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iDREAMS

NEWSLETTER

No. 3

December
2020



DEAR READER,

On the verge of a new year, I am delighted to share with you our third i-DREAMS Newsletter. In November 2020, our project reached its mid-term, an important milestone for the project. After a successful mid-term review meeting with our European Commission Project Officer, we are excited to present to you the highlights of our project so far. It must be said, 2020 was in many respects a strange year due to COVID-19. i-DREAMS too was affected by this global pandemic, posing unexpected challenges and requiring creative solutions and risk mitigation strategies from the project partners. As project coordinator, I am grateful and proud of the work that the project team has accomplished under these difficult circumstances. I am therefore very happy to share with you the main accomplishments of the project during the first 18 months. Sit back, relax and let me take you on our project journey...

Stay safe and healthy and my best wishes for 2021!

A handwritten signature in blue ink, appearing to read 'Brijs', with a stylized flourish extending from the end.

PROF. DR. TOM BRIJS
COORDINATOR

SAFETY TOLERANCE ZONE



KEEPING DRIVERS IN THE SAFETY TOLERANCE ZONE

The goal of i-DREAMS is to develop a system that assists drivers to drive safely. To make sure the driver stays in a 'safe zone', the driver's mental state (e.g. alertness), the driving context (e.g. speed limits, weather conditions) and concrete driver behaviour (e.g. lane positioning, headway) will be monitored in real-time. How safely the driver is driving, is reflected by his position in what is called the '**Safety Tolerance Zone**'.

The STZ is a continuum that distinguishes 3 stages: (1) the normal or safe driving stage where no interventions are required, (2) the danger phase where the risk of a collision is increasing and where the driver will be informed about potential dangers and (3) the avoidable accident phase where the system issues concrete warnings to avoid a collision.

Besides in-vehicle interventions during the trip, post-trip interventions will further educate drivers about their specific safe and unsafe driving performances. To realize this ambition, the consortium tackles a complex set of tasks of which intermediate progress and results are reported in technical reports.

The project is organized in the following work packages:

- WP1: Project management
- WP2: State of the art on monitoring driver state and task demand
- WP3: Operational design of i-DREAMS
- WP4: Technical implementation
- WP5: 4-stage, 5-country experiment
- WP6: Analysis of risk factors
- WP7: Evaluation of safety interventions
- WP8: Roadmap to market and society
- WP9: Stakeholder consultation and dissemination
- WP10: Ethics requirements

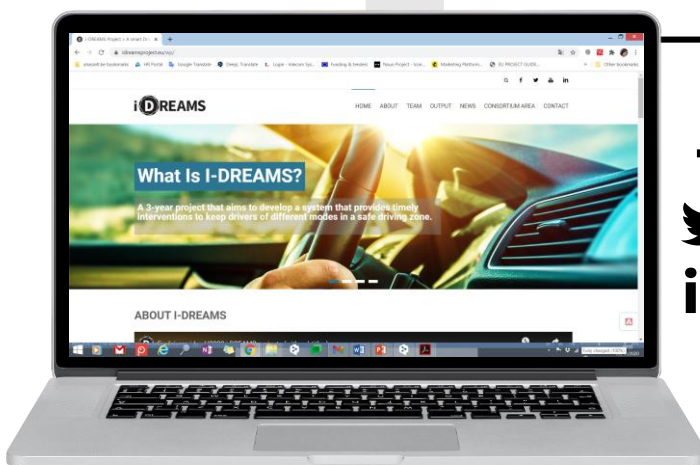
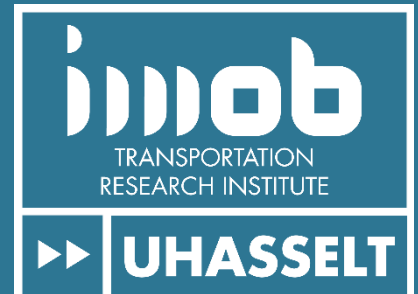
MAY 2019



UHASSELT coordinates i-DREAMS. For that reason, the project **kicked-off** in Hasselt. The consortium partners met up at the Holiday Inn hotel in Hasselt for two intense meeting days. They planned a course of action and the researchers returned home, knowing what they had on their plate and what was expected.

