Tremplin recherche : Second appel à sujets de projet
Formation « à » et « par » la recherche à ESIEE Paris
20 septembre 2021

Titre du projet

Exploring new methods for collecting urban freight data: to characterize instant delivery workers behavior from Velib data.

Laboratoire, institution

LVMT (Laboratoire Ville, Mobilité, Transport), Université Gustave Eiffel.

SPLOTT (Laboratoire Systèmes Productifs, Logistique, Organisation des Transports et Travail), Université Gustave Eiffel.

GRETTIA, Université Gustave Eiffel.

Équipe ou projet dans le laboratoire

Chaire Logistics City – Laetitia Dablanc (Directrice de recherches, LVMT, Directrice de la Chaire) ; Heleen Buldeo Rai (Postdoctorante, LVMT) ; Matthieu Schorung (Postdoctorant, SPLOTT)

Pour le GRETTIA – Etienne Côme (Chargé de recherche, GRETTIA).

Partenaire international envisagé pour la poursuite en stage (mai-août)

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Datascience, Urban Logistics

Présentation générale du sujet (environ 5 à 10 lignes)

Logistics logically creates congestion, as delivery vehicles use the same route as commuters, cabs or buses. Urban logistics is characterized by frequent small deliveries, as storage space in stores is reduced, preferring to allocate more space to sales due to the price of land. This exacerbates the

problem of congestion in cities and causes delays and increased delivery costs. As a consequence of the scarcity of land, in addition to parking spaces, logistics companies cannot establish warehouses in urban centers to serve their customers. This leads to the "logistic sprawl" effect, i.e., warehouses move to the outskirts of cities in communities where land is available and affordable. However, urban logistics is essential to the functioning of the city and is not going to stop growing, as evidenced by the ever-increasing growth of e-commerce, which was so popular during the Covid-19 pandemic.

To be able to analyze these problems, their extent, their impacts and to imagine solutions, it is essential to have precise data on logistics. At present, public authorities have little knowledge and data about urban logistics in their territory. The Freturb model goes in this direction: based on field surveys in several cities (Bordeaux, Marseille and Dijon), it is feasible to perform several simulations without a specific local survey. It is possible to have an approach to the number of operations in the city as well as the occupation of the road by delivery vehicles . However, these data exist, because each transiting goods is followed point by point. Delivery information is digitized and delivery vehicles can even be equipped with GPS systems. Nevertheless, companies remain reluctant to share their data with public actors and research. In this logic of lack of data, we seek to find out how it would be possible to obtain more data directly from public actors. Traditional urban freight surveys are comprehensive but too expensive for local authorities. Several new methods can be identified: use of drivers' location data from telecom operators; use of data from logistics operators (and e-retailers, delivery apps, etc.); use of data from municipal agencies (e.g. Automatic Number Plate Recognition (ANPR) cameras for traffic enforcement). These methods represent opportunities but also huge technical and legal challenges. Efforts to recognize 'freight behaviors' from global mobility/GPS data are under way but there is not yet a clear technical solution. Research on these issues could provide opportunities for knowledge and action, contributing to public policies' modelling and forecasting goods flows. This could be crucial in assessing/monitoring GHG emissions from urban freight.

Objectif du projet (environ 10 à 20 lignes)

In parallel, intrusive and non-intrusive methods have been developed using GPS data. The advantage of FCD (*Floating Car Data*) is to be able to locate in real time the location of vehicles. This can be done with GPS information provided by a sensor installed on the vehicle or by using a mobile application by the driver. Knowing that smartphones are very widespread today, CDFs based on cellular phones can be a possible solution. Less expensive than installing GPS beacons on vehicles, using phones to transmit traffic information can be an effective method. Cell phone-based CDFs have the advantage of being less expensive and, given their widespread use, can be implemented quickly. The accuracy is lower than with a GPS sensor (about 300 m), but the weakness is compensated by the strength in numbers. CDF data can also classify vehicles, although usually other methods are used, such as measuring the weight or length of vehicles. CDF data can also be used to understand behaviors, determine real-time and average vehicle speeds as well as origins and destinations.

This research-oriented proposal aimed at analysing the bike-sharing system in Paris and data from Velib and identifying the mobility behaviour of « instant delivery » courriers working for platforms such as Deliveroo and UberEats who use this system.

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