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Preliminary communication
UDC: 656.1.021(4)
656.615.073.27(4)
Received: 11th November 2008
Accepted: 19th February 2009

ROAD CONGESTION GENERATED BY DISTRIBUTION CENTRES IN EUROPEAN PORT REGIONS: RISKS AND OPPORTUNITIES OF THE DEVELOPMENT OF HYBRID LOGISTICS

Setting up warehouses for logistics distribution activities in port regions brings economic advantages to the territory of port regions but can have negative effects on road circulation and create traffic jams. In the long run, this can be translated into a loss of time for workers that drive along the arteries of port areas and even into a disincentive to the very location of logistics activities in ports. This article will first describe the significant case study on road congestion determined by the location of many European Distribution Centres (EDC) in Rotterdam and then analyse whether the spreading of innovative 'hybrid logistics' models (e.g. the use of both centralised warehouses in port regions and regional inland warehouses), which was recently pointed out by some scholars, can have further negative effects on road congestion in the European port areas. The conclusion this article draws is that, contrary to what some researchers assume, the new hybrid logistics models may actually have positive effects on the reduction of road congestion in port areas if the intermodal transport systems from ports to the inland are adequately integrated within the distribution logistics networks both through policies that support and coordinate the intermodal transport from sea to land to be implemented by port organisations and through the creation of inland terminals that can provide room to distribution centres.

Key words: *intermodal transport; port; hybrid logistics*

1. THE LOCATION OF DISTRIBUTION CENTRES IN PORT REGIONS AND THE PROBLEM OF ROAD CONGESTION

In the 1990s, when global production networks were developing and the typical industrial approaches to the organisation of transport and logistics were spreading, several major European ports adopted strategies which favoured the location of warehouses and logistics hubs - in particular of European Distribution Centres (EDC) - very close to ports, in order to exploit the greater opportunities deriving from the positive economic impact induced on the territory by the added-value services which characterize logistics nodes serving global production networks.

Locating EDCs close to ports enabled port towns to benefit from an economic and employment impact that was greater than the impact determined by the unloading, loading and intermodal transfer of goods to the inland. With the industrial development of container transport, such activities turned out to be both less capable of providing an added value to the territory and also increasingly expensive in terms of space use, social cost and environmental impact (Musso, 2004; Hesse, 2006).

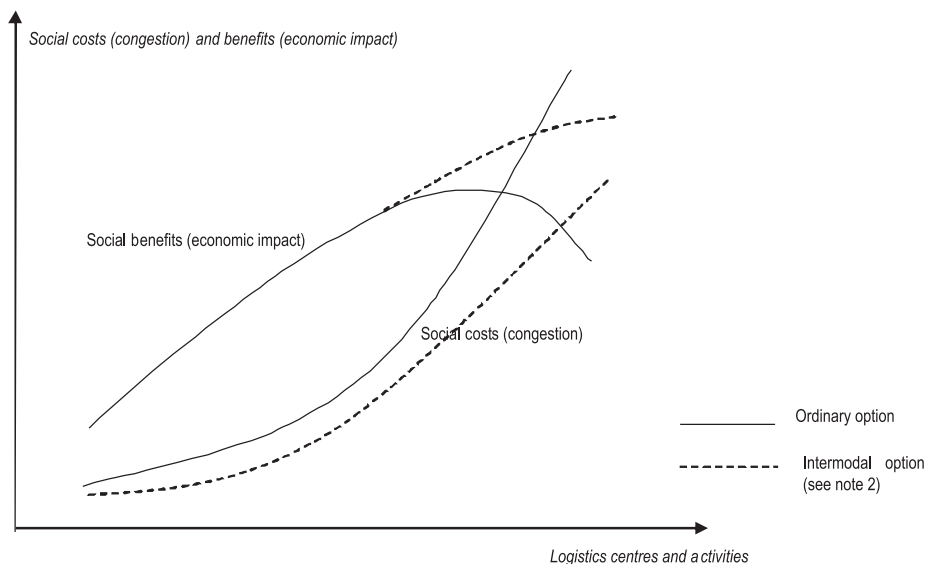
This phenomenon took place mostly in some large port areas in Northern Europe (e.g. Antwerp, Rotterdam and Hamburg) where there was a large maritime flow of products coming mostly (but not exclusively) from the Far-East markets. Such areas were also privileged because they had the greatest accessibility to the major European consumption areas, especially at the time when Europe had 15 members (Ferrari & al., 2006).

The creation of EDCs, but also of other type of distribution centres, was often sustained by precise territorial marketing strategies, which were sometimes combined with the creation of new specific infrastructural and service opportunities (a classical example of this being 'distriparks' in the port of Rotterdam) in order to promote the location of great logistics operators very close to the quays, that is within the area that can be defined as the primary logistics zone of the logistics pole of the port region.

We should not forget that, especially after the first stage of this trend was over, EDCs were also located outside the areas closest to ports and to port towns, although they were still within the logistics pole of the port area. Logistics distribution centres were often located in cheaper areas further away from the port and sometimes actually quite far, as in the case of Venlo, Holland (an area located about 130 km from Rotterdam that has many distribution warehouses), or of the *Süderelbe* in the case of the port of Hamburg. The creation of secondary logistics zones that are still within the logistics pole of the port region is an integral part of the phenomenon of 'port regionalization' that was accurately identified in the field of economic geography (Notteboom & al. 2005; Hesse, 2006).

