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D9.5
Report on the activities of and recommendations made by the User and Expert Advisory Boards

Safe tolerance zone calculation and interventions for driver-vehicle-environment interactions under challenging conditions

iDREAMS

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Glossary and abbreviations

Word / Abbreviation	Description
UAB	User Advisory Board
EAB	Expert Advisory Board
STZ	Safety Tolerance Zone

1 Introduction

The objective of the i-Dreams project is to setup a framework for the definition, development, testing and validation of a context-aware 'Safety Tolerance Zone' for driving, within a smart Driver, Vehicle & Environment Assessment and Monitoring System (i-DREAMS). Taking into account, on the one hand, driver background factors and real-time risk indicators, and on the other hand, driving task complexity indicators, a continuous real-time assessment will be made to monitor and determine if a driver is within acceptable boundaries of safe operation. Moreover, safety-oriented interventions will be developed. On the one hand, the i-DREAMS platform will offer a series of in-vehicle interventions, meant to prevent drivers from getting too close to the boundaries of unsafe operation and to bring them back into the Safety Tolerance Zone, while driving. On the other hand, the i-DREAMS platform will allow implementation of post-trip interventions, meant to motivate and enable drivers to develop the appropriate safety-oriented attitude.

More specifically the following **goals** are pursued in the project:

- The measurement of risk-related physiological indicators (e.g. fatigue, distraction), driver related background factors (age, driving experience, safety attitudes and perceptions), and driving environment and traffic complexity indicators (e.g. time of day, speed, traffic intensity, presence of vulnerable road users, adverse weather) to assess driver capacity and task demand in real-time;
- The conceptual definition and operational implementation of a Safety Tolerance Zone based on the above identified factors and indicators (i.e. context-aware);
- The definition and operational implementation of safety and driver comfort related interventions to keep the driver in the Safety Tolerance Zone; Interventions will be both immediate (i.e. real-time in-vehicle), and 'delayed' i.e. aimed at enhancing the knowledge, attitudes, perceptions and behavioural reaction of drivers with respect to safety-related technologies, situations and behaviours.

The current report is part of WP9-Stakeholder consultation and dissemination. WP9 aims to ensure wide consultation of all relevant stakeholders and to guarantee efficient dissemination of the project activities throughout the project to ensure wide outreach of the project's results and outputs among all groups of stakeholders.

The current report focuses on Task 9.1-Stakeholders' consultation (led by Polis) and, more specifically, on the activities of the User Advisory Board and on Task 9.2-Constitution and Management of an Expert Advisory Board (led by ETSC).

1.1 Deliverable overview and report structure

The Report addresses separately the activities of the User Advisory Board and of the Expert Advisory Board.

Chapter 2 will deal with the User Advisory Board (UAB). After a description of the composition of the UAB, the three meetings of the UAB (held respectively in March 2020, March 2021 and September 2022) will be analysed together with the feedback received and the actions taken by the consortium.

In a similar way, Chapter 3 will focus on the Expert Advisory Board (EAB), its members, its meetings (held in December 2019, December 2020 and October 2022), the recommendations received and the actions taken by the consortium.

2 The User Advisory Board (UAB)

A User Advisory Board (UAB) of relevant stakeholders supports the i-DREAMS consortium in ensuring the research continues to address the key issues as well as providing a major route to implementation of the results.

The User Advisory Board consists of stakeholder organisations which might have an interest in the results of the project, either from a commercial point of view (e.g. as potential license taker, reseller), as an end user or employer of end users (e.g. transport operator), or from policy making point of view (e.g. to draft policy recommendations or future best practice guidelines).

2.1 Composition of the User Advisory Board

The User Advisory Board, which was set up in February 2020, includes original equipment manufacturers and suppliers, local/regional/national authorities, insurance companies and driver associations representatives, road, fleet and public transport operators, as well as researchers and driver educators. Its aim is to help the project gather sufficient data, knowledge and experience on the development, testing and validation of a 'Safety Tolerance Zone' for driving. The UAB consists of the following organisations and institutions:

- The Finnish Crash Data Institute OTI works to prevent road accidents in Finland and provides important information that can be used to improve traffic safety at both legislative and practical levels. The institute operates as an independent unit within the Finnish Motor Insurers' Centre.
- Wiener Linien is Vienna's public transport operator and is responsible for some 180 underground, tram and bus lines. The underground network extends to 83 kilometers, the tram network comprises around 220 kilometers, which makes it the sixth-largest in the world, and the bus lines travel a network of 850 kilometers.
- Toyota Motor Europe is a subsidiary of Toyota Motor Corporation responsible for company operations in Europe and Western Asia. Its operations include research and development, manufacturing, sales, marketing, after-sales, and corporate functions. The company is headquartered in Brussels, Belgium.
- Nea Odos is the concession company which has undertaken the construction, operation, exploitation and maintenance of the "Ionia Odos" project, with primary objective to provide safe and faster transportation conditions, as well as high quality services, to all motorway's users in Greece
- Budapesti Közlekedési Központ (BKK), Centre for Budapest Transport, is the largest public transport company in Budapest and one of the largest in Europe. BKK operates buses (200+ lines, 40 night lines), trams (33 lines) and trolleybuses (15 lines).
- Edinburgh Trams is a tramway in Edinburgh, Scotland, operated by Edinburgh Trams Ltd. As of 2017 it is a 14-kilometre line between York Place in the New Town and Edinburgh Airport, with 16 stops.
- The City of Gothenburg, Sweden.
- The International Federation of Pedestrians (IFP) is an umbrella federation for national pedestrian organisations, promoting and defending walking as a form of sustainable mobility throughout the world.
- Autoridade Nacional de Segurança Rodoviária (ANSR), the Portuguese National Authority for Road Safety, is a central government service with administrative autonomy. ANSR's mission is to plan and coordinate at national level to support government policy on road safety and the application of administrative law to the motorway in Portugal.

- Carris (Companhia Carris de Ferro de Lisboa), Lisbon Tramways Company, is a public transportation company in Lisbon, Portugal. Carris operates Lisbon's buses, trams, and funiculars. It does not operate the Lisbon Metro.
- The RAC Foundation, located in London, is a transport policy and research organisation which explores the economic, mobility, safety and environmental issues relating to roads and their users.
- The Österreichische Bundesbahnen or ÖBB (Austrian State Railways; historically also BBÖ) is the largest railway company in Austria.
- The Empresa Municipal de Transportes de Madrid (also known as EMT Madrid) is the company charged with the planning of public urban transport in the city in Madrid, Spain. Among the services provided by EMT Madrid are urban bus transportation as well as the BiciMAD bicycle-sharing system.
- The Hellenic Institute of Transport (HIT) is part of the Centre for Research and Technology Hellas (CERTH) which is a non-profit organisation that directly reports to the General Secretariat for Research and Technology (GSRT) of the Greek Ministry of Development and Investments. HIT's main objective is the conduct and support of applied research activities in the field of transportation in Greece.
- Toyota Motor Europe supports the sustained development of Toyota's operations in Europe, based on their key priorities of superior quality and customer satisfaction.
- The European Cyclist's Federation (ECF) is a partnership between cyclists' organisations at European level that promotes cycling as a sustainable and healthy means of transportation and recreation.
- Federdrive is the Federation of the Belgian accredited driving schools for obtaining driving licences and of the training centres within the framework of the training of professional competence/code 95 for professional drivers (trucks and buses), as well as for the driving proficiency centres.
- Safe.T is an innovative online HR programme for transport companies and truck drivers. This tool applies gamification principles to continuously monitor and coach drivers through a non-stop learning process.
- AustriaTech is a non-profit-organisation that focuses all its activities on topics related to digital, connected and automated mobility, decarbonisation and clean mobility as well as mobility innovations. AustriaTech supports the active shaping of these transformation processes in the field of mobility.
- The Automóvel Club de Portugal (ACP) is a public utility institution, being today recognised as the largest Portuguese club. ACP's vision is to create more mobility for a better life.
- Interamerican is a leading insurance company in Greece, operating all insurance business lines and engaging more than 1 million individual & corporate customers. It belongs to the ACHMEA Group. The company was founded in 1969 and it has held a leading position in the Greek market for more than 50 years. Its name is strongly related to the concept of private insurance in the country.
- The Ministry of Transport of Greece is a department of the Greek Government.
- The Athens Public Transport Organization (OASA S.A.) is a public utility company. Its key mission is the strategic and operational planning, co-ordination and control of the public transport carried out by (ground and underground) public transport means in the Attica Region.

The i-DREAMS UAB met three times in the course of the project: in March 2020, in March 2021 and in September 2022.

2.2 First meeting of the User Advisory Board

The first meeting of the i-Dreams User Advisory Board was organised on the 30th of March 2020. The original plan was to organise it in Brussels, at POLIS. However, due to the COVID-19 pandemic, this turned out not to be possible so the meeting was held online.

Thirty-six participants were registered. This included both members of the UAB (14) and members of the i-DREAMS consortium (22).

