

LOGISTICS AND DELIVERY TIMES IN THE CERAMIC SECTOR: THE NEED FOR A LOGISTICS PLATFORM

**Vicente Rius ⁽¹⁾, Miguel Angel Moliner Tena ⁽²⁾, Javier Sánchez García ⁽²⁾,
Miguel Angel López Navarro ⁽²⁾, Lluís Callarisa Fiol ⁽²⁾
and Rosa María Rodríguez Artola. ⁽²⁾**

⁽¹⁾ Director of Planning Department. Castellón Harbour Authority

⁽²⁾ IMK

Innovation in Marketing, Research Group of the Advanced Services Network of
Universitat Jaume I of Castellón. Spain

ABSTRACT:

The present paper analyses the foreseeable evolution of goods transport and the need for ceramic clusters to equip themselves with appropriate logistics infrastructures to face the challenge of delivery times. The case of the European market of ceramic products, the world's largest consumer, is taken as an example, and the transport restrictions that exporters of ceramic products will have to face are analysed. Logistics presents itself as a first-order strategy for the future.

1. INTRODUCTION

Today nobody doubts the importance of logistics when it comes to understanding the success of any business. We, consumers, want to have products as soon as possible and at the lowest possible cost. The advances in information technology and in means of transport have allowed shortening times and cutting costs. Much of the blame for the globalisation of the economy stems from the advances in the logistics, which allow finished and semi-processed products to arrive on time in the farthest corners of the world.

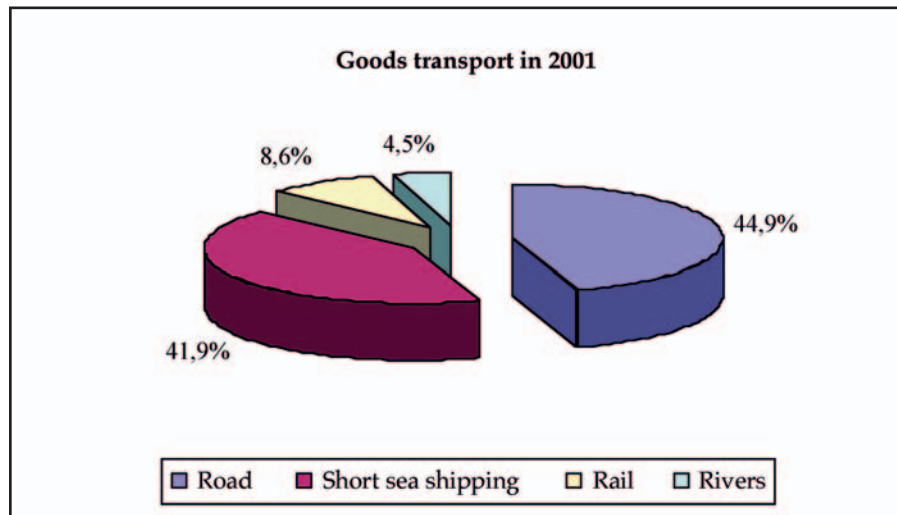
The ceramic sector has only paid relative attention to matters of logistics. It has only been a few years, for example, since Spanish ceramic companies started making important investments in intelligent stores, beginning to work against stock. The present paper posits this is insufficient. Setting the example of the European Union, the world's major consumer of ceramic products, the authors consider that delivery times will become a differentiating element of the first order. Together with this, the increase in fuel prices and restrictions on goods transport by road will entail a change in the logistics strategy of ceramic companies. For these reasons, the objective of the present paper is to demonstrate the strategic importance for clusters to equip themselves with first-order logistics infrastructures in order to maintain their competitiveness.

2. THE EUROPEAN UNION AND GOODS TRANSPORT

In 2002 the European Commission published the *White Book on the European Transport Policy for 2010: Time to Decide*. Its content is highly revealing as regards the future of the goods transport sector in the next few years. And, in particular, it points out what the priorities of the European governments regarding infrastructure and transport policies are going to be.

