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# TWIN-SAFE NEWSLETTER

January 2025, ISSUE 01

**twinsafe**

# THE AGENDA:

- TWIN-SAFE project overview
- TWIN-SAFE list of activities
- TWIN-SAFE impact: sharing knowledge for safer road
- TWIN-SAFE calendar

**Dear reader,**

**Welcome to the first TWIN-SAFE project newsletter!**

We are excited that our project, funded under the Horizon Europe coordination and support program, has started, and that we can present our work so far. Launched in May 2024, the TWIN-SAFE project aims to enhance road safety research capabilities at the Faculty of Transport and Traffic Sciences University of Zagreb (FTTS) by collaborating with two leading European institutions — Lund University and Hasselt University.

Our vision is to establish FTTS as a centre of excellence in multidisciplinary road safety research, education, and innovation. The project also encompasses a joint research initiative delving into the relationship between infrastructure characteristics and driver behaviour, targeted capacity building of FTTS as a centre of excellence, and programs to spur internationalisation, diversity, and entrepreneurial thinking. Through its multidimensional approach, TWIN-SAFE will cultivate an ecosystem that unites academia, industry, and government to pioneer data-driven solutions for a key societal challenge – improving road safety.

In just seven months since our start, we have made significant progress across various work packages. So far, we have recruited 75 participants (55 car drivers and 20 motorcyclists) for the research part of the project and achieved our first milestone in October 2024. Additionally, we have hosted four online PhD seminars on road safety topics and several workshops covering Vision Zero, the Safe System Approach, Civic university initiatives, and grant writing. We completed work package 2, the "Mapping phase," where we developed a strategic framework to optimize laboratory infrastructure at FTTS, defining the needs for two new laboratories: the Road Simulation Laboratory and the Traffic Behaviour Research Laboratory.

We also reviewed project management practices at partnering institutions (Lund and Hasselt University) to provide tailored recommendations for FTTS and initiated the development of an open science collaboration framework to enhance data exchange and research partnerships.

A highlight of our recent activities is the Road Safety Summer School held at FTTS from September 2 to 11, 2024. This program included 60 hours of lectures delivered by 30 experts from 10 countries, featuring practical exercises and group work. Participants gained a deeper understanding and applied their knowledge in real-world scenarios, fostering collaboration and critical thinking skills. A total of 23 participants from 15 countries took part, and we look forward to the next edition!

Thank you for reading our newsletter! We invite you to visit our website, follow us on social media, or contact us directly for more information and updates on our project.



Yours sincerely,  
Asst. prof. Dario Babic

Project coordinator



# TWIN-SAFE OVERVIEW

Road safety remains a pressing global issue, with road crashes causing 1.19 million deaths annually and leaving countless individuals injured. These incidents take a devastating toll on families, communities, and economies, with costs reaching 1-3% of GDP. In the EU, around 20,000 people lose their lives on the roads each year. While significant progress has been made, the disparity in road safety between EU Member States highlights the need for more unified and effective strategies.

To address this issue, the EU has set ambitious targets: a 50% reduction in road deaths and serious injuries by 2030 and zero road deaths by 2050 under its "Vision Zero" initiative. Central to this plan is the Safe System Approach, which anticipates human errors and designs systems to minimize fatal consequences by ensuring safe road users, vehicles, infrastructure, speeds, and post-crash care.

Croatia faces unique challenges despite having high-quality road infrastructure and EU-aligned legislation. The country lacks more concrete interdisciplinary collaboration among legislators, authorities, the public and private sectors, NGOs, and academia.

The TWIN-SAFE project focuses on advancing the Faculty of Transport and Traffic Sciences University of Zagreb (FTTS) by enhancing its research and education, with a strong emphasis on road safety. It aims to support the development of the newly established Centre of Excellence in Road Traffic Safety (CERTS) at FTTS, solidifying its role in pioneering road safety research and innovation.

The project leverages partnerships with Hasselt University (HU) and Lund University (LU) to incorporate best practices and expertise, enhancing FTTS's position as a leader in road safety research and innovation. This collaboration is strengthened by the "Q-helix" model, which brings together academia, industry, public authorities, and end-users to address road safety challenges through a multidisciplinary approach.

