Capacity with a pOsitive enviRonmEntal and societAL footprInt: portS in the future era

D.2.5: Cargo flow Optimiser

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Executive Summary

Funded under the European Union's Horizon2020 Framework Programme, the aim of COREALIS is to develop a strategic, innovative framework, supported by disruptive technologies, including Internet of Things (IoT), data analytics, next generation traffic management and emerging 5G networks, for cargo ports to handle upcoming and future capacity, traffic, efficiency and environmental challenges. Within this framework, the proposed beyond state-of-the-art innovations, target to increase efficiency and optimize land use, while being financially viable, respecting circular economy principles, and being of service to the urban environment.

This report presents the technical description of the final version of the Cargo Flow Optimiser solution which results from an iterative process of progressive improvements in joint collaboration with Task 5.4 Port of Antwerp LL. The Cargo Flow Optimiser pursues the smart organization of containers placed on a port's terminal with different destinations and modes of transport. It helps in the reduction of storage time at ports and increases the percentage of use of more sustainable transport modes, by using real time data sharing and rail/barge data for cargo bundling and consolidation.

The solution is divided into two independent modules, the first module is the Multimodal Inland Planner and its main aim is to give a complete overview of the most efficient connections from Port of Antwerp to its hinterland by rail, barge or truck. It calculates the optimal door-to-door container routes between two points, determining the optimal one in terms of estimated duration, price and CO_2 emissions.

The second module is the Cargo Flow Prediction and it predicts the traffic of containers going from Port of Antwerp to different European destinations. A forecasting algorithm has been developed that can predict flow of containers, the destination and the mode of transport by means of historical and real-time data.