D9.4

TransAID Symposium

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Editor / Main Author: Sven Maerivoet (TML)
Reviewer: Anton Wijbenga (MAP)
Julian Schindler (DLR)
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<table>
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<th>Comments</th>
</tr>
</thead>
<tbody>
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<td>First complete draft version</td>
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</tbody>
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Editor / Main author
Sven Maerivoet (TML)

List of contributors
Kristof Carlier (TML)
Péter Pápics (TML)
Yun-Pang Flötteröd (DLR)
Robert Alms (DLR)
Julian Schindler (DLR)
Yun-Pang Flötteröd (DLR)
Leonhard Lücken (DLR)
Evangelos Mintsis (CERTH)
Anton Wijbenga (MAP)
Jaap Vreeswijk (MAP)
Alejandro Correa (UMH)
Meng Lu (DYN)
Michele Rondinone (HYU)

List of reviewers
Anton Wijbenga (MAP)
Julian Schindler (DLR)

Dissemination level:
■ PU: Public
□ RE: Restricted to a group specified by the consortium (including the Commission Services)
□ CO: Confidential, only for members of the consortium (including the Commission Services)
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1 Executive summary

This report describes the organisation and outcome of the TransAID Symposium, held in Paris, France, on 9 June 2019, in conjunction with the IEEE Intelligent Vehicles Symposium (IV 2019), one of the major annual conferences of the IEEE Intelligent Transportation Systems Society (ITSS). In light of dissemination and obtaining stakeholder knowledge, TransAID bundled its resources with a large existing IV 2019 event to ensure a higher probability of attracting people to the workshop.

As the audience of our workshop (which targeted technologies for cooperative and automated road transport) constituted a mix of academia, researchers, and industry, we were able to foster the interactive exchange between all these parties.

The contents of the workshop comprised survey questions posed via the Mentimeter platform, invited speakers, and oral-paper presentations (which were thematically put into the two categories, of Connected and Automated driving, as well as security-related aspects of Cooperative ITS). Each time, an interactive discussion with the audience ensued, providing further insights into the authors’ points of view.

The survey results revealed that about half of the participants came from academia. Interestingly, a large group was in favour of foreseeing areas where automated driving should not be allowed, thereby directly confirming that TransAID’s research questions and approach are sound and sensible. A very high proportion of the participants also spoke out towards OEMs, asking them to explain the limitations of their automated vehicles. In addition, connectivity was perceived as a mandatory requirement for Level 3 or higher automated vehicles. To conclude, a discussion followed some of the results related to the question whether (connected) automated vehicles would be allowed to break the law. This was seen as moderately acceptable when optimisation of the traffic stream was called for, but definitely for the purpose of increasing traffic safety.
2 Introduction

In the following sections we first give a concise overview of the TransAID project, followed by the purpose of this document, and finally its structure.

2.1 About TransAID

As the introduction of automated vehicles becomes feasible, even in urban areas, it will be necessary to investigate their impacts on traffic safety and efficiency. This is particularly true during the early stages of market introduction, where automated vehicles of all SAE levels, connected vehicles (able to communicate via V2X) and conventional vehicles will share the same roads with varying penetration rates.

There will be areas and situations on the roads where high automation can be granted, and others where it is not allowed or not possible due to missing sensor inputs, highly complex situations, etc. Moving between those areas, there will be areas where many automated vehicles will change their level of automation. We refer to these areas as “Transition Areas”.

TransAID develops and demonstrates traffic management procedures and protocols to enable smooth coexistence of automated, connected, and conventional vehicles, especially at Transition Areas. A hierarchical approach is followed where control actions are implemented at different layers including centralised traffic management, infrastructure, and vehicles.

First, simulations are performed to find optimal infrastructure-assisted management solutions to control connected, automated, and conventional vehicles at Transition Areas, considering traffic safety and efficiency metrics. Then, communication protocols for the cooperation between connected/automated vehicles and the road infrastructure are developed. Measures to detect and inform conventional vehicles are also addressed. The most promising solutions are then implemented as real world prototypes and demonstrated under real urban conditions. Finally, guidelines for advanced infrastructure-assisted driving are formulated. These guidelines also include a roadmap defining activities and needed upgrades of road infrastructure in the upcoming fifteen years in order to guarantee a smooth coexistence of conventional, connected, and automated vehicles.

