Society's Perception to the Presence of Urban Distribution Trucks

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***Abstract*—It ś undeniable that the urban freight transport interferes on the quality of urban life. At the same time benefiting from availability and variety of necessary products for their subsistence, the population suffers with a large number of problems generated while trucks are carrying out deliveries. This study aims to identify, through qualitative research, the perception of society regarding the presence of delivery trucks in four urban neighborhood of Porto Alegre city: Floresta, Cristo Redentor, Humaitá and downtown. It was observed during the interviews that people only see the trucks when they feel negatively affected by them. The largest amount of problems expressed by respondents occurs when trucks are parked performing the loading and unloading. The interruptions in traffic flow to maneuvers, interruptions in the pedestrians flow on the sidewalk due to goods loading and unloading and contribution to congestion problems presented the highest manifestations.**

***Index Terms*—Urban congestion, urban freight transport**

I. Introduction

Uban freight transport is an activity which is based essentially in road services, that have to share the existent infrastructure with another users [1] – private cars, public transportation, non- motorized transport and pedestrians. The growth of urban areas in the last century resulted in a continuous increase of this activity [2], [3] that, to maintain product availability in sale points, generate externalities that directly affect people life ś quality.

Technical literature indicates that the main causes of urban distribution problems come from the complexity of relationships between different stakeholders involved in this process, the deficient road infrastructure e the lack of adequate regulation and specific planning.

Urban freight transport is a private activity where all actors involved work for profit and their needs, perceptions and goals often diverge from each other [1].

It ś very difficult to find consensus between themselves, but the successful of solution implementation is totally dependent on this [4].

Modeling of interactions in the goods circulation, to analyze and evaluate proposal actions considering all groups behavior is the biggest logistic challenge [5]-[7], but is needed to guarantee an efficient and environmental friendly transport.

In the past, levels of motorization and sustainability awareness were not relevant like they are today. The evolution of urban regions structures was done with specific purposes to each stage of development [1]. Therefore, a lot of cities have a lack of adequate infrastructure to collection and delivery activities, which are developed in streets and avenues, doing more difficult vehicle traffic, access to some routes and pedestrians movements. The lack of specific places to logistic operations causes more time to vehicle circulating to find parking spot, impairing circulation, causing congestion problems, increasing levels of air and noise pollution, increasing travel time and reducing system efficiency.

Regarding to regulation Dablanc [3] argues that public interventions in urban logistic have been treated so far in a narrower scope, is commonly limited to traffic restrictions (access times or dimensions vehicles). Macário [1] believes that while some problems generated by urban freight transport are specific to a region, national policies (or supranational like the European Union and World Bank) could yield better results. She presents in her paper the Europe example, where there is a Common European Transport policy that contemplates only interurban flows, and there isn ́t a national policy to urban freight transport. Lindholm [8] and Betanzo [9] support this idea in their researches. The first one analyzed some Swedish municipality focusing in urban freight transport sustainability from the viewpoint of local authorities and conclude that this issue are receiving low priority in the urban planning. The second one reveals that in Mexico the freight transport does not receive adequate attention in both local and national levels.

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Generally, it takes more awareness to the urban freight transportation issues since the traffic flow is a growing problem in most of cities. Besides reducing people life ś quality, congestion problems affect negatively the economic development. Therefore, it is undeniable that the activity causes interference on the society wellbeing, justifying then know what people think about it, what activities are most bothering them and how they want to be treated the problem.

This study aims to identify, using qualitative researches, the society ś perception regarding to the presence of urban transport trucks on streets. The study was performed in Porto Alegre city, in south Brazil. The method used is presented in section 2. The section 3 presents some results and an appropriate discussion. The section 4 contains the work conclusions.

II. METHOD

The method used to achieve the objective of this study consisted of a qualitative approach. The qualitative research look for understand the study object without considering numerical representation or intensity. This kind of approach allows to researcher obtain descriptive data through direct and interactive contact with the study situation.

