TRUST – Growing a Positive Traffic Safety Culture in the EU

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Abstract. After years of remarkable road safety improvements across Europe, progress has recently stalled. A systematic change is needed to reach the EU vision of zero road deaths and serious injuries by 2050. And this change will need to be a cultural one.
This paper explains how a consortium of 13 European expert organisations, supported by a worldwide network of contributors and advisors, will use an EU-funded project, TRUST, to explore the options for improving Traffic Safety Culture (TSC) in Europe. The project addresses both road users and people shaping the traffic system through their work. Measures for improving TSC developed within the project will be evaluated in seven pilots, working with municipalities, businesses and schools. Tools, benchmarking facilities and guidance developed through the project will be accessible through the TRUST platform.
The project will draw insights from aviation, rail and maritime transport and other industries, such as nuclear and public health.
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Keywords: Traffic Safety Culture (TSC), Road Safety, Assessment Tools, Conceptual Model, Pilot Interventions.

1 Introduction

Every year, around 20,000 people die on EU roads and at least 100,000 more are severely injured [1] [2]. Despite progress over the last decades, these numbers are still unacceptably high, and they remain a key challenge for all European countries. There

are signs that the trend of decreasing road deaths is stagnating or even reversing in some countries, and most European countries face the challenge of large numbers of pedestrians and cyclists being seriously injured.

Whilst progress can still be expected from improved infrastructure, (vehicle) technology and traffic laws and enforcement, many road safety experts believe that a cultural change is needed, not only among road user groups, but also among people responsible for shaping the traffic system through their roles in organisations and in all of the Safe System pillars.

2 Bringing about Clarity – How to Define Traffic Safety Culture?

There is substantial confusion about the term ‘Traffic Safety Culture’ and it is even misused [3]. The TSC concept to leverage improvement of road safety gained notable traction and visibility in the US in the 2010s and evolved out of organisational safety culture and its application in high-risk industries (e.g., aviation, nuclear energy). It can be defined as ‘A social climate in which traffic safety is highly valued and rigorously pursued’ [4]. Broad definitions like this one, facilitate grasping TSC as a concept, however, they are not suitable for operationalisation and measurement.

Another definition is TSC as ‘the shared belief system of a group of people, which influences road user behaviours and stakeholder actions that impact traffic safety’ [5]. This is an example of definitions which explicitly expand the applicability of the concept to stakeholders, which is in line with the Safe System approach.

Many more definitions have been proposed but none of them have prevailed. While safety culture in organisations as a concept meanwhile is widely used, applying the principles to the entire road safety context is more complex, as it is not a closed system. TSC has mainly been used as a boundary concept, which researchers tended to define based on their background or for a specific research purpose.

First results of the systematic literature reviews on definitions of ‘culture’, ‘organisational culture’, ‘safety culture’ and ‘traffic safety culture’ are available. 25 definitions of either ‘traffic safety culture' or 'road safety culture’ were extracted from scientific publications. Publications explicitly dealing with safety culture in organisations were looked at in a separate step. 12 of the 25 definitions alone can be credited to two research groups, who proposed similar and over time evolving definitions. A total of 13 sub-dimensions is contained in the 25 definitions which were subject to the analysis, demonstrating once more the heterogeneity of the understanding of TSC. The sub-dimensions used in the definitions are, in descending order of occurrence: beliefs, values, attitudes or opinions, norms (descriptive or injunctive), behaviours, perceptions (e.g. of risks), assumptions, knowledge and skills, perceived control over behaviours, motivation, intentions, commitment, and meaning. The analysed definitions include one to five of those dimensions. Most of those dimensions are (mainly cognitive) constructs themselves, meaning they are also not directly observable and that their definitions matter as well.

Only very few authors suggest models on how different dimensions (1) are defined, (2) relate to each other and (3) relate to road safety outcomes. Ward et al. (2020) [6] for example proposed such a behavioural model, including also suggestions for measuring its components. Furthermore, the extent to which proposed definitions were empirically put to test and by what methods also varies considerably [7] [8] [9].

If the concept is to be applied to bring about real change, the terminology must be precise, otherwise it remains hollow.