Iterative project approach

TransAID will perform its development and testing in two project iterations. Each project iteration lasts half of the total project duration. During the first project iteration, the focus is placed on studying Transitions-of-Control (ToCs) and Minimum-Risk Manoeuvres (MRMs) using simplified scenarios. To this end, models for automated driving and ToC/MRM are adopted and developed. The simplified scenarios are used for conducting several simulation experiments to analyse the impacts of ToCs at TAs, and the effects of the corresponding mitigating measures.

During the second project iteration, the experience accumulated during the first project iteration is used to refine/tune the driver models and enhance/extend the proposed mitigating measures. Moreover, the complexity and realism of the tested scenarios will be increased and the possibility of combining multiple simplified scenarios into one new more complex use case will be considered.
2.2 Purpose of this document

This report describes the organisation and outcome of the TransAID Symposium, held in Paris, France, on 9 June 2019, in conjunction with the IEEE Intelligent Vehicles Symposium (IV 2019).

2.3 Structure of this document

In this document we first describe in section 3, the setup of the TransAID Symposium, as well as its location and organisational aspects. We then elaborate in section 4, on some of the presentations given. The document then concludes with sections 5 and 6, which focus on the survey we organised during the Symposium and what its main results were, and the main conclusions.
3 Setup, location, and organisation

After careful internal deliberation, we were able to find a period, location, and time slot that would allow us to slipstream our workshop together with a large existing event such that we would have a higher probability of attracting people to our workshop.

We planned to hold our Symposium on June 9, 2018 in Paris, France, in conjunction with the IEEE Intelligent Vehicles Symposium (IV’19), one of the major annual conferences of the IEEE Intelligent Transportation Systems Society (ITSS). We called our Symposium the “3rd Workshop on “Connected, Cooperative, and Autonomous Driving”, which targeted connected, cooperative, and autonomous technologies for cooperative and automated road transport. The workshop also featured an Industry Panel with experts from related industries, which fostered the interactive exchange of academia and industry.

The 30th IEEE Intelligent Vehicles Symposium (IV’19) was a premier annual technical forum sponsored by the IEEE Intelligent Transportation Systems Society (ITSS). It brought together researchers and practitioners from universities, industry, and government agencies worldwide to share and discuss the latest advances in theory and technology related to intelligent vehicles. Papers concerning all aspects of intelligent vehicles as well as proposals for workshops and specials sessions were invited for IV’19. Additionally, related technical Demonstrations and Exhibitions were welcomed.

As our workshop was planned in parallel with other IEEE-related events we also provided a suitably tailored invitation to set ourselves aside from the other events:

Recent developments in telecommunications, sensor, information processing, and control technologies have enabled substantial progress in the domain of ITS. C-ITS is in a very early stage of deployment, as it is technologically achievable, but the deployment requires cooperation of multiple stakeholders. Automated driving is on the horizon, and will still need substantial and longer-term development and testing to make even the high automation levels a reality in complex situations, such as in urban environments, and in a transit period of only partial market penetration. Cooperative and automated transport are certainly complementary. They are expected to bring substantial benefits in terms of safety, comfort and (traffic and fuel) efficiency. Many challenges exist in this important domain.

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1 https://iv2019.org/
The workshop targets the challenges for C-ITS applications, especially connected and cooperative systems towards automated driving. Competing communication technologies (e.g., peer to peer (IEEE 802.11p), cellular network, and future 5G), sensor, information processing and control technologies will be highlighted. The impacts of (C-)ITS applications will be analysed. Requirements for strong cooperation between industry, authorities and academia in different regions will be addressed.

