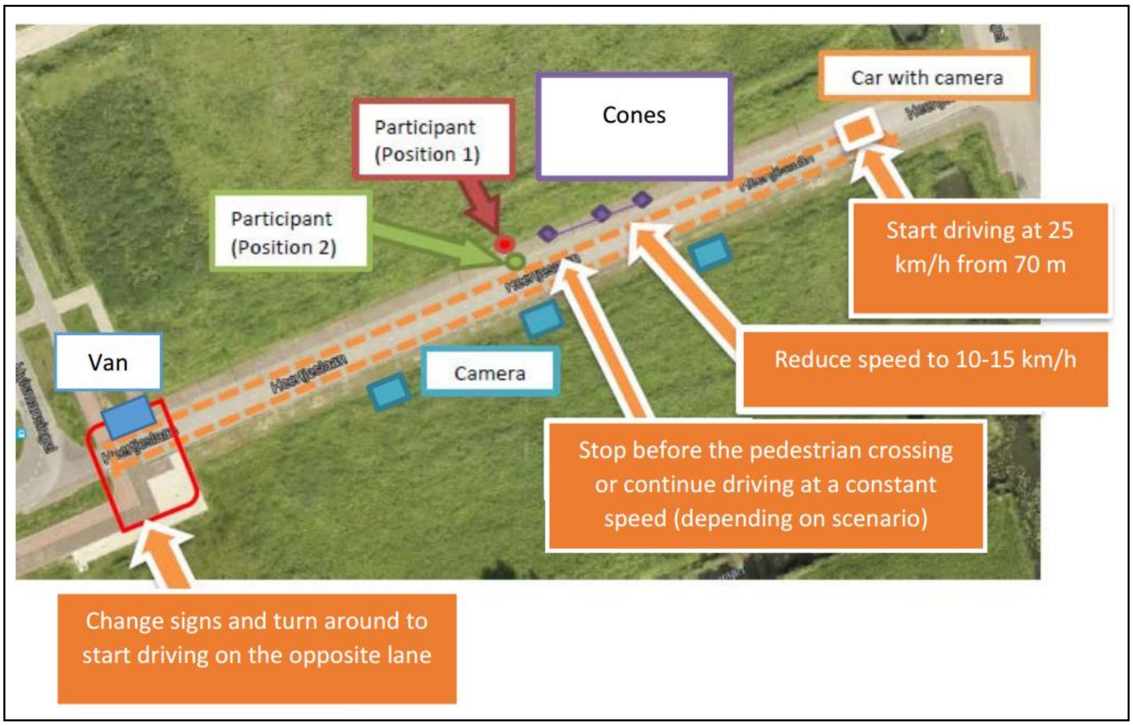
6. After every interaction with the car, make participant turn around and go back to position 1, with his back to the road until the car is again in the starting position for the next interaction. That way the participant cannot see how the vehicle is driven or how the signs are changed. During this time, ask questions from the interview post-interaction.
7. After the last interaction with the vehicle, ***also*** ask the questions from the interview post-experiment.

In the van:

8. After finishing the different scenarios interacting with the car (see attached list), go back to the van.
9. Let participant fill in the digital questionnaire (check submission)
10. Give debriefing form and compensation to the participant.

-Example set-up:

In the following image, the set-up of the experiment is shown in the case the vehicle approaches the pedestrian from his left side.



Interview *post-interaction (after each interaction with the car)*:

1. Which factors did you take into account before making the decision to take a step backwards?

2. Did you perceive something different than what you see when interacting with a car in real life? (In case of affirmative answer: how did that influence your decision making?)

3. How stressed were you on a scale from 0 to 10 where 0 is 'not stressed at all' and 10 is 'extremely stressed'?

Interview *post-experiment (at the end of the experiment)*:

Last question at the ***END OF THE EXPERIMENT*** (after finishing ***ALL*** the interactions with the vehicle):

1. *How realistic do you think the set-up of the experiment was on a scale from 0 to 10? Do you think it was similar to a crossing situation in real-life? Why / why not?*

2. *Was it natural for you to take a step forward in the first moment you would cross the road and a step backward in the last moment you would do it? Why / why not?*

3. *How do you think the vehicle was driving? Do you think the vehicle was driving manually?*

Questionnaire post-experiment: interaction between pedestrians and vehicles

Thank you for your participation in this study. As the last part of the experiment you are kindly requested to fill in the following questionnaire. The objective of this questionnaire is to obtain a better understanding of the interaction between vehicles and pedestrians and find out more about your opinion after participating in the field study you just completed.

This questionnaire will take approximately 10 minutes. All your answers will remain confidential and they will just be used for this study.

Part 1: Personal data:

1. What is your age?

2. Gender:
   - ○ Male
   - ○ Female

3. What is your country of origin?

Part 2: Interaction with the vehicle during the experiment:

4. Did you realize, *before making the decision to cross*, that in some scenarios the vehicle was equipped with specific signs on the outside with the message self-driving vehicle?

   - ○ Yes
   - ○ No

5. In case of affirmative answer to the previous question, did the signs on the outside of the vehicle influence your decision to cross?

   - ○ Yes
   - ○ No

   If yes, how did the signs influence your decision to cross?

6. Which of the different sign types was clearer for you? (The given pictures are an example of the possible scenarios you have seen during the experiment)

   ○ Signs on the side and on the front of the vehicle

   ○ Sign on the vehicle roof

7. Did you realize, *<u>before making the decision to cross</u>*, that in some scenarios the driver was performing other tasks than driving?

   ○ Yes
   ○ No

8. In case of affirmative answer to the previous question. Did the fact that the driver was performing other tasks than driving influence your decision to cross?

   ○ Yes
   ○ No

   If yes, how did the driver performing other tasks influence your decision to cross?

Part 3: Personal opinion and trust in self-driving vehicles:

9. Please indicate how strongly you agree or disagree with the following statements:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I would like to explore strange places					
I get restless when I spend too much time at home					
I like to do frightening things					
I like wild parties					
I would like to take off on a trip with no pre-planned routes or timetables					
I prefer friends who are excitingly unpredictable					
I would like to try bungee jumping					
I would love to have new and exciting experiences, even if they are illegal					

10. Please indicate how strongly you agree or disagree with the following statements regarding trust in self-driving vehicles:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
In general, I trust the self-driving vehicle					
I trust the self-driving vehicle to avoid obstacles					
I trust the self-driving vehicle when overtaking					
I trust the self-driving vehicle to keep to the right lane					
I trust the self-driving vehicle to keep distance from a vehicle ahead					
I trust the self-driving vehicle to interact safely with pedestrians					

Part 4: Feedback and future improvements:

11. Please write any suggestion or comment you might have to improve the current experiment in the future.

Thank you for participating in this study!

PARTICIPANT 1 (Page 1 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**B**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	2nd	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	3rd	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4th	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	5th	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 1 (Page 2 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	7th	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	8th	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	9th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	10th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 1 (Page 3 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	12th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	13th	**F**	**Traditional vehicle-From the right of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	14th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	15th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 1 (Page 4 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	16th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	17th	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	18th	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	19th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	20th	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 2 (Page 1 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2nd	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3rd	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4th	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	5th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 2 (Page 2 out of 4) [22 February]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	6th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	7th	**B**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	8th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	9th	**F**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	10th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 2 (Page 3 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	12th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	13th	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	14th	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	15th	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 2 (Page 4 out of 4) [22 February]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16th	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	17th	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	19th	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	20th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 3 (Page 1 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2nd	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	3rd	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	5th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*

PARTICIPANT 3 (Page 2 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6th	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7th	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	8th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	9th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	10th	**B**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 3 (Page 3 out of 4) [22 February]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	11th	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	12th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	13th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	15th	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 3 (Page 4 out of 4) [22 February]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16th	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	17th	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	18th	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	19th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	20th	**F**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 4 (Page 1 out of 4) [22 February]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1st	C	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2nd	I	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3rd	A	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	4th	L	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	5th	F	**Traditional vehicle-From the right of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 4 (Page 2 out of 4) [22 February]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	6th	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	8th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	9th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	10th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 4 (Page 3 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11th	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	12th	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	13th	**B**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	14th	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	15th	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 4 (Page 4 out of 4) [22 February]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	17th	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18th	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	19th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	20th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 5 (Page 1 out of 4) [22 February]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1st	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	2nd	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3rd	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	4th	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	5th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*

PARTICIPANT 5 (Page 2 out of 4) [22 February]			
START TIME	ORDER	SCENARIO CODE	SCENARIO
	6th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	7th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	8th	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	9th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	10th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 5 (Page 3 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11th	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	12th	**B**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	13th	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	14th	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	15th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 5 (Page 4 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	16th	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	17th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	18th	**F**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	19th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	20th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

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START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	2nd	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3rd	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	4th	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	5th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*

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START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6th	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	8th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	9th	**F**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	10th	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	11th	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	12th	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	13th	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	15th	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 6 (Page 4 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	16th	**B**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	17th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	18th	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	19th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	20th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*

PARTICIPANT 7 (Page 1 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	2nd	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3rd	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4th	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	5th	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	6th	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7th	**F**	**Traditional vehicle-From the right of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	8th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	9th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	10th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	11th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	12th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	13th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	14th	**B**	**Traditional vehicle-From the right of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	15th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 7 (Page 4 out of 4) [22 February]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	16th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	17th	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	19th	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	20th	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	1st	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2nd	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	3rd	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	4th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	5th	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 1 (Page 2 out of 4) [23 February] (8)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	6th	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	8th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	9th	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	10th	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 1 (Page 3 out of 4) [23 February] (8)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	12th	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	13th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	15th	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	16th	H	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	17th	E	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	18th	L	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	19th	A	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	20th	O	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	1st	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	2nd	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3rd	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	4th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	5th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 2 (Page 2 out of 4) [23 February] (9)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	6th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	7th	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	8th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	9th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	10th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Do NOT stop before pedestrian crossing)*

PARTICIPANT 2 (Page 3 out of 4) [23 February] (9)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	11th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	12th	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	13th	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	14th	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	15th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 2 (Page 4 out of 4) [23 February] (9)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16th	K	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	17th	O	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18th	T	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	19th	F	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	20th	B	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 3 (Page 1 out of 4) [23 February] (10)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2nd	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3rd	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	4th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	5th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*

PARTICIPANT 3 (Page 2 out of 4) [23 February] (10)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6th	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	7th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	8th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	9th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	10th	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 3 (Page 3 out of 4) [23 February] (10)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	12th	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	13th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14th	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	15th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 3 (Page 4 out of 4) [23 February] (10)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16th	K	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	17th	H	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	18th	S	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	19th	F	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	20th	R	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 4 (Page 1 out of 4) [23 February] (11)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1st	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	2nd	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	3rd	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	4th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	5th	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 4 (Page 2 out of 4) [23 February] (11)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	7th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	8th	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	9th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	10th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 4 (Page 3 out of 4) [23 February] (11)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	11th	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	12th	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	13th	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	14th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	15th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 4 (Page 4 out of 4) [23 February] (11)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16th	R	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	17th	K	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18th	M	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	19th	G	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	20th	A	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 5 (Page 1 out of 4) [23 February] (12)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1st	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2nd	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	3rd	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	4th	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	5th	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 5 (Page 2 out of 4) [23 February] (12)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	6th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	7th	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	8th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	9th	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	10th	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 5 (Page 3 out of 4) [23 February] (12)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	12th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	13th	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	15th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 5 (Page 4 out of 4) [23 February] (12)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	16th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	17th	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18th	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	19th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	20th	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 6 (Page 1 out of 4) [23 February] (13)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1st	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	2nd	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3rd	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	5th	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 6 (Page 2 out of 4) [23 February] (13)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	7th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	8th	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	9th	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	10th	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 6 (Page 3 out of 4) [23 February] (13)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	11th	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	12th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	13th	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	14th	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	15th	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 6 (Page 4 out of 4) [23 February] (13)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16th	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	17th	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	18th	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	19th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	20th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 7 (Page 1 out of 4) [23 February] (14)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1st	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2nd	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	3rd	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	4th	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	5th	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 7 (Page 2 out of 4) [23 February] (14)			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6th	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7th	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	8th	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	9th	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	10th	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 7 (Page 3 out of 4) [23 February] (14)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	11th	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	12th	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	13th	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	14th	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	15th	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 7 (Page 4 out of 4) [23 February] (14)

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16th	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	17th	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	18th	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	19th	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	20th	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 1 (Page 1 out of 4) [2 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1	S	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	2	Q	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3	D	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	4	J	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	5	R	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 1 (Page 2 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	8	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	9	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	10	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 1 (Page 3 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	12	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	13	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	15	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 1 (Page 4 out of 4) [2 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	17	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	18	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	19	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	20	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 2 (Page 1 out of 4) [2 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	2	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	3	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	5	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 2 (Page 2 out of 4) [2 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	6	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	8	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	9	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	10	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	11	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	12	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	13	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	15	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

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START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	16	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	17	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	18	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	19	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	20	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 3 (Page 1 out of 4) [2 March]			
START TIME	ORDER	SCENARIO CODE	SCENARIO
	1	J	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	2	E	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	3	P	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	4	A	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	5	C	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 3 (Page 2 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	7	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	8	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	9	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	10	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	11	H	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	12	N	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	13	B	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	14	M	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	15	I	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	16	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	17	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	19	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	20	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 4 (Page 1 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	3	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	5	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 4 (Page 2 out of 4) [2 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	6	T	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	7	M	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	8	N	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	9	Q	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	10	O	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 4 (Page 3 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	12	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	13	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	14	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	15	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	16	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	17	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	19	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	20	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	1	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	3	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	4	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	5	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	6	J	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	7	B	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	8	L	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	9	T	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	10	S	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 5 (Page 3 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	12	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	13	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	15	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	16	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	17	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	18	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	19	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	20	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 6 (Page 1 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	2	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	3	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	5	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	6	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	7	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	8	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	9	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	10	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 6 (Page 3 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***<u>USE NEWSPAPER</u>*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	12	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	13	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - <u>NOT</u> Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do <u>NOT</u> stop before pedestrian crossing)*
	14	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	15	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - <u>NOT</u> Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***<u>NOT</u>*** stop before pedestrian crossing)

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	16	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	17	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	18	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	19	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	20	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

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START TIME	ORDER	SCENARIO CODE	SCENARIO
	1	P	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	2	N	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	3	C	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	4	J	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	5	H	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 7 (Page 2 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	7	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	8	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	9	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	10	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 7 (Page 3 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	12	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - <u>NOT</u> stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do <u>NOT</u> stop before pedestrian crossing)*
	13	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***<u>USE NEWSPAPER</u>*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	15	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 7 (Page 4 out of 4) [2 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	16	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	17	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	19	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	20	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") -** ***NOT*** **Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 1 (Page 1 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	2	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	4	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	5	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 1 (Page 2 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	7	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	8	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	9	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	10	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 1 (Page 3 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	11	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	12	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	13	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	15	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*

PARTICIPANT 1 (Page 4 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	17	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	18	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	19	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	20	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 2 (Page 1 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	4	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	5	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 2 (Page 2 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	6	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	7	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	8	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	9	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	10	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 2 (Page 3 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	12	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	13	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	15	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 2 (Page 4 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	17	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	19	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	20	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 3 (Page 1 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	2	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	3	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	4	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	5	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 3 (Page 2 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	8	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	9	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	10	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 3 (Page 3 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	12	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	13	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	14	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	15	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 3 (Page 4 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	16	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	17	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	18	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	19	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	20	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 4 (Page 1 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	2	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	3	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	4	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	5	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 4 (Page 2 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	6	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	7	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	8	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	9	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	10	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 4 (Page 3 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	12	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	13	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	14	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	15	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 4 (Page 4 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	17	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	18	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	19	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	20	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 5 (Page 1 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	2	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	3	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	4	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	5	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 5 (Page 2 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	7	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	8	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	9	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	10	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

PARTICIPANT 5 (Page 3 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	11	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	12	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	13	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	14	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	15	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 5 (Page 4 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	17	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	18	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	19	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	20	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*

PARTICIPANT 6 (Page 1 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	1	**Q**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	2	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	3	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	4	**I**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	5	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 6 (Page 2 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	6	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	7	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	8	**S**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	9	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	10	**F**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)

PARTICIPANT 6 (Page 3 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	11	**O**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	12	**L**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	13	**D**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	14	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	15	**M**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 6 (Page 4 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	16	**C**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	17	**T**	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	18	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	19	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do* ***NOT*** *stop before pedestrian crossing)*
	20	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick,* ***USE NEWSPAPER*** *)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 7 (Page 1 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	1	**G**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	2	**J**	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	3	**R**	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - NOT stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	4	**N**	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	5	**P**	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*

PARTICIPANT 7 (Page 2 out of 4) [8 March]

START TIME	ORDER	SCENARIO CODE	SCENARIO
	6	M	**Automated vehicle without signs-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	7	D	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	8	S	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	9	T	**Automated vehicle with roof sign-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do NOT stop before pedestrian crossing)*
	10	O	**Automated vehicle without signs-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick, **USE NEWSPAPER**)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 7 (Page 3 out of 4) [8 March]			
START TIME	ORDER	SCENARIO CODE	SCENARIO
	11	L	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do **NOT** stop before pedestrian crossing)*
	12	I	**Automated vehicle with magnets on the hood and on the door-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	13	C	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	14	F	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	15	Q	**Automated vehicle with roof sign-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*

PARTICIPANT 7 (Page 4 out of 4) [8 March]			
START TIME	**ORDER**	**SCENARIO CODE**	**SCENARIO**
	16	**B**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - *NOT* Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	17	**H**	**Traditional vehicle-From the right of the pedestrian ("Aerospace side") - NOT Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; Do ***NOT*** stop before pedestrian crossing)
	18	**A**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(Manually driven)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)
	19	**K**	**Automated vehicle with magnets on the hood and on the door-From the right of the pedestrian ("Aerospace side") - Stopping** *(driven with joystick)* *(Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)*
	20	**E**	**Traditional vehicle-From the left of the pedestrian ("Exact side") - Stopping** *(driven with joystick)* (Start speed = 25 km/h at 70 m from pedestrian; Reduce to 10-15 km/h; stop before pedestrian crossing)

I

Informed consent (Final experiment)

INFORMED CONSENT STATEMENT

To participate in the scientific research: field study to analyse interactions between pedestrians and vehicles.