The Agenda was divided into two sessions and can be seen below:

Timeslot	Topic	
10:00 – 10:10	Welcome address [Host, Polis]	10'
10:10 – 10:30	Introduction to the i-DREAMS project [Project Coordinator, UH]	20'
10:30 – 10:50	Purpose of the UAB, Questions and Expectations from UAB members [Host, POLIS] + *Interactive*	20'
10:50 – 12:00	Presentation of i-DREAMS methodologies and feedback • Safety promoting goals • Performance objectives • Real-time and post-trip interventions [Partner, UH] + *Interactive*	1h
First session: 1h 50'		
12:00 – 13:00	Break	1h
13:00 – 13:30	Demonstrations of Technology • In vehicle monitoring technology • Illustration of dangerous events detected by i-DREAMS technology in pilot vehicles [Partner, CARDIOID] + *Interactive*	30'
13:30 – 14:00	Identification of routes for exploitation [Partner, UH] + *Interactive*	30'
14:00 – 14:30	Opportunities for collaboration & Conclusion [Partner, UH] + *Interactive*	30’
Second session: 1h 30'		

After introducing the i-DREAMS project, its goals and ambitions, the purpose of the UAB within the framework of the project was explained. UAB members were able to ask questions, they introduced themselves and the consortium shared their expectations regarding the role of the UAB in the project (gather as much input as possible related to human factor elements, safety

of vulnerable road users, importance of the technology for research, needs and concerns of transport companies, public administrations, local authorities, insurers).

Furthermore, Hasselt University provided more in-dept insights in the i-DREAMS methodologies (safety promoting goals, performance objectives and real-time and post-trip interventions) after which feedback form the UAB was collected. The most important feedback elements resulting from the questions and remarks from the UAB, are summarized below:

- Hazard perception, in the sense of detecting where risks are and how to manage them, is intertwined in the safety promoting goals. Through real-time interactions the system draws attention to the specific risks by detecting them and providing feedback after the trips.
- Eye movements are not measured. The use of ocular parameters was identified as important; however, no suitable tool was identified to realise this for the volume of vehicles and drivers that are monitored in i-DREAMS. Although the suggestion was made to use some type of sunglasses for that.
- The focus of i-DREAMS is not on technologies that are directly intervening, but on the interaction between humans and working systems in the vehicle to understand the limitations of vehicle interactions. So, the project is not dealing with level 2 and level 3 technologies.
- i-DREAMS works with ambassadors in the post-trip strategy, so role modelling is taken into account.
- App data will not proactively be provided to legal authorities, unless required by law following a specific legal request.
- It is expected that many companies will be interested in the i-DREAMS tools to help drivers behave properly. Similar types of applications are currently already in use, mostly focussing on eco-driving. No application exists yet with application in road safety.

The first part of the second session focused on an interactive demonstration of the in-vehicle monitoring technology and on an illustration of dangerous events detected by the i-DREAMS technology in pilot vehicles. Following this, a discussion was held on the identification of routes for exploitation. The most important feedback elements, based on questions and remarks from the UAB, are summarized below:

- Truck and bus companies could and should consider the i-DREAMS technology as an asset instead of a cost. It is an investment to decrease costs like insurance.
- i-Dreams technology could be particularly appealing since the equipment can be retrofitted. Moreover, opening up the possibility of making the technology cheaper for the operators (via, for example, reduced insurance premiums) rather than making it mandatory could be considered.
- In terms of transferability to other modes, the biggest benefit could come from transferring knowledge from car to train drivers, mostly on driver fitness (distraction and driver alertness, speeding, stopping on tracks, not overshooting the platform). As of aviation, this would be very difficult, since the cockpit is a very different environment.

Feedback from the UAB members on a series of specific questions raised by the i-DREAMS consortium can be found in Annex 1 of this document.

2.3 Second meeting of the User Advisory Board

The second meeting of the i-Dreams User Advisory Board was organised on the 17th of March 2021. Due to the COVID-19 pandemic, the meeting was held online in conjunction with the project's steering committee.

Fifty participants were registered. This included both members of the UAB (17) and members of the i-DREAMS consortium (33).

This Agenda can be seen below:

Timeslot	Topic

10:00 – 12:00 (CET)	**User Advisory Board meeting (WP9)**
	• Organizer: POLIS + UHASSELT
	• *Participants: User Advisory Board members + consortium partners*
	• Topics
	  ○ Video demonstration of in-vehicle warnings
	  ○ Live demonstration of driver coaching app
	  ○ Live demonstration of coaching web platform

The three demonstrations were given, followed by a lively debate and Q&A session (both live and in the chat).

Video demonstration of in-vehicle interventions
The most important feedback elements resulting from the discussion following the demonstration are:

- How much overlap is there between many of the features in new vehicles and the i-Dreams technology?
- Reference is made to a study from Nottingham University (published in November 2020) which found that drivers who received behavioural training were more measured in their behaviour and better understood the car's capabilities and limitations.
- How the consortium deals with the trade unions' reservations and resistance to drivers being monitored depends on the transport mode. For the buses, the operator is a project partner and the project is a continuation of an instrumentation that was already present in some buses. For trams a dialogue was started with the unions for the simulator trials. Unions seem to be more open if the monitoring is done for safety research and if the data on individuals is not shared with the company.

Live demonstration of driver coaching app
The most important feedback elements resulting from the discussion following the demonstration are:

- Sleep events are shown as events on the map if they occur.
- If the driver is maintaining distance between himself and the vehicle in front and another vehicle cuts in, it is not possible to obtain a perfect score for tailgating.
- The suggestion is raised to frame the app towards the driver community as a guiding tool for professional development with positive reinforcement and rewards rather than purely a monitoring/control instrument.

- The question was raised how easy or difficult it would be to complete a goal. Do drivers know what to do and is there a link between specific coping strategies and scores? The system always starts with easy goals, that become harder over a longer period of time to achieve behavioural improvement. Coping tips are added to goals so users can consult tips on how to complete the goal. The tips are meant to 'empower' users and increase the likelihood of being able to complete a goal.
- Effects will depend on how compelling an individual finds the rewards and the gamification aspect.
- What is the cost for upscaling/upgrading a conventional vehicle with this equipment? The suggestion is raised to consider the possibility of intercommunication among vehicles with this equipment (C-ITS).
- What about the longevity of any safety effect as research shows a drop of effect over time. Research shows that applications providing 'feedback alone' have impact over 3 to 4 weeks and, afterwards, effects stagnate or decline. Motivation to continue using such applications seems to be the key-challenge. Some studies show that adding gamification features can increase user retention to 10 weeks or even longer.
- Gamification and rewards are possibly key to ensuring more ongoing engagement with the average driver, who would largely be driven to engage via these means rather than self-improvement, although it is easier via fleets where there are other reasons to compel use.
- Behaviour Change Techniques (BCTs) used in the app development is mapped. Detailed schedules linking BCTs to driving parameters on the one hand and gamification features on the other hand were included in Deliverable 3.3.
- Video footage from alerts is available via the dashcam, so the driver can see what he did wrong.
- The app can be a good instrument to follow-up in fleets. It can be a good basis for dialogue.

Live demonstration of the coaching web platform
The most important feedback elements from the discussion following the demonstration are:

- The platform can indicate that there is a common issue and that routes need to be reviewed by the company.
- Some contemplation on the use of the video footage in the accident investigation.
- Video material/logs can also be useful to provide content for training purposes. For example, collecting different tailgating events from different users.

2.4 Third meeting of the User Advisory Board

Although the initial idea was to organise two UAB meetings throughout the project, the consortium decided to organise a third one as well. The meeting was held on the 26th of September 2022 and took place in person in Brussels, hosted by POLIS.

Twenty-two participants were registered. This included members of the UAB (6), members of the i-DREAMS consortium (13) and EU officers (3).

This Agenda can be seen below:

	Timeslot	Topic
1	10:30 – 11:00	**Registration and coffee**
2	11:00 – 11:10	**Welcome and meeting agenda** Presenter: Tom Brijs, i-DREAMS project coordinator (Hasselt University, Belgium)
3	11:10 – 11:30	**i-DREAMS project in a nutshell** Presenter: Tom Brijs, i-DREAMS project coordinator (Hasselt University, Belgium)
4	11:30 – 13:00	**Sneak preview project outcome and results** • Demonstration of i-DREAMS driver app + web dashboard Presented by: Tom Brijs, Hasselt University (Belgium) • Effectiveness of i-DREAMS interventions Presented by Kris Brijs, Hasselt University (Belgium)
5	13:00 – 14:00	**Lunch and live demo i-DREAMS instrumented vehicle** Participants have the opportunity to experience live demo of i-DREAMS system
6	14:00 – 14:30	**i-DREAMS roadmap to market** Presenter: Geert Wets, Hasselt University (Belgium)
7	14:30 – 15:15	**i-DREAMS roadmap to society** Presenters: • Klaus Machata, KFV (Austria) • Pedro Homem de Gouveia, POLIS (Belgium)
8	15:15 – 15:30	**Q&A**
9	15:30 – 16:30	**Continuation live demo instrumented vehicle** Participants who haven't got the chance during lunch to participate in the demo can still do so at the end of the meeting.

i-DREAMS project in a nutshell

The meeting started with a presentation of the i-DREAMS project to remind the audience of what the project is about. The following feedback elements result from the discussion after the presentation:

- Fatigue is measured from heart rate via a validated algorithm which is based on heart rate (IBI) and trip duration.
- Only hand-held mobile phone use is measured.
- Only what happens in front of the car is monitored, not the inside of the car.
- Eye-movements are not monitored as a result of choices that are made based on the means available and the scale of the field trial.
- i-DREAMS technology is compatible with the 2008 Commission Recommendation on "Safe and efficient in-vehicle information and communication systems: update of the European Statement of Principles on human-machine interface". Guidelines were

taken into account both during the design stage as well as during the installation of the system in the vehicles.