However, the concentration of logistics warehouses in port towns is a typical case in which “the polarization in a limited number of centres is contributing to the saturation of the space and, at the same time, to the environmental impact deriving from the intense use of space and from the growing congestion of road traffic along the arteries that connect the main polarities” (Forte, 2008).

It goes without saying that the larger and more intensely active a port region is, the heavier is the road congestion of some of its key junctions. The fact that distribution logistics generates intense road traffic is due to the fact that in order to reach final customers and offer them a satisfactory service, while reducing inventories along the chain, it is necessary to resort to frequent and fast deliveries that can be carried out only by using trucks intensely and frequently.



Graph 1 Benefits and social costs for the port region in relation to the intensity of logistic activities

The policy followed to attract logistics hubs right next to port areas offered some opportunities (the territorial added value and the vast number of services provided to port customers, which is a general attraction factor for any kind of flow), but it also brought about some disadvantages, that is heavier traffic on the roads leading to the port region and often on highway junctions further away from the port. The continuous curves¹ of Graph 1 show, in a sim-

¹ The dashed curves refer to the possible introduction of the intermodal transport option discussed in paragraph 3.

plified and schematic way, a possible outline of the correlation between 'social costs' connected to congestion and 'social benefits' deriving from higher employment rates and from the greater added value for the port region.

Choosing the right policy is a dilemma that cannot be solved easily because each of the two juxtaposed aspects (added value for the territory on the one hand and environmental and circulation quality on the other) represents relevant social and economic values and it is not always easy to estimate the net social benefit of each policy.

The continuous curve of social benefits starts to decrease after logistics density reaches a certain value because, due to the expected high congestion levels, it is influenced by the impact of inefficiencies and diseconomies generated by private operators working in the area, corresponding to lower employment rates and a lower territorial added value. The sensitivity of operators towards this problem is proven by recent publications, such as the 'Position Document' of the European Shipper Council, which points out the problem of congestion around ports and logistics hubs (European Shippers' Council, 2007).

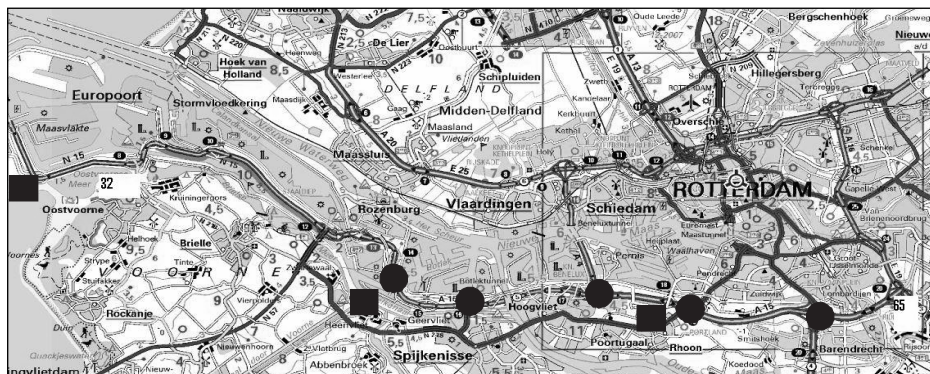
Even when congestion is basically limited to the main junctions of the road system of port areas, and it does not concern all outer urban junctions promiscuously used by many types of passenger and goods flows (even not pertaining to the harbour), the negative impacts are not limited exclusively to the time costs affecting freight road transport. In these cases, the negative effects concern the entire system of the 'port community', starting from the employees of the port community who drive, by private car, to work every day.

1.1. Rotterdam: a perfect example

As confirmed by the interpretation of local researchers (Erasmus University, 2008), Rotterdam is a perfect example of what was outlined above since the heaviest congested junctions are said to be those along the artery that runs parallel to the Meuse, the A15, which distributes road flows to the various areas where port activities are carried out (Picture 2) and also connects to the 'Distriparks'.

Rotterdam is not the only example in Europe of the problem generated by the relation between the location of logistics activities and road circulation: therefore, the considerations made on this case can apply to any large port acting as a gate that can attract distribution centres to its territory.

Over the last few years the problem of road congestion in the port area of Rotterdam has become rather serious as can be seen in statistics, which seem to point out how the effect of distribution logistics (and not the effect of the growth of maritime flows in general) can well be considered as the main cause.



