TRAVISIÈNS 2024



"This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101056931"

- TRA2024 –

Young Researcher Competition rules, guidelines and evaluation criteria

1. INTRODUCTION

The TRA VISIONS 2024 YOUNG RESEARCHER COMPETITION will be aimed at Universities and Research Institutes for young researchers pursuing bachelor's degrees and higher (Master's and PhD) in all scientific domains involving transport, sustainability, mobility, energy, engineering, and related areas. The competition presents an opportunity for young researchers to showcase their work on an international stage at the Transport Research Arena (TRA) 2024 Conference scheduled for April 2024 in Dublin. Initially, participants will be invited to submit an abstract (Call for Ideas) under one of the TRA 2024 Conference Topics / Overarching themes (see Table 1).

The registration period for the Young Researcher Competition will be open from 07/02/2023 until 30/06/2023, during which all the participants are invited to register their ideas through the submission of a title and a short abstract. Participants will then have a four-month period (until 31/10/2023) to further develop their proposal into a final project. The Submission should include a report based on the Final Project Template (available for download from the TRA VISIONS section on TRA2024 website), a short presentation and a project poster accompanied by an optional short video (mandatory for all shortlisted).

The submission phase will end with the submission of the aforementioned documentation (a final report, a short presentation, a project poster and an optional video) followed by an Evaluation of Ideas period during which a judging panel will determine which are the top 3 ideas per mode (road, rail, waterborne, air and cross-modality). The evaluation of ideas will be divided into three steps: an eligibility assessment, an online evaluation, and a judging panel (further explained in section 4).

The winning certificates and prizes will be presented in a prestigious Award Ceremony during the TRA 2024 event.



1

2. ACADEMIC COMPETITION SUBJECT COVERAGE 2024

2.1. Pillars / Transport Modes

Participants of the TRA VISIONS 2024 Young Researcher Competition can submit their application to one of the following five Pillars / Transport Modes presented in Table 1.

	TRA VISIONS 2024 Pillars / Transport Modes
A. Road	Highways; Urban and inter-urban roads; Pedestrian and Cycling infrastructures.
B. Rail	High-speed rail; Passenger and Freight Railways; Urban and light rail systems
C. Waterborne	Long distance shipping; Inland shipping; Cruise & Ferries; Short-sea shipping; Offshore, floating infrastructures and support vessels; Maritime transport; Dredging
D. Airborne	ATM and UTM; Drones, automation, and autonomy concepts; Aerodynamics; acoustic and aero elasticity; Aircraft avionics and systems; Cabin design and Passenger comfort; Future challenges in aviation; Emerging aviation risks; Material research
E. Cross-modality	Multimodality; Combined transport; Intermodality; Integrated infrastructures; Public transport; Logistics; Interfaces; Ports; ITS; Aviation infrastructures; Airports

Table 1 - Pillars / Transport Modes for the TRA VISIONS 2024 Young Researcher Competition

2.2. Research Topics / Areas

Besides submitting their application to one of the previous Pillars / Transport Modes outlined in section 2.1., participants of the TRA VISIONS 2024 Young Researcher Competition are invited to submit an abstract under the following research topics/areas based on the theme: **Transport Transitions: Advancing Sustainable and Inclusive Mobility.** This theme has been covered under 4 main Research Areas (RA) as outlined below:

- RA1. Safe & Inclusive Transport
- RA2. Sustainable Mobility of People and Goods
- **RA3.** Collaborative Digitalisation
- RA4. Efficient & Resilient Systems

Participants are encouraged to also consider the following sub-themes, which are intended to provide a structure of the challenges facing the transport sector and the multi-disciplinary ways in which these are being addressed.

