



## The Potential for Off Peak Delivery in Metropolitan Chicago

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Funding provided by



## Traffic Congestion & Delay Cost Our Region.

- Congestion costs our economy \$7.6 billion annually.
- Travel in AM peak periods takes 60% longer than free flow travel.
  - Trucks are 6-10 percent of the region's traffic.
  - Most truck traffic happens in peak times.
- Peak period deliveries cost carriers 30-40% more.
- 70 percent\* of our communities reported to CMAP that peak period deliveries are a challenge.

\* weighted by population

## Off Peak Delivery: The Basic Idea

Businesses generally want deliveries during normal hours. Truckers need to meet those demands. So, most truck deliveries occur during congested peak daytime periods.

If more businesses would accept deliveries in off peak times, trucks could deliver goods faster and at less cost. That would reduce congestion and cost of goods, and yield economic and environmental benefits.



Image credit: www.flickr.com/photos/65172294@N00/8142555406/

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## Our Approach to the Project

- **Research**
  - Literature review
  - Case studies
  - Data analysis: Zip Code Business Patterns, Hoover's Business Database, CMAP Congestion Maps
  - Surveys of truckers and businesses
- **Design a Pilot Project in Partnership with Implementers**
  - Primary Partner: Supply Chain Innovation Network of Chicago (SINC), a unit of World Business Chicago
  - Chicago Department of Transportation
  - Chicago Metropolitan Agency for Planning
  - Illinois Department of Transportation
  - Mid-West Truckers Association
  - And others . . .

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## Other Regions Have Tried OPD

### New York

- Initially a pilot project with 35 receivers, the long-term program now has more than 400 participants.

### PierPass, Ports of Long Beach and Los Angeles

- PierPass began OffPeak in 2005 and by 2008 shifted 45% of container cargo to off peak shifts; still reporting more than 30% shift from peak to off peak.

### Barcelona

- Began in 2003 with two grocery stores receiving off peak deliveries, by 2010 spread to over 400 stores in 35 provinces.

### London

- Implemented off peak deliveries during the 2012 Olympics and currently conducting OPD trials in addition to cordon pricing in central London.

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## Other Regions Have Tried OPD

### Dublin

- Cordon pricing in addition to limitations on heavy goods vehicles from 7am to 7pm. In 2011, approximately 25% of all food deliveries occurred during off-peak hours.

### The Netherlands

- Fostered innovations in low-noise technologies and behaviors resulting in standards now used in over 50 cities with 1,400 quiet deliveries a week.

### Orlando Pilot

- Hospital system Orlando Health is currently piloting OPD on their main campus in "South of Downtown Orlando."

### Washington D.C. Pilot

- OPD was listed as a strategy to improve the movement and delivery of goods in the District's 2014 freight plan and is now being implemented through a pilot project.

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## New York City - Rensselaer Polytechnic Pilot

- Pilot project involved 35 receivers and 20 trucks/vendors.
- Half of participants did staffed OPD and half did unassisted OPD (store provided driver with a key or passcode).
- Receivers were given a \$2,000 incentive to participate; carriers got \$300 per truck.
- After the pilot all receivers doing staffed OPD reverted back to regular daytime deliveries, but almost all receivers doing unassisted OPD remained in the off-hours because of its reliability.



### Results:

- Off-hour deliveries cost carriers about 30% less -- carriers save about 48 minutes in travel time and 1 to 3 hours in total service time for each delivery tour.
- Parking fines, often exceeding \$1,000 per truck per month, are reduced.
- OPD policies in Manhattan could save all highway users 3-5 minutes per trip.
- Long term OPD policies would save between \$100 and \$200 million/year in travel time and pollution reduction.
- Reduced peak time congestion makes it safer for pedestrians, cyclists and vehicles.
- Reduced travel time leads to a reduction in environmental pollutants.

More than 400 companies are participating in the permanent Off Hours Delivery program.

Find out more at <http://www.nyc.gov/html/dot/html/motorist/offhoursdelivery.shtml>

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## PierPass OffPeak - Ports of LA and Long Beach

- Los Angeles and Long Beach terminal operators launched PierPass OffPeak July 23, 2005.
- OffPeak uses pricing to reduce congestion and delay at the ports.
- International terminals established five OffPeak shifts per week:
  - 6:00 p.m. to 3:00 a.m. Monday through Thursday
  - 8:00 a.m. to 5:00 p.m. on Saturday
- No fee for containers entering or exiting the terminals during off-peak hours.
- Containers entering or exiting by road during peak hours (3:00 a.m. to 6:00 p.m. Monday to Friday) are charged a Traffic Mitigation Fee.
- By 2008, 45% of container cargo traffic shifted to off peak; still reporting more than 30% shifted.
- By 2014, OffPeak had diverted more than 30 million total truck trips from peak to off-peak times.
- More information can be found at <http://www.pierpass.org/>



