

Synthesis-rapport of the project LAMBIT (Location Analysis for Belgian Intermodal Terminals)

Introduction

Intermodal transport is freight transportation where several transport modes (road, rail, water) are combined and integrated in order to provide a user-friendly door-to-door service which can compete with unimodal road transportation. De potential advantages for the community of intermodal transport are important : a reduction of the congestion on the roads and more environment-friendly transport. The last ten years the intermodal transportation market has seen a spectacular growth. The increase was however was hardly higher than the strong growth of the transportation market as a whole. With other words, no substantial modal shift arose in favour of intermodal transport.

The LAMBIT-project, in the framework of the program “sustainable mobility”, has as goal to first get a view of the Belgian intermodal transportation market and second to provide policy instruments to stimulate this transportation market.

To obtain this goals three successive parts were finished, namely the LAMBIT-database, the LAMBIT-survey and the LAMBIT-evaluation tool.

The first part consists in the development of a database of intermodal terminals ([section 1](#)).

The second part of the study consisted in identifying the bottlenecks for a further growth of the intermodal transportsector and proposing the possible solutions for these problems ([section 2](#)).

A third big part consisted in the development of a model for the evaluation of new intermodal terminals. The pursuing of a consistent location policy by the government for the location of the intermodal terminals are one of the fulcrums of the stimulation of the intermodal transportsector. This settlement policy has to, from one side, to stimulate the settlement of new intermodal terminals as the accessibility (and as such the price) will improve . From the other side, a proliferation of terminals will decrease the rentability and will as such affect the liveability on the longer term of the terminals. A model to support the objective evaluation of the policymaker was developed ([section 3](#)).

1. Part 1 : The LAMBIT-database

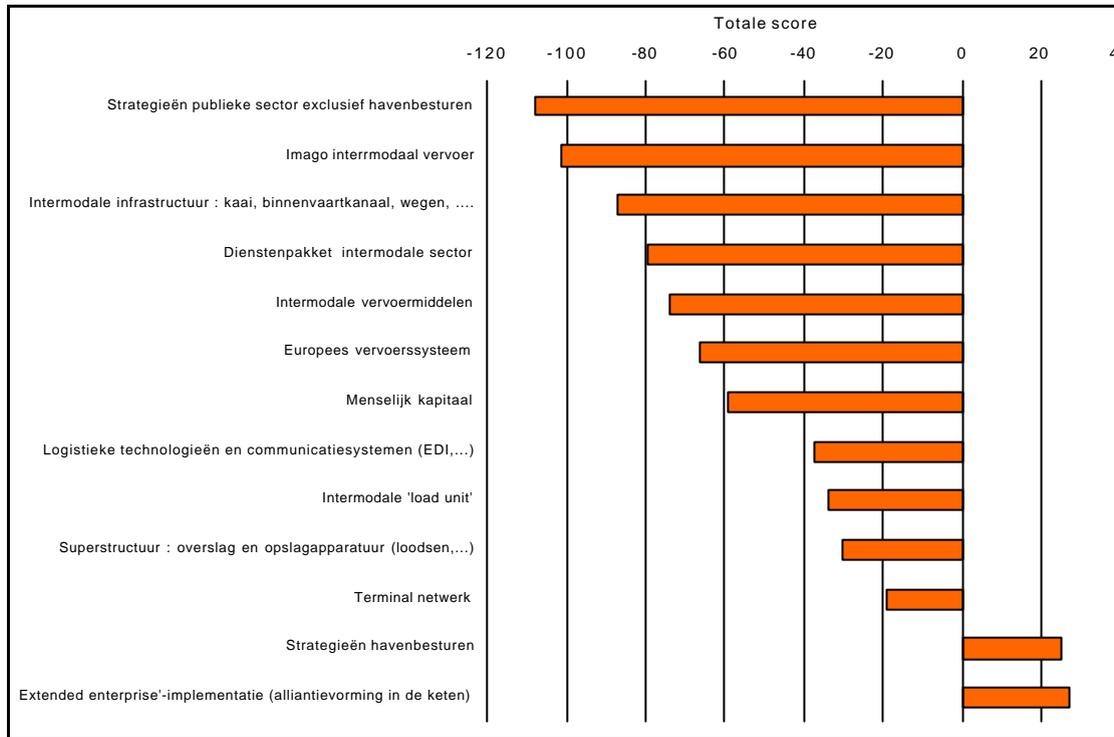
The LAMBIT-database makes it possible to retrieve easily the most important data on the intermodal terminals in Belgium. The most important goal to develop the database was to get a good view on the Belgian intermodal landscape. Twenty-five intermodal terminals were mapped and some fifth-teen new initiatives were traced. The structure and the organisation of the intermodal transportsector were studied. Especially the existing and the planned Belgian terminals and the networks that are connecting them were discussed.