RA1. Safe & Inclusive Transport

The coming decade will see green and digital transitions within the European transport sector, and social engagement and acceptance will be key for these changes to successfully take effect. There is an imperative to place the user at the heart of all decision making and deliver



a more inclusive transport system. A better understanding of behavioural drivers will lead to more sustainable and efficient modal choices with improved safety performance. These transitions will also be an enabler for economic growth, supporting the single market and international cooperation. This will create new employment opportunities, and the evolving transport sector will create markets for new skills and training. Papers are invited in the following areas:

- 1.1 Transport safety: Our transport systems are becoming increasingly automated, and this is occurring in a time when society expects our mobility services to continuously improve. Advances in areas such as passive, active & tertiary safety, human-machine interfaces & technological integration and autonomous vehicle risk assessment are key enablers for a more inclusive & safer transport system.
- 1.2 Future workforce & skills: New mobility technologies and solutions are changing the way in which people and goods move around Europe and internationally, and this has significant implications for the millions that work within the transport labour market. These technologies will require new skills, new curricula & specialties, and policies that support / educate / re-train employees will be central to this transition.
- 1.3 People-centred & inclusive transport: An important consideration for all transport research is the position occupied by people. Transport accessibility has significant impacts on social equity & affordability, and issues of gender, poverty and vulnerability remain a major focus. The role of human behaviour in adapting & using sustainable mobility is vital, as are new ways of testing technologies and preparing people for the transition (e.g. testbeds).
- **1.4 Transport policy:** Transport policy should address pertinent social issues, while also providing the framework for new business opportunities. Transport accessibility, strategic planning, active mobility and micro-mobility can all contribute to sustainable urban and regional mobility. They also play an important role in supporting entrepreneurship and cross-modal cooperation, stakeholder involvement (both public and private), international cooperation and competition policy, regulation and liberalisation of services.

RA2. Sustainable Mobility of People & Goods

Today transport represents about 25% of the EUs total greenhouse gas emissions and addressing this is a core element of the European Green Deal. Goals have been set of at least a 55% reduction in transport related GHGs by 2030 and 90% by 2050. This must also be accompanied by reduced environmental impact and associated loss of biodiversity.

The path to sustainable mobility requires multi-disciplinary research and innovation across all sectors of society. Our transport systems must foster cohesion, reduce regional disparities and improve connectivity and access to the internal market for all. There is a need for greener mobility of people and goods, supported by zero emissions vehicles and systems.



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101056931

TRAVISIDNS 2024

- 2.1 Urban, regional & rural transport: The transition to sustainable mobility requires a clear focus on active, collective and shared mobility. Implementing this in urban, regional and rural settings however presents a wide range of challenges, such as investment priorities, equity and universal access, citizen engagement, sustainable urban, rural, & regional mobility plans, mobility management plans, access to and a better design of urban spaces.
- 2.2 Zero emissions transport: Zero emissions transport is a core element of the international climate action strategy and actions are required across all transport modes. Key issues include zero emissions ports & airports, zero emission vehicles, vessels & aircraft and the use of financial incentives to support this transition. Decarbonisation of transport due to different technologies (including electromobility, hydrogen, alternative fuels).
- 2.3 Impact on health & the environment: Transport activities can have significant environmental & health impacts and understanding these is a key element of our response to the climate crisis. There is a need for practices that mitigate vibration and air and noise pollution from transport, and instead promote biodiversity in sustainable cities, regions and communities.
- 2.4 Logistics and sustainable transport: Supply chain emissions are a challenge for all sectors and solutions are needed to support the transition to zero emissions logistics. Interconnectivity between long distance and 'first and last mile' connections is critical for efficient freight transport, as are advances in freight intermodality, load optimisation processes and energy efficient fleets.

RA3. Collaborative Digitalisation

Digitalisation is a key driver of change in the transport sector and will lead to efficiencies in all modes, through solutions such as Intelligent Transport Systems (ITS), automated mobility, Mobility as a Service (MaaS) etc. The digital transition will place data sharing as a key requirement for Europe to achieve efficient connectivity, leading to open questions on governance, cyber security and open science. Digital infrastructure (5G and beyond) will be a key enabler, as will the use of artificial intelligence (AI) and other digital technologies.

- **3.1 Digital transition:** Digitalisation is driving the transition to smart mobility, enabled by advances in AI, the internet of things (IoT) and data science. This is opening up new possibilities as digital twins and blockchain can support more efficient logistics operations, and new solutions for mobility of people.
- **3.2 Transport data sharing:** The digital transition is opening up new opportunities for business and society to utilise the large amounts of data generated and shared across modes and sectors (including energy). Public authorities & businesses need access to data for planning & monitoring. This requires new solutions to address issues of data governance and European data regulations seek to create a single market for data that will work with GDPR requirements and the future European mobility data



space. This approach is in agreement with the principles of open science, while cybersecurity remains an ongoing challenge.