The researcher understands the phenomena from the interviewed perspective and, from there, situate an interpretation [10]. There are several techniques to data collection. The individual interview is the most used and it was adopted in this study. This technique explores in deep the study object probing knowledge, opinions, attitudes and feelings about topic in order to assist the understanding of a given phenomenon [11].

We chose using a semi structured script to ensure that all interest issues were covered. The script used to guide the interview includes questions presented in Table I.

TABLE I. SCRIPT USED TO INTERVIEWS CONDUCT

1-	Do you see urban freight trucks in the city?
2-	Which situations do you see them?
3-	Do they bother you?
4-	Review and comment a situation when you were troubled by a truck.
5-	In your opinion, what are the problems generated by trucks circulating in urban areas?
6-	Air pollution, noise and accidents, do you see that ?

The research was performed in different neighborhoods of Porto Alegre city. To select those areas, it was used information about number of establishments of shops and services located in metropolitan region, using the official register at Municipal Industry and Commerce Secretary (SMIC, 2010). Neighborhood were stratified in four groups by density of shops and services (No. establishments/km2): low density (0 to 500), middle-low (500 to 1000), middle-high (1000 to 1500) and high (> 1500) as shown in Fig. 1. This separation was important to include areas with different vehicles and pedestrians features. Used data was georeferenced using Geographic Information System (GIS) Transcad 4.5.

The cutoff point of these bands was determined from the histogram analysis and data dispersion of a density variable through the Box-splot graphic. This graphic identified a outlier which is corresponding to the downtown.

In order to ensure that the trucks were present in daily life of all interviewed, it was chosen one district of each group of density. Then the target population of this research was comprise by residents of four neighborhood of Porto Alegre. Floresta, Cristo Redentor, Humait á and the downtown, which density of shops and services are presented in Table II.

TABLE II. DENSITY OF SHOPS AND SERVICES TO SELECTED NEIGHBORHOOD

	Downtown	Floresta	Cristo Redentor	Humait á
Density (n ºestablishments /km^2)	3.120	1.429	656	83
Density (n ºresidents / km^2)	14.738	8.538	11.261	2.475

The interviewed selection considered three stratification variables: house location (downtown, Floresta, Cristo Redentor, Humait â), age group (under 40 years old, over 40 years old) and if is owner and drives private motorized vehicle frequently in the neighborhood or not. The interview distribution was planned to get a balanced number of respondents in each band. The interviewed selection follow the plan presented in Table III, that include two interviewed in each row and each column. This ensures a diversity of answers which is desirable in qualitative studies. The Table III presents the distribution of all eight performed interviewed.

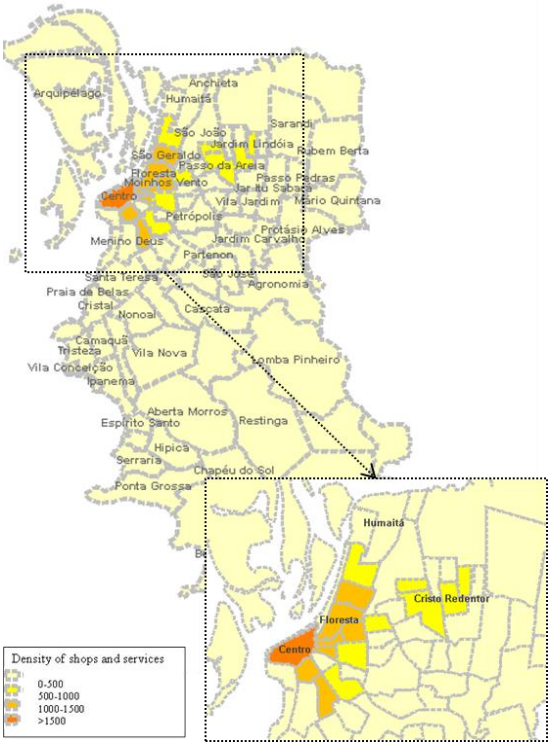

Figure 1. Density of shops and services by neighborhood in Porto Alegre city

TABLE III. SAMPLE CHARACTERIZATION

		Downtown	Floresta	Cristo Redentor	Humaitá
Drives	Younger (<40 years old)		x	x	
	Older (>40 years old)	x			x
Does Not Drive	Younger (<40 years old)	x			x
	Older (>40 years old)		x	x	