The workshop is expected to be very interactive. Participants will have an excellent opportunity to discuss with and to challenge distinguished speakers and panellists. The technical areas to be discussed include, but are not limited to the following:

- Connected and automated Vehicles
- V2X communications
- C-ITS deployment
- Standardisation
- 5G research and testing
- Connected and cooperative systems
- Impacts evaluation of connected, cooperative, and automated transport

The main conference organisers were on the one hand Dr. Meng Lu, Strategic Innovation Manager at Dynniq (The Netherlands), VP for the IEEE Intelligent Transportation Systems Society, and Steering Committee Member for the IEEE Future Networks (Enabling 5G and Beyond), and on the other hand Dr. Cristiano Premebida, Aeronautical and Automotive Engineering at the Loughborough University.

As speakers and panellists, we targeted academia, OEMs, suppliers, ICT infrastructure providers, authorities, standardisation bodies, and other organisations.

The workshop was moderated by Mr. Tim Leinmueller from DENSO AUTOMOTIVE (Germany).
The set of workshop partners with whom we cooperated was:

![TransAID](image1)
![MAVEN](image2)
![C-MOBILE](image3)

![INFRAMIX](image4)
![CoEXist](image5)

![IEEE Future Networks](image6)

Our workshop presented part of the research results of TransAID, MAVEN (Managing Automated Vehicles Enhances Network), and C-Mobile (Accelerating C-ITS Mobility Innovation and Deployment in Europe), which are funded by the European Commission Horizon 2020 Research and Innovation Framework Programme, under Grant agreements No. 723390, 690727, and 723311, respectively.

The programme and results of our workshop were also put online at:

https://www.transaid.eu/organised-events-workshop2/
## 4 Presentations given

### 4.1 Programme

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Welcome &amp; Introduction</td>
</tr>
<tr>
<td>9:15</td>
<td>Survey questions</td>
</tr>
<tr>
<td>9:30</td>
<td>Dr Meng Lu (Dynniq, The Netherlands) - &quot;ICT infrastructure systems for automated driving&quot;</td>
</tr>
<tr>
<td>9:45</td>
<td>Coffee Break (30 min)</td>
</tr>
<tr>
<td>10:00</td>
<td>Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>10:15</td>
<td>(paper 2) Dr Meng Lu (Dynniq, The Netherlands) - &quot;ICT infrastructure systems for automated driving&quot;</td>
</tr>
<tr>
<td>10:30</td>
<td>(paper 3) Dr Meng Lu (Dynniq, The Netherlands) - &quot;ICT infrastructure systems for automated driving&quot;</td>
</tr>
<tr>
<td>10:45</td>
<td>(paper 4) Dr Meng Lu (Dynniq, The Netherlands) - &quot;ICT infrastructure systems for automated driving&quot;</td>
</tr>
<tr>
<td>11:00</td>
<td>Lunch (1h30')</td>
</tr>
<tr>
<td>11:45</td>
<td>Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>11:55</td>
<td>(paper 5) Dr Meng Lu (Dynniq, The Netherlands) - &quot;ICT infrastructure systems for automated driving&quot;</td>
</tr>
<tr>
<td>12:00</td>
<td>lunch (1h30')</td>
</tr>
<tr>
<td>12:45</td>
<td>Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>13:00</td>
<td>Dr Julian Schindler (DLR, Germany) - &quot;Infrastructure-assisted automated driving in transition areas&quot;</td>
</tr>
<tr>
<td>13:30</td>
<td>Dr Julian Schindler (DLR, Germany) - &quot;Infrastructure-assisted automated driving in transition areas&quot;</td>
</tr>
<tr>
<td>13:45</td>
<td>(paper 6) Dr Julian Schindler (DLR, Germany) - &quot;Infrastructure-assisted automated driving in transition areas&quot;</td>
</tr>
<tr>
<td>14:00</td>
<td>Survey questions</td>
</tr>
<tr>
<td>14:15</td>
<td>David Quesada (Enide, Spain) - &quot;Preparing the road infrastructure for the introduction of Automated Driving in Real-world Scenarios&quot;</td>
</tr>
<tr>
<td>14:30</td>
<td>(paper 7) Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>14:45</td>
<td>(paper 8) Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>15:00</td>
<td>Survey questions</td>
</tr>
<tr>
<td>15:15</td>
<td>(paper 9) Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>15:30</td>
<td>(paper 10) Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>15:45</td>
<td>(paper 11) Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>16:00</td>
<td>Dr Henning Hamer (Continental AG) - &quot;Enabling L3 + driving through the generation of crowd-sourced maps&quot;</td>
</tr>
<tr>
<td>16:15</td>
<td>(paper 12) Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>16:30</td>
<td>(paper 13) Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>16:45</td>
<td>(paper 14) Dr Marc Lacoste (Orange Labs, France) - &quot;Optimal control based CACC: problem formulation, solution, and stability analysis&quot;</td>
</tr>
<tr>
<td>17:00</td>
<td>Round table, concluding remarks, discussion</td>
</tr>
<tr>
<td>17:30</td>
<td>Survey discussion</td>
</tr>
</tbody>
</table>

