

ANALYSIS OF THE TRANSPORTATION LOGISTICS ON THE HIGHWAYS OF THE SÃO PAULO STATE DURING THE WORLD CUP 2014



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Abstract

The supply chain of freight transport in Brazil is mainly supported by road mode, which has the biggest weight in the Brazilian transportation matrix. The Brazilian industries prefer the road because it is a door to door transport, which does not happen with the other modes, except in a few cases. A major event like the World Cup requires a special transportation planning because this type of event interferes in the daily traffic of public roads, overloading and blocking movement of vehicles. This paper presents an analysis of transportation logistics on the highways of the São Paulo State during the World Cup 2014. The five main types of Brazilian companies were surveyed: food, machinery, pharmaceutical products, clothing and services. Food and clothing companies show an increase in demand, but their delivery services were not delayed. The machinery and pharmaceutical companies didn't have increase in demand and their delivery services have not suffered delays. Service companies had an increase in demand equal to 50% and their services were delayed.

Keywords: Freight transport, Transportation logistics, Highways, World Cup 2014.

1. Introduction

Logistics is can be defined as the process of planning, implementing and controlling efficient and cost-effective raw materials, in-process inventory, finished goods and related information from point of origin to point of consumption in order to meet the requirements of customers.

So, logistics is the planning and operation of physical, informational and managerial systems required for inputs and outputs overcome spatial and temporal restrictions economically (Bicca, 2004).

The main issues addressed in the logistics process are demand, management and infrastructure. The infrastructure consists of warehouses, vehicles and transport networks. The transport network is used for the supply of inputs in the production of industries and for the distribution of finished products or services.

Determining factors for the distribution of products and services are spatial and temporal. Spatial factors are related to the distance between the origin and destination of the delivery or service. The temporal factors are related to the requirement to comply with deadlines and operational reliability.

The main components of the logistics system are producers, transporters, consumers and government. The consumer demand is generally fixed during the routine, but shows variable behavior at social events.

The demand behavior guides the organization of production systems and distribution of goods. Distribution systems must ensure the storage, fractionation and transportation operations. Transportation systems must adjust the functions of collection and delivery in time and space.

The government has the function of providing the infrastructure and regulates the operation of transport systems. The ultimate goal of logistics systems is to achieve cost-effective solutions to reduce transportation costs.

The distribution system is usually more complex when there are many suppliers or production regions and many areas in demand. Moreover, the lack of integration of networks flow hinders the use of multimodal transportation systems.

A network of integrated flow optimizes the production of consumer markets. Transportation costs between the production areas and consumer markets should be considered throughout the distribution network.

The biggest challenge of the logistics systems is to deliver the product to the market at lower prices than competitors. For this, there is the difficult task of minimizing the cost of transportation.

Transportation costs can be reduced with operational optimization techniques. One of the ways to mitigate the costs is to coordinate the receipt of inputs in the industry at the time of your use. This technique, called just in time, implies the delivery of inputs neither before nor after the scheduled time.

2. Transport Logistics

Transport logistics involves, in an integrated manner, the various segments in sequential path of the product, from manufacture to consumption. The freight transport generates a stock in transit because the product remains retained into the vehicle during the travel time (Mota et. al, 2005).

The management of the operations of transport in logistics process is responsible for the establishment of routes and scheduling of freight vehicles from a base (store / warehouse), according to the levels of demand and availability of vehicles and drivers.

The objectives of transportation logistics is to minimize the delivery time of the products; maximizing capacity utilization of vehicles; minimize the distance traveled; minimize fleet and minimize the total shipping cost for a given level of service desired.

The logistics of permanent transportation systems is to establish an operational planning. The operational planning consists of defining routes and scheduling of vehicles to operate daily. The demand for products and delivery points can be estimated easily since they are characterized as deterministic process.

The various types of transport should be integrated in order to ensure that goods are transported safely, efficiently and without damage to the environment. The integration of vehicles in cargo decreases the congestion on the city roads and highways in the interior of a state.

