MetroFreight
Research, Education and Impact

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Introduction

• The MetroFreight partnership
  • METTRANS Transportation Center, USC and CSULB
  • University Transportation Research Center, CCNY, Columbia, Hofstra, U Buffalo
  • French Institute for Science and Technology for Transport (IFSTTAR), University of Paris-East
  • Korea Transport Institute, KOTI
Research

• Themes
  • Land use dynamics
  • Changing production and consumption
  • Last mile strategies
  • Public policy
  • Improving passenger-freight interaction

• Some numbers
  • 41 research projects, 28 completed, 13 in progress
  • 2017: 5 PhDs granted, supported by MetroFreight
  • 2016: 18 refereed publications, and 13 in review
  • 17 MF faculty and students participating in I-NUF
Research Highlights

Land use dynamics: Giuliano, Dablanc
Changing production and consumption: Dablanc, Conway, Lee
Last mile: Dablanc, Lee
Does density crowd out freight intensive activities?

Low intensity sector: 
\[ D(x) = 6.726 \times e^{-0.033x} \]

Medium intensity sector: 
\[ D(x) = 5.389 \times e^{-0.025x} \]

High intensity sector: 
\[ D(x) = 2.282 \times e^{-0.013x} \]
Warehouse location and impacts

Centralization, decentralization, concentration and dispersion
Explaining differences in patterns across metro areas

Warehouse location and low income, minority populations
Land use dynamics

• Warehouse location, comparative studies (Dablanc, Heitz)
  • Increase in number of warehouses in large metro areas around the world (25 case studies)
  • High spatial decentralization of warehouses
  • An emerging niche market for urban warehouses

• Freight trip generation and urban form (Beziat, Koning)
  • Using the Paris Urban Goods Movement Survey (LAET)
  • Comparing urban freight movements with population, job densities in Paris
  • Evaluating impacts of urban freight on congestion
Changing production and consumption

• On-Demand ‘instant deliveries’ (Dablanc, Saidi)
  • New delivery services in cities connecting consumers, shippers, and delivery couriers via phone apps, providing delivery in less than two hours
  • Fast increase (3% of Paris urban freight trips, mostly by bike)
  • Business models not stabilized, large companies v. small start-ups
  • Two groups of couriers: students & employees (additional revenue), full time couriers (labor issues)
Changing production and consumption

• Parcel deliveries in Seoul Metropolitan Area

✓ Seoul is the Hotspot
  - 24.2% to Seoul
  - more actively interacts with its vicinity (SMA)
  - 30.3% from Seoul

✓ Variations within the city of Seoul

< interregional flows of parcel freight in Korea >
Changing production and consumption

- Deliveries to Residential Buildings in NYC
  - How do we measure home-based delivery activity?

- Fort Lee Pilot: Building Delivery Records $\rightarrow$ Parcels
  - Frequencies
  - Growth
  - Time distributions (time, day, season)

- 4 Borough Pilot: Field Observation $\rightarrow$ Parcels and Vehicles
  - Delivery types
  - Delivery times by type
  - Shipment size
  - Vehicle types
  - Parking and delivery behavior
Last mile strategies

• Low Emission Zones in Europe (Dablanc, Montenon)
  • Old trucks and vans banned from cities
  • More than 200 LEZs in Europe
  • Positive impacts: urban freight market restructured (larger companies, more investments in vehicles and technology)

• Electric Delivery Vans (Camilleri)
  • Converting to EDVs implies deep operational changes
  • Subsidies remain a key factor to keep TCO acceptable
  • Technological improvement is and will remain fast, we are at a tipping point
Last mile strategies

• Motorcycles in *Dongdaemun Market (CBD of Seoul)*

• Consolidation: pick-up and drop-off points, lockers
Education Highlights

University education: Conway
Professional education: O’Brien
University education

• City Logistics Course
  • Module 1: Freight and the City
    (Planning, Geography, Economics, Supply Chain Logistics)
  • Module 2: Issues and Challenges in City Logistics
    (Stakeholders, Vehicles, Infrastructure, Facilities, Externalities)
  • Module 3: City Logistics in Practice
    (Data Collection and Analysis, Modeling, Design, Management and Mitigation)

• Public resources in development
  • Educational modules
  • City Logistics textbook
OUTLINE

A. Freight and the City
Urban geography. Urban economics.

B. Issues and Challenges of City Logistics
Congestion and externalities. Stakeholders of urban logistics. Urban logistics facilities. Mitigation policies and strategies.

C. City Logistics in Practice
Professional education

• Urban Freight for Regional Planners (Paris)
Professional education

Metropolitan Transportation Management Certificate and the urban freight audit (Los Angeles)
Impact Highlights

Los Angeles: Giuliano
New York: Conway
Paris: Dablanc
Seoul: Lee
Los Angeles

- California Freight Management Plan
  - Research in support of development of CFMP

- California Sustainable Freight Action Plan
  - Research in support of developing metrics for freight efficiency, economic competitiveness
  - Analysis of workforce needs

- Developing freight expertise at state, local levels
  - Urban freight components of Caltrans Freight Academy, CITT Global Logistics Specialist and POLB Academy of Global Logistics
  - Freight capacity building studies addressing KSAs in urban freight management
New York

• Pneumatic Tubes for Waste Removal
  • Research demonstrated benefits
  • High Line pilot study in pre-implementation

• Accommodating Freight in Complete Streets
  • Guidebook being developed in partnership w/ NYCDOT, supported by NYSERDA
    • Illustrated guidebook (PDF)
    • Educational modules
  • Inputs from 10 US cities
  • Publication on MetroFreight website, late 2017
  • Insights for NYC Street Design Manual update
Paris

• City of Paris Freight Forum
  • Active participation of MF team in steering committee and technical groups

• Paris planning agency (APUR)
  • Use of MF data for the 2017 Paris urban atlas

• Regional planning agency (IAU)
  • Use of MF research on urban goods movements

• Freight curriculum
  • Freight introduced in two Master’s degree programs at the Ecole des Ponts/University of Paris-East
Seoul

- National Logistics Master Plan 2016-2025
- National Logistics Facilities Development Master Plan 2018-2022
- Seoul Logistics Master Plan 2018-2022
- Province Level Logistics Plans: Gwangju, Jeju, etc.