**Survey discussion**
4.2 Presentations

The workshop was composed of three different types of interaction: survey questions, invited speakers, and oral-paper presentations.

- **Survey questions**
  - These were based on TransAID’s D2.2 (Scenario definitions and modellng requirements)
  - They were interactively posed and presented using Mentimeter (see also Section 5).

- **Invited speakers**
  - *ICT infrastructure systems for automated driving*
    - Dr. Meng Lu (Dynniq, The Netherlands)
  - *Assuring the Safety of Autonomous Vehicles*
    - Dr. Pete Thomas (Loughborough University, UK)
  - *Enabling L3 + driving through the generation of crowd-sourced maps*
    - Dr. Henning Hamer (Continental AG)
  - *Vehicle Automation*
    - Dr. Michele Rondinone (Hyundai Europe)
  - *Infrastructure-assisted automated driving in transition areas*
    - Julian Schindler (DLR, Germany)
  - *Preparing the road infrastructure for the introduction of Automated Driving – the INFRAMIX approach*
    - David Quesada (Enide, Spain)
  - *Management of privacy in cooperative ITS*
    - Dr. Antonio Kung (CEO of Trialog, France)
  - *Connected and Autonomous Vehicle Security: Challenges Ahead for 5G*
    - Dr. Marc Lacoste (Orange Labs, France)
  - *Base material for microscopic autonomous simulation*
    - Nouhed Naidja (VeDeCom, France)

- **Oral-paper presentations**
  - *CAD*
    - *In-Chamber V2X Oriented Test Scheme for Connected Vehicles*
      - Lei, Jianmei State Key Laboratory of Vehicle NVH and Safety Technology & Chon
      - Chen, Siru Beijing University of Posts and Telecommunications
      - Zeng, Lingqiu Chongqing University
      - Liu, Fangli Chongqing University
      - Zhu, Konglin Beijing University of Posts and Telecommunications
      - Liu, Jie China Automotive Engineering Research Institute Co., Ltd

Photos of the Symposium’s presenters can be found in Appendix B.
- **Optimal control based CACC: problem formulation, solution, and stability analysis**
  - Bai, Yu Key Laboratory of Road and Traffic Engineering, Ministry Of
  - Zhang, Yu The Key Laboratory of Road and Traffic Engineering, Ministry Of
  - Wang, Meng Delft University of Technology
  - Hu, Jia Tongji University, Federal Highway Administration

- **Infrastructure Support for Cooperative Maneuvers in Connected and Automated Driving**
  - Correa, Alejandro University Miguel Hernández of Elche
  - Alms, Robert Deutsches Zentrum Für Luft Und Raumfahrt
  - Gozalvez, Javier University Miguel Hernández of Elche
  - Sepulcre, Miguel Miguel Hernández University of Elche
  - Rondinone, Michele Hyundai Motor Europe Technical Center
  - Blokpoel, Robbin Dynniq
  - Luecken, Leonhard DLR
  - Thandavarayan, Gokulnath Miguel Hernandez University of Elche

- **Test and Evaluation of Connected and Autonomous Vehicles in Real-world Scenarios**
  - Premebida, Cristiano Loughborough University
  - Asvadi, Alireza Institute of Systems and Robotics
  - Garrote, Luis ISR-UC
  - Nunes, Urbano University of Coimbra