- i-DREAMS technology is oriented towards retrofitting in vehicles. The project made this choice as it was monitoring the driver, the driving context and vehicle parameters and needed sensors to do this which were typically not part of existing vehicles. Furthermore, the field trials included many different vehicle models and types for which it was impossible to obtain the data from the vehicle directly. In addition, there was a large market of vehicles that were not yet equipped with ADAS technologies and for which the i-DREAMS retrofitting solution created an opportunity to modernise existing vehicles with state-of-the-art safety technology. Nonetheless, there were components (e.g. STZ estimation, CardioWheel) in the i-DREAMS solution that could potentially be integrated into future vehicles as well. Also, the coaching app based on post-trip gamification could be of interest to OEMs to better explore the data coming from modern vehicles.

Demonstration of the web dashboard

The following feedback elements result from the discussion after the demonstration:

- It is possible to collect score points and badges for distraction, even after hand-held mobile phone use. Doubts are expressed in the audience regarding this approach, since it might give the impression that hand-held mobile phone use is tolerated. The consortium understands this concern, although i-DREAMS is designed to coach and motivate drivers to improve their behaviour when it is not (yet) perfect. For that reason, the system rewards a driver with a badge even if they did not yet reach a perfect score since behaviour change requires support and motivation to continue. A badge helps drivers to feel rewarded for small positive steps towards safer driving behaviour. In addition, several other gamification elements (tips, pros/cons, facts) are included in the i-DREAMS app clearly demonstrating the risks of mobile phone use.
- Drivers can follow up on their scores on individual behavioural parameters (e.g. speed, mobile phone use, tailgating) on a per trip level, or aggregated over time (week, month, lifetime). Trends are also shown in the app to monitor progress over time. Drivers can benchmark against others by means of the leader board.
- It would be interesting to check if there is a correlation between de schedules that companies impose on drivers and how fatigued a driver is. However, the project cannot access the work schedules of drivers.
- It is currently not possible to penalise drivers more if they infringe the rules in high risk locations. However, it can be technically possible if a common definition and reliable data about the location of high-risk zones across multiple member states becomes available. This is an interesting idea for exploration in the commercial valorisation phase.

Presentation on outcome and process evaluation.

The results are based on completed data from the field trials in the UK and Belgium. The researchers observed a less pronounced reduction of high-risk events/100km in wave 1 in Belgium (compared to data from wave 2), and assumed this was due to the pandemic. COVID restrictions were released between phase 3 and phase 4 of the data collection in wave 1 in Belgium. Wave 2 in Belgium and wave 1 and 2 in the UK had shown a more consistent pattern of reduction in high risk events over the different stages of the interventions. The following feedback elements result from the discussion after the presentation

- Members of the UAB were surprised about the high number of risky events per 100km, for example more than 200 events per 100km. This was a total of all monitored safety parameters (13 in total) and all risk levels (low-medium-high). Obviously, high risk events occurred much less frequently compared to low risk events. The focus of i-DREAMS was mainly to reduce the number of high and medium risk events, since these are the most dangerous. Nevertheless, for speeding for example, they monitored on average between 15 to 25 high risk speeding events per 100km. A high-risk speeding event was defined as a single instance during the trip where the driver was going beyond x% of the posted speed limit.
- A control group was not created. Each driver's number of risk events had been benchmarked against their own baseline when interventions were not yet active. A control group would have been informative to compare the behaviour of drivers participating in the interventions against the behaviour of drivers who were not at all exposed to the interventions (in none of the intervention stages). This was a deliberate choice in order to keep the size of the study acceptable.
- It would be interesting to know what the standard deviation is of the number of risky events/100km.
- Members of the UAB agreed that a big value of the project lies in the collected field trial data and wondered whether these would be made available publicly. Individual trip and risk event data will be shared in an aggregated format (per x seconds) while preserving the privacy of individual participants (i.e. anonymised, no location data, no heart rate data).

Live demo of the i-DREAMS instrumented vehicle
The lunch break of the UAB's meeting was an occasion for participants to experience a live demo of the i-DREAMS instrumented vehicle while driving in the environment of the hotel.

Demonstration of the i-DREAMS app
After lunch, the i-DREAMS app was demonstrated, illustrating how details of trips and risky events are depicted.

i-DREAMS roadmap to market
The following feedback elements result from the discussion after the presentation:

- Four pre-selected markets were introduced. The UAB members made several suggestions for alternative markets, including corporate fleets, government contracts, the rental vehicle market and private vehicle insurance (particularly for young drivers), the car sharing sector, taxi drivers, and platform drivers (e.g. Uber).
- The consortium is also interested to work with OEMs, even though this turns out not to be very easy mostly due to IP related issues.
- i-DREAMS plans to set up a discussion with an OEM on potential areas of cooperation.
- The cost of the full system lies roughly between 500 and 1000 Euros. Currently the i-DREAMS set-up was more expensive, but the consortium is looking into cheaper alternatives for some of the components.

I-DREAMS roadmap to society
The following feedback elements result from the discussion after the presentation:

- The type of content that is considered to be most promising to get the message across depends on the stakeholder but the message should always be attention grabbing and brief.

- Factsheets aimed at specific markets could be interesting.
- Webinars are not recommended, as there were too many of them already.
- Peer-to-peer relationships to share experiences are also considered to be important. Potential customers should be given the opportunity to test the technology.
- In-vehicle technology (to be able to monitor) is considered to have the highest priority for the bus company represented in the UAB. Post-trip technology and data are considered a nice to have extra.

3 The Expert Advisory Board (EAB)

A targeted group of experts in the field of road safety, human factors and automation (the Expert Advisory Board) supports the consortium in strategic choices throughout the project by providing useful input in terms of knowledge, network and policy orientation.

The aim of the EAB is to contribute to relevant deliverables with comments and feedback, to support the drafting of recommendations, to support the exploitation of the concepts and technologies created by the project and to support the development of new road safety interventions.

From their academic expertise, the EAB experts provide input that is useful for the project consortium to take into account during the execution of the project.

3.1 Composition of the Expert Advisory Board

The Expert Advisory Board consists of experts from whom the Consortium obtains technical guidance and support by correspondence, online meetings and in-person meetings.

The i-DREAMS Expert Advisory Board includes the following experts:

- Professor Judith Charlton – Director of MUARC – the Monash University Accident Research Centre – Monash University, Australia;
- Dr. Ward Vanlaar – Chief Operating Officer – Traffic Injury Research Foundation, Canada;
- Dr. Wael Khaleel Alhajyaseen – Assistant Professor – Qatar Transportation and Traffic Safety Center;
- Dr. Carol Flannagan – Research Associate Professor – University of Michigan Transportation Research Institute, USA;
- Professor Samuel G. Charlton – The University of Waikato, New Zeeland.

The Monash University Accident Research Centre (MUARC) is Australia's largest and most respected accident and injury prevention research organisation. Their research, consultancy, training and scientific expertise includes safety in all modes of transport, in the workplace, in the community and in the home. Their goal is to create safe and resilient solutions to local and global challenges.

The vision of the Traffic Injury Research Foundation (TIRF) is to ensure that people using roads make it home safely every day by eliminating road deaths, serious injuries and their social costs. TIRF’s mission is to be the knowledge source for safe road users and a world leader in research, program and policy development, evaluation, and knowledge transfer.

The Qatar Transportation and Traffic Safety Centre was established in September 2012 to address the needs and aspiration of the country in terms of road safety. The output sought by Qatar University is primarily internationally sound research achievements, external research funding, research and industrial collaboration, and community service. The outcomes of these activities provide authorities with scientific evidence to inform plans and policy decision.

The Transportation Research Institute of the University of Michigan is focused on multidisciplinary research to advance safe, equitable, and efficient transportation and mobility.

The Institute is using their expertise, passion and 55 years of history to become the world's foremost organisation focusing on multidisciplinary transportation safety and mobility.

The University of Waikato is committed to delivering a world-class education and research portfolio. With around 13,000 students and 1,500 staff, they offer a distinctive and rewarding university experience, while pursuing strong international links to advance knowledge.

3.2 First meeting of the Expert Advisory Board

The first meeting of the i-DREAMS Expert Advisory Board was organised physically on the 12th and 13th of December 2019 in Munich (hosted by TUM, the Technical University of Munich) in conjunction with the i-DREAMS Steering Committee and Data Knowledge and Management meeting.

Thirty-one participants attended the meeting. This included both members of the EAB (4) and members of the i-DREAMS consortium (27). Ward Vanlaar, who had registered to attend the meeting, had to cancel because of medical reasons.

