



**OPTIMIZATION OF LOCAL TRANSPORTATION COSTS FROM CONSOLIDATION
AND DECONSOLIDATION LOADS**

ANGELICA HENAO SIERRA

LIZETH CAROLINA NICHOLLS ACEVEDO

SANDRA CATHERINE CASTAÑO GAVIRIA

**INSTITUCIÓN UNIVERSITARIA ESUMER
FACULTAD DE ESTUDIOS INTERNACIONALES
MEDELLÍN, COLOMBIA**

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ANGÉLICA HENAO SIERRA

LIZETH CAROLINA NICHOLLS ACEVEDO

SANDRA CATHERINE CASTAÑO GAVIRIA

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Director (a):

**ISABEL CRISTINA ÁLZATE RENDÓN, LOGISTICS MANAGEMENT SPECIALIST
INTERNACIONAL**

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**INSTITUCIÓN UNIVERSITARIA ESUMER
FACULTAD DE ESTUDIOS INTERNACIONALES
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DEDICATIONS

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ABSTRACT

Today transportation supply chain companies worldwide, has established itself as a key process to ensure that other chain processes perform their management efficiently, this added weight, which is in the final cost of product.

This study aims to offer Colombian companies an alternative to reducing landside freight through a model of deconsolidation and consolidation of nationalized cargo in ports, plus the savings generated by the reduction in delays container. Also, this model will parallel a contribution to the reduction in the emission of greenhouse gases due to the decrease in the flow of cargo vehicles from ports (green logistics).

The development of the study will begin offering the reader an overview of the current state and evolution of freight transportation in Colombia also factors that currently affect the increase in transport costs, followed by the

Keywords: National Transportation Cost Optimization, consolidation, deconsolidation, Logistics Costs, Freight

LIST OF SYMBOLS AND ABBREVIATIONS

List of Symbols

- ✓ **T:** Indicates the symbol Tons
- ✓ **M3 o m3:** Indicates the symbol Cubic Meters
- ✓ **%:** Indicates percent symbol

List of abbreviations

BID: The term in English is Bidding and refers to the rate agreed between the carrier and the cargo-generating company

INTRODUCTION

This research refers to the transport of domestic cargo as one of the most influential Growth Factors in the cost of goods produced and the need for companies to mitigate or reduce significantly the costs generated during transportation of cargo post-process nationalization in port.

Main objective of this research intend to offer Colombian companies an alternative for mobilizing loads at low cost based on a model of consolidation and deconsolidation.

During the development of the study is to evaluate the most influential factors in the high logistics costs and offer following the need for reducing these, an alternative that allows generating freight companies reduce costs in the logistics chain, which they will be reflected in the price of the final product produced.

The method used in this research involves taking a sample taken 20 generators charge and 20 transport companies which will be evaluated through a series of questions so well known is the model and therefore is used in national transport market. In addition to the above the results obtained and the advantages that the model represents in reducing costs evaluated.

1. FORMULATION OF THE PROJECT

1.1 Background

Today, it has become very important in business continuous, the improvement of the supply chain from adhering to this process.

For this project, it will be taken as a fundamental basis the literature collected about road transport in Colombia, and that despite its size, does not have a study of similar characteristics to this project. Previous studies emphasize the great dependence of Colombian land transport industries to mobilize their loads into the country.

Gutiérrez (2013) refers to the explanation of bank World Bank, in which it is said that there is in Colombia a lack of coordination between rivers, roads and railways, a condition which increases by 50% transportation costs, while in Europe 60% of transport is Multimodal. The author concludes from this report that the savings Colombian companies in terms of transport costs depend on the rates that trasportadoras companies can provide them, ie, lowest cost only in this way reductions will be in logistics costs associated with this link.

Other studies related to national freight propose an integrated infrastructure in Colombia through public investment development. These projects building pose interconnected pathways that

promote free flow of goods. In a clear example, Müller (2004) suggests that each department of Colombia should employ a mode of transport depending on its systematic advantages.

1.1.1 State of the Art. Despite the lack of Colombian companies, which considered wrong so that their reductions in logistics costs related to road transport could only be achieved through a reduction in rates granted by transportation companies, today companies have begun to dump to the areas involved in the processes of distribution, supply and transportation to improve processes and design strategies aimed at reducing costs and increasing profits for the company.

Given the above, organizations have begun to realize projects and to seek added transport processes constitute a significant tool for saving time and money.

It is important to highlight that to know the current state of national transport in Colombia, one must address a lot of factors involved in the subject, these range from the more general topics such as geography and Colombian economic development, to the most specific as the location of production sites and the location of the target market.

According Yepes, Ramirez Villar, & Aguilar (2013), Colombia is lagging behind in road infrastructure both ports, airports, railways and roads. Provisions in infrastructure especially the roads are very low compared to other Latin American countries and even compared with developing East Asian countries. This study raises a challenge and that is if Colombia does not

have adequate infrastructure, it is possible that national transport is a complex issue for Colombian companies and have economic impacts for them to be reflected high transport costs.

Studies related to this topic generally conclude on the need to invest in road development of our country, such as:

"To close the gap in the country in infrastructure, compared to the level of provisions that should have given its development, Colombia needs to invest annually over the next decade, 5.39% of PIB. These funds also allow us to build the infrastructure required to meet the additional increase in demand resulting from economic growth and population to be observed during this period so that the delay not rise again "(Yepez, 2014)

In addition to this, so that there is adequate distribution and supply of products should take into account factors such as: planning, implementation timelines, delivery times identified by supplier, delivery locations and contemplate mishaps that may occur to minimize the risks of the operation and enable timely or that product is being distributed delivery.

