AI for Vision Zero in Road Safety
IVORY

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Together with:
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MARIE CURIE ACTIONS

IVORY

Artificial Intelligence
for Road Safety and Mobility Workshop

8th UN Global Road Safety Week

Athens, 15 May 2025

DECADE OF ACTION FOR ROAD SAFETY 2021 - 2030

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The IVORY project

- **IVORY**:

  "AI for Vision Zero in Road Safety"
  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

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Objectives

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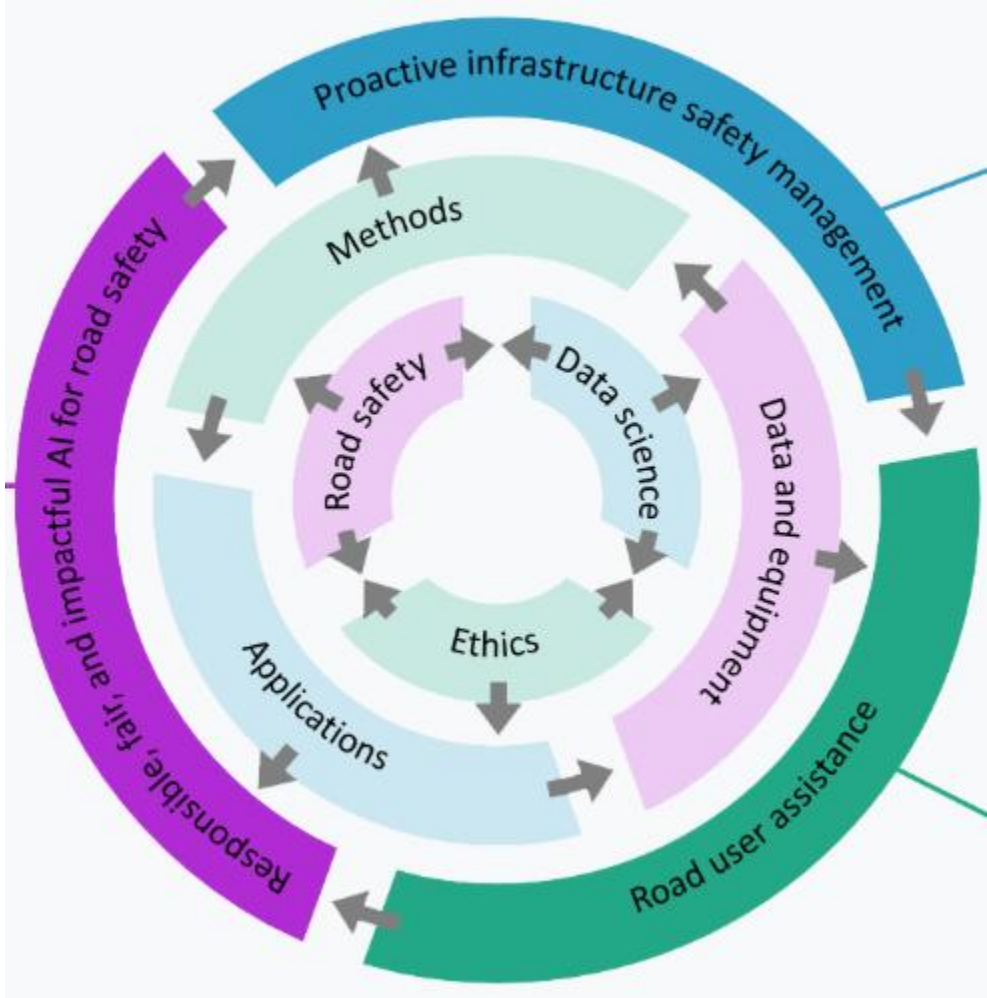
To develop a new framework
for the integration of AI in road safety
and create a new generation of leading researchers,
in order to address the EC 'Vision Zero' strategy
(eliminating traffic fatalities by 2050)