The Agenda was spread over two days and can be seen below:

Day 1: 12 December

Item No.	Timeslot	Topic
	09:30 – 10:00	Welcome with coffee and pastries
	10:00 – 10:15	Welcome address from Technical University of Munich
1	10:15 – 12:00	Round table introduction of consortium partners and experts **Introductory project overview** presentation by Tom Brijs (UHasselt), project coordinator Session type: plenary
	12:00 – 13:00	Lunch
2	13:00 – 14:45	Discussion on results from **work package 2** Presentation by Susanne Kaiser (KFV) Session type: focus
	14:45 – 15:15	Coffee break
3	15:15 – 17:00	Discussion on activities in **work package 3**, including: results from stakeholder survey, conceptual and mathematical description of Safety Tolerance Zone Presentations by Rachel Talbot (LOUGH) and Christos Katrakazas (NTUA) Session type: focus
	18:00 – 19:00	Social activity: visit of the famous Bavarian Christmas markets. This is an opportunity to walk around the center and enjoy the city, while listening to live music and drinking some Glühwein.
	19:00 -	'Bavarian' project dinner (exact details are to be confirmed)

Day 2: 13 December

Item No.	Timeslot	Topic
	08:30 – 09:00	Welcome with coffee and pastries
4	09:00 – 11:00	Discussion on activities in **work package 4**, including: presentation of i-DREAMS technology and ideas for in-vehicle and post-trip interventions Presentations by: André Lourenço (CARDIO-ID), Kris Brijs (UHasselt) Session type: focus
	11:00 – 11:30	Coffee break
5	11:30 – 12:30	Discussion on activities in **work package 5**, including: practical aspects of driving simulator and on-road experiments Presentations by: Christelle Al Haddad (TUM) Session type: focus
	12:30 – 13:30	Lunch
6	13:30 – 14:15	Discussion on i-DREAMS exploitation strategy **(work package 8)** Presentation by: Geert Wets (UHasselt) Session type: focus
7 8	14:15 – 15:00	Practical project announcements by Edith Donders (UHasselt) Concluding remarks by expert advisory board members Session type: plenary
	15:00	Closing

Introductory project overview
The following feedback elements result from the discussion after the presentation:

- Within the project, two simulators are built (car + heavy vehicle for bus/truck). NTUA will use their own car simulator. For the train/tram mode, the consortium relies on organisations that have train and tram simulators.
- There are project tasks dealing with data handling, pseudonymisation and anonymisation. The GDPR regulations are strictly followed in the project. The DPOs of the different partners involved in data collection were consulted and an ethics review was carried out.
- The project need to take national legislation into account. The consortium is not obliged to report law infringements (e.g. simple traffic violations) to authorities. However, in a situation where there is police intervention and a court request to provide data, this will have to be done.
- Concerning the sample size of the driving simulator testings, the size is small, because the focus of the driving simulator testing is more on user experience and user acceptance.
- With respect to monitoring the environment, the project is limited in what they can monitor. Connected vehicles are not the focus of the project. The focus isn't on vehicle

automation either where the vehicle is taking over active longitudinal or lateral control from the driver.
- The connection with car manufacturers is very important: OEMs are invited to participate in the User Advisory Board (UAB).

Work package 2 presentation
In response to questions from the EAB, members of the consortium clarified that:

- When it comes to task demand, the project is not looking at the risk, but at the cognitive load it is causing trying to translate that in what it means for road safety.
- The WP asses the quality of the research sample size in their literature survey even though it is often really hard to compare different studies.
- Concerning physiological measures representing the cognitive workload, since factors are so interrelated, that will be one of the big questions. It is part of the model and an important aspect that the project will need to figure out. This will be a big challenge.
- Members of the EAB suggest to consult literature on aviation: eye tracking is the most important indicator, more than heartrate. There is no fixed pattern to find on heartrate: change should be monitored instead of level. For hyperactive young drivers, for example, the heartrate is always high.

In response to further questions from the EAB on real-time interventions and post-trip interventions, members of the consortium clarified that:

- There is a study about headway under speed conditions. People kept the same distance, no matter how fast they drove. But that had obviously a different effect on time to collision.
- After the various comments from the EAB, it appeared that the project should not focus on lane departure warning as lateral proximity appeared to be more useful to detect danger. Drivers will not consider lane departure as a possible danger.
- Professional drivers will probably need to be handled differently. If there is a company's interference, then a lot more can be done on the intervention level compared to private drivers. Depending on the safety culture in the company, professional drivers are easier to deal with. In the recruitment phase, it is important to select companies with a strong safety culture.
- Drivers from different ages will respond very differently to post-trip interventions. This needs to be taken into account.
- It is important to consider anti-social people who will try to gather as many alerts as possible.
- Gamification will be used to convince people and to motivate them to continue.

Work package 3 presentation on the results from the online stakeholder survey and on the Safety Tolerance Zone (STZ).

In response to questions from the EAB, members of the consortium clarified that:

- For trucks the consortium already looked at reports and literature about accidents and interventions.
- Even though the sample size seems rather small, increasing the sample size is not planned. The User Advisory Board (UAB) will also provide the project with more insights of the stakeholders.

- It is important to identify the conditions when an intervention is really needed. If there are too many interventions, then the driver will start ignoring them.
- We are thinking about how to take into account subjective assessments, considering that we can only depend on objective measures. What do we do when objective measures say nothing is wrong, but the driver is perceiving something? There are indications of the existence of objective measures that can say something about what people are subjectively perceiving. There is literature on somatic markers using physiological indicators such as stress based on skin conductance.

Work package 4 presentation on Data collection instruments, data handling and processing; Procedures for post-trip interventions; and Procedures for real-time interventions.

In response to questions from the EAB, members of the consortium clarified that:

- Even if in the simulator all the information is available already, there is an added value for Mobileye. The project wants to replicate as much as possible in the simulator the equipment that will be used in the on-road trials to increase the transferability of results from simulator to on-road.
- A dashcam will be present in the simulator. However, a camera facing the driver will cause a lot of privacy issues. That would unnecessarily complicate the on-road experiments. Also, the cost would be too high as eye-tracking equipment is extremely expensive.
- It was agreed that for the on-road experiments, it is important to minimise the number of times that participants need to go back to the project's facility. The idea is to have Wi-Fi and 3G/4G connection inside the vehicle for data transmission. The preferred mode of data transmission is Wi-Fi when the vehicle reaches a recognised Wi-Fi spot (e.g. at home or at the company where the vehicle is stationed). The idea for the real-time interventions is to process the data locally but to have the possibility of a delayed transmission of the data to post-process them on the server for use during the post-trip interventions.
- All interventions are turned off during the baseline measurement stage.
- Participants are informed about the purpose of the study via the project information sheet. Participants also receive an installation sheet with details about which systems are installed in the vehicle and they receive a training on how to use the equipment.
- For private drivers, CardioWheel is not used for reasons of acceptability. However, for heavy vehicle drivers (bus/truck) a CardioWheel is considered acceptable.
- For post-trip interventions the project will provide deeper insight in why scores are bad. The project will provide info on different sets of parameters.
- It will be important to combine both real-time warnings and post-trip feedback to avoid drop-out. Post-trip interventions are used to sustain a more continuous dialogue with participants (on top of real-time interventions). Both approaches are complimentary. In the on-road experiments it is also planned to have a stage with real-time interventions only, followed by a stage where post-trip interventions are added. In this way, the consortium hopes to be able to distinguish between the effectiveness of both approaches (and the added value of providing both).
- It is possible to log the participants' access frequency and duration of visits both on the smartphone and on the post-trip intervention website.
- A gamification approach is developed to offer suggestions to take up a certain goal. Ideally there will also be the possibility to motivate drivers by offering advice to other drivers. Peer instructions can be very effective.

- The objectives of in-vehicle interventions and post-trip interventions are different. In-vehicle interventions are useful to influence concrete situations, post-trip interventions aim to change habits.
- Interventions provide feedback on individual actions (specific behaviour like 'lane changing behaviour').
- While the integration of IRAP road scores is a good suggestion, this is not feasible as IRAP is only for major roads and this means that scores on minor roads will be missing and cannot be used.
- When providing real-time interventions, the importance to test icons (to make sure that everyone understands them) is recognised.
- It is important to provide incentives for participants. This can help to keep their motivation high.
- The recruitment experience from the U-drive project should be used.

Work package 5 presentation with an emphasis on simulator studies.

In response to questions from the EAB, members of the consortium clarified that:

- Ergonomic driving for the heavy vehicle simulator referred to the fact that the driving position in cars is different from trucks and buses. In the heavy vehicle simulator, the project wishes to replicate the driving position as much as possible like in a real vehicle.
- The goal of the simulator study is to get a feel of the technology and user experience. Simulator data can be used to calibrate the model and the impact of the real-time interventions can be evaluated.
- It is a good idea to have a baseline driving in the simulator. However, it isn't clear how many trips are needed to create a good baseline. The idea is to have a part of the test with and without interventions in the simulator.
- The car system should be ready in early January 2020. The mathematical model could then be fed with the data collected during simulator runs.
- The timing of the intervention and the dynamic warnings, based on operator state and environment information, are a distinctive feature of i-DREAMS in comparison to other warning systems.
- Mobileye was only interested to provide systems, not to participate in the research part as they have their own research programmes and don't want to share IP.
- For on-road experiments equipment will have to be rotated between participants, since the consortium doesn't have enough equipment for each participant.
- It is important to collect diagnostics info from the devices to make sure the equipment is working correctly. Since participants are not coming in regularly, the consortium will otherwise not know if the system is still collecting data correctly.
- The consortium agreed to include in the budget a cost for vehicle damages related to the installation of the equipment. Some participants may try to hold the project accountable for damages to their vehicle, even if it could not be proven that the equipment was the cause.
- Data storage should preferably be centralised, because otherwise database and software installation capacity and knowledge will need to be available in each country.

Work package 8 presentation on the exploitation strategy.

