

FREIGHT DEMAND MANAGEMENT AND ITS ROLE TO FOSTER SUSTAINABLE URBAN FREIGHT SYSTEMS

José Holguín-Veras, Ph.D., P.E.
Rensselaer Polytechnic Institute
USA

ABSTRACT

Increasing concerns about the impacts of human activity on climate change have added huge pressure to foster sustainability of transportation systems. The emphasis on transportation is undoubtedly well placed as the sector consumes 27.8% of the total energy and 70% of the petroleum; and produces 53% of the carbon monoxide, 31.3% of the nitrogen oxide, 24.2% of the volatile organic compounds, and 39.3% of the carbon dioxide. Freight transportation, particularly trucking, represents a sizable portion of these totals as trucks, only 4.3% of the motor vehicles registered, generate 9.8% of the vehicle-miles-traveled, 6.8% of the person-miles traveled, consume 26.5% of the fuel, and produce 41% of the greenhouse gas emissions. At the same time, freight transportation is a crucial component of modern economies, as without efficient freight transport modern life is not possible. In essence, vibrant economies require efficient freight transport systems. Freight transportation is a crucial component of modern economies, as without efficient freight transport modern life is not possible. Understanding freight activity will help to better evaluate projects and policies that affect the movement of goods and ultimately local businesses and economic activity.

There are a multitude of agents involved in the freight system, including producers/manufacturers, shippers, freight forwarders, third party logistic providers, warehouse operators, carriers, and receivers. However, close examination of what they do reveals that the primary roles are played by those that supply, transport, and consume the supplies. The “supplier” is a super-agent that conflates the roles of producer/manufacturers and shippers. The “carrier” represents the agents that take care of the transportation between shipping and receiving locations. The “receiver” is the actual recipient of the cargo, the generator of the demand, and the agent with the most potential to reduce the negative externalities of freight activity.

A wide range of potential actions could enhance the sustainability of urban freight activity. Broadly speaking, these initiatives could be classified into: Infrastructure Management, Parking/Loading Areas Management, Vehicle-Related Strategies, Traffic Management; Pricing, Incentives, and Taxation, Logistical Management, and Freight Demand/Land-Use Management strategies alter the demand for freight to improve sustainability and efficiency. By far, the least frequently used group is freight demand management, which is ironic as this field is bound to play a key role in increasing the sustainability of urban freight activity.

Freight demand management seeks to alter the demand for freight to mitigate the negative impacts produced. These initiatives are unique because, while other strategies focus on the freight carriers and their vehicles, freight demand management focuses on changing the behavior of the receivers of the supplies, which are the ones that generate the demand. Examples include: off-hour delivery programs that incentivizes receivers to accept deliveries in the off-hours; staggered pick-up/delivery programs; and receiver led consolidation.

In this talk, Professor Holguín-Veras will discuss the potential of freight demand management as a tool to foster sustainable urban freight systems, and why he believes freight demand management is the family of initiatives with the largest potential to transform urban freight systems for the better. To illustrate the potential of freight demand management, he will discuss key results of his behavior research pertaining to off-hour deliveries and receiver-led consolidation systems.