It is estimated that Brazil spends about 17% of Gross Domestic Product (GDP) on logistics activities, 10% of GDP spending on transportation and, on average, the transportation costs correspond to 60% of logistics costs (Ganga et. al, 2004).

The measurement of logistics performance of transportation can take different perspectives such as cost, customer offering, productivity, management and quality of service (Bowersox, 2009).

Frequent deliveries, compliments of deadlines, availability of goods, after sales service, ordering information, extended hours of delivery and technical support are some of the attributes increasingly valued by customers of logistics transportation service.

The logistics of transport systems is very important in maintaining customer satisfaction and, consequently, maintain profitability in business. The average level of service does not measure the quality of transport logistics performance. The client, even though I received many excellent services, remains demanding better services for all current and future orders.

Customer requirements govern the structure of the supply chain, including manufacturing and transportation logistics. The level of quality of transport logistics is important in customer service, either on orders or delivery of the products.

The ease of communication, prompt service, the friendliness in customer contact, preparation of the attendants, the credibility of transport services and the flexibility of delivery of the product are the basic requirements for an efficient transport system logistics.

3. Transportation for Special Events

In São Paulo city, Brazil, an event is defined as any activity that interferes with the normal conditions of the roads of the city, disrupting or interrupting the free movement of pedestrians and vehicles, endangering the safety of persons and properties (Serra, 2005).

A special event can be defined as a public activity, with planned schedule and location, which has an impact on the normal operations of the transportation system. This impact is the result of increased demand due to the creation of a new generator polo travel on the transport system in question. Traffic problems are greater in places where there is a decreased ability of the road network infrastructure for a reserve to be used exclusively for the event itself.

The planning of transport to special events is a public activity with a programmed schedule, location and duration that may affect the normal operation of the road system due to increased demand for travel and reduce the capacity of the roads due to the need of the event (NCTR, 2006).

The logistics of eventual transport logistics systems is to establish a tactical planning. Tactical planning is to define the routes and scheduling of vehicles during the event. The demand for products and delivery points are more difficult to determine than the permanent transportation systems because they are characterized as stochastic process.

Transportation planning in special events is of utmost importance, so to develop a plan of operations of transportation systems during these events is essential to reduce that impact on everyday activities (Pereira, 2008).

A major event like the World Cup requires a special transportation planning because this type of event interferes in the daily traffic of public roads, overloading and blocking movement of vehicles. Therefore, developing a plan of operations of transportation systems during the event is essential to reduce the impacts on everyday activities, ensuring safe transport and traffic flow.

A comprehensive way to plan the activities of a special event is to disseminate the information to drivers allowing selection of the best route, monitor traffic and manage travel demand (NCHRP, 2008).

Transportation planning to special events should also consider the following components related to the event: duration - time impact, extent - spatial impact or definition of the affected area, and intensity - impact on traffic volume.

Special events are associated with creating a great infrastructure support, which in the view of public finances means a lot of resources or debts long term, which can overload the public accounts, in addition to affecting some areas with higher short-term need, such as health, education and social welfare (Barros & Cosenza, 2008).

There are five factors that influence the level of severity of impact to the planning of special events, they are: travel demand; capacity of roads in the region; operation of the event; available resources and external factors (FHWA, 2009).

4. Methodology

This paper presents an analysis of transportation logistics on the highways of the São Paulo State during the World Cup 2014. The five main types of Brazilian companies were surveyed: food, machinery, pharmaceutical products, clothing and services.

A survey of businesses was conducted by telephone. Data collection was performed with companies in the city and state of São Paulo. The interview questions followed the order of the flowchart shown in Figure 1.