In response to questions from the EAB, members of the consortium clarified that:

- In general, most fleet companies don't have a strong safety culture, since the profit margin is very low. Only large companies have that. However, companies who are willing to participate are most likely companies who are already inclined to have a safety culture.
- The consortium is also talking to governments. The Certificate of Professional Competence (CPC) was obligatory in the EU, but there was hardly any evaluation of its effectiveness.
- Some interest was shown by small taxi companies.
- Driving schools might be interested in the system.
- Drivers with dementia or other progressive disorders could be another target group: monitoring could be used as an alternative to immediately taking away a driving license.
- The project will need to convince companies that they will make profit. That will be crucial. For the insurance companies the loss ratio is the crucial parameter: i.e. how much of the premium will return to the market. It might also be important to convince private drivers of the advantages of having the technology installed in their car?

Concluding comments, given by the EAB members:

- It is important not to wait too long to start with WP6 and WP7 as they are very valuable.
- It is important to think as a participant and not always as a researcher. It will help to avoid problems afterwards.
- It is important to design the system, experiments and analysis to make sure that the added value is concrete (e.g. the dynamic aspects of the system).
- The development of the STZ algorithm has to be the key priority.
- It is important to think about the distinctive features of the future product. An important aspect is that the consortium works in an evidence-based way, unlike many system developers. The system cannot answer everything. What is really distinctive in the project is that it is trying to create the safest possible drivers, using the combination of real-time and innovative post-trip interventions. The main selling point is to work towards "5 star drivers - on 5 star roads - in 5 star vehicles".

3.3 Second meeting of the Expert Advisory Board

After the first EAB meeting, organised physically in December 2019, the COVID19 pandemic prevented the organisation of physical meetings. An online meeting of the EAB was therefore organised on the 10th of December 2020, in conjunction with a consortium meeting.

The EAB meeting was organised in two sessions. The first one was attended by Professor Judith Charlton and Professor Samuel Charlton. The second one was attended by Dr. Carol Flannagan and Dr. Ward Vanlaar. Dr. Wael Khaleel Alhajyaseen could not participate.

The meeting could count on 27 participants (first session) and 22 participants (second session) respectively.

The Agenda can be seen below:

Timeslot	Topic
08:30 – 10:30 (CET)	**Expert Advisory Board session with Judith Charlton & Samuel Charlton** • Organizer: Project coordinator + WP leaders WP3-WP4-WP5 • *Participants: WP leaders WP3-WP4-WP5 (other partners are welcome)* • Topic: status overview of the project and feedback from experts
10:30 – 10:45 (CET)	**Short break**

10:45 – 12:30 (CET)	**Session 1: Data and knowledge management**
	• Organizer: TUM
	• *Participants: Partners involved in field trials + tech partners*
	• Topics
	  o Discussion on Open Research Data Pilot for i-DREAMS
	  o Data processing (video, map matching, …)

12:30 – 13:15 (CET)	**Lunch break**

13:15 – 14:45 (CET)	**Session 2: WP 6 & mathematical working group**
	• Organizer: NTUA
	• *Participants: Partners involved in WP6 + mathematical working group*
	• Topics:
	  o WP6 progress
	  o Discretization of continuous risk indicators
	  o Endogeneity in real-time predictions
	  o Hybrid Choice models

14:45 – 15:00 (CET)	**Short break**
15:00 – 17:00 (CET)	**Expert Advisory Board session with Carol Flannagan & Ward Vanlaar** • Organizer: Project coordinator + WP leaders WP3-WP4-WP5 • *Participants: WP leaders WP3-WP4-WP5 (other partners are welcome)* • Topic: status overview of the project and feedback from experts

General project presentation

- In response to this presentation, members of the EAB discussed the consequences of the COVID pandemic on the developments in the i-DREAMS project. The importance

of a project extension was mentioned in order to allow the consortium to reach the requested amount of observations.
- It is also underlined that a wider use of the simulator could replace on-road observations (because of the reduction in traffic) and commercial drivers could be targeted as they were driving more than in the pre-pandemic period.
- More generally on the project results, the EAB mentions there is an excellent opportunity to connect with car manufacturers to find out how the i-DREAMS system could complement their systems. The EAB is happy to learn that, while it was difficult to get manufacturers on board at the proposal stage, contacts were subsequently developed and a vivid interest is shown in the i-DREAMS system.

WP3 presentation and discussion led to the following feedback:
- The EAB is particularly interested in the app being mode-specific, in the thresholds of intervention being different depending on the context (for example the warning setting is earlier for sleepiness) and on the 3 stages of the STZ and the way these three stages are defined. On this last point it is clarified that it is more a continuum than a step-based function, it is an artificial distinction: it would be otherwise difficult to determine when one needs to increase the intensity of communication with the driver. Moreover, it is important to have two waves of experiments: lessons could be learnt from the first wave and adjustments can be made in the second wave.
- EAB underlines the importance of user acceptance regarding data collection sensors and hardware, which seems to be more relevant for private drivers than for commercial drivers.

WP4 presentation and discussion led to the following feedback:
- The EAB starts by congratulating WP4 participants for managing to effectively respond to all the challenges emerging from COVID-19.
- The technology is already used in two pilot vehicles and this allowed the team to identify issues needing action already at an early stage. The two waves of trials will also be very important in allowing to make the necessary adjustments.
- The EAB warns on potential data loss in the real-world tests (because of not putting both hands on the CardioWheel, because of problems with the batteries in the wearables and so on). However, triggers are set up to avoid these situations.

WP5 presentation and discussion led to the following feedback:
- Questions and observations by the EAB concentrates on the presence of a status monitoring platform which allows contacts with the project team. Its presence is judged positively especially in cases of vehicle servicing and police checks.
- The drop-out rate in the field trials is also discussed and it is clarified that a drop-out plan was already created by the project. Elements of the plan include: recruiting more participants than needed and not giving all incentives at once but spacing them during the entire duration of the trials.

Conclusions from the EAB members:
- Congratulations for the status of advancement of the project, notwithstanding the COVID-19 difficulties.
- Samuel Charlton: “I want to offer my congratulations to the team for what you have achieved in these circumstances. I am so excited about what is to come now that you will start collecting data. I can’t wait another year to find out how the data collection has happened!”

- Judith Charlton: “I can echo Sam’s comments. It is nice to see how the project has evolved in these challenging 12 months. It is astonishing what you have achieved. Thank you for feeding back to us how you have taken on board our comments”.
- Ward Vanlaar: “I wanted to congratulate the entire team, because you made a lot of progress in this past weird year”.
- Carol Flannagan: “I am really impressed with how much progress was made. In the US we see that people are speeding a whole lot more, so there is a need for a system like yours”.

3.4 Third meeting of the Expert Advisory Board

The third meeting of the Expert Advisory Board was organised, as an online meeting, on the 5th of October 2022. The purpose of the meeting was to demonstrate and discuss the results of the i-DREAMS project, more specifically the outcome evaluation and the process evaluation based on data from the field trials from Belgium and the UK for private and professional drivers.

The meeting counted on 21 participants including four members of the EAB. Dr. Ward Vanlaar could not participate.

Presentation on the current status of the i-DREAMS project. The presentation generated several questions and comments from the EAB. In response to these, members of the consortium clarified that:

- We were not able to resolve the union issues in the UK in the rail sector. As a consequence, tests could not be carried out in real trams and trains. Simulator trials were set up and focus groups organised instead. Participants were asked about aspects they believed to be interesting.
- Simulator participants did not participate in the focus groups.
- For trams, the researchers showed participants the app and asked them what could be interesting.
- For trains, the technology was not really compatible for heavy rail. The focus group approach was split, one half looked at the STZ and how that translated into the rail context and the other half looked if this could help them in their day-to-day driving.
- The technology was not demonstrated to train participants, only to tram participants
- For each mode (car, bus, truck), the participation periods and approaches were the same: 4 weeks baseline reference measuring, 4 weeks real-time interventions, 4 weeks real-time interventions + app (introducing several functionalities: trips, events and scores). In the last 6 weeks of participation the gamification features were activated: leader board, goals, tips and feedback related to all the performance objectives being measured.
- Drivers were all exposed to the same interventions, related to speed warnings (relative to limits per mode), fatigue, distraction (hand-held mobile phone use), acceleration, deceleration, tailgating. Not everything led to an intervention.

Presentation on outcome and process evaluation. In response to questions, members of the consortium clarified that:

- The consortium established a correlation between traffic intensity and the number of events / 100km. It is not (yet) clear whether COVID played a role.

- Standard deviations increased significantly from phase 3 to phase 4: a possible explanation is that some drivers took the gamification features very seriously, but others did not and this might have had a big impact in the total result.
- The EAB suggested that 'trips' might not the correct unit to analyse, 'drivers' are. Therefore, the standard deviation for the unit 'drivers', not for the unit 'trips', should be analysed instead. Some outliers could have caused the standard deviations to be so large. A clustering exercise was already made.
- The definition for distraction was binary whereas for fatigue there were three levels.
- Regarding speeding, the biggest shift is created by the real-time interventions.
- Most truck drivers had telematics in the trucks before being retrofitted with the i-DREAMS technology. Some had equipment on board for tracking and tracing and some for eco-driving purposes and this could explain the familiarity with being monitored.
- It is important to understand how familiar the drivers were with being monitored to see if that explained why there were less events for them in the baseline.
- It is suggested to include in the statistical analysis covariates accommodating for different contextual variables (e.g. driving experience, type of road, etc.)
- It is understood that conclusions should not be based on descriptive numbers only and that the use of the word 'significant' following an observation should be done with care until it is backed by statistics.
- One could look at the data from many viewpoints, but it is clear that the driver level is the one, the project should further explore.
- There is no significant reduction in events per 100 km from phase 3 to phase 4. But one could see a lot more interaction with the app. It is important to check whether there is a dose-response relationship.