An important part of the TWIN-SAFE project is its research component, in which the research team will employ mobile tools, such as the iDREAMS app, to monitor driver behaviour and GIS to identify high-risk road sections. These insights, evaluated using the iRAP methodology, will guide the design of safer road systems.

# Key work packages driving the TWIN-SAFE vision



## Project Coordination and Management



Goals

Efficiently coordinate and manage the TWIN-SAFE project to achieve its objectives.



Activities

Ensure smooth collaboration between partners, oversee project progress, manage administrative tasks, and ensure compliance with EU funding requirements.



## Innovation and Commercialization



Goals

Strengthen FTTS expertise in road safety approaches and foster interdisciplinary collaboration.



Activities

Conduct training workshops, summer schools, researcher exchanges, and define joint PhD research areas.



## Capacity Building for Road Safety Research



Goals

Map FTTS's current capabilities and develop a roadmap for improving road safety research infrastructure



Activities

Benchmark technologies, identify investment priorities, and strategize infrastructure enhancements.



## Research on Driver Behaviour and Infrastructure



Goals

Investigate the relationship between rural road infrastructure and driver behaviour.



Activities

Collect and analyse driving data, assess high-risk locations, propose safety measures, and validate them through simulations and user feedback.



## Internationalisation and Gender Inclusion



Goals

Boost FTTS's global outreach, management, and innovation skills.



Activities

Develop an English curriculum, organize workshops, establish an innovation office, and facilitate internships.



## Dissemination and Sustainability



Goals

Ensure dissemination, sustainability, and impact of project outcomes.



Activities

Host summer schools, present solutions at conferences, and provide policy recommendations.

# CONSORTIUM



**The Faculty of Transport and Traffic Sciences (FTTS)**, established in 1984 as part of the University of Zagreb, is a leading institution in transport and traffic engineering in Croatia. Specializing in transport technology, intelligent transport systems (ITS), logistics, and aeronautics, FTTS actively participates in national and international research projects to address critical transport challenges. Particularly prominent in road safety, FTTS has led or partnered in several EU-funded initiatives, contributing to the development of innovative solutions and strategies for improving traffic safety and efficiency. These efforts position FTTS as a key player in advancing transport research and fostering safer, more sustainable mobility.



**Lund University**, Scandinavia's largest institution for education and research, is consistently ranked among the world's top 100 universities and has a strong focus on road safety research through its Transport and Roads unit. This multidisciplinary team, with around 30 permanent staff members, is involved in various EU projects related to traffic safety. The unit promotes the Vision Zero initiative, aiming for zero fatalities and serious injuries in road traffic while fostering safer and more sustainable transportation systems.



The **Transportation Research Institute (IMOB)** at Hasselt University conducts fundamental and applied research in transportation and road safety and transportation modelling, employing a total of 50 staff members, including faculty and researchers. Their road safety research unit, comprising 20 specialists, focuses on human factors related to road infrastructure and vehicle technology, employing innovative methods like driving simulations camera-based studies, and drone technology to analyse and improve traffic safety outcomes.

# TWIN-SAFE TEAM

(part of it 😊)







# MAY 2024

## The Kick-off meeting



Prof. dr. Tom Brijs  
Hasselt University

*"We share our road safety expertise and civic university experience to shape FTTS's civic mission."*



Carmelo D'Agostino  
Senior Lecturer at Lund University

*"Lund contributes expertise in proactive road safety analysis and diversity, equity, and inclusion in transport, adding a new dimension to the well-established knowledge of FTTS."*



Asst. prof. Dario Babić  
Faculty of Transport and Traffic Sciences, University of Zagreb

*"As the lead coordinator, our focus is on developing CERTS and advancing FTTS's role in road safety research and education."*



# SEP 2024

## 1st Road Safety Summer School Held from 2nd to 11th September in Zagreb, Croatia

The Faculty of Transport and Traffic Sciences at the University of Zagreb has long been devoted to providing students with a stimulating environment. We encourage them to become active and independent researchers and develop critical thinking, communication, and problem-solving skills. One of our aims is to train individuals who have a passion for lifelong learning and want to achieve personal and professional growth.



