

**P2P #17: The Impacts of Congestion on Supply Chains:
Recent Results from an Inter-American Development Bank Initiative**

Questions and Answers

1. Could you please brief me about the Inter-American Development Bank (IDB)?

R/ The Inter-American Development Bank (IDB) is an institution that works to improve lives in Latin America and the Caribbean. Through financial and technical support for countries working to reduce poverty and inequality, the IDB helps improve health and education, and advance infrastructure. It provides loans, grants, and technical assistance; and conduct extensive research. The Bank's current focus areas include three development challenges – social inclusion and inequality, productivity and innovation, and economic integration – and three cross-cutting issues – gender equality and diversity, climate change and environmental sustainability; and institutional capacity and the rule of law. For more information go to: <http://www.iadb.org/>

2. How many GPS loggers were needed to ensure appropriate statistical sampling?

R/ 15-25 loggers were installed for about 3-4 weeks. In most cases, it is not possible to obtain statistically representative samples because the delivery routes frequently change, in terms of the sequence of deliveries and the time.

3. Why did vendors choose to participate in study?

R/ There were two primary reasons: (1) because the receiver (who is the customer) asked them to participate; and (2) because they understood that by participating in the study they could help raise awareness about the importance of improving the efficiency of freight activity.

4. How many companies and trucks were monitored in Brazil? When was this pilot conducted?

R/ The pilot took place in 2015 between the end of July until middle of September. However, most of the data is from August. The tally includes:

- 3 companies: 1 big grocery chain and 2 suppliers with in-store deliveries (big multinationals, one beverage, other foods). The retailer also generated trips from its DC (Distribution Center) to the stores.
- 7 vehicles from each DC to 2 different stores (one located in regular congestion area, and the other located in a heavy congestion area)

5. Could you specify the main inefficiencies that impact the cost delivery?

R/ The two largest ones were congestion followed by delays at the receiving locations (for unknown reasons the trucks waited there for relatively long times).

- 6. Please explain how representative is your sample (Trucks, Commercial Centers and population). Assumptions and variables are not the same for Santiago, Barranquilla and Sao Paulo.**

R/ This methodology is intended to provide a quick and low-cost indicator of the problem. For the reasons explained before (see Question 2), achieving statistically representative results need very large samples. The applied methodology was the same for all cities.

- 7. How did you estimate the routing time of the base scenario that you used to compute the additional time?**

R/ We solved the vehicle-routing-problems for the free-congestion condition, computed time and distance, and obtained the generalized cost. These results were used to compute the Congestion Impact Factor.

- 8. Why depreciation was considered part of the cost? Shouldn't it be based on variable costs only?**

R/ Depreciation takes place as a function of the use of the vehicle. Thus, it is a variable cost. It was computed using the models developed by the World Bank. (Note: In accounting, depreciation is treated in a very different way.)

- 9. Does your data include automobiles apart from trucks that also contribute to overall cumulative congestion, especially to retail outs, shopping centers and distribution centers?**

R/ No. The main emphasis was on the direct effects of congestion on supply chains.

- 10. What causes the receiver delays?**

R/ It is not possible to tell without being there. Our guess is that the receivers—who have a lot of power because of the over-supply of trucks—do not have any incentive to rush to unload trucks. The carriers complain bitterly about these delays (which also creates many problems in cities because the trucks are obstructing streets, frequently double-parked) but are powerless.

- 11. Did all the vehicle journeys studied involve single, full load deliveries (rather than multi-drop delivery rounds in the cities)?**

R/ No. Most of them had multiple delivery locations.

- 12. What is the basis for setting parameters without congestion? Absolutely no traffic? Average traffic?**

R/ We used realistic values of congestion-free travel times that account for traffic signals etc.

- 13. When congestion cost comparison was compiled, was it based upon local currency value or was it indexed to Dollar?**

R/ Both, local currency and dollars.

14. Besides the routing, are there effects that the carriers transfer up the supply chain or in other logistics decisions (e.g. warehouse location, rejecting some consignments)? In other words, did the participants make decisions that affect the rest of the supply chain?

R/ There are numerous second-order effects on supply chains, which we did not study. Our emphasis was on the direct first-order effects.

15. Will you make this dataset available for collaboration purposes?

R/ We are always open to mutually beneficial collaborations. If as part of these collaborations, sharing data is needed we have no problem in doing so.

16. I believe you mentioned that the data collected was reviewed with and verified by the businesses. If so, how was this done? Also, were those businesses questioned or surveyed as to find out if they had any recommended low-cost, high-value freight mobility improvement suggestions?

R/ During the research process, we shared intermediate results with carriers and receivers and asked them to explain results that we found puzzling. They validated the findings.

17. How should the congestion delay study impact freight?

R/ This study clearly shows that the cost of congestion delays is larger than what many experts expected. In addition, it reveals that receiver inefficiencies are huge. Our hope is that the transportation community, particularly the public sector, takes action to mitigate these issues.

18. Are there any other means to deliver goods other than trucks? Any trains? or tricycles for last mile

R/ There are other modes that could be used--in a case by case basis--in general terms trucks are hard to beat.