



## *TRA Visions 2018*



### *Young Researcher Competition:*

- Eligible Topics*
- Rules, Guidelines and Evaluation Criteria*

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## 1) Introduction

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TRA VISIONS will be aimed at University and Technical Institutes young researchers pursuing bachelor degrees and higher. The competition presents an opportunity for young researchers to showcase their work on an international stage at the Transport Research Arena (TRA) 2018 Conference between the 16<sup>th</sup> and 19<sup>th</sup> of April 2018 in Vienna. Initially, participants will be invited to submit an abstract under one of the TRA-2018 conference Topics (*Call for Ideas*) which covers the general areas relating to surface transport of:

1. Environment and Energy Efficiency
2. Vehicles & Vessels – Design, Development and Production
3. Advanced Propulsion Systems
4. Smart Urban Mobility & Logistics
5. People Mobility – Systems and Services
6. Freight Transport and Logistics
7. Transport Infrastructure
8. Connected and Automated Transport
9. Digital Technologies for Transport
10. Safe, Secure and Resilient Transport Systems
11. Human Dimension in Transport
12. Socio-Economics, Innovation and Policy

The registration period will be open until 30/06/2017, where all the participants are invited to register their ideas and submit a title and a short abstract of their ideas for the Young Researcher Competition. Participants will then have a four-month period (until 31/10/2017) to further develop their proposal into a final project. The Submission should be a report based on the Final Project Template (available for download from the TRA VISIONS website), a short presentation and a project poster accompanied by an optional short video (mandatory for all shortlisted).

The submission phase will be 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 and cross-modality). Evaluation of ideas will be divided into three steps: An eligibility assessment, an online evaluation and a judging panel (further explained in section 3.20).

The winner certificates and their prizes will be presented in a prestigious award ceremony during the TRA 2018 event.

## 2) Academic Competition Research Areas 2018

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### 2.1 Pillars / Transport modes

<p><b>A. Road</b></p> <ul style="list-style-type: none"> <li>• Highways</li> <li>• Urban and rural roads</li> <li>• Passenger and freight transport</li> <li>• Cycling</li> <li>• Pedestrian</li> </ul>	<p><b>B. Rail</b></p> <ul style="list-style-type: none"> <li>• High-speed</li> <li>• Passenger and freight railways</li> <li>• Urban and light rail systems</li> </ul>
<p><b>C. Waterborne</b></p> <ul style="list-style-type: none"> <li>• Maritime</li> <li>• In-land waterborne</li> <li>• Short sea shipping</li> <li>• Deep Sea Shipping</li> <li>• Passenger transport and cruises</li> <li>• Floating infrastructures and support vessels</li> <li>• Aquaculture</li> <li>• Dredging</li> </ul>	<p><b>D. Cross-modality</b></p> <ul style="list-style-type: none"> <li>• Co-modality</li> <li>• Inter-modality</li> <li>• Intelligent Transport Systems (ITS)</li> <li>• Logistics</li> <li>• Combined transport</li> <li>• Interfaces</li> <li>• Intermodal terminals</li> <li>• Integrated infrastructures</li> <li>• Public transport</li> <li>• Airports</li> <li>• Ports</li> </ul>

### 2.2 Research Topics/Areas

#### RA1: Environment and Energy Efficiency

- Environmental impact of transport
- Emissions
- Decarbonization
- Energy efficiency
- Air quality/Noise/Health issues

#### RA2: Vehicles & Vessels – Design, Development and Production

- Digital tools in vehicle & vessel design
- Low emission design
- Onboard technologies
- Testing tools, Virtual testing
- Materials, Components
- Material processing and manufacturing
- Robotics in manufacturing
- Industry 4.0
- Vehicle & Vessel Testing

#### RA3: Advanced Propulsion Systems

- Electromobility
- Alternative fuels
- Clean energy for transport
- Supply infrastructure

#### RA4: Smart Urban Mobility & Logistics

- Mobility in Smart Cities
- Mobility as a Service
- Transport Modelling and Management
- Spatial planning, Last mile
- Integration of transport, energy and IT systems
- Smart grid, Retrofitting
- People and goods

#### RA5: People Mobility – Systems and Services

- Public Transport
- Transport hubs
- Mobility as a Service
- Transport on demand
- Rural and interurban
- Intermodality
- Active Mobility (cycling, walking)
- Info Systems, Ticketing
- Crowd management
- Transport modeling & simulation
- Spatial planning