UHASSELT'S ROLE IN i-DREAMS

The Transportation Research Institute of Hasselt University (UHASSELT) is the initiator of i-DREAMS and takes up the overall responsibility for the technical and administrative coordination. Moreover, UHASSELT coordinates the work package 'Roadmap to market and society'. UHASSELT also contributes its expertise and task leadership on road safety, human factors and gamification, mainly in development, roll-out and analysis of technical project activities related to post-trip interventions, as well as in the participant recruitment and the coordination of project dissemination activities. Furthermore, UHASSELT supports other consortium partners with expertise in several other project activities.



The project **website** www.idreamsproject.eu is launched, a [Facebook](#) and [Twitter](#) account are opened and a closed [LinkedIn](#) group is created. All set to go full force ahead.



WP1, WP2, WP3 and WP9 immediately start their activities. **WP1** (Project coordination) and **WP9** (Communication & Dissemination) will continue all the way until the end of the project.

WP2 is in fact a large scale literature study that tries to shed light on the measurable factors contributing to the overall risk level and the corresponding indicators we can use to measure them in cars, buses, trucks and trains. Furthermore it reviews and assesses the state of the art on in-vehicle technology to measure those indicators and the state of the art on user feedback and intervention technology.

All this to provide recommendations to **WP3** where an actual methodology is designed to develop the overall operational project design, select the data collection tools and the most appropriate interventions, and where the experimental protocol and the procedures for Big Data handling are designed.

Although **WP4** normally doesn't start before February 2020, CARDIOID, the partner leading the work package and OSEVEN PC immediately take the bull by the horns. WP4 is the work package where all the technical implementations take place. Discussions on technical implementation requirements and challenges make it clear that there is no time to waste and we are better off immediately starting preparations.

CARDIOID'S ROLE IN i-DREAMS

Being the WP leader for WP4, CARDIOID Technologies (CARDIOID), a spin-off company of the University of Lisbon, takes up a key role in the technical implementation of the i-DREAMS platform. More specifically, CARDIOID will focus on the integration of the different data collection instruments that will be used to monitor task complexity and coping capacity. In addition, CARDIOID will contribute significantly in the implementation of procedures for data handling and protection, and Big Data processing. Furthermore, CARDIOID will be involved in working out a roadmap to market and society.



OSEVEN PC'S ROLE IN i-DREAMS

In WP4, OSEVEN PC will contribute significantly to the integration of the different data collection instruments and will participate in the implementation procedures for data handling and protection and Big Data processing. In addition, OSEVEN PC takes a leading role in the implementation of feedback on driver behaviour. Furthermore, OSEVEN PC supports the road testings in Greece in WP5.



JUNE 2019

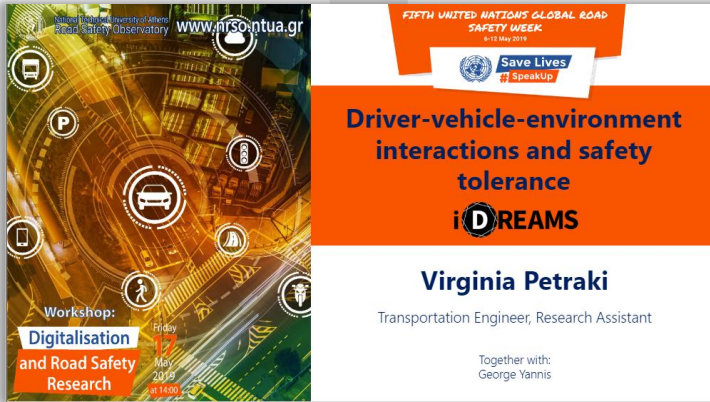


A **project identity** is worked out: i-DREAMS gets its own recognisable look-and-feel which is translated into all communication materials.