The *European Commission* has identified a series of difficulties in the European transport sector:

- Unequal growth of the different modes of transport; thus, road transport nowadays represents 45% of all goods transport, as opposed to 42% by short sea shipping, 8.5% by rail, and 4.5% by navigable routes. Between 1970 and 2000, the motor pool of the European Community has tripled, going from 62.5 million cars to almost 175 million. Every year the motor pool increases by a further 3 million cars.
- Congestion of the roads and most important railway axes, as well as of the cities and airports. In the case of the roads, an important part of the problem is due to international goods transport. Despite this, the Commission recognises that, for short trajectories, there is no alternative transport sufficiently adapted to the needs of the economy as transport by lorry.
- The harmful effects for the environment and for the health of citizens, without forgetting the high cost in human lives claimed by the roads every year (there were over 40,000 deaths on the roads in the year 2000 in the whole European Union).



Graph 1

It is calculated that around 10% of the European roads are affected daily by traffic jams. Similarly, 25% of the railway networks become authentic bottlenecks. In the case of the railway grid, it has been observed that in the United States 40% of the merchandise is transported by rail. In contrast, in Europe rail just represents 8%, perhaps because the average speed of goods transport by rail is 18 km/h¹. Such congestion is a very serious danger for the competitiveness of the European economy, because by 2010, traffic delays could entail a cost equivalent to 1% of Community GDP.

To this analysis by the European Union it is necessary to add a series of general, prevailing tendencies in logistics on a global level:

1. Stock reduction: stores tend to disappear
2. Smaller and more frequent shipments (3 out of every 4 shipments have a weight <1 metric ton; 5% of the total shipments have a weight >20 metric tons, and the fastest growing activities are those that generate small shipments)
3. Intense increase of short-distance lorry transport and moderate increase of the larger distance
4. Greater pressure on the road infrastructure, for the distribution of industrial products, consumption and circulation of goods in transit

Most of the infrastructure investments in the last few years have been in roads, but in the new context marked by sustainable development, the *European Commission* proposes to reorient the investments made towards rail, sea and river transport. This decision has been reinforced by the foresight that if the European Union takes no significant measures between now and the year 2010, lorry traffic will increase by almost 50% in regard to 1998.

The lines of action proposed by the *European Commission* are based on sustainable development, a principle introduced in the *Treaty of Amsterdam* and endorsed in the *European Council of Gothenburg*, where it was decided that rebalancing the transport modes would be the core of the sustainable development strategy.

¹ Note, however, the following datum: rail continues to represent over 40% of the market share of goods transport in Central and East European countries (if sea cabotage is excluded), which is very similar to that of the United States.

Although isolated measures have already been taken, such as prohibiting the circulation of lorries on weekends, there is no doubt that it is considered necessary to approach the problem from an increasingly intermodal vision. The *European Commission* envisages three possible strategies for rebalancing the different modes of transport:

- Focusing all the effort on reducing road transport by resorting to tariffication measures, i.e. increasing the cost of transport by road.
- Tariffing road transport to inhibit this and, in addition, putting in place measures to increase the efficiency of other modes (improvement of the quality of the service, of the logistics, application of new technologies, etc.).
- Combining tariffication of road transport, and revitalising alternative modes of transport, with incidental investments in the trans-European network.

The strategy to which the *European Commission* inclines is the third one, which will involve an increase in the cost of the goods transport by road and a policy of infrastructure investments for railroads, navigable routes, short sea shipping, and intermodal operations.

The main measures set out in the *White Book* are detailed in 60 concrete proposals, which, in relation to goods transport, may be summed up under six heads:

