

# AI for Vision Zero in Road Safety

## IVORY

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Together with:

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**Artificial Intelligence  
for Road Safety and Mobility Workshop**

8<sup>th</sup> UN Global Road Safety Week

Athens, 15 May 2025



Streets for Life

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# The IVORY project



## ➤ IVORY:



"AI for Vision Zero in Road Safety"  
[ivory-network.eu](http://ivory-network.eu)

## ➤ Partners:

- 4 Universities
- 8 Non-academic partners
- 13 Associated Partners
- 10 Countries

## ➤ Duration of the project:

48 months (November 2023 – October 2027)

## ➤ Framework Program:

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101119590



Co-funded by  
the European Union



E.Papadimitriou - AI for Vision Zero in Road Safety 'IVORY'



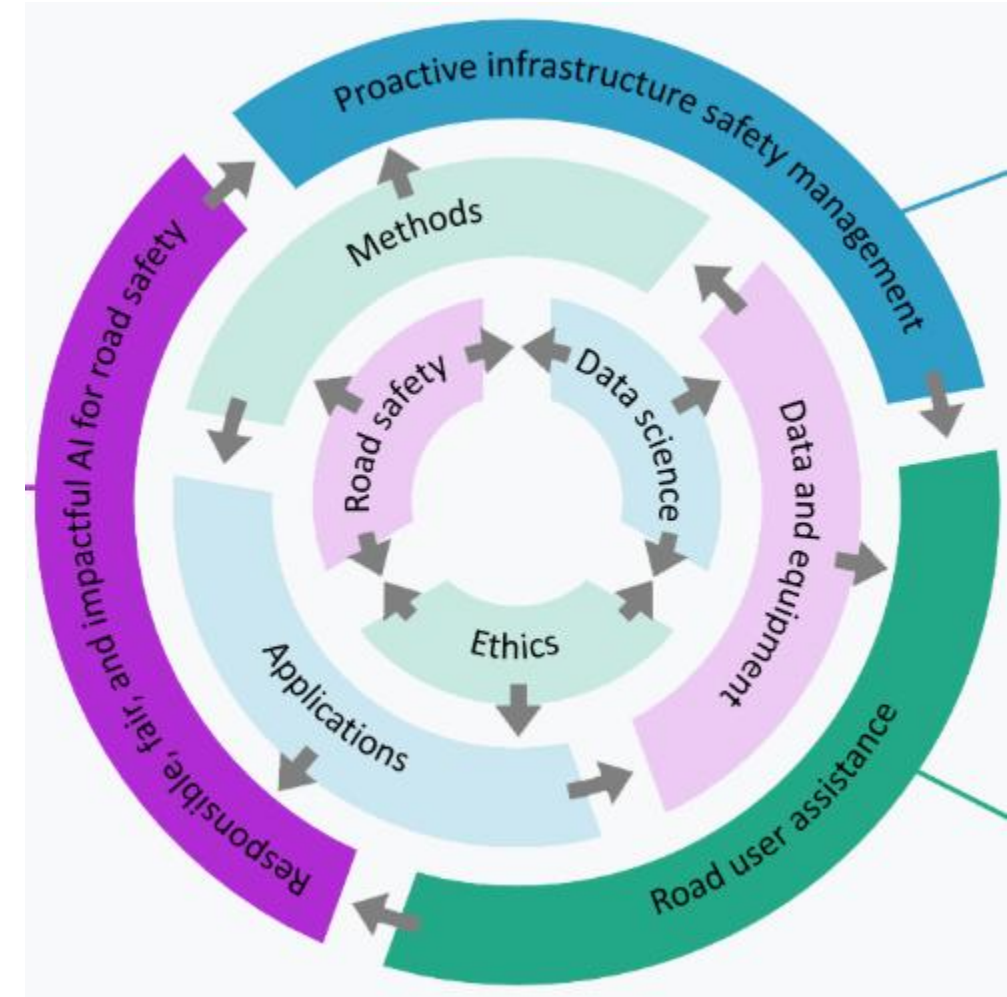
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# Objectives