# Road Safety

*Summer* SCHOOL 2024

## Goal

The main goal of the school is to provide expert training related to advanced concepts and elements of road safety.



[CHECK OUR WEBSITE](#)

## Course

During the course of nine days, world-renowned experts from the field will introduce participants to the state-of-the-art findings related to the main factors of road safety: the human factor, the road and its environment, and the vehicle factor.

[CHECK OUR BROCHURE](#)



## Practical part

The practical part of the summer school introduced participants to the basics of crash analysis based on the actual data obtained from a crash test. Participants were also introduced to road safety inspection in a real world environment.







## Highlights from the 2024 Road Safety Summer School!



# TESTIMONIALS

*"The Summer school offered great networking with experts and companies, plus insightful lectures."*

Mollalign Yizengaw Mebrat



*"Being part of the Road Safety Summer School was an incredible experience that I will carry with me for years to come. The insights and connections I gained there have been truly invaluable."*

Symbat Zhanguzhinova



"I gained diverse perspectives on road safety, met great people, and enjoyed exploring Zagreb and Plitvice Lakes."

Tomáš Blodek



"The Road Safety Summer School gave me great insights into traffic safety and inspired my future work. The well-organized program and friendly atmosphere made it a great experience."

Jakub Nováček



## SEP 2024

PhD online seminars  
...in case you have missed it



Date	PhD Student	Topic	Institution
Sep 20th 2024	Muhammad W. Khattak	Development and Calibration of Safety Performance Functions for Urban Roads in Flanders, Belgium	Hasselt U.
Oct 25th 2024	Mladen Miletić	Learning Cooperative Multi-Agent Adaptive Control System of Signalized Intersections based on Growing Neural Gas for Mixed Traffic Flows	FTTS
Nov 22nd 2024	Zhankun Chen	Develop a new crash prediction method based on non-accident indicators to evaluate the effect of infrastructure on the interaction of CAV and conventional road users when they share the same physical space	Lund U.

<b>Dec 13th 2024</b>	<b>Waqas Ahmed</b>	<b>Enhancing Road Safety through UAV captured Aerial Footage and Deep Learning: Object Detection, Risk Prediction, and Real-time Analysis</b>	<b>Hasselt U.</b>
<b>Jan 24th 2025</b>	<b>Marija Ferko</b>	<b>Assessment of influential factors on motorcyclists' safety on rural roads</b>	<b>FTTS</b>
<b>TO BE CONTINUED...</b>			
<b>Feb 21st 2025</b>	<b>Oksana Yastremska- Kravchenko</b>	<b>Application of video recordings in traffic studies</b>	<b>Lund U.</b>
<b>Mar 21st 2025</b>	<b>Muhammad Bilal Akram</b>	<b>Enhancing children's road safety at schools by testing Route2School (R2S) app for improving the education level and by using video cameras and drones to identify conflict points between children and other road users</b>	<b>Hasselt U.</b>
<b>Apr 11th 2025</b>	<b>Leonid Ljubotina</b>	<b>Predictive Model for Assessing a City's Bikeability Potential</b>	<b>FTTS</b>
<b>May 23rd 2025</b>	<b>Elvira Grah</b>	<b>The production of emotion and rationality in street-level mobility planning</b>	<b>Lund U.</b>



**ONLINE PhD seminar**  
**September 20th 2024**  
**10:00 AM**

Scan to REGISTER!

**Muhammad Wisal  
Khattak**

Hasselt University

*"Development and Calibration  
of Safety Performance  
Functions for Urban Roads in  
Flanders, Belgium."*



*"Knowledge sharing across disciplines  
enhances learning and fosters innovation."*

*"Exposure to state-of-the-art practices keeps  
researchers informed of the latest  
advancements."*

*"Diversity in research groups brings new  
perspectives and approaches to transport  
safety challenges."*

**LINK FOR THE SEMINAR MATERIALS**



**ONLINE PhD seminar**  
**October 25th 2024**  
**10:00 AM**

Scan to REGISTER!