1. Revitalising rail transport. Railway transport is considered the strategic sector that will condition the rebalancing success in goods transport, since it decongests the roads and connects the ports to the cities. This will mean the opening up of markets to international goods transport and cabotage in national markets (so that trains will not circulate empty). In this sense, it is also proposed to have a railway network exclusively for goods transport. In any case, the *European Commission* is very ambitious and has proposed a goods transport market share for rail of 35%.
2. Reinforcing the quality of road transport. Undoubtedly, the main appeal of goods transport by road lies in its incomparable flexibility and lower cost than other modes of transport. But the congestion and the priority of the environment require putting in place measures, such as tariffication, which makes payment approach the actual transport cost involved (investments in roads, pollution). It is also proposed to reinforce and harmonise the control procedures on lorries in order to achieve conformity to regulations regarding speed, driving times, etc. In this sense, the *European Commission* wonders why long-distance goods transport by lorry is maintained and even fostered, when alternative solutions exist. This is considered to be partly due to the persistence of practices that falsify competition standards and whose disappearance will not so much require new standards as an effective application of ones in force, thanks to the consolidation and harmonisation of penalties.
3. Fostering sea and river transport. Short sea shipping and river transport are two transport modes that can respond to the congestion of some road infrastructures and to the lack of railway infrastructures. The reactivation of short sea shipping requires the creation of authentic sea highways, and involves a greater connection of ports to the rail and river networks, as well as greater quality of the harbour services. Some maritime connections (especially those that will enable avoiding the strangulation points, like the Alps, the Pyrenees, the Benelux), will be included in the trans-European

network. Finally, the *European Commission* seeks to equip EU with reinforced standards on maritime safety.

With respect to river transport, which is by nature an intermodal transport, it is proposed to reinforce its position by creating river connections and installing transfer systems to allow the continuous passage of ships all year round.

4. Materialising intermodality. The intermodality resource has a fundamental importance for the development of competitive alternatives to road transport. Technical harmonisation and inter-operability between systems, in particular for containers, are considered high-priority measures. In addition, the Community support programme *Marco Polo* is also being launched, which focuses on innovative initiatives, especially fostering sea highways.
5. Deciding on a policy of effective transport tariffication. The basic idea guiding this policy is that the different modes of transport must pay the costs they generate (congestion, preliminary processes, atmospheric pollution, urban impact, noise, effect on nature and landscape, accidents and climate change). This tariffication will especially be centred on road transport, although the other modes will also have to follow the same principle. The *European Commission* considers highway maintenance would cost six times less if only cars were used. A calculation of the external cost and infrastructure of a lorry for a route of 100 km on a little-congested highway would range from 8€ to 36€². At the moment the average fiscal load that a lorry bears is between 12€ and 24€, of which 8.3€ refers to infrastructures. In any case priority will be given to the construction of infrastructures³ that foster intermodality and offer an alternative that is more respectful with the environment.
6. Developing medium and long-term environmental objectives for a system of sustainable transport.

3. THE IMPACT ON THE EUROPEAN MARKET OF CERAMIC PRODUCTS

All these reflections are going to directly affect the export logistics of ceramic products. If we take the Spanish or the Italian case as an example, around 50% of ceramic exports go to the European Union. Normally this transport is by lorry, with little use of rail. If the tariffication materialises and the controls on lorries intensify, in addition to the usual cost already related to the bottlenecks, it will be necessary to add a direct cost increase (between 8€ and 36€ per 100 km). To all this it is necessary to add the dramatic increase in the price of diesel oil in the last few years, which displays a continuously rising tendency.

In addition to these problems relating to logistics it is further necessary to take into account the situation of the European market itself. Except for some countries like Spain, Great Britain or Ireland, the large countries are going through a phase of economic stagnation (Germany, France and Italy). The EU enlargement with the Eastern European countries up new markets, but they are countries in which the logistics infrastructures are poorly developed. The basic strategies that many ceramic companies follow in the European market are grounded on price and product quality.

2 The calculation breakdown is as follows: atmospheric pollution: 2.3-15; climate change: 0.2-1.54; infrastructure: 2.1-3.3; noise: 0.7-4; accidents: 0.2-2.6; congestion: 2.7-9.3.

3 In Germany the duty foreseen for infrastructures is 13€ and in Switzerland the duty in force is 36€.

Few try to differentiate themselves from the rest though service and delivery times, even though it has been verified that the European consumer values speed and delivery times. In addition, European clients buy increasingly smaller amounts, but do so more frequently, a phenomenon known in the sector as 'groupage'. For all these reasons, delivery times in these prestige markets are fundamental in order not to lose market share, which is why the decisions regarding logistics are decisive.