The **first technical report** (confidential, thus not published publicly) **under WP1 (D1.1)** is submitted to the Commission. It concerns the Project Management Plan describing all the tasks, timings and dependencies, responsible partner per task and progress status. The PMP is subject to regular updates.

JULY 2019



NTUA presents i-DREAMS at the **Road Safety Research Workshop** in Athens. The workshop attempted to shed light on the role and the challenges of digitalisation on road safety, through an intensive flow of state of the art presentations on key NTUA road safety research projects and vivid Expert Panel discussions. Of course i-DREAMS could not be lacking.

NTUA's ROLE IN i-DREAMS

Over the past 35 years, the Department of Transport Planning and Engineering of the National Technical University of Athens (NTUA) has focused road safety research on safety modelling, user behaviour and human factors, advanced driver assistance systems and safety impact assessment. Needless to say that NTUA is best suited to lead the analysis and evaluation work packages (WP6 and WP7), as well as several other analysis tasks.



**National
Technical
University
of Athens**



Our technicians (from DSS and CARDIOID) face the **first major technical challenge**: They equip IMOB's car simulator and 2 pilot vehicles in Hasselt with a first set of essential technologies that make it possible to monitor the complex tasks that have to be carried out in a vehicle, and the skills of the drivers. After all, the ultimate aim is to assist the driver during the trip (and after the trip) in order to increase road safety.

DSS's ROLE IN i-DREAMS

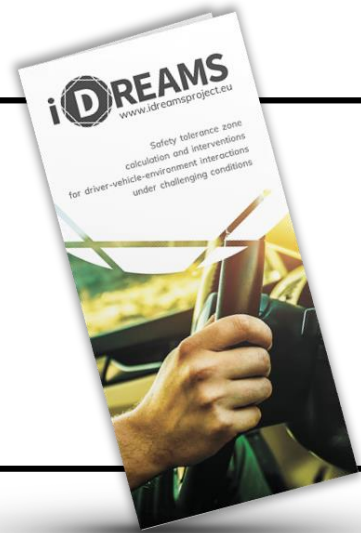
DriveSimSolutions (DSS), a spin-off company of the Transportation Research Institute of Hasselt University, will mainly be involved in activities of technical implementation and data collection, and has a supporting role in providing expert advice related to state-of-the-art on technologies, operational design and the roadmap to market and society. DSS will be responsible for building simulator systems (car, bus & truck), creating simulator scenarios and installing these systems for the planned simulator testings in the respective participating countries where field experiments will take place. Additionally, DSS will train and support researchers in the respective academic groups to operate the simulator and to analyse the simulator data.



SEPTEMBER 2019



A general [triptych flyer](#) and a general **PowerPoint** presentations have become available.



Rethinking transport
#TRA2020



The first i-DREAMS project papers are selected for the **Transport Research Arena Conference 2020** which will be held between 27 and 30 April in Helsinki, Finland. A first recognition for the scientific work done within the project.



LOUGH starts with a **survey of transport stakeholders**, including policymakers, sector specialists (e.g. operators), transport education and training providers, transport insurers or transport organisations/firms. The survey will focus on the following modes: cars, buses, trucks, trains and trams. Their knowledge and expertise are vital for the development of the research to ensure the technology being developed will address the most important problems.

LOUGH's ROLE IN i-DREAMS

The Transport Safety Research Group of Loughborough University (LOUGH) is a specialist research team that focuses on the real-world aspects of road and vehicle safety. LOUGH will lead the work package (WP3) on operational design of the i-DREAMS platform. In addition they will lead the simulator and field study organization and support and the on-road testings in WP5 and they will contribute significantly to the subsequent analysis of the combined data (WP6 and WP7). Furthermore, LOUGH provides contributions with respect to the technical implementations in WP4 and the consultation and dissemination activities in WP9.



Loughborough University



For the first time after the project started, the partners meet again in person for a **consortium meeting in Vienna**. The project's progress and challenges are discussed, the project work plan is re-evaluated and upcoming goals and deliverables are brought into focus.