**Mladen Miletic**

Faculty of Transport and Traffic  
Sciences, University of Zagreb



*"Learning Cooperative Multi-Agent  
Adaptive Control System of Signalized  
Intersections based on Growing Neural  
Gas for Mixed Traffic Flows"*

*"Connected vehicles open new possibilities  
for traffic data collection and modern signal  
control."*

*"Mixed traffic flows (autonomous and  
human-driven vehicles) present a rich area  
for research."*

*"AI-driven traffic control can be effectively  
applied in large-scale mixed traffic  
environments."*

**LINK FOR THE SEMINAR MATERIALS**







ONLINE PhD seminar  
November 22nd 2024  
10:00 AM

Scan to REGISTER!



**Zhankun Chen**

The Faculty of Engineering at  
Lund University, Transport and  
Road division

*"Feasible framework of Surrogate  
Measure of Safety (SMoS), what, why,  
and how"*



*"The safe system approach is essential for  
advancing traffic safety research."*

*"Advanced technologies like AI are shaping  
the future of traffic safety methodologies."*

*"Drone trajectory data could provide better  
insights compared to traditional stationary  
cameras."*

**LINK FOR THE SEMINAR MATERIALS**

*"Often the simplest solution is the most  
optimum one: a lesson learned in terms of  
surrogate safety measures deployment."*

*"How state-of-the-art can make our roads  
safer."*

*"Educating the road users is of key  
importance as behavioural changes are  
necessary."*

**LINK FOR THE SEMINAR MATERIALS**



ONLINE PhD seminar  
December 13th 2024  
10:00 AM

Scan to REGISTER!



**Waqas Ahmed**

Hasselt University, Belgium

*"Enhancing Road Safety through UAV  
captured Aerial Footage and Deep  
Learning: Object Detection, Risk  
Prediction, and Real-time Analysis"*





# OCT 2024

## Participant recruitment process

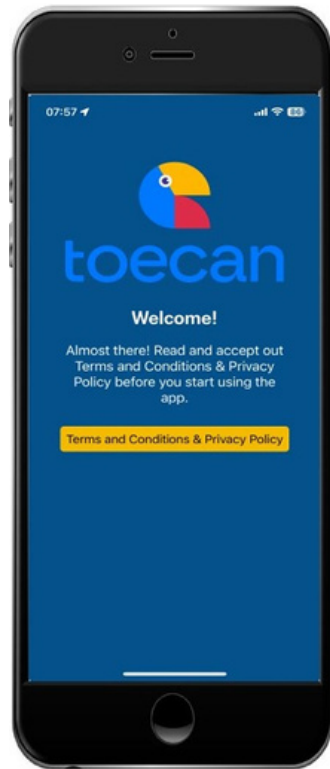
The TWIN-SAFE team has officially begun recruiting participants for the research part of the program.

So far the study has involved 75 participants, 55 car drivers and 20 motorcyclists. **FIRST MILESTONE** ✓

Using the **TOECAN** app, developed under the Horizon Europe **i-Dreams** project, the project team will monitor participants' driving patterns, such as speeding, sudden acceleration, and phone use, while integrating this data with road infrastructure characteristics.

### **TOECAN app (or the iDREAMS driver monitoring system)**

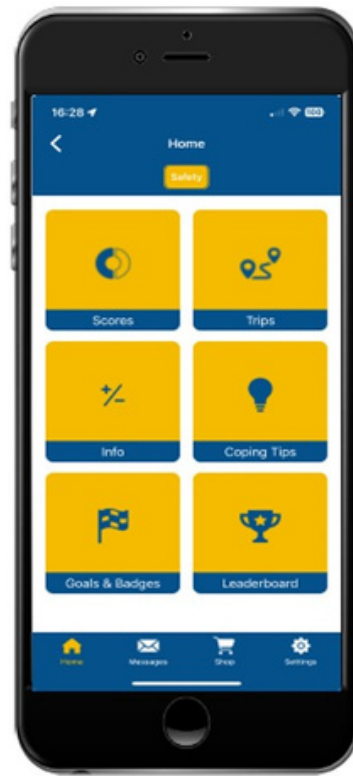
The TOECAN app collects data on driving behaviour, including speed, acceleration, deceleration, and mobile phone use. Drivers install the app using a unique link and access code. The app tracks trips, scores driving behaviour, and analyses patterns to identify safety risks on rural roads. This data helps improve road safety solutions tailored to driver behaviour.