Picture 2 Congestion at road junctions in the port area of Rotterdam

Source: Elaboration of “Ports as Logistics Hubs: Chances and Challenges” (Erasmus University, 2008)

- Congestion at road junctions
- “Distriparks”

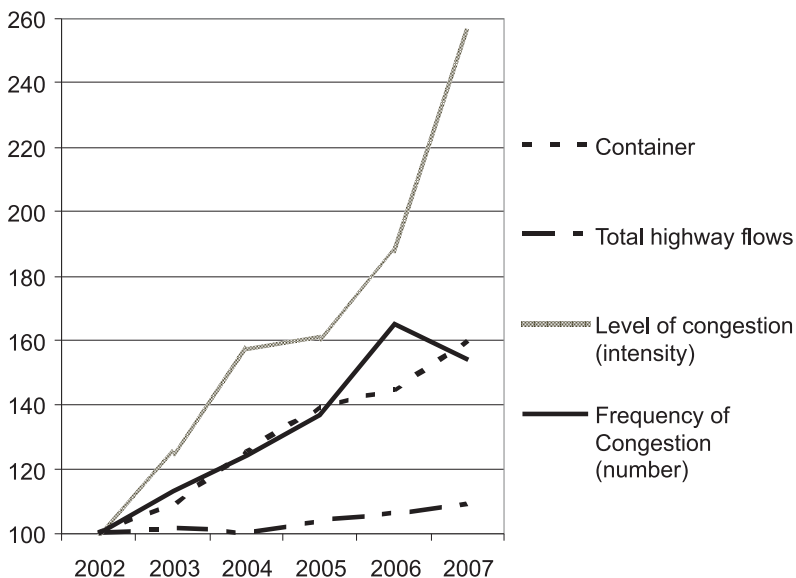


Table 3 Rotterdam port area, 2002-2007: maritime flows of containers, highway flows and intensity of road congestion (index number: 2002 = 100)

Source: Rotterdam Port Statistics (Port Authority Rotterdam) and Erasmus University (Erasmus University, 2008)

As you can see in Table 3, which I drew up on the basis of the data available on Rotterdam, it is precisely the data on the congestion at road junctions in port areas that show the highest percentage growth, for this is much higher than the traffic on highways and than the container flow. This applies in particular to the synthetic indicator (kilometres multiplied by minutes), which measures the intensity of congestion by taking into account the length of the congested road sections and how long they were congested.

It is estimated that 60% of the road congestion generated by the port is linked to despatches pertaining to the container sector, also because, according to this case study, *most* distribution logistics activities concern goods that reach the port of destination in containers (Erasmus University, 2008). The structural component of the recent congestion growth derives specifically from the traffic peaks determined by trucks that arrive or leave from logistics warehouses where the content of containers is processed after unloading.

These are the typical components of the road traffic linked to the location of logistics warehouses in the area:

- the short-distance road transfer of containers from the container terminal to the logistics warehouses in the port area and the return of empty containers to terminals (or to other storage place);
- the transport of handmade goods from warehouses by trailer truck (without container); phase one of this process is bringing trucks to warehouses.

It is easy to understand that a large proportion of the congestion phenomena is determined by the expansion of logistics activities, and not by the increase of the container flow arriving by sea. As a matter of fact, the incoming and outgoing flows at logistics facilities are concentrated at the beginning and at the end of the working day at warehouses, which apply the typical time diagram of the industry sector.

These time slots coincide with other traffic peaks generated by employees going home from work or by the despatch of other industrial products. On the contrary, the flow of goods leaving container terminals and heading towards the inland of the continent can be distributed during the working day or throughout the day because terminals also operate all day long as they are obviously linked to the ship cycle. A given number of containers arriving at the port is less likely to be expected to reach its final market destination in a short time than a spot delivery product that leaves a distribution logistics warehouse.

2. THE DEVELOPMENT OF DISTRIBUTION NETWORKS CONCENTRATED IN PORTS: TOWARDS HYBRID LOGISTICS

In view of what was outlined in the preceding paragraph, it is interesting to examine the development perspectives of this situation in the next few years and the possible choices to be made by private and public operators in order to solve this problem.

First of all, it is necessary to determine what changes are under way within the distribution systems linked to the maritime transport and to global production networks; more specifically, we need to establish whether the trend of locating centralised warehouses in the port region and close to the quays (following the concept of 'Distripark') is still prevailing.

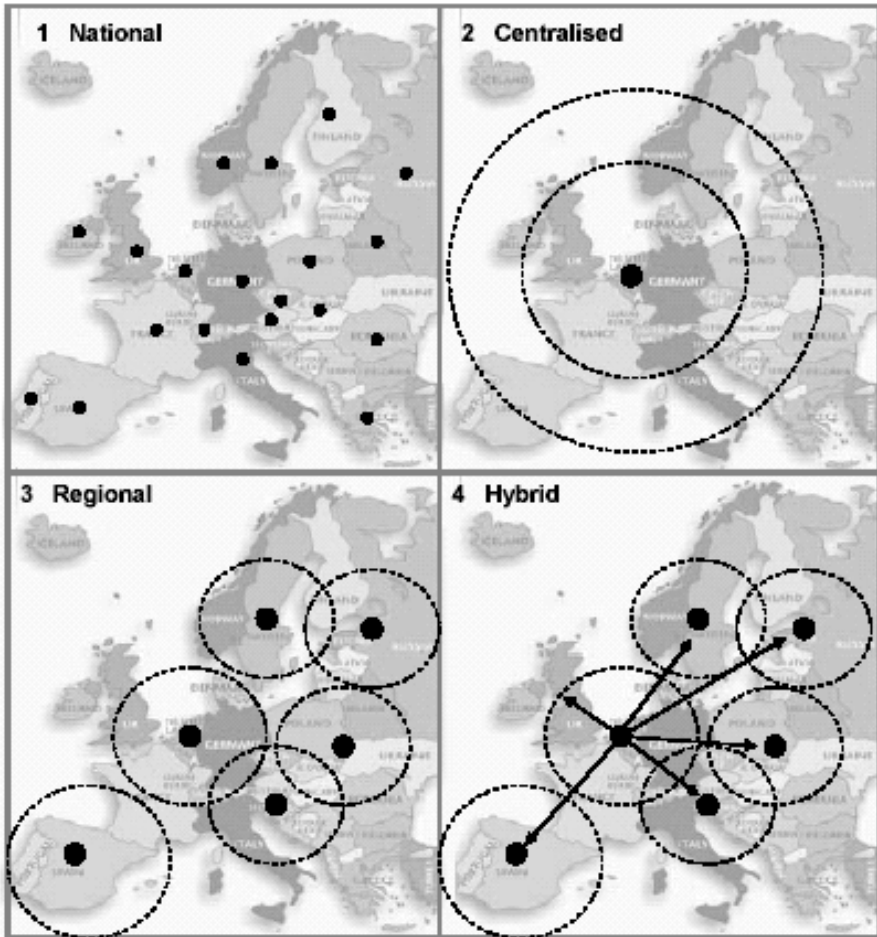
2.1. General features of the hybrid model