UM presents i-DREAMS at the **European Mobility Week in Maribor**. In a session in which students and companies, active in the Slovenian mobility field, participated in, some mobility issues and innovative ways to tackle them were discussed. UM colleagues seized the opportunity to present the i-DREAMS project.

UM's ROLE IN i-DREAMS

The University of Maribor (UM) is involved in the identification, evaluation and selection of technologies for monitoring task complexity and driver capacity (WP2 and WP3) and in the evaluation of interventions (WP7).



OCTOBER 2019



Two new technical reports are submitted to the Commission:

The [Data Management Plan \(D1.2\) under WP1](#), describing the data management life cycle for the data to be collected, processed and/or generated by i-DREAMS.

The [Dissemination Plan \(D9.3\) under WP9](#), elaborating on our strategy to ensure stakeholder involvement, and our approach on how to regularly inform stakeholders on the progress and results of the project. The Dissemination Plan is subject to regular updates.



Team i-DREAMS and team MEDIATOR meet to discuss possible collaborations. MEDIATOR will develop a mediating system for drivers in semi-automated and highly automated vehicles, resulting in safe, real-time switching between the human driver and the automated system based on who is fittest to drive. Given the link between the projects and their complementarity, both teams are looking for opportunities to organise joint workshops and seminars.

During the meeting i-DREAMS was represented by delegates from UHASSELT, NTUA, LOUGH and TUD

TUD's ROLE IN i-DREAMS

The Safety and Security Science Group of the Technical University of Delft (TUD) contributes to several work packages. TUD's efforts focus on Big Data handling (with focus on ethics and security issues), modelling of extreme events and on tasks related to analysis and modelling of risk factors. Furthermore, in WP8 TUD is responsible for translating knowledge between modes.



WP5 and WP8 start: **WP8** is the roadmap to market and society, coordinated by UHASSELT. **WP5** is the work package where the proof of the pudding is in the eating, meaning that in WP5 the i-DREAMS platform will be extensively tested in simulator and field trials in 4 different stages and in 5 different countries. WP5 is coordinated by TUM.

TUM's ROLE IN i-DREAMS

The Transportation Systems Engineering department of the Technical University of Munich (TUM) coordinates the empirical framework of the project. This means TUM leads the 4-stage 5-country experiment, which is concerned with practical and organizational study set-up, participant recruitment, data collection, and integration from all the (pilot) studies and simulations. TUM will be the main contributor to the design procedures for Big Data handling and processing.



DECEMBER 2019



The [second technical report under WP9 \(D9.1\)](#) is submitted. It concerns a report on survey vehicle operator needs. Transport experts from modes such as buses, trains and trucks shared their knowledge and expertise which is crucial for the development process in i-DREAMS.

The consortium meets again in person to discuss project progress, results and the further course of action. This meeting is a special one, since the members of the i-DREAMS Expert Advisory Board (EAB) have joined. The EAB consists of a group of experts in the field of road safety, human factors and automation. They will support the consortium in strategic choices throughout the project. Strategic orientations are discussed with them and they will be asked to reflect on the project progress. The EAB consists of the following members:



- Professor Judith Charlton (Director of MUARC), Monash University Accident Research Centre (Australia)
- Dr. Ward Vanlaar (Chief Operating Officer), Traffic Injury Research Foundation (Canada)
- Dr. Wael Khaleel Alhajjaseen (Assistant Professor), Qatar Transportation and Traffic Safety Center, Qatar
- Dr. Carol Flannagan (Research Associate Professor), University of Michigan Transportation Research Institute (USA)
- Professor Samuel G. Charlton, School of Psychology, University of Waikato (New Zealand)

JANUARY 2020



The i-DREAMS [explainer video](#) is launched. It explains the added value of i-DREAMS in our daily lives through the life of character Emma.



The [first i-DREAMS newsletter](#) is published.



The [first technical report under WP3 \(D3.1\)](#) is submitted to the Commission. It describes the framework for operational design of experimental work in i-DREAMS.



