

Getting the Goods Without the Bads

Freight TDM Strategies to Reduce Urban Impacts



State
Smart Transportation
Initiative



CFIRE
NATIONAL CENTER FOR
FREIGHT & INFRASTRUCTURE
RESEARCH & EDUCATION



- ⌘ Increasing urban highway congestion
- ⌘ Rising road maintenance and construction costs
- ⌘ Social costs
 - ⌘ Emissions
 - ⌘ Noise
 - ⌘ Safety
 - ⌘ Road damage
 - ⌘ Congestion-related delay
 - ⌘ Livability

The Problem

- ⌘ What are the costs of transporting freight by highway and railroad in urban areas? How are these costs allocated to shippers, taxpayers, and society at-large?
- ⌘ How can the social costs of goods movement in urban areas be reduced most effectively through freight transportation demand management activities?

Research Questions





Photo: Marcus Wong via Wikimedia Commons

1. Review literature to estimate and allocate the costs associated with truck and rail transportation
2. Identify freight TDM strategies for urban areas
3. Evaluate strategies & develop case studies
 - ✎ Chicago
 - ✎ Philadelphia
 - ✎ Kansas City
 - ✎ New York City
 - ✎ Orlando
 - ✎ Portland
4. Prepare final report

Methods

Estimated Marginal Societal Costs Attributable to Truck and Rail Freight Not Passed on to Consumers, per Million Ton-Miles (in 1000s of 2013 dollars)

	Trucking	Railroad
Marginal Social Costs		
Marginal Public Infrastructure Costs (e.g., pavement preservation costs)*	\$7.45	-
Emissions of Particulate Matter and Nitrogen Oxide	\$46.85	\$8.52
Accidents	\$8.52	\$1.06
Congestion	\$7.45	-
Marginal Taxes and Fees		
Taxes and Fees Associated with Marginal Freight Activity	\$11.71	-
Marginal Social Costs Not Passed on to Consumers		
Unpriced Costs – Marginal Social Costs Minus Taxes and Fees Associated with Marginal Freight Activity	Over \$58	Over \$9 (but less than trucking costs that are not passed on)

Source: Government Accountability Office, *Surface Freight Transportation* (2011).

*Infrastructure costs and taxes and fees represent averages of data from fiscal years 2000 through 2006.



- ⌘ Anti-idling rules
- ⌘ Truck Routes
- ⌘ Promote a shift from truck to rail
- ⌘ Change pickup & delivery times
- ⌘ Use mobile apps & dynamic messaging signs to transmit congestion, parking, or other info
- ⌘ Land use strategies
- ⌘ Adjust parking policies
- ⌘ Planning information strategies

Strategies



<http://www.in.gov/idem/airquality/2569.htm>

- ⌘ Over 110 states, counties, and municipalities have restrictions against idling vehicles.
- ⌘ Goals, vehicles covered, idling time limits, enforcement, exemptions, and penalties vary widely.
 - ⌘ Time limits most often 1-15 minutes
 - ⌘ Goals are normally noise and/or emissions reduction
 - ⌘ Exemptions for extreme weather, equipment operation
 - ⌘ Vehicle operator, vehicle owner, and/or property owner may be held responsible

Anti-Idling Rules

⌘ Designating truck routes is one of the most common ways that cities manage freight transportation demand.

- ⌘ Target infrastructure improvements
- ⌘ Reduce exposure of residents to emissions
- ⌘ Separate truck traffic from bicyclists & pedestrians

⌘ Strategies include:

- ⌘ Standard truck route network
- ⌘ Turn restrictions
- ⌘ Arterials-only

Truck Routes



Photo: Stephen Miller

- ⌘ Incentivizing a shift from truck to rail seems like a good idea
- ⌘ But there are a lot of challenges
 - ⌘ Residents along lightly used/abandoned RR lines
 - ⌘ Grade separation
 - ⌘ Rail network inflexibility
 - ⌘ Speed
 - ⌘ First/last mile
 - ⌘ Often in cities, more trains = more trucks

BARRINGTON

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CN, Barrington at odds over who should pay for grade separation

By VERONICA JONES - vjones@shawmedia.com

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Anthony Hatch said he shares the viewpoint of much of the rail industry when it comes to the years-long fight between Canadian National Railroad and the village of Barrington.