#### RA6: Freight Transport and Logistics

- Industry 4.0
- ICT Technology applications (e.g. block chain, Internet of Things, Big Data)
- Decarbonization & Electromobility for Logistics
- Governance of Physical Internet
- Transfer hubs (multimodal), synchromodality
- Collaboration and supply chain management
- Robotics, platooning, and automation in goods transport
- Modularization, Vehicle adaptation and compliance

#### RA7: Transport Infrastructure

- Transport Infrastructure Systems and Components
- Infrastructure as part of the Internet of Things, Intelligent/Smart infrastructure
- Sensors/Monitoring/Maintenance/Asset management, use of robotics, drones
- Sustainability, Life cycle analysis (Modelling and prediction)
- Durability/Resilience
- Cost optimisation
- Safe and resilient transport infrastructure
- BIM (Building Information Management)
- Tunnels

#### RA8: Connected and Automated Transport

- V2X, I2X for Automation
- Connectivity (including e.g. 5G)
- Sensors, Data Acquisition and Management
- Test Systems, Test fields, Virtual testing

- Digital Maps
- Physical infrastructure needs
- Use Cases
- Use of robotics, drones
- Control centers (multimodal)
- Safety of automated transport
- Transition to Automation
- Digital safety and security
- Regulatory framework
- Probe vehicle Data

## RA9: Digital Technologies for Transport

- Big Data, Cybersecurity
- ITS and Traffic Management
- Connectivity (V2x, I2x)
- Communication standards, 5G
- Satellite navigation and earth observation
- Connected services
- Streaming technologies
- Crowdsourcing of data (Smartphones)
- Augmented reality
- Block chain
- Regulation/standardization/harmonization beyond Europe

## RA10: Safe, Secure and Resilient Transport Systems

- Vulnerable Road Users (VRU)
- Transport Safety
- Climate change resilience
- Resilience to environmental and man-made hazards
- Security

## RA11: Human Dimension in Transport

- Human Factors, Human Machine Interfaces (HMI), User needs, User Acceptance, Customer Satisfaction
- Accessibility/Affordability
- Inclusion
- Behaviour

## RA12: Socio-Economics, Innovation and Policy

- Impact of new trends on the transport labor market
- Socio-Economics and Foresights
- Industry competitiveness
- Transforming Systems
- New business models
- Transaction management/security (Block chain)
- Political and legal framework
- Regulation deregulation
- Education/Training, Skills for future transport technologies

### 3) Competition rules

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1. Group or individual entries are eligible for all pillars. Entries may be submitted by any individual or team that consists of up to a maximum of 7 participants.
2. Only one entry will be accepted per person/team and all entries must fall into one of the outlined pillars. Participants cannot submit the same abstract/ video under different pillars/ transport mode.
3. The registration period is from 21/12/2016 to 30/06/2017 in which young researchers are invited to submit an abstract of their idea under one of the TRA 2018 conference Topics.
4. The deadline for comprehensive project submission is 31/10/2017 at Mid-Night Central European Time (31/10/2017 23:59 CET). Any entries beyond this time will not be accepted unless an extension is granted.
5. All abstracts must be 220-250 words. They may contain up to 3 diagrams, high quality images or figures as appropriate. Participants are encouraged to submit at least two high resolution 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 project 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 (available for download from the TRA VISIONS website), 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 in order to develop the short videos.
8. All submitted entries need to be in understandable, academic English, of general European interest and need to ensure a clear understanding of the idea. We will accept video entries in any language; however, foreign language videos must include English subtitles.
9. 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 website 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 website will be accepted.
13. The competition is open to young researchers registered in a College, University or Technical Institute from across the European Union, EU Candidate Countries,

Potential EU Candidate Countries and European Economic Area<sup>1</sup>. A young researcher is defined herein as University and Technical Institute student pursuing (or recently completed) a BSc, MSc, PhD or comparable degrees. Those who graduated earlier than the 1<sup>st</sup> of January 2016 are not eligible to apply.

14. Winners will be acknowledged on both the TRA Visions and the TRA 2018 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 2018 Conference in Vienna, Austria. The contribution is dependent on the point of origin within Europe which could be the young researchers' normal place of study or normal place of residence. It is a condition of this award that the finalists attend the conference. It is up to all finalists to organize their own travel arrangements to Vienna. The organizers 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 1<sup>st</sup> (5000€), 2<sup>nd</sup> (3000€) and 3<sup>rd</sup> runner-up (2000€). All finalists will be given a certificate acknowledging their achievement.
17. Entrants must indicate a supervising professor and his/her organisation and contact details. The TRA Visions organisers can contact the supervising professor to verify the submitted idea and the entrants' status. Entrants must 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.
18. 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. 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 and cross-modality).