In line with the more general tendency to make the geographical shape of distribution networks more flexible (Hesse and Rodrigue, 2004), the changing role of ports as locations for logistics activities was focused some years ago by some researchers who putted in light the possibility that "*with the evolution of logistics concepts towards central coordination and more decentralized physical distribution, ports will see its multinational function diminish, eventually replaced by logistics activities with a more regional function and stronger integrated with production*" (Van der Lugt & de Langen, 2005).

In fact, a more evolved concept of the centralised direct distribution from EDC appeared recently. Some logistics operators that distribute goods arriving to the major European ports from overseas countries seem determined to choose a type of distribution network which has some new elements and that some Dutch scholars classify as 'hybrid'. In the hybrid logistics model, which Dumey examined in the 'Sutranet' project (Dumey, 2007), there are:

- a main distribution centre typically located in an easy accessible port region and in which some of the key distribution functions can be found (starting from the coordination functions that characterize centralised logistics) and within which the typical economies of scale of large warehouses are introduced;
- other regional distribution centres, which are organised in a hierarchical way, where other logistics operations can be carried out according to specific cases and needs, and from which the final distribution to customers can be made. This aims at bringing the distribution place closer to customers, thereby increasing the quality of the service.

The difference between a centralised distribution model and a hybrid model is shown in Picture 4; it is taken from Dumey's publication.



Picture 4 An example of models of distribution networks including the hybrid model

Source: Dumey, B., 2007, in Minutes of the TRANSUMO meeting “Workshop on Transport and Logistics Centres”, Bremen, 26th January 2007

Adopting a hybrid model enables to choose among various alternatives, depending on the specific logistics needs of the products, on the required delivery time or other factors:

- goods are distributed directly from primary warehouses (located in port regions) to the places of final delivery;
- goods are brought to central warehouses to secondary (regional) distribution centres and then to final customers;

- goods are taken from the ports directly to secondary warehouses and then distributed to final customers – they don't go through primary warehouses in port regions.

In general, hybrid logistics tends to reduce the quantity of goods that are distributed from central warehouses directly to final markets, although using a hub warehouse when necessary, even for transit, (see alternative b), enables to bring about relevant economies of scale and savings in logistics.

Therefore, the hybrid model is used to optimize the relation between costs and service level to customers (delivery time, etc.) within an extremely flexible framework. Both parameters are growing increasingly relevant also in the light of the growing difficulty to find large and cheap pieces of land with good accessibility to markets, where big centralised warehouses can be located.

2.2. The hybrid model and its impact on road congestion

At the moment, at least in the light of what was outlined by the Dutch case studies mentioned above, the majority of the companies that distribute their goods from port areas are not opting for hybrid logistics (Erasmus University, 2008; Roebuck, 2008): according to a sample survey, only about a third of the logistics operators in the Rotterdam area are said to be thinking about adopting hybrid logistics by 2012.

However, in view of the fact that hybrid logistics could catch on, it is worth analysing the consequences of the widespread use of this distribution model on road congestion in port regions.

First of all, the opportunities offered by the hybrid model could theoretically lead companies that are not using a central distribution warehouse – but rather a more traditional distribution network - to create a (new) distribution centre in a port region chosen as a 'gate' while keeping the traditional network. This would have a greater impact on the traffic within the port region where the (new) central warehouse would be located.

But apart from the effect determined by new central distribution warehouses on networks that were not using them, it is more relevant to determine whether there are any differences in terms of road traffic (and if this is the case, which ones) between traditional logistics based on EDC (which revolve around central warehouses located in port regions) and hybrid logistics – assuming that hybrid logistics can be introduced first into companies that already have a centralised distribution model.

First of all, since within the hybrid model the distribution buffer is divided between regional warehouses, it could be assumed that in hybrid logistics the central warehouse tends to become smaller if compared to the standard EDC option, thus favouring its location within the primary logistics area of a port town and no longer in secondary logistics areas, that is further away from the

port. As dimensions grow smaller, the economic impact of surface costs (which are higher in the primary logistics area, i.e. closer to ports) tends to decrease.

