

optihubs

Optimierung logistischer Prozesse an multimodalen Knoten für wasserstraßenaffine Gütersegmente am Fallbeispiel des Hafens Wien

Ein Projekt finanziert im Rahmen der 3. Ausschreibung
des Programms **Mobilität der Zukunft**
[*Gütermobilität*]

Kontaktdaten:

**Technische Universität Wien,
Fachbereich Verkehrssystemplanung**
Erzherzog-Johann-Platz 1/E2805
1040 Wien
(Projektleitung)



**Fachhochschule des bfi Wien
Gesellschaft m.b.H.**
Wohlmutterstraße 22
1020 Wien



nast consulting ZT GmbH
Lindengasse 38
1070 Wien



TINA International GmbH
Liechtensteinstraße 12/10
1090 Wien



Wiener Hafen GmbH & Co KG
Seitenhafenstraße 15
1023 Wien



Problem and objectives

A coordinated development of multimodal hubs regarding space, traffic and organisation is a very delicate and sensitive task. Due to the variety and wide range of logistical processes as well as local conditions (traffic connections, settlement structure, economic structure etc.) customised innovative solutions are required.

Optihubs develops an innovative and standardised model system for process optimisation at the level of individual loading units and vehicles, which can simulate and analyse process sequences of logistical, operational and administrative types at any multimodal hub. The development and test application of the optimisation system is carried out by means of a case study of the Port of Vienna. It focuses on effects (infrastructure congestions, mutual obstructions etc.) resulting from the overlapping of formerly isolated processes (for example a sequence of processes within a sector/terminal etc.) including their spatial and temporal context. Special consideration is given to operational and overall economic aspects (environmental protection, welfare goals etc.) as well as the embedding of processes of water way affine classes of goods in terms of space, traffic and organisation. Consequently, new potentials for the use of the Danube waterway capacity can be identified.

Simulation model

The key element of process optimisation is a simulation model. For this purpose, standardised procedures for mapping local terminal conditions (such as traffic organisation, land use etc.) and process flows are defined. By means of process handling parameters which are first defined in the course of the project development phase (incoming orders, loading units, priorities for order processing etc.) existing dependencies and spatial-temporal requirements (time slots, infrastructures etc.) can be imported into the simulation model. While the observation of traffic streams and source and target relationships is possible at macroscopic level, the mapping of small-scale terminal processes (guidance of individual vehicles, waiting times for handling etc.) can be carried out on a microscopic level.

For an efficient supply chain – taking the test application at the Port of Vienna into account – different process operations (traffic movements with different cargo handling equipment, disturbances in access roads etc.) are simulated under existing spatial circumstances in a first step. Due to the ongoing localisation of the vehicles and loading units and the determination of the temporal activities the simulation model calculates pre-defined performance indicators (movement times, waiting times, number of strokes etc.) which enable deducible perfor-

mance statements (capacity of infrastructure or suprastructure, personnel requirement), bottlenecks and other problems. Then, on the basis of the problems identified by the initial simulation, customised solutions are developed. In a second step proposed solutions are considered individually or bundled by means of additional simulations and visualisations (see Abb. 1). On the basis of the indicators calculated by the simulation model as well as the comparison of the inventory and variant simulation, the suitability of one or several measures for problem solutions can be assessed and the occurrence of potential consequences (positive as well as negative) can be investigated and finally evaluated from a business and overall economic perspective.

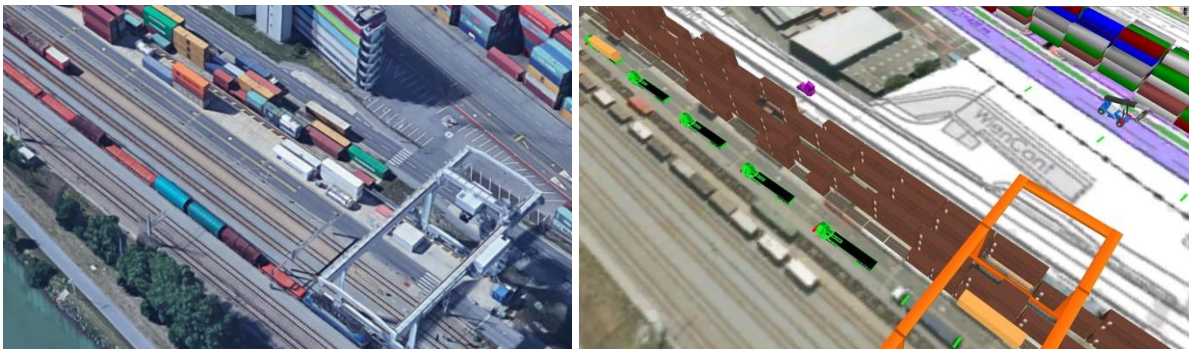


Abb. 1: Comparison of a simulated detailed situation with the real situation

Future applications of simulation model

The simulation model is suitable for the assessment of planning alternatives whose effects on terminal processes can be rated for selection of suitable optimisation measures. The following applications can be indicated exemplarily:

- Effects of the use of different/specialised handling equipment to ensure flexibility and capacity increase (reduction of handling and waiting times etc.)
- Estimation of the potential for a change in use of different areas and its corresponding advantages and disadvantages
- Standardised process integration of waterside handlings including assessment of the process-oriented effects of increased use of waterside handlings
- Identification of suitable areas for terminal expansion
- Impact of various land reclamation measures
- Spatial rearrangements and/or measures for the interlocking of process operations