



BMVI-Workshop series “Data Innovations for Smart Mobility in Europe”

Workshop No. 4: Data use for planning and operations in logistics – improving efficiency and reducing emissions

Date: Wednesday, 22 September 2021

Location: Virtual Room (Zoom)

Time: 09.30 – 12.00 h (CET)

Summary

Logistics play a key role in our modern world. Ensuring a timely and efficient transport of goods and people is key in all sectors of our society. The covid-19 pandemic, the increase of e-commerce practices and steadily increasing CO₂ emissions in the transport sector have placed logistics in the center of our attention in recent years. In order to properly deal with these challenges, innovations are necessary, and the use of data is of utmost importance for optimising logistics planning and operations. Therefore, the fourth workshop of the BMVI Workshop Series “Data Innovations for Smart Mobility in Europe” was dedicated to the use of data for planning and operations in the logistics sector to improve efficiency and reduce emissions.

Thematic overview

Christian Schlosser, head of division Data Innovations, Grant Initiatives (DG21) of the German Federal Ministry of Transport and Digital Infrastructure (BMVI) opened the workshop with words of welcome, a short introduction to the programme mFUND and information about the event. Next, Andreas Nettsträter from the European Technology Platform ALICE presented an excellent overview of the platform’s roadmap outlining a path towards zero emissions logistics by 2050 and its views on the importance of collaboration and data sharing as enabler to achieve sustainable and zero emissions logistics.

Innovative solutions

The thematic overview set the stage for the presentations of projects dealing with several aspects of logistics in different modes and how data use can improve planning and operations.

Artificial intelligence contributing to logistics

Project SchleusenNOK40 was the first project to be presented in this session, and its consortium was represented by Armin Wolf (IT4Energy-Zentrum). The main objective of SchleusenNOK40 is the development of an improved lock management system along the Kiel Canal allowing for better planning and a reduction of the waiting time for ships. Two main



types of data are required for the planning of operation: “static” data on the lock infrastructure and “situational” data on the current status of and situation in the locks. The static data has already been compiled and will be made available to the project partners. The project is now concentrating on the collection of situational data. First project results show how crucial accurate estimations of the amount of time necessary for vessels to enter and exit the lock chambers are for a realistic and reliable management of lock operations (i.e. scheduling).

Konstantinos Louzis (School of Naval Architecture and Marine Engineering - National Technical University of Athens) presented the goals and some achievements of MOSES, a project about automated vessels and supply chain optimisation for sustainable short sea shipping funded within the programme Horizon 2020. In order to facilitate a modal shift to short sea shipping, MOSES addresses challenges such as the fact that existing feeders cannot be served by small ports and the lack of incentive for carriers to choose maritime transport over road and rail. To overcome these barriers, MOSES is making use of multidisciplinary horizontal collaboration and interaction between key stakeholders within the maritime supply chain for the deployment of multiple data-producing devices that will contribute to the development of logistics applications and an automated, interconnected, multimodal transportation system.

KITE, a project funded by the programme mFUND, was presented by Maximilian Schmahl (Schmahl & Stoepel Spedition). KITE focuses on the use of artificial intelligence to reduce CO₂ emissions by reducing empty running by trucks. According to the calculations of the project partners, reducing empty runs by 10% could alone lead to a reduction of CO₂ emissions amounting to approximately 6% of the yearly reduction target of the German Federal Government. By combining time series analysis and optimisation, artificial intelligence can be used for network and scheduling improvements that lead to maximizing loads and a decrease in empty runs.

Data collection and application for resilient and cleaner logistics

The project SEAPeople, presented by Diego Piedra-Garcia (JAKOTA Cruise Systems), aims at developing an application which determines the number and spatial distribution of people at sea worldwide irrespective of the ship type. With this application, authorities will have a tool for dealing more effectively with evacuations in crisis situations as well as for planning infrastructure and logistic chains.

Dimitri Laureys (Port of Antwerp) presented the Horizon 2020 project ePIcenter. Among its several goals, ePIcenter intends to reduce greenhouse gases emissions, logistics costs, meet increasing customer demands, improve the ability to deal with unexpected events, progress towards the concept of the Physical Internet and reduce the negative impact of shipping on



whale populations. In this complex project, the consortium is developing and testing AI driven logistic software solutions, new transport technologies and supporting methodologies to increase the efficiency of global supply chains and reduce their environmental impact.

The project SmartRadL intends to make real-time tour planning for cargo bike transport a reality. Steffen Bengel (University of Stuttgart - Institute for Ergonomics and Technology Management) explained that currently, cargo bikes are faced with several hindrances on the streets, such as construction sites, bollards, random obstacles, narrow streets, the absence of bike paths and generally poor road conditions. In order to choose an appropriate route, real-time information needs to be available and easily accessible. The consortium is working on an integrated software application for intelligent route and order management for inner-city cargo bike traffic.

Katharina Hentschel (Smart City System) presented a system for capturing the real-time occupancy of truck parking spaces. The real-time occupancy can be visualized on LED displays or digitally to efficiently guide traffic, e.g. to and from waiting areas or loading/unloading areas or gates. Ms. Hentschel explained that these systems can be easily installed in all sorts of areas, as they are powered by solar energy and do not need extra infrastructure.

Discussion and wrap up

During the discussion, speakers and other participants posed specific questions to the presenters concerning the collection and use of data. Furthermore, the use of concepts developed for the different modes of transport and the possibility of upscaling was discussed. One of the topics most discussed was the availability of data and on how to fill in knowledge gaps. Some of the projects presented in this workshop facilitate the collection of missing data while they are running; however, solutions must be sought to ensure the availability of and access to this data beyond the duration of the project. The importance of collaboration between stakeholders was stressed by almost all projects, especially concerning data sharing challenges. Business models can be protected if shared data sets are essential and restrict to specific innovations, but data governance models to ensure this protection are lacking. Here, several models are being tested and transparency and trust seem to lead to the best results.