



## **Cost modelling of hyper-local food delivery in an urban area-A case study of Kolkata**

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In order to make our cities globally competitive, the cost of transport, both passenger and freight, needs to be reduced drastically. Freight is a major contributor to our economy and is responsible for creating negative externalities like congestion and pollution. But effort has largely been invested in improving passenger transport and intra-urban freight transport remains an area of neglect. Moreover, the rise of B2C eCommerce and home delivery is changing the very nature of urban freight. From a thick supply chain of homogeneous goods, freight flows are morphing into home delivery of single packages. The competitive nature of online commerce ensures that companies are unwilling to compromise on short delivery times and are thus adding to the already burdened urban infrastructure. Hyper-local delivery of food has added yet another dimension to B2C eCommerce. In hyper-local food delivery, the aggregator matches a delivery partner to an order request, originating at a food business operator (FBO) and terminating at the customer location.

In this study an extensive review of the hyper-local food delivery model adopted in the city of Kolkata, India, has been carried out. To begin with, the economics of hyper-local delivery are studied. It is found that the aggregators engage with delivery partners in an effort based pay scheme. The cost of delivery is borne by the customer, the FBO and the aggregator. The actual cost of delivery in terms of fuel cost and capital cost of vehicle, is borne by the delivery partner, who is in turn paid by the aggregator based on the number of miles travelled. The average vehicle kilometers travelled per order, the average cost of delivery borne by the partner and his/her average earning per order is modelled. It is found that the present delivery model adopted by the aggregator engages a large fleet of delivery partners, results in lower number of orders per partner and thus poor per capita partner earnings. The model also lacks an efficient location allocation method for delivery partners, who are forced to relocate on their own, consuming miles for which they are not paid. The study concludes by proposing parameters for the evaluation of alternate hyper-local delivery models. The parameters proposed, encompass operational efficiency, earning potential of delivery partner, customer flexibility and externalities generated.