The design of these intelligent stores, which mirror those being used by commercial distribution companies, provide a partial solution to the logistic problem facing the ceramic companies. However, management of delivery times does not just depend on store management. Before reaching the store, a product must be made, which depends on the product portfolio of the company, and on the production programming. After the products have been deposited in the store, delivery times are going to depend on the congestion of the roads and the ports, or the connections and the regularity of the chosen means of transport.

The internal management of the product portfolio and production programming are important problems for ceramic companies, but these lie beyond the scope of this paper. The objective of this paper is to highlight the need for an integral solution to the logistics of ceramic companies located in a cluster. For this, the need is addressed of equipping clusters with appropriate communication infrastructures, which connect them by high capacity overland routes with seaports. However, for an industrial cluster to continue being competitive and maintaining its jobs, it is necessary nowadays to go a step further. It is necessary to have an intermodal logistics platform, in which all the modes of transport come together.

A logistics platform would enable covering an expensive shortcoming, which is important for the improvement of delivery times. A study carried out in 2004 by *IMK Innovation in Marketing of the UJI* and by the *Harbour Authority of Castellón* revealed the importance of these logistics centres in regard to delivery times. Interviews were held with 36 Italian ceramic manufacturers, who were asked to evaluate the logistics centre of Sassuolo (Table 1).

	Mean	n
Favours management of groupages	4.15	34
Helps improve the company image	4.14	36
Helps improve the quality of the service offered to clients	4.08	36
Improves the organisation of transport in general	3.94	36
Helps meet delivery deadlines	3.67	36
Reduces delivery times	3.59	34
Shorter product commercialisation time	3.57	35
Improvement in stock management efficiency	3.44	36
Cost savings in general	3.39	36
Improvement in the organisation of sea shipping	3.06	35
Reduction of paperwork and administrative costs	2.97	36
Minimisation of costs and risks of inventory	2.50	36

The "n" column indicates the valid number of answers.

A rating of 1 is 'fully in disagreement' with the statement and 5 is 'fully in agreement'

Table 1. Evaluation of the specialised logistics centre for ceramic products in Sassuolo (Italy)
Source: interviews of Heads of exports at Italian ceramic companies

The Bologna Centre of Intermodal Transport (Interporto of Bologna) comprises an integrated logistic system, with road and rail infrastructures designed for goods transport, and is connected directly to the Italian rail and roads networks (www.bo.interporto.it).

The Interporto of Bologna covers an area of 2,000,000 m² of which 650,000 m² belong to TRENITALIA S.p.A. An area of 2,270,000 m² has been set aside for future expansion. At present it houses 81 national and international transport companies, customs offices, public depots, a petrol station, banks, post office and cafeterias. In all, in 2003, 236,000 m² of building space were already occupied (offices and depots provided with raised loading bays or platforms).

The following facilities are currently running:

- 13 depots equipped with raised loading bays and offices
- 4 depots with raised loading bays, railway exchange and offices
- 5 large-sized depots
- General depots for storage
- Post office
- Customs District
- Services and Management Centre
- Areas for parking and loading/unloading operations
- Intermodal stations of the Italian Railroads
- Rinfuse Terminal
- Petrol station



In 2002, total traffic of the merchandise mobilised at the Transport Centre, by road and rail, ascended to approximately 3,906,000 tons. This year, the railway terminal alone has mobilised more than 1,706,000 tons, approximately equivalent to 68,300 trucks that would have used roads and highways.

Nevertheless, the logistics centre concept has evolved and one now speaks of logistics platforms and logistics activities areas, linked to seaports. Throughout Europe logistics platforms are being designed and constructed around the seaports, since this is the best way to assure intermodality and sustainability. In the following we shall describe what the logistics platform concept involves.

