

# **BRIDGING THE GAP BETWEEN KNOWLEDGE CREATION AND PRACTICAL IMPLEMENTATION IN MULTIMODAL TRANSPORT – VIL AS MATCH MAKER**

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## **Abstract (Dutch)**

De brug slaan tussen kenniscreatie en praktische implementatie in multimodaal achterlandvervoer. De brug slaan tussen theorie en praktijk vormt steeds een grote uitdaging. Het Vlaams Instituut voor de Logistiek (VIL) heeft deze missie op het vlak van logistiek. Het VIL wil de logistieke sector in Vlaanderen duurzaam ondersteunen en versterken in haar competitiviteit. Het wil een platform zijn met concrete antwoorden op relevante logistieke vraagstukken. Zo wil het VIL de brugfunctie vervullen tussen enerzijds de kennis die gecreëerd wordt aan de traditionele kennisinstellingen, zoals universiteiten of hogescholen, en anderzijds de concrete problematiek die zich stelt in het werkveld. Het VIL wil uitgroeien tot een centrum dat logistieke kennis opbouwt, verzamelt en verspreidt. Het innoveert en moedigt innovatie aan. Het stuwt de promotie van de Vlaamse logistiek en van de logistiek in Vlaanderen. Het VIL is voortdurend op zoek naar instrumenten om theorie te vertalen naar de praktijk. Dat kan via een toegankelijk rapport (VIL-Series), een handleiding (bvb. om de meest geschikte modal split te achterhalen), een stappenplan (bvb. om een samenwerking onder logistieke dienstverleners op te zetten),... maar ook via best practices. Via verspreiding van deze testimonials kunnen logistieke actoren warm gemaakt worden voor bepaalde logistieke concepten. Zo kan bijvoorbeeld een multimodale ontsluiting van een haven gepromoot worden. Er wordt een kloof waargenomen tussen vraag en aanbod in de vervoermarkt. Een afstemming tussen vraag en aanbod is nodig voor een goed afgewogen modaliteitskeuze. Verladers nemen nog te vaak beslissingen op basis van een incompleet of gekleurd beeld van de beschikbare dienstverlening van de verschillende modaliteiten. Daarnaast hebben vervoerders en transportoperatoren te weinig voeling met de verzuchtingen van de verladende sector. In de paper wordt ingegaan op de methodiek die het VIL hanteert om de brug te slaan tussen vaak uit elkaar gegroeide werkvelden.

## **Abstract (English)**

The Flanders Institute for Logistics (VIL) is continuously searching for opportunities to bring together the various logistics actors. The main role of the VIL is often the one of match-maker. A match should be made between transport demand and supply, between users and providers of transport. Knowledge and experience about the different transport modes has to be distributed towards potential users. Transport providers, on their side, should be given insight in the shippers' requirements. Through best practices and a manual elaborated in the field of multimodal transport one supports this matching goal. A match should also be looked for between on one hand the ports with their maritime activities (i.e. loading and unloading sea vessels) and on the other hand customers in the hinterland searching for appropriate connections with the ports. Several improvements can be worked on. Often one of the most critical success factors seems to be the ability to bring together the right players. The VIL, as a neutral party, has often a facilitating or coordinating role in collaboration projects. Finally one should match the academicians with the practitioners. There often seems to be a knowledge gap between these two different worlds. The Flanders Institute for Logistics (VIL) has the mission to develop and to apply several tools in order to bridge these various gaps.

## **Introduction**

The Flanders Institute for Logistics (VIL) started in May 2003 and was an initiative of a few logistics service providers with financial support from the Flemish government. It immediately filled a gap.

Flanders takes a prominent place in the logistics environment of Europe. That position is gained by this region through its prime location, dense and integrated multimodal transport infrastructure and its well trained, multilingual and productive employees. Foreign investors discover in Flanders an ideal location for a European Distribution Centre, as is confirmed by the European Distribution Report of Cushman & Wakefield Healey & Baker (2004).