- 3.3 Connected, Co-operative and Automated Mobility: Advances in autonomous mobility are having transformative effects in all transport modes. Connected, Cooperative and Automated Mobility (CCAM) exploits the connectivity between road vehicles / bikes / aircraft / trains / vessels and with infrastructure, seeking to address traffic safety and reduce congestion. In related fields, we are also seeing advances in urban air mobility, and automated terminal operations, new mobility services and logistics.
- **3.4 Digital transport infrastructure:** The digital transition will place significant emphasis on the supporting digital infrastructure, with connectivity to 5G a key issue. This connectivity underpins smart infrastructure, enabling sensor-based monitoring, digital twins and the physical internet. The advent of 6G will have a transformative effect for future transport systems.

RA4. Efficient & Resilient Systems

The green and digital transitions will offer significant opportunities to Europe's citizens and businesses, but their success will be dependent on a transport system that can meet the increasing demands. Recent experiences have shown that our transport systems may be subjected to disruption (pandemics, climate change, cyber-attacks etc) – their resilience to withstand and recover from these is essential. This places increased demands on our infrastructures and operations, which must make use of new innovations to support appropriate management & investment.

This required resilience will also link to energy supply and access to raw materials, as our transport systems move from fossil fuels to more sustainable alternatives. There is a clear need to apply circular economy principles to all elements of the transport system.

- 4.1 Resilient infrastructure: Creating resilient, multi-modal infrastructure is essential for society, and it must now respond to a diverse range of hazards. Key to their continued functioning is predictive maintenance and autonomous monitoring offers new ways forward. In other cases, the use of nature-based solutions or advanced materials offer alternative approaches to deploy and manage infrastructure.
- **4.2 Resilient networks & operations:** In recent years our transport networks and operations have been subjected to a plethora of challenges, arising from sources such as climate change, man-made disasters, cyber-attacks and pandemics. This diversity requires coordinated approaches to risk avoidance, management & recovery, involving key stakeholders to deliver resilient transport and cities.
- **4.3 Circular economy & life cycle assessments:** The circular economy is a core element of the European Green Deal and an essential component in our efforts to reduce pressure on natural resources. Successful implementation requires the



application of circular economy principles to all steps in the value chain, for all components of the transport system (vehicles, batteries, fuels, infrastructure etc). Innovative sustainable procurement processes are increasingly required, and life cycle assessments will play a key role in their use.

4.4 Transport energy transition: Energy is a critical element for a resilient transport system, and the transition from fossil fuels to more sustainable sources of energy is a major technical challenge. Significant hurdles will include sufficient charging & refuelling infrastructures and advances in battery technology for electric vehicles, the development of alternative fuels such as hydrogen and advances in waterborne, aviation and in high-speed rail across Europe.

3. COMPETITION RULES

- 1. Group or individual entries are eligible for all transport modes. Entries may be submitted by any individual or research team that consists of up to a maximum of 7 participants.
- Only one entry will be accepted per person/team and all entries must fall into one of the outlined pillars/transport modes. Participants cannot submit the same abstract / video under different pillars/transport modes.
- The registration period will be open from 07/02/2023 until 30/06/2023 and the young researchers are invited to submit an abstract of their idea, under one of the TRA VISIONS 2024 Competition Research Topics / Areas.
- The deadline for comprehensive project submission is 31/10/2023 at Midnight Central European Time (31/10/2023 23:59 CET). Any entries beyond this time will not be accepted unless an extension is granted.
- All abstracts must have a maximum of 250 words. It may contain up to 3 diagrams, highquality images, or figures as appropriate. Participants need to submit at least two highresolution images or diagrams. The minimum resolution should be 1920x1080 pixels at 72 dpi (monitor resolution).
- 6. All submitted entries will automatically give their permission for their abstract to go public on the TRA2024 website and on the TRA VISIONS contest book. It is the applicant's responsibility to ensure that such publication does not breach the copyright of others.
- 7. All submissions need to include a report based on the Final Project Template (a TRA VISIONS 2024 public website <u>https://www.travisions.eu/</u> or via the TRA 2024 Conference portal <u>https://traconference.eu/</u>), a short presentation and a project poster accompanied by an optional short video (about 1 minute). The submission of a video is mandatory for all shortlisted ideas (top 10 ideas per mode). The shortlisted students will be notified well in advance to develop the short videos.