### STEP 1

#### Receive Access

Users receive a unique link and access code via email or SMS.



### STEP 2

#### Install the App

Open the link on a smartphone, download the app from the app store, and install it.

### STEP 3

#### Grant Permissions

Provide required permissions (e.g., location, Bluetooth) to ensure the app functions properly.

### STEP 4

#### Log In

Use the unique access code to log into the app. The login process is a one-time step unless switching devices.

### STEP 5

#### Automatic Data Collection

The app automatically records driving data, including speed, acceleration, deceleration, and phone usage during trips.

### STEP 6

#### Track Performance

View trip summaries, scores, and safety feedback directly in the app.

### STEP 7

#### Set Goals

Select safety improvement goals and monitor progress through the app's dashboard.



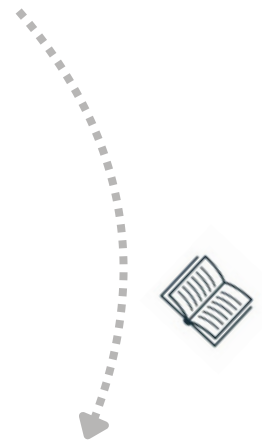
# OCT 2024

Workshops in Hasselt, Belgium:  
Human Factors & Civic University

## [WORKSHOP 1]

### Human Factors

Day 1 brought the **Safe Systems Approach** to life, blending core theories with real-world applications in human factors and road safety. This dynamic session sharpened FTTS's expertise in modern road safety strategies, paving the way for deeper collaboration and shared innovation between institutions.



### About the Safe System Approach

The Safe System Approach is a holistic framework aimed at preventing road traffic fatalities and serious injuries by recognizing human limitations and addressing the interplay between road users, vehicles, and infrastructure. This approach is based on the principle that while human errors are inevitable, they should not result in fatal or severe consequences.

# SAFE SYSTEM APPROACH

(Key components)

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## Safe Road Users

Promote responsible behaviour via education, enforcement, and awareness.



## Safe Vehicles

Support adoption of safety-equipped vehicles.



## Safe Speeds

Manage speeds to match road design and ensure survivable collisions.



## Safe Roads

Design infrastructure to reduce crashes and severity.



## Post-Crash Care

Ensure efficient emergency response to reduce injury severity.

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## [WORKSHOP 2]

### Civic University

DAY 2 spotlighted the Civic University concept, with Hasselt University leading the way. This workshop inspired FTTS and Lund University to craft a civic mission that bridges academia and society. The collaboration aims to boost internationalisation, sharpen project management skills, and ignite entrepreneurial thinking at FTTS.



## What is Civic University?

“Hasselt’s guiding belief is that we can serve our community best by being a **civic university**. Our civic mission is aimed at making and keeping this region strong – a good place to build a future, a career, a business, a home, a life.”

*Hasselt, Belgium*

A civic university is more than a place for studying and research—it's an active partner in its community. It works hand-in-hand with local people, companies, and governments to solve real-world problems while aiming for academic excellence.

By focusing on shared challenges, from education gaps to environmental issues, a civic university turns its region into a living laboratory for innovation. At its core, it's about using knowledge not just for discovery, but to create meaningful change that benefits both local and global societies.

**Curious about the roots and impact of civic universities? Hear from expert John Goddard in Hasselt hosted interview!**



## THE INTERVIEW



# DEC 2024

## Workshops in Lund, Sweden: Strengthening Road Safety and Research Collaboration

Participants kicked off the workshop with an introduction to K2, Sweden's national research hub for public transport. The day included an inspiring tour of the advanced laboratories at Lund University's Campus Helsingborg, showcasing cutting-edge infrastructure for transport and safety research.