2. Part 2 : The LAMBIT-survey

A survey with in-depth interviews was executed under the actors of intermodal transport : shippers, transporters, terminaloperators, shipping companies, forwarding agencies, portauthorities, national and regional governments and the European Union in order to identify the bottlenecks to hamper a further growth of the sector. Around 50 respondents were reached.

The interviewee gave a score from -2 to +2 as he judged the specific aspect as a strong bottleneck for intermodal transport against road transportation (-2) or a strong competitive advantage (+2). More moderate scores were given when it consisted of less extreme differences : -1 for a bottleneck, 0 for neutrality and +1 for a moderate competitive advantage. The analysis of the sum of the scores that were given to the different aspects (infrastructure, superstructure,...) by all the interviewees (Figure 1) provides some interesting conclusions.

Figure 1: Total of scores given by the experts

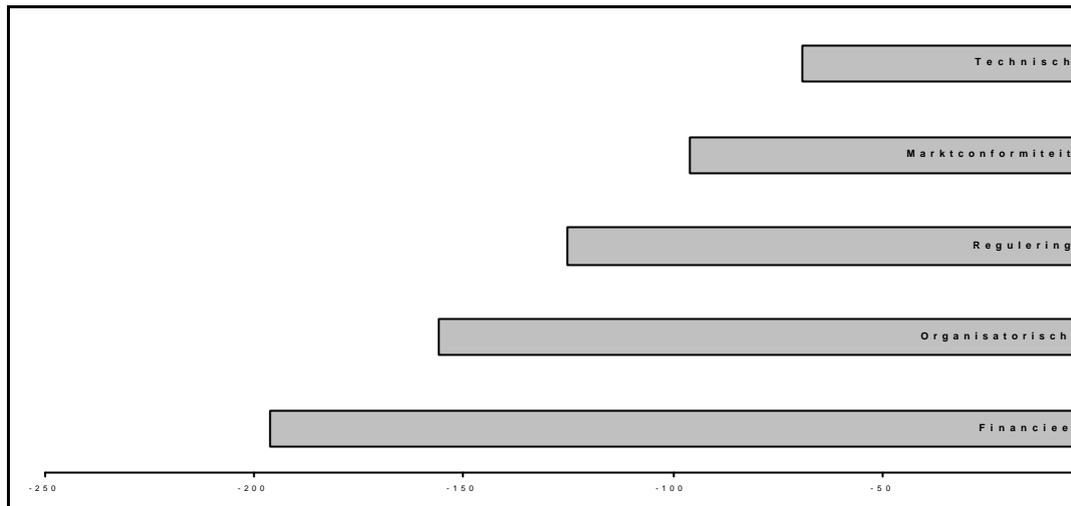


Source : C. Macharis en A. Verbeke, 1999

In the first place it can be concluded that the biggest bottlenecks are situated at the strategies of the public sector (European, Federal and Flemish government). The economic actors that were interviewed were not satisfied with the policy that was executed until now. This conclusion has to be softened for the European policy as here some positive reactions were formulated. A second big bottleneck is the image of intermodal transport : this would be bad for the forwarding companies that have not tried this mode already and it also closely related to the bad image of rail transportation. The intermodal infrastructure (quay, canals, rails, ...) makes it on technical and financial sphere difficult to organise intermodal transport in an efficient way. Road transport, for which the infrastructure already is provided has here a very big costadvantage.

Two aspects were also judged quite positive (this does not mean that they only got positive scores but that in total more positive scores were attributed than positive ones), namely the strategy of the portauthorities and the extended enterprise implementation. The portauthorities are taking or are supporting appreciated initiatives to stimulate intermodal transport. This is, in view of the absolute necessity of good hinterland connections for a further growth of the ports, an economic rational strategy. With extended enterprise implementation we mean the systematic creation of alliances between separated actors in the chain. This strategy, which aims at a amelioration of the chaincontrole, is positive experienced by the actors.

Figure 2 : Division of de total scores of the intermodal bottlenecks through components on technical, financial, organisational, regulation en market conform level



Source : C. Macharis en A. Verbeke, 1999

When the global result is split up in scores on technical, financial, organisational, regulatory and market conform level [Figure 2](#)) we come to the conclusion that the experts that were interviewed the bottlenecks mostly on the financial level situates. This is due to the very competitive road transportmarket (were the prices are very low due to heavy competition) and the more heavy fixed costs for intermodal transport against road transport but explains the cry of distress from the sector towards the government. Also the organisational aspect of intermodal transport would create heavy bottlenecks. This last issue can come from for example shortages on the level of load units or the transportation means, what causes problems in the organisation. Regulation come on the third place, followed by the market conformity. With market conformity we mean to anticipate on the preferences of the final end user. On technical side, we see -paradoxical enough-the less bottlenecks, what does not mean there are none.