Since the above-mentioned advantages are of a temporary nature and in order to maintain and improve its position, the logistics sector in Flanders has to innovate continuously. Moreover, sufficient attention has to be given to value added activities and innovative concepts and technologies that can anchor and further strengthen the logistics future of Flanders. Creating, spreading and encouraging innovation for logistics belongs to the main task of the Flanders Institute for Logistics (VIL).

The logistics sector in Flanders has to fulfil an important role in the global, fast changing logistics market. This means that Flanders needs to have a platform to permanently unite the three interested parties involved, namely the companies in the logistics sector, the Flemish institutions of knowledge (e.g. universities) and the Flemish government. The intense cooperation between companies with logistics activities, researchers and experts, and the government, is the best guarantee to realise continuous improvement in the Flemish logistics sector, partially through technological and conceptual innovation, in order to develop Flanders as the 'logistics region of excellence' in Europe. To materialise this cooperation and as a consequence to bridge the gap between the different logistics actors, the VIL has a task as knowledge base. It has to formulate specific answers to relevant questions and issues in the Flemish logistics sector.

In this paper first the research methodology of the VIL is explained. The different knowledge pillars and research levels are presented. Further the paper focuses on multimodal transport and its challenges. Looking for appropriate tools in order to match supply and demand in transport is one of these challenges. Another is matching the port community with the logistics actors in the port hinterland through efficient hinterland connections. Finally some promising innovative concepts are presented and the role of the VIL here in.

## **Research methodology**

Knowledge development of the VIL is structured in two dimensions. In the first dimension there are four pillars, that make a first division of the various research projects. Of these four pillars there are three knowledge pillars (Multimodal Transport, Value added concepts and Technologies, Partnerships) and one supporting pillar (Benchmarking of Flanders). In the pillar 'Benchmarking of Flanders' projects are set up to map logistics in Flanders quantitatively and qualitatively. For projects developed within the knowledge pillars, knowledge creation is the main goal as well as the support of the competitiveness of the logistics sector.

Within each of these knowledge pillars projects are set up when they meet predefined criteria such as the magnitude of the user basis, the innovative character and the support and interest from the sector. In this topic selection, criteria such as the clear identification of the target

group, the contribution to the competitive position in Flanders and the strengthening of the image of logistics in Flanders are taken into consideration.

These projects can, in a second dimension, be divided according to research level. We can identify four types of projects:

1. Feasibility studies
2. Strategic projects
3. Pilot-projects in cooperation with companies
4. Contract research

### ***Feasibility studies***

A feasibility study (<http://www.vil.be/en/standvzaken.htm>) is the first introduction to a topic. It describes a current status of research and practice of this chosen topic. Different players, expertise and relevant work on this topic is mapped. Bottlenecks, opportunities and solid cases are listed. Existing patents and licences are verified. The throughput time of such study is generally four to six months. The findings of a feasibility study are collected and presented to the VIL members, with whom feedback sessions are organised.

With the feedback of the sector it is then decided if a strategic project is initiated. A feasibility study will always result in a publication, in most cases a VIL-series.

### ***Strategic project***

A strategic project (<http://www.vil.be/en/strategischewg.htm>) aims at an in-depth study of a (niche of) a research topic and the start-up of innovative knowledge in this domain. The taskforce, of which the project period can last up to 12 months and more, is divided into phases and presented to a steering committee. This steering committee, assembled from academic experts and logistics players, acts as a soundboard that follows up and steers the course of a project. The project is rounded up with an actual realisation in which the new concepts are applied.

### ***Pilot-projects in cooperation with companies***

Generic knowledge is developed within a strategic project. This knowledge, crystallized in a manual and a step-by-step plan, can be applied by a wide range of companies and industrial sectors. The VIL also wants to be active in a more specific context through counselling companies (clusters) in the practical development of the developed knowledge. In pilot projects the tools developed in strategic projects are used and further validated. Companies are willing to invest (financial) resources in the pilot. Practical results are translated by the VIL into generic lessons relevant for a broader target group.