At the end of the meeting, some concluding comments were given by the EAB:

- Judith Charlton: "The project did impressive work and collected an immense amount of data in challenging circumstances. It is exciting to see what is done already and even more exciting to think about the next level of analysis."
- Sam Charlton: "It is incredible what the project managed to do. There were some issues with the presentation of the data, particularly the two sets of t-test data. However, if the project was able to break those out according to some of the context variables, the results will be very good."
- Wael Khaleel Alhaiyaseen: "i-Dreams realised a very commendable achievement. Moving from theory to actual implementation of the equipment is very important. And this is only the first stage of the analysis. Much more depth and significance will come from future analyses."
- Carol Flannagan left the meeting a bit more early.

The consortium concluded that the availability of very rich and complex data created an interesting but tough environment to explore within the timeframe of the project. The rich data set, however, in itself is an important output of the project.

4 Conclusions

Notwithstanding the challenges of the COVID pandemic, the i-DREAMS consortium has managed to organise three meetings of the User Advisory Board (UAB) and three meetings of the Expert Advisory Board (EAB). For each of the Boards, one of the meetings was organised physically and two online.

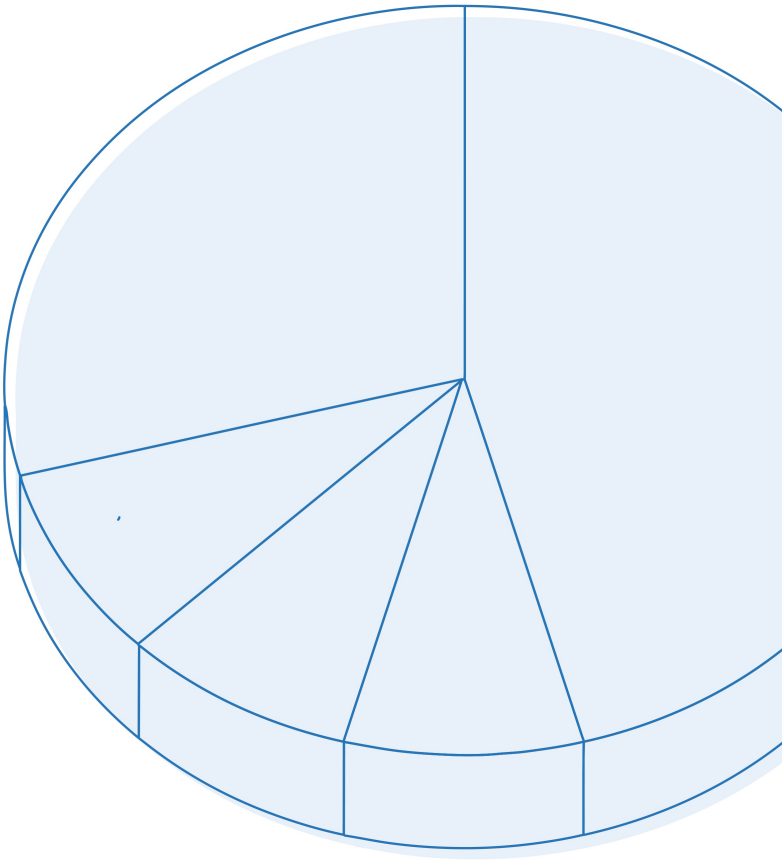
Participants of both structures have proven to be extremely interested and committed to their role and have provided meaningful and relevant input to the work and the results of the i-DREAMS project.

The i-DREAMS consortium wishes to express its gratitude to all members and organisations taking part in the EAB and UAB.

Appendix 1: feedback from UAB

PRESENTATION RESULTS

i-DREAMS UAB introduction - Edith

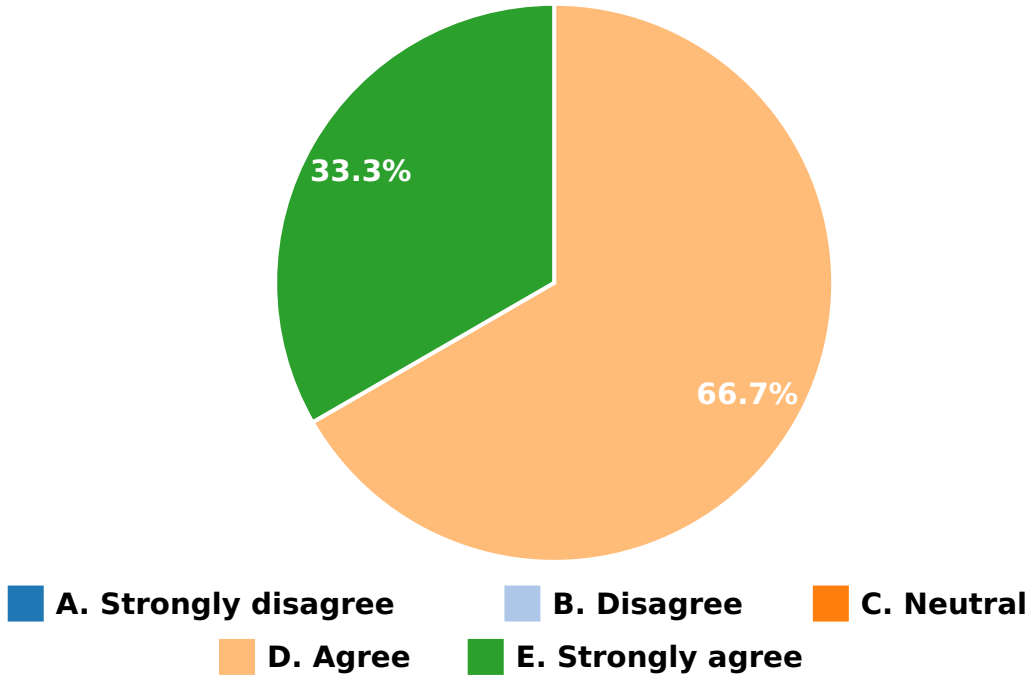


About the day

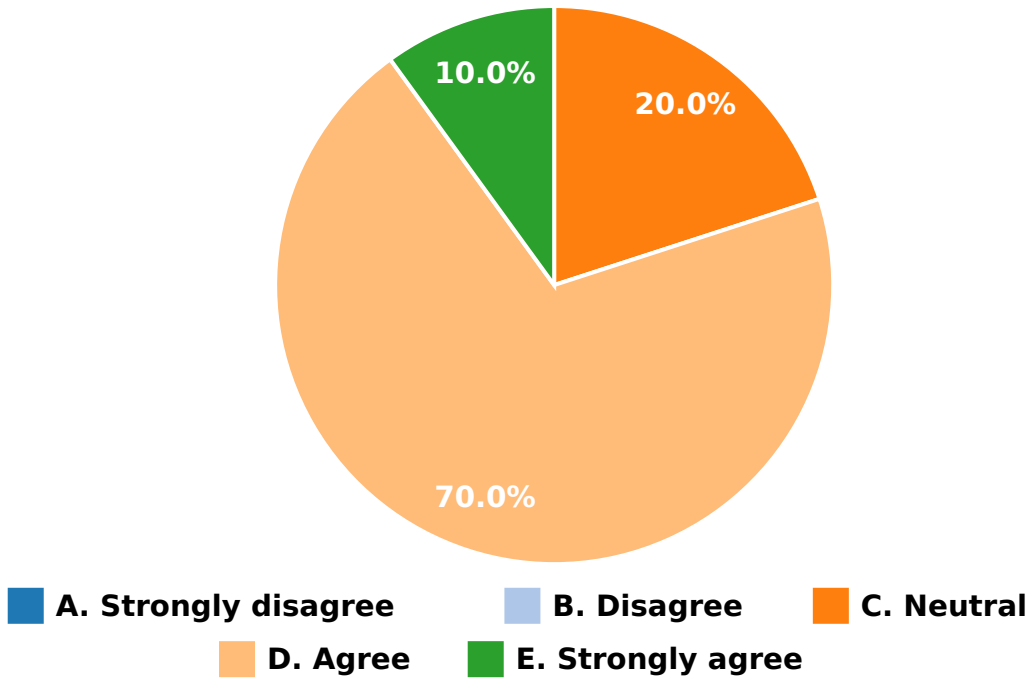
Start to end Mar 17, 2021 09:53 - Mar 17, 2021 10:51

Start to end	Mar 17, 2021 09:53 - Mar 17, 2021 10:51
Nr. of active attendees	15
Nr. of responses	155

