Research and Development of an Eco-Transfer System to Foster Sustainable Last-Leg Delivery Mode

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Background

- Commercial vehicles: difficulty of parking
- Bikes and handcarts: limited range and need for space
- System operation: multi-stakeholder
Eco-Transfer System

- Micro-depot style transfer sites + operation mechanism + partnership
- Similar to taxi stand in a congested city
  - Provide physical space to transfer cargo to sustainable modes
  - Provide an avenue for the traditional carriers to find sustainable freight operators
Objectives

- Identify locations and time windows of the transfer sites based on the delivery demand, parking supply, and road network condition;
- Identify barriers, legal or otherwise, to implementation of Eco-Transfer System;
- Gain the support of public and private sector stakeholders; and
- Design a preliminary plan for the implementation of the Eco-Transfer System
T1. Determine locations and operation time

- On hourly basis:
  - Assess freight demand – establishment level model available
  - Evaluate parking space availability – commercial parking demand and on-street parking space estimation
  - Consider road network conditions, e.g., road (including sidewalks) capacity, connectivity, accessibility and other conditions that may influence the operation of handcarts, bicycles and tricycles.

- Key Challenge: Temporal variation and parking duration – time-lapse cameras and post-processing
Review State of Practice and Interview:

- Attitudes of involved users: goods parking facility management agencies, receivers, truckers, and the potential providers of the sustainable last-leg delivery modes.

- Legal issues: liability and the definition of “sustainable last-leg delivery modes” and infrastructure requirements.

What are the liability issues that may occur for each involved stakeholder? Are there feasible models to deal with this issue?

What type of vehicle engines can be legally classified as “sustainable last-leg delivery modes?”

What should be the speed limit for these vehicles, with or without an electrical assistance?

What is the maximum width requirement?

What is the legal range of payload?

What should be the regulation regarding the use of road space or bicycle lanes?

What should be the regulations related to parking, for both trucks waiting for eco-transfer system sites and the sustainable last-leg delivery vehicles?

Should there be any specific infrastructure consideration for these transfer sites, such as lighting, curb ramp, and signs?

What are the key impediments to adoption of Eco-Transfer System? What are the key concerns?

What could the public sector do to foster adoption of Eco-Transfer System?

What types of carriers, receivers, and sustainable last-leg delivery providers are most and least inclined to participate in this initiative?
T3. Preliminary Design

- Propose locations and operation time windows of the transfer sites.
- Summarize regulation and infrastructure considerations.
T4. Develop Plan for Pilot Testing

- Actual pilot test is beyond the scope of this project
- Develop a ready-to-implement pilot test plan
  - General design
    - General location, number of transfer sites, participants to be invited, and duration of the pilot, among others
  - Design
    - On the basis of the outreach efforts, recommend the pilot location(s) and design pilot activities
  - Evaluation plan to monitor the performance of pilot test(s).
    - Should describes the key aspects to be monitored and the corresponding metrics.
Potential Benefits

- **For Community**
  - Play as a central component of integrated mobility solutions for smarter cities and communities.
  - Reduce truck traffic thus significantly reduce the externalities associated with congestion.
  - Reduce energy consumption by the transportation sector.

- **For Transportation Community**
  - Provide opportunities for synergies between private and commercial bicycle use, enhancing the benefits of cycling infrastructure investment.
  - Benefit freight carriers because reducing, or retiming traffic in the peak hours will reduce delivery costs and increase profitability.
  - Benefit receivers because the delivery can be more flexible with door-to-door transport and more reliable as it will be less impacted by traffic.
  - Increase the arsenal of tools available to the transportation community, freight policy makers and planners.
  - Provide a platform for expanding the public-private sector collaborations.
Thanks!
Questions?