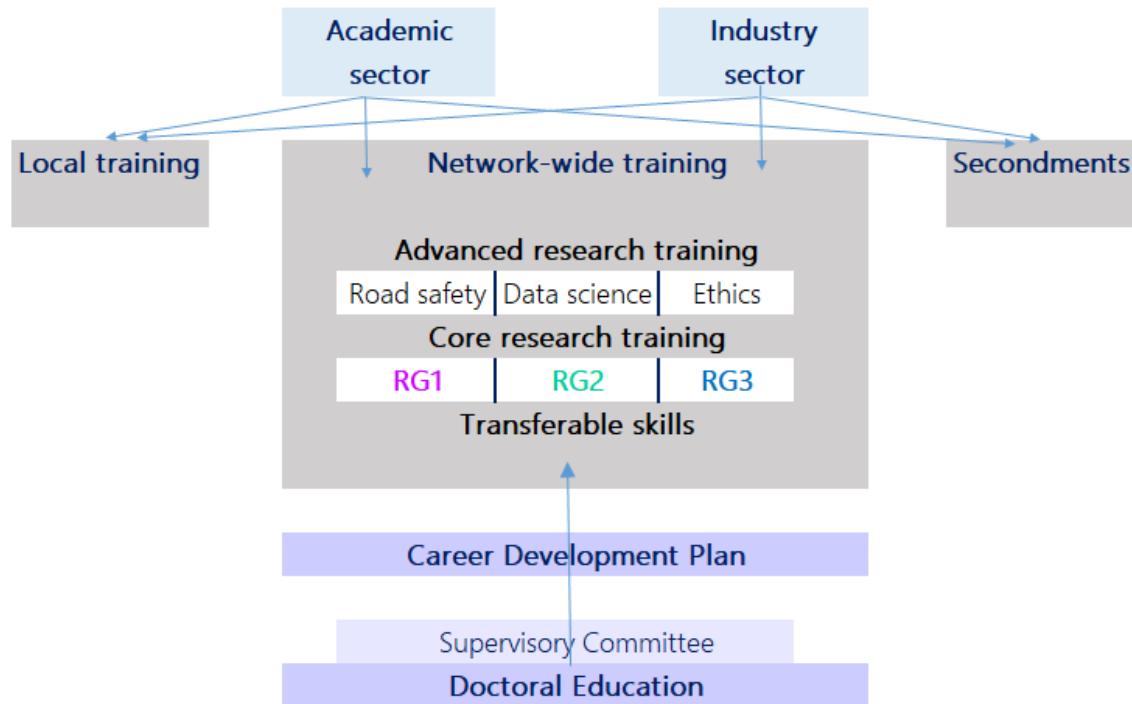
To develop a **new framework for the integration of AI in road safety** and create a new generation of leading researchers, in order to address the EC 'Vision Zero' strategy (eliminating traffic fatalities by 2050)

- **Responsible and fair AI** for road safety;
- **Safe road users** and human-vehicle-environment interaction by means of AI;
- Scalable and equitable AI technologies for **proactive infrastructure safety management**;
- A sustainable **learning, knowledge sharing and networking platform** on AI for road safety.



# Training and supervision

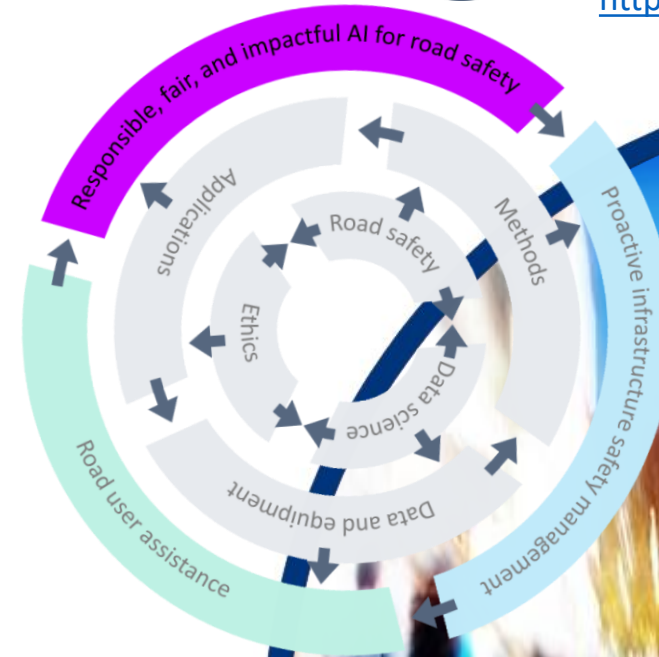
- A dedicated **interdisciplinary training programme** of **10 ECTS**
- **Joint supervision** by academic & industry partners





# Research Goals (1/3)

- Responsible, fair & impactful AI for road safety
- **Doctoral Candidate (DC) 1.** How to implement justice in AI for road safety?
- **DC 2.** Explainable AI for road safety: benchmarking AI methods and data
- **DC 3.** AI for road safety in LMICs



