Mechanics of the seminar

- The webinar is being recorded, the URL will be sent out to participants and posted at www.coe-sufs.org
- Participants from the US and Canada can:
  - Use Adobe Connect to receive the audio (PRIMARY method)
  - Dial 1-888-446-7584, access code 1120583
- International participants can:
  - Use Adobe Connect to receive the audio (PRIMARY method)
  - Use Skype or similar to dial 1-888-446-7584, code 1120583
  - Dial 212-372-3742 (caller paid call)
- Submit questions using the Chat feature
Introductory Remarks
Mr. Thomas Maguire, Assistant Commissioner, New York City Department of Transportation

The VREF Center of Excellence for Sustainable Urban Freight Systems (CoE-SUFS)
José Holguín-Veras, Presenter
CoE-SUFS

- Funded by the Volvo Research and Educational Foundations (VREF)
- Main Goal: To jumpstart an integrative process, involving cities, private sector, and researchers to develop new freight systems paradigms that:
  - Are sustainable
  - Increase quality of life
  - Foster economic competitiveness and efficiency
  - Enhance environmental justice
CoE-SUFS Dissemination Programs

- **Peer-to-Peer (P2P) Exchange** to share global best practice cases and real world examples of sustainable urban freight systems

- **Next P2P (date to be determined):**
  - “The London approach, and building on the Olympic legacy”
  - Ian Wainwright, Head of Freight and Fleet Programmes, Transport for London; and Professor Michael Browne, University of Westminster, London

- **The Research Exchange** to share innovative research on urban freight, and related topics

- **Workshops** to bring together public/private sectors and academia, to jointly work to address urban freight issues; successfully held in India, Brazil, and Colombia
Our Challenge

This is what we all want...
This is what we need to change…

What is source of all those trucks?

In Manhattan:
- 56 buildings create about 4% of delivery traffic
- 6,800 restaurants and drinking places generate more truck traffic than the port
- 10 ZIP codes with freight parking demands larger than the parking capacity of the streets
The USDOT/RITA Project on Off-Hour Deliveries (OHD)

Main Project Partners
Background

Milestones

- **2002:** The Council of Logistics Management asked New York State Department of Transportation (NYSDOT) to study how to foster OHD in NYC
- **2003-2006:** NYSDOT funded an OHD project focused on Manhattan; Brooklyn private sector groups asked for a study, and the project was expanded
- **2007-current:** USDOT’s Commercial Remote Sensing and Spatial Technology program funded two projects with a pilot, and a design/implementation phase

“Off-Hour Deliveries” are those taking place between 10PM and 6AM
Milestones

- **2011:** NYC added OHD to its sustainability plan (plaNYC)
- **2012 Federal Highway Administration/ Environmental Protection Agency** announced a OHD program
- **2013 NYSERDA/NYCDOT** funded a project to incentivize receivers to accept OHD
- Numerous cities have inquired about OHD programs

Why do We Need to Intervene to Foster OHD?

- Markets find efficient outcomes, if they do not, there is a market failure → public sector intervention
- The market failure is the result of the unwillingness of receivers to accept OHD
- Increasing off-hour deliveries is beneficial to Society
- The solution is to either:
  - Compensate the receivers for additional costs, or
  - Develop technologies/systems to allow receivers to do OHD at lower costs (so that compensation could work)
1st Phase: Research and Pilot Testing

Research Conducted

- Behavioral/economic
  - Analyses of most promising industry segments
  - Incentives to receivers of cargo willing to do OHD
- Technology: GPS to assess performance
- Network models were used to assess local and network wide impacts
- Industry/Agency outreach and engagement
- Pilot test to assess real life impacts...delayed by:
  - Skepticism on the part of the industry
  - The huge challenge of not having any precedents

and...
Pilot Test

- Three separate one-month stages:
  - Foot Locker (ten stores)/NDL
  - Whole Foods (four stores)
  - Sysco (twenty one stores)
- About 35 receivers, 20 trucks/vendors
  - Half doing staffed OHD
  - Half doing unassisted OHD
Regular vs. Off-Hour Deliveries

Regular vs. Off-Hour Deliveries
Results From Satisfaction Surveys

- Carriers/Vendors: 1.55
- Drivers:
  - Travel speeds = 1.33
  - Parking = 1.11
  - Time to deliver = 1.38
  - Time to complete the route = 1.44
- Receivers:
  - Impression of off-hour deliveries = 1.50
  - How likely are you to off-hour deliveries = 1.42
  - If all liability issues were addressed, would you be interested in receiving unassisted OHD? = 2.17