In [Figure 3](#) the thirty identified specific bottlenecks and possible solutions are displayed in a synthetic way.

Also the way in which the Flemish government can play a role in the possible solution of a bottleneck, namely as the initiative-taker, katalysator or facilitator is described. The role of facilitator can be important if the EU-regulation has to be implemented or if the private sector has to play the biggest role. The role of katalysator can be seen very broad : this can go from bringing together the involved parties till giving a restricted amount of money to finance the start-up costs.

Figure 3 : Synthesis bottlenecks

Bottlenecks on the level of the infrastructure	Possible solutions	Role of the Flemish government		
		Initiative taker	Katalisator	Facilitator
1. Terminals				
Expensive infrastructure, indistinctness on the financing of it	Government support for intermodal infrastructure, taking into account the possible distortion of competition		X	
maximal capacity reached in certain Flemish terminals (esp. in the port of Antwerp)	1° building of main hub (IFB) 2° Construction of Scheldekade West that will give place for the construction of new container terminals	2		1
Congestion on the gates of the terminals for which the maximum capacity utilisation is reached	Adaptations on the terminals		X	
2. Rail				
Congestion at the morning station Antwerpen-Noord and retarding of the rail traffic in the port	1° Building main hub 2° Second rail access to the port		2	1
Maximal capacity utilisation of some lines	1° better utilisation of the existing capacity 2° increase of the priority of freight against person transport 3° Start up of studies to construct second rail tracks for some lines		2-3	1
3. Inland waterways				
Bottlenecks on certain canals for which the passage has been hampered	1° Seine-Schelde project 2° Further amelioration of the inland waterways	X		
Certain infrastructure blockages (bridges)	Adaptation of the infrastructure in function of the economic optimal fleet structure		X	
Inland waterway connections for the port of Zeebrugge	Noorderkanaal, floating lock, adaptation of the existing canal	X		
Restricted working of the locks	24-hours working	X		
Administrative nuisance caused by the port- and canal dues	Vignette or a yearly subscription		X	
Bottlenecks on the level of the superstructure	Possible solutions	Initiative taker	Katalisator	Facilitator
Expensive superstructure	Government support for intermodal superstructure taking into account the possible distortion of competition		X	
Higher cost in the ports for containers that have to be transhipped to the inland waterway	Reduction of the tariffs for handling for a container that arrives or departs from the port (for example 400 à 500 BEF)			X
Bottlenecks on the level of the intermodal transport means	Possible solutions	Initiative taker	Katalisator	Facilitator
1. Rail				
Shortages of wagons and locomotives	Establishment of a pool of wagons and locomotives for specific goals		X	
Locomotives : not enough tractive power	Purchasing new locomotives for freight transport		X	
Locomotive switch necessary at the country border and at the terminals	Purchase of locomotives with gas turbines or multi-tension locomotives or diesel traction		X	
2. Inland waterways				
old fleet : not adapted to intermodal transport	Abolition of "toerbeurtsysteem" (rotationsystem) in the inland waterways, government support, interesting fiscal regime for investments, once only demolition regulation, stimulation of clustering		X	
Sunday and night bans	Relaxation of the regulation		X	

Source : Macharis en Verbeke, 1999

A detailed description of the bottlenecks and the possible solutions are discussed in the recently published book:

Macharis, C. en Verbeke, A., 1999, *Intermodaal vervoer. Economische en strategische aspecten van het intermodaal vervoer in Vlaanderen*, Garant, Leuven, p. 210.

3. Part 3 : The LAMBIT-evaluation model

Figure 4 gives an overview of the LAMBIT-method.

The LAMBIT-method allows for a comparative evaluation of a set of terminal projects and to compare these projects with the characteristics of the existing terminals. In this way the strong and weak points of the terminals are highlighted and the policy-maker can judge in an objective way.

In the preliminary phase, a discrete set of possible terminals must be selected. Two possible situations can occur:

- (A) The private and/or public sector already proposes several new possible projects;
- (B) The possible locations still have to be identified.

