An interactive multi-actor multi-criteria analysis: a case study for alternative off-peak delivery solutions in freight distribution in Rome

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Extended abstract

Sustainable urban freight policies strive to minimize the negative externalities freight distribution produce in densely populated cities. Urban congestion is possibly the most critical issue local authorities have to deal with. It is typically aggravated by the temporal and spatial overlapping of freight related operations with peaking passenger demand. Among the various solutions suggested and implemented, off-peak deliveries (OPD) represent a promising solution with positive impacts on environment, economy and energy consumption. OPD is a form of retiming of deliveries shifting the operations from the regular business hours to the off-hours (e.g. Holguin-Veras et al., 2006).

The present behavioral research aims at identifying the most desirable OPD solution in the city center of Rome according to the main stakeholders' point of view. Previous researches in the same geographical context investigated stakeholders' preferences for specific parking and pricing related policies through appropriate behavioral models (Gatta and Marcucci, 2014; Marcucci et al., 2015). This paper, instead, focuses on three core issues: (a) understand the OPD awareness and its potential for each stakeholder involved; (b) obtain acceptability and feasibility measures to different types of OPD; (c) assess the overall effectiveness of such OPD initiatives through a stakeholder agreement.

The three OPD solutions considered are: i) combined OPD, with urban consolidation centers; ii) assisted OPD, with staff from the receiving establishment present; iii) unassisted OPD, without staff from the receiving establishment (Holguin-Veras and Sanchez-Diaz, 2014).

The stakeholders involved in the study are: 1) retailers, who commonly decide delivery times preferring business hours; 2) transport providers, who are generally attracted by the possibility to reduce transportation costs derivable from an increase in the number of deliveries during the off-peak hours; 3) public authorities, who are responsible for carrying out policy interventions for urban freight distribution; 4) citizens, the last but strategically most important link in the value chain, who could be both concerned about noise impacts potentially hampering OPD and willing to pay an extra cost for a "greener" distribution of freight.

An interactive multi-actor multi-criteria analysis (IMAMCA) is used to evaluate the different OPD solutions. This technique combines the standard multi-actor multi-criteria analysis (Macharis, 2004) with the stakeholder dialogue (Franceschini and Marletto, 2015). The novelty refers to the deliberative evaluation of the alternative solutions on the basis of the identified strategic goals.

Stakeholders’ perceptions are acquired through a combined approach which includes two phases: single in-depth interviews and a focus group. The former consists on extended individual discussions that allow to deeply investigate the knowledge and perceptions of the various OPD solutions (e.g. definition, effectiveness, feasibility, propensity, evaluation criteria). The latter enable collective discussions that facilitate the generation of a “shared vision” on the impact of the alternative OPD options on the strategic goals.

The proposed analysis allows to obtain: i) a solid understanding of how OPD solutions are perceived by the various stakeholders; ii) useful information identifying strengths and weaknesses for each alternative policies; iii) both individual and agreed evaluation of different OPD options. More in detail, results show that the overall assessment of the alternative OPD solutions achieved through IMAMCA is substantially different from that obtained via a standard multi-criteria analysis. In fact, IMAMCA, accounting for both the bargaining power among stakeholders and their interactive dialogues, allows to attain more robust and appropriate findings.

The results provide notable insights concerning the impediments and potential of OPD solutions. All the information produced are strategically relevant and represent the basis for a future implementation of OPD.

References

• Holguin-Veras et al., 2006 "Off-Peak Freight Deliveries. Challenges and Stakeholders' Perceptions"
• Holguin-Veras, J. and Sanchez-Diaz I (2014), Receiver-Led Consolidation Programs: Rationale and Potential, Transportation Research Board 93rd Annual Meeting.

**Keywords:** off-peak delivery; multi-criteria analysis; stakeholder dialogue, freight transport, city logistics.