### ***Contract projects***

A fourth type of project is contract research. This involves collaboration between (a group of) companies and the VIL as partners, whereby each party has input and the results are shared. Important is the social relevance of the project assignment, whereby the neutral and advising position of the VIL is essential. In this contract research the VIL will have a coordinating and

supervising role and specific external expertise will be consolidated and integrated through consultants or knowledge centres. Breakthrough, innovation, neutrality and quality are kept high in these projects. The VIL was already involved in different contract research projects, e.g. BIAC (Airport Zaventem), CEPA (Head office for employers at the harbour of Antwerp) and the Administration of Customs and duties of the FOD Finance.

## **Multimodal transport**

In this paper we focus on the VIL knowledge pillar Multimodal Transport. Often multimodal transport, considering the different modes of transport in transport decisions, is named one of the sustainable solutions for crucial mobility issues. Both public and private actors are looking for solid initiatives and innovations in this domain. The ultimate goal should be to use in an optimal way the available capacities of the transport networks (roads, rails, inland waterways, terminals,...). A well developed multimodal transport system is assessed as the critical success factor for the continuation and expansion of Flanders as logistics top region.

The VIL started mid 2004 with an exploration phase on the domain of multimodal transport. The goal of this exploration phase was mapping the bottlenecks and opportunities in multimodal transport. A modus neutral position is taken. Multimodal has the following meaning to the VIL: on the basis of sufficient knowledge of the various transport modes for the type goods concerned, choosing the most appropriate means of transport. This implies that a solution can be either uni-modal or intermodal.

In August 2004 an information meeting was organised where a wide group of actors was invited. The intent was to check the role of the VIL in this multimodal context. A steering committee for multimodal transport was formed that overlooks this knowledge pillar of the VIL and that is able to offer that feedback useful to validate the created knowledge on multimodal transport.

Via various, well-chosen in-depth interviews with 'prominent witnesses' this exploration phase was conducted.

The exploration phase brought about seven multimodal challenges:

1. Matching demand and supply in transport
2. Working on a fair market –a level playing field- for transport
3. Optimising hinterland connections for the ports
4. Revitalising rail traffic
5. Optimising the use of all available network capacity
6. Total logistics optimisation
7. Analysis of innovative transport concepts

The VIL is determined to follow up these seven themes. In order to guarantee the vigour of the VIL and a structural research approach in this knowledge pillar multimodal transport, one should focus on a limited number of topics. The following three priority projects were chosen:

1. Matching demand and supply in transport
2. Optimising hinterland connections for the ports
3. Analysis of innovative transport concepts

The first two projects are drawn in a generic research project (strategic project). The third one is research in various separate (pilot) projects.

## **Matching tools in the multimodal transport market**

### ***Introduction***

Because of growing congestion problems and environmental and safety concerns in road transport, freight transportation becomes more and more a key issue in logistics in particular and in the whole industrial process in general. Nowadays a large majority of freight flows are going by road haulage. Multimodality is more and more presented as the option to deal with the above-mentioned transport problems. In a multimodal transport context the decision maker is able to consider different transport modes and to eventually choose the most appropriate solution. This can be a uni-modal or an intermodal one. An intermodal journey combines different transport modes with transshipment in between. Shippers often admit they have a lack of knowledge and experience about the different transport modes. On the other hand transport suppliers are not always aware of the specific requirements of the transport user. Often there appears a wide gap between transport demand and supply.