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## Barcelona - Mercadona Supermarket Silent Nighttime Unloading Program

- Pilot project began in 2003 at two Mercadona supermarket locations. Deliveries took place from 11pm-midnight and 5am-6am. Large 40 ton trucks replaced small delivery vans.
- The pilot sought to determine:
  - The feasibility of silent night deliveries
  - The return on investment for vehicle adaptations and night shifts
- Noise reducing measures included carpeted flooring in the truck, low noise lifting system, carriers with low-noise rubber wheels, and staff training to minimize verbal communication and other noises.
- The results:
  - Noise level during loading and unloading complied with regulations and differed very little from ambient conditions. No noise complaints from nearby residents.
  - The pilot led Mercadona supermarkets to set up two night-time deliveries using large 40 ton trucks instead of seven peak-hour deliveries using vans.
  - Mercadona estimated that full investment in vehicle adaptation is recoverable within three years.
- Following success of the pilot, Mercadona implemented a nationwide Silent Nighttime Unloading Program. By 2010, it had expanded to 407 stores in 35 provinces. They estimate that in 2010 their vehicles spent up to 80 percent less time in city centers, reducing congestion and noise and eliminating 70,000 tons of CO2 emissions.



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## OPD Can Yield Significant Benefits to Carriers, Receivers, and Travelers.

- **Reduced peak time congestion**
- **Reduced costs**
- **Time savings**
- **Reduced parking fines**
- **Increased reliability**
- **Improved safety**
- **Economic benefits**
- **Less pollution**

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## OPD Can Yield Significant Benefits to Rail and Intermodal Businesses and Their Customers.

- Companies up and down the supply chain can benefit.
- In the Chicago region, the six class one railroads generate 15,000 daily truck trips to and from their customers and 7,500 daily truck trips between intermodal facilities.
- According to the 2012 Commodity Flow Survey, 25% of goods destined for Chicago by train (measured by value) will make some portion of their journey on a truck.



Photo credit: Russell Sekeet, [www.flickr.com/photos/73784413@N00/4599014520/](http://www.flickr.com/photos/73784413@N00/4599014520/)

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## Several Factors Affect OPD Participation.

- There is a mismatch between who receives benefits and who pays.
  - Most of the benefits are spread throughout the greater community.
  - Carriers mostly receive positive net benefits while receivers often perceive that their direct costs (staff, security, etc.) would exceed their benefits.
- Many businesses want to receive deliveries during daytime hours.
  - Receiving businesses are the customers and specify delivery times.
  - Carriers must meet required pick-up and delivery times of shippers and receivers.
- Location and industry type can affect participation.
- Unassisted OPD may be more sustainable for some businesses because of its reliability.

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## Unassisted off peak delivery may have more potential for some types of businesses.

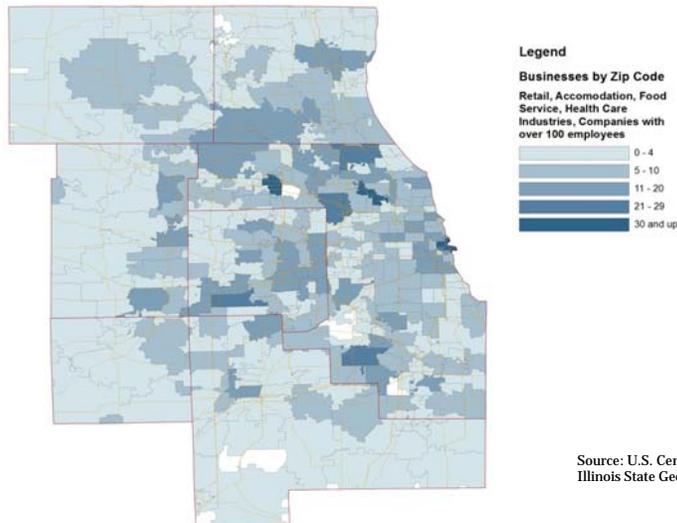
- It involves providing a setting for unassisted drop-offs.
- It may require some investment to create a secure area – options include:
  - Delivery lockers
  - Double doors
  - Electronic key boxes
  - Virtual cages with deliveries entered through a hand-held scanner
- Less ongoing staff expense can enhance long term success.



## Location and industry type can affect participation.

- Businesses most receptive to off-peak deliveries are those that would likely be open anyway, such as restaurants, bars, hotels, 24-hour supermarkets, medical facilities and many retailers.
- Larger establishments, buildings with many businesses and more densely developed areas yield greater savings in the number of truck trips and cost effective implementation, as added costs can be shared among more customers.
- Mapping selected industries, locations, congestion, and parking ticket violations.