In Colombia freight transport has become a very competitive sector, as trade grows customers that require the use of this type of service are increasingly demanding and ask for more advantages in cost, speed, and reliability. This situation is one of the biggest concerns that Colombian firms have when choosing the transport company.

Ground transportation in Colombia and throughout Latin America behaves as one of the cost factors most affecting regional trade competitiveness, hence the need to provide alternatives for reducing logistics costs combined transport.

"As world trade is growing at a great pace, so do the requirements for efficient and economical transportation, both within the country and for international trade. By increasing competitiveness in major markets is forcing the country to adapt and offer customers advantages of cost, speed, reliability and flexibility in the distribution of goods". That is why the process of decision making in transport is one of the issues that most concern at the management level. "(Bravo, Orejuela, & Osorio, 2007)

Finally, as mentioned in the background, multiple literature exists which is all the conceptual foundation and research on the subject under study and that would be the starting point for the construction of this project.

1.2 Problem

High logistics costs are a major concern that companies have in the national distribution. Every day thousands of companies must take large amounts of money on freight costs of inputs they import or export, which are subsequently added to the value of the final product and borne by the consumer. If logistics costs are high, the total product cost will be high affecting the competitiveness of this market.

This project aims to propose the deconsolidation and consolidation of cargo in ports as a strategy to lower costs, companies can save on domestic freight and thus significantly reduce the costs incurred by the national transport once completed the process of nationalization of goods .

1.3 Justification

In the process of national transport, each company operates differently depending on their need. In companies is not only the responsibility of determining the distribution system that best reflects your business model, your product or your target market fits, is also the responsibility to face daily obstacles to the normal functioning of the process transport such as high costs.

In conducting this study may determine how companies currently operate on the issue of national transport, besides showing through the theory, how to make improvements in related processes and allow optimization of costs in local transport.

The benefits it can bring to businesses having more lean processes and also generate economic for this benefit, this is very important if looked at from the perspective of the supply chain, and are also a fundamental value that provides the possibility of finding opportunities to improve results in its commercial management and logistics

This project seeks to provide a benefit for companies by implementing transport optimization, coupled with the identification of implemented innovations that have shown a positive impact on logistics process of the supply chain. The study is primarily a logistical enrichment for students of international business and contribute to future studies on the subject.

Finally it is important to note that this project not only represents significant savings in transportation costs, but also the positive environmental impact that consolidation of loads, since the emission of greenhouse gases will be reduced favorably.

1.4 Objectives

1.4.1 General objective. Demonstrate through a logistic model potential cost reduction in the national transport through deconsolidation and consolidation of import charges in Colombian port terminals.

1.4.2 Specific objectives.

- Describe the development of road transport in Colombia during the last decade (2005-2015).
- Identify factors influencing the increased logistics costs related to national freight.
- Illustrate deconsolidation and consolidation process of nationalized charges in Colombian ports and subject to national transport.
- Analyze the positive impact of Colombian companies with the implementation of this type of model.

1.5 Methodological Framework

1.5.1 Method. The research addressed in this project is explanatory because it seeks to expose the impacts associated costs to transport the final product, in addition to exposing the benefits of improved processes involved in national transport as are the deconsolidation and consolidation cargo port terminals.

In addition to the above, the information gathered from primary and secondary sources to develop the objectives will be analyzed to better understand the process and determine procedures to optimize the cost of transport.

Although this project is of explanatory type, semi-structured opinion surveys would make to people working in the transport sector, which will be tabulated in order to complement the information collected will be made.

1.5.2 Methodology. The collection of primary data is conducted through semi-structured surveys personnel transport companies to know how informed they are about the consolidation and deconsolidation of cargo in port terminals, as well as identifying valuable information for the development of this project. Secondary information about the topic under study will be taken from the internet search, reference books, journals and database which will serve as a guide in the development of the project.

1.6 Scope

This project performs the analysis of road transport and the consolidation and deconsolidation of cargo in ports in Colombia during the years 2005 to 2015.

2. IMPLEMENTATION OF THE PROJECT

2.1. Evolution of road transport in Colombia

To start with the analysis of the issues that are relevant to this study, it is important to start with the history of transportation in Colombia, more specifically and overtaking the last decade, where it is common to find that those who have studied and researched the matter, usually they conclude in two important aspects. The first of these is the delay in the Colombian infrastructure, and the second corresponds to the failure to develop other modes of transport such as rail and river system, a condition that promotes reliance on road transport for handling loads to inside the country.

According Mintransporte (2011), in the last decade Colombia has been concerned about investing in the infrastructure sector and has developed important projects of national significance because it recognizes the importance of the issue to successful economic growth.

Among the investments that have been made have been carried out the construction of new roads, tunnels and bridges have improved security conditions and service at airports, and in addition, has worked constantly on the road maintenance river and sea.

According to the Office of Communications of the ANI (2015) During the current government of President Juan Manuel Santos, it is carried out the execution of an infrastructure program

highway road called 4G or fourth generation highways. The main objective of this mega project is to enable the country to develop so that it can be more competitive to meet the challenges of foreign trade, minimize transit times within the country, lead to a decrease in transportation costs due to transits shorter and finally close the gap between industries located within the country with major seaports.

Torres, Hoyos, Villegas, & Fernandez (2013) believe that for the case of Colombia, it is clear deficiency in road infrastructure, which is a problem for organizations, and the absence of clear central government policies, challenge must be taken up by companies from the perspective of projects that provides engineering and logistics, to make transport processes more optimal and efficient, generating better costs, and ultimately not further compromise the other processes that make up the chain of supply.

On the other hand, the Banco Interamericano de Desarrollo BID (2010) relates in his article that the movement of international trade loads has shown an important dynamic which has led to both organizations and the governments of the countries, give the relevant relevance . With the opening of economies and, consequently, the expansion of supply chains can say that globalization has resulted intensive transport.

