MODEL FOR A SUSTAINABLE DEVELOPMENT OF THE LAST MILE DELIVERY LOGISTICS BY DRONES

Bruno Lamiscarre

NEOMETSYS 1, esplanade Compans Cafarelli 31000 Toulouse France
e-mail: bruno.lamiscarre@neometsys.fr , web page: http://www.neometsys.fr

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Abstract.

Last mile delivery is defined as the movement of goods to/from a transportation hub from/to final delivery destinations, this part of the logistics chain being in general for many fields of logistics the more problematic and costly. Latest technologies are providing new means for collecting and exchanging information as well as for delivering logistics services. For example, advanced drone technology can produce today logistics solutions considering its now acceptable payload, autonomy and collision avoidance capability. This technology appears to be an opportunity to diminish last mile logistics costs as well as to contribute to sustainability objectives.

This tutorial focuses on the development of a methodology to design last mile logistics based on the drone technology. The current UAS technology will be described, the the regulatory framework will be described. Then, the proposed approach is able to cope with very different situations according to socio-economic and geographical characteristics of the considered areas covered by the logistics operations. According to the situation, localization, of the hub can be performed as well as the design of collecting/delivery routes and the dimensioning of the fleet so that different service standards levels are met. Solutions are built taking into consideration the structure of demand in the covered area as well as the performances of the logistics vehicles and some environmental restriction of operation (noise and emission levels for instance). Then a set of heuristics allows to produce quickly the whole logistics solution while different simulation experiments are performed to illustrate the proposed approach.