- 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

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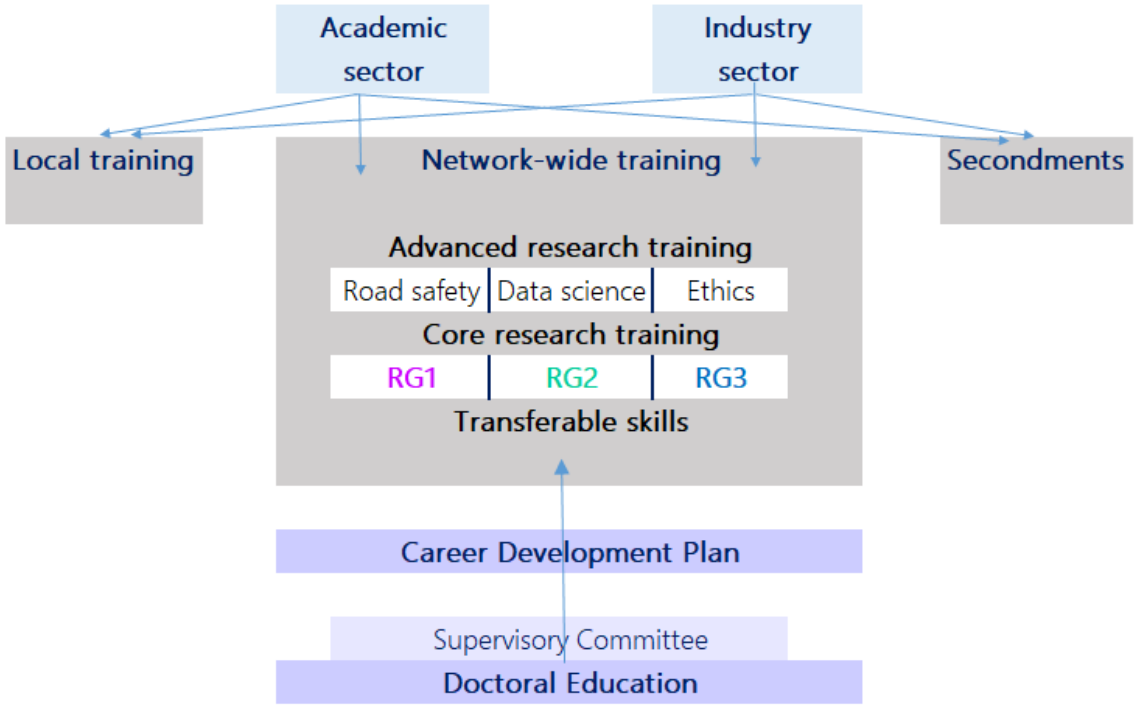
- A dedicated interdisciplinary training programme of 10 ECTS
- Joint supervision by academic & industry partners



Research Goals (1/3)

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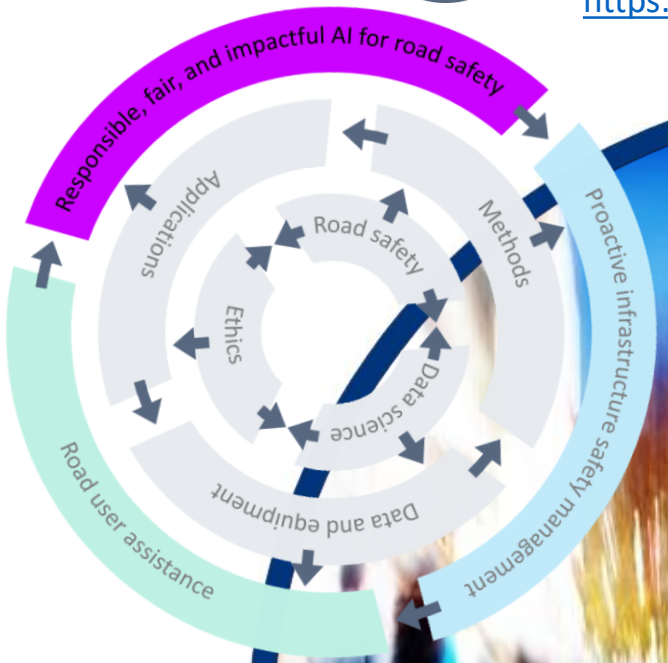
- Responsible, fair & impactful AI for road safety

- 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



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Research Goals (2/3)

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- 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)

