European Commission

Towards a Connected, Coordinated and Automated Road Transport (C2ART) system

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The European Commission's science and knowledge service

Joint Research Centre

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Rationale

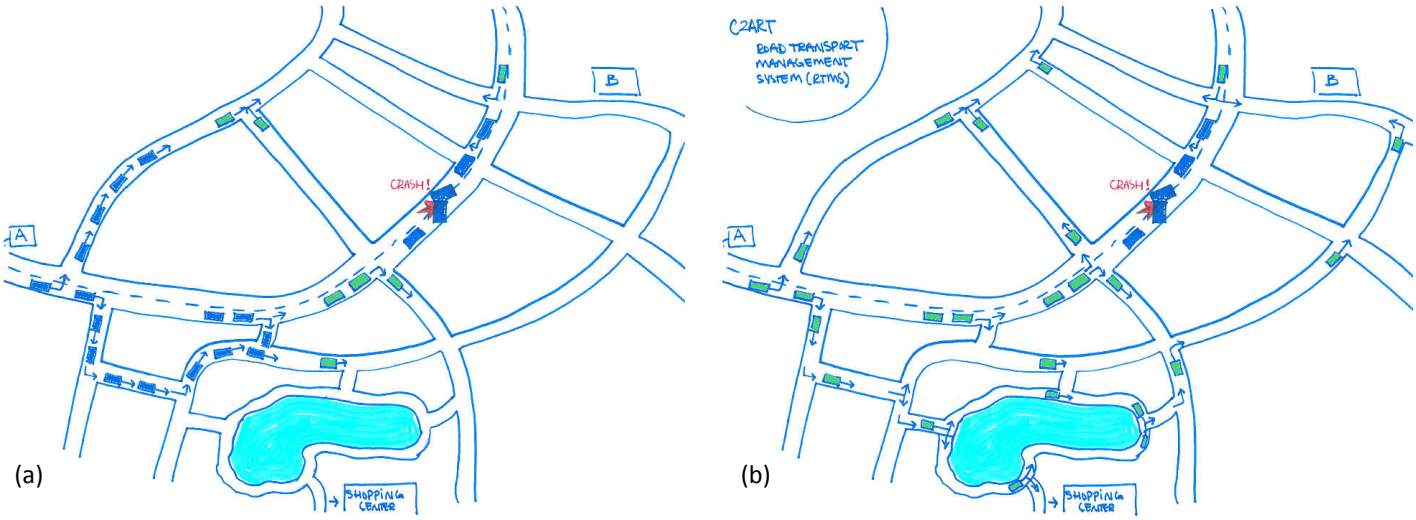
- We are facing **a paradigm shift in transport and mobility**, with vehicles becoming increasingly **connected, electrified and automated**.
- In parallel, **new mobility trends** are increasingly emerging, e.g.: **Mobility as a Service (MaaS) and shared mobility** models.
- The **socio-economic and environmental impacts** from these different (but entangled) trends could be **overwhelmingly positive** (e.g. reducing accidents, congestion, emissions). However, if the transition from the current status to the future mobility system is not done in a thoughtful way, it could **lead to negative outcomes**. Existing studies anticipate that **Connected and Automated Vehicle (CAV) technologies may boost road travel** as a result of the most favourable travel conditions and new groups of users (e.g. elderly, disabled, young).
- In future scenarios (especially in the event of substantial increases in travel demand), **traffic management would need to play a decisive role** in enabling a safe and efficient mobility, with increased control possibilities offered by a **Connected, Coordinated and Automated Road Transport (C2ART)** system.

Objectives

In this picture, **the Joint Research Centre (JRC) is investigating the impacts of CAV technologies** through a combined approach based on **traffic modelling and simulation, desk research and stakeholders' consultation**. Some preliminary results of this research have been published in specialised conferences and a **JRC Science for Policy report** titled "*The r-evolution of driving: from Connected Vehicles to Coordinated Automated Road Transport (C-ART*)*" has been recently delivered:
http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106565/art_science_for_policy_report_1-soa_final_tobepublished_online.pdf
In addition, a stakeholders' workshop on challenges and opportunities of C2ART was organized in Brussels on 12-13 June 2017 with the active participation of many of the main actors involved in this transformation.
**later on renamed as C2ART*

Further research

Further work by the JRC will focus on analysing the possible effects of CAV technologies and mobility paradigms in the future management of the road transport system, in consideration of different rates of connected, automated and in the end, coordinated vehicles (i.e. mixed traffic). The scenarios arising from having different rates of these vehicles will be analysed from multiple perspectives, specifically covering users, system performance, security, data governance and protection, and traffic management.



(a) (b)

Fig. 1 (a) Traffic distribution without C2ART (b) Traffic distribution with C2ART
(blue vehicles represent vehicles which are stuck in traffic; green vehicles represent free flow traffic)

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