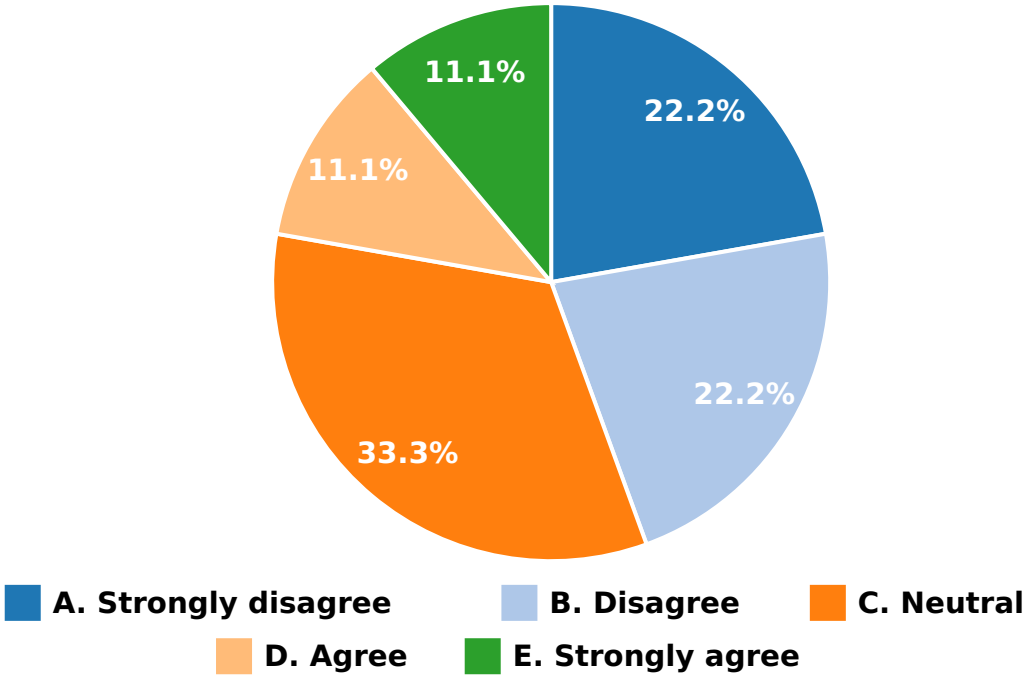
1) Using The System Increases Awareness Of The Surroundings



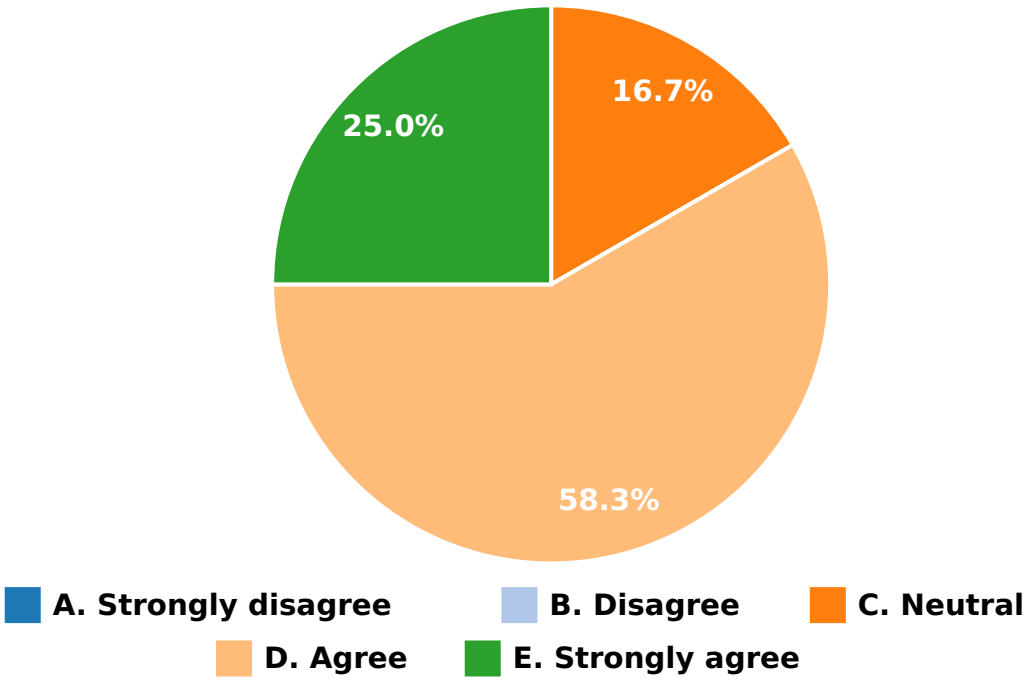
2) Using The System Increases Safe Driving



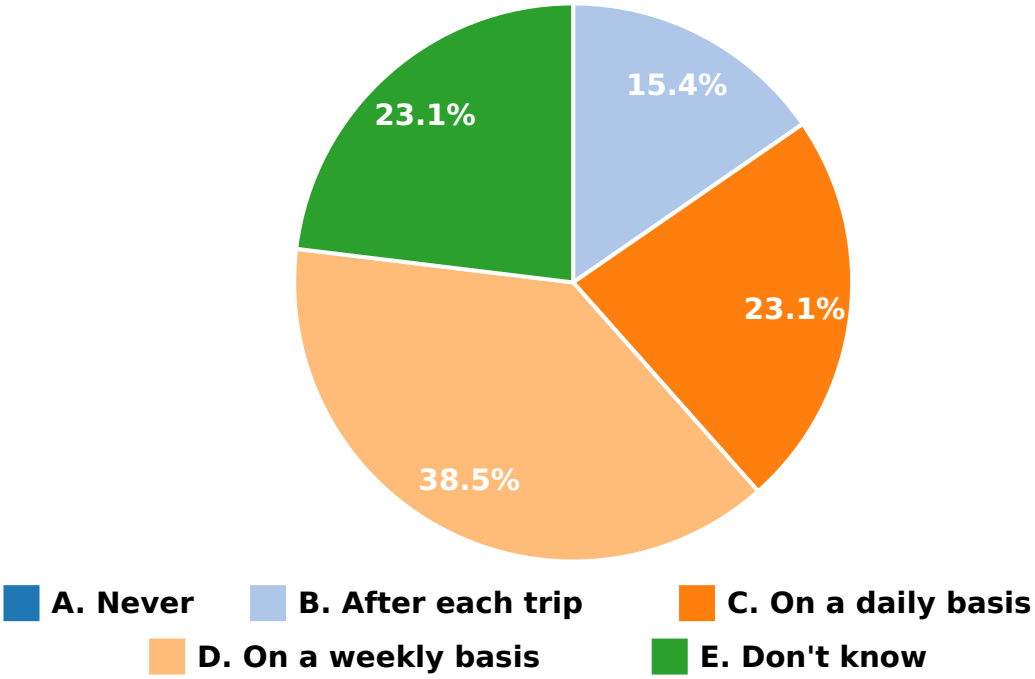
3) The System Provides Too Much Information For Me To Process While Driving



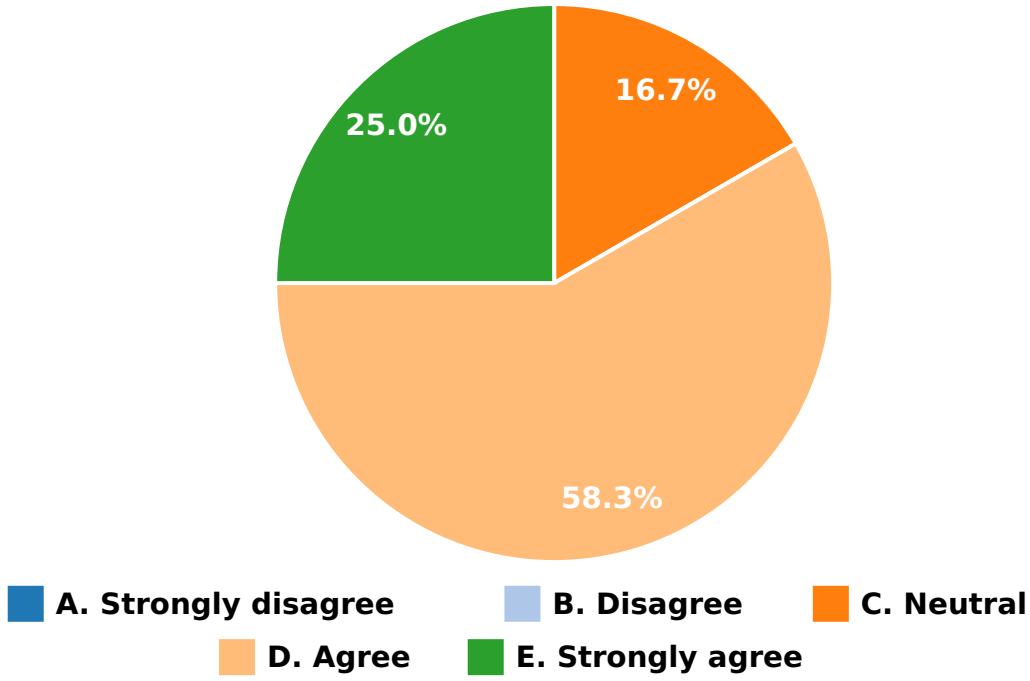
1) The Smartphone App Looks Self-Explaining / Easy To Use