4. LOGISTICS PLATFORMS

The logistics concept has evolved from the storage and transports of goods to a conception related to the satisfaction of clients' transport needs. A good example is the definition by the *Catalan Institute of Logistics*, which defines logistics as 'the strategy that enables, in each case, meeting the client's requirements with maximum safety and an optimum combination of costs, resources and stocks in close collaboration with the members of the overall supply chain'. This means that logistics must make an effort to optimise times and costs, without neglecting safety, in a comprehensive view of the logistics chain. This view may be observed in the large international logistic operators who combine all the modes of transport and sometimes even run the stores of their large clients. That is, logistics is being outsourced or externalised in companies to specialists who offer integral solutions.

Together with the need, not exclusively of the ceramic sector, to manage groupages and to have to work 'just-in-time' with its distributing clients, another general phenomenon that has revolutionised logistics lately has been the containerisation of high-value manufactured goods. A standardisation of the containers sizes has been established, with which the transshipment between different modes of transports has gained in efficiency, in addition eliminating specific problems stemming from the peculiarities of each country or region. This traffic is generating a demand for specialised logistics services, which requires the creation of a specific infrastructure, known as a Logistics Platform.

A Logistics platform or Logistics Activities Area is defined as a large area of land equipped with connections for intermodal transport, with installations for load storage, rupture, concentration and distribution, centres of tertiary activities related to international trade, offices for companies from different fields of production, which need information and connection with the global trade networks, and any other types of installations that enable implementing processes that increase the value of the merchandise (such as packaging, labelling, quality control, etc.). Therefore, an area is involved in which operators concentrate that perform some or all of the logistics activities, with a view to satisfying the time, costs and security needs of their clients.

In themselves, logistics platforms are a source of wealth generation and job creation, since the companies that are located there are labour-intensive. In the case of industrial concentrations, such as with clusters, logistics platforms may specialise, as in Vigo with automobiles.

5. A LOGISTICS PLATFORM, A CERAMIC CLUSTER NEED

According to Porter (1998) *clusters* are 'geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field (sector) that are present in a nation or region'. *Clusters* are successful because they increase the productivity of companies. Porter (1998, 2000) states that the development and fostering of clusters are an important issue on the agenda of governments, companies and other institutions.

Clusters represent an ideal breeding ground for reaching high levels of productivity and innovation. This is a paradox in an era of global competition. In theory, the geographic location should not be a source of competitive advantage. Open global markets, rapid transport, and high-speed communications enable any company to obtain anything from any place and at any time.

However, in practice, geographic location continues to be a core element in company competitiveness. The present economic map of the world is characterised by *clusters*. The most famous examples are *Silicone Valley* and *Hollywood*, but *clusters* dominate the global landscape.

Clusters affect competitiveness in three ways:

1. increasing the productivity of the companies located in the area
2. leading innovation
3. stimulating the formation of new businesses within the cluster

Geographic, cultural and institutional proximity means that companies have a special accessibility to resources, closer relations, better information, more incentives to innovate and other advantages that are difficult to obtain from a distance.

According to Porter (1998) the more complex, the more knowledge-based, and the more dynamic the global economy becomes, the more advantages has the *cluster*. The competitive advantage lies increasingly in local things – knowledge, relations, and motivation – which distant competitors cannot reproduce.

Therefore, competition, aside from being between ceramic companies, lies between ceramic *clusters*. It is necessary that the institutions, companies and universities that make up the cluster should tighten their ties.

A key point for the companies in the *cluster* to be able to access the European market lies in logistics. In the Spanish ceramic cluster, many ceramic companies in the *cluster* have made a great effort to improve their internal logistics in recent years. However, it is necessary to invest in the external logistics infrastructures in order to enhance the competitiveness of a *cluster* with regard to other ceramic *clusters*.

Let us focus now on the case of the Spanish ceramic cluster. One of the main features of the Spanish ceramic sector is the high concentration of the industry in Castellón province; in 2003 it concentrated 80 % of the tile companies and 94 % of tile production, which has reached 624 million m² tile, and represents 10 % worldwide, only exceeded by China. Total EU production is 1419 million m², of which the Spanish share is 44 %. The sector provides direct employment for 25,200 workers and indirect employment for more than 6000.