The BID also argues that governments have been taking note of this new scenario and have initiated a number of projects in their quest to improve the competitiveness of their economies, seeking to improve the quality of logistics performance.

Figure # 1 in the list of criteria according to the BID (2010) are the logistical impediment to the development of Colombia shown.

Table 1. Problems identified by the BID for logistics development in Colombia

(Banco Interamericano de Desarrollo BID, 2010)

Despite the difficulties of the roads and the complexities of transit through these, about 81% of cargoes subject to foreign trade in Colombia are mobilized in road transport (Banco Interamericano de Desarrollo, BID 2010).

Colombia

- Institutional / Dispersion weakness Base Information.
- Falencia road infrastructure.
- Inefficient operation of road freight transportation and logistics operators.
- Little development of other modes of transport other than domestic trucks: Railroad (excluding coal) Fluvial.
- Problem port capacity and competition, particularly in the Pacific Coast.
- Limited use of information and communication technologies.
- Interest in the development of logistics platforms linked with runners.

However, thanks to a series of reforms and changes governments shift in the last decade, the situation for land freight transport has come in improving significantly, without neglecting, still

drawbacks are presented in terms of security, but allow the mobilization of cargo for sustainable development of the nation (Cogollo & Hernandez, 2010).

2.2 Factors influencing the increase in logistics costs associated national freight.

To identify the factors influencing the increase of logistics costs in Colombia related to national freight forwarding, it shall be based on the report of the Consejo Privado de Competitividad (2013). In this report, it is expressed concretely the factors that increase the logistics costs in Colombia. One of them is the low logistics performance of the country and delays in road infrastructure, already mentioned throughout the present study situation, however, there are other elements that under national competitiveness report also represent a bottleneck, these factors are:

- ✓ **Lack of competitiveness in the freight sector.** Thanks to the lack possessing today transport companies in providing competitive services, thus affecting the country's logistics performance.





"The sector is characterized by highly informal, which means low standards in service delivery. In turn, transport companies suffer from true management schemes. Additionally, there are shortcomings in human capital and there is no agenda for science, technology and innovation for the sector strong "(Consejo Privado de Competitividad, 2013)

- ✓ **Lack of multimodal transport and lack of logistics platforms.** Other modes of transport also efficient as river transport and Ferrous which are little used and developed systems in the country.
- ✓ **The lack of efficiency in foreign trade procedures in ports.** Delays in customs processes generate additional costs on imported and exported products.

Figure # 2 the quality of infrastructure according to the Privy Council on Competitiveness (2013) compared to other countries shown. The indices reflect for 148 countries, generally and for each mode of transport, the answers to the question: how would you rate the infrastructure in your country? (1 = extremely poor, 7 = extensive and efficient by international standards).

Table 2. Classification Infrastructure

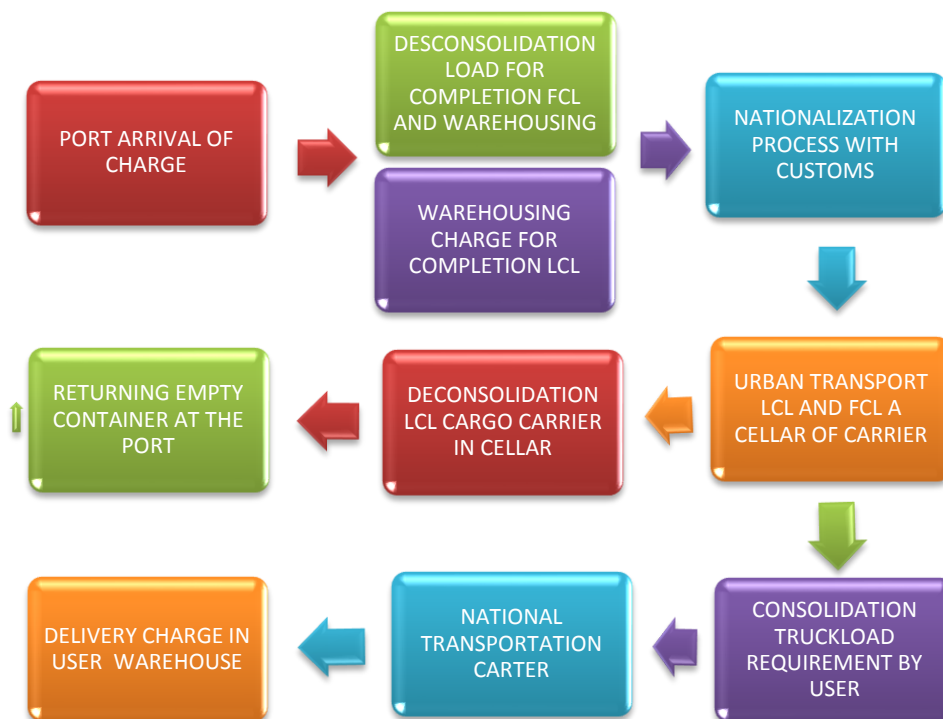
(Consejo Privado de Competitividad, 2013)

País								
	Red vial		Red férrea		Infraestructura portuaria		Infraestructura aérea	
	Puesto	Puntaje	Puesto	Puntaje	Puesto	Puntaje	Puesto	Puntaje
Corea del Sur	15	5,8	8	5,7	21	5,5	22	5,8
Malasia	23	5,4	18	4,8	24	5,4	20	5,8
Panamá	48	4,8	30	4,2	6	6,4	5	6,3
Turquía	44	4,9	52	3,1	63	4,3	33	5,5
Chile	27	5,4	65	2,7	32	5,2	46	5,2
Suráfrica	41	4,9	48	3,4	51	4,7	11	6,1
México	51	4,6	60	2,8	62	4,4	64	4,7
Perú	98	3,3	102	1,8	93	3,7	85	4,2
Brasil	120	2,8	103	1,8	131	2,7	123	3,3
Colombia	130	2,6	113	1,5	110	3,5	96	4,0

Finally, although as suggested by the Consejo Privado de Competitividad (2013) the construction of a modern transport network for the country from a process of continuous planning is necessary, organizations should seek to optimize their costs calve projects or models for the effective and efficient reduction of these.

