Efficiency with Simulation

Mapping, Designing and Optimizing Processes in Ports, Terminals and in Transport

Designing and Optimizing Processes in Maritime Logistics Through Simulation

With simulation and optimisation, you can secure your investment decisions, find optimisation potential in existing systems or coordinate the commissioning of new facilities with your overall system.

We carry out optimisation projects for you on the basis of simulations on various issues in the port sector, such as:

- Logistics Processes in Terminals
- Traffic Flows in Ports
  and on factory premises
  (Road, Water, Rail)

Our simulation studies are characterised by their high quality, which we achieve by bringing in our many years of expertise from working with port infrastructure companies and terminal operators.

Our know-how in maritime logistics, terminal operations and port processes enables us to interpret the simulation results in the context of the operational challenges and to develop recommendations for action based on your questions.

Simulation Programs

The Fraunhofer CML works with state-of-the-art simulation programs that can be used, for example, to simulate small-scale traffic systems. It is thus suitable for mapping and analysing road traffic such as truck traffic at terminals.

Another application benefits from a generic structure of the simulation modules. This allows both global logistics chains and complex and small-scale processes to be mapped and analyzed in a very confined space.

Likewise, the programming interface allows company-specific features or historically developed structures to be taken into account without further ado.
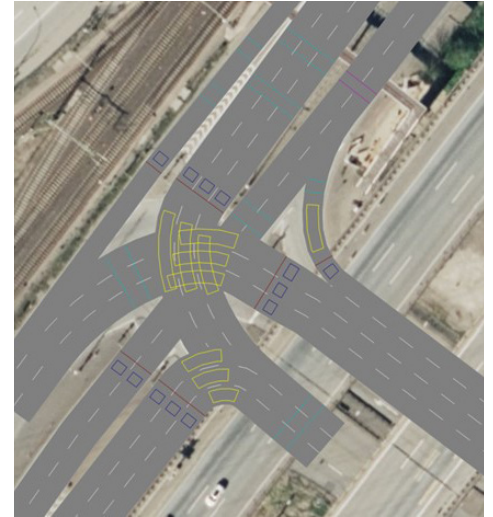
Simulation Studies

With regard to logistics, simulation studies on the behaviour of global supply chains are implemented as well as for the simulation of classic logistics and production processes (transport processes, handling processes, storage processes and production processes indi-vidually, but also in the system).

This enables us, for example, to examine logistics processes in unit-goods terminals or space restructuring measures. In our simulation studies, we work with you to define a variety of key performance indicators for the simulation model, which we use to evaluate the measures under investigation.

This provides you with a sound basis for deciding on optimisation measures to be implemented.

Planning of truck waiting areas by means of simulation
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Simulation Project Procedure

This example of a simulation study is based on the thesis that autonomously driving trucks contribute to a reduction in throughput time in terminals. For a structured and goal-oriented implementation, the simulation study is based on VDI guideline 3633. According to this guideline, the terminal and its system boundaries are first recorded and a target system is defined for evaluation. Then the model is mapped in the simulation software. Data is continuously obtained and processed, and quality is ensured through verification and validation. This is followed by the execution of the simulation experiments and the analysis of their results. One possible result would be the confirmation of the established thesis: the simulation shows that autonomous trucks contribute to a reduction in throughput time. However, in order to be able to leverage this efficiency potential, organisational measures must be implemented. These can be found in the recommendations for action.

AP 1: System analysis and concept model

AP 2: Model formalisation and implementation

AP 5: Data procurement and preparation

AP 6: Verification and validation of the data and of the simulation model

AP 3: Carrying out simulation and result analysis

AP 4: Discussion of results and recommendations

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