Researcher: Ana Rodríguez Palmeiro

In collaboration with: SWOV and TU Delft

Please take the time to read the following information carefully

You are about to participate in a field study as a part of a research project (MSc thesis) to analyse the interaction between pedestrians and vehicles.

You will be asked to stand on the sidewalk of the road while vehicles with different characteristics will drive on the road towards your direction. You will be asked to take a step forward in the first moment you would cross the road and one step backward in the last moment you would cross the road (last moment you think it is safe to cross). However, you are explicitly requested **NOT to cross the road** under any circumstances. Different scenarios will be studied and you will not be informed in advance on what vehicle type you will be interacting with in each case.

Video recording will be used during the experiment to facilitate the data analysis afterwards. After every interaction you will be asked to answer some short questions that will be recorded. At the end of the experiment you will be asked to fill in a short questionnaire regarding your impressions about the experiment.

Carrying out the experiment will take around 60 minutes for you and at the end you will receive a 10 euro gift voucher as a compensation for your participation.

By signing this form you agree to participate in the experiment and you agree with the following conditions:

- You have been informed about the research.
- You have carefully read and understood the above-mentioned information and you agree with it.[
- You have had the opportunity to ask questions about the research.
- You can terminate your participation in the experiment at any time without giving reasons and without any consequences for you.
- You are 18 years old or more.
- Video data and all other collected (personal) data will be treated confidentially and anonymised so that it cannot be traced back to individual persons.

I agree to participate in this study.

Name:

Date of birth:

Signature: Date:

J

Debriefing form
(Final experiment)

Debriefing form

After collaborating in the scientific research: field study to analyse interactions between pedestrians and Wizard of Oz automated vehicles.

Thank you very much for your collaboration in this research. The aim of this study is to analyse the impact of automated vehicles on pedestrian crossing behaviour and perceived safety. Pedestrian crossing behaviour can be studied in terms of gap acceptance, stress level and perceived safety.

During the experiment in which you just participated, you were asked to take a step backwards at the last moment you would cross the road when interacting with a certain vehicle. In that way, critical crossing gaps could be measured with the aid of video recording. After that, data related to perceived safety and trust in technology was collected from the interview, your reactions during the interactions with the vehicle and the questionnaire you just filled in.

Different scenarios were studied regarding vehicle recognition.

The results of this experiment will help to understand the changes in crossing behaviour of pedestrians when interacting with self-driving vehicles in terms of critical crossing gap, stress level and perceived safety. Furthermore, in the case of the self-driving vehicles, the influence of the vehicle recognition on the pedestrian crossing behaviour will be studied.

Please do not hesitate to contact Ana Rodríguez Palmeiro at the following e-mail address (ana.rodriguez@swov.nl) if you have any question about the study.

Thank you again for your collaboration

K

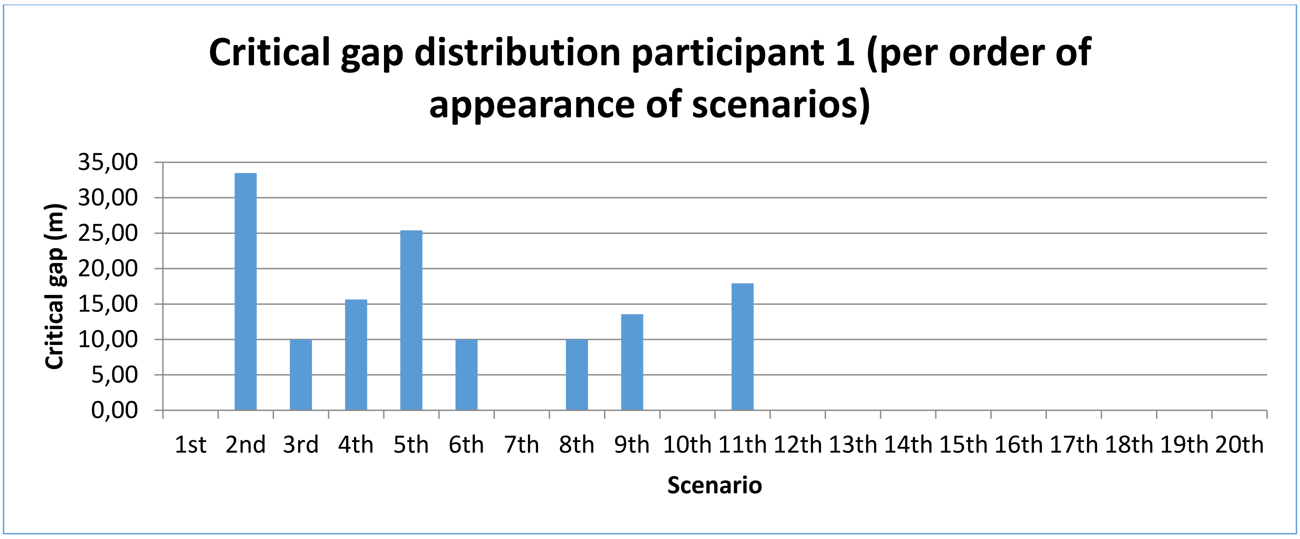
Critical gaps per participant (Final experiment)

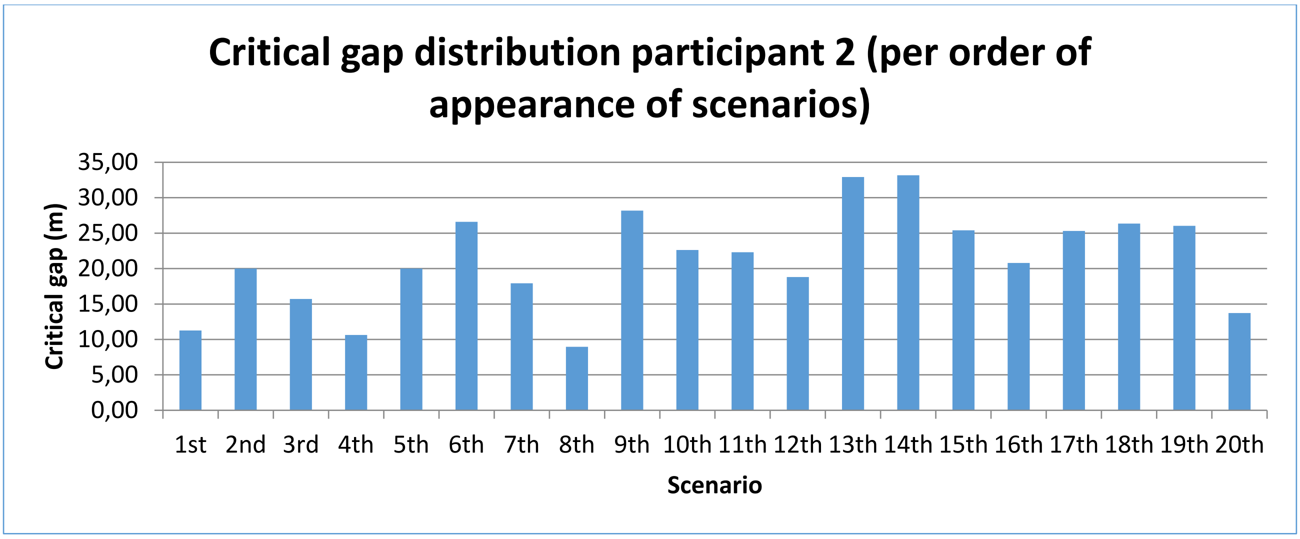
	Critical gap [m]																			
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**
1	25,40	-	10,00	-	-	-	-	-	17,94	-	-	-	-	-	10,00	-	13,57	33,50	15,64	10,00
2	32,94	17,94	25,40	10,64	11,27	28,18	20,00	26,03	26,35	26,59	20,00	18,81	25,32	13,74	15,72	8,97	22,62	33,18	20,79	22,30
3	25,40	26,59	18,57	No step back	No step back	21,27	20,00	16,67	33,18	29,76	10,00	12,94	10,00	24,13	20,00	10,00	30,00	30,40	17,94	25,00
4	26,59	32,94	26,03	25,32	22,78	16,59	15,40	22,94	18,81	26,03	11,91	11,50	10,24	33,57	26,99	24,60	34,21	32,70	31,03	10,00
5	10,79	22,94	10,40	10,00	10,00	25,40	11,03	10,00	9,61	21,83	10,40	11,03	11,67	15,24	10,00	17,94	10,64	11,03	11,03	10,00
6	32,62	21,27	11,67	12,62	33,81	32,62	20,00	26,91	9,61	18,81	21,03	11,67	10,00	15,40	13,57	17,30	10,00	11,35	17,54	15,00
7*	12,30	16,03	32,30	10,00	23,57	10,00	31,67	27,30	11,91	15,00	10,00	21,27	15,72	10,00	10,00	11,27	17,94	15,00	10,00	10,00
8	10,00	12,94	11,91	17,94	16,03	20,00	10,00	11,27	14,21	10,00	11,27	24,21	10,72	16,35	10,00	32,54	16,03	15,00	10,00	11,67
9	16,67	11,91	10,00	10,00	11,67	16,35	17,30	17,30	13,57	11,91	21,35	11,27	11,03	10,64	25,40	11,27	26,27	25,72	33,81	15,00
10	10,00	No step front or backwards	10,00	No step front or backwards	20,64	15,96	10,64	33,89	25,00	13,18	33,89	10,00	11,27	11,03	20,00	30,00	17,62	11,67	11,67	29,61
11	10,00	17,30	32,54	32,94	15,72	11,03	10,00	28,18	12,94	16,03	20,00	28,18	30,00	15,00	11,91	25,00	12,94	15,00	20,00	20,00
12	12,94	14,21	28,57	18,81	19,21	20,00	30,40	27,54	10,00	13,57	16,27	30,40	13,89	27,94	26,27	30,00	10,00	17,30	30,64	26,03
13	28,57	11,27	30,64	13,57	10,72	23,89	10,00	15,64	11,99	25,40	11,03	20,40	29,51	17,62	20,00	10,00	26,35	21,99	12,94	21,27
14	10,00	26,27	15,00	18,57	16,91	12,70	15,00	10,00	12,79	16,03	25,00	10,00	11,43	no step	31,91	11,99	16,27	13,97	10,00	15,00
15	15,64	21,03	30,00	30,00	31,67	21,67	23,42	31,91	25,32	21,03	31,91	22,54	25,715	32,54	20,64	25,00	28,175	31,91	20,00	31,91
16	27,94	32,94	10,00	25,64	10,00	11,43	25,00	15,00	12,46	23,57	31,91	12,54	11,43	23,57	31,91	10,00	25,00	26,27	10,00	10,00
17*	47,50	33,57	45,00	55,00	16,67	50,00	52,50	30,00	14,37	33,57	45,00	55,00	45,00	33,81	50,00	50,00	45,00	33,18	47,50	45,00
18	10,00	23,81	26,91	28,18	16,03	11,43	10,00	10,00	26,03	21,91	27,30	30,00	22,30	11,19	10,00	10,00	13,65	26,03	10,00	11,03
19	13,10	16,35	21,27	10,00	12,07	17,30	10,00	21,03	11,75	21,67	23,18	10,00	13,34	21,43	10,00	26,03	14,37	18,81	10,00	15,00
20	8,97	10,40	26,39	24,44	12,94	21,03	16,39	30,00	11,99	14,61	19,54	30,00	10,00	20,00	15,00	19,26	13,81	8,34	27,59	15,00
21	26,43	10,00	no step	15,00	15,00	11,91	23,15	10,00	10,64	21,67	15,93	10,00	15,00	12,94	30,00	35,00	10,32	23,18	10,00	10,00
22	8,25	15,64	27,78	26,48	11,67	10,00	40,00	27,22	7,98	10,64	25,00	27,59	10,00	8,51	27,04	30,00	8,25	8,86	30,00	23,70
23	24,68	26,27	no step	35,00	20,64	30,00	37,50	45,00	17,70	18,26	35,00	30,00	16,27	20,64	35,00	35,00	16,03	18,18	37,50	47,50
24	6,84	18,43	15,00	8,25	6,49	19,61	18,70	10,00	15,00	10,40	35,00	20,00	14,61	6,84	16,85	17,87	15,56	6,49	10,00	23,70

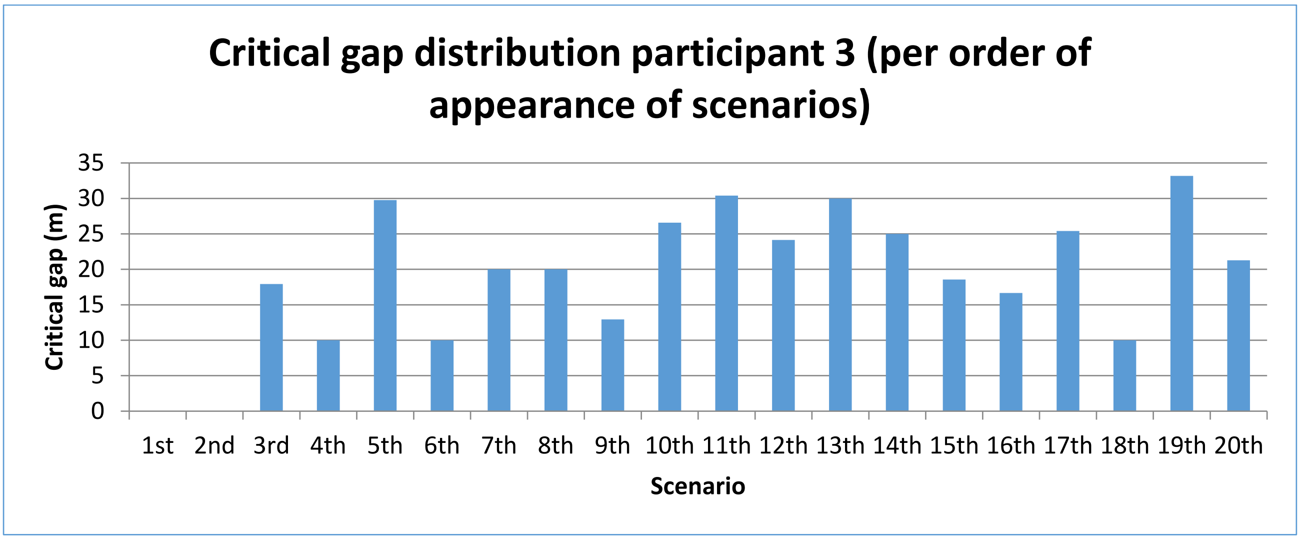
** (more than one critical gap in some cases, smallest critical gap considered)*

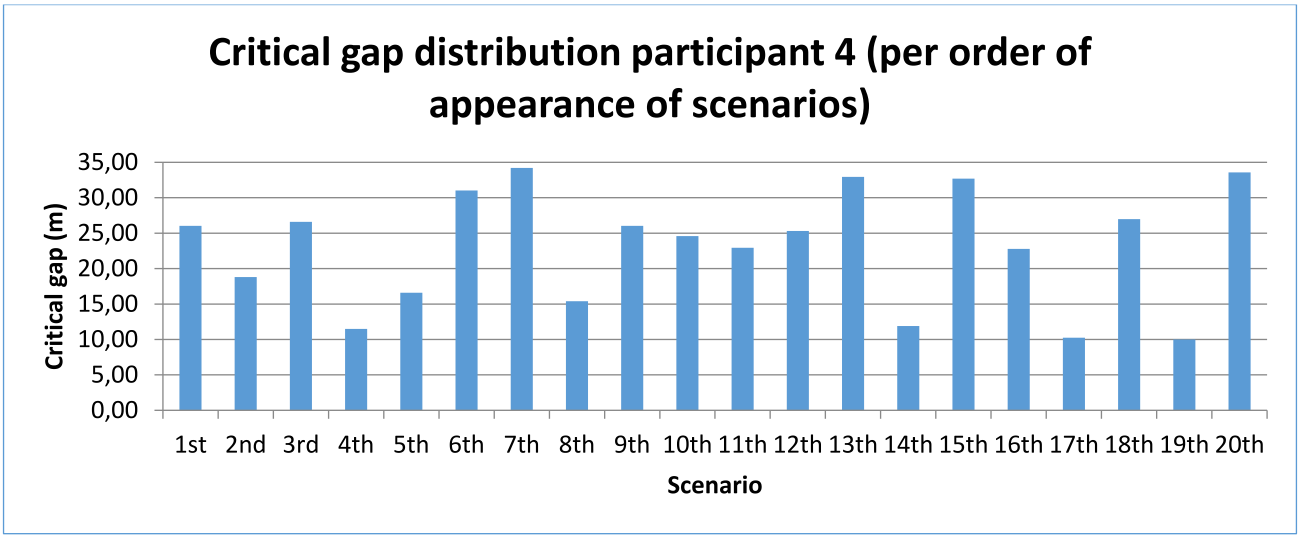
L

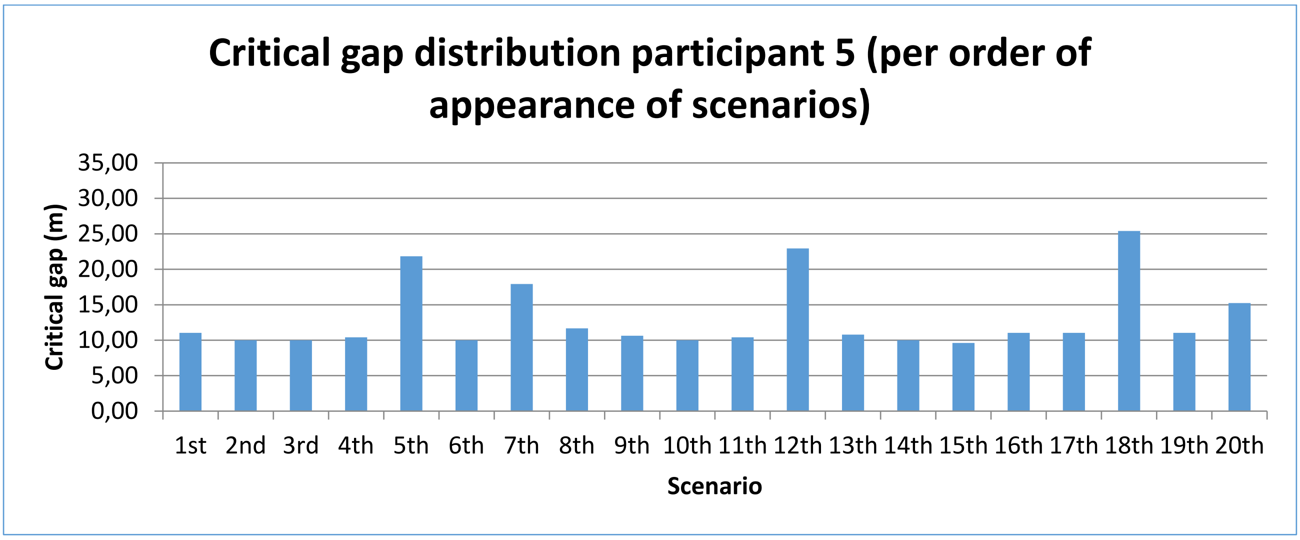
Critical gap distribution over time (Final experiment)