2.3 Process deconsolidation and consolidation of nationalized loads

Chart 1. Process deconsolidation and consolidation of nationalized loads



Source: Own made

To understand how the model used in this paper, it is important to build on the Graphic No 1 which shows a step by step process with loads since their arrival in ports of Colombia to delivery at the customer warehouses. The following explains in order each of the steps:

- **First:** Arrival of cargo at Port
- **Second:**
 - If the load or up LCL (Less Container Load - loose load), proceed to its deconsolidation (descontenedorización) and subsequently leads to the cellar of the port, the charge is finally terminated by the bulking agent.
 - If the load up or FCL (Full Container Load - CONTAINER) is desunitariza and is subsequently passed to the warehouse to the port, the charge is finally terminated by the bulking agent.
- **Third:** Nationalization of loads by the customs agency.
- **Fourth:** Public transport (city of arrival) loads LCL and FCL to hold the conveyor.
 - The load or FCL (descontenedoriza) was deconsolidated to make the return of the container to the port.
- ✓ **Fifth:** Nurturing truckload according to customer requirements. This consolidation aims to optimize transportation so that their final destination may take several loads at a lower cost.
- **Sixth:** Domestic transport road.
- **Seventh:** Cargo Delivery cellaring user.

As is well described in the process, saving on transport costs are reflected national road from step five, when a load is consolidated with other for land transport. Colombian companies only pay a fraction of freight according to the volume or weight of the load being used inside the vehicle, and further, is achieved for cargo containerized savings paying Drop off¹ for returning the container and freight back from this port. A practical example of this model might be:

Suppose that an importing company in Colombia purchase in Mexico of X tons of cargo with a volume of 10 cubic meters. After the nationalization process and delivered the cargo to the carrier, the importing company would have two alternatives to transport cargo to the warehouse: The first is to pay the full quota of a vehicle, and the second is to transport consolidated with a second Importer or taking hold of your carrier several loads of your property, which subsequently and as required, be consolidated cargo to be transported to his warehouse.

Because if the importing company opt for the first alternative, the minimum payment to be paid will be the full quota of a vehicle type turbo paying for 4.5 T and 20 m3. If, however, the importing company is decided by the second option, this would only pay the amount corresponding to 2T freight and 10 m3 corresponding to weight and volume of its load as the second largest importer would pay for the other 2T and the percentage of remaining volume, obtaining a significant reduction in the cost of local ground transportation.

¹ Drop off: It is a cost that the shipping invoice line for delivery at the city of final destination of the cargo.

In addition to the above, a decrease identified in the number of vehicles used, if the first importing company had chosen the first option, not only would have paid more for transportation of cargo, also have left a second vehicle to travel since the second importer would have seen the need to hire cargo shipment, a condition that increases the emission of greenhouse gases.

If the importer use exclusively the model, that is, just be mobilized consolidated loads your property charge, the savings would be higher and should be supported by a planning process imports and the selection and certification strict providers and strategically.

3. FINDINGS

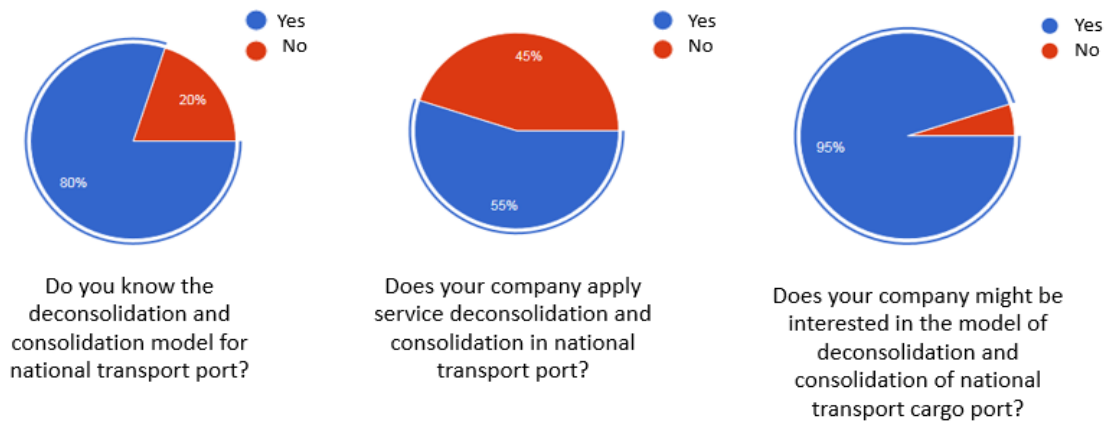
3.1 Sample Characteristics

The sample includes 20 user companies surveyed national road transport, among which are: Proplas S.A, Haceb Industries, Banacol, Leather Velez, Faismon S.A., Avon, among others.

Of the total respondents, ChartNo. 2 to the question Do you know the deconsolidation and consolidation model for national transport port?, 80% of respondents said that if they know this service. They were also asked the question Does your service company applies deconsolidation and consolidation in national transport port?, to which 55% of respondents gave a positive answer and 45% responded negatively.