Another characteristic of the sector is its variety, since there are a great number of product references: 2000 basic pieces and 6000 trims, involving long production processes that need anticipatory planning and which may have a highly constraining effect on the flexibility of the demand, considering, in addition, that ceramic materials are very heavy and fragile, which lead to low transport optimisation in regard to volume.

Tile exports in year 2003 went to 186 countries and totalled 1939 million euros (56% of the total turnover), with Spain being the second exporting country behind Italy.

The globalisation process of the economy is forcing the ceramic sector to act in a competitive environment in which, besides higher demands as far as quality and level of service are concerned, the sector must take into account other factors, such as flexibility, availability, rapidity and geographic coverage of its supply and distribution chains. For this, logistics should become a competitive factor for differentiation and added value. Thus, for the production companies, it is vital to control the entire logistics chain in order to offer customised quality service to their clients.

One of the ways of maintaining/increasing the competitiveness of the companies is by creating a logistics platform at source, located in the vicinity of the cluster, whose location should take into account the demands of the sector operators and companies that will need to establish themselves there, and which are as follows:

- High maritime connectivity, with a variety of destination ports and high-frequency maritime lines.
- High overland connectivity, to the general motorway, highway, and rail networks.
- Favourable environmental factors, such as image, environmental quality, high level business environment, international projection, and information and telematic synergies, which convert the Logistics Platform into an intelligent area.

The benefits deriving from the creation of a Logistics platform for the ceramic sector would include:

- Covering the needs of the national and international clients of the ceramic product manufacturers in regard to shorter finished product delivery times.
- Rationalising the capillary pick-up at the companies of small product consignments, reception and grouping of these consignments, and their classification by destinations.
- Eliminating the traffic congestion of lorries on the roads.
- Lowering transport costs, which in recent months have been subject to rising diesel oil prices.
- Eliminating saturation and downtimes at factories for the loading of the finished product.
- Functional simplification of the excessive number of product handling stages in the pick-up and delivery service.

6. THE SPANISH CERAMIC CLUSTER AND PARC CASTELLO

The Valencia Region presents itself as one of the regions of the European Union with the greatest appeal for the development of new economic, cultural and environmental projects.

Castellón province features, as its main economic activity, the tile manufacturing industry. The realisation of *Parc Castelló* (Castellón Park) will facilitate the arrival of solid bulk materials for the ceramic sector, while at the same time intensifying exports of goods like ceramics, furniture or glazes, which is why locating a logistics platform for the ceramic sector would be feasible.

Parc Castelló is an initiative promoted by the Generalitat Valenciana (Autonomous Government), through SEPIVA, which seeks to strengthen the area of economic and enterprise development in Castellón, thus consolidating its economic and productive competitiveness.

Parc Castelló will include a total area of 1,250,000 square metres, with the following layout: 750,000 square metres to the industrial zone and logistics; 300,000 square metres to roads and 200,000 square metres to green spaces, designed to integrate the project in the environment.

The investment foreseen by SEPIVA in the construction of *Parc Castelló* is 80 million euros. The park will be able to house 100 companies, and it is expected to produce 5,000 jobs and an induced investment of 1000 million euros.

The park is located between the CN-225 road, the new access to the port of Castellón, and the old route to the sea, 'el Camino Viejo al Mar', forming a triangle whose dimensions include a total of 11 million square metres, of which one and a half million square metres will correspond to *Parc Castelló*.

Thus, *Parc Castelló* presents itself as an intermodal logistics platform that will enable reducing costs for transport, storage and distribution of merchandise, serving as operational base for the groupages of the ceramic sector and other types of goods, which will contribute increasing traffic in the port of Castellón, offering land and sea protection to all the logistics of the operators, and even to the own exporter/importers who wish to use these facilities for distribution, concentration and activities of added value.

In short, the Spanish cluster ceramic needs to equip itself with a logistics platform that allows rationalising and optimising the logistics of its products. In a global environment where the competition in product quality and prices is intensifying, it is necessary to seek new, differentiating elements. European ceramic products distributors do not want to have stocks of products and, in addition, EU consumers are sensitive to delivery times, which is why the solution requires creating a logistics platform that provides services for the cluster.

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