Scale: 1= Very favorable, 5= Very unfavorable

Average Space Mean Speeds

More than twice as fast
Average Service Times

More than three times as fast

After the End of the Pilot

- All of the receivers doing staffed OHD reverted back to the regular hours
- Almost all the receivers doing unassisted OHD remained in the off-hours
  - The reason: reliability of OHD
  - “Our locations will continue to receive ‘night drops’ even though this program has ended as our managers now favor the dependability of night drops vs. late day time deliveries. Thanks again for the program.”
  - Nick Kenner, Managing Partner, Just Salad LLC

- **Key lesson:** Unassisted OHD work for large numbers of receivers, and do not require on-going incentives
2\textsuperscript{nd} Phase: Design and Launch

Unassisted Off-Hour Deliveries

- Main focus of the 2\textsuperscript{nd} phase of the OHD project
  - Unassisted OHD:
    - Only a one-time-incentive is needed
    - Once they try it and like it, receivers stay in the off-hours
    - Large Traffic Generators (large buildings/establishments)
  - Research was conducted to find out how to:
    - Foster:
      - Unassisted OHD at businesses establishments (retail and the food sector are the top priority)
      - OHD at Large Traffic Generators
    - Use technology to:
      - Reduce noise during OHD
      - Facilitate Unassisted OHD
Unassisted OHD: Behavioral Research

- Key determinants in OHD participation:
  - One-Time-Incentive (financial)
  - Discounts from vendors (financial)
  - Business support is worth → US$1,000 - $3,000
  - Public recognition is worth → US$600 - $1,100
  - Trusted vendor is worth → US$24,000 - $36,000

- Suggestion:
  - Public sector → Incentives and public recognition
  - Carriers/vendors → Shipping discounts
  - Trucking groups → Create a “Trusted vendor” program

- Re-align federal/state incentive programs:
  - Environmental, economic, etc. to support OHD
  - Require recipients to accept OHD

Unassisted OHD: Virtual Cages

Left: The security gate outside the store is brought up and down electronically by the turn of a key. This is the first level of access control.

Center: On the opposite side of the gate key wall is an electronic keypad that logs the start and end times of the delivery, in addition to the driver number.

Right: Once inside, the driver is restricted by a virtual cage that is marked off by four sensors. The area is almost the full width and roughly half the depth of the store.
Top: The goods are brought inside the store past the security tag detectors, which will sound if the boxes are brought back outside. The driver dismantles the pallets and sorts the boxes according to department.

Right: The carrier company provides the driver with a handheld scanner, and there is a program to connect to the specific retailer. Goods are automatically entered into the inventory system.

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Noise Policy

- **1st layer: Commitment**
  - Code of conduct / Training
  - Low noise strategies / tech.

- **2nd layer: Training**
  - Driver behavior
  - Low cost measures – noise absorbing materials
  - Low noise trucks/equipment

- **3rd layer: Enforcement**
  - NYCDOT, NYC Dept. of Environmental Protection investigate violations and enforce compliance
Noise Monitoring

Sample Noise Profile of a Delivery Truck

- Snorting care
- Riding up ramp
- Moving cart
- Closing back door
- Changing flat

Measured at a distance of 20’

Noise Monitoring

Low Noise Technologies...Among Many More

- Electric/alternative fuel trucks
- Low noise lift platforms
- Noise absorbing coatings
- Low noise carts
The Economic Bottom Line

Economic Impacts

- Implementing various forms of off-hour delivery policies in Manhattan leads to:
  - Travel time savings to all highway users of about 3-5 minutes per trip
  - Travel time savings to carriers that switch to the off-hours of about 48 minutes per delivery tour
  - Savings in service times (per tour) could be up to 1-3 hours
- Depending on the extent of the implementation, economic savings are between $100 and $200 million/year in travel time savings and pollution reductions
### Environmental Pollution Reductions

#### TOTAL/YEAR

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<th>Scenario</th>
<th>% OHD</th>
<th>CO (tonnes)</th>
<th>HC (tonnes)</th>
<th>NOx (tonnes)</th>
<th>PM10 (kg)</th>
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#### PER RECEIVER/YEAR

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<th>% OHD</th>
<th>VMT (veh-mi)</th>
<th>VHT (veh-hrs)</th>
<th>CO (kg)</th>
<th>HC (kg)</th>
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There is Public Support...as Reflected by Media

TIME magazine listed the OHD project as a “Top 10 Ideas” March 25th, 2013
NYCDOT Market Research: Key Findings

- Insight #1: Find signature chains to be the leaders
- Insight #2: Focus on developing incentives
  - This validates previous research
  - Our energy is better spent in getting the incentives developed and making a clearer business case
- Insight #3: Engage community stakeholders once there is a clear plan
  - Marketing strategy
  - With several key champion chain companies on board
  - A business case well defined for those champion companies
  - Only then it is possible to win over residents and small businesses
NYCDOT/RPI are in Conversations with...