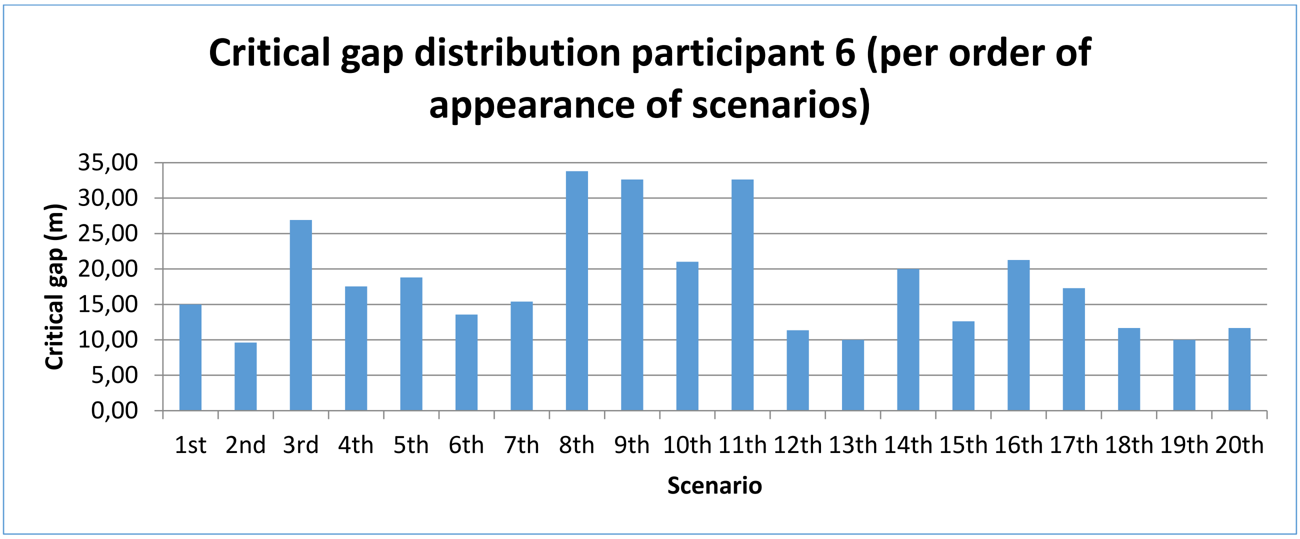

Critical gap distribution participant 1 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th
Scenario

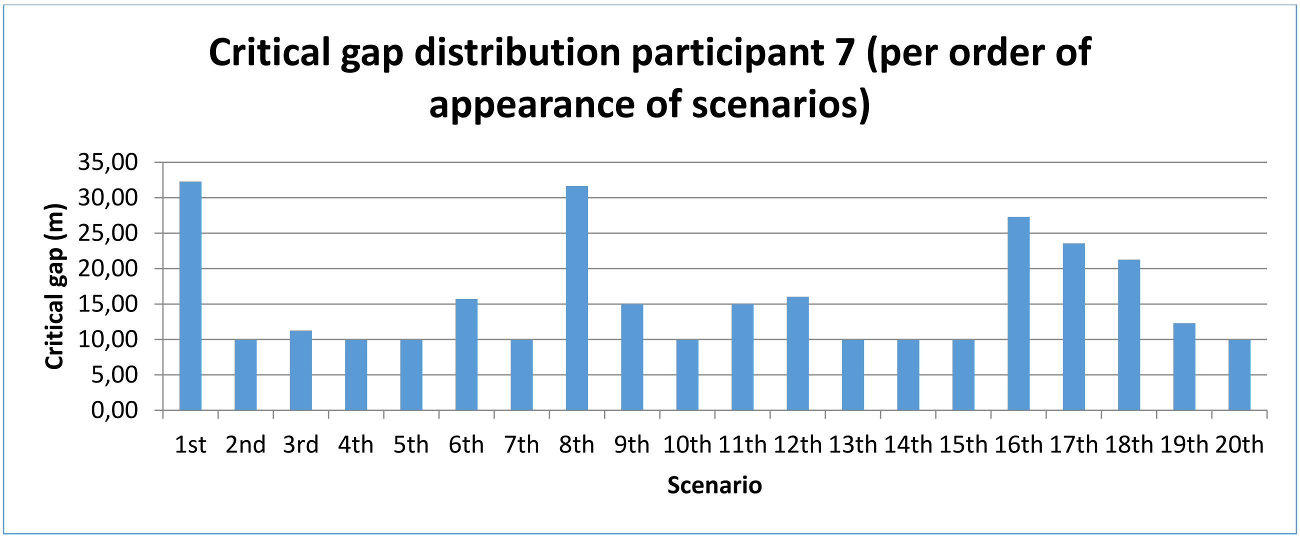

Critical gap distribution participant 2 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th
Scenario

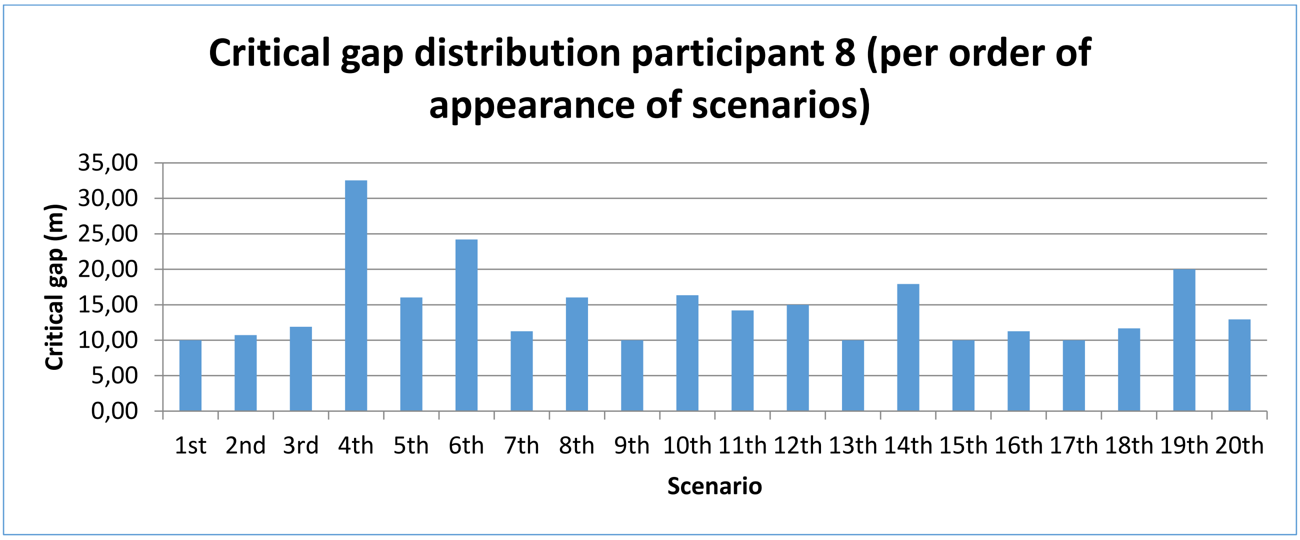

Critical gap distribution participant 3 (per order of appearance of scenarios)
Critical gap (m)
35
30
25
20
15
10
5
0
1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th
Scenario

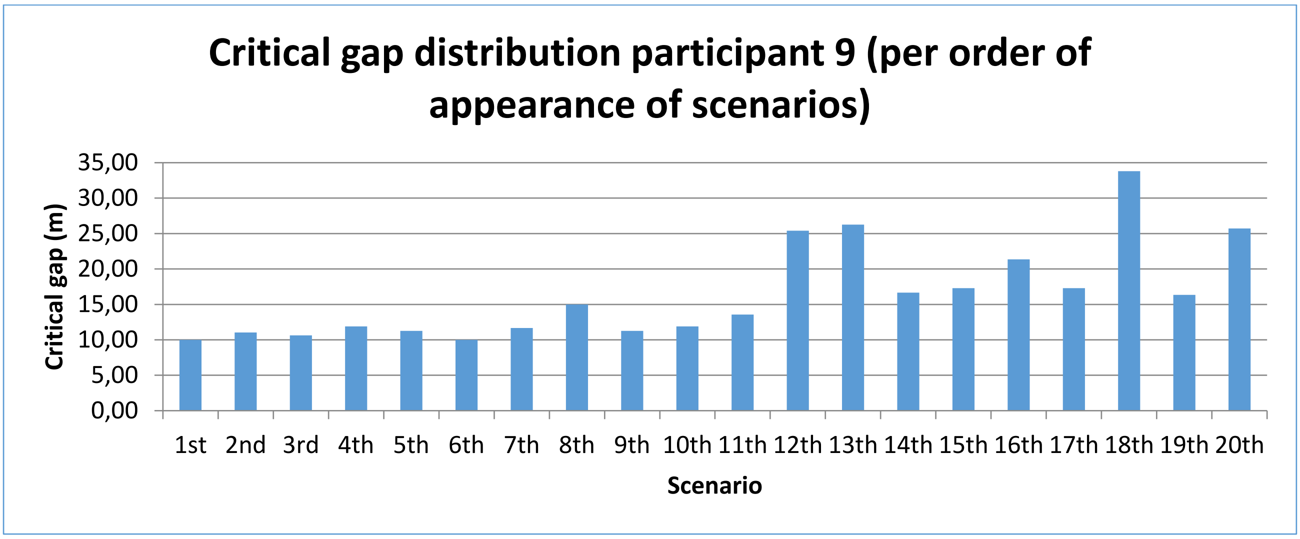

Critical gap distribution participant 4 (per order of appearance of scenarios)

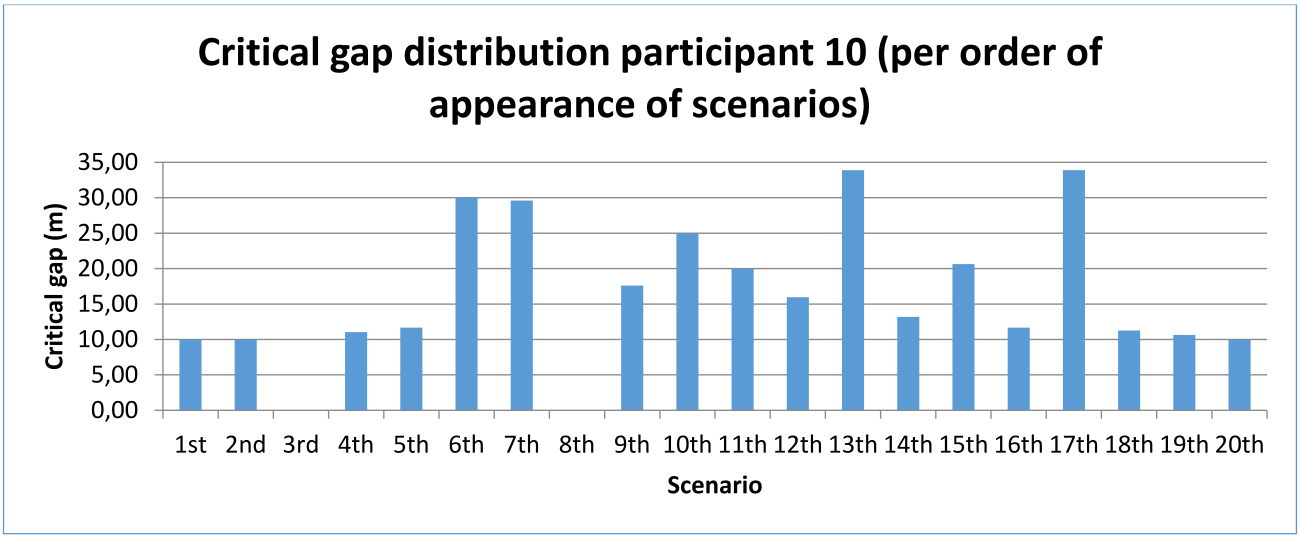

Critical gap distribution participant 5 (per order of appearance of scenarios)

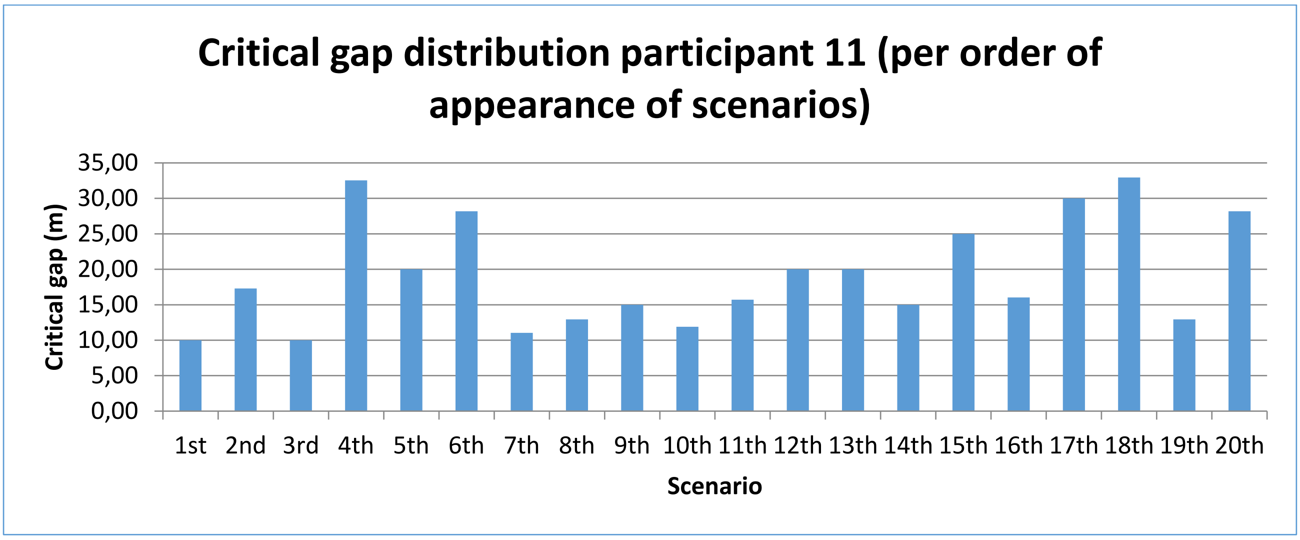

Critical gap distribution participant 6 (per order of appearance of scenarios)

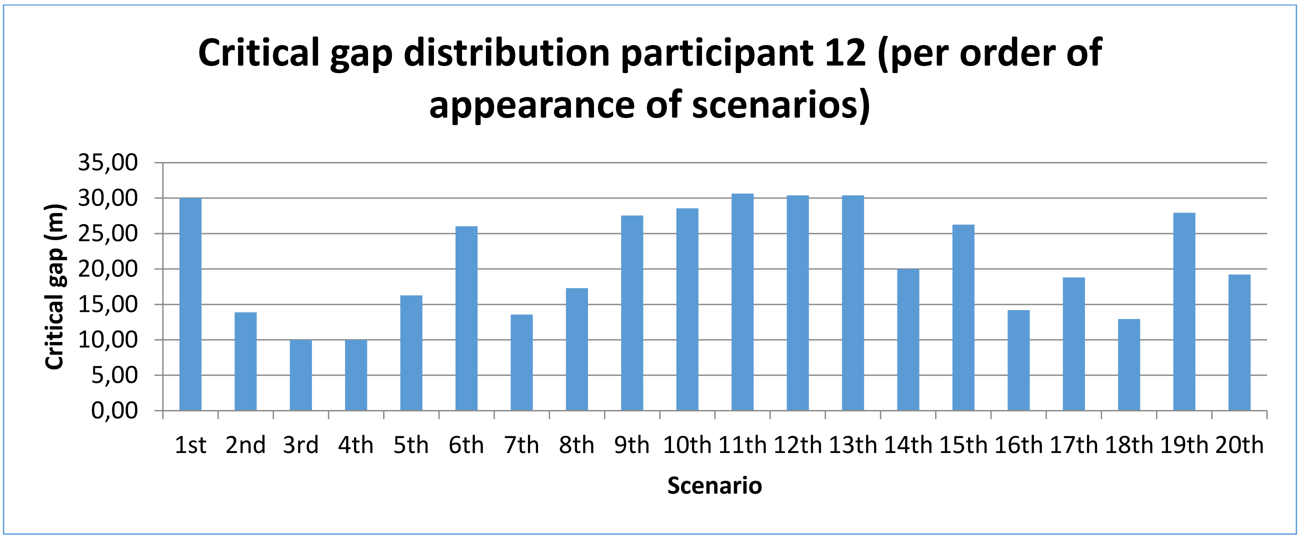

Critical gap distribution participant 7 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario

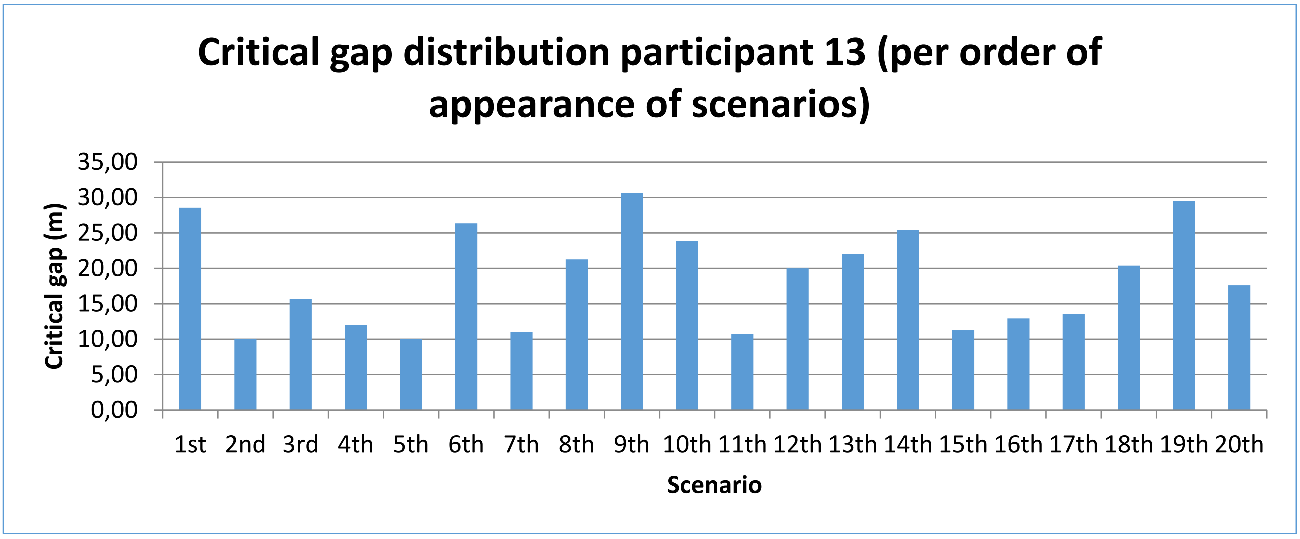

Critical gap distribution participant 8 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario


Critical gap distribution participant 9 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario

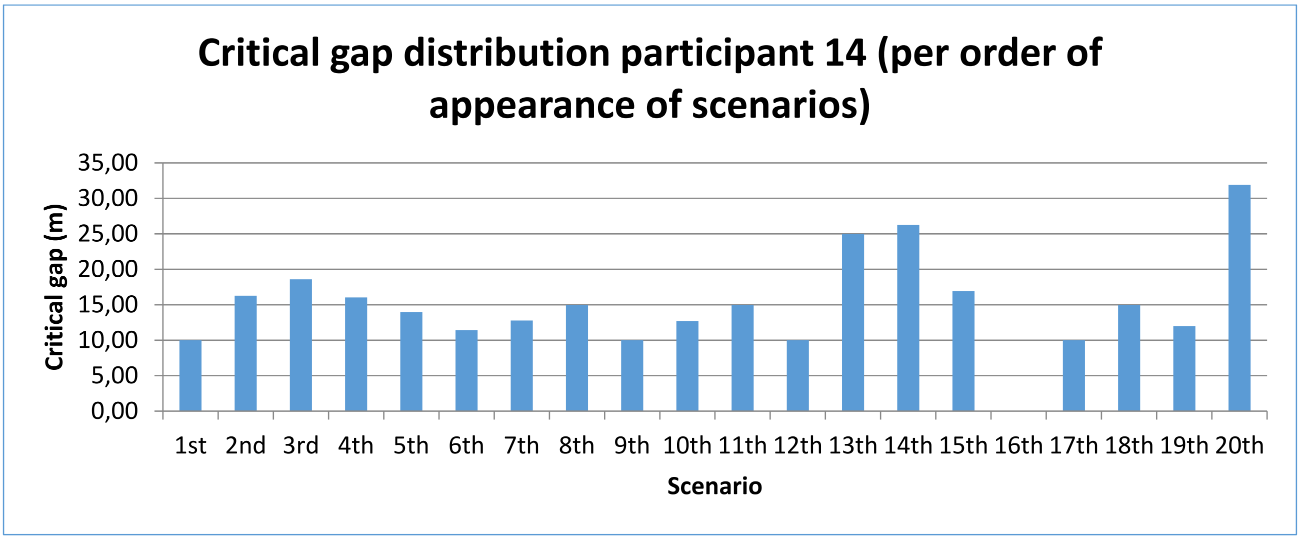

Critical gap distribution participant 10 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario


Critical gap distribution participant 11 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario

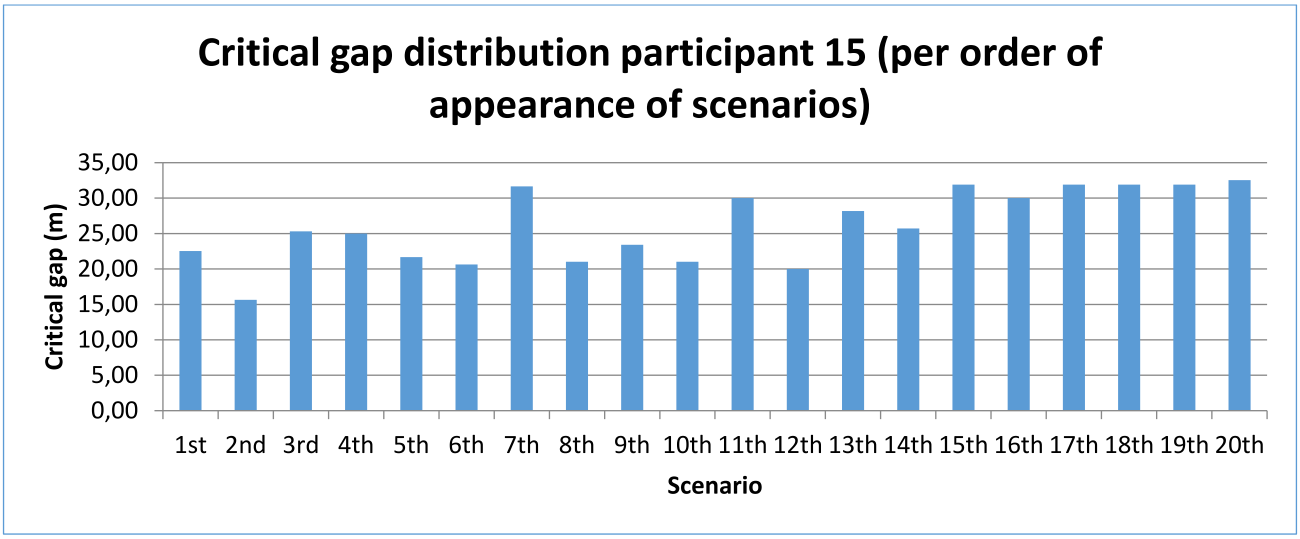

Critical gap distribution participant 12 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario



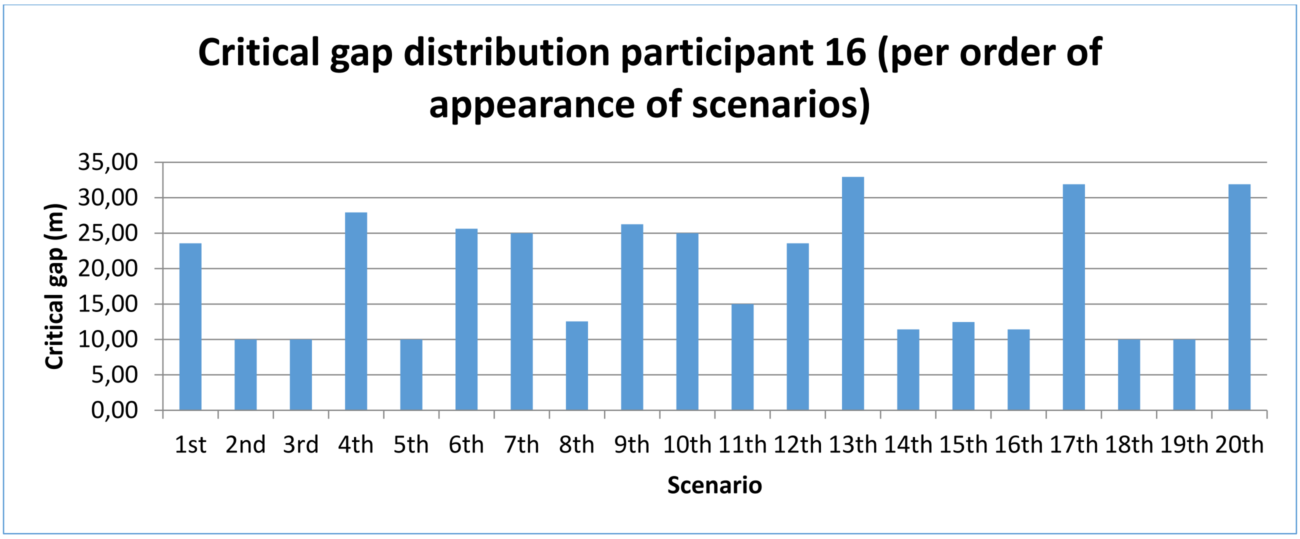
Critical gap distribution participant 13 (per order of appearance of scenarios)

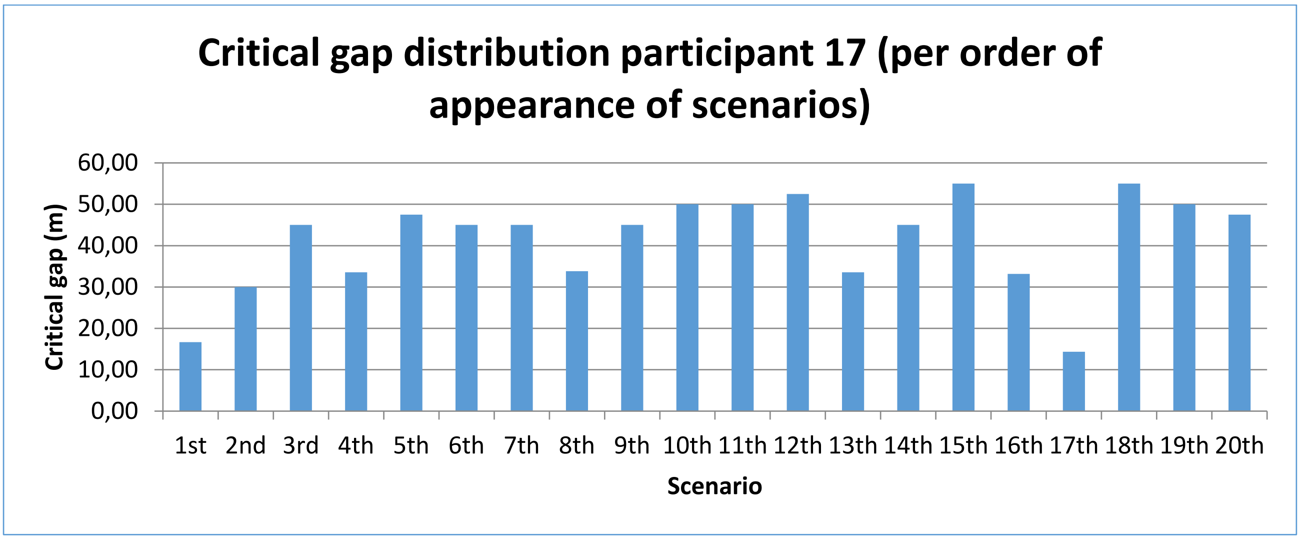


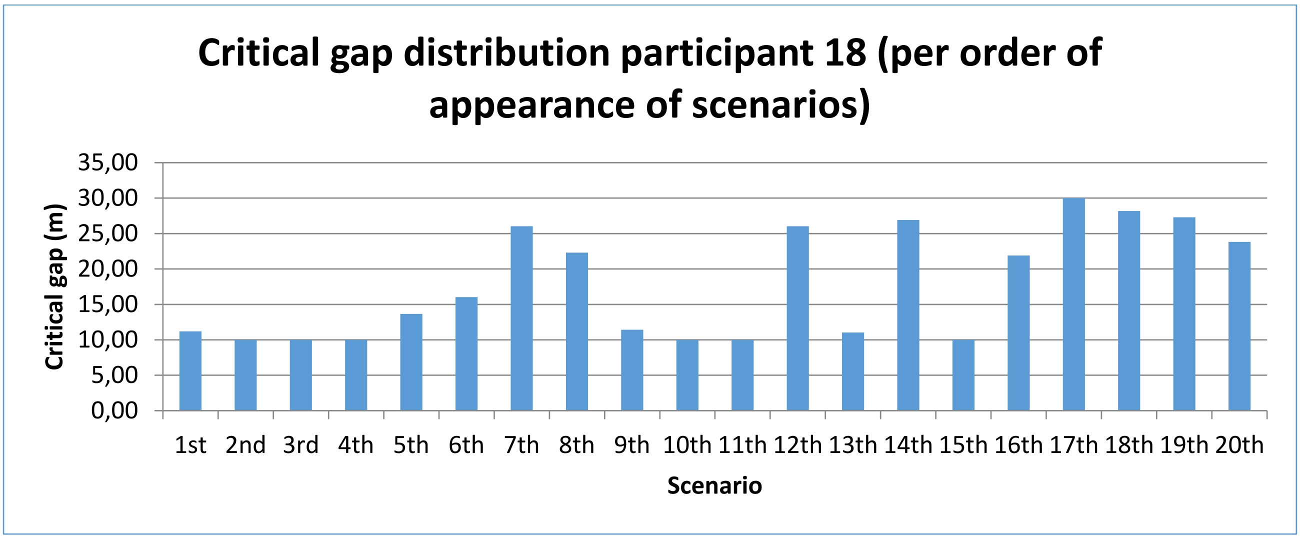
Critical gap distribution participant 14 (per order of appearance of scenarios)

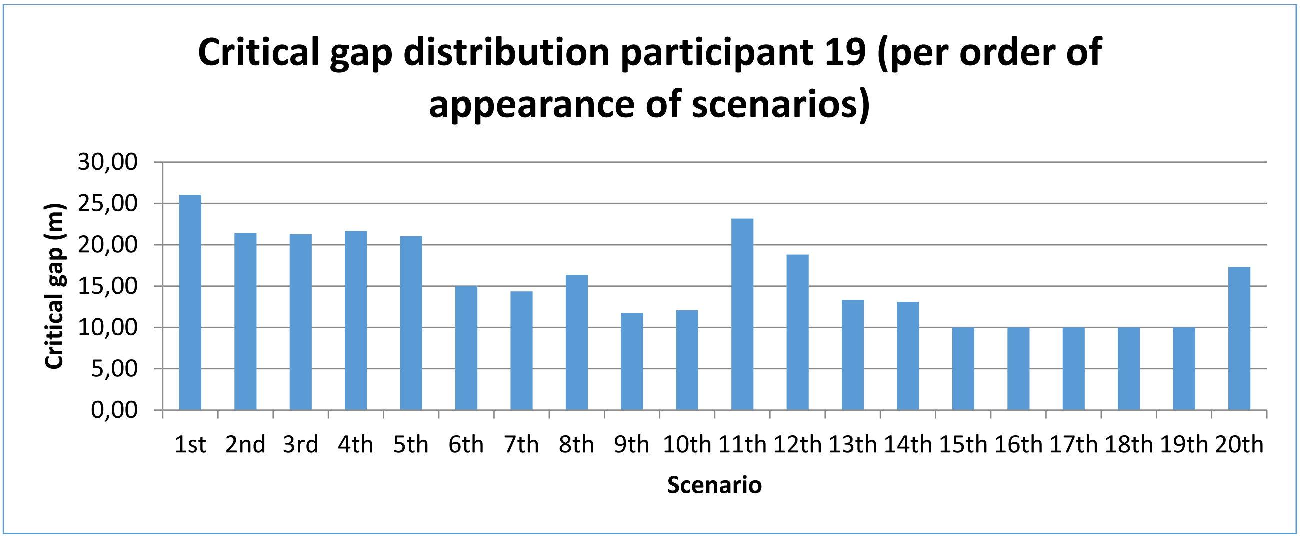


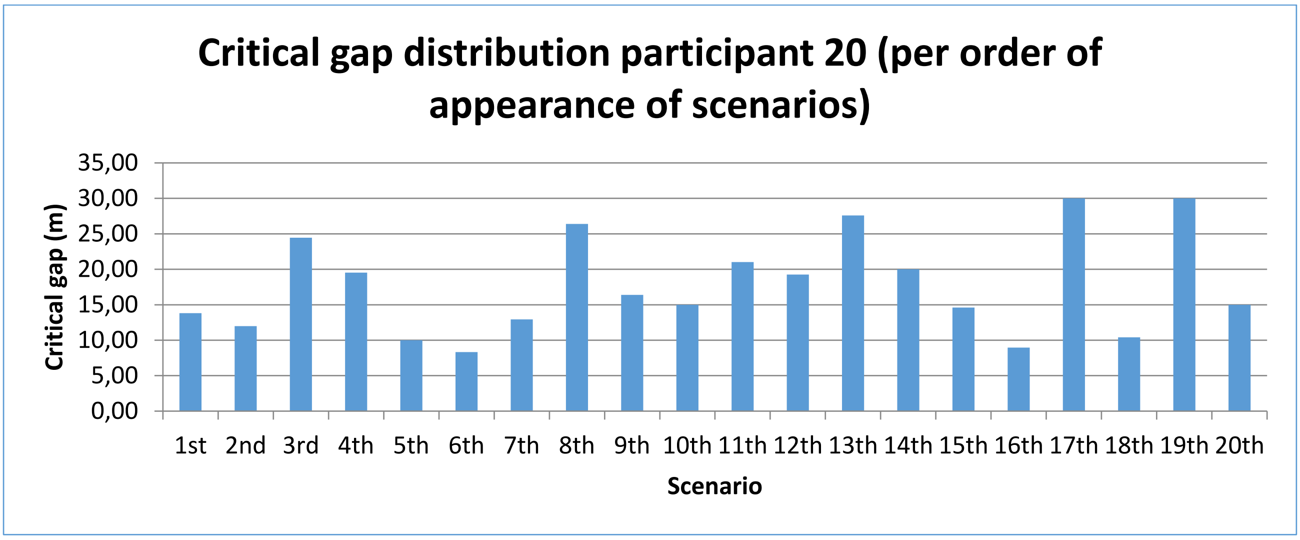
Critical gap distribution participant 15 (per order of appearance of scenarios)