The interviews were conducted in August 2010 and were preceded by an explanation of the research purpose and the importance to participate. All respondents were available and interested to answer questions. The script questions were interrelated to allow important citations previously forgotten by the respondents. The interviews were recorded in order to obtain the best use of the statements. In some cases, the recording was supplemented by notes if it was considered important. The recordings were transcribed for further analysis and interpretation.

III. RESULTS AND DISCUSSION

The respondent's answers about the situations which trucks bother them are presented in Table 4. From this structure, a Pareto Diagram [12] was built, and presented in Fig. 2, where is possible to see the frequency which this events occurred. According to the research, trucks are perceived by all interviewed when they are parked, but only half of respondents perceive them when they are in movement on the streets.

TABLE IV. AMOUNT OF ANSWERS ABOUT THE SITUATION WHICH TRUCKS ARE PERCEIVED OR BOTHER THE RESPONDENTS

		Downtown		Floresta		Cristo Redentor		Humaitá		Total
		D	ND	D	ND	D	ND	D	ND	
Situations which trucks are perceived	Parked	1	1	1	1	1	1	1	1	8
	Circulating	0	0	0	0	1	1	1	1	4
	Truck circulating	0	0	0	0	0	0	1	0	1
	Truck parked on the street	1	1	1	1	1	1	1	1	8
Situations which trucks bother the respondents	Trucks parked on the sidewalk	0	0	0	1	0	0	0	0	1
	Loading / unloading operation on the sidewalk	1	1	1	1	0	0	1	1	6
	Air pollution	1	1	1	1	1	0	0	0	5
	Noise	1	1	1	1	1	0	0	0	5
	Accidents	0	0	0	0	1	0	1	0	2

D = drives and ND = does not drive

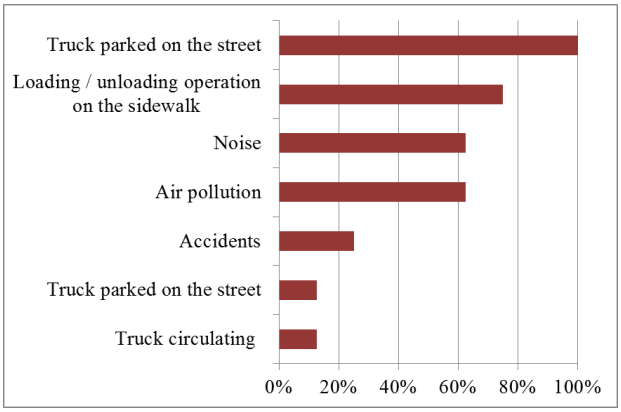

Figure 2. Answer ś frequency

Vehicles parked on the street loading / unloading goods, was the situation that generated the highest amount of demonstrations by respondents. All respondents cited witnessed unpleasant facts. The loading / unloading operation, which occurs on the sidewalk impairing pedestrians movement, comes next and creates discomfort in 75% of respondents. Air pollution and noise were cited by 63% of respondents, mainly by residents in Floresta and downtown, areas which higher shops and services density. Only one respondent from Cristo Redentor neighborhood expressed bother with these topics. Accidents occurrence was cited by 25% of respondents, mostly by Cristo Redentor and Humaitá residents ́, neighborhoods where the vehicles run even faster. The circulation of trucks on the streets was mentioned only by one Humaitá resident, who drives frequently. He also commented that trucks circulate at high speed in the neighborhood ś access roads, intimidating smaller vehicles. The presence of trucks parked on the sidewalk was also mentioned by only one respondent, a resident of the neighborhood Floresta. This respondent not drives and he often witnesses trucks occupying the sidewalk to unload at the supermarket warehouse using the rear of the vehicle.