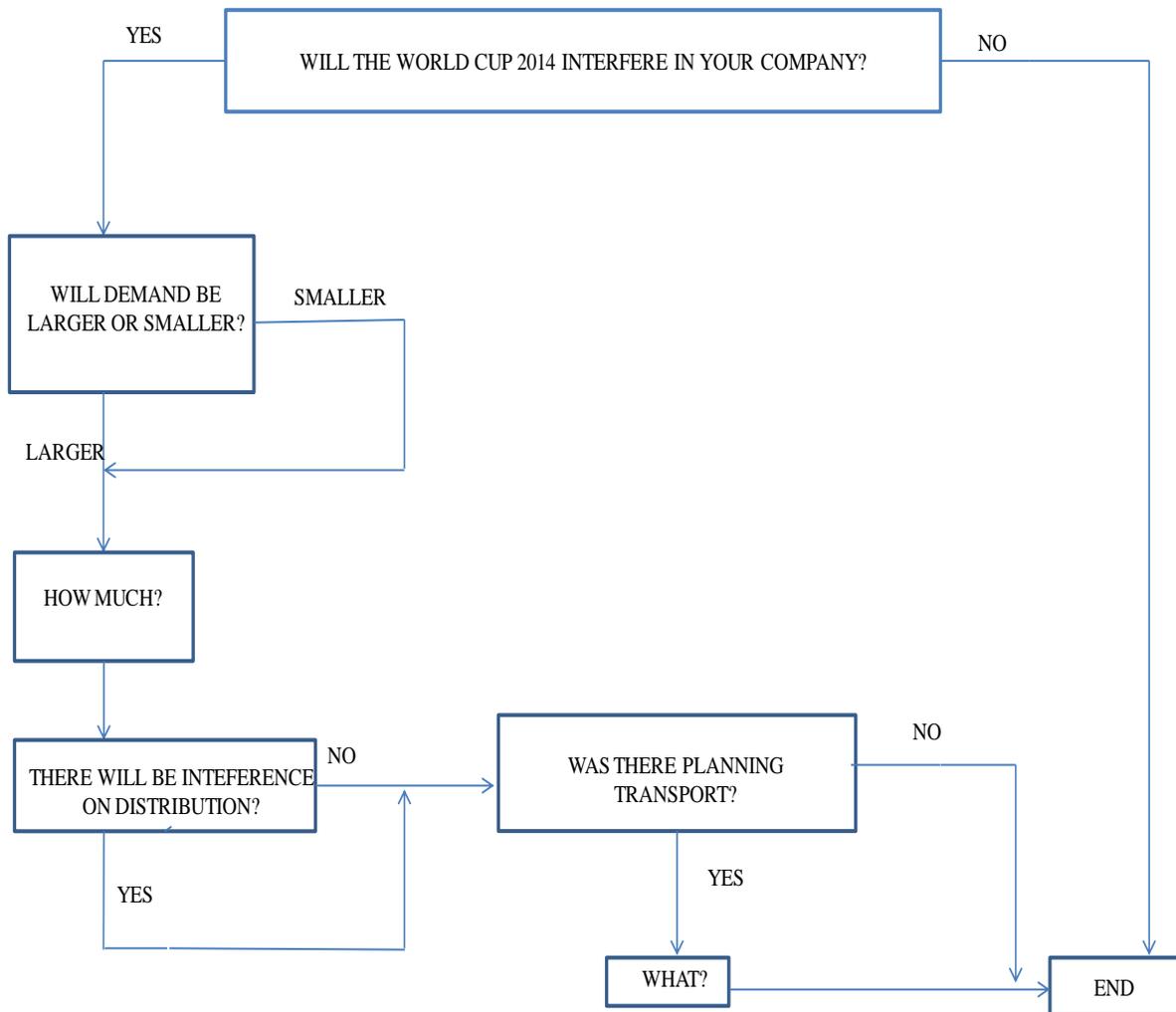


Figure 1. Flowchart of questions to interview with companies

The event World Cup 2014 will be played by 32 soccer teams, with 15 soccer teams be staying in the state of São Paulo, and not only in the capital, during the period of one month. Therefore, the research was also conducted with companies that are located within the state and make deliveries in the capital.

The companies were chosen randomly within the area of influence of the major highways in São Paulo State. Figure 2 shows the road system in the São Paulo State which converges to the capital.