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- **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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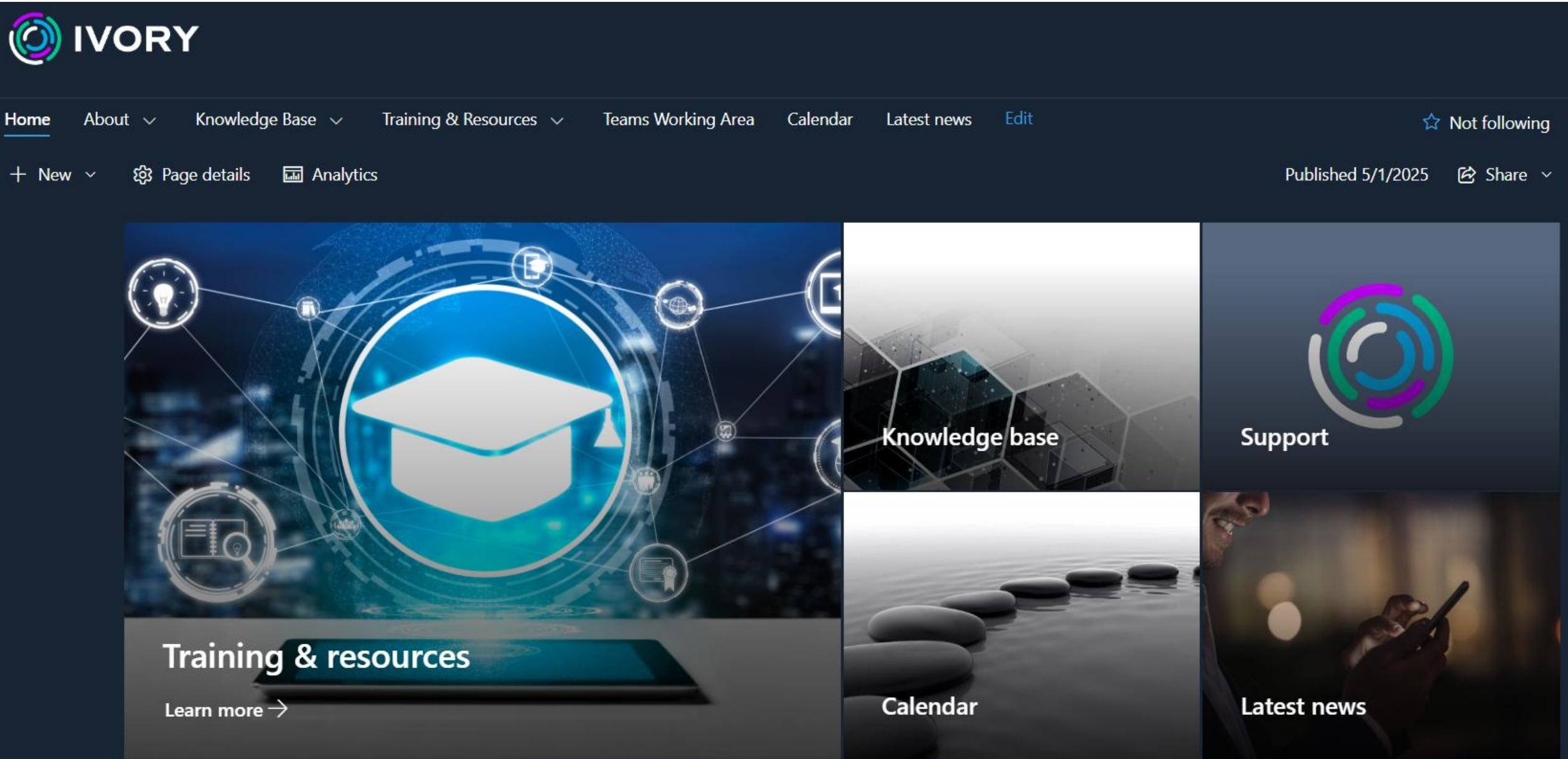

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- The Vision Zero strategy of the EC is the new road safety paradigm; however, the efforts to improve road safety have plateaued in many countries.

- 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.

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Scientific and Societal Impact

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- 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.

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Future Challenges

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- 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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