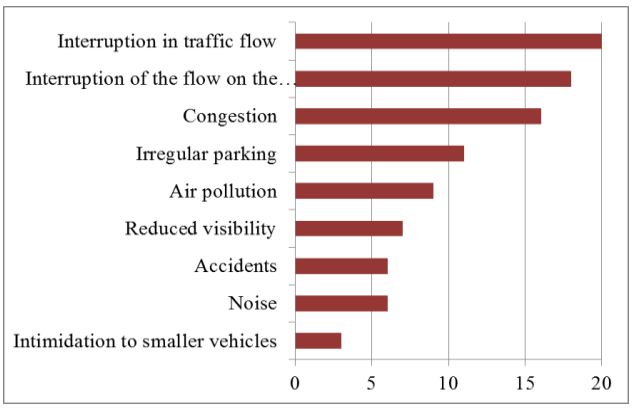

Figure 3. Expressions levels about problems generated by trucks presence on the road

Table 5 presents a summary of the main problems caused by the presence of trucks the streets, in the opinion of respondents. The word count of each respondent, when expressed on the subject, was used as a

means of analysis. The table allowed the construction of the Pareto Diagram [12], shown in Fig. 3, where it is possible to observe the level of such events. A cause and effect relationship between the issues raised and the unpleasant situations, by the presence of trucks on the streets, expressed by respondents was possible to identify. Fig. 4 shows a deployment diagram, pooled from the elements that cause nuisance: truck circulating, truck parked on the road or sidewalk, loading and unloading on the sidewalk and environmental problems.

TABLE V. WORDS COUNT ABOUT PROBLEMS GENERATED BY TRUCKS PRESENCE IN POINT OF VIEW OF ALL INTERVIEWED

		Downtown		Floresta		Cristo Redentor		Humaitá		Manifestations level
		D	ND	D	ND	D	ND	D	ND	
Problems caused by the presence of trucks on the streets	Congestion	0	2	2	2	4	2	3	1	16
	Reduced visibility (for vehicles and pedestrian)	0	3	1	0	0	0	3	0	7
	Interruption in traffic flow	1	2	2	0	1	2	10	2	20
	Irregular parking	2	1	1	1	2	1	3	0	11
	Intimidation to smaller vehicles	0	0	0	0	0	0	3	0	3
	Interruption of the flow on the sidewalk	3	5	1	0	1	2	4	2	18
	Noise	1	1	2	2	0	0	0	0	6
	Air pollution	1	1	1	5	1	0	0	0	9
	Accidents	0	0	0	0	3	0	3	0	6

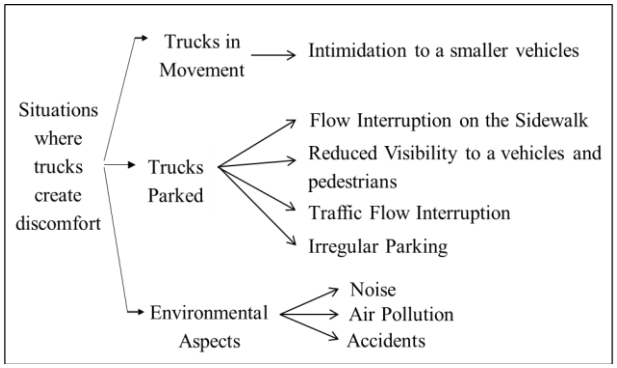

Figure 4. Cause and effect relationship deployment

The deployment diagram shows us that the greatest number of problems occurs when trucks are parked for loading and unloading. When a truck has to stop somewhere to make a delivery, the parking maneuver is already causing a traffic interruption, and it can be extended if the roads are too narrow, if the vehicles are too large or if the driver is not too experienced. This momentary interruption could be prolonged. If the truck, while parked, occupies much of the road forcing drivers to change lanes, the momentary interruption may generate a located jam. Two other points related to truck stop were still quoted. They are related to each other and refer to parking in inappropriate or not allowed places (such as entry and exit of parking on both sides of the road reducing the number of tracks for the passage of vehicles and near the corners) and reducing visibility for vehicles circulating and pedestrian.