### ***Listing matching opportunities***

An abundance of matching tools are suggested in academic and funded project work environments. The step towards implementation and commercialisation is often either neglected or underestimated. The Flanders Institute for Logistics (VIL) has carried out a thorough analysis of the matching opportunities in the transport market. A clustering exercise resulted in an exhaustive and unambiguous list of matching opportunities, from creating awareness through information providing (e.g. promotion, best practices,...) to supporting decisions by means of various tools (simulation tools, route planners, communication platforms,...). Based on a SWOT analysis of the different opportunities a roadmap for further initiatives has been developed. This resulted in concrete tools for logistics decision makers. A manual describing the different steps in the modal split process in a user-friendly way is such a tool. It helps industrial actors to make mature multimodal decisions. Such a tool is developed, made available and promoted by VIL after an extended validation among logistics decision makers.

### ***Industry relevance***

Many logistics managers regularly face the choice between different transportation modes: road haulage, inland navigation, rail transport, short sea shipping, etc... The transportation mode choice is still often made in a rather irrational way. Recently this problem was merely a cost minimisation problem; cost was mainly understood as 'out of pocket' cost. The increasing pressure for fast delivery of small batches (cf. JIT), the possibility of direct and flexible access to the final customer (responsiveness) and various other reasons have favoured road transportation in the years past. Congestion, environmental damage, accidents and the threatening re-regulation make that industrial actors at least should examine the opportunities of alternative transport modes. Nowadays, one decides to apply alternative transport for spreading of risks. Logistics decision makers admit they often have not enough background to choose the most appropriate transport solution. They are searching for tools to support transport decisions in a multimodal context. It is part of the VIL mission to anticipate that need.

## ***The VIL role***

The VIL has the role of match maker in multimodal transport. Beside the developed manual supporting decision makers in their modal split decisions (see above), one has chosen for best practices or testimonials about a certain issue in multimodal transport. The aim is that logistics actors will learn something by reading these structured cases or will come to new insights. Perhaps this can help these logistics decision makers to realise a modal shift. At least they become aware of the opportunities of alternative transport concepts and in this way they get a mental shift. About 30 well-chosen best practices are offered on the VIL-website. Again, this is a way to decrease the gap between shippers and transport providers.

## **Optimising hinterland connections of Flemish ports**

The developments in multimodal networks take place in a fast changing economic context with important logistics and maritime evolutions, that equally have an impact on the logistics organisation of the hinterland network. Ports are hereby mainly focussed on loading and unloading sea vessels. The strong increase of the total volume handled in the Flemish seaports, mainly under the impulse of the fast growing container traffic in the port of Antwerp, poses new demands to the multimodal hinterland connection. Hereby is recognized that smooth connections from the Flemish ports to the hinterland are crucial to safeguard the competitive position of these ports.

In this strategic project the VIL has focussed on the bottlenecks of hinterland connections and the requirements of users of these connections to ports. The first objective is to search for organizational aspects in a current existing infrastructural context with a final goal of optimal use of the capacity in the existing hinterland network across borders of the individual modes. The following phases were completed:

### ***Bottleneck analysis***

Enumeration of bottlenecks through about 30 in-depth interviews with interested actors within the hinterland connections such as port authorities, forwarding agents, shipping companies, (inland) terminal operators, logistics service providers (LSPs) and shippers.

### ***Best practices***

Fifteen best practices according to a fixed structure were worked out. The cases describe mainly organizational but also technical improvements in the optimisation of hinterland connections.

### ***Requirements analysis***

The (logistics) requirements of transport applicants, primarily shippers but also LSPs and terminal operators, were mapped qualitatively through in-depth interviews. On the basis of the findings of these interviews, a survey was composed that ensured a quantitative check at the shippers' side.

## **Improvement projects**

From the synthesis of bottlenecks and requirements of hinterland connections in combination with inventarised best practices, a long list of improvement opportunities was created, mainly

focussing on market players. After evaluation on the basis of two criteria, the opportunity for success and the final effect on multimodal transport, six favourable improvements projects were selected whereby the role of the VIL was stated:

1. Set-up of a neutral multimodal information desk
2. Encouragement of collaboration within the multimodal transport chain actors
3. Stimulation of technological development and innovation in multimodal transport
4. Creation of a basis for increasing opening hours of seaport terminals
5. Improvement of the insight in total logistics costs
6. Study of opportunities in the development of an integrated multimodal network

In most of these improvement tracks the VIL again has a role of coordinator or facilitator. There is often lack of a neutral partner who is able to bring together the necessary actors and who is guarding a *level playing field* among the different players.

