

47th European Transport Conference 2019, ETC 2019, 9-11 October 2019, Dublin, Ireland

## Facing the complexity of transport models and innovative developments in sustainable mobility

The 47<sup>th</sup> European Transport Conference (ETC) was held for the second year in Dublin, on October 9-11, 2019, in the frame of the Dublin Castle, sponsored by the Irish Minister for Transport, Tourism and Sport. The ETC is organised by the Association for European Transport (AET) that currently comprises over 200 corporate and individual members, based in over 35 countries. It was formed in 1998 to develop a network of transport professionals and academics across Europe and evolved and changed to stay relevant to the European transport community. Building on over 40 years' of amazing voluntary effort AET and ETC has changed with the times to reflect the needs of not only the profession but global thinking about transport, what it does, and what it should be doing in the future.

Some of the key themes of the 47<sup>th</sup> European Transport Conference, ETC2019, were:

- Autonomous Vehicles
- Climate Change
- Transport models
- Big Data

Out of 279 papers presented at the Conference, we shortlisted 32 papers covering (i) transport models in combination with autonomous vehicles, presenting national transport models (NTM) and/or relevant modelling application at national scales and (ii) sustainability issue in mobility and transport at different scales and including several dimensions. At the end of the review process, a total of 15 high quality papers were accepted for publication in this special issues of Transportation Research Procedia.

The first article by Pfaffenbichler et al is a systemic analysis of environmental impacts of individual and shared automated mobility in Austria. It addresses the advantages of system dynamics approach using data from various sources to model the ecological impact of automated vehicles. By using a combination of the toolbox of System Dynamics to handle the complexity of

the issue, Causal Loop Diagrams build the initial step to find potential effects of automated vehicles. A quantitative impact assessment followed, and a sensitivity analysis showed that there is a need to regulate the implementation of autonomous vehicles. Mileage driven would massively increase due to new user groups being able to use private cars such as people without drivers' licenses. Although *road capacity/speed* are the only factors that do not increase the mileage driven, the other factors *remote parking*, the *value of in vehicle time* and *new user groups* have the potential of synergy effects leading to a negative impact on the environment, that need to be addressed with policy measures.

The second article of this special issue by Kiel et al. deals with the hierarchical transport model and issues that have occurred in the past and the use of the current hierarchical model in the Netherlands. They describe the method and organisation of the hierarchical model of Noord-Brabant, a province in the Netherlands. The historical overview shows issues provinces and municipalities had to face when they started to align their models to see the greater picture. In 2013, Noord-Brabant implemented a two-level multimodal transport model successfully. Key elements as the *common goals and interests*, *forming alliances and collaboration*, *clear structure in decision making* and *agreements on financial resources* and finally *process and communication* are further developed to improve the quality of the current hierarchical transport model. This article provides the framework for a successful implementation that could be used by other cooperating provinces and municipalities.

Scherr et al. present another use case of transport micro-modelling called SIMBA MOBi in their article, which simulates each traveller as an individual entity. Their model is multimodal and covers the population of Switzerland. With this article, Scherr et al. demonstrate that microscopic demand modelling can be applied in practice with the necessary resources to support decision making business and planning processes. Within the 24-hour simulation that includes rural and urban areas same as intercity travel that has been developed by the Swiss Federal Railways within the past two years, the calibration provides a model quality as of conventional macroscopic.

The modelling article by Agriesti et al. covers the impact of driverless on urban environments by using scenario development and respective evaluation of measures. The three scenarios business as usual, private connected automated vehicles and the mobility as a service are used to assess the effect in a holistic and multidisciplinary approach to demonstrate challenges such as induced traffic or increased sprawl due to reduced cost of commute time and safety issues for pedestrians. To

being able to minimise negative outcomes of increased use of autonomous vehicles, which is supposed to come in any of the scenarios and use the opportunity of the changes, they need to be well known and foreseen.