Similarly Chart No. 2 shows the results of the question that was done in order to know how much you might be interested in the model to business users of the national transport. To the question: **Does your company might be interested in the model of deconsolidation and consolidation of national transport cargo port?** 95% of respondents answered that they would be interested this model.

Chart 2. Characteristics of Sample 1

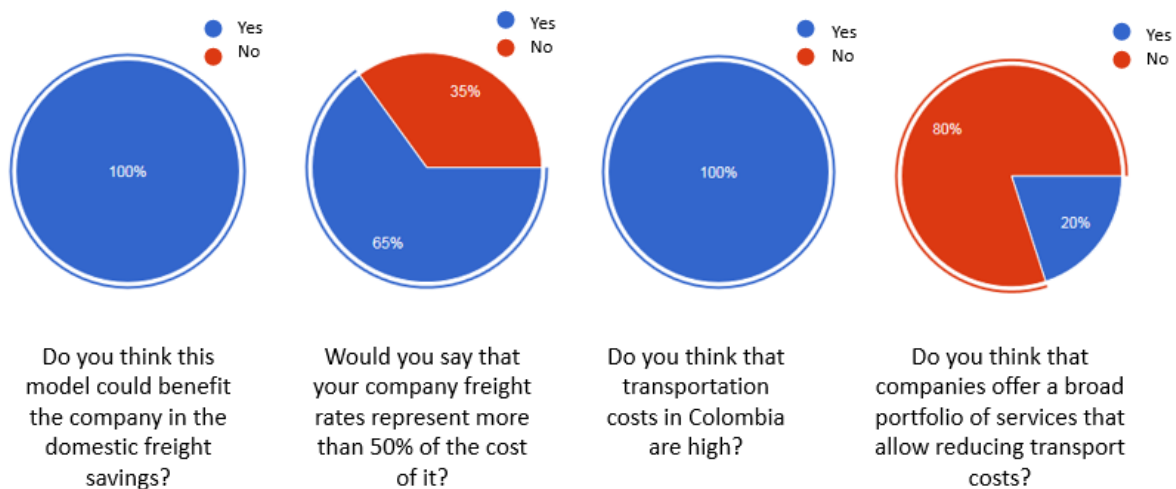


As Shown in Chart No. 3 to the question: **Do you think that this model could benefit the company in the domestic freight savings?** 100% of respondents answered yes. Similarly, the question was asked: **would you say that your company freight rates represent more than 50% of the cost of it?** what 65% of respondents said that freight rates represent more than 50% of the costs of it. We can clearly notice that this model would be helpful for national road transport users, thus achieving a considerable reduction in freight rates and reflect them in the final product cost.

While there are multiple methods for optimization of transport from the perspective of engineering such as mathematical models, for example programming Bellman, which is an efficient tool for optimization and that can be applied to problems with discrete variables or continuous (Torres, Hoyos, Villegas, & Fernandez, 2013); from the perspective of international business in combination with logistics, such proposals seek to improve companies not only their logistics costs, but also organize from the planning of imports, coupled with a selection and certification of their suppliers, processes or coordinated by International Purchasing Sourcing.

In Addition to the above, as shown in Chart No. 4 to the question: **Do you think that transportation costs in Colombia are high?** 100% of respondents indicate that transport costs in Colombia are high; and the question: **Do you think that the companies offer a broad portfolio of services that allow reducing transport costs?** 80% of respondents indicate that transport companies do not have a broad portfolio that allows them to reduce transportation costs.

Chart 3. Characteristics of Sample 2



Due to high transportation costs and the few options that companies offer domestic transport, it is important to have as an option model implementation deconsolidation and cargo consolidation because it helps to considerably reduce freight costs, delivery times and manipulations, thus becoming more competitive in the market.

In addition to this, it should be noted that it is important that companies seek to improve at all levels of the organization to achieve a reduction in costs, especially in the processes associated with the supply chain is where higher and significant costs are evident as is the cost of transportation. Eduardo Escobedo, Mexican expert on saving time and logistics costs in addition to design more efficient processes, highlights the methodology Lean Six Sigma to achieve time savings, increased customer satisfaction, and reduce logistics costs.

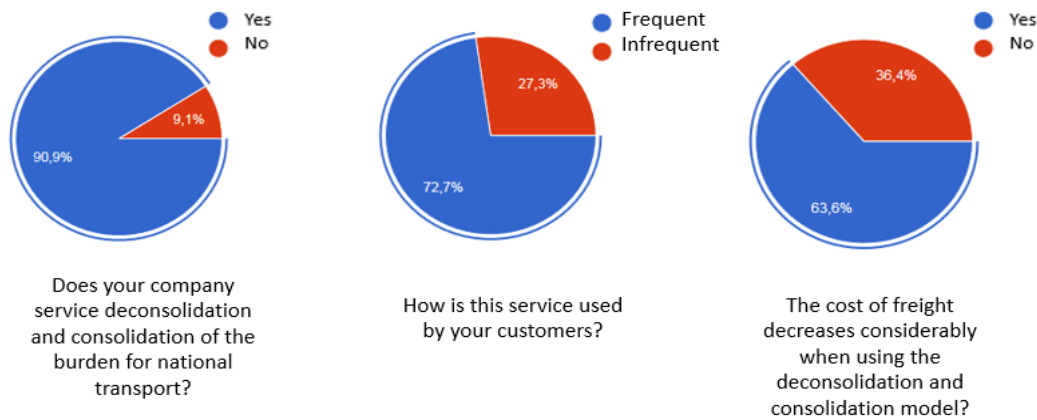
"The atmosphere that I have perceived in companies Colombia is equal to that of Latin America: there are many opportunities to improve logistics processes Through the implementation of this system Lean Six Sigma can get a reduction of 5% to 10 % in logistics costs on sales, brings Eduardo Escobedo "(Money, 2014).

