

P2P #21: Internet Deliveries to Households, and Deliveries to Business: Impacts on Cities and Solution Approaches

Questions and Answers

1. What is the definition of a service vehicle vs commercial delivery vehicle?

R/ Service vehicles are those vehicles that are making service calls, such as HVAC repair. Commercial delivery vehicles are those that are delivering or picking-up packages and supplies.

2. What is the difference between freight and service activities?

R/ In the case of freight activities, the primary activity is either pick-up shipment or make delivery of something else. The activity focus is on transporting supplies from one kind or the other. Service activities include activities performed by the AC technician, repair people, and catering, etc. It is important to consider service activities because they have long durations that can take hours and hours, and significantly reduce the number of parking spaces available for freight activity.

3. What data sources provide information on the number of B2C/B2B deliveries in a day? Is there any granular (block groups/tracts) flow data and other travel characteristics data which can be used for modeling? Are any of them available at the commodity level?

R/ For B2B, there are no freely available data sources, and it is very unlikely to have data that fits the needs of everyone. Our approach is to conduct surveys to collect data that we use to estimate freight activity. The NCFRP Report 37 (see <http://www.trb.org/Main/Blurbs/175283.aspx>) contains models estimated using the confidential version of commodity flow survey, that can be used to estimate freight production and attraction.

For B2C, there is a mixture of everything. There are publically available data, but it is still lacking in details needed for the modeling effort. So we often need to supplement it with the survey data.

However, although the NCFRP Report 37 is relatively recent, the models are rapidly becoming obsolete on account of ecommerce and other changes in the economy.

4. Did you consider looking at disability as a sociodemographic factor? Disabilities make it harder to shop in brick and mortar stores, especially in winter.

R/ It is a very interesting point. It comes to the availability of data. So far, not much is known about home deliveries. We are trying to supplement the current knowledge by collecting a lot of additional data. So far, we have been focusing on the connection between home delivery and return frequency and how the different types of commodities influence the home delivery frequency. I agree that disability is a very important factor that we should look into. So far, we do not have the resource to look into this area, but it is definitely something that we should be looked into.

5. Can you please explain what "crowd delivery" means?

R/ Crowd delivery (or crowdsourcing delivery) do not use professional carriers. Instead, we can have people to help transport the goods while driving to work or driving home and use their car to deliver some of the packages.

6. Can you elaborate on the trips to shops are not reduced by home deliveries?

R/ One thing we have to make clear is that the money spent in stores and trips to stores are two different things. We can generally agree that now people spend more money online, which reduces the money they spent in stores. But what I am talking about is the travel activities, which include the home delivery frequency and people's trips to shops. On this side, I don't see the reduction of shopping trip activities. We also thought about the reasons. One obvious reason, especially in the US, is grocery shopping. A large part of our shopping trips is for grocery shopping. This part has not been replaced by online shopping yet. So it is inelastic at this stage. People are still going to the grocery stores for shopping. Another part of the shopping activity is for recreation. So that part is also not replaced. If you add in the fact that people like to try things before they buy -they may try the clothes, feel the electronics, etc. If you consider all these factors, in the end, the trips to shops are not reduced even though the money spent there might be reduced, which has been confirmed by the data

7. Did I hear you correct that regions with higher densities have a lower propensity for home delivery? Can you expand more on that?

R/In terms of the national average, higher density is related to higher home delivery frequency. What I mentioned in the presentation is that it differs across regions, and we are talking about the home delivery frequency at the individual and household level. People who live in the high density areas tend to shop more in the West Coast and Atlantic region. It is not the same in New England and other regions. There could be a lot of factors behind it. For example, the population density could be proxy variables for accessibility to shops and the congestion level. Many reasons could influence household level of delivery frequency.

8. Slide 71: Are the bars accounting for the height of buildings? Or is this assuming a 2D geography?

R/The vertical bars represent the numbers of deliveries and shipments per linear mile of road space.

9. I'm puzzled by how much vendor-specific, low-volume package delivery to business still occurs, in oversized trucks. Why are some suppliers persisting on with this model, rather than bundling their products in shared deliveries?

R/ The answer is competition, which is one of the major obstacles for consolidation across supply chain. In some cases, why should a carrier or vendor share transportation equipment if the collaborator can steal customers? This a major challenge to this type of concept. It is the lack of trust. One of our project studies the transfer of goods from trucks to cargo bikes or tricycles. If there is such collaboration, we can improve the efficiency and sustainability. But one concern from the carriers is that once they transfer the goods to other carriers, either of cargo bikes of tricycles, they lose face time with their customers. This is a major concern.

10. What impact does "signature required" deliveries have on congestion? If a signature is not obtained, multiple attempts are made. Has this impact been evaluated and, if so, is there a solution strategy being considered?

R/ We have not studied the impact of "signature required" deliveries in great detail.

11. Has there been a follow-up study done to check if they really did change their behavior? It would be interesting to see the revealed vs stated behavior.

R/ It will be interesting, and we look forward to that day. Currently, many local agencies are interested in pilot testing these initiatives or policies. But I don't see any cities in the US have comprehensively or formally implemented these policies yet. Once we have the revealed data, we will collect more data to see the revealed behavior.

12. Could you please describe the survey further? Number of responses, who were the respondents, what is the geographic representation of the respondents?

R/ This survey we have 550 respondents. They cover the entire nation. The majority of them are from NY State, but several of the other major MSAs are also very well represented. This is just the first phase, and we are going to have a follow-up survey. And we are going to have an increased sample size.

13. How can governments regulate individual parcel shipments?

R/ I am not a big fan of regulation. Complex problems do not have a simple solution. For regulation to pass through the political process, it has to be simple for people to understand. Because of the simple nature, they tend to complicate things. These are complex problems. Regulation has a role to play but I would see regulation as the magic bullet. It is part of the solution but not the entire solution to the issues.

