

# Rail and transshipment processes simulation for hinterland logistics centre

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From March to June 2009, an innovative project was successfully carried out by DB International with DB Schenker's Turkish joint venture partner ARKAS, one of the largest private logistics and transport companies in Turkey, on the design for a multimodal logistics centre with railway sidings, in the hinterland of Istanbul.

Among others, ARKAS owns 27 container ships and operates several Turkish ports. Furthermore, ARKAS also has a subsidiary AR-GÜ, which is one of the first private railway undertakings in Turkey, owning more than 500 wagons. As part of the process to liberalise the railways in Turkey, AR-GÜ is applying for an operator licence on the country's existing rail-way network.

Indeed, it appears that railway operations in Turkey will be assuming an increasingly significant role in the near future. The state railway TCDD is pursuing major plans to upgrade the passenger and freight transport network with corresponding invitations to tender taking place for the infrastructure projects. This also includes the development of multimodal logistics platforms, including railway sidings, such as the project initiated by ARKAS.

Together with the country's major, growing economy and population of 72 million people, who seem to have been less severely affected by the current economic crisis thanks to previous restructuring of the banking landscape, Turkey also has a principle geographic role to play as the link between Asia and Europe. These, therefore, constitute excellent economic and logistics prerequisites for upgrading the country's logistics infrastructures and linking them up to the national and international transport networks.

And so the development of the logistics centre, with the involvement of DB International's logistics team on behalf of ARKAS, is right in line with current trends.

The task in hand consisted of defining the interfaces between the planned warehouse and transshipment structure on the one hand, and the railway operations on the other. The project therefore focused on:

- Ensuring that the logistics centre would be able to cope with the predicted storage and transport volumes with capacity for 300,000 TEU (twenty-foot equivalent unit/standard containers)
- Warranting cost efficient railway operation and minimising necessary investment while offering scope for modular, gradual expansion of capacity

While many of the general conditions involved in creating logistics centres will be similar, the future logistics centre did in fact offer a special challenge: the railway siding consists of a six kilometre single track feeder connection from the main railway line. This results from land ownership issues and the topographic situation with the line passing through a neighbouring mountain range.



Multimodal logistics centre with railway sidings – Located in the hinterland of Istanbul, Turkey.

At first, there were justified doubts regarding the economic efficiency of the logistics centre, particularly as ARKAS wanted to use a shunting locomotive to serve the logistics centre. At the same time, it was necessary to ensure that the installed crane and track infrastructure was dimensioned adequately to cope with the transshipment volumes of containers. In concrete terms, it was a case of finding the ideal combination of cranes and tracks and how to link these together.

In this way, what was originally a fairly simple task evolved into a complex multivariable challenge that could scarcely be solved by a 'manual' approach. The DB International project team used the Promodel simulation software, taking vectorised infrastructure data for realistic analysis of various scenarios for the operational concept. The findings, obtained in this way, were a great help both in dimensioning the logistics centre and in the customer's subsequent decision-making processes, which were:

- Only a shunting locomotive can be used for bringing wagons and operating the logistics centre
- Low-cost installation of a small '2x2' crane/track module (2 cranes over 2 tracks) will adequately cover the capacity required in the initial phase of the logistics centre
- A second 2x2 module can be added as the need arises to increase the installed capacity in a second phase

The modular concept would seem an appropriate approach in investment terms, using the capacity of one module initial with optional upgrading of the infrastructure for a further transshipment module. In this way, the customer can avoid having to invest an extortionate amount during the start-up phase.

## ABOUT THE COMPANY

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