The second sample comprises 20 national transport companies, among which we find: Botero Soto, Transport RG, Transtainer, tanks and trucks, Ditransa, Lodiscarga, Transport Macarena among others.

Other positive aspects of the advantages of this model is found in the formulation of the following questions:

To the question: **Does your company services deconsolidation and consolidation of the burden for national transport?** 90.9% of the companies surveyed responded that if they offer such services while 9.1% does not offer the service. **Following the results of the survey, the question: How is this service used by your customers?** 72.7% said that the consolidation and deconsolidation service charge is widely used by its customers while 27.3% said that the service is used with some frequency. The question was also made **The cost of freight decreases considerably when using the deconsolidation and consolidation model?** where 63.6% responded that significantly reduces the value of freight to use the service while 36.4% disagreed. In Figure No. 5 shows the results to these questions is.

Chart 4. Characteristics of Sample 3



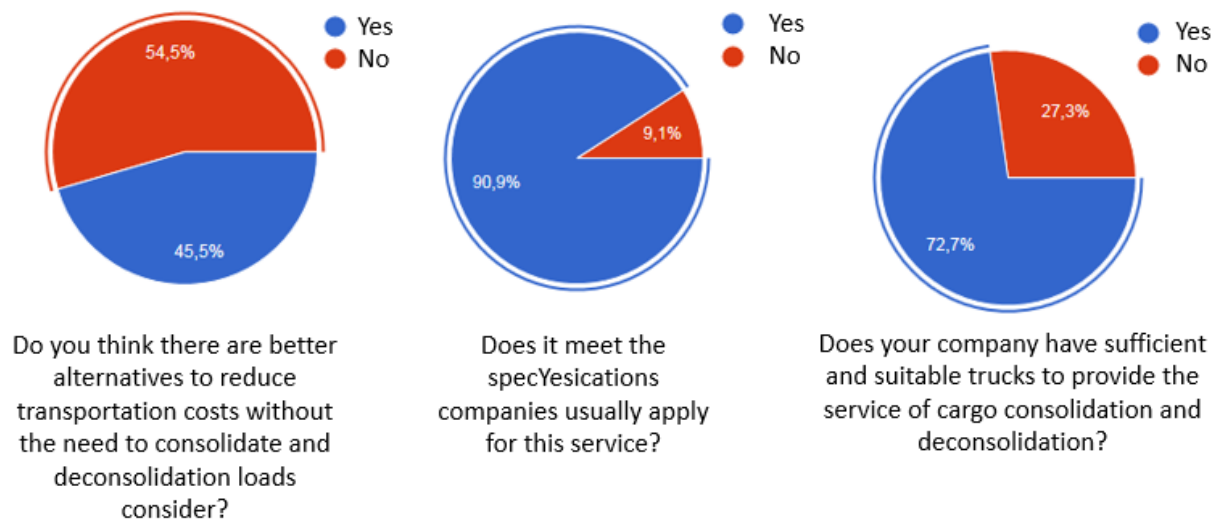
It is important at this point to note that although companies have provided option for transportation companies consolidate their burdens with other companies thus achieving a reduction in transport costs, the model itself also seeks to present the option to through proper programming of imports, have the opportunity to consolidate themselves solely with goods loads, which further facilitates the service provided by the carriers and further increases safety in the chain.

Complementing the freight cost issue was held the following question Do you think there are better alternatives to reduce transportation costs without the need to unbind and consolidate loads consider? 54.5% believe that there are no better alternatives, which indicates that users of national transport should consider implementing this model in their companies to take advantage of the decline in freight rates, thus improving the final price of their products becoming more competitive in the market (see ChartNo. 6).

As for this model, Figure No. 6 summarizes that is the question: Meets companies usually apply for this service? 90.9% of respondents indicate that meet the specifications requested by the user to provide this service.

On the other hand, to the question: Does your company have sufficient and suitable trucks to provide the service of cargo consolidation and deconsolidation ?, to which 72.7% of the sample considered to have the trucks required for this type of service (see Figure No. 6)

Chart 5. Characteristics of Sample 4

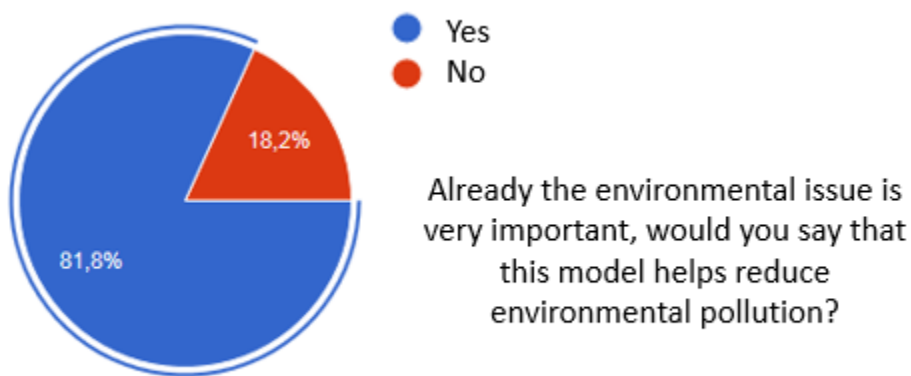


Results from the sample not only reflect the importance of implementing the model of deconsolidation and consolidation of cargo, but also that transportation companies are able to meet what the customer requires.