## **Transport innovation**

The Flanders Institute for Logistics (VIL) has the objective to search for new opportunities and innovation in transport. Not only introducing new modes of transport, but also applying new concepts making use of existing transport modes is part of the VIL mission. Two examples are given here in order to illustrate the VIL innovative approach.

### ***Transport of pallets through inland navigation***

In the *Distrivaart* project (2002-2004) the opportunities were investigated to transport pallets with fast moving consumer goods via inland waterways. This innovative logistics concept was elaborated in the Netherlands. The concept is innovative in the sense that it is focused on non-traditional flows for inland navigation, i.e. neither bulk nor containers. Line services are offered for palletized goods wherein several vessels fulfil a fixed journey.

The objective is to attract palletized fast moving consumer goods (FMCG), with the aim to establish economies of scale and scope through collaboration. Retail organizations like Albert Heijn, Schuitema and Laurus and manufacturers like Heineken, Interbrew, Grolsch, Unilever, Coca Cola, and Kimberly-Clark participated in the pilot project. In the implementation phase both technical and economical problems appeared.

Nowadays, in Flanders a project has been started to explore the opportunities of a similar concept. A trade-off should be made between on one hand the ease to implement such pallet transport and on the other hand the economies of scale and network effects obtained by that concept. This study should result in concrete pilot projects implementing such innovative concepts in inland navigation. After the first phase collaboration among actors in construction materials seems to be promising in order to attain the necessary volumes. Again, the VIL can play the role of *consolidator*.

### ***Barge shuttle***

Congestion is not only a problem on roads, but also more and more in ports. Ports are trying to optimise the handling operations at the sea terminals. They are focused on loading and unloading the often huge sea vessels. Handling inland barges comes on the second place. One of the improvement options is trying to avoid the small call and drop sizes of the inland container barges in the port. A barge shuttle service might be useful for the collection and distribution of containers between the different sea terminals in the port or between different

transshipment points in a certain region in the hinterland. As a result high volume line services can be organised between the port on one hand and the hinterland hubs on the other hand.

Nowadays, individual actors already offer such a service. Opportunities are examined in which several shippers use a common barge shuttle service. There are examples where a crane is connected on the vessel (e.g. the AMS crane-vessel in the port of Amsterdam). In the latter concept transshipment infrastructure can be avoided on the quays. The critical success factor as almost always is a high enough volume. Through collaboration one can consolidate freight flows and as a consequence a structured line service might be viable. The VIL is asked by some actors from the petrochemical sector to examine the opportunities in this field.

## **Conclusion**

The Flanders Institute for Logistics (VIL) is continuously searching for opportunities to bring together the various logistics actors. The main role of the VIL is often the one of match-maker. A match should be made between transport demand and supply, between users and providers of transport. Knowledge and experience about the different transport modes has to be distributed towards potential users. Transport providers, on their side, should be given insight in the shippers' requirements. Through best practices and a manual elaborated in the field of multimodal transport one supports this matching goal. A match should also be looked for between on one hand the ports with their maritime activities (i.e. loading and unloading sea vessels) and on the other hand customers in the hinterland searching for appropriate connections with the ports. Several improvements can be worked on. Often one of the most critical success factors seems to be the ability to bring together the right players. The VIL as a neutral party has often a facilitating or coordinating role in collaboration projects. Finally one should match the academicians with the practitioners. There often seems to be a knowledge gap between these two different worlds. The Flanders Institute for Logistics (VIL) has the mission to develop and to apply several tools in order to bridge these various gaps.