On top of this, the growing tendency to make the supply chain work faster prompts to resorting to warehouses very close to quays. For example, some operators are planning to work with delivery windows of 30 minutes from terminal to distribution centre, which requires the distribution centre to have a very good location and possibly limited road congestion (Thomas, 2008).

This seems to indicate that if hybrid logistics catches on, it could reinforce the tendency to locate distribution centres very close to quays; in this case, the consequences on the congestion of arteries located within the port area would be even worse than those determined by the traditional centralised model.

Besides being generated by a larger number of logistics hubs in the port (albeit over a smaller surface), such higher congestion levels would be due to what could be seen as a deterrent to the use of the intermodal option for goods arriving at warehouses.

As a matter of fact, when (traditional) EDCs are located in the secondary logistics area, it makes more sense to transfer containers to ports by lighter or rail before opening them. Using waterways or rails to supply distribution centres is no use when warehouses are located close to port terminals.

On top of this, it must be noted that in the hybrid model, just like in the pure centralised model, a forward distribution (from primary centres to regional centres), albeit not targeted to final customers, takes place after containers are opened, thereby substantially reducing the advantages given by the transport by rail (including combined transport by road and rail) or by internal navigation. In fact, it is well known that generally in Europe the intermodal option for internal transport (including primary transport, namely not targeted to final customers) is not used much since costs are not particularly competitive in comparison to trucks or terminals network - the latter being often considered not widespread enough.

The fact that regional distribution centres are generally not located very close to intermodal terminals favours the choice of trucks.

Speaking of intermodal services used within logistics systems, it is worth pointing out that in Rotterdam the intermodal transport of goods arriving at warehouses in the port area is practically irrelevant and that the intermodal system is used only for 5% of the goods leaving logistics hubs (Erasmus University, 2008).

Carrying out logistics operations very close to port areas would seem to create a series of deterrents against the use of intermodal transport (both for incoming and outgoing goods).

3. WILL INTERMODAL TRANSPORT PLAY A NEW ROLE IN THE HYBRID MODEL? INLAND TERMINALS AS DISTRIBUTION CENTRES

3.1. Opportunities offered by intermodal transport in the hybrid model: concentrating flows between port areas and regional warehouses

In spite of the pessimistic conclusions drawn in the preceding paragraph, we cannot rule out the option that the hybrid model could even gain some intermodal potential if compared to the traditional centralised system both in terms of the initial supply of central warehouses in port regions and most of all of the supply of regional warehouses at the end of the chain – provided some conditions are changed. This is why if the intermodal option is introduced, it must be able to increase the economic and logistic performance of the system in comparison with road transport.

The fact that the hybrid model of logistic network becomes more competitive if it resorts to intermodal transport can be appreciated if you consider that in theory the use of ‘intermediate’ means of transport (waterways or rail, while avoiding trucks) implies saving by using intermodal techniques (rail or lighter) because distribution flows leaving the port region and heading towards the regional distribution centres are geographically circumscribed. They are not heading towards a large number of final delivery places scattered around a normally vast territory, as is the case with direct distribution from a traditional EDC, which basically has to resort to road transport.

Similarly, delivery time and/or required time margins for planning are less short when goods are transferred to intermediate peripheral sub-centres in comparison to the time requirements set for distribution to places of final delivery. In the latter case, delivery to final customers requires a service level and ‘on call’ availability that makes it necessary to use trucks.

Chart 5 shows how intermodal transport can be applied to hybrid logistics.

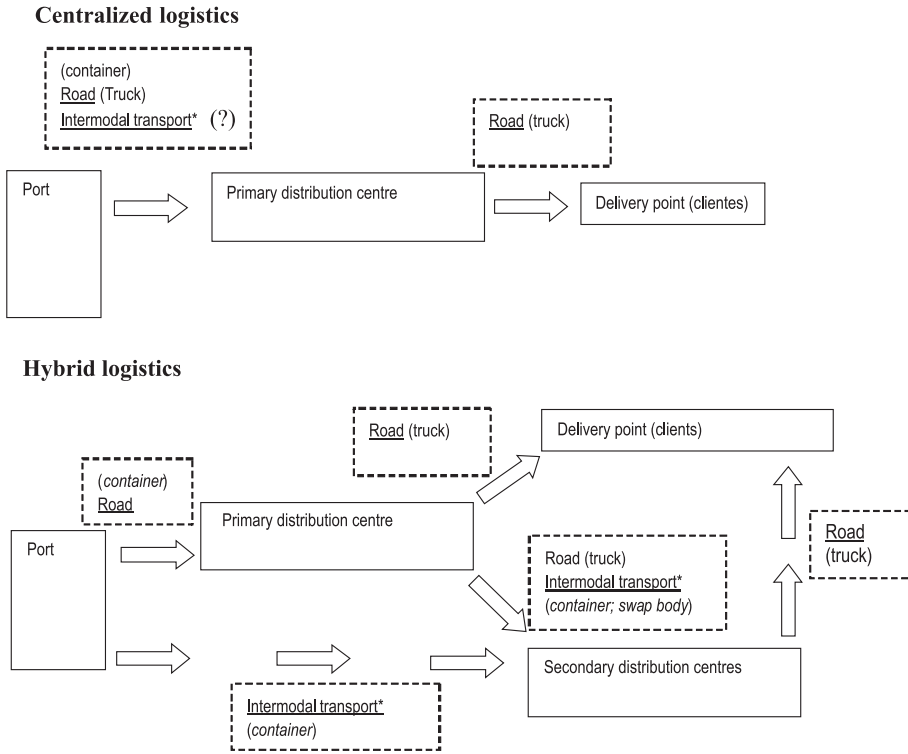


Chart 5 Modes of transport in centralised logistics and in hybrid logistics based on the port