As relates consulting and logistics research - LOGyCA (2016), in recent years in Colombia it has been a change in business mentality regarding logistics and its impact on organizations, so as logistics went from being a concept tied solely to issues of storage and distribution, to be regarded as a cross-cutting strategy that touches all areas of the company, which allows to increase the competitiveness of enterprises regarding productivity and costs, which are reflected in final consumer.

Finally, and to conclude the analysis of surveys to companies in the transport sector, Figure No. 7 shows that the question: Since the environmental issue is important, would you say that the model helps consolidation and deconsolidation reduce environmental pollution? 81.8% of respondents believe that this type of model helps reduce environmental pollution, so that businesses should contribute to the environment by deploying environment, thus replicating within companies current issues such as green logistics².

Figure 6. Characteristics of Sample 5



"The Road Freight Transport in Colombia is a fundamental pillar in the dynamics of the country's economy as it constitutes the basic tool to place products to the consumer in the country or abroad. For this reason, it is essential that the transport sector has the necessary elements to take great commitment to economic development "(Rodriguez, 2013)

Interview

² Green Logistics measure and reduce the environmental impacts in the implementation of logistics activities such as supply, storage, distribution, transport, etc.

To secure the benefits of this model optimization of transportation costs, it will bring context the interview with Lopez JD-engineer production EAFIT University and who has four years of experience in the position of Analyst Supply Chain Transportation, responsible for the distribution of primary transport for one of the largest direct selling companies in the cosmetics sector in Colombia. He has worked on projects such as redesigning the logistics network of primary transportation and Courier (paqueteo) for the company in which they work, it has also had the opportunity to use and evaluate closely the model of consolidation and deconsolidation of cargo for which responded to the following questions:

- ✓ **Have you used in your company service consolidation and / or deconsolidation of cargo?** what the respondent says that only consolidation (Lopez, 2016).

- ✓ **What result of this experience, what you think is the biggest advantage and disadvantage of using the cargo consolidation service you think?** the expert replied that the main advantage is that you can pay for a fraction of volume of the vehicle or fraction thereof ton, then comes cheaper to pay for a portion to pay for the complete vehicle. The disadvantage is that much depends on whether you have a strategy by the conveyor company with which companies consolidate cargo, additional time the subject will be held. As an example states that if you take a vehicle carrying five hours, and the other company takes four or six hours, then, or my company affects traveling companion, or another company affects my company at the time of loading; so do download times if the delivery promises are short, not to make a cargo consolidation, for example, tells of a consolidation with a

single vehicle. The capacity of this vehicle is an average of 38 to 40 m³, in this vehicle the company sends only 30 m³ and almost half the price has tendered with the conveyor company. The company which consolidates had already paid freight for the full cost of the vehicle to carry goods from point A to point B, and as was the merchandise of my company would halfway the journey of another company because the merchandise was loaded at the end of the vehicle, he managed to deliver at a lower cost, this is also an advantage for the conveyor company, which as had the fixed cost saved and my company was paying about half of the trip. They will have greater utility in the way that is done, they can also transferring the payment to the driver but who really stays with that money is the transportation company (Lopez, 2016).

- ✓ **What do you think is the biggest mistake Colombian companies when choosing a transport company?** The respondent believes that the biggest mistake you can make a company generating load when choosing a carrier is to go with a BID³ to choose lower transportation costs of each of the routes of the companies, because they generally companies transport are strong in some sectors, for example, Coltanques is very strong in what are articulated vehicles and large and mini mules and mules to sectors of capital cities and ports, while companies like TKS also focus on the parts of ports but do not go to municipalities that are far in the country, for example, what are Fonseca, Valledupar and that sector in the plain are strong, companies generally are stronger but are priced slightly higher and when making a BID them they go by sector and offer a more economic costs in some sectors where they are strong but in others sectors that are not so strong they try to leverage

³ BID. The term in English is Bidding and refers to the rate agreed between the carrier and the cargo-generating company.

economically to win those BID and when you choose the lower costs of each are playing different the two companies then you you must be very clear with the information to not make these mistakes (Lopez, 2016)

- ✓ **From your experience, what is your overall assessment of the current status of freight transportation in Colombia?** the expert adds that the transport ministry has tried to mediate in the matter, but has no clear rules, then if one starts from the state could say that there is no clear regulation that allows everyone involved comply with their little part in the process, as well, at first there was a table of minimum freight transport which was not met fully because when some drivers out a route in many of them, they had lost, then for example when they had to go out with a trip multiple handing in various towns coming for example from here Medellin delivered in Honda, Bogotá Chía, Cajicá etc., is a journey that at every stop they have to deliver and there are windows of time time they do they can not deliver the entire route in a very fast time and it's up to stay pernotando in those towns, which passes those costs are not taken into account in such regulations, so will the government is very hard make clear rules of transport and there is a flaw in this point, today you have the cisetak that works very similar to those optimal costs they call them, but applied to the practice are costs that can not be executed fully to exceptions points where you go out of a source and deliver in another, in those points if they are very clear but when multiple routes no time for these costs to the government is concerned, to the last thing I mean is why you do believe there has been so much unemployment in recent years ?, the respondent left the question open (Lopez, 2016).

✓ **Since his professional opinion, what do you think are the factors that most influence with the high costs of freight transportation in Colombia?** I consider that the factors that influence the costs of road freight in Colombia can be summarized by three factors:

1. The road infrastructure in the country, because in Colombia we have a drawback is that the roads are just one road on which to go from here to Bogotá you you find yourself with landslides in the rainy season, you encontras sometimes that you can not take way alternate, if I spend a collapse or anything, if there is an armed strike got no where to go to certain places.
2. High cost of fuel in which most of the vehicle is consumed because the cost as such and tolls, fuel and tolls you got almost that more than 50% of the cost of a trip, additional travel expenses that are given drivers and there will about 75% of freight.
3. For companies that outsource transportation, the commission takes the third is considerable, for some companies and some routes, for example an average transport company may be comisionando between 15 and 25% of the value of freight pays generating company and this is significant in the total cost of transportation (Lopez, 2016).