- All submitted entries need to be in understandable, academic English, of general European interest and need to ensure a clear understanding of the idea. Video entries in any language will be accepted; however, foreign language videos must include English subtitles.
- All abstracts and videos must be the work of the young researchers. Participants may submit work already published, provided it is their own work and its publication to the TRA VISIONS 2024 public website or to the TRA 2024 Conference portal does not breach the copyright of others.
- 10. The maximum allowable number of final submissions is 100 per mode. This limitation works on a first come first serve basis.
- 11. No "copyright" infringing content can be included.
- 12. Only entries submitted within the online submission section of the TRA VISIONS section on TRA2024 website will be accepted.
- The competition is open to young researchers registered in a College, University or Research Institute from across the European Union, EU Candidate Countries, Potential EU Candidate Countries and European Economic Area¹.
- 14. Winners will be acknowledged on the TRA 2024 websites and may be acknowledged elsewhere.
- 15. All finalists (one nominee/team representative per winning team) will receive a contribution towards their accommodation and travel expenses to the TRA 2024 Conference in Dublin, Ireland. The contribution is dependent on the point of origin within Europe which could be the young researchers' place of study or permanent place of residence. It is a condition of this award that the finalists attend the conference. It is up to all finalists to organise their own travel arrangements to Dublin. The organisers will endeavour to make available low-cost accommodation, subject to availability.
- 16. There will be 3 winning ideas per transport mode. The winning young researcher prizes per mode consist of 1st (5000€), 2nd (3000€) and 3rd runner-up (2000€). All finalists will be given a certificate acknowledging their achievement.
- 17. Entrants must indicate a supervising professor/senior researcher/senior scientist, her/his organisation and contact details. The TRA VISIONS organisers can contact the supervising professor to verify the submitted idea and the entrant's status. Entrants must

¹ Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxemburg, FYRO Macedonia, Malta, Montenegro, the Netherlands, Norway, Poland, Ireland, Romania, Serbia, Slovakia, Slovenia, Switzerland, Spain, Sweden, Turkey, United Kingdom



provide all requested details when entering the competition, as outlined in the Application Form. Entrants must comply with all rules to be eligible for the prizes. No responsibility is accepted for ineligible entries or entries made fraudulently. Entrants will be deemed to have accepted these rules and to agree to be bound by them when entering this competition.

- The TRA VISIONS organisers do not accept any responsibility for late or lost entries due to poor performance of the Internet or any other technical difficulties on the applicant's side – applicants are advised to apply as early as possible.
- 19. Without the expressed permission of the organisers, this competition is not open to employees or contractors of the TRA Conference, or anyone already involved or participating in it, or any person directly or indirectly involved in the organisation or running of the TRA VISIONS competition, or their direct family members.
- 20. The evaluation of ideas is divided into three steps: an eligibility assessment, an online evaluation, and a judging panel. The eligibility assessment is conducted by the TRA VISIONS organisers. Submissions which comply with the stated requirements are evaluated in a remote online evaluation in which two evaluators assess each eligible project and give a ranking. The final evaluation phase, in which the shortlisted top 10 ideas for each mode are evaluated by a judging panel during a shortlisting workshop, determines the three top ideas per mode (road, rail, waterborne, air and cross-modality).
- 21. The judges' decision is final in every situation including any not covered above and no correspondence will be entered into. The judges reserve the right to have discretion regarding the rules. The organisers reserve the right to cancel the competition at any stage, if deemed necessary in their opinion, and if circumstances arise outside of their control. The competition will be cancelled if financial support anticipated by the organisers does not materialise. In such circumstances, no costs will be refunded.

