


Moving Goods in Dense Urban Areas

Where do we stand?

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Existing Planning Environment

Demand for freight is growing

More regions are creating freight plans

BUT

- freight is often overlooked in general planning
- freight demand is hard to predict
- moving freight in urban areas creates tensions

What solutions are available?

What gaps remain?

Context: Dense Urban Areas

http://www.cooltownstudios.com/images/addisoncircle.jpg

Dense Urban Areas: Efficiency

- infrastructure and services require lower per capita expense[1]
- trip lengths are shortened[2,3,4]
- dense mixed-use areas have been associated with
  - decreased VMT
  - increased walking and transit use[1,5,6,7,8,9]
  - lower energy consumption[10]

What about the trucks?

→What is the effect of dense, mixed-use urban form on goods movement?

- Literature Review
- Focus Groups:
  - Consult the actors most responsible for goods movement
  - Conducted in Philadelphia, PA and Seattle WA
  - Three groups in each city
    - truck drivers
    - logistics managers
    - planners

Without trucks, America stops

If you bought it, a truck brought it

(Logistics manager)

Photo source: http://www.belltowner.com/2008/05/amazon-fresh-now-available-in.html




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Problems

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The worst places to deliver

Common courtesy doesn't exist in the streets; people look at trucks as a nuisance

(Truck driver)

Goods don't vote, and goods don't buy

(City official)

How to think about the impacts?

- 4 key areas matter when moving goods in urban regions:
  1. Access, parking, and loading zones
  2. Road channelization, bicycle and pedestrian facilities
  3. Warehouse and distribution center locations
  4. Impacts of land use

Parking is limited

We're the bad guys because we double park

(Truck driver)

Photo courtesy of Brian Porter

Access, parking, and loading zones

- Insufficient loading zones and curbside parking[11,12,13,14]
- Demand for longer time limits[11]
- Need for better designed loading docks[11,12,13,14]

→ No work identifies balance between goods movement needs and other users of road space

Create safe multi-modal environments

Bicyclists don't follow the rules, pedestrians aren't aware of their surroundings, but trucks are asked to consider all else

(Logistics manager)

Photo courtesy of Melanie Mayock

Trucks & other road users

- Research focuses on overall safety impacts:
  - road diets & narrower lanes may be safer[15,16]
  - they promote appropriate travel speeds

→Research has not shown those effects extend to freight vehicles

Truck deliveries are noisy

Photo source: http://www.flickr.com/photos/27249820@N04/3537474916/

Time & Size Restrictions

- Public policy measures aim to reduce some externalities [17]
- Private market motivations generally reduce emissions

→ restrictions usually result in higher emissions

or increased exposure to noise & pollution

17,18,19,20,21,22,23

→ How to balance easing goods movement with minimizing impacts to residents?

Protect industrial areas

If you (jurisdiction) want this (industrial area) to be something else, just tell us and we'll leave. If you do it slowly, it's just death by a thousand cuts.

(Freight business owner)

If what we're worried about is carbon footprint, we'd better start thinking about freight movement

(Truck driver)

Warehouse locations

- Multiple-party, satellite warehouses
  - reduced heavy truck VMT in the urban center
  - but increased the total mileage and number of vehicles in the urban center.[24]
- Distribution facilities closer to urban centers
  - reduce the average length of haul and total VMT/VKT[25,26]

→How do we encourage DCs closer to CBD?

→How do we weigh competing impacts of multi-party warehouses?

How many goods?

They (planners) don't stop and think about how to handle freight; get it in their heads, everything comes by truck.

(Logistics manager)

Photo courtesy of Erica Wygonik

Land Use & Truck Trip Generation

- Truck trip generation hard to estimate[27,28,29]
- Limited, inconsistent data[28,29]
- Significant variation in correlation of truck trip rates to land use size[30,31]

→Sparse literature on land-use and truck trip generation, especially in urban environments

→Hard to plan for an unknown volume




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Solutions

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Solution: Dedicated Loading

- Philadelphia has set aside street space during morning hours
- Roads are protected for deliveries, then open for consumers

When William Penn designed Philadelphia, he wasn't thinking about 50 foot trailers

(Logistics manager)

Solution: Receiver incentives[32]

We're working around our customer's economy; your freight dictates your travel time

(Logistics manager)

Photo source: http://www.flickr.com/photos/kevinborland/3574436523/sizes/o/in/photostream/

Solution: Right-sizing vehicles

The more you touch freight, the more you break it.

(Logistics manager)

Photo source: http://beelohgee.blogspot.com/2010_10_01_archive.html

Solution: Private sector optimization

After time, you get to know police officers and other drivers. If you can't figure out how to make your job easier, you're just stupid; If you're not flexible in transportation, might as well get out.

(Truck driver)




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Gaps

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Innovations requiring research

- Using excess capacity in passenger rail service to deliver goods to urban areas
- Small deliveries by bicycle in urban areas
- Load consolidation at empty park-and-ride facilities
- IT for real-time route optimization
- Metering access of goods vehicles

Future Research: Existing Gaps

- What is the balance between goods movement needs and other users of road space?
- What is the safety relationship of freight and non-motorized modes?
- What is the optimal warehouse location?
- How to balance easing goods movement with minimizing impacts to residents?
- How does density or land use affect truck trip generation?

Summary

- Tensions and trade-offs:
  - Ease of goods movement
    vs.
    safety, health, and livability
  - Air & noise pollution
    vs.
    congestion & greenhouse gas emissions
- Understanding the behavior of trucks
  - Identifies thresholds and tools for change
  - Plan best for their needs

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Questions?

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