
Integrating Logistics Optimization into Traffic Management Policies

Rodrigo Rezende Amaral^{*†1,2} and El-Houssaine Aghezzaf^{‡1,2}

¹Department of Industrial Systems Engineering and Product Design – Belgium

²Ghent University – Belgium

Abstract

In an urban area, traffic managers aim to implement transport policies which are efficient, safe and sustainable. To achieve this goal, they must assess the costs and benefits of the possible measures and deploy optimization techniques to determine the best actions to be taken. However, the costs and benefits depend on how the users of the transportation network will respond to the measures. Therefore, their decision processes must also be understood and predicted.

Traffic assignment models represent, in this context, an attempt to anticipate how road users would be scattered in a traffic network given the demand rates (measured in number of vehicles per unit of time) between pairs of origin and destination points. These models assume that each user chooses the route that minimizes the costs of his/her trip, and the expected flows are calculated based on the network equilibrium.

In reality, however, there are different classes of users in a transportation network, and not all of them are trying to minimize the costs of a trip from one point to another. Logistic companies, for instance, have many other concerns when defining their routing schemes. Intricate logistic models have been developed to aid their decision processes.

Integrating these optimization models provides a good opportunity to enhance traffic management policies in a way to benefit all involved stakeholders. The analysis carried out in this paper demonstrates an improvement in traffic and logistics performance when the specific goals and requirements of logistic operators are explicitly taken into account.

*Speaker

†Corresponding author: rodrigo.rezendeamaral@ugent.be

‡Corresponding author: ElHoussaine.Aghezzaf@UGent.be