**Freight Trip Generation Patterns in Developing Countries
Questions and Answers.**

Q1: What are the survey timings in a day in India?
R/ Surveys were done from morning until late evening. However during peak periods (evenings) response rates were less.

Q2: Of the total sample what would be the attraction and generation percentages?
R/ In the case of Chennai, all establishments attract trips but only about 60% produced trips.
In the case of Medellin, all establishments attract trips but only 30% produced trips. This percentage is lesser than Chennai possibly because the sample of Medellin includes a large proportion of small establishment.

Q3: There was not a schedule before showing at the establishments, right? How many people went to the field interviews?
R/ In Chennai, no schedules / appointments were taken. They landed up there and requested data. People were kind. In Medellin, there were no scheduled appointments either.

Q4: How much time you took to collect this data?
R/ Chennai: We had about 20-25 staff and students but not everyone did surveys on all days. Overall the data collection was spread over 3-4 weeks. In two phases separated by a couple of months
In Medellin, 40-50 students worked during two months. The staff varied along the study because different difficulties and the academic schedule of the students.

Q5: What is the major reason behind smaller vehicles? Restrictions? Narrow roads? Smaller shipment size or other reasons?
R/
For the case of Medellin, the logistics practices, the cost of the storage room, and the limitations of money to have large stocks define the pattern of small shipments. Then the suitable vehicles are small. In some cases there is a restriction in the CBD that allows only vehicles up to 10 tons, but the distribution centers are located near the main highways that permit the access to larger vehicles. This restriction to 10 tons could be influenced by narrow roads but although the city would have wider roads the majority of shipments would be small.
In Chennai, lack of storage space, smaller establishments requiring lesser quantities, ready availability of small vehicles, restrictions during peak hour in city areas, and possibly lack of parking space as well as narrow road/congestion could all be reasons for using smaller vehicles for freight transport.

Q6: Did you find any difference among geographic areas - CBD vs. inner districts vs. outer areas, etc?
R/ In Chennai, we have not analyzed differences among geographic areas. We had a fairly small sample.
In the case of Medellin, we have not done this analysis yet. But with the data we can do that. This spatial analysis is the next step.

Q7: How was the response in Medellin? How you convinced the people about survey?
R/

In the case of <u>Medellin</u>, for cordon survey we use the support of the Police, and in Colombia is mandatory stop when the highway police want to implement control procedures. Although is not mandatory to answer the questionnaire, the presence of police persuaded drivers to do that. In the case of establishments survey, is common that the authorities conduct surveys to the different economic sectors, then when the surveyor go to do a face to face survey, they show the authorization of the municipality to do that, and this is important to gain trust from respondents. In other cases, when the survey is through a phone call, the surveyor introduce himself like a person authorized by the municipality.

Q8: In Medellin, how drivers responded to the survey and also, if possible, to clarify which agencies were involved to undertake that part of the study.
R/ The drivers are stopped by the Police in a bay at highway aside, and then the surveyor apply the questionnaire in 5 minutes. The agency involved is the Metropolitan Area Authority and the Highway Metropolitan police.

Q9: There should be a large % of short distance trips by the informal sector, which you wouldn't be able to capture in a formal establishment-based survey?
R/

<u>Medellin</u>: For the informal sector, it could be assumed that has the same behavior that the formal sector. The problem is to estimate the market share of informal sector. Additional work has to be done to determine the number of informal establishments per km2 in each zone. In Colombia, the informal sector do not have a conventional place to sell, they are located using the sidewalk and they transport their own products using handcarts without motor, very early in the morning and late in the evening. Sometimes they store their products in some improvised storage room in the formal establishments.

Q10: In Chennai, have you collected data about freight tonnage?
R/ We did. However this data is less reliable since the respondents measured the quantity of goods using different methods – sackful, by volume, by number of crates, etc instead of by weight. Also many establishments had wide variety of goods and they were not patient enough to share all details. Finally in a few cases they did not have any information about tonnage**.**

Q11: For both speakers, what was the motivation behind these surveys? Simply describing the current freight scenario or do you have plans to use the data for predictive purposes, simulation of traffic, etc.?
R/

<u>Medellin</u>: First to do the first attempt in understanding what happens with the freight in the region. Second, to implement a model that complement the real model of passengers and predict the future freight behavior in the region in response to different policies.

The motivation in Chennai was a workshop conducted along with Prof. Jose Holguin-Veras last summer (2013). We realized how very little data is available and limited research has been done in this area. This was seen as an initial study which could give insights into planning for a larger survey.

Q12: Is there, for any of the areas studied, any longitudinal trends known with respect to the type and size of vehicles used? (E.g. Steady state – or vehicles used getting bigger?)
R/

<u>Medellin</u>: There is no evidence of that in urban areas, but in highways it has been perceived a trend in increasing use of medium and large trucks. Only based on empirical observations in urban areas the number of motorcycles is increasing in the commercial trips.

There is very little data on this in India. We could look at vehicle registrations to get a better idea – however this has not been done so far.

Q13: Ivan and Gita: have you envisioned a scalability for your models or trends?
R/ <u>Chennai</u>: Our sample is very small to claim any trends or scalability. But it does give interesting insights and motivation for a further study.
<u>Medellin</u>: Not yet. But in general the figures found in Medellin in Kg/person/day are similar to those found in Bogota (the Capital of Colombia) that is double the population.

Q14: For Gita: How was the response rate? How you convinced people about survey?
R/ Response rate was 45% in the case of surveying establishments listed in government databases (major difficulty because of wrong or incomplete address). In the random sampling where addresses were visited near randomly selected locations, the response rate was 66%. Having students do the survey and handing over a letter to establishments stating the objective of the survey helped improve the response rate.

Q15: Is there any information of where do the vehicles parked to load/unload the freight?
R/ In Chennai, majority of parking was on street. Few had parking space. Loading docks were absent in all establishments surveyed. In <u>Medellin</u>, they park in the street, or in a bay, or in a parking in the inner of the establishment

Q16: How was set up the size of the sample, taking into account the different types of establishments and products?
R/

<u>Medellin</u>: We conducted first a pilot survey and obtained the variability of the variable shipments per month. With the Shapiro-Wilk test the normality of the data was checked. Then we designed the number of surveys needed to reach near 90% of confidence in the sample. If each economic sector has an infinite population of establishment, for 10% of error we need 400 surveys per sector. But when the population of establishment in a sector is finite, you have to correct with the expression

$$n = \frac{n_0 N}{n_0 + (N - 1)}$$

Where n is the simple size for finite population, N is the population size and n_0 is the size calculated of 400. For example, if N in a sector is 100 establishment, then n = 89 for this sector.

Although you can have near 100 codes of industry international code, in practice, you can aggregate all types of establishments in approximately 40 codes and later in less than 20 groups. Then the number needed of surveys could be less than 3000 for any big region.