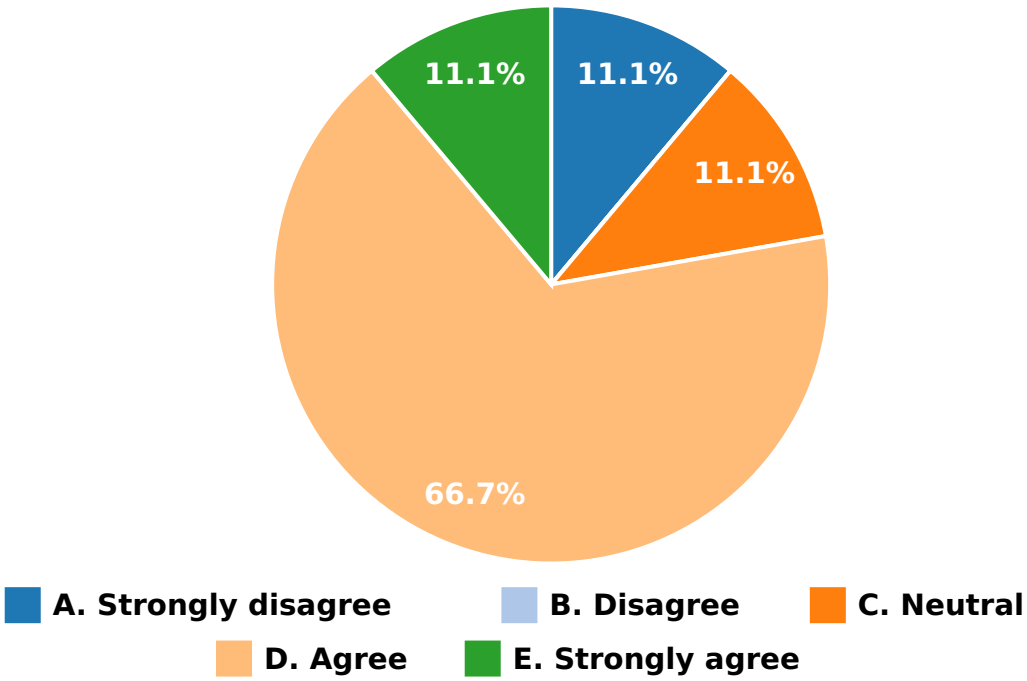
2) I Would Use The Smartphone App...



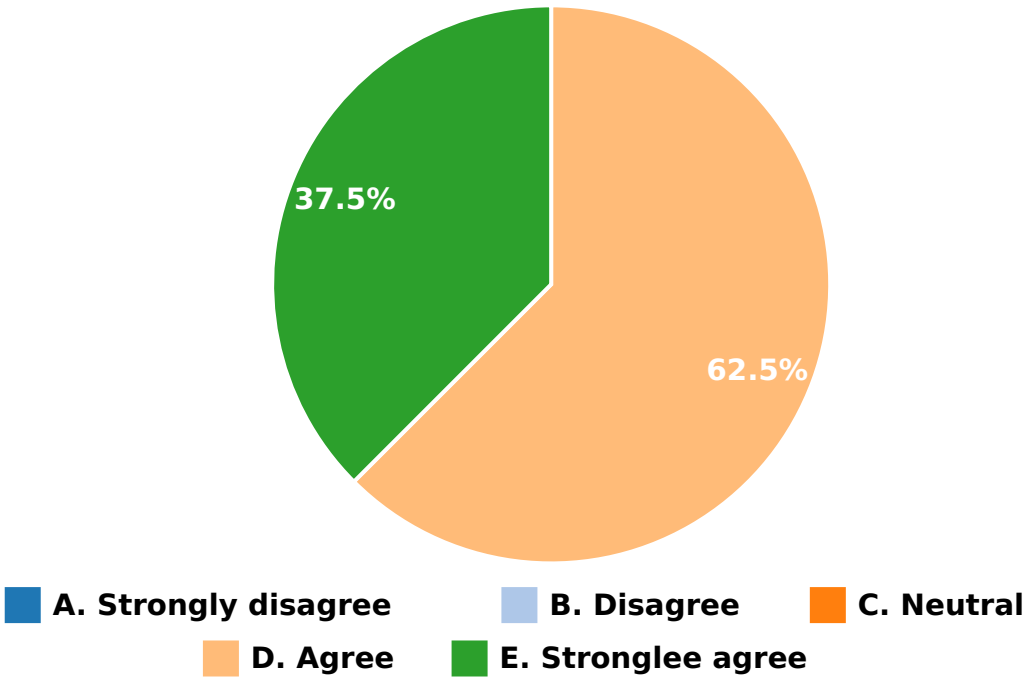
3) Using The Smartphone App As A Coaching Instrument, In Combination With The In-Vehicle Interventions, Will Help Increase The Safety Effects



1) The Web Platform Looks Self-Explaining / Easy To Use?



2) I Think The Web Platform Provides An Added Value For A Driver Coach In An Organization



3) What Is The Maximum Acceptable Cost Per Month Per User For The Complete I-DREAMS System (Real-Time Interventions & Post-Trip Coaching Via Smartphone & Web Platform) For Private Drivers?

Depends on the value of the rewards. Ideally should be part of the existing insurance offer. Can see it being a difficult separate sell to private drivers

20-30 euro similar to mobile phone contacts

Should not be more that a telecom subscription. Maybe around 60-80 euro

for private purposes, I think no more than 25 euro montly

4) What Is The Maximum Acceptable Cost Per Month Per User For The Complete I-DREAMS System (Real-Time Interventions & Post-Trip Coaching Via Smartphone & Web Platform) For Professional Drivers?

Depends on the cost benefit analysis that a company can do on savings attributable to the system.

For (public) companies, I would say that it is better to have kind of a full package all included to ease procurement processes and to avoid recurrent payments

Between 80 and 120 euro per driver

200 €

4) What Do You Consider To Be The Most Distinctive Feature Of The System?

Altering headway warnings based on weather events

Looks very similar to that available currently in Audi

Adapting the safety tolerance zone based on the drivers state and the driving conditions

iPhone in hand detection.

Visual. Easy to follow and understand.

Vehicle-independent installation? Suits for all cars?

What happens in the vehicle is monitored as well

Concise

5) What Do You Think Is The Most Crucial Missing Feature (If Any) Of The System?

Training in advance for users to ensure they use the system effectively to monitor conditions

Ability for a fleet control to intervene with the driver

Adapt the safety tolerance zone to each driver's normal behaviour to increase the acceptance.

Do you consider the possibility of C-ITS with other vehicles?

Alcohol interlock. Should require a breath sample before ignition.

Open flashing msgs to take care of safety and sustainability concepts (like care for vulnerable road users, reduce speed according to weather, etc)

Find a Good/Safe place to place the monitor

6) Is There A Comment You Wish To Share?

4) What Do You Consider To Be The Most Distinctive Feature Of The Smartphone App?

Feedback related to concrete benefits which can be purchased

The route history map is good

Gamefication of safe driving

Route history map and gamification

Checking your own driving statistics

Possibility to monitor own driving behaviour in different conditions and time points.

The ability to go and visit specific events after the trip. This can be useful for coaching/ training and driving skills development.

Gamification

Driver training and raking issues

Safety scoring - gamification

5) What Do You Think Is The Most Crucial Missing Feature (If Any) Of The Smartphone App?

Are drivers provided with notification when to take a test

The driver should be able to give feedback

Bidirectional communication with driver in case feedback is needed

112-button for a case of emergency.

The driver should be able to flag specific events so as to receive feedback on these events afterwards.

As I understood, video related with inccident alerts are only available on the web desktop. It could be useful to have it on the app to

6) Is There A Comment You Wish To Share?

3) What Type Of Information Should Be Included In The (Driver) Reports?

- Highlighting trends in behaviours
- Positive and negative feedback with indication of how to improve
- Aggregated information on high-risk behaviour or safety events.
- Advices about driving improving performance, according each driver's use

4) What Do You Consider To Be The Most Distinctive Feature Of The Web Platform?

- Customisability of tool & ability to review video footage
- Does it provide any real time alarms
- Visualisation of the trends in safety behaviour
- Possibility of monitoring driver performance by an organization
- Visualise Driver performance
- The video isseus, in increasing the driver performance

5) Is There A Comment You Wish To Share?

1) What Is The Maximum Acceptable Hardware Investment Cost For Private Drivers?

Can this link to insurance costs - I.e. be part of that offer to a private driver.

Retrofit options could be targeted at same level as GPS navigation. Eg TomTom

As a private driver I would say up to 300 euro

Private 100e

depends on the reduction in insurance cost.

No more than 1000 euros per user, as professional use. For no professional not so much

250 - 300 € - question on why? because of a deal with my insurance company

< 500 / year

2) What Is The Maximum Acceptable Hardware Investment Cost For Professional Drivers?

Around 2000 per vehicle

Up to 1000 euro but linked to potential advantages (monetization)

Big fleets have already monitoring systems for following the driving behaviour - the price should be in line with those.

Depends entirely on the associated reduction in TCO for the fleet owner: Less insurance premium, lower deductibles

1000 euro for each bus

1000 - but not the driver is investing, but the fleet operator/owner

< 400 € / year with fleet discount

5) If You Can Distribute €10 Over The Two Most Important Features, How Much Would The Real-Time Interventions (A) Be Worth And How Much Would The Post-Tip Coaching (B) Be Worth? (E.g. A = €5, B = €5)

A = €5, B = €5 (both equally important - can't have one without the other if seeking to improve safety)

A=3 B=7

A=4 B=6

A=7 B=3

A=5 B=5

a=4, b=6