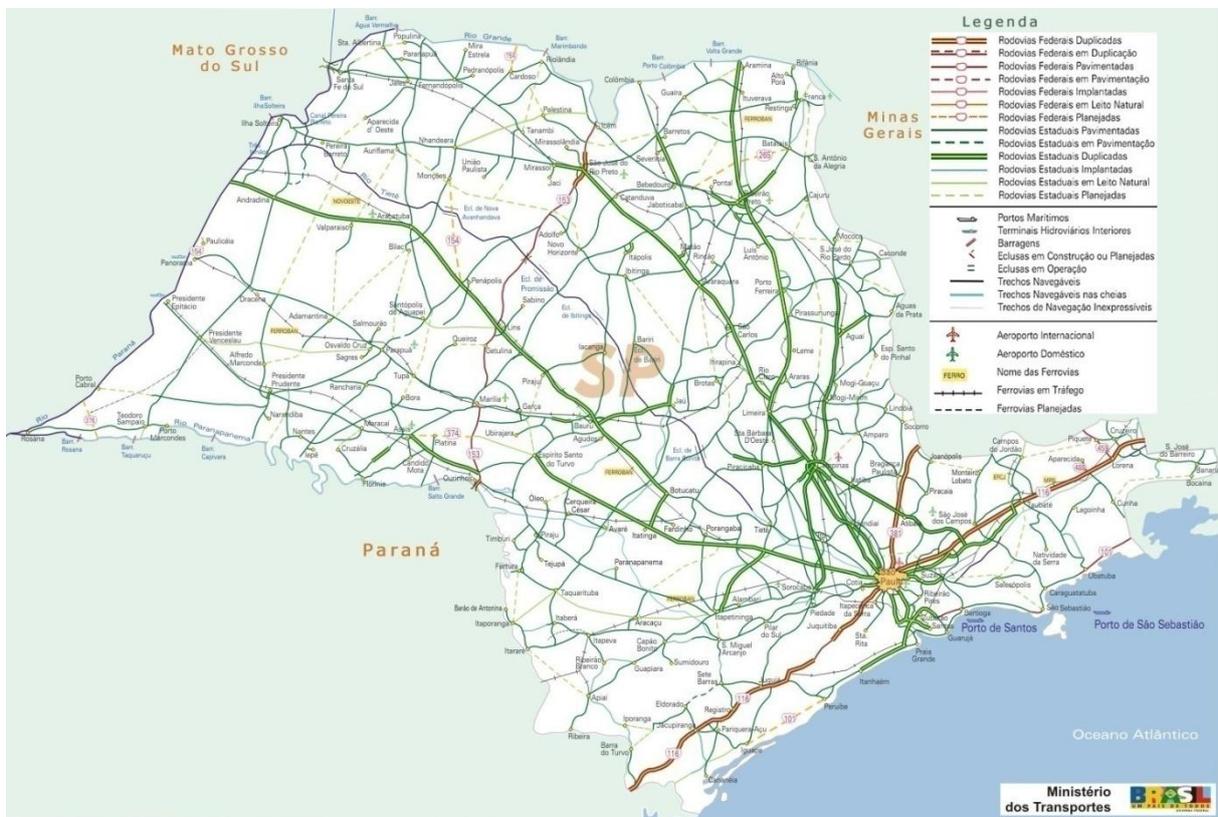


Figure 2. Major highways of the São Paulo State that converge on the capital

5. Results

All clothes companies surveyed (factories and shops) responded that the event of the World Cup affected their operations. There was an increase of at least 100% of the demand. The event did not affect in product distribution. There was a transportation planning for delivery of the products before the event.

All machinery companies surveyed (manufacturers and stores) responded that the World Cup event did not affect their operations. There was no increase in demand. The event did not affect the distribution of products.

All pharmaceutical products companies surveyed (industries and pharmacies) responded that the event of the World Cup did not affect their operations. There was no increase in demand. The event did not affect the distribution of products.