Collaboration between the private and public sectors. The use of the curbside requires collaboration on both sides. Land use planning on where the freight facilities are located can be a collaboration between the private and public sectors. We have a lot of options before regulation.

Off-hour delivery is a very good example of public-private collaboration, which has been implemented very successfully in NYC. It is the City and the private sector that decided to collaborate long-term. Collaboration is not fully exploited. If regulation is the picture, that phase of collaboration will rapidly disappear. We have to exploit collaboration first.

14. Who is in charge of educating consumers and businesses?

R/ They have to be done by the private sectors and the public sectors. Academia can play an important role in this.

15. In places like New York City and Boston, which have some of the worst recurring congestion in the country, are Cargo Bikes and Nighttime Deliveries the best options to reduce freight congestion and double parking?

R/ They are some of the effective options. I would not say they are the best. Fortunately, both cities are actively looking into these options. NYC has already adopted the off-hour delivery initiative and cargo bikes operated in both cities. I don't think these two options are appropriate for all businesses and customers, but I think for those who have the potential to use them, who should fully explore the potential. In essence, there is no magic solution. In our view, cargo bikes, off-hour delivery, delivery lockers, all these are part of the solution. In our view, all strategies related to freight demand management, curbside management, parking management, they have the biggest potential. None of them offer the complete solution. Off-hour delivery can be extremely impactful, but off-hour delivery is not for all businesses. We need to articulate multi-layer policies, attacking the different segments, using the initiatives that are most effective for that particular industry sector.

16. Do any of the speakers have any speculation on differences between online shopping in US vs Asia? Asia is ahead of US in terms of demand, correct?

R/ In terms of home delivery frequency, yes. The main difference is the local on-demand delivery, especially on groceries and food. A lot of the Asian metropolitan regions, with high population density, we see a lot of food deliveries and groceries delivery. It is happening in the US, but not as popular yet. That is one of the reasons we believe that the home delivery frequency is going to keep increasing in the future.

17. Are there studies you are aware of that look specifically at food delivery?

R/ Here is a list of papers that look at food delivery.

- Akkerman, R., P. Farahani and M. Grunow (2010). "Quality, Safety and Sustainability in Food Distribution: a Review of Quantitative Operations Management Approaches and Challenges." *Or Spectrum* 32(4): 863-904.
- Allen, J., S. Anderson, M. Browne and P. Jones (2000). *A Framework for Considering Policies to Encourage Sustainable Urban Freight Traffic and Goods/Service Flows*. Sustainable Cities Programme. London, England, University of Westminster: 1-137.
- Bosona, T. G. and G. Gebresenbet (2011). "Cluster Building and Logistics Network Integration of Local Food Supply Chain." *Biosystems Engineering* 108(4): 293-302.
- Dablanc, L., E. Morganti, N. Arvidsson, J. Woxenius, M. Browne and N. Saidi (2017). "The Rise of On-demand 'Instant Deliveries' in European Cities." *Supply Chain Forum: An International Journal*: 203-217.
- Economic Research Service (2009). *Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences*, U.S. Department of Agriculture, : 160.
- King, R. P. and P. F. Phumpiu (1996). "Reengineering the Food Supply Chain: The ECR Initiative in the Grocery Industry." *American Journal of Agricultural Economics* 78(5): 1181-1186.
- Manzini, R. and R. Accorsi (2013). "The New Conceptual Framework for Food Supply Chain Assessment." *Journal of Food Engineering* 115(2): 251-263.
- McKinsey & Company (2016). *Parcel Delivery: The Future of Last Mile*. Travel, Transport and Logistics. M. Joerss, J. Schroder, F. Neuhaus, C. Klink and F. Mann, McKinsey & Company.
- Morganti, E. and J. Gonzalez-Feliu (2015). "City Logistics for Perishable Products. The Case of the Parma's Food Hub." *Case Studies on Transport Policy* 3: 120-128.

18. Who are the largest "locker" providers? I think we are all aware of the Amazon Lockers at Whole Foods and Universities, but what are the other locker options are available to help reduce freight trips in urban areas.

R/ There are many providers in Europe, such as DHL, which have implemented delivery lockers for more than 10 years.

19. There is a close correlation between technology and economic condition of a state. Assuming economic slowdown, but continued presence of tech - how will that impact any projections on reduction in online shopping activity?

R/ We have not studied this subject.

20. Are there any studies that you recommend which show a definitive link between air quality degradation and an increase in online shopping?

R/ The only study we are aware of is conducted by Miguel Jaller and Anmol Pahwa on “Evaluating the environmental impacts of online shopping: A behavioral and transportation approach”, which is published in Transportation Research Part D: Transport and Environment 80, 102223.

21. What do you think about the possible relationship the sharing economy applications to the urban freight systems?

R/ Building on the experience with Uber, they may not be a magic bullet. The trucking industry is pretty efficient. There may some improvements based on sharing facilities and vehicles. They will not be big enough to counter the more than doubling of demand or activities.

22. What are the negative impacts you found during the interviews about the delivery alternatives?

R/ The roads serving the residential area are not designed for the use of freight transportation. As we have more freight transportation, we can expect more congestion, damage to the pavement and more conflict between pedestrian and freight activities. All these are typical externalities generated by freight activities. But it is probably worse for places with high density of residents.

If we were transferring all the deliveries to delivery lockers in NYC, we are talking about 1.5 million deliveries. If a locker required 3 square feet, we are looking at 4.5 million cubic feet. If we have different vendors providing different delivery lockers as part of the strategy, where is the space? These have to be sorted out.