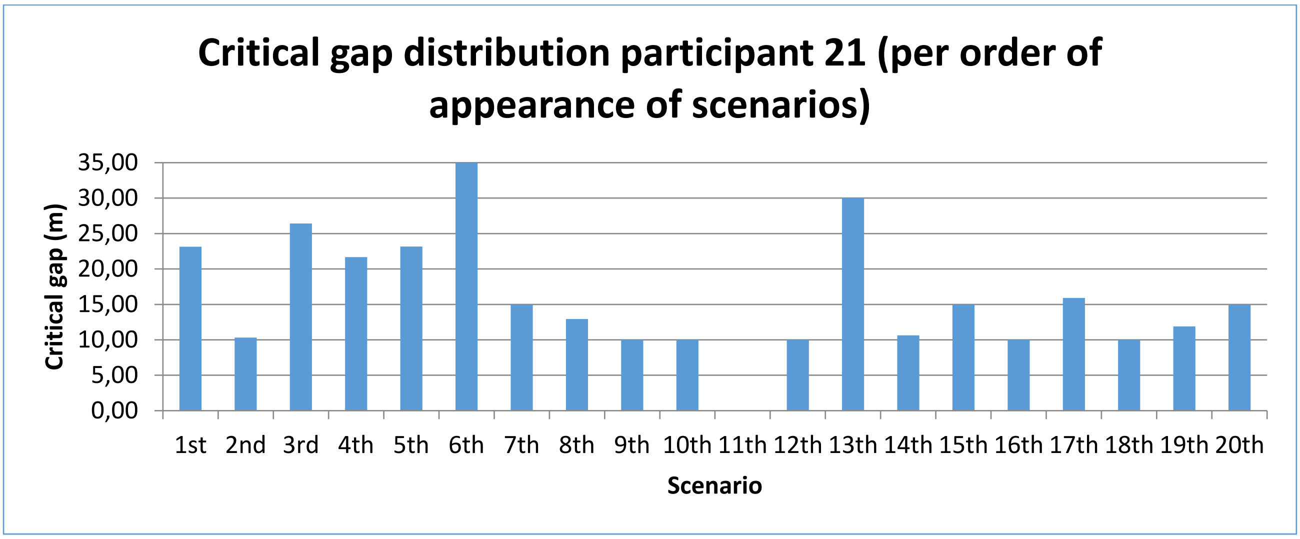

Critical gap distribution participant 16 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario

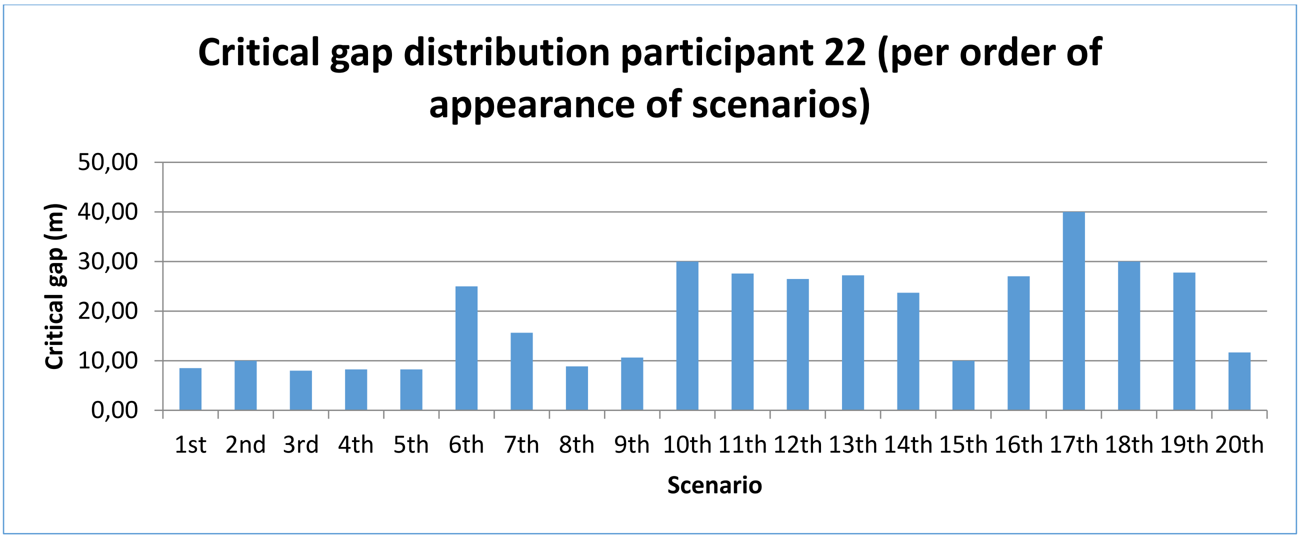

Critical gap distribution participant 17 (per order of appearance of scenarios)
Critical gap (m)
60,00
50,00
40,00
30,00
20,00
10,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario

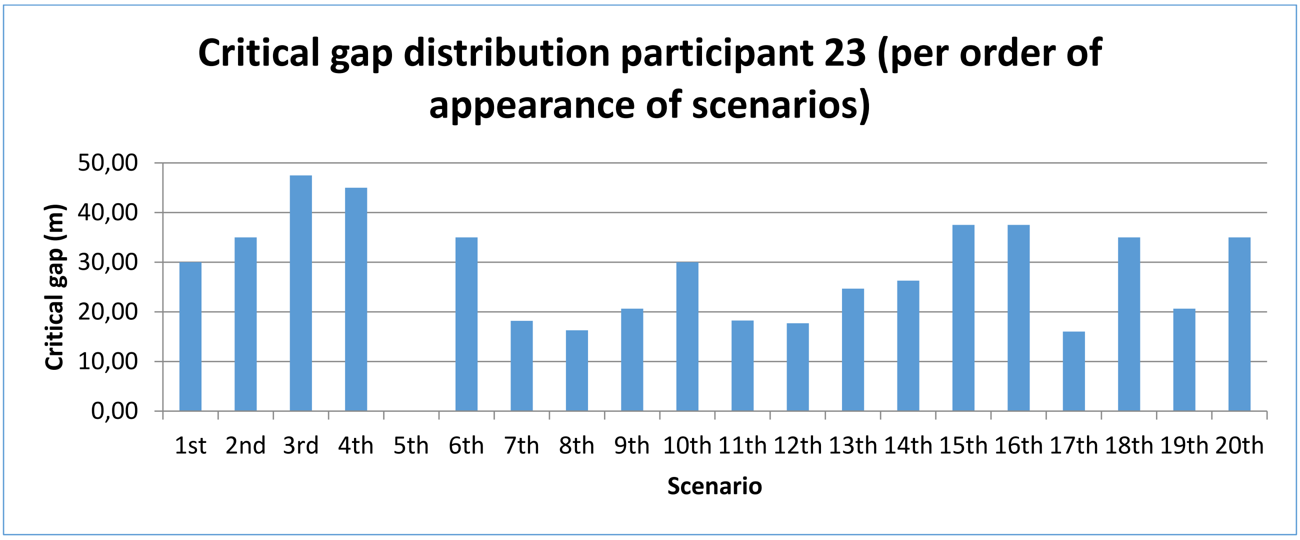

Critical gap distribution participant 18 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario

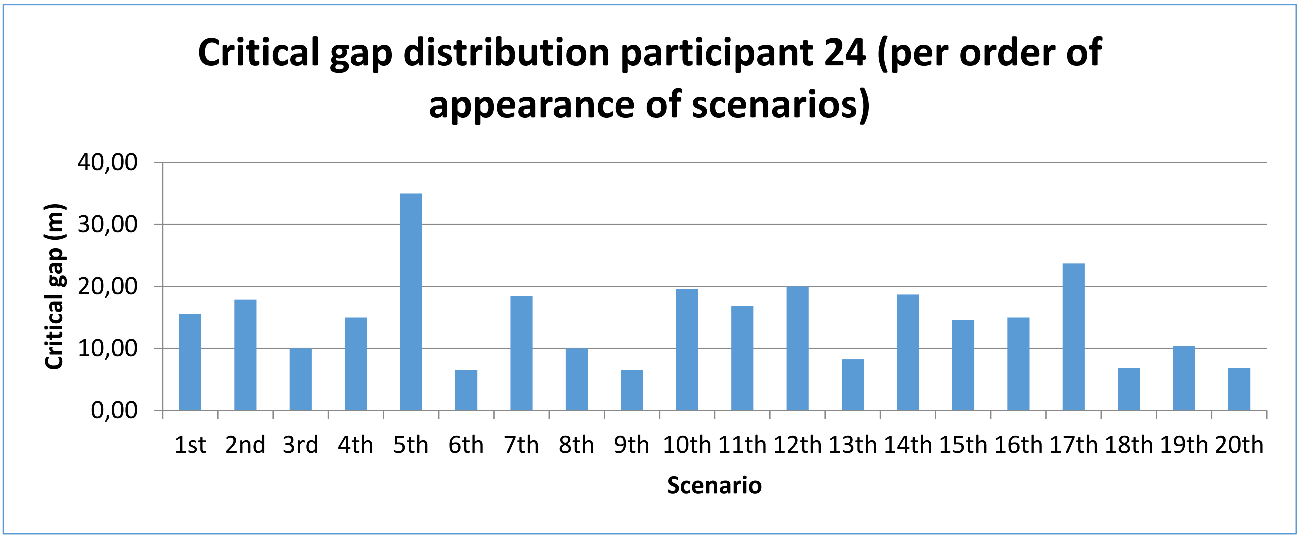

Critical gap distribution participant 19 (per order of appearance of scenarios)
Critical gap (m)
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th
Scenario


Critical gap distribution participant 20 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th
Scenario


Critical gap distribution participant 21 (per order of appearance of scenarios)
Critical gap (m)
35,00
30,00
25,00
20,00
15,00
10,00
5,00
0,00
1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th
Scenario

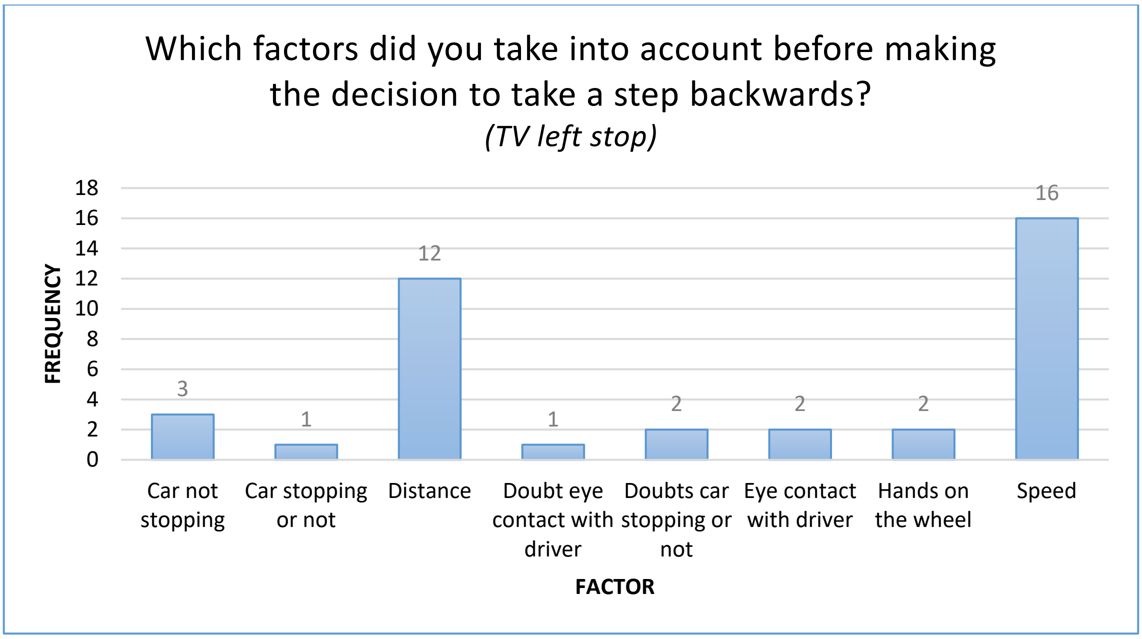

Critical gap distribution participant 22 (per order of appearance of scenarios)
Critical gap (m)
50,00
40,00
30,00
20,00
10,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario

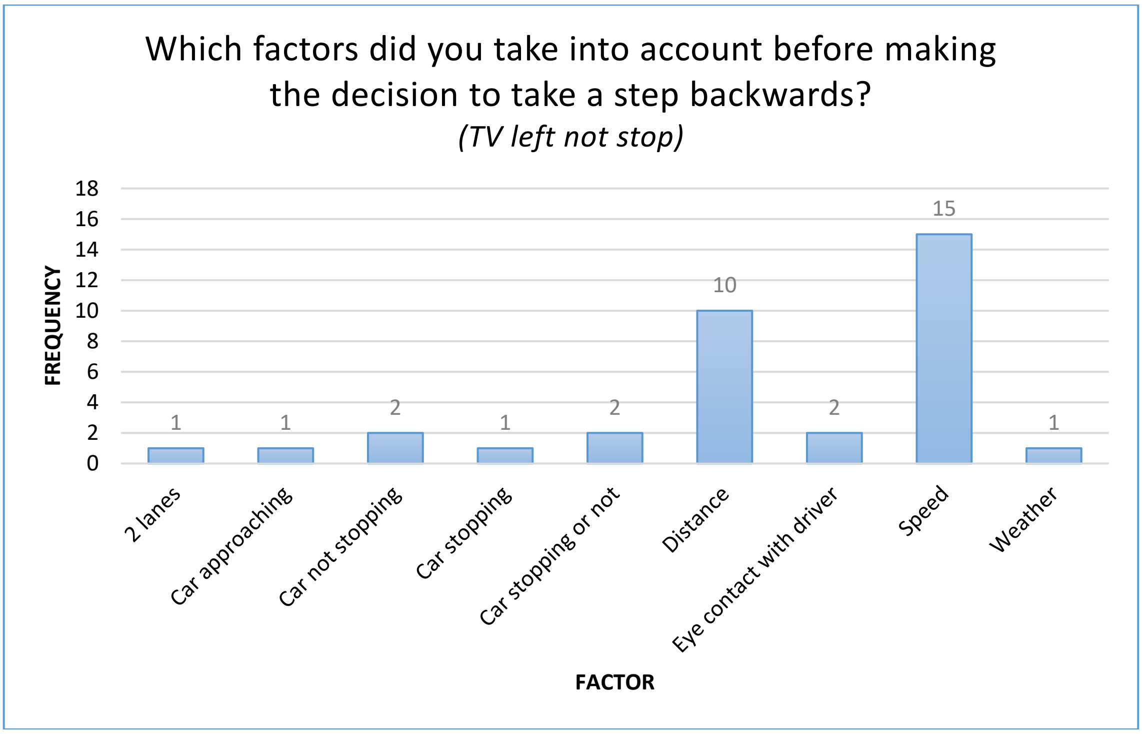

Critical gap distribution participant 23 (per order of appearance of scenarios)
Critical gap (m)
50,00
40,00
30,00
20,00
10,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario

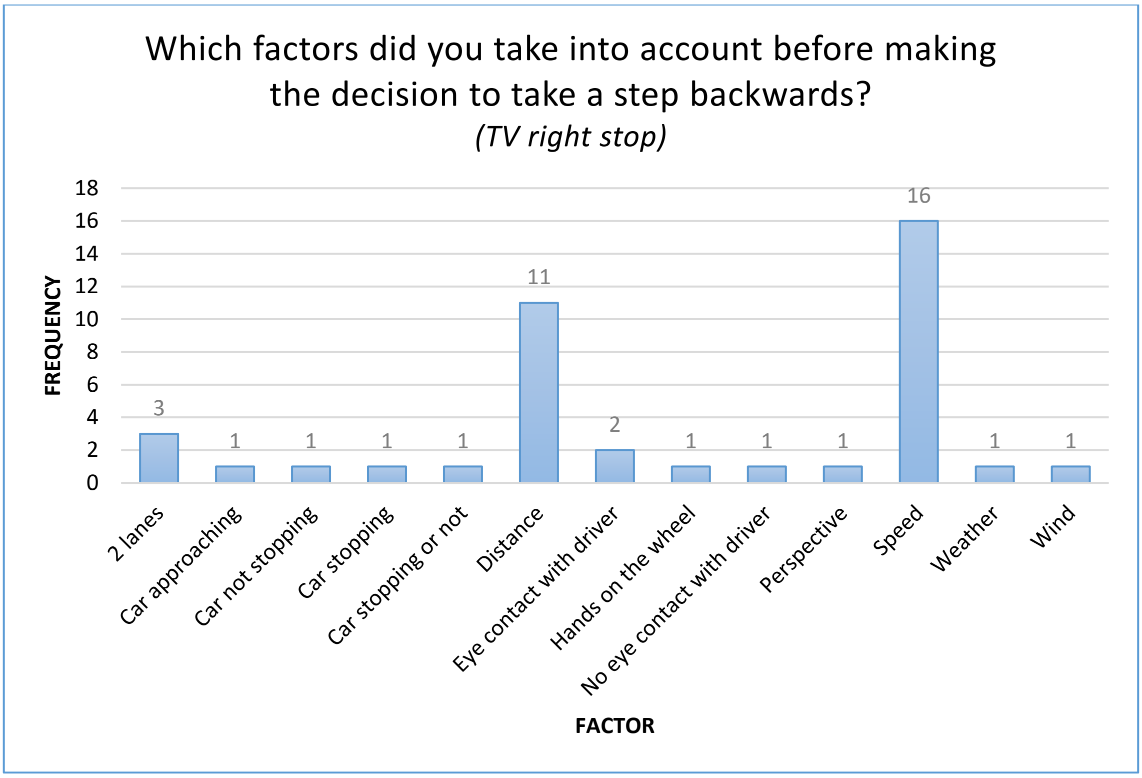

Critical gap distribution participant 24 (per order of appearance of scenarios)
Critical gap (m)
40,00
30,00
20,00
10,00
0,00
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th
Scenario