By May 2026, the TRUST project will have developed a conceptual and operational definition of TSC that is scientifically grounded and that can be used as a basis for developing models and measurement tools. The TSC definition will be based on further examination of related fields (culture, organisational culture, and safety culture) and by drawing insights from other transport modes (aviation, rail, maritime) and safety-critical fields (nuclear industry, public health). It will be well-grounded in literature and agreed upon by leading experts and practitioners, which will collaborated in a Delphi study as well as a consensus workshop. The Delphi surveys were conducted separately for experts with backgrounds in organizational safety (culture) and traffic safety culture, presenting them with elements of previously proposed definitions. Both surveys resulted in a high degree of agreement regarding the importance of the elements: values, attitudes, norms, patterns of behaviour and beliefs. Despite the congruent results for the organizational context as well as the context of traffic safety culture in general, experts emphasized that the latter is much more complex.

3 How does TSC Contribute to Road Safety Outcomes?

With a definition of TSC in place, a second stage of the TRUST project will be to determine the link between TSC and road safety outcomes. Research already exists to link national culture to collision rates, but the specific impact of TSC components at the community and organisational levels is less well understood.

Through a literature review and analysis of data from ESRA (E-Survey of Road users' Attitudes) [10] as well as from complementary sources, the TRUST project will seek to collect best practises and determine how TSC levels in various traffic ecosystems influence specific road safety outcomes. The TRUST project will also consider TSC's place within the Safe System Approach, particularly with a view to seeing whether a strong TSC can facilitate the adoption of the Safe System. The potential for an even broader and integrated approach will be envisaged, embracing the various aspects of sustainability.

4 Developing a Conceptual Model for TSC and Accompanying Assessment Tools

Core endeavours of the TRUST project will be to develop and validate a comprehensive scientific model for TSC as well as TSC assessment tools. In addition, TRUST will

introduce a new TSC index, considering TSC of road users but also policy integration and other indicators of a functioning Safe System for the national and sub-national level.

4.1 The TSC Model

The TSC model will depict TSC and its sub-dimensions at different levels (national, regional, local community and the organisational level). Hypotheses about relationships between key elements and road safety outcomes will be developed and tested. Next to key elements of TSC, the following constructs will be included: safety policies and leadership, societal indicators (e.g., levels of corruption), organisational safety culture, behaviours of road users, as well as crash involvement and risks.

4.2 TSC Assessment Tools – Traditional and Innovative AI-based Tools

TSC assessment tools will be developed in the TRUST project for use both at the community and organisational level.

At the organisational level, two types of TSC assessment tools will be developed: traditional survey-based tools and innovative tools based on Large Language Models (LLM, AI-based) - an original feature of the TRUST project.

The AI-based TSC assessment tool using Large Language Models (LLMs) is an approach which provides unobtrusive measures of TSC, less prone to subjectivity and social desirability bias. The AI tool, based on the OODA (Observe, Orient, Decide, Act) loop concept, analyses various data sources, including social media, public documents, and relevant statistics. It complements traditional surveys by:

a. Identifying at-risk groups: The AI tool analyses social media, public documents, and other relevant data sources to help identify groups that may most benefit from targeted safety campaigns.

b. Establishing baselines and measuring impact: The tool assesses the cultural landscape before and after safety campaigns, helping to quantify their effectiveness in changing attitudes and behaviours.

c. Analysing culture-behaviour relationships: By correlating changes in safety culture with behavioural statistics (e.g., accident rates, speeding incidents), the tool helps measure the impact of improved safety culture on actual road safety outcomes.

d. Informing campaign adjustments: Insights generated by the AI tool allow for continuous refinement of safety campaigns, enabling more effective targeting and messaging.

5 Development of Interventions, Implementation and Testing

TRUST will identify cultural intervention mechanisms for various community and organizational settings. While safety interventions in organisations have a long-standing history, the community level is much less developed, as it can have many characteristics in terms of actors, roles and requirements.