### OPD Target Locations: Selected Industries, Companies with over 100 Employees by Zip Code

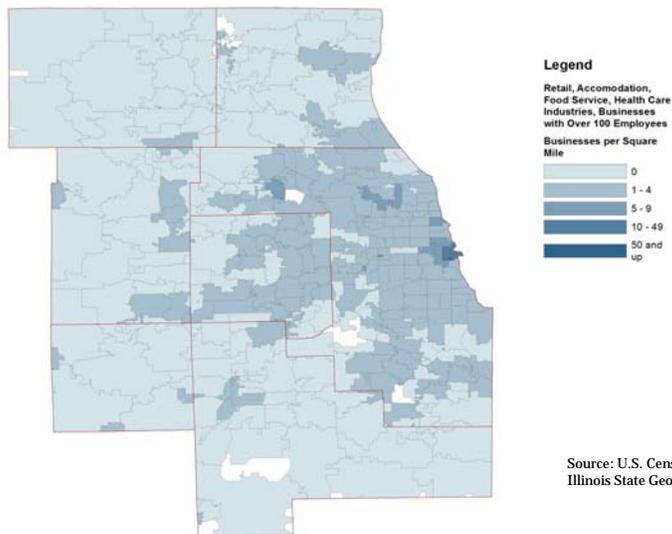


Source: U.S. Census Bureau, Illinois State Geological Survey

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### OPD Target Locations: Density of Selected Industries, Companies with Over 100 Employees by Zip Code

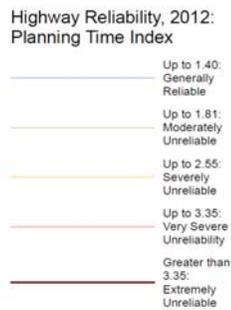
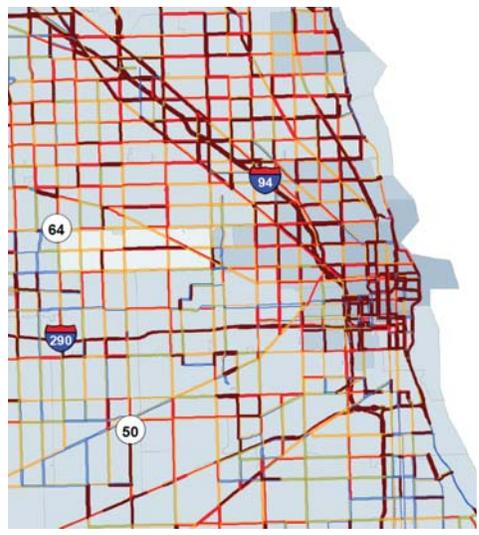


Source: U.S. Census Bureau, Illinois State Geological Survey

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### Congestion: Travel Time Reliability



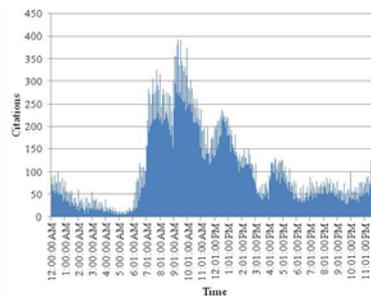
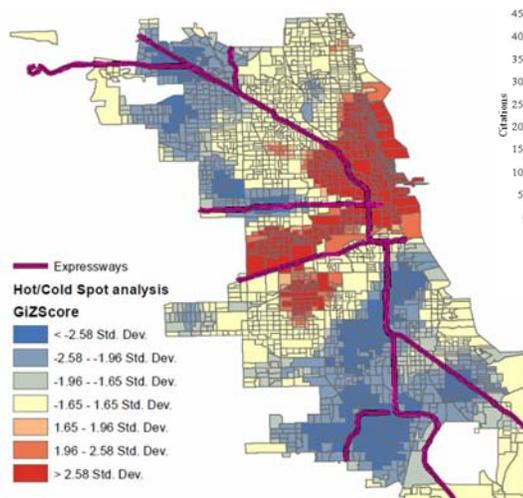
The planning time index is the ratio of peak travel time to free flow travel time. It is a measure of travel time reliability.