Another widely cited point, placing second in the ranking events, was the problem of disruption in the sidewalk due to the need for goods loading and unloading at point of trade. It was expected, and proved in research, that places with high population density and high shops and services density suffer more with this problem. Respondents from central regions indicated that, on occasion, they have to across the street and change sidewalk to continue the path. Although the severity is higher in the center, respondents from all neighborhoods cited this as a problem, even in the neighborhood Humaitá which has the lowest trade and services density, among the surveyed. In the latter, there are a lot of deposits and, as the respondent, the trucks work in the street and sidewalk.

The next point to be discussed refers to environmental aspects. The residents of downtown, Floresta and Cristo Redentor neighborhoods expressed their opinion in relation to aspects such as noise and air pollution. One resident of Floresta was extremely sensitive to this issue, showing discomfort before being questioned. The other respondents perceive the "smoke" coming from the trucks, but do not feel uncomfortable. Respondents from downtown expressed feel the difference in air quality and noise on weekends, but due to changes in the whole set of movements not only of the trucks. The accidents have been identified as a problem only for residents of neighborhoods Humaitá and Cristo Redentor. Others expressed that they had never seen and do not classify as a problem, showing consistency with the first question. In that question they said that they see the trucks as parked vehicles.

In Humaitá neighborhood, where vehicles reach biggest speeds because of the region characteristics and perhaps because of the large amount of trucks circulating, the respondent stated that the smaller vehicles are intimidated by the presence of trucks that "dominate" the region. Expressions like "trucks always have preference" and "everybody respects trucks" show discontent. In other neighborhoods, this problem was not mentioned.

IV. CONCLUSIONS

The reduction of conflicts between goods and services demanded by society which is more and more exigent to the variety and availability for these goods and the people responsible to satisfies them conditioned, in some cases, to a deficient road, it isn't a good task. Urban freight distribution is a challenge to local authorities that need to regulate the specific vehicles movement. The decision making process must consider the different needs of various stakeholders involved.

This work aimed identify, using qualitative research, the society perception regarding to the presence of urban freight vehicles in four neighborhood of Porto Alegre city:

Floresta, Cristo Redentor, Humaitá and downtown. Those areas was chosen based on their density of shops and services looking for different vehicles movement and pedestrians features in order to verify the impact of freight transport in the people perception. Eight interviews were conducted, guide by a semi-structured script to ensure that all interest issues would be covered.

The largest amount of problems expressed by respondents occurs when trucks are parked loading or unloading. Interruptions in traffic flow to maneuvers, interruptions in pedestrians flow on the sidewalk due to load and unload operations and congestion problems presented the most level of citation.

An interest issue could be noted during the interviews is that people tend to notice trucks when feel negatively affected by them. Regulatory efforts should focus on reducing the negative impact of urban freight transport in people ś lives. This research shows that solutions must creative to overcome physical limitations or some new design of urban spaces must destine specific locations to load/unload operations in urban areas.

Another important issue is monitoring, some respondents have questioned some facts using expressions like “Is it allowed?”, “No one enforces!”. Regulation must be combined with enforcement.

Specific literature shows that environmental problems, like noise and emissions levels are increased by congestion. However, this levels doesn ́t come directly from truck, but from the number of vehicles circulating in the city. Trucks are a contributing factor which must be considered in transport policies to avoid an excess of pollutants which can cause health people ś problems.

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