This chart shows the idea that, under given conditions, intermodal transport can be applied on hybrid logistics network or only to delivery cargo units directly from a port to a secondary warehouse without opening containers (see case ‘c’ of paragraph 2.1 pointing out the option of not making goods transit through the primary warehouse), but also to provide transport on the segments of primary distribution, located between central and secondary warehouses (see case ‘b’ of paragraph 2.1.)

Researchers clearly identified the option of exploiting the improvement reachable through hybrid logistics by private operators that wanted to increase their efficiency and flexibility so as to reach social goals, starting from environmental protection.

The way scholars discussed about hybrid logistics shows their willingness to point out the chance of using intermodality more intensively: when evaluating the option of developing more flexible logistics network that offer the chance of providing tailor-made services to customers at a low logistic cost,

they state that more attention should be paid to hybrid logistics networks for goods that can be brought to their final destinations by using “*various transport options*” (Dumey, 2007).

3.2. Conditions for the development of intermodal transport within hybrid networks and the issue of “inland terminals” as logistics hubs

The fact that hybrid logistics networks could potentially take on an intermodal nature does not mean that this has to happen. In fact, this change requires precise conditions for, as was pointed out in paragraph 2.2., without them hybrid networks, which are adopted to increase flexibility, would have a worst impact on congestion than the network models used in the past.

As was pointed out when discussing Rotterdam’s case, intermodal transport at present does not seem to be catching on while the location of logistics activities in ports is growing. On the contrary, at present, there is a direct proportion between the concentration of logistics in a port area and the road traffic in the same area (see graph 1). This corresponds to an inverse proportion between logistics located within a port area and intermodal transport precisely because intermodal transport has not managed to enter the market of the segments of intermediate distribution of logistics networks.

This problem is well known to the European Commission, which went into it in the *Communication on a European Ports Policy* (European Union, 2007).

But which are the conditions for a reversal of trend and for intermodal transport to meet the flexibility needs of designers and customers within the global production networks – probably after making some changes in terms of prerogatives and traditional role attribution? In order to make a turn, it would be necessary for intermodal services leaving port regions to:

be able to offer some prerogatives (frequency, regularity and delivery time) at a price that is more competitive than the price of all-road transport and capable of meeting the typical needs of the intermediate transport of hybrid logistics, that is transport between central and secondary warehouses;

arrive directly to logistics platforms from which the final distribution can be carried out using warehouses as a basis.

The last point is particularly important and requires a precise infrastructural condition: for intermodal services to be able to play a relevant role in hybrid models, and more generally in the flexible logistics of global production networks, it is necessary for secondary distribution warehouses to be located very close to intermodal inland terminals based on rail or rivers that must be well connected to port regions acting as gates.

The use of both inland terminals and distribution logistics hubs was not a very common planning option in the past, apart from the widely quoted case of Italian interports, which placed intermodal terminals and warehouse areas in the same spot but did not meet all expectations for a number of reasons, in-

cluding location errors. This was due to the fact that in the past intermodal services were seen strictly as a transport activity and they were not linked to the needs of distribution logistics; besides, taking goods out of terminal areas was conceived as a form of pure transport rather than a kind of logistics distribution.

Today, this is changing and the option of creating logistics warehouses or even logistics hubs close to the new inland terminals is gaining momentum to the point that even great maritime transport operators are investing in specific inland terminals thinking that such terminals will become the crux of the areas of distribution logistics.

An example of this are the trimodal terminals combining rail, internal navigation and road transport built by Maersk in Neuss and Duisburg in Germany with the intent of creating a kind of ‘green logistics’ that reduces the limits set by road congestion for the big customers of logistics (Roebuck, 2008).

The intermodal system could help reduce the rising costs of road transport deriving from the cost of petrol and from the norms that establish how long people can drive.

The option of having primary distribution centres in port areas and regional distribution centres right in the middle of the market – for example in Central and Eastern Europe after the enlargement of the EU – is viewed as an interesting future option by operators that still prefer centralised distribution leaving from maritime regions. However, such operators point out the need for markets to develop further before large investments can be made in distribution centres right in the middle of the market (Roebuck, 2008).

What was outlined above applies to the segments between port regions and inland secondary distribution centres.

Obviously, the intermodal option could be also used for transport carried out to bring goods to primary distribution warehouses located in port regions, which can be found in hybrid logistics too.

For example, by exploiting the opportunities and potential offered by the regionalization process of port-related activities, the location of primary warehouses of hybrid logistics (or common EDCs) in the proximity of ‘port-inland terminals’ could be stimulated. These would be located relatively close to ports but outside of the areas where the heaviest road congestion is. The public sector could organize intermodal connections (typically by waterway) to connect port terminals with port inland terminals.