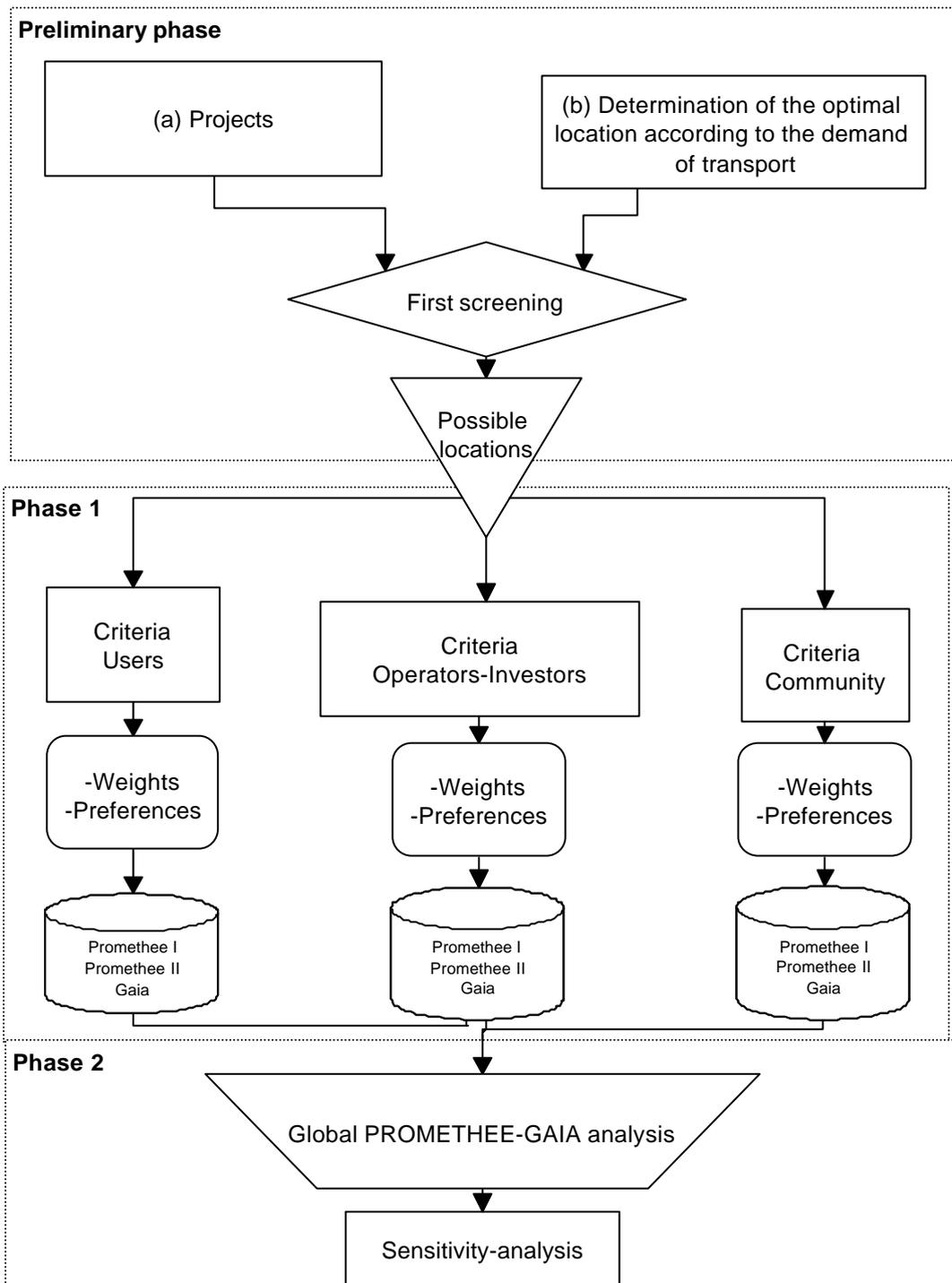
In the latter case one can use a location model based on the maximisation of the potential demand to generate possible locations for the terminal. The results of this location model can also be used in the evaluation model of the next phase.

In any case, the proposed terminals will have to be screened according to some standards (large enough for an intermodal terminal, allowances by the local district, ability to get permissions, etc.).

- The retained locations will then be evaluated in phase 1 on several criteria. These criteria represent the aims of the actors involved, namely the users of the terminal, the operators/investors and the community as a whole. One of the criteria can include the results of the location-analysis executed in the preliminary phase. For each group of actors, a multi-criteria analysis (MCDA) will be performed. The PROMETHEE-method (Brans, 1982; Brans and Mareschal, 1994; Macharis et al., 1998) is followed here. The associated software (Decision Lab by Visual Decision, 1999) is adapted to provide a specific LAMBIT-software.
- The results of the multi-actor analysis are brought together in phase 2 where a global ranking of the projects is obtained. A sensitivity analysis can be performed at the end of this process.

Note that the location model of the preliminary phase and the MCDA-model from the first and second phase can be used as stand alone models. The location model of the preliminary phase is particularly interesting for the investor/operator for which the potential demand is the most important decision variable.

Figure 1: Overview of the methodology



Source : C. Macharis

The method was successfully implemented for the evaluation of the terminal projects Roeselare en Wielsbeke for the Flemish government. The results that can be obtained by the method are described in

:

Macharis, C. en A. Verbeke, 1999, "Een multicriteria-analyse methode voor de evaluatie van intermodale terminals", *Tijdschrift Vervoerswetenschap*, nr. 4, pp. 323-341.

Macharis, C. en A. Verbeke, 1999, "The optimal location of intermodal terminals", Nectar conference, Delft.