As relates Hamann (2012), "market conditions in the infrastructure and transport services provided are one of the main determinants of transport costs, to be an important part of the costs of the services." It also gives the author that the presence of "bottlenecks" such

as physical restraints, poor road conditions and lack of road interconnections appropriate, hinder the conditions in which transport further develops in our country, rendering it inefficient and costly for businesses.

- ✓ **What are the most important aspects with Colombian companies when choosing a transport company?** in response to the question, it provides the expert that the factors that are taken into account are the costs and service, which is done when a selection of a carrier is virtually take the points where they are strong each one of the companies and try to play with the costs verifying that the service is not impacted by this (Lopez, 2016).

In accordance with the answer, it is worth noting the comments made by Garay (2016) on the participation of transport costs on the competitiveness of a company. Tells the author that transportation costs have a major impact on selling prices of goods, prices of raw materials and intermediate goods and as a result, affect the international competitiveness of domestic production, ie the Colombian companies. Garay (2016), brings others particularly in Colombia freight rates charged from the interior to the ports are lower than those who have to pay in reverse, which favors certain extent on exports, but in turn affect the cost of imports, and therefore the final product cost.

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

The current conditions of the country in terms of infrastructure and road development are adverse to transport domestic cargo, which is reflected in an increase in transportation costs which ultimately hurt the Colombian industries and the competitiveness of these national markets and international.

The alternative models to mitigate domestic transport costs are positive for loads generating companies as they allow economic benefits, reflected in the total cost of goods produced.

It is essential today that companies freight and generating freight companies are creators of projects that benefit positively transportation costs, since it depends on them to innovate and propose better results in terms of price, time and service that leads them to be more competitive.

As a great advantage in the model consolidation and deconsolidation load is reduced transportation costs and optimization of freight vehicles.

The emission of greenhouse gases is reduced considerably with the implementation of the model of consolidation and deconsolidation of cargo, because the mobilization of

vehicles decreases when used at 100% capacity of these, helping the planet and contributing to the development of greener logistics.

3.2 Recommendations

The importer must have adequate planning for all those involved in the supply chain to fulfill their tasks on time, involving actors from the supplier to the road carrier, which must be informed before the arrival of the goods to meet the amount of the load to be consolidated to national transport.

The carrier should take the information the importer of the amount of charge in advance and get the right truck to transport cargo domestically and comply with deliver on time at the winery.

The importer must choose a transport company that has the capacity to meet the requirements imposed on it, and finally that meets wineries and suitable transport to preserve the charges in good condition.

From the perspective of international business, strategic choice is recommended:

- International suppliers, which must be selected and certified from a proper process.
- International Freight Forwarder or which meets the specific function of guarding the cargo from the country of origin to the destination country.

- Customs Agency, it fulfills the function of the nationalization process and delivery of cargo with its own lift to the conveyor.
- national road transport company, which must comply with: wineries in good condition for receiving the load, suitable vehicles for mobilization, and finally, compliance with delivery warehouse.

Although most models are more focused logistics optimization from the perspective of engineering, professional in International Business must be in the ability to suggest models or projects that contribute to optimal management costs.

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ATTACHMENTS

Attachment A. Survey design companies charge for generators.

Do you know the deconsolidation and consolidation model for national transport port?

Yes

No

Does your company apply service deconsolidation and consolidation in national transport port?

Yes

No

Does your company might be interested in the model of deconsolidation and consolidation of national transport cargo port?

Yes

No

Do you think this model could benefit the company in the domestic freight savings?

Yes

No

Do you think that would improve delivery times loads in the hold?

Yes

No

Would you say that your company freight rates represent more than 50% of the cost of it?

Yes

No

Do you think that transportation costs in Colombia are high?

Yes

No

Do you think that companies offer a broad portfolio of services that allow reducing transport costs?

Yes

No

Transportation companies that contracts meet all the requirements requested by your company?

Yes

No

What grade would you give the service of transportation companies in general?

Excellent

Good

Regular

Bad

Attachment B. Survey design Enterprise Haulage

Does your company service deconsolidation and consolidation of the burden for national transport?

Yes

No

How much does your company offer service deconsolidation and consolidation in national transport?

Never

Sometimes

Always

Will port operations, facilitate or help the deconsolidation and consolidation operation more agile and fast?

Yes

No

How is this service used by your customers?

Frequent

Infrequent

Do you think there are better alternatives to reduce transportation costs without the need to consolidate and deconsolidation loads consider?

Yes

No

The cost of freight decreases considerably when using the deconsolidation and consolidation model?

Yes

No

Does it meet the specifications companies usually apply for this service?

Yes

No

Does your transportation company benefits you provide this service?

Yes

No

Does your company have sufficient and suitable trucks to provide the service of cargo consolidation and deconsolidation?

Yes

No

Already the environmental issue is very important, would you say that this model helps reduce environmental pollution?

Yes

No

Attachment C. *Questions interview.*

1. What do you think is the biggest mistake Colombian companies when choosing a transport company?
2. What are the most important aspects with Colombian companies when choosing a transport company?
3. From your experience, what is your overall assessment of the current state of cargo transportation in Colombia?
4. Has your company used in the service of consolidation and / or cargo desconsolidacion?
5. Following this experience, what you think is the biggest advantage and disadvantage of using the cargo consolidation service you think?
6. Since his professional opinion, what do you think are the factors that most influence with the high costs of freight transportation in Colombia believes.