Rotterdam represents once again a meaningful case: it was the Port Authority that invested in the intermodal transport to supply a logistics hub located in a secondary area of the port region within a project called “Container Transferium”. This project, which involves several maritime companies and is supervised by the Port Authority, has provided the transfer of containers, reaching the port, to the inland terminal of Allblaserdam by internal water-

ways. The area of Allblaserdam, which is 50 km away from the oceanic container terminals, will be the location of warehouses for distribution logistics. This project reflects a more general strategy aiming at reducing the road transport quota of Rotterdam's port to 35% by 2035 – it was 48% in 2006.

4. SOME CONCLUSIONS IN TERMS OF POLICIES

In principle, hybrid distribution logistics networks show an interesting potential that favours the creation of logistics hubs close to inland terminals (both within and outside port logistics hubs) when intermodal services are available and locations have features that can be adjusted to the new distribution needs.

Therefore, this trend could set a new balance at a European level between the location of logistics warehouses in ports and the effects of road congestion by changing the present relation between relative costs and benefits, thus bringing to the situation that is shown by the dashed curves on Graph 1.

The dashed curves on Graph 1 represent the 'new' curves of social costs and benefits of logistics warehouses on condition that hybrid logistics resorts to intermodal transport.

Integrating intermodal transport in hybrid logistics would allow to increase the density of logistics investments made in port regions (with the deriving economic and employment benefits) and this benefit would not be dissolved by the higher costs deriving from road congestions that have an impact on operators and the community in general.

With reference to the continuous curves on Graph 1, at present, administrations, representing the interests of port regions, have to decide whether to further increase the location of logistics hubs in port areas (thus increasing the added value of the territory but taking the risk of saturating the road system with a negative impact on warehouses and on port activities in general) or rather to limit this option, thereby reducing the territorial added value but also congestion. In the future, this problem could be solved if - as shown by the dashed curves on Graph 1 – the operators' tendency to resort to flexible hybrid networks increased and if it were possible to integrate the intermodal option in that model (starting from the creation of logistics areas close to intermodal inland stops).

This would be a great advantage, although the new logistics areas close to inland terminals will cause some conflict with other urban functions (Haily, 2008).

Obviously, taking into consideration the interest of port regions, the higher quality of intermodal services for goods leaving ports (especially by river) and the spreading of inland terminals conceived as logistics distribution areas,

particularly if located in the middle of the continent and not within a short distance from ports - as is the case for Alblasserdam – could turn out being counter-productive for port regions in the long run.

Taking this to an extreme, in the long run to a clear improvement of intermodal transport in the segments from port to inland terminals, along with a shift of the European economic centres of gravity towards the middle of the continent (central and eastern Europe), may favour a switch to logistics networks that can be defined as ‘pseudo-hybrid’. They would be able to exploit the concentration of maritime flows in large port gates without making it necessary to set up any warehouses in port regions. In this case, the logistics mode ‘a’ and ‘b’ of the hybrid option described in paragraph 2.1. would be ruled out and the ‘transit mode’ ‘c’ would be chosen instead.

Anyway, even if this borderline scenario does not come into being, the spreading of hybrid logistics based on intermodal services widens the perspectives of competition between inland areas and port regions for the location of logistics warehouses. This could change the balance of the present situation in which the areas close to the North Sea are the capitals of the European distribution logistics.

Within this framework, port administrations (possibly along with transport companies), conscious of the fact that they could potentially coordinate operators and activities of port communities, will try hard to play an active role in the hinterland – intermodal competition, trying to develop inland terminal networks ideally linked to maritime port gates.

The widening of the field of activity of ports both in terms of geographical and functional expansion, which tends to increase the power and the role of port organisations in the use of the territory along logistics corridors, will be carried out by ports not only in order to increase port flows but also to take control, where possible and through a joint corporate effort, over segments of the value chain located even far from ports. This goal is particularly important when port institutions are profit-oriented corporations.

The interest of some port administrations in the management of internal connections and, in general, in the coordination of inland transport chains is certainly a topic that is drawing the attention of researchers in many ways (Van Klink, 2003; Van der Lugt & al., 2007; Jaržemskis & al, 2007; Van Der Horst & al. 2008), because it highlights the opportunities of new instruments of port policies that play an active role in logistics networks.

It goes without saying that private operators who are independent from the interests of port regions, and in particular from issues concerning maritime and intermodal transport, along with real estates dealing in logistics, will try to take action along these lines, as has already been the case.

However, it is important to point out that in Europe any new policy concerning intermodal transport and aiming, on the one hand, at reducing the use

of road transport in view of the heavy incoming flows at large European port gates and, on the other hand, at bringing about a more balanced distribution of added value to territories (starting from port regions) can be put in practice only if that policy takes into account the new needs for flexibility of distribution logistics networks, which are exemplified by the hybrid logistics networks that seem to be catching on in Europe.

A new European intermodal policy actually capable of meeting the needs of the market and the strategies of the dominating operators (ports, big carriers and distribution logistics operators) cannot be limited to the aspects pertaining to transport economics as such, as was often the case in the past.

A new European intermodal policy (both by rail and by river) should thus support, on the one hand, port organisations because they are the first to integrate the inland chain and, on the other hand, inland terminals that can support regional distribution logistics hubs which can be supplied through intermodal flows leaving the port regions.