The DSS simulator boys build a large vehicle simulator that simulates the driving experience in a truck or bus. This simulator will be used to test the newly developed i-DREAMS technology and to investigate the effect of i-DREAMS interventions on truck and bus drivers. **Discover how they build a large vehicle simulator and watch the [time lapse video](#).**

FEBRUARY 2020



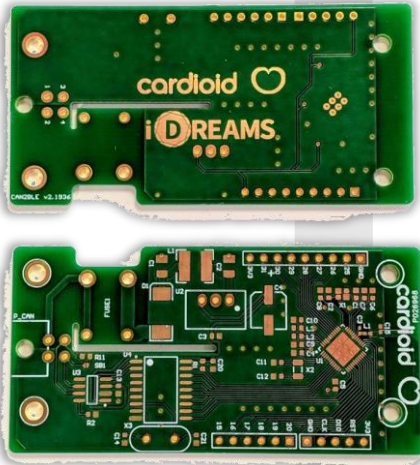
Three new technical reports are submitted to the Commission:

[D2.1 \(under WP2\)](#), describing a large-scale literature study on the state of the art regarding endogenous factors for monitoring driver state and exogenous factors related to task demand and on the technology to carry out the monitoring.

[D2.2 \(under WP2\)](#), providing an overview of the state of the art technology for safety interventions and assessment of their effectiveness.

The [first technical report under WP5, D5.1](#), describing the organization protocols for the driving simulator and on-road trial experiments.

Prototypes, prototypes ... they are vitally important for this project, because they make it possible to gain a better understanding of the safety potential and the implementation challenges we face with in the large-scale application in road studies later in the project.



CARDIOID made a **prototype of the Gateway** ... or the brain of the i-DREAMS application. The Gateway receives all the signals from the sensors that measure what is happening outside the vehicle and inside the vehicle and it receives the signals that tell us how the driver is doing. On this basis, the Gateway makes an assessment of the safety risk and gives warnings in real time (and without) delay if necessary.



DSS developed a **custom-made driving simulator system based on parts of a Peugeot 206**. In this way, the reality is simulated as truthfully as possible and the i-DREAMS monitoring and intervention technology can be tested and optimised before being rolled out in field studies.

MARCH 2020



The **consortium meets for the third time in Ericeira, Portugal**. The meeting was organised by BARRA, the largest, privately owned, public passenger road transport company operating in Portugal. An 'instrumented vehicle', fully equipped with i-DREAMS technology is presented. But on the downside, COVID-19 is slowly getting a grip on society and on i-DREAMS as well. Possible effects of COVID-19 on what is to come in i-DREAMS are discussed.

BARRA's ROLE IN i-DREAMS

The main role of Barraqueiro Transportes (BARRA) is situated in WP5, in the simulator and on road experiments and real operation data collection. Besides actually collecting the data, BARRA also has a small role in analysing and processing the data.

**BARRAQUEIRO
TRANSPORTES, SA**



Two i-DREAMS abstracts are selected for the HUMANIST conference that takes place on 24 and 25 September in Rhodes Island. The biennial HUMANIST conference brings together a wide range of researchers and experts from the research communities in Human Factors, Behaviour, ITS and vehicle automation. Researchers present results of recent developments and trends in this area. HUMANIST also serves as a forum for discussion and debate.



The first [User Advisory Board meeting](#) is organised online because of COVID-19. The impact of the project will be maximised through the User Advisory Board, which acts as a counselling body throughout the project's lifetime. The UAB consists of 22 core stakeholders comprising public authorities, companies, and key international organizations representing road users, associations, fleet operators and insurance companies. The role of the User Advisory Board is to support the consortium in ensuring the research continues to address the key issues as well as providing a major route to implementation of the results.

APRIL 2020



A [second technical report under WP3 \(D3.2\)](#) is submitted to the Commission. A conceptual definition of the safety tolerance zone is worked out by shortlisting the data collection tools and driver/monitoring methodologies, used in the project.



The Transport Research Arena Conference in Helsinki is cancelled due to COVID-19.