  - C-ITS
    - **TARA+: Controllability-aware Threat Analysis and Risk Assessment for L3 Automated Driving Systems**
      - Bolovinou, Anastasia Institute of Communications and Computer Systems
      - Atmaca, Ugur Ilker Warwick Manufacturing Group, University of Warwick, Coventry CV4
      - Sheik, Al Tariq University of Warwick, Warwick Manufacturing Group
      - Ur-Rehman, Obaid FEV Europe GmbH
      - Wallraf, Gerhard FEV Europe GmbH
      - Amditis, Angelos Institute of Communication and Computer Systems

    - **A Test-Driven Approach for Security Designs of Automated Vehicles**
      - Suo, Dajiang Massachusetts Institute of Technology
      - Sarma, Sanjay E. Massachusetts Institute of Technology
5 Survey results

In this section, we give the main results from a survey polled using the Mentimeter\(^2\) platform with the audience.

We asked our questions during two different moments, one in the morning and one right after lunch. The results were then aggregated, analysed, and discussed before closing the Symposium. At the beginning of each question session, participants logged in to a specific website using their phone, tablet, or laptop. Then a series of questions was, one at a time, shown on the main screen, as well as their own devices. The question was also slowly and clearly read aloud, repeatedly if necessary. The audience members could then anonymously select various options to vote, with the poll results each time per question shown in real-time on the main screen.

To support the results from TransAID’s simulations and field trials, it is necessary to get a good grasp on certain issues that require an understanding of how connected and/or automated vehicles operate on the one hand, and what the policy makers allow or require on the other hand. This forms a cornerstone to support TransAID’s goal, i.e. achieve a library with applicable and scrutinised measures for transition areas. To that end, we pose questions throughout the project to several stakeholders and experts. The goal is to gain insights into legal implications, (expected) driver and/or automated vehicle behaviour and infrastructure specific aspects with respect to automated vehicles. The answers to these questions will provide some feedback on the work done so far, some of which is based on views from experts within the project consortium, and collect insights for future work.

It is within that frame of mind that TransAID organised short surveys\(^3\). To that end, we used the extensive list in Appendix C of TransAID’s Deliverable D2.2, and selected some of the more prone questions to pose to the present audience. Both survey moments were organised efficiently, such that they did not take much time, and thus did not impose on the time available for the presentations.

The detailed, slide-by-slide results can be found in Appendix A.

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2 https://www.mentimeter.com

3 For the surveys we made the protection of personal data compliant the EU’s GDPR regulations. The execution of our surveys was in line with the ethics aspects as covered in TransAID’s Deliverable D10.14. No personal data was gathered during the surveys.
### 5.1 First session results

Half of the 22 participants came from academia; a fifth were OEMs. The first session contained 8 questions.

<table>
<thead>
<tr>
<th>Question #1</th>
<th>How would you rank the goals of managing traffic with (C)AVs?</th>
</tr>
</thead>
</table>
| **Results** | 1. Increasing traffic safety  
2. Increasing throughput  
3. Decreasing emissions |

<table>
<thead>
<tr>
<th>Question #2</th>
<th>Level 3 is considered unsafe from an HMI perspective by some; should authorities forbid those vehicles?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Results</strong></td>
<td>1 out of 4 would allow authorities to forbid L3 vehicles, about 2 out of 3 do not.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #3</th>
<th>Do you foresee areas in the road network where you do not want to allow automated driving?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Results</strong></td>
<td>Over half of the people foresee areas where AD is not allowed, and 2 out of 3 are for dedicated lanes.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #4</th>
<th>Should the infrastructure provider put a limitation on the level of automated driving that it allows?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Results</strong></td>
<td>Opinions are somewhat divided, with fifty/fifty percent of the people in the audience expressing pro/contra an infrastructure limitation on the AD level.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #5</th>
<th>Should OEMs explain the limitations of their automation?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Results</strong></td>
<td>A large majority of 85% wants OEMs to explain their AD limitations. The other also want this, but just to some extent.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #6</th>
<th>Should OEMs be forced to report disengagements (ToCs) from automated driving to a road authority?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Results</strong></td>
<td>2 out of 3 people reply positive, wanting OEMs to report disengagements; 1 out of 4 is unsure.</td>
</tr>
<tr>
<td>Question #7</td>
<td>Is connectivity required for some levels of automation (cf. L3 and higher)?</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Results</td>
<td>Connectivity is perceived as a requirement for L3+ AVs (with 4 out of 5 agreeing).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #8</th>
<th>Should authorities forbid AVs of Level 3 and higher that are not connected?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results</td>
<td>Only 1 out of 4 wants to forbid these vehicles (note that this is probably a strongly biased sample, as only 4 people responded).</td>
</tr>
</tbody>
</table>