Sources: CMAP, Midwest Software Solutions, HERE, IDOT

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### Parking Ticket Violation Hot Spots and Time Of Day

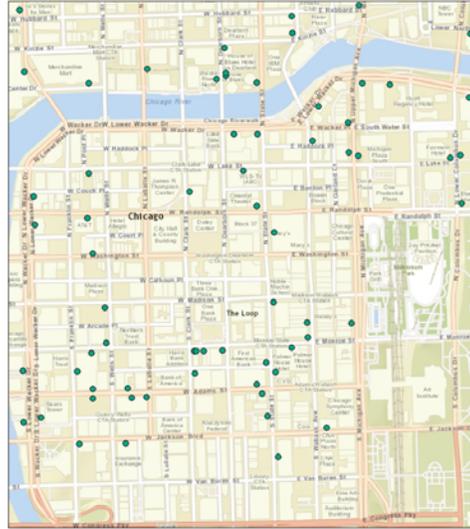


Prepared by: Kazuya Kawamura, P.S. Sriraj, Havan Raj Surat, Martin Menninger, College of Urban Planning and Public Affairs and Urban Transportation Center, UIC (Analysis of Factors Affecting Truck Parking Violation Frequency in Urban Areas)

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## Loop Off Peak Delivery Receiver Candidates



Source: Mergent Intellect

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, and the GIS User Community

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## North Michigan Avenue Area Off Peak Delivery Receiver Candidates



Source: Mergent Intellect

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, and the GIS User Community

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## Drilling down to design the pilot

- **North Michigan Avenue: Northwestern Memorial Hospital Campus, Lurie Children's Hospital, Northwestern University Chicago Campus**
  - Located in an extremely congested Chicago neighborhood, these institutions share similar challenges with freight deliveries.
  - Most bulk and scheduled deliveries arrive during off-peak hours.
  - Unscheduled deliveries (typically via FedEx and UPS), construction deliveries, and some food items arrive during peak hours.
  - There is interest in moving more deliveries to off-peak hours.
  
- **The Loop: Targeted surveys to carriers and receivers**
  - A survey to carriers has been distributed by the Mid-West Truckers Association to its members.
  - Getting the receiver survey to the right people is a challenge.

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## Initial Survey Results

- A survey of freight carriers that assesses the potential for and challenges to OPD is currently in progress. Twelve responses have been received so far, but the early responses provide some insight into OPD from a trucking perspective.

### Timing of current deliveries

- 100% of the respondents make deliveries from 6am-10am.
- Over 50% also make deliveries from 10am to 3pm.
- Less than 10% make deliveries from 3pm to 7pm.
- About 25% of the respondents are already making deliveries during the off hours of 7pm to 6am.

### Ease of implementation

- Nearly 75% of respondents report that if receivers were willing, it would be easy or somewhat easy to make deliveries during off-peak hours.
- Those that indicated implementing OPD would be difficult cited problems such as freight that needs constant refrigeration, the shipper's hours, and logistics for loading the next delivery.

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## Initial Survey Results

- A survey of freight carriers that assesses the potential for and challenges to OPD is currently in progress. Twelve responses have been received so far, but the early responses provide some insight into OPD from a trucking perspective.

### Savings and discounts

- Respondents agreed that making deliveries during off-peak hours would be less expensive – perhaps as much as 30-40% cheaper than delivering during the day.
- However, only 18% indicated they would give a discount as high as 10% to deliver in the off hours.

### Interest in participation

- Nearly 75% of respondents indicated that they might be interested in participating in an off-peak delivery pilot project.

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## Many Businesses Will Need Incentives to Shift to Off Peak Delivery.

- **Public recognition**
- **Direct monetary incentives – subject to funding**
- **Discounted pricing by carriers – could be coordinated**
- **Organized business support and encouragement**
- **Discounted fees from governments or businesses**
- **List of “Trusted Vendors” that certify quiet delivery practices**



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## Possible models for an OPD program

### New York City Approach –

Using grant funding as a financial incentive as in the New York pilot, seek out receivers in a particular corridor or area to implement off peak delivery on a trial basis.

### One Large Receiver Approach –

Identify one large receiver to be a demonstration project. A major healthcare facility would have ideal scale and volume. This may or may not require a financial incentive; none was needed in Orlando.

### Package Approach –

Piece together an attractive package of discounts and non-monetary incentives, such as:

- Financial incentives
- Public recognition through a coordinated program
- Direct discounts by carriers to receivers for off peak deliveries
- Coordinated participation by receiving businesses
- Discounted fees and charges from governments and supportive businesses.
- One-time funding for physical improvements such as storage lockers for unstaffed OPD or sound-reducing technologies (if funds are available).
- List of "Trusted Vendors" that certify certain safe and quiet delivery practices

Any of these approaches would need coordinated administration and publicity.

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## Key decisions are needed.

- Design and location(s) for the pilot
- Gaining participation of:
  - Receiving businesses
  - Carriers
- Incentives
- Type of OPD (staffed, unstaffed or both?)
- Administrative requirements
- Budgeting and paying for the program:
  - Can it pay for itself?
  - Grants needed?
  - Sponsorships?
- Publicity and communication
- Possible supportive government actions

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