Another article by Almlöf et al. deals with the relevance of public transport in a future of more and more automated vehicles. Their research is conducted in Sweden, and a scenario-based transport modelling approach is used to assess the impact of the developments in mobility and transport. Their results indicate that in all their four scenarios walking and cycling decreases and for the case of taxi-like car service use of public transport decreases due to a shift towards the use of cars. Nevertheless, in their work, they show that most of the travel to and from the city centre of Stockholm would be made by public transport.

In their article, Carroll and Sullivan have identified fields that need special attention over the next years in the road network for Dublin City by modelling and analysing the schemes that are part of the scenarios used in the PLUTO project. This project by the National Transport Authority Ireland aims at improving the current framework for transport investment from 2015 and adapts for the four areas of *compact growth*, *interurban connectivity*, *rural priorities*, and *strategic links*. By looking at mode choice, volume capacity ratios, link delays and journey time for cars and public transport, they conclude that for instance demand management measures and the assignment of additional road space to active modes and public transport services.

Anagnostopoulos and Kehagia used microsimulation in their article *CAVS and roundabouts: research on traffic impacts and design elements* as well providing insights into the potential impacts on traffic flow, traffic safety and pollutant emissions by the implementation of connected automated vehicles. They had a look at roundabouts with double lanes and different geometrical specifications and traffic flow patterns. The outcomes of their models are safety aspects and emission trajectories. They conclude that there is still a lot of work that needs to be done in order to design elements of roundabouts with the uptake of connected automated vehicles especially concerning the decreasing of gaps and resulting in more aggressive behaviour, conflicts and safety issues.

The Austrian model VMÖ was presented in 2010, and the developments on the transport market due to the financial crises is reassessed by Grebe et al. in their article *VMÖ – a new strategic transport model for Austria*. Their critical assessment of the results of the VMÖ was done by cost-benefit-analysis, environmental impact assessments and other formal assessment procedures.

Newly available data enables the models for freight and passengers to be advanced and adapted over the next years and in this article Grebe et al. provide the insights into the first part of the model development, the pilot study that yielded a proposed specification for the new model.

Arsenio et al. contributed with a case study from the Algarve region in Portugal using heterogeneous data sources and data mining techniques in their article *Assessing multimodal mobility trends using heterogeneous data sources: a case study for supporting sustainable mobility policy goals within the Algarve region*. Time-series passenger flow data was used in an econometric analysis to gain insights into how to reduce the trends of increased road traffic and support strategies of decarbonisation and social equity for the Algarve region.

De Jong et al. present a comparison of the new stated preference survey and the respective estimated model with the model from twenty years ago. Analysing survey data from 1094 interviews provides an original high-quality data source for modelling transport in the Netherlands.

The second set of articles covers advances in sustainability issues from various perspectives. Ydersbond et al. answer the questions of how the regulatory frameworks of Norway and Finland shape the development of mobility as a service and describe the differences between the more open Finnish regulatory framework and the less open Norwegian frameworks. Each shows advantage and also challenges in the long run, and other policymakers can learn from the results to established or adapt their regulatory frameworks. On the other hand, Engholm et al. aim focus on what actors, networks and institutions constitute technological innovation system of driverless trucks in Sweden. They use the analysis framework *technology innovation systems* to describe critical aspects that might occur for the identified actors. The traditional business practices need to adapt new technological knowledge and expertise.

Carrignon has a look at the historical analysis of the British and French road development focussing on *Connected and Autonomous Vehicles, Electric Scooter and Their Implications for Road Network Design*. He develops a theoretical framework from this historical assessment and applies it to shed light on the potential of connected autonomous vehicles and forms of E-scooter. A series of key reference points is identified, and safety aspects are discussed for integrated infrastructure.

Finally, Mellegård and Reichenberg present a systematic mapping study in their article *The C-roads day-1 service green-light optimal speed advisory—a mapping study*. They bring together

the findings via systematic literature reviews and systematic mapping studies comprising 43 articles on the topic discussing public trends and public focus.

In conclusion, with this special issue we hope to have contributed to the advances in mobility and transport research and practice and to promote new ways of looking at the field transferring knowledge and best practice studies. Special thanks go to all anonymous reviewers, to the publisher, and to those involved in the technical processes.

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