# Research Goals (2/3)

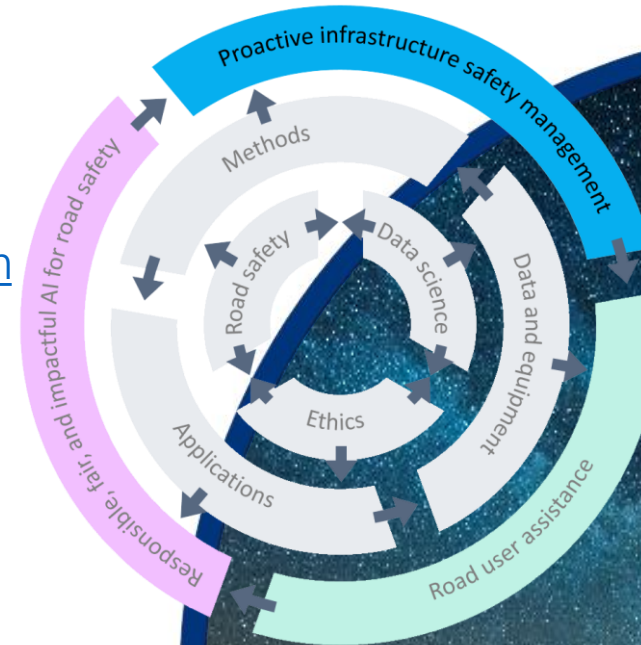
- Road User Assistance
- **DC 4.** Road user profiling using multimodal data of naturalistic driving databases
- **DC 5.** AI to mitigate driver distraction and drowsiness at different levels of automation
- **DC 6.** Learning from the whole spectrum of driver behaviour: from unsafe to optimal driving
- **DC 7.** Data fusion of traffic, behaviour & infrastructure for holistic driver assistance
- **DC 14.** Road safety prediction on the basis of ethically sound physiological measurements





# Research Goals (3/3)

- Infrastructure safety management
- **DC 8.** Proactive risk mapping and infrastructure safety management
- **DC 9.** AI for road safety monitoring and crash prediction from micro- to macro levels
- **DC 10.** Using AI for the identification and utilisation of a self-learning safe route network for home-school trips
- **DC 11.** AI for proactive safety detection using conflict techniques
- **DC 12.** Harmonisation and hybrid application of AI datasets for road safety
- **DC 13.** AI-aided BIM-based design for road infrastructure
- **DC 15.** AI Chat models for advising road authorities on Vulnerable Road User safety improvements



# The Learning Platform



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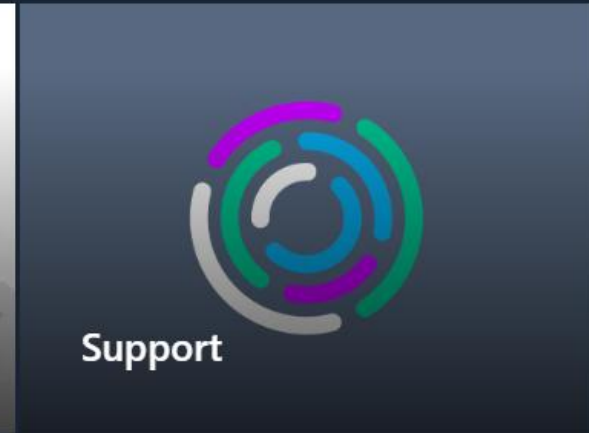


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# Streets for Life

- The **Vision Zero strategy of the EC** is the new road safety paradigm; however, the efforts to improve road safety have plateaued in many countries.
- IVORY develops new AI-based methods for mapping improving road safety in urban and interurban roads:
  - **scalable models** (from micro- to macro-levels)
  - **inclusive models** (dedicated research on pedestrians, women, schoolchildren, low income groups etc.)
- A **Design-for-Values** framework in road safety AI applications, operationalizing values such as fairness, non-discrimination, explainability and privacy – both for the users and managers of roads.



# Scientific and Societal Impact

- **Unlocking the full potential of AI for road safety**, so that new opportunities for global road safety impact can emerge:
  - **15 highly skilled researchers** meeting industry and policy stakeholders' needs;
  - **A learning and networking platform** on AI for road safety, including open, interdisciplinary and interactive training material, as well as a 'social network' of researchers;
  - **New applications of AI for road safety**, including data protocols and cutting-edge analytical models;
  - **Taxonomies** for designing responsible, equitable and efficient AI for road safety.





# Future Challenges

- **Balancing AI developments in road safety**, in order to bridge the gaps between engineering, technology & society, and ensure equal opportunities for all countries around the globe.
- **Meaningful human-AI interaction:** AI can only learn from existing data, but lacks the critical thinking and inspiration needed for making a 'breakthrough'; without steering, AI can induce bias.
- **Systematic and sustainable intersectoral collaboration:** breaking the 'silos' between sectors (academia, industry and policy) and disciplines involving AI (engineering, data science, ethics of technology).



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