4. SUBMISSIONS

Projects may cover the topics on the list of research areas/topics outlined in 2.2 and include transport development and innovation aspects around the design, construction, research, equipment, training or operations of new and innovative transport and mobility concepts. Existing products, devices, services, or procedures will not be considered.

Output: The participants should engage in further research and use their creativity, knowledge, and personal effort in order to produce an innovative concept idea of high-quality standards. The "concept idea" is not required to be a completely engineered "ready to build" product. The idea may also contain new ("quantum leap") technical solutions, based on solid engineering judgment



and feasibility estimation. All submissions should include evidence of originality identifying any similar work and, if so, what distinguishes the submission from this other work.

Upon registration participants should register their personal details (username, password, name, surname, organisation, supervising professor, etc). After an eligibility check, participants will then have to submit an abstract and a title describing their idea by **30/06/2023 23:59 CET** using the Abstract submission form available from the TRA VISIONS section on TRA2024 website.

Final project submissions should be submitted in electronic format, using the "Final Project" template, the "Poster" template, and the "Presentation" template (documents available for download from the website). The Final Project can be submitted at any time repeatedly (only the latest version uploaded will be considered) up until **31/10/2023 23:59 CET**.

The Final Report should include the following:

- The main text is in electronic format and neatly presented in an academic format. The final submissions must be more than 2 pages but must not to exceed 20 pages.
- A description of the methodical approach, the concept, its basic principles, the assumptions made and an indication of how the concept contributes to the state of the art.
- It must show how the concept meets the future market and society needs and address potential technology gaps.
- A comprehensive literature survey to demonstrate knowledge on the field should be included. The report should include clear references.
- It should address issues such as safety, environment, production, logistics, etc. where necessary and provide some evidence, in the form of calculation or engineering judgment and feasibility.
- The above requirements should be presented according to the following table of contents:
- Management summary
- Introduction
- Selection of pillar/transport mode and related research topics: describe the selected transport mode and research topic that the concept idea fits into.
- Literature survey: describe existing published concept ideas fitting to selected research topics.
- **Description of Idea: Proposed solution**: describe the proposed solution including advantages as compared with existing concepts. Address how "Contest Targets" are met considering the specific research topics.
- Potential technological gaps and issues in research topics: describe the identified technology gaps and themes for further development in the areas of technical and economic feasibility, safety, security, environment, production, logistics, etc.



For example, for a project within waterborne:

Detailed design description covering the following (where applicable):

- sizing and principal dimensions including the approach to sizing
- speed/powering/propulsion
- weight estimation
- load capacity
- stability analysis
- sea keeping analysis
- general arrangement plans
- cost analysis (investment costs)
- cargo rate analysis
- Appendices, if necessary, should provide additional details to support the concept.
- **Drawings, illustrations, calculations, and data listings** should only appear in the appendices where necessary and should all be submitted in electronic format.

The **Presentation** should include the following:

- Title slide containing: Project title, key specifications, team members, contact data, supervising professor/senior researcher/senior scientist
- Motivation and objectives of project
- Methodological approach
- Summary of key results, added value to state of the art should be highlighted
- Conclusion and further research demand
- Illustrations should be used throughout the presentation describing the concept idea. All illustrations need to have a high resolution.
- Quantity of max.10 slides

A short supportive Video is optional and should be uploaded separately. Ideas which are shortlisted (top 10) are obliged to submit a video.

• Videos can show a real moving picture, interviews with team members and/or commented slides.

The **Poster** should include the following:

- Project title
- Key characteristics (a few bullet points highlighting the most distinct characteristics of the project)
- Motivation and objectives of your project
- Methodology (as illustration / figure)
- Project results



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101056931

- Further steps/ Research demand and outlook
- Team/ Project partners

Submissions should be submitted to TRA VISIONS in electronic format via the registration website. **Table 2** is a summary of the expected deliverables and their corresponding deadlines.