WP6 and WP7 start. **WP6** focuses on the development and implementation of a methodology to analyse risk factors related to operator state, vehicle state and task complexity.

In **WP7** we will develop a methodology for evaluating the interventions to improve driver/operator safety. Furthermore the effectiveness of the i-DREAMS interventions will be tested, based on the field study data.

MAY 2020

The **effects of COVID-19** are felt. Most of the team members are **working from home** to tackle the challenges from there. At this point, CARDIOID who is responsible for assembling the i-DREAMS systems that need to be installed in the vehicles during the field trials, is **working out solutions** for:



The **timely production of sufficient number of i-DREAMS systems**. Supply chain and stock outage are threatening to cause serious delays. Therefore CARDIOID evaluates different supply channels for critical i-DREAMS system components.

But **getting the i-DREAMS systems installed in time**, will also be challenging. Training and availability of technical staff in the different field-trial countries is difficult under the imposed travel restrictions. Therefore a lot of effort goes to the creation of online learning and technical support materials for in-vehicle installations. Nevertheless a physical on-site installation training remains essential and necessary to get certified. In Belgium and Portugal, on-site training already took place, therefore they are all set to go.

JUNE 2020



The [third technical report under WP3 \(D3.3\)](#) is submitted to the Commission. This report shortlists real-time and post-trip interventions which can be used to assist in staying within their safety tolerance zone.



The **fourth gathering of the consortium partners** takes place online. It is different, it feels different, but COVID-19 is not stopping us.

JULY 2020



The [second i-DREAMS newsletter](#) is published.

AUGUST 2020



Under WP3 the **fourth technical report (D3.4)** is submitted to the Commission. It describes the experimental protocol that will steer the simulator and on-road trials.

(This report has not yet been approved for publication)

The first two technical reports under WP4 are submitted to the Commission:

D4.2 elaborates on the safety tolerance zone algorithm that will be implemented and serves as the central brain of i-DREAMS to assess real-time risk.

D4.3 describes the back-end database that enables data management and subsequent analysis of raw and processed data.

(Both reports are confidential and thus not publicly available.)



DSS tests their prototype real-time intervention technology in a vehicle.

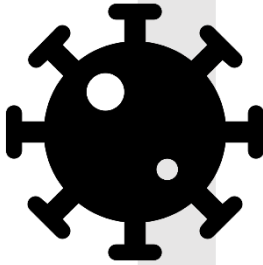
This provides better insight into the placement, readability under different lighting conditions and comprehensibility. This way it becomes clear where there is room for improvement.

SEPTEMBER 2020



The fifth technical report under **(D3.5)** under **WP3** is submitted, describing the standard protocol for the handling of Big Data.

(This report has not yet been approved for publication.)



The **HUMANIST** conference is **cancelled** due to COVID-19.

OCTOBER 2020



i-DREAMS is represented by Prof. dr. Tom Brijs in the **Urban Mobility Days**.



Four technical reports are submitted to the Commission:

D1.3 (under WP1), which is an update of the Project Management Plan and the Data Management Plan.

(This report is confidential, thus not publicly available.)

D9.4, the update of the Dissemination Plan

D5.2 (under WP5) describes the experimental design, the methodology, the timetable, the necessary operational checks, the KPI's and the essential resources to fulfil the experiments.

D7.1 (under WP7) provides a methodology for the evaluation of interventions.

(These reports have not yet been approved for publication)



The **consortium members gather for the last time in Period 1 and again they meet online**, still undergoing the effects of COVID-19. During this meeting, i-DREAMS also got acquainted with another liaison project, called the HADRIAN project (<https://hadrianproject.eu/>).



The [first Policy Brief](#), written by POLIS, is published.

POLIS's ROLE IN i-DREAMS

POLIS contributes mainly to WP8 and WP9. In WP8 their focus is on drafting policy recommendations. In WP9, POLIS supports the stakeholder consultation and manages the Expert and Advisory Boards.

POLIS
CITIES AND REGIONS FOR TRANSPORT INNOVATION



The first 18 months are concluded with a successful mid-term review meeting.