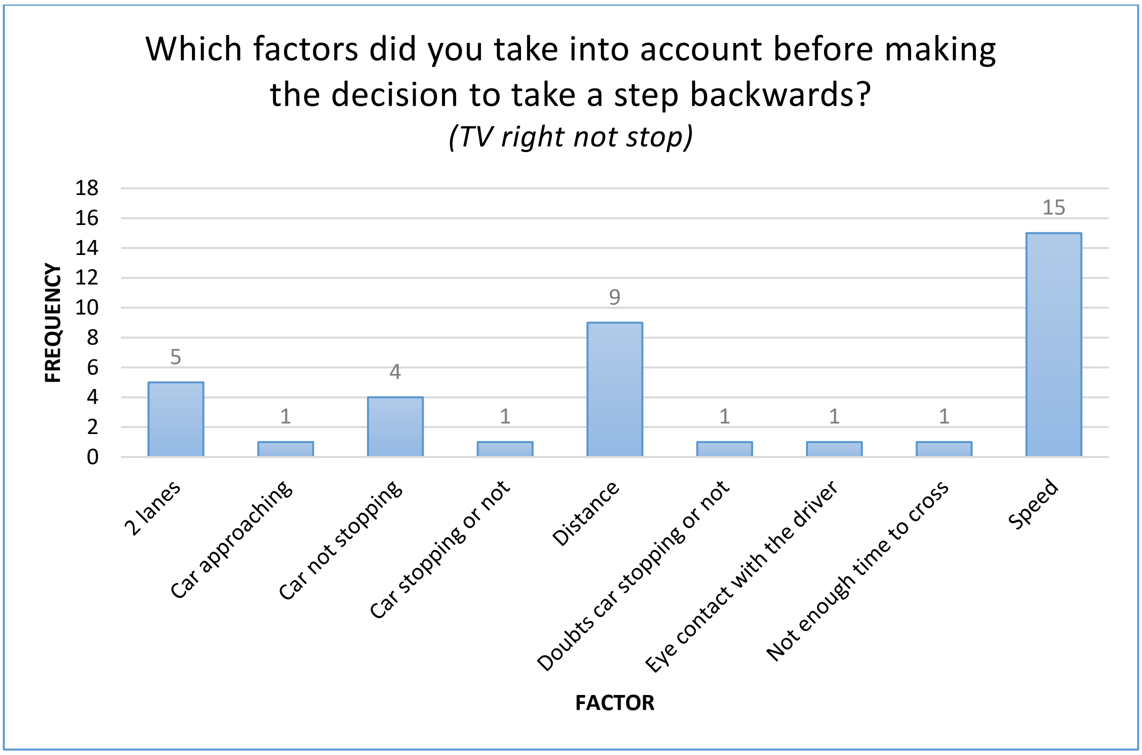
M

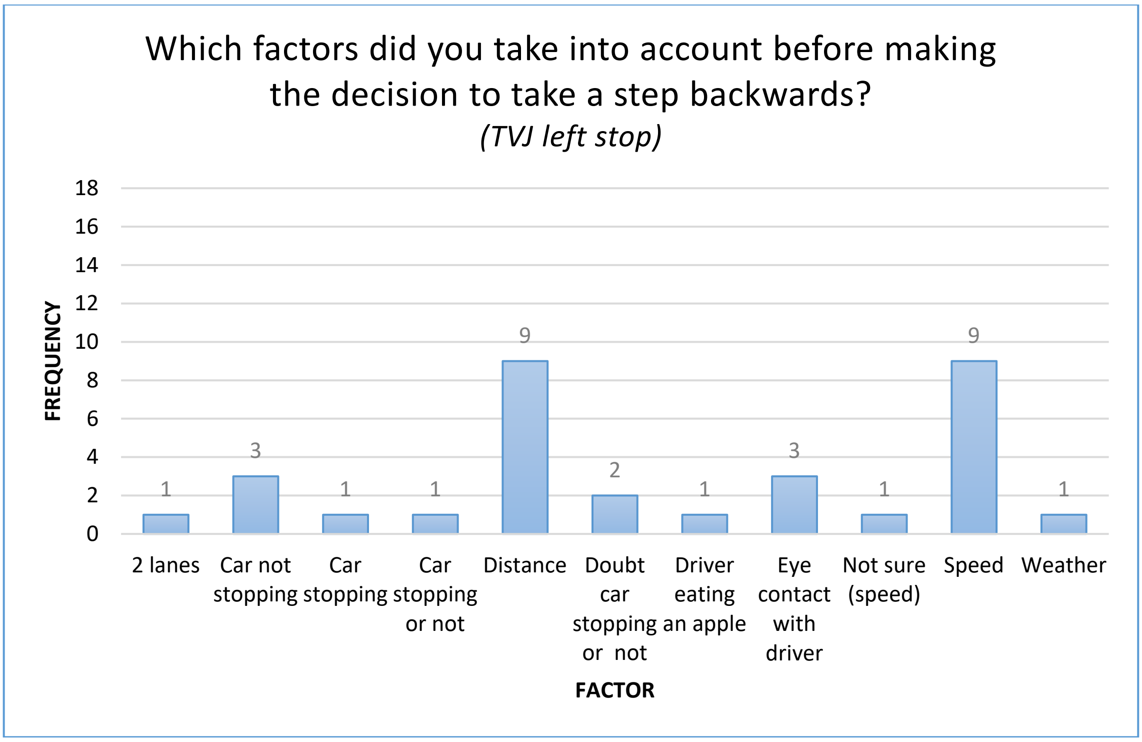
Factors taken into account before making the decision to take a step backwards, per scenario (Final experiment)


Which factors did you take into account before making the decision to take a step backwards?
(TV left stop)
FREQUENCY
0
2
4
6
8
10
12
14
16
18
3
1
12
1
2
2
2
16
Car not stopping
Car stopping or not
Distance
Doubt eye contact with driver
Doubts car stopping or not
Eye contact with driver
Hands on the wheel
Speed
FACTOR


Which factors did you take into account before making the decision to take a step backwards?
(TV left not stop)
FREQUENCY
0
2
4
6
8
10
12
14
16
18
1
1
2
1
2
10
2
15
1
2 lanes
Car approaching
Car not stopping
Car stopping
Car stopping or not
Distance
Eye contact with driver
Speed
Weather
FACTOR

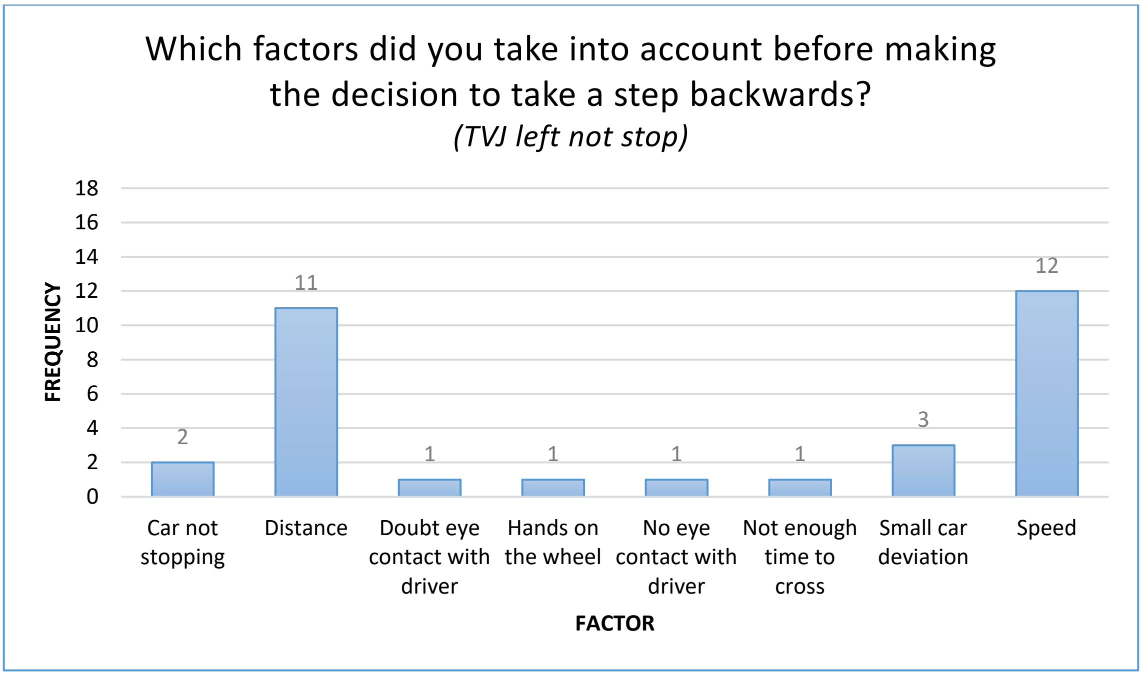

Which factors did you take into account before making the decision to take a step backwards?
(TV right stop)
FREQUENCY
18
16
14
12
10
8
6
4
2
0
3
1
1
1
1
11
2
1
1
1
16
1
1
2 lanes
Car approaching
Car not stopping
Car stopping
Car stopping or not
Distance
Eye contact with driver
Hands on the wheel
No eye contact with driver
Perspective
Speed
Weather
Wind
FACTOR


Which factors did you take into account before making the decision to take a step backwards?
(TV right not stop)
FREQUENCY
18
16
14
12
10
8
6
4
2
0
5
1
4
1
9
1
1
1
15
2 lanes
Car approaching
Car not stopping
Car stopping or not
Distance
Doubts car stopping or not
Eye contact with the driver
Not enough time to cross
Speed
FACTOR



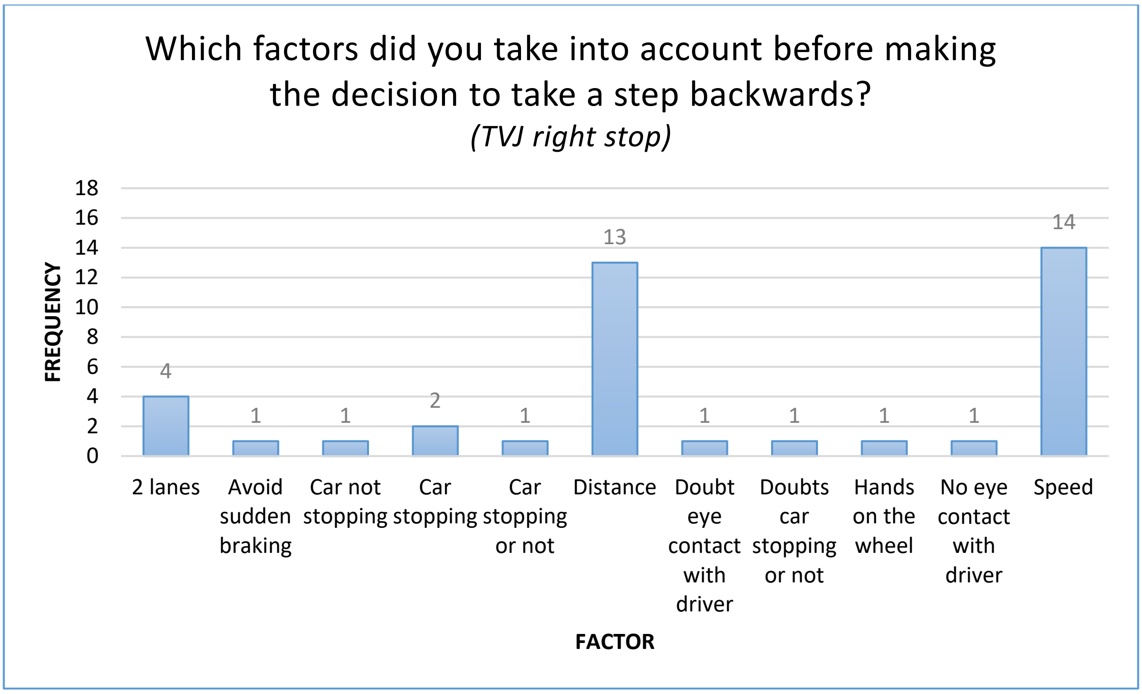
Which factors did you take into account before making the decision to take a step backwards?

(TVJ left stop)



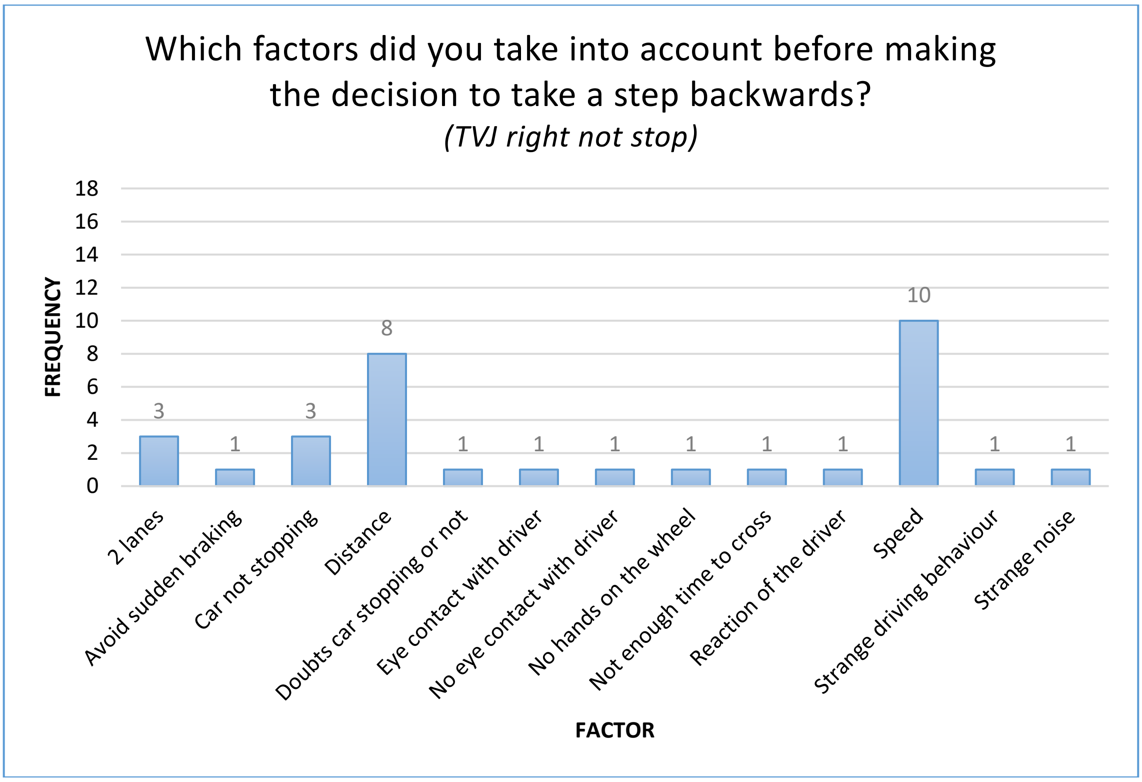
Which factors did you take into account before making the decision to take a step backwards?

(TVJ left not stop)



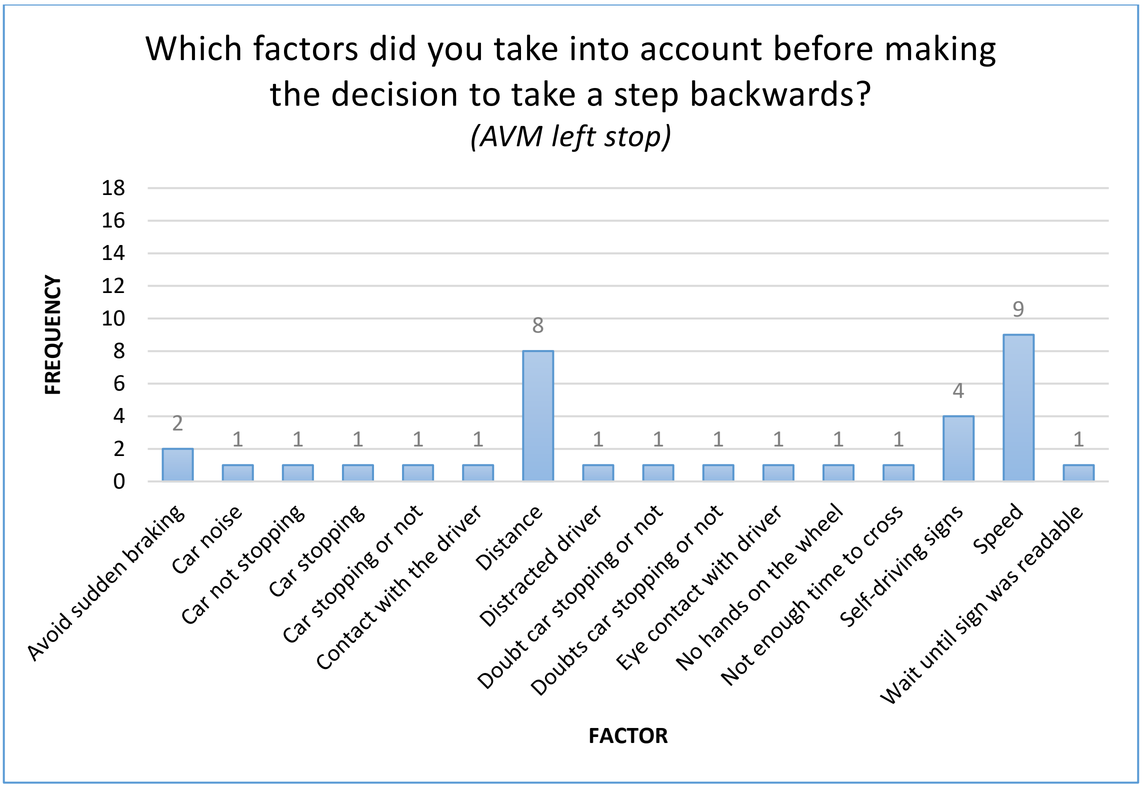
Which factors did you take into account before making the decision to take a step backwards?