- Economic development agencies: to define OHD incentive programs and tie other incentives to OHD
- Federal agencies: to see if existing federal programs can be expanded to include OHD
- Leadership in Energy and Environmental Design (LEED): to see if it could include OHD-friendly features
- Leaders in the real estate sector: to gain their support on OHD and sustainable delivery practices
- Trade groups and leading companies: to foster participation in OHD

NYC DOT

On Going Discussions With...

- Duane Reade
- InterContinental Hotels & Resorts
- Keating Hotels
- The Waldorf Astoria
- The Chefs Warehouse
- Whole Foods Market
- New York State Restaurant Association
- CVS Pharmacy
- The Beverage Works
- Gristedes
- Sysco
- Wakefern Food Corp.
- Gap
Super Storm Sandy impacted the project...

- NYC economy went into recession, restaurants heavily impacted, some partners lost +20% of their fleets
- NYCDOT heavily impacted, focused on recovery efforts

Lessons Learned
Lesson #1: Behavior Changes are Needed

- The path to sustainability entails behavior change
  - We need to understand behavior, to identify the best ways to induce changes for the better

- Changing behavior is not easy:
  - It requires the right combination of incentives/penalties
  - Must know what incentives/penalties, and the amounts

- We need to account for self-interest:
  - Define policies, based on incentives and penalties, that benefit all, or at least the vast majority of key players
  - This leads to policies that all involved will fight for
  - More importantly, these policies will last...Policies that impose costs on some stakeholders will be challenged

Lesson #2: Stakeholder Collaboration is Needed

- No single player could solve all freight issues by itself
  - Public sector → Regulates, manages infrastructure
  - Private sector → Operates the system
  - Academia → Conducts research to find solutions
  - Communities → Enjoy freight benefits, suffer the impacts

- All players control a different piece, no one benefits from the status quo:
Lesson #2 – continued–

- If things were easy to solve, they would have been solved already...there is no way to escape complexity
- Unilateral solutions do not work in complex systems
- Proper stakeholder engagement requires:
  - Constancy over time
  - Development of trust
  - Transparency of actions and purpose
  - Patience
  - Two way communications
  - Ability to change course based on the input received
Lesson #3: Receivers are the Key

- Receivers are the ones that create freight demand
  - By specifying delivery times, they define when the vendors/carriers travel
  - If they are not ready to accept deliveries, trucks spend more time than needed at the curb
- As the customers, they have great influence on how the supply chains take place
- However, receivers:
  - May be OK with the status quo: Why should they change?
  - May not be aware of their influence in supply chains
  - Need incentives, financial and non-financial, to be motivated to act in favor of sustainable practices
Lesson #4: Incentives are Needed

- Engaging receivers as agents-of-change requires the use of incentives:
  - Financial, e.g., tax deductions for sustainable practices
  - Public recognition for performing outstanding service
  - Discount from vendors, e.g., for accepting OHD

Lesson #5: Ensure High Level Support

- Enacting change at a large scale and quickly requires a powerful message coming from civic leaders
  - A clear message stating the need to change practices, and a path to do it, helps keep the private sector on track
  - The London Olympics provides a good example
- High level decision makers should be involved, working in concert with private/public sector
  - High level campaigns together with multi-stakeholder support involving: trade groups and associations, leading private companies, etc. will do the trick
  - Multiple public agencies may need to play a role
- Convincing one receiver at the time is a slow process
In Conclusion

- Engaging receivers is the winning strategy
- OHD is a win-win-win-win-win policy:
  - Benefits regular hours travelers
  - Benefits the environment, improves quality of life
  - Benefits the business community, enhances economy
  - Noise impacts could be easily mitigated → electric trucks, low-noise truck technologies/practices
- A win-win-win-win-win policy is politically appealing, implementable as a voluntary program
- In our opinion, this is the way to go...

Acknowledgments

- Funding Agencies:
  - USDOT/RITA's Commercial Remote Sensing and Spatial Information Technology Application Program, and Mr. Caesar Singh
  - New York City Department of Transportation, and particularly, Commissioner Janette Sadik-Kahn
  - NY State Department of Transportation (NYSDOT)
  - NY State Energy Research and Development Agency
- Private sector partners
- Project partners and team members
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- Brom, M., J. Holguín-Veras and S. Hodge (2011). "Off-Hour Deliveries In Manhattan: Experiences Of Pilot Test Participants." Transportation Research Record 2238: 77-85. 10.3141/2238-10
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- New York City Department of Transportation(NYCDOT) and Rensselaer Polytechnic Institute (RPI) (2012). Noise Mitigation Strategies: Educational Material for the Participants of the Launch Phase of the New York City Off Hours Delivery Project.

Thanks! Questions?

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