### 5.2 Second session results

As some people in the audience switched workshops after lunch (ours was organised in conjunction with several others), we asked them again about their background. This time, 2 out of 3 participants came from academia; others were OEMs and service providers.

<table>
<thead>
<tr>
<th>Question #1</th>
<th>Are road authorities allowed to give advice that will conflict with traffic regulations?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results</td>
<td>A large majority of over 80% of the people agreed with the statement. However, 1 out of 10 replied negative, mostly citing safety-issues as the main reasons.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #2</th>
<th>Would (C)AVs be allowed to ‘break the law’ if the traffic manager wants to optimise lane changing or merging?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results</td>
<td>The responses to this question were somewhat mixed. About half of the audience agreed, with a third disagreeing, and the rest being unsure. The main reason for these diverse responses was because of the difficulty in trying to understand/comprehend the question, visualising a possible traffic situation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #3</th>
<th>Would (C)AVs be allowed to ‘break the law’ in order to behave as all other road users?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results</td>
<td>3 out of 4 people agreed with this statement, albeit that it heavily depended on the current traffic situation and context.</td>
</tr>
<tr>
<td>Question #4</td>
<td>Would (C)AVs be allowed to ‘break the law’ if this results in a safer situation on the road?</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Results</td>
<td>1 out of 3 people replied positive, with the rest saying no or being unsure. After discussion, this mostly stemmed from the fact that the response is highly dependent on the specific traffic situation at hand.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #5</th>
<th>Is a ToC needed when another vehicle cuts in and triggers emergency braking?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results</td>
<td>2 out of 3 people do not prefer MRMs after cut-in situations, with the remainder being unsure.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #6</th>
<th>Would automated driving require the support of some sort of backend?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results</td>
<td>A large majority of almost 80% of the people answered positive. Some would require no support of a backend or from an OEM back-end only.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #7</th>
<th>What should a (C)AV do in case its route is blocked?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results</td>
<td>All responses were mixed, evenly distributed over the available options, i.e.:</td>
</tr>
<tr>
<td></td>
<td>• Execute an MRM</td>
</tr>
<tr>
<td></td>
<td>• Execute a ToC</td>
</tr>
<tr>
<td></td>
<td>• Find another route</td>
</tr>
<tr>
<td></td>
<td>• Ask for advice</td>
</tr>
</tbody>
</table>
6 Conclusions

From a perspective of dissemination on the one hand, and obtaining stakeholder knowledge on the other hand, TransAID organised its Symposium together with a large existing event to ensure a higher probability of attracting people. It was held on June 9, 2018 in Paris, France, in conjunction with the IEEE Intelligent Vehicles Symposium (IV 2019), one of the major annual conferences of the IEEE Intelligent Transportation Systems Society (ITSS).

Given the audience of our workshop (targeting technologies for cooperative and automated road transport), we were able to foster the interactive exchange of academia and industry.

The contents of the workshop were three-fold: there were survey questions posed via the Mentimeter platform, we had a range of invited speakers, and finally we expanded the programme with oral-paper presentations. These latter fall into two categories, i.e. Connected and Automated driving, as well as security-related aspects of Cooperative ITS. Each time, an interactive discussion with the audience ensued, providing further insights into the authors’ points of view.