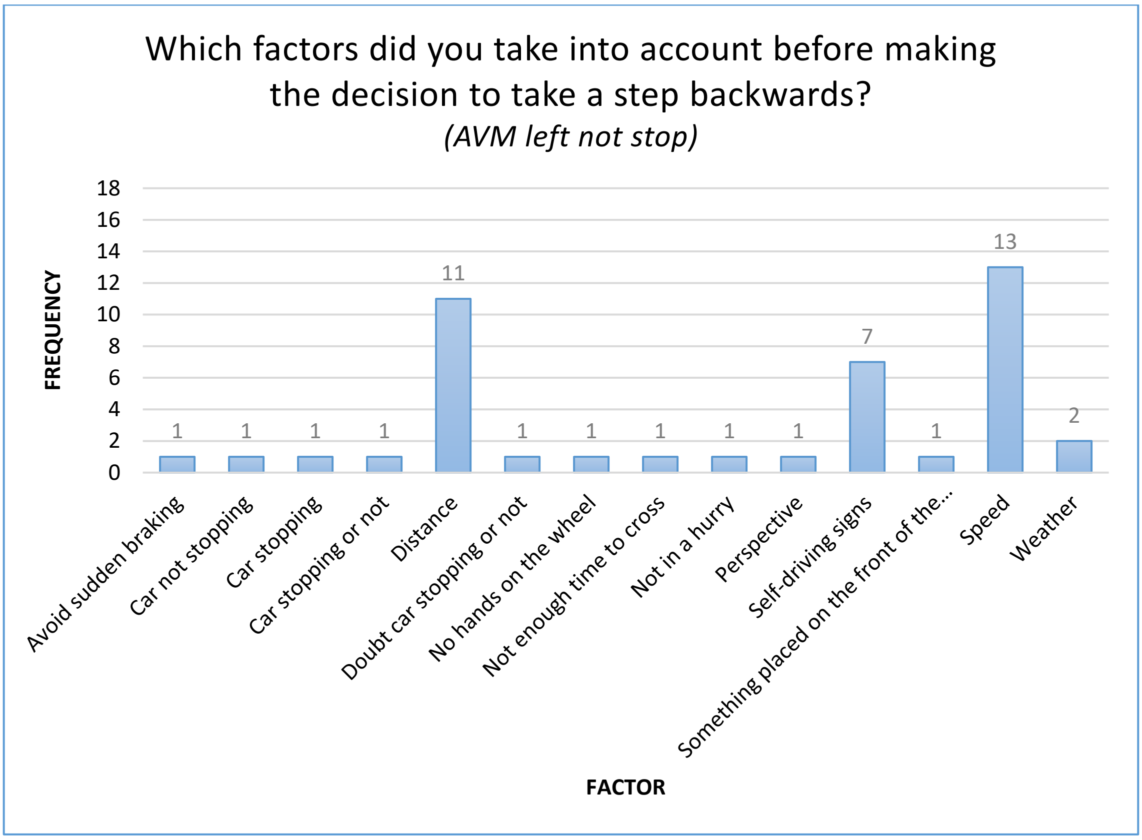
(TVJ right stop)

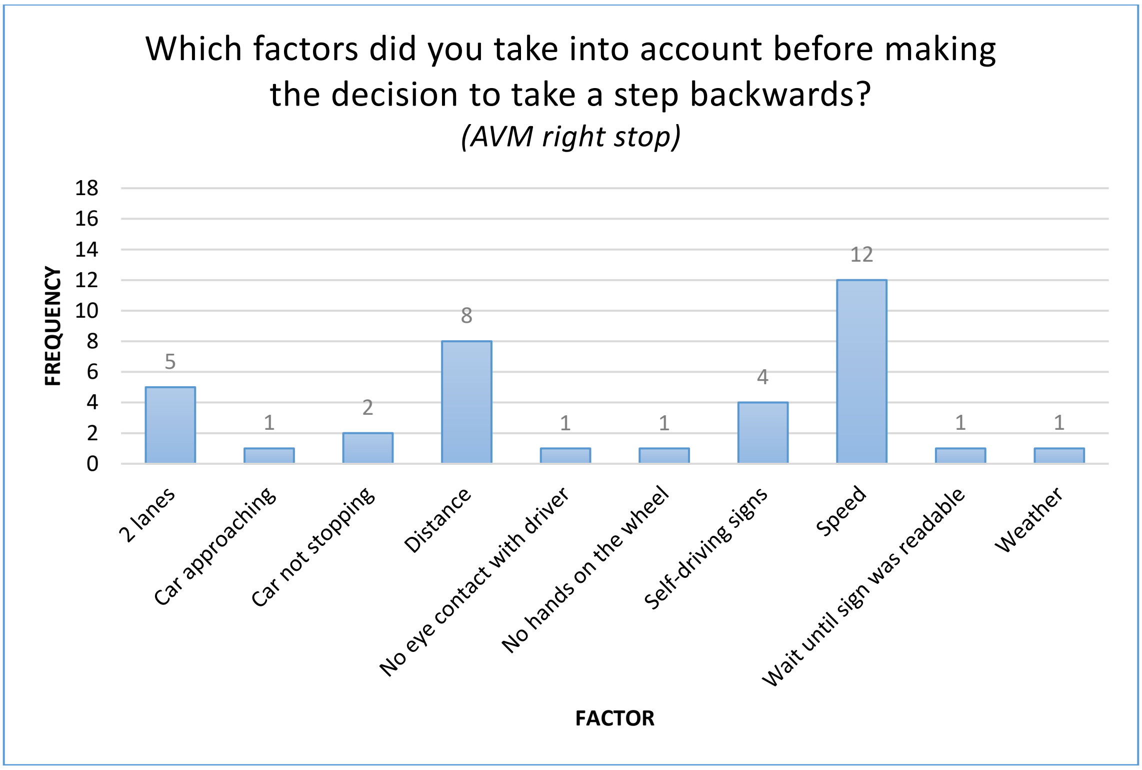


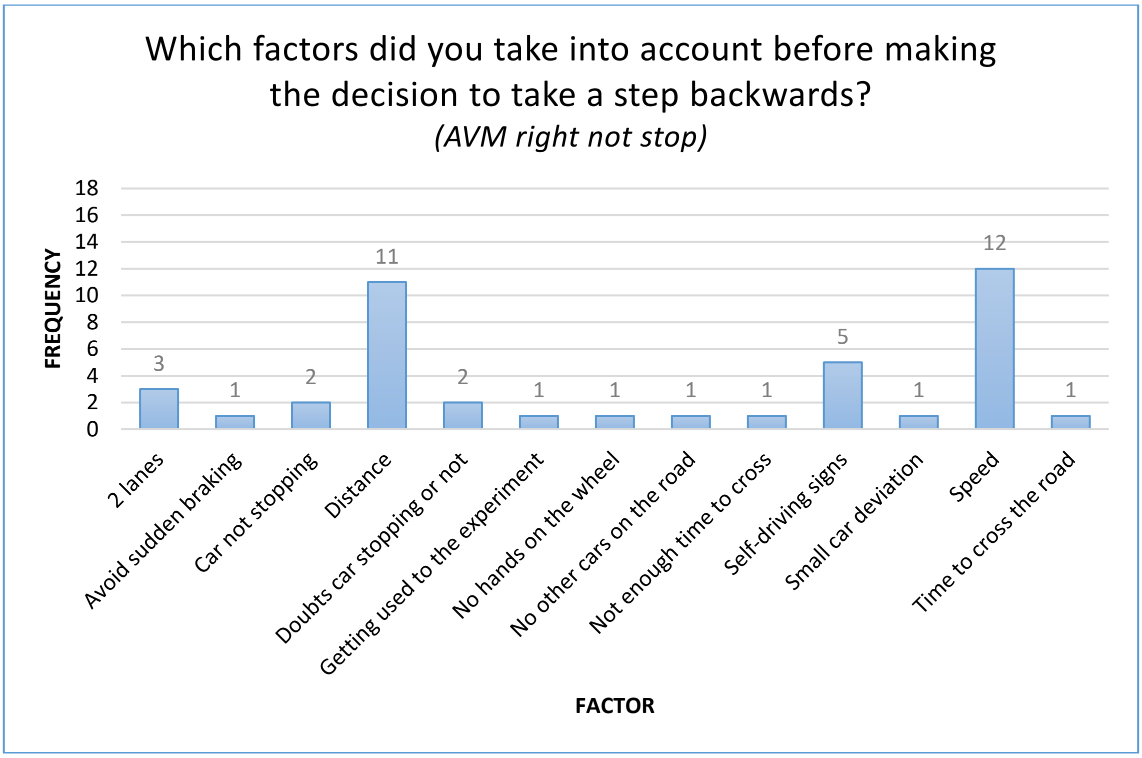
Which factors did you take into account before making the decision to take a step backwards?

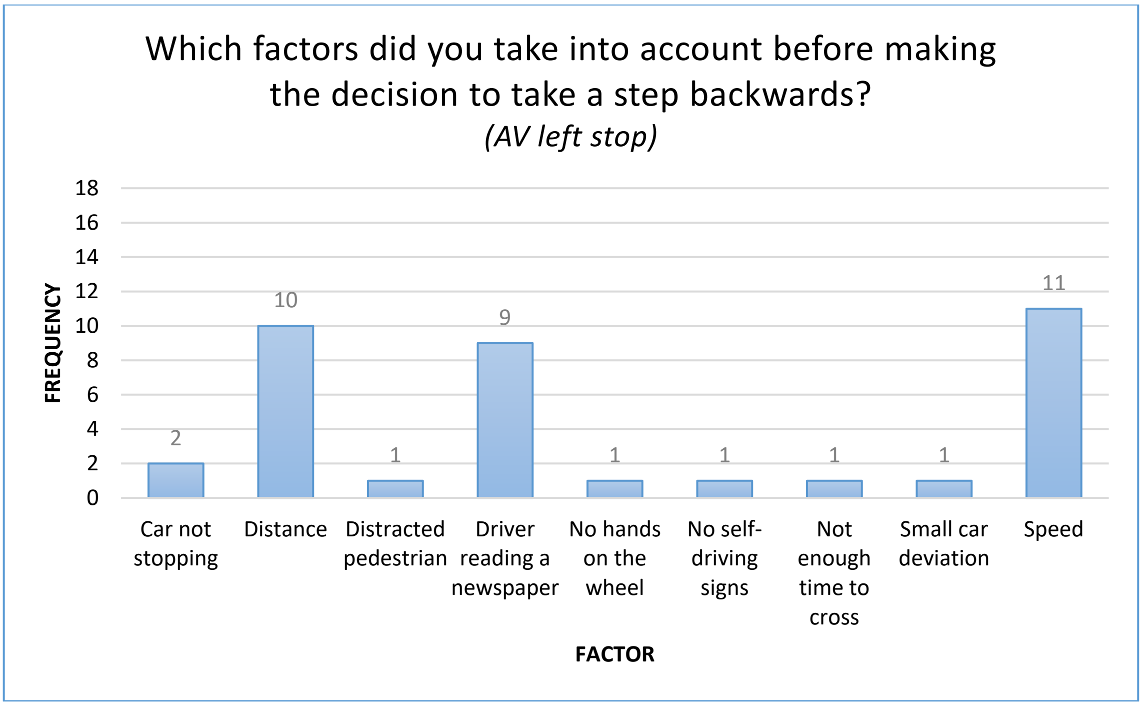
(TVJ right not stop)

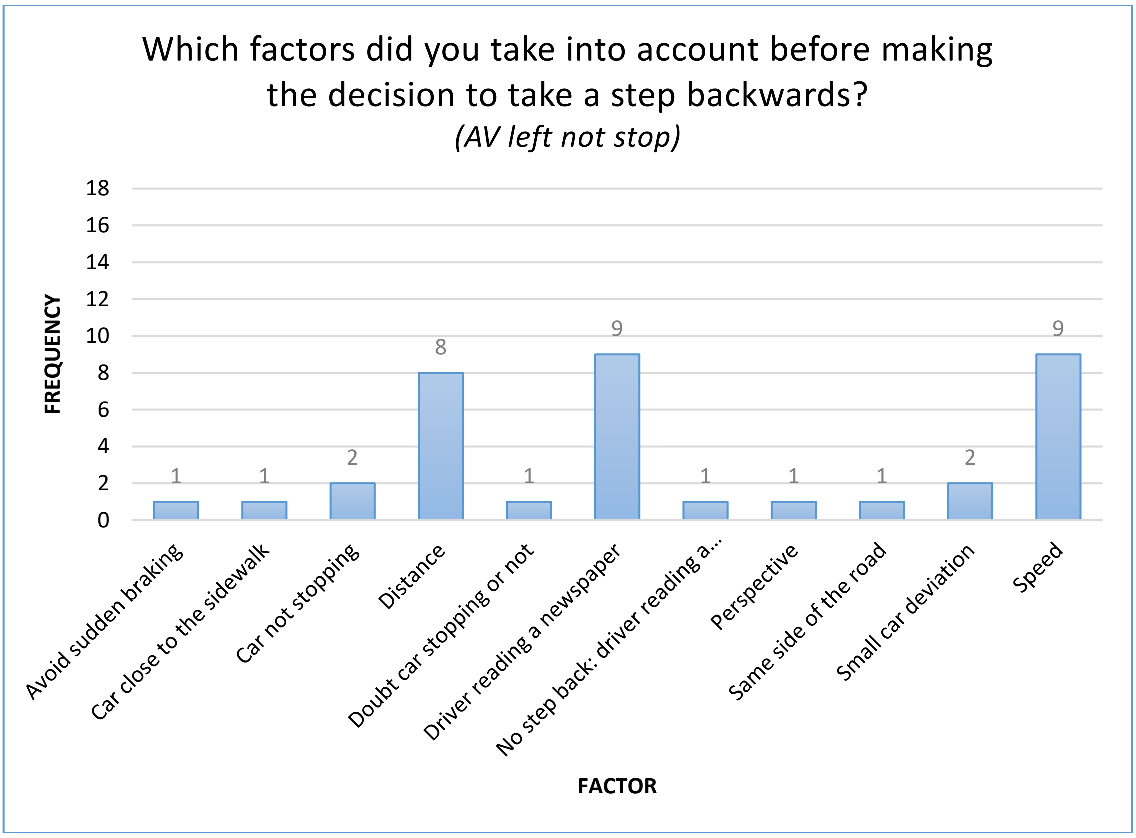

Which factors did you take into account before making the decision to take a step backwards?
(AVM left stop)
FREQUENCY
0
2
4
6
8
10
12
14
16
18
Avoid sudden braking 2
Car noise 1
Car not stopping 1
Car stopping 1
Car stopping or not 1
Contact with the driver 1
Distance 8
Distracted driver 1
Doubt car stopping or not 1
Doubts car stopping or not 1
Eye contact with driver 1
No hands on the wheel 1
Not enough time to cross 1
Self-driving signs 4
Speed 9
Wait until sign was readable 1
FACTOR

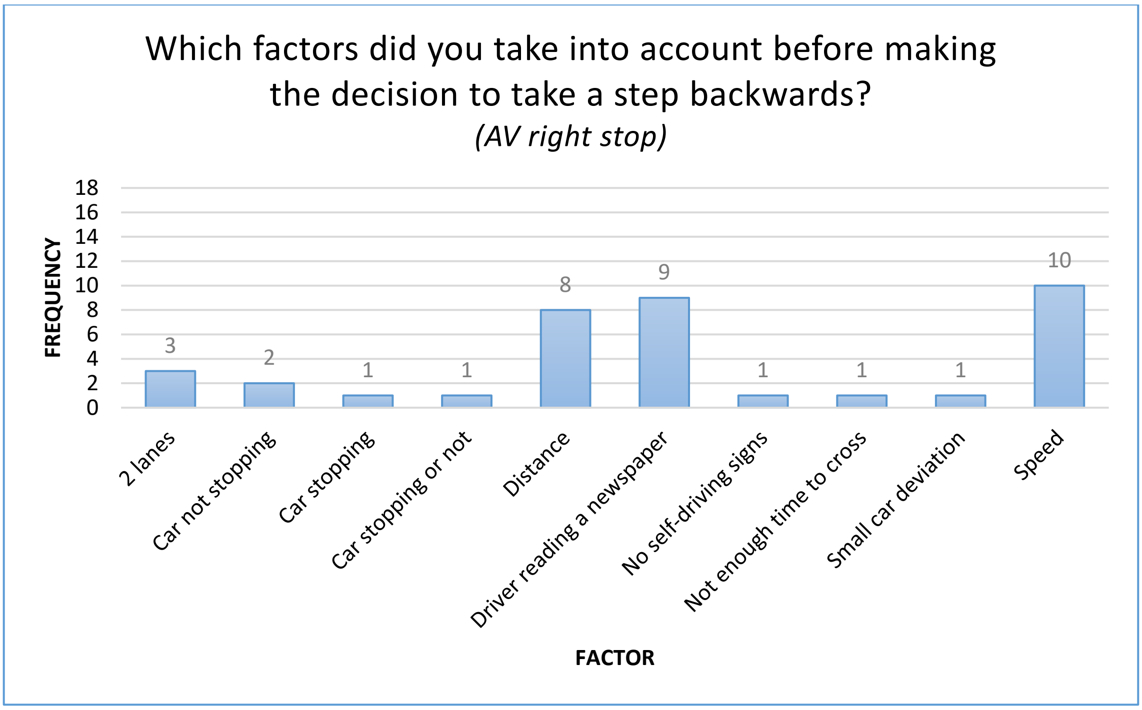

Which factors did you take into account before making the decision to take a step backwards?
(AVM left not stop)
FREQUENCY
0
2
4
6
8
10
12
14
16
18
Avoid sudden braking 1
Car not stopping 1
Car stopping 1
Car stopping or not 1
Distance 11
Doubt car stopping or not 1
No hands on the wheel 1
Not enough time to cross 1
Not in a hurry 1
Perspective 1
Self-driving signs 7
Something placed on the front of the... 1
Speed 13
Weather 2
FACTOR