All food companies surveyed (agricultural, industrial and restaurants) responded that the event of the World Cup affected their operations. Figure 3 shows the increase of the demand in the food business.

Half of the service companies which increased demand during the World Cup event faced traffic jams. The other half of the service companies which increased demand during the event of the World Cup did not face traffic jams because they had transportation planning.

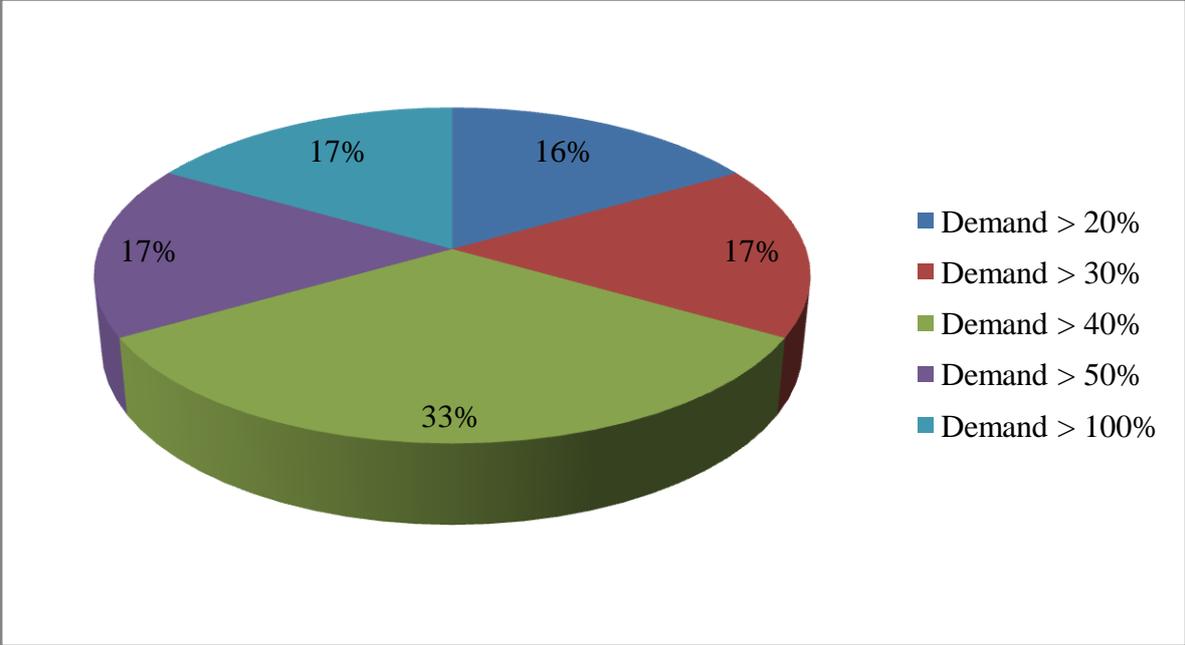


Figure 3. The increase of the demand in the food business

There was an average increase of demand equal to 83% to food companies. Some food companies showed delays in product distribution during the event. Figure 4 shows the percentage of companies surveyed had interference in the distribution of products.