Deliverable	Deliverable Content	Dates
Registration & Abstract	Online Registration: Register online as a team leader or as a member of an existing team. Required information include Supervisor, young researcher profile etc. Name, Organisation, Team, Research Area of Contribution. Title and Short description (abstract) of idea (about 250 words)	From 07/02/2023 To 30/06/2023 23:59 CET
Final Deliverables	 Final Project Report: Upload final project template containing anonymous final document containing the final project contribution from the team. Final Project Presentation: Upload Presentation template containing final project presentation from the team. Final Project Poster: Upload Poster template containing final project poster from the team. Attachments & others: Upload any attachments related to the final project (supporting video, excel spreadsheets, CAD files etc.) 	To 31/10/2023 23:59 CET
Video for shortlisted Ideas	Video: Upload video containing description of the idea/project (top 10 projects only)	To 31/01/2024 23:59 CET

Table 2 - Summary of the expected deliverables with their deadlines

The IP rights of any project submitted will be processed according to each University's procedures and policies.

5. COMPETITION SCHEDULE

The scheduled deadlines for the TRA VISIONS Young Researcher Competition are presented in **Table 3**. Each deliverable will be open for editing until the end of the deliverable deadline (even if the participant(s) have submitted it prior to that). For electronic registration, you should visit: <u>http://www.travisions.eu</u>



Official start date for the contest	07 - February - 2023	
End of registration period/ Abstract Submission Deadline	30 - June - 2023 (23:59 CET)	
Final version submission deadline	31 - Oct - 2023 (23:59 CET)	
Deadline for submission of pitch videos (top 10 only)	31 - Jan - 2024 (23:59 CET)	
Awards ceremony	April 2024	

Table 3 - Official deadlines for the TRA VISIONS 2024 Young Researcher Competition

6. EVALUATION CRITERIA

As previously explained, all project entries submitted to this competition are going to be subjected to an initial eligibility assessment, an online evaluation, and a judging panel. The eligibility assessment is conducted by the TRA VISIONS organisers and submissions that comply with the stated requirements will be evaluated in a remote online evaluation in which two evaluators assess each eligible project and give a ranking.

This evaluation process is carried out based on the following criteria and their respective weights as outlined in **Table 4** below:

Criteria	Weight	
Scientific Merit		
Research must:		
emphasize novelty or at least an innovative application of existing knowledge		
address an important transport/mobility problem		
advance scientific knowledge by the completion of this project	60%	
be appropriate to the research field being investigated		
 have a conceptual framework, design, methods, and analyses adequately developed, well-integrated and appropriate to the aims of the project 		
acknowledge potential problem areas and consider alternatives		
have adequate scientific support for the project		
Impact		
Research must:		
show adequate relevance to the sustainability of the transport industry and society		
• provide support that it is applicable within the industry and society	20%	
• be appropriate to the current (or future) trends within the industry and society		
• propose how it could be incorporated into the system, if not already present		
not be out-dated		



Pre	esentation				
Submissions must:					
•	clearly state the primary theme or purpose				
•	contain properly sequenced ideas				
•	have the depth of communication appropriate to the audience				
•	include words and terms appropriate to the audience				
•	not exceed the length appropriate to the competition	20%			
•	follow punctuation, spelling, and formatting conventions				
•	observe correct grammar in the written text				
•	secure the audience's attention at the beginning				
•	use visual aids and produce a presentation of up to 10 slides with pictures				
•	use the correct level of formality				
•	figures and tables must be clear, precise, and well formatted				

Table 4 - TRA VISIONS 2024 Young Researcher Competition evaluation criteria and weights

7. PRIZES AND AWARDS

There will be 3 winning ideas per transport mode. The winning young researcher prizes will be sponsored by the industry and every mode will consist of the:

- 1st runner-up 5000€
- 2nd runner-up 3000€
- 3rd runner-up 2000€

All finalists will be given a certificate acknowledging their achievement. The awards and prizes of the top 3 winners will be announced during the TRA VISIONS 2024 Award Ceremony which will take place during the prestigious high-level event of Transport Research Arena (TRA 2024) which will be organised in Dublin, Ireland in April 2024.

8. FURTHER INFORMATION

For further information, please visit <u>http://www.travisions.eu</u> where you will have access to all the template documents and you will be able to register online your idea for the competition. Alternatively, you can contact <u>info@travisions.eu</u>.



APPENDIX I: TRA VISIONS 2024 YOUNG RESEARCHER COMPETITION TIMELINE