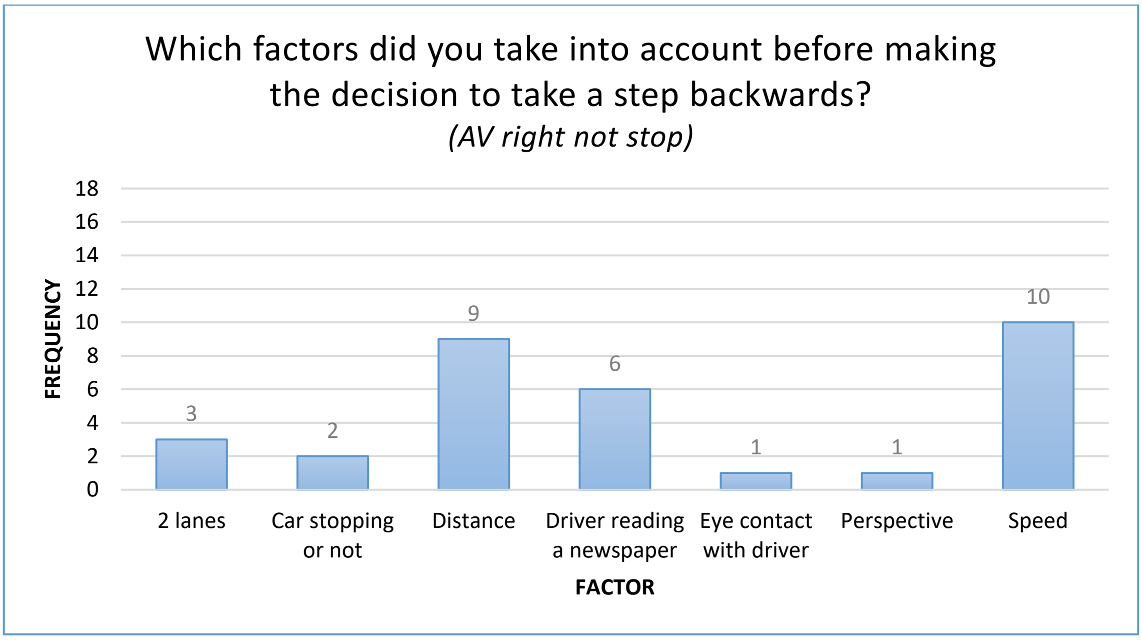

Which factors did you take into account before making the decision to take a step backwards?
(AVM right stop)
FREQUENCY
18
16
14
12
10
8
6
4
2
0
5
1
2
8
1
1
4
12
1
1
2 lanes
Car approaching
Car not stopping
Distance
No eye contact with driver
No hands on the wheel
Self-driving signs
Speed
Wait until sign was readable
Weather
FACTOR

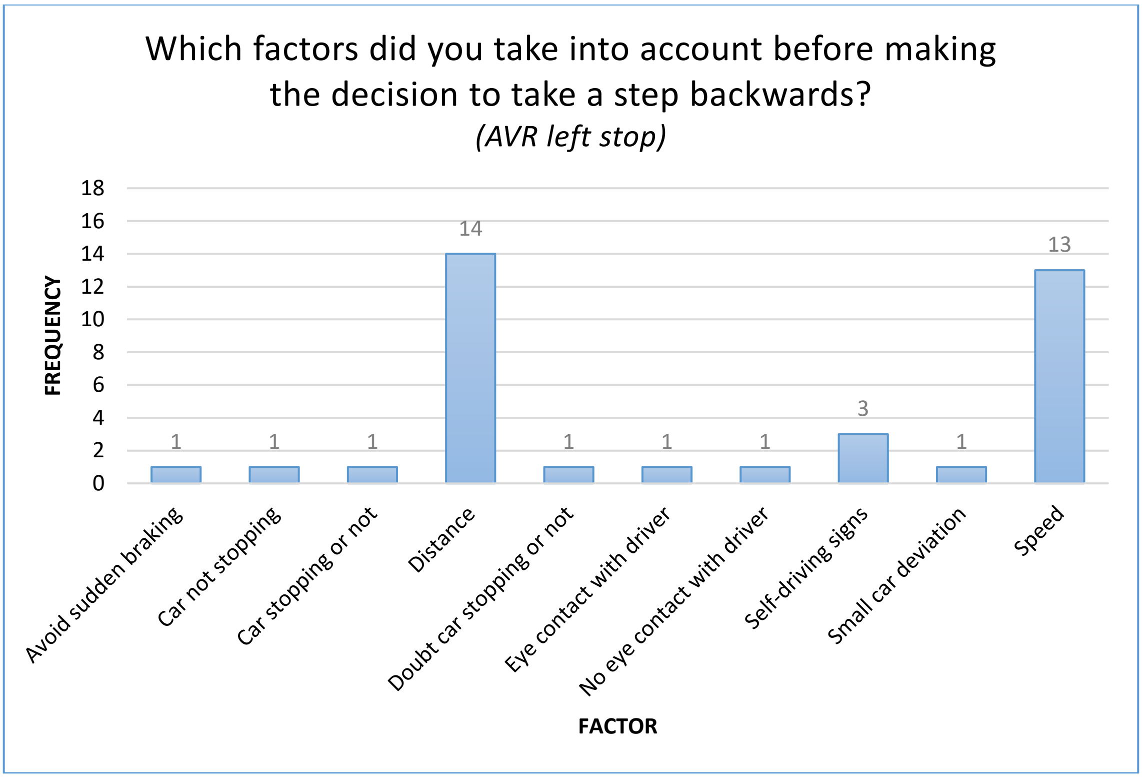

Which factors did you take into account before making the decision to take a step backwards?
(AVM right not stop)
FREQUENCY
18
16
14
12
10
8
6
4
2
0
3
1
2
11
2
1
1
1
1
5
1
12
1
2 lanes
Avoid sudden braking
Car not stopping
Distance
Doubts car stopping or not
Getting used to the experiment
No hands on the wheel
No other cars on the road
Not enough time to cross
Self-driving signs
Small car deviation
Speed
Time to cross the road
FACTOR

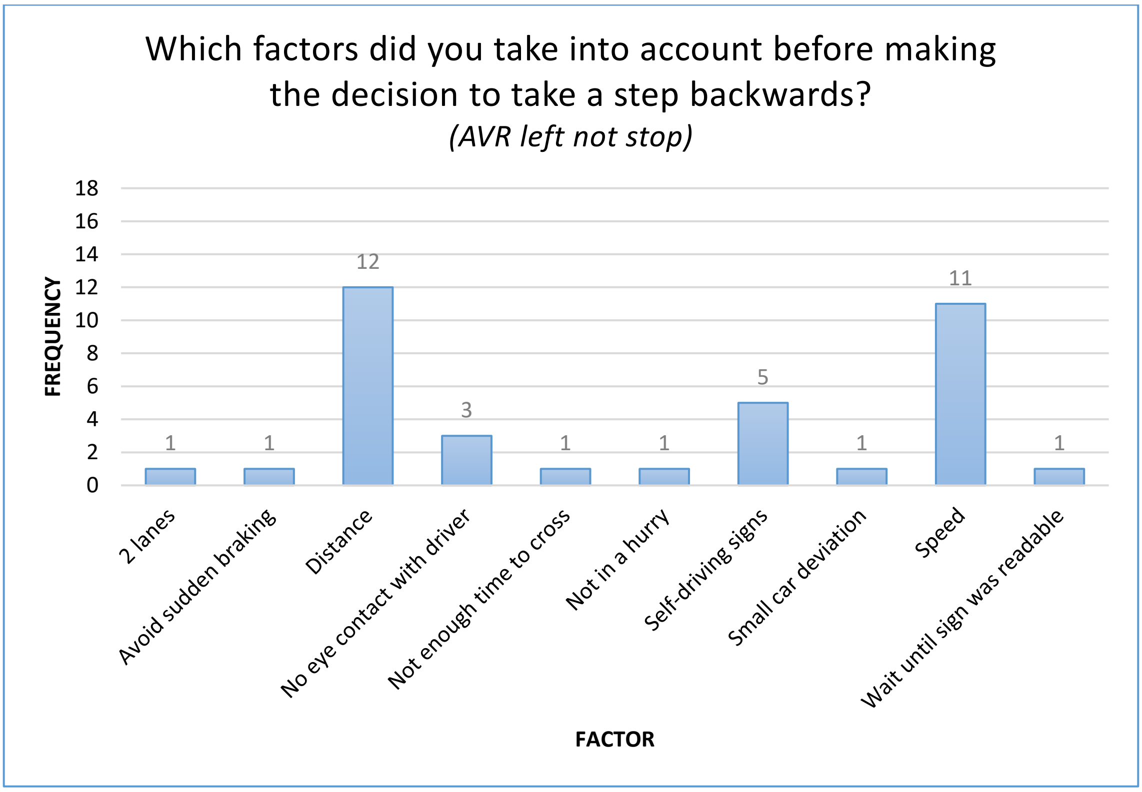

Which factors did you take into account before making the decision to take a step backwards?
(AV left stop)
FREQUENCY
18
16
14
12
10
8
6
4
2
0
2
10
1
9
1
1
1
1
11
Car not stopping
Distance
Distracted pedestrian
Driver reading a newspaper
No hands on the wheel
No self-driving signs
Not enough time to cross
Small car deviation
Speed
FACTOR

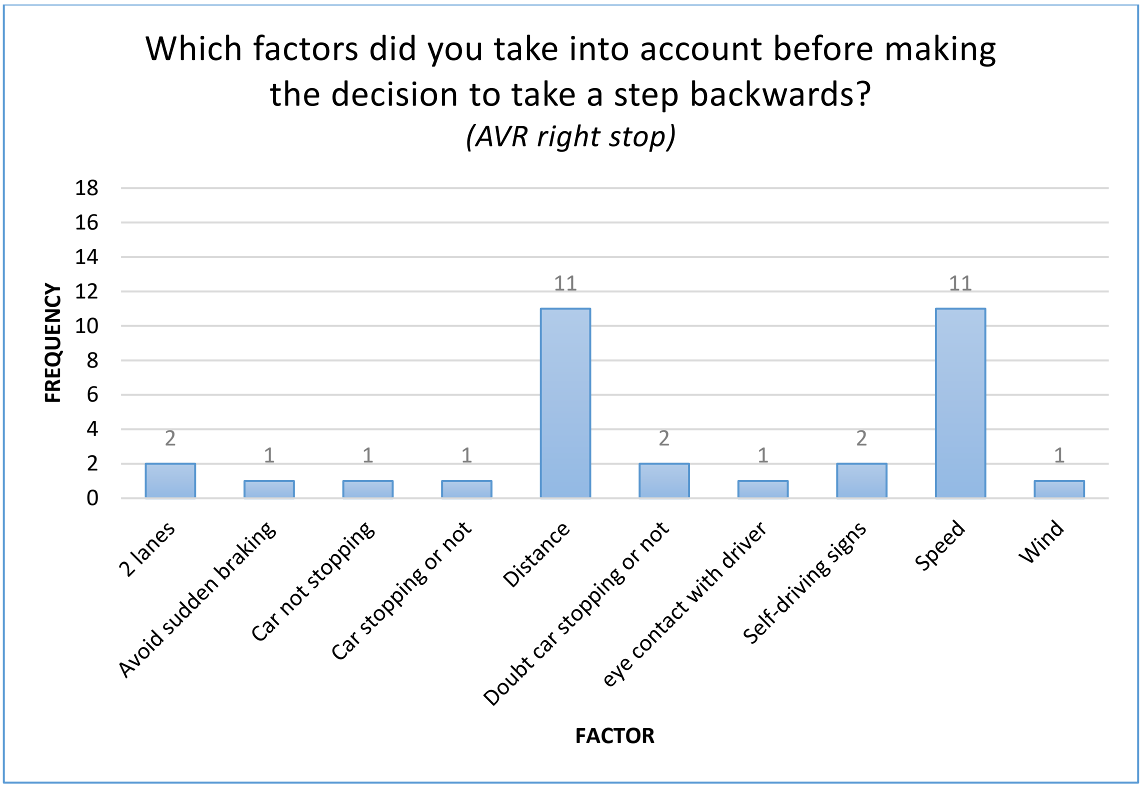

Which factors did you take into account before making the decision to take a step backwards?
(AV left not stop)
FREQUENCY
18
16
14
12
10
8
6
4
2
0
1
1
2
8
1
9
1
1
1
2
9
Avoid sudden braking
Car close to the sidewalk
Car not stopping
Distance
Doubt car stopping or not
Driver reading a newspaper
No step back: driver reading a...
Perspective
Same side of the road
Small car deviation
Speed
FACTOR

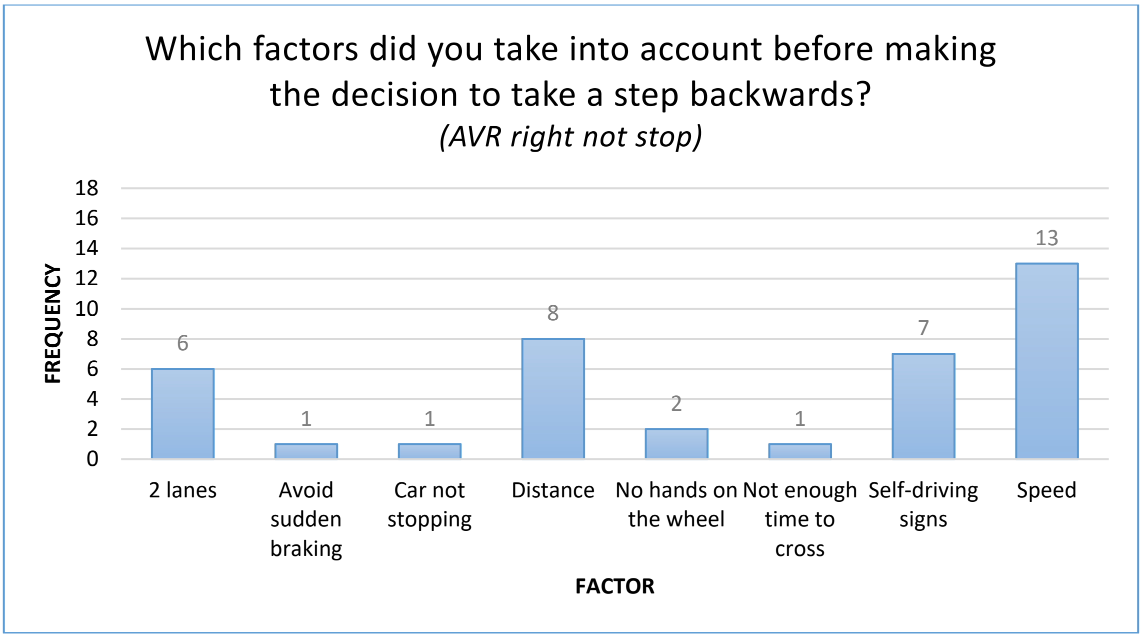

Which factors did you take into account before making the decision to take a step backwards?
(AV right stop)
FREQUENCY
18
16
14
12
10
8
6
4
2
0
3
2
1
1
8
9
1
1
1
10
2 lanes
Car not stopping
Car stopping
Car stopping or not
Distance
Driver reading a newspaper
No self-driving signs
Not enough time to cross
Small car deviation
Speed
FACTOR


Which factors did you take into account before making the decision to take a step backwards?
(AV right not stop)
FREQUENCY
18
16
14
12
10
8
6
4
2
0
3
2
9
6
1
1
10
2 lanes
Car stopping or not
Distance
Driver reading a newspaper
Eye contact with driver
Perspective
Speed
FACTOR


Which factors did you take into account before making the decision to take a step backwards?
(AVR left stop)
FREQUENCY
0
2
4
6
8
10
12
14
16
18
1
1
1
14
1
1
1
3
1
13
Avoid sudden braking
Car not stopping
Car stopping or not
Distance
Doubt car stopping or not
Eye contact with driver
No eye contact with driver
Self-driving signs
Small car deviation
Speed
FACTOR


Which factors did you take into account before making the decision to take a step backwards?
(AVR left not stop)
FREQUENCY
0
2
4
6
8
10
12
14
16
18
1
1
12
3
1
1
5
1
11
1
2 lanes
Avoid sudden braking
Distance
No eye contact with driver
Not enough time to cross
Not in a hurry
Self-driving signs
Small car deviation
Speed
Wait until sign was readable
FACTOR


Which factors did you take into account before making the decision to take a step backwards?
(AVR right stop)
FREQUENCY
0
2
4
6
8
10
12
14
16
18
2
1
1
1
11
2
1
2
11
1
2 lanes
Avoid sudden braking
Car not stopping
Car stopping or not
Distance
Doubt car stopping or not
eye contact with driver
Self-driving signs
Speed
Wind
FACTOR


Which factors did you take into account before making the decision to take a step backwards?
(AVR right not stop)
FREQUENCY
0
2
4
6
8
10
12
14
16
18
6
1
1
8
2
1
7
13
2 lanes
Avoid sudden braking
Car not stopping
Distance
No hands on the wheel
Not enough time to cross
Self-driving signs
Speed
FACTOR