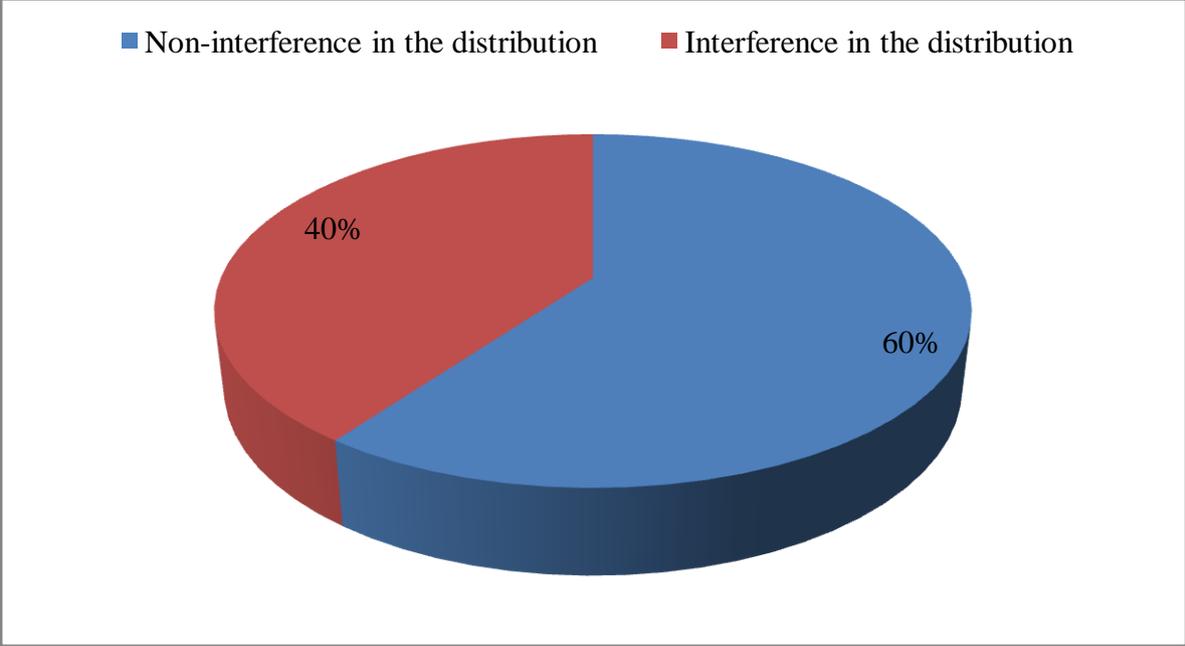


Figure 4. Percentage of companies surveyed had interference in the distribution of products

Figure 5 shows the percentage of service companies surveyed had their operations affected by the World Cup event. All service companies that had their operations affected had increased demand.