This makes the choice of effective measures a more complex, yet achievable task. 7 pilots, organized by at least 20 local authorities and companies plus a number of driving schools and secondary schools in 12 European countries, serve as test environments for the applicability and effectiveness both of the TSC assessment tools and interventions developed within the TRUST project, in the following sectors and groups:

1. Local authorities & cities (P1)
2. Drivers at work (P2)
3. Hot food delivery (P3)
4. Tourism sector (P4)
5. Driving school students (P5)
6. Secondary school students (P6)
7. Road safety professionals (P7)

The diversity of the 7 pilots is crucial to demonstrate that improving TSC requires: (a) interventions which are tailored to the context and sub-culture (no "one size fits all") and (b) starting from many different points in the traffic system to generate a bigger change. Four pilots are situated (mainly) at the organisational level and three pilots (mainly) at the community level. The first set of pilots (P1-P4) aims at impacting TSC in organisations, focusing on leadership and management practices (cf. [11]). The other set of pilots (P5-P7) aims at impacting TSC among individual road users, but also road safety professionals. (Table 1)

TRUST's forthcoming evaluation strategy will foresee that sound evaluation methodologies are available and applied already from the initial planning phases of the pilots. Thorough before and after comparisons of (elements of) TSC will be carried out for all pilots as well as an evaluation of the validity and reliability of the developed TSC model(s) and measuring tools. If required, the models will be revised and the measuring tools adapted.

Fig. 1. Overview of the 7 Pilots covering a wider range of road user groups, stakeholders and road safety hot topics. *DUI: Driving Under the Influence. VRU: Vulnerable Road Users.

6 Beyond the Life of the TRUST Project – the TRUST Platform

As the TRUST project develops, the TRUST platform website will emerge as a repository for all the knowledge generated within the TRUST project and as a tool providing guidance to authorities, companies and decision-makers at all levels. It should include low-threshold access to validated (self-) assessment tools for benchmarking and guidance for applying appropriate intervention strategies, using established and AI-based approaches as well as a European TSC index for national and subnational levels.

The TRUST platform will provide information on the conceptualisation and operationalisation of the TSC Framework and be a basis for communication and dissemination of the results and tools of the TRUST project. Access to all tools developed by the TRUST project will be provided (in several languages) including facilities for benchmarking and all the public deliverables of the TRUST project. The TRUST platform will become a repository for information on TSC and be linked to other relevant projects and initiatives.

7 Conclusion

The TRUST project is in its infancy but by the end of the project, a range of results will have been produced, most notably:

- A conceptual and operational definition of TSC that can be used as a basis for models and tool development.
- A model on the impact of TSC on road safety performance and its contribution to a Safe System approach.
- An understanding of how TSC can contribute to sustainable mobility at community and organisational level.
- A TSC Framework including models, validated assessment tools and intervention methods for measuring TSC maturity and improving TSC in organisations and communities (at national/regional/local level). The TSC framework can be used in High-, Middle- and Low-Income Countries.
- Seven documented and evaluated pilot interventions across Europe to assess and improve TSC in different contexts with different road safety challenges.
- A range of resources produced in the course of these pilots, including:
  - an adapted version of the Norwegian Traffic Safe Municipality, namely the European Sustainable Traffic Safe Municipality (P1)
  - online tools for organisations to self-assess their level of TSC maturity (P2)
  - a gamification-based road safety performance application concept (P3)
  - a practical guide on safe mobility for tourists, with focus on young drivers and Vulnerable Road Users (VRUs) (P4)
  - validated teaching and learning materials for driving schools for at least five countries (P5)
  - a webinar for designing evidence-based teaching resources on road safety and mobility education (P6)
  - a modular set of webinars to educate road safety and sustainability professionals on TSC and an Integrated Approach for road safety and sustainable mobility. (P7)
- Policy recommendations to European, national and regional policy-makers for improving TSC.
- Comprehensive guidance documents for organisations and communities showing how to tailor TSC interventions including hand-on advice on how to evaluate the impact of their interventions.
- A suggestion for adapting the ESRA survey so that it can even better accommodate different TSC components.
- A European TSC index that can also be used at national and subnational level.
- The TRUST platform with a wealth of information on TSC, facilitating low-threshold use of validated TSC tools and benchmarking. We expect the platform to attract at least 4000 users in the 5 years after the project.

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