BIBLIOGRAPHY

- [1] Dumey, B. (2007), Results of the case study of the economics and logistics of intermodal network components, port terminals and logistics centres, Minutes of the TRANSUMO meeting “Workshop on Transport and Logistics Centres”, Bremen, 26th January 2007
- [2] Erasmus University (2008), *Ports as logistics hub: Chances and Challenges*, working document presented by W. Jacobs to the students of the Master Course “Logistics Promoter” (University of Trieste), Rotterdam Port Authority, 22th May 2008
- [3] European Shipper Council (2007), *Mitigating Congestion in Transport - A position document produced by European Shippers' Council for the Sofia Ministerial Session on Congestion to be held 30-31 May 2007*, February 2007.
- [4] European Union (2007), Communication from the Commission - *Communication on a European Ports Policy* SEC(2007)1339, SEC(2007)140, COM/2007/0616 final, 25th October
- [5] Ferrari, C., Parola, F.m Morchio, E. (2006), Southern European Ports and the Spatial Distribution of EDCs, *Maritime Economics and Logistics*, March, v. 8, iss. 1, pp. 60-81
- [6] Haiely, R. (2008), Inland Revenue, *Lloyd's List*, 9, 16th May
- [7] Hesse, M. (2006), Global Chain, Local Pain: Regional Implications of Global Distribution Networks in the German North Range, *Growth and Change*, Vol. 37 No. 4, pp. 570–596
- [8] Hesse, M., Rodrigue, J.-P (2004), The transport geography of logistics and freight distribution, *Journal of Transport Geography*, 12(3):, pp171–184. Hill, H. (2008), Rotterdam gains support for off-port trucking interchange, *Lloyd's List*, 6, 4th August
- [9] Jaržemskis1, A., Vasilis Vasiliauskas, A. (2007), Research on dry port concept as intermodal node, *Transport – 2007, Vol XXII, No 3, 207–213*

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- [10] Musso, E. *Port added value at the heart of the city-port negotiations*, Trasporti Europei, marzo 2004.
- [11] Notteboom, T., Rodrigue, J.P. (2005), Port Regionalization: Toward a new Phase in port development, *Maritime Policy and management*, 32, 297-313
- [12] Roebuck, M. (2008), Netherlands-The ideal location to feed the blue banana, *International Freighting Weekly*, 28th April
- [13] Thomas, K. (2008), Container Shipping-The race for space, *International Freighting Weekly*, 25th February
- [14] Van der Horst, M.R., De Langen, P. (2008), *Coordination in hinterland transport chain: a major challenge for the seaport community*, *Maritime Economics & Logistics*, Vol. 10, Num. 1/2 (March/June 2008), 108-129
- [15] Van der Lugt, L. M.; de Langen, P. W. (2005), The changing role of ports as locations for logistics activities, *Journal of International Logistics and Trade*, Volume3, Number 2, December, pp.59~72
- [16] Van der Lugt, L., de Langen, P. (2007), Port authority strategy; beyond the landlord, proceedings International Association for Maritime Economists 2007, july 2007, Athens, Greece
- [17] Van Klink, A. (2003), The Kempen nexus, in *Struggling for leadership: Antwerp-Rotterdam port competition between 1870-2000*, ed. R. Loyen, E. Buyst, and G. Devos,

Sažetak

DISTRIBUCIJSKI CENTRI UNUTAR EUROPSKIH LUKA UZROK SU ZAKRČENOSTI CESTA: RIZICI I POVOLJNE PRILIKE ZA RAZVOJ HIBRIDNE LOGISTIKE

Sagraditi skladište za poslove logističke distribucije u području luke donosi tom području ekonomske prednosti, ali može imati i negativne posljedice na cestovni promet stvarajući gužvu u prometu. Na kraju krajeva, to se može protumačiti i kao gubitak vremena za radnike koji voze po glavnim prometnim cestama lučkih središta, pa čak biti i destimulativno za određivanje lučkih aktivnosti unutar luka. U ovom će se članku najprije opisati slučaj zakrčenosti ceste zbog lokacije mnogih Europskih distribucijskih centara (EDC) u Rotterdam-u, a zatim će se analizirati da li rasprostranjenost novih modela "hibridne logistike" (npr. korištenje i centraliziranih skladišta unutar područja luka i regionalnih skladišta u unutrašnjosti), koju su nedavno obradili neki stručnjaci, može ubuduće negativno utjecati na zakrčenost cesta u europskim lučkim središtima. Zaključak do kojeg se u ovom radu došlo jeste činjenica da, suprotno onome što neki istraživači pretpostavljaju, novi modeli hibridne logistike mogu stvarno imati pozitivan učinak na smanjenje zakrčenosti cesta u lučkim središtima ukoliko su intermodalni transportni sustavi od luka do unutrašnjosti pravilno integrirani unutar mreže distribucijske logistike, i to kako politikom koja podupire i koordinira intermodalni transport od mora do kopna, a kojeg trebaju organizirati lučke organizacije, tako i stvaranjem terminala na kopnu koji mogu osigurati prostor za distribucijske centre.

Ključne riječi: intermodalni transport, luka, hibridna logistika.

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