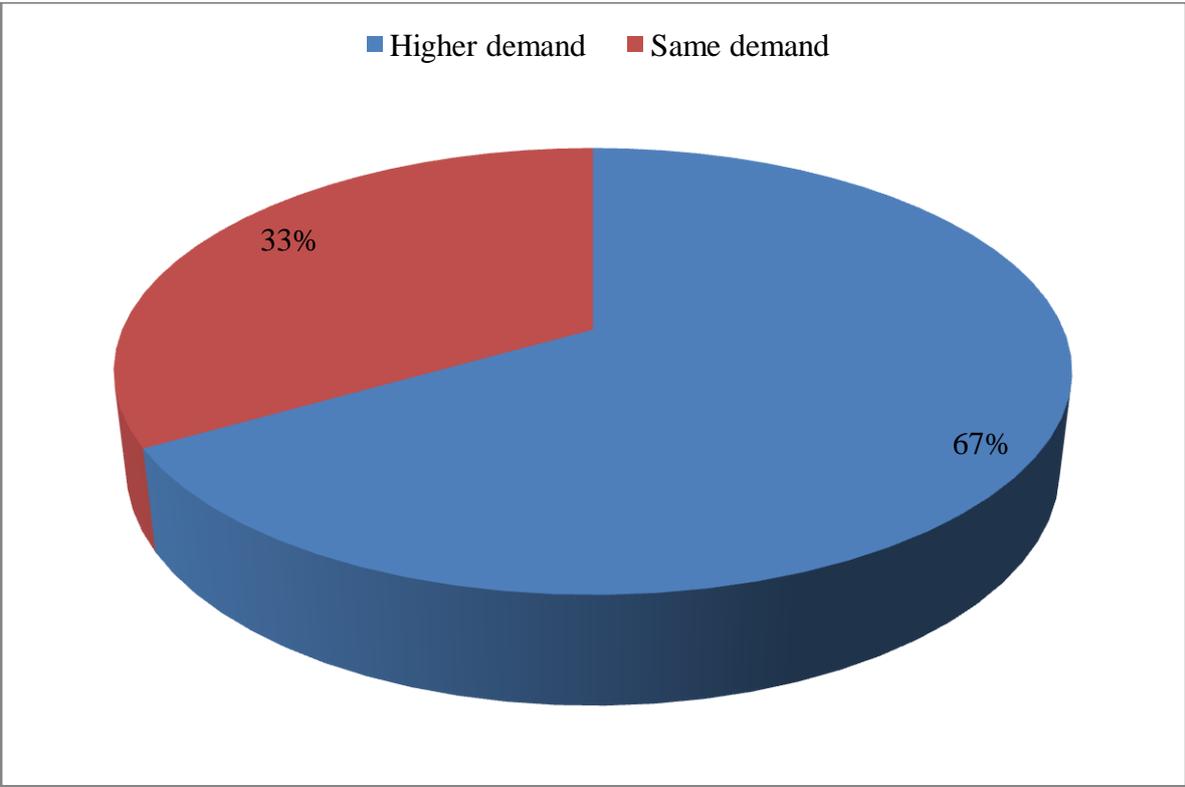


Figure 5. Percentage of service companies had their operations affected by the World Cup

6. Analysis

The event of the World Cup 2014 in São Paulo State interfered in the operations of food, clothing and services companies. Firms of machinery and pharmaceutical products have not suffered interference by event.

The World Cup provided an increase in demand of food, clothing and services companies. Demand for pharmaceutical products and machinery had not increased because of the event. The machines are durable consumer goods.

The distribution of garments, machinery and pharmaceutical products have not suffered delays in delivery. The food distribution was delayed in distribution and service companies had delay in operation because of traffic congestion during the event.

Companies of food, machinery and pharmaceutical products made transport planning to deliver their products during the event of the World Cup 2014. Not all food and services companies made transportation planning to deliver their products during the event.

There were protests from people who were against the World Cup 2014 in Brazil. But the protest did not affect the delivery of products and services during the event. On the other hand, there was a generation of temporary jobs in the logistics of cargo transportation sector.

7. Conclusions

The event of the 2014 World Cup brought significant progress in the transport logistics in delivering products and servicing industry. However, this progress could have been higher if all freight and services companies had made transportation planning for delivery of the product prior to the event.

This fact is very important to show that planning the logistics of transportation is very important for the delivery of products and service realization consumers are made in order to supply timely and surely all the demand.

Companies that were planning the logistics activities of freight transportation and services had increased profit also gained working reliability in the logistics market. These companies are suppliers of food, clothing, machinery and pharmaceuticals.

The companies that did not make planning of logistics activities in cargo services had a small increase in profit because they contracted temporary workers and spent an excessive amount of fuel to perform their services.

Thus, we can conclude that one major event like the World Cup requires a special transportation planning, because this type of event interferes with daily traffic of public roads, overloading and blocking movement of vehicles.

Therefore, developing a plan of operations of transportation systems during the event is essential to reduce the impacts on everyday activities, ensuring safe transport and traffic flow. The transit agencies should develop a transport plan detailing schedules and resources.

Therefore, the event can benefit the general logistics sector, such as the reduction in the delay of vehicles, through intense dissemination of information on traffic management and the use of alternative routes, with greater certainty and given all the demand.

In large urban areas such as São Paulo city, transportation agencies should be considered as the main coordinators of special events, because the planning and management of transport allow carrying out the daily activities and prevent traffic congestion.

The planning of logistics activities of freight and services should include all involved and the actions necessary road system to ensure better accessibility in the delivery of products, minimizing the impact that the growth in demand will cause.

For this, it is necessary to characterize the road system in the region as well as its daily performance. The characterization of the road system should consider the areas of influence, the amount of public and the event period.

Finally, to ensure the achievement of logistics services and freight transportation service at special events it is necessary to make an estimate of demand for products, define the area of influence and the components of the impacted transportation system, making analysis of the demand for traffic and parking and identify and correct deficiencies in capacity of the roads.

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