"It is an example of the problems of an overregulated society where a single town can hold up a big deal that is good for commerce in general," said Hatch, a transportation analyst who has spent decades looking at the industry on Wall Street. "Our view is that CN



Mode Shift to Rail

Different policies with competing goals:

- ⌘ Off-peak delivery – reduces the amount of congestion associated with truck traffic and truck loading and unloading during peak travel times.
- ⌘ Nighttime delivery bans - reduces nighttime noise in residential areas



Photo: <http://www.truckinginfo.com>

Pickup/delivery times

⌘ “electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system,”

-FHWA



Photo: B. Schuman via Wikimedia Commons

- ⌘ Variable Message Signs
- ⌘ Real Time GPS Guidance
- ⌘ Dynamic Traffic Management
- ⌘ Computerized Scheduling and Shipment Information
- ⌘ Load Matching Systems

Intelligent Transportation Systems



Photo: Maryland Port Administration

- ⌘ **Freight Villages** – Zoning districts created to foster or maintain freight and industrial activities
- ⌘ **Industrial Zoning Overlay Districts** – special zoning districts, overlaying the existing base zoning classifications, which preserve land with uniquely valuable assets, such as deep water berth access or rail infrastructure, for industrial use

Land Use Strategies



Photo: DT Wash via Flickr

Ensuring adequate curbside parking space for commercial vehicles, whether through pricing or time limits, reduces truck double-parking and VMT, increases pickup/delivery efficiency, and reduces congestion.

Parking



- ⌘ Understand where key freight nodes and transportation corridors are located.
- ⌘ Understand policies in nearby jurisdictions that impact the movement of freight.

Planning Information Strategies

Issues

- ⌘ Rail bottleneck
- ⌘ Highway congestion
- ⌘ 250+ jurisdictions with conflicting freight policies.



Chicago

Uncoordinated Freight Policies

- 284 jurisdictions in the Chicago Metropolitan Area with different, and sometimes, conflicting regulations governing freight.

Unintended Consequences of Nighttime Delivery Restrictions



Source: Cambridge Systematics, "Regional Freight Systems Planning," presented to CMAP, September 2, 2009.

Chicago

Solutions

- ⌘ Regional Freight Leadership Task Force
- ⌘ Regional freight policy database
- ⌘ Scenario testing for the revision of truck route regulations
- ⌘ Identification of delivery time and parking restrictions that adversely impact the flow of cargo
- ⌘ Public outreach and stakeholder coordination



By J. Crocker via Wikimedia Commons

Chicago

TDM Strategy	External Costs					Private Costs		Difficulty to Implement
	Congestion	Health	Safety	Noise	Livability	Shipper & Receiver Costs	Carrier Costs	
Anti-idling Policies	0	+	0	+	+	0	+	Low
Designation of Truck Routes	+	+	+	+	+	+	~	Medium
Modal Shift	~	~	~	~	~	~	~	High
Off-Peak Pickup and Delivery	+	+	+	-	~	~	+	Medium
Restrictions on Nighttime Delivery	-	-	~	+	~	~	-	Medium
ITS Solutions	+	+	0	0	+	+	+	Low
Land Use Strategies	+	+	+	+	+	+	+	Medium / High
Parking Policies	+	+	+	+	+	+	+	Low
Planning Information Strategies	+	+	+	+	+	+	+	Low



Beneficial Impact +

Detrimental Impact -

No Impact 0

Dependent upon other variables ~



- ⌘ Freight TDM strategies have potential to create efficiency for businesses as well as reduce the social costs associated with urban freight transportation.
- ⌘ Two of these strategies, however, may create more problems than they solve:
 1. Restrictions on nighttime freight delivery are likely to exacerbate regional congestion and increase transportation costs.
 2. Efforts to affect modal shift from truck to rail may face strong community opposition and end up generating more truck trips than they eliminate.

Conclusions

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