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<sup>1</sup> 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, Portugal, Romania, Serbia, Slovakia, Slovenia, Switzerland, Spain, Sweden, Turkey, United Kingdom



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

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Projects may cover design, construction, research, equipment, training or operations of new and innovative concept ideas and products. 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 30/06/2017 23:59 CET using the Abstract submission form available from the TRAVISIONS 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 the 31/10/2017 23:59 CET.

The **Final Report** should include the following:

- The main text should be in electronic format and neatly presented in an academic format. The final submissions must be more than 2 pages but must not exceed 20 pages.
- It should comprise of 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 transport mode / pillar 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 feasibility, safety, environment, production, logistics etc.

**For example for a project within waterborne:**

Detailed design description covering the following (where applicable):

- sizing and principal dimensions including approach for 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.
- 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
- Further steps/ Research demand and outlook
- Team/ Project Partners

Submissions should be submitted to TRA Visions in electronic format via the registration website.

Table 1 is a summary of the expected deliverables and their corresponding deadlines.

**Table 1 Summary of the expected deliverables with their deadlines**

<b>Deliverable</b>	<b>Deliverable Content</b>	<b>Dates</b>
<b>Registration &amp; Abstract</b>	<p><b>Online Registration:</b> Register online as a team leader or as a member of an existing team. Required information include Supervisor, young researcher profile etc. Name, Organization, Team, Research Area of Contribution. Title and Short description (abstract) of idea (about 250 words)</p>	<p><b>From 21 December 2016</b></p> <p><b>To 30/06/2017 23:59 CET</b></p>
<b>Final Deliverables</b>	<p><b>Final Project Report:</b> Upload final project template containing anonymous final document containing the final project contribution from the team.</p> <p><b>Final Project Presentation:</b> Upload Presentation template containing final project presentation from the team.</p> <p><b>Final Project Poster:</b> Upload Poster template containing final project poster from the team.</p> <p><b>Attachments &amp; others:</b> Upload any attachments related to the final project (supporting video, excel spreadsheets, CAD files etc.)</p>	<p><b>To 31/10/2017 23:59 CET</b></p>
<b>Video for shortlisted Ideas</b>	<p><b>Video:</b> Upload video containing description of the idea/project (top 10 projects only)</p>	<p><b>To 31/01/2018 23:59 CET</b></p>

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

## 5) Competition Schedule

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The scheduled deadlines for the TRA Visions Young Researchers Competition are presented in Table 2. 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

<http://www.travisions.eu>

**Table 2**

Official start date for the contest	<b>21 - Dec - 2016</b>
End of registration period/ Abstract Submission	<b>30 - June – 2017 (23:59 CET)</b>
<b>Final version submission deadline</b>	<b>31 - Oct - 2017(23:59 CET)</b>
Deadline for submission of pitch videos (top 10 only)	<b>31 - Jan - 2018(23:59 CET)</b>
Awards ceremony	<b>APR 2018</b>

## 6) Evaluation Criteria

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- **Scientific Merit 60%**
- **Impact 20%**
- **Presentation 20%**

### 6.1 Scientific Merit

Research must:

- emphasize on novelty, or at least an innovative application of existing knowledge
- address an important problem
- advance scientific knowledge by the completion of this project
- be appropriate to the research field being investigated
- have 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

### 6.2 Impact

Research must:

- show adequate relevance to the transport industry
- provide support that it is applicable within the industry
- be appropriate to the current (or future) trends within the industry
- propose how it could be incorporated into the system, if not already present
- not be out-dated

### 6.3 Presentation

Submissions must:

- clearly state the primary theme or purpose
- contain properly sequenced ideas
- have depth of communications appropriate to the audience
- include words and terms appropriate to the audience

- not exceed the length appropriate to the competition
- 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

Additionally, submitted supporting video is to be evaluated positively.

## 7) Prizes and awards

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

- 1<sup>st</sup> runner-up - 5000€
- 2<sup>nd</sup> runner-up - 3000€
- 3<sup>rd</sup> 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 VISIONS TRA 2018 award ceremony which will take place during the prestigious high level event of Transport Research Arena (TRA 2018) which will be organised in Vienna 16-19 April 2018.

## 8) Further Information

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For further information, please visit <http://www.travisions.eu> 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 [info@travisions.eu](mailto:info@travisions.eu).

## Appendix I: VISIONS-TRA2018 Competition Timeline

