

## TRAIL seminar

# Bridging the Gap between Human Factors and Engineering. From qualitative to quantitative knowledge.

**8 February 2024**  
**10:00 h – 13:00 h**  
**TU Delft, room t.b.a.**

On 8 February 2024, TRAIL PhD researcher Johan Vos will defend his PhD thesis '*Drivers' Behaviour on Freeway Curve Approach - Different Angles, different Perspectives*' at Delft University of Technology. The defence is public, and you are invited to join.

Moreover, on the occasion of this public defence, TRAIL and TU Delft have set up a seminar on: *Bridging the gap between human factors and engineering. From qualitative to quantitative knowledge.*

### Programme seminar

*Chairwoman: Dr. ir. Haneen Farah*

10.00 – 10.30 Welcome and coffee

10:30 – 11:00 **Prof. Alfonso Montella** – A methodology for setting credible speed limits based on numerical analyses and driving simulator experiments.

11:00 – 11:30 **Anke Mulder** - Integration of Human Factors in traffic engineering in daily practice.

11:30 – 12:00 **Prof.dr.ir. Hans van Lint** – Getting Human Factors in NextGen FOSIM — where we are and where we are going.

12:00–13:00 Lunch

### Registration

Participation is free, registration is required: [click here](#).

### Public defence Johan Vos

At 15:00 h the public defence starts in the Senaatszaal of the Aula.

At 14:30 h Johan will give a brief presentation about his research in the same room.

## **Prof. Alfonso Montella**

Professor and Chair of Road Safety Laboratory at University of Naples Federico II.

He is Director of the Italian Scientific Association of Transportation Infrastructures, Handling Editor of the journal Transportation Research Record, and member of the Joint International Research Laboratory of Transportation Safety of Tongji University, the Editorial Board of the Journal Accident Analysis and Prevention, the TRB Standing Committee ACS20 on Safety Performance and Analysis, and the PIARC Task Force Road Design Standards.

His main areas of expertise include highway design, highway safety management, highway safety modelling, road safety audits and inspections, and drivers' behavior investigations by driving simulator experiments.

### ***A methodology for setting credible speed limits based on numerical analyses and driving simulator experiments.***

I will present a methodology to set credible speed limits based on the roadway design characteristics and the drivers' operating speeds. Then I will describe a case study on the A16 Naples–Canosa motorway, section Baiano–Candela, in southern Italy where a posted speed limit of 80 km/h is installed in both travel directions and a new speed limit of 100 km/h is proposed, based on the results of the experiments developed within the methodology. Drivers' operating speeds have been estimated using the results of both speed prediction models and driving simulator experiments. Finally, I will present the results of a safety impact assessment considering both the safety effects of the expected change in the speed distribution as well as the effects of the safety countermeasures implemented in association with the speed limit change.

## **Anke Mulder**

Anke works as Human Factors Advisor at Rijkswaterstaat. She has a background in cognitive and experimental psychology. She is concerned with human road interactions within the Dutch trunk road network. Her work revolves around the principles of human centered design and an understanding of cognitive abilities.

### ***Integration of Human Factors in traffic engineering in daily practice***

The gap between human factors and engineering represents a challenge in creating a safe, efficient and user-friendly traffic system. Road designs based on technical specifications may not inherently align with human behavior. The field of human factors focuses on studying cognitive abilities. Integrating human factors in traffic engineering involves an understanding of how road users interact with the traffic system. This presentation offers insights into the practical implementation of human factors within the Dutch trunk road network.

## **Prof. Hans van Lint**

Hans is a Professor of Traffic Simulation and Computing. He received his master's degree in civil engineering in 1997, and his PhD at the Transport & Planning department of Civil Engineering in 2004. He was appointed Anthony van Leeuwenhoek Professor in 2013. His research lies on the interface between traffic flow theory and simulation and advanced data processing and assimilation. He has worked on travel time reliability; on new traffic flow theories and models; and on data assimilation and fusion methods for estimating and predicting the traffic state in networks. Many of these research projects have led to follow up and valorisation projects in which the developed models and tools have led to innovative applications in practice.

### ***Getting Human Factors in NextGen FOSIM — where we are and where we are going.***

FOSIM (Freeway operations simulation) has been a workhorse tool for many years in smaller and larger ex post and ex ante evaluation projects to estimate capacity distributions on Dutch Freeways. However, to infer effects on capacity and safety of mixed traffic flows with higher degrees of driver assistance and (partial) automation, endogenous HF mechanisms are required. In this exciting new project, sponsored by RWS, we replace the computational kernel of FOSIM with OpenTrafficSim (OTS) to achieve exactly this. I will bring you up to date on some of the key principles and sketch the timeline of development.