### [WORKSHOP 1]: Zero Vision/ Safety System Approach

The workshop highlighted impactful research and real-world solutions:

- Surrogate safety measures by Lund University.
- Driving simulation insights from 15+ years of research at Hasselt University.
- Smart guiderails improving post-crash outcomes in Croatia.
- Road safety lessons from AfroSAFE for low- and middle-income countries.
- Practical applications of the Safe System Approach from Belgium, Croatia, and Sweden.

### [WORKSHOP 2]: Grant Writing

The second day featured an interactive workshop on Horizon Europe funding opportunities. Experts guided attendees through the essentials of grant writing, from idea development to finalizing competitive research proposals. This hands-on session provided valuable insights into navigating the complexities of EU funding systems.





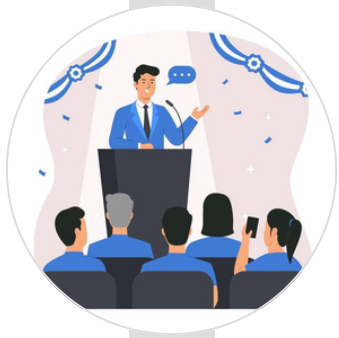
# TWIN-SAFE IMPACT

## SHARING KNOWLEDGE FOR SAFER ROADS

### Public Forum on Motorcycle Rider Safety in Croatia

The Faculty of Transport and Traffic Sciences at the University of Zagreb hosted a forum on motorcycle rider safety. Supported by the National Road Safety Plan, the event featured presentations, including one by Asst. Prof. Dario Babić, PhD, who introduced the TWIN-SAFE project and the TOECAN app. Developed under the Horizon i-DREAMS project by Hasselt University, TOECAN collects driving data from both car and motorcycle drivers helping to improve driving behaviours. This app is part of the broader TWIN-SAFE project, emphasizing a holistic approach to enhancing road safety.





# STATE PROFESSIONAL CONFERENCE FOR PRIMARY SCHOOL PRINCIPALS

## *- Innovative Approaches and Professional Competencies in Promoting Traffic Safety and Culture in Primary School Education*

A national professional conference for primary school principals, "Innovative Approaches and Professional Competencies in Promoting Traffic Safety and Culture in Primary School Education," was held, organised by the Faculty of Transport and Traffic Sciences University of Zagreb, in cooperation with the Ministry of the Interior, the Ministry of Science, Education and Youth, and the Agency for Education and Teacher Training.

The conference aimed to raise awareness among principals about the importance of traffic safety education for children. Key topics included the importance of teaching traffic safety and culture in primary education, presented by the coordinator of the TWIN-SAFE project, Asst. Prof. Dario Babić, PhD.



# TWIN-SAFE ACTIVITIES 2025

## WP1: Project Management

20% Complete

Upcoming activities:

- ▶ Steering committee meetings, quality and risk management

## WP2: Mapping phase

100% Complete

## WP3: Research of road infrastructure impacts on driver behaviour

10% Complete

Upcoming activities:

- ▶ Data collection using TOECAN app
- ▶ Collecting road infrastructure data
- ▶ Literature review of common infrastructure measures for eliciting desired driver behaviour

## WP4: Empowering the Centre of Excellence for Road Traffic Safety

40% Complete

Upcoming activities:

- ▶ Continuation of online PhD seminars
- ▶ Identification of the research topics of joint interest
- ▶ Summer school on road safety assessment methodologies
- ▶ Immersive training program for safety auditors
- ▶ Road Safety Summer School program enhancement

## WP5: Developing an international research environment with strong project management capabilities

10% Complete

Upcoming activities:

- ▶ Defining FTTS civic mission, strategy and objectives

## WP6: Dissemination, outreach, and sustainability

10% Complete

Upcoming activities:

- ▶ Proactive promotion of project activities and effective dissemination of its outcomes

50% Complete

Thanks for keeping up with the TWIN-SAFE project. There's plenty more ahead as we continue working towards safer roads through research, collaboration, and innovation. In the coming months, expect more updates on our research findings, upcoming events, and new opportunities to get involved. Whether you're interested in our training workshops, research insights, or partnerships, we encourage you to stay connected.

Visit our website for the latest news, follow us on social media for real-time updates, or reach out to our team directly—we're always open to new ideas and collaborations.

Where to find us:

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