A.R.T.Forum
Automated Road Transport

Interreg
North Sea Region
ART-Forum
European Regional Development Fund

EUROPEAN UNION

Digital regulation of the connected and automated vehicles of the future

CITY OF BERGEN

How can regulators make sure that automated vehicles in the future actually make cities more liveable? The digital regulation pilot in the city of Bergen has explored a method to manage large fleets of shared, connected vehicles in a city. Since large fleets of automated vehicles are not yet available, shared e-scooters were used to test the concept. A digital regulation tool has been developed for the pilot. The operators were required to send live MDS data to the city, allowing real time monitoring of around 6000 vehicles. The City of Bergen used the tool to create geofenced zones to regulate speed, parking and set vehicle caps.

These rules were pushed to the operators digitally through the MDS Policy API, allowing for a flexible and dynamic regulation. Fees for the use of public space were also calculated by the tool.

Some key findings:

- The MDS standard has proven to be reliable and valuable as a tool to manage large fleets of e-scooters, and the multimodal approach in the newest version seems promising for all other vehicles, including the automated vehicles of the future.
- A digital regulation tool based on two-way data sharing allows cities to set detailed rules on access, speed, parking and distribution for all connected vehicles. These rules can be flexible, allowing for variations throughout the day and temporary regulations for large events.

- With reliable data, fees (and subsidies) per vehicle can be calculated and tweaked to support city targets on sustainable transport. As an example, fees can be high in the inner city, limiting the number of vehicles and prioritizing walking and cycling – and lower and even negative in the suburban areas, where public transport is scarce and the potential to replace car trips is higher.
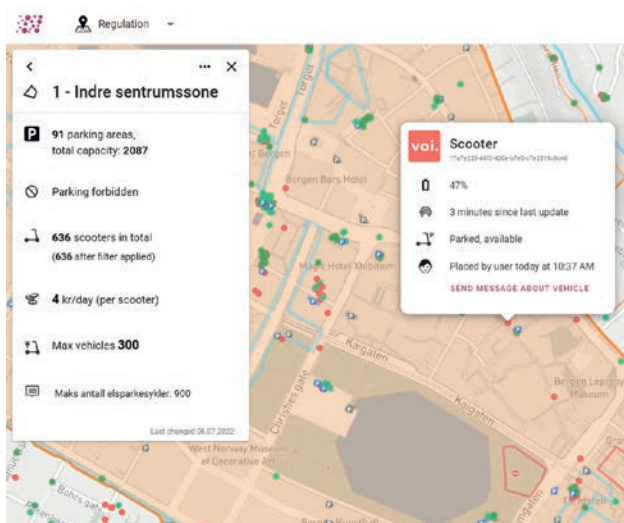
» *Bergen's digital regulation could be the solution cities in Europe are looking for.*
Trond Hovland, ITS Norway

What remains to make digital regulation work for automated vehicles?

Technology:
- Positioning technology: The testing of GPS technology for e-scooters has shown that the accuracy in real-life city conditions must improve significantly before it can be applied to larger and faster vehicles. This applies to all geofenced regulations (speed, parking, restricted access).
- Connections: This regulation method depends on ultra-fast and reliable communication between vehicles and "the cloud". This is critical when applied to larger and faster vehicles. More on-board storage of data in IOT units in vehicles needs to be explored further.

Legislation:
- National and/or EU legal frameworks for data sharing and the connectivity of vehicles must be worked out. The common framework must sort out what should be common standards and requirements on the national/EU level and what should be allowed to be regulated on the regional or local level.
- The legal framework that allows public authorities to charge (dynamic) fees for use of public space and infrastructure (e.g. road pricing) must be strengthened and completed. The justification to use such fees should be to prioritize active and sustainable transport modes and ensure equal access to transport services.
- The Bergen pilot using MDS shows that privacy issues are challenging but manageable when regulating shared fleets. Regulating privately owned vehicles may prove more challenging.

Cultural and political factors:
- The transition from ownership to access in transport must be further stimulated. For cities, automated transport in large scale only makes sense if it is part of a shared mobility system. The fees tested in the pilot could be used to favour shared solutions, including wide scale ridesharing.
- The cultural shift away from private car ownership is a formidable one, and the political pressure and resistance from the car industry and various interest groups must not be underestimated.
- The experience with micromobility so far indicates that when motorized transport alternatives becomes widely available and affordable, walking and cycling may suffer. Active transport modes need to be supported and prioritized.

Contact

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www.art-forum.eu

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More on the MDS standard:
www.openmobilityfoundation.org

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