The survey results revealed that about half of the participants came from academia. Interestingly, a large group was in favour of foreseeing areas where automated driving should not be allowed, thereby directly confirming that TransAID’s research questions and approach are sound and sensible. A very high proportion of the participants also spoke out towards OEMs, asking them to explain the limitations of their autonomous vehicles. In addition, connectivity was perceived as a requirement for Level 3 or higher autonomous vehicles. To conclude, a discussion followed some of the results related to the question whether (connected) automated vehicles would be allowed to break the law. This was seen as moderately acceptable when optimisation of the traffic stream was called for, but definitely for the purpose of increasing traffic safety.
Appendix A. Detailed survey results

A.1 First session results

**What is your background?**

- 2 Road operator
- 4 OEM
- 12 Academia/research
- 0 Authority

**How would you rank the goals of managing traffic with (C)AVs?**

1st: Increasing traffic safety
2nd: Increasing throughput
3rd: Decreasing emissions
Level 3 is considered unsafe from an HMI perspective by some; should authorities forbid those vehicles?

- Yes: 24%
- No: 57%
- I'm not sure: 19%

Do you foresee areas in the road network where you do not want to allow automated driving?

- Yes: 57%
- No: 38%
- I'm not sure: 5%
Should the infrastructure provider put a limitation on the level of automated driving that it allows?

- Yes: 43%
- No: 43%
- I'm not sure: 14%

Should OEMs explain the limitations of their automation?

- Yes, all of them: 85%
- Yes, but only to some extent: 15%
- No, not at all: 0%
- I'm not sure: 0%
Should OEMs be forced to report disengagements (ToCs) from automated driving to a road authority?

- 67% Yes
- 24% I'm not sure
- 10% No

Is connectivity required for some levels of automation (cf. L3 and higher)?

- 81% Yes
- 19% No
- 0% I'm not sure
Should authorities forbid AVs of Level 3 and higher that are not connected?

- Yes: 25%
- No: 50%
- I'm not sure: 25%
A.2 Second session results

**What is your background?**

- 0 Road operator
- 2 OEM
- 11 Academia/research
- 0 (Local) Authority
- 2 Service provider
- 2 Other

17 respondents

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(1/7) Are road authorities allowed to give advice that will conflict with traffic regulations?

- 82% Yes
- 12% No
- 6% I'm not sure

17 respondents
(2/7) Would (C)AVs be allowed to 'break the law' if the traffic manager wants to optimise lane changing or merging?

- Yes: 47%
- No: 35%
- I'm not sure: 18%

(3/7) Would (C)AVs be allowed to 'break the law' in order to behave as all other road users?

- Yes, always: 0%
- Yes, but it depends on the context (e.g., safety): 76%
- No: 12%
- I'm not sure: 12%
(4/7) Would (C)AVs be allowed to 'break the law' if this results in a safer situation on the road?

- Yes: 61%
- No: 22%
- I'm not sure: 17%

(5/7) Is a ToC needed when another vehicle cuts in and triggers emergency braking?

- Yes: 6%
- No: 67%
- I'm not sure: 28%
(6/7) Would automated driving require the support of some sort of back-end?

- Yes, OEM only: 6%
- Yes, infrastructure provider only: 0%
- Yes, both: 78%
- No: 11%
- I'm not sure: 6%

(7/7) What should a (C)AV do in case its route is blocked?

- Try to find another route (if possible): 4
- Transfer control to the driver: 5
- Ask advice from a back-end (OEM and/or infrastructure): 2
- Execute a minimum-risk manoeuvre: 6
Appendix B. Photos
Traffic signal control methods

- Static control or Fixed-time control
- Actuated control
- Semi-fixed time control
  - Based on a fixed time control plan
  - Switching can occur between a configured nominal time
- Adaptive control
- Stabilized adaptive control
Policy based CACC
- Low computation burden
- Can be easily implemented
- Normally the local stability and string stability of the policy based CACC system can be easily analyzed

Optimal Control based CACC
- Can be designed to fulfill multiple objectives: efficiency, safety, etc.
- Can achieve optimal behavior and anticipative behavior
Goal of Electronic Horizon (eHorizon)
Expand vehicle senses through backend information