Public Sector Freight Initiatives in Metropolitan Areas I: Governance, Supply Side, and Traffic Operations

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Acknowledgements

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Transportation policy should ensure efficient freight movement

If freight is delayed or unreliable:
- Lost sales
- Customers cannot get products on time
- Reductions in output of businesses using cargo
- Increased inventories to account unreliability

Freight generates traffic that produces congestion, pollution, noise, infrastructure damage, and deterioration of quality of life.
**Introduction and Background**

- **Goal of public policy**: Maximize benefits of the freight flows while minimize associated negative externalities

- **Challenge**:  
  - Freight system complexity with multiple agents concerned with profitability  
  - Chronic lack of data and knowledge  
  - Overlooked delivery vans and small trucks producing about 80% of the freight traffic  
  - Research available dispersed and there is no catalog of public sector initiatives
Successful implementation of initiatives to improve urban freight requires:

- Understanding freight activity and commerce
- Engaging the private sector
- Educating decision makers on freight logistics
- Disseminating best practices
- Defining an implementation path considering concerns of all stakeholders involved
Key Stakeholders in Freight Policy

- **Public Sector**
  - City / County DOTs
  - MPOs
  - State DOTs

- **Private Sector**
  - Carriers
  - Receivers
  - Logistics
Stakeholder Engagement

- **Proposed steps for effective engagement of the private sector**
  1. Designate a “freight-person” at the key city agencies
     - Focal point of communications
  2. Create an Industry Advisory Group, IAG, (FAC)
     - Forum for discussion of freight issues
  3. Educate Elected Officials
     - To enhance importance of freight and how to improve it
  4. Create a Technical Advisory Committee (TAC)
     - Public sector staff meet to discuss freight policy
  5. Consider Freight Quality Partnerships (FQP)
     - To create formal working environments
Typology of Public Sector Initiatives
Groups of Initiatives

Continuum from Supply side to Demand side

1. Infrastructure Management
2. Parking/Loading Areas Management
3. Vehicle Related Initiatives
4. Traffic Management
5. Pricing, Incentives, and Taxation
6. Logistical Management
7. Freight Demand / Land Use Management

Discussed in 14-0837
1. Infrastructure Management

- Use infrastructure improvements to enhance freight mobility.
- Enhancements often necessary due to increases over time in truck size and traffic.
- Classified in
  - Major Improvements
  - Minor Improvements
1a. Major Improvements

- Ring Roads
- New and Upgraded Infrastructure, Intermodal Terminals
- Freight Cluster Development (Freight Village)
1b. Minor Improvements

- Acceleration / Deceleration Lanes
- Removal of Geometric Constraints at Intersections
- Ramps for Handcarts and Forklifts
2. Parking/Loading Areas Management

- Include initiatives aiming to improve the way urban spaces are used by freight vehicles
- Attempts to reduce:
  - Double parking events
  - Delivery time
  - Parking into sidewalks and roadways
- Classified in
  - On-Street Parking and Loading
  - Off-Street Parking and Loading
2a. On-Street Parking and Loading

- Freight Parking and Loading Zones
- Loading and Parking Restrictions
- Peak-Hour Clearways
- Vehicle Parking Reservation Systems
## 2b. Off-Street Parking and Loading

- Enhanced Building Codes
- Timeshare of Parking Space
- Upgrade Parking Areas and Loading Docks

<table>
<thead>
<tr>
<th>Land use</th>
<th>Floor area</th>
<th>Minimum number of bays</th>
<th>Land use</th>
<th>Floor area</th>
<th>Minimum number of bays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>General</td>
<td>1/5000 m²</td>
<td>Dept Store</td>
<td>General</td>
<td>1/1000 m²</td>
</tr>
<tr>
<td>Minimum</td>
<td>1 LR</td>
<td></td>
<td>Minimum</td>
<td>1 HR</td>
<td></td>
</tr>
<tr>
<td>e.g., 5000 m²</td>
<td>1 HR</td>
<td></td>
<td>e.g., 2000 m²</td>
<td>2 HR or 1A + 1HR</td>
<td></td>
</tr>
<tr>
<td>e.g., 20000 m²</td>
<td>4 HR</td>
<td></td>
<td>e.g., 4000 m²</td>
<td>1 A + 3HR</td>
<td></td>
</tr>
<tr>
<td>Shop</td>
<td>General</td>
<td>1/2000 m²</td>
<td>Showrooms</td>
<td>General</td>
<td>1/2000 m²</td>
</tr>
<tr>
<td>Minimum</td>
<td>1 LR</td>
<td></td>
<td>Minimum</td>
<td>1 HR</td>
<td></td>
</tr>
<tr>
<td>e.g., 2000 m²</td>
<td>1 HR</td>
<td></td>
<td>e.g., 5000 m²</td>
<td>3 HR</td>
<td></td>
</tr>
<tr>
<td>e.g., 10000 m²</td>
<td>2 HR + 3 LR</td>
<td></td>
<td>e.g., 10000 m²</td>
<td>4 HR + 1A</td>
<td></td>
</tr>
<tr>
<td>Supermarket</td>
<td>General</td>
<td>1/1000 m²</td>
<td>Warehouse</td>
<td>General</td>
<td>1/1000 m²</td>
</tr>
<tr>
<td>Minimum</td>
<td>1 HR</td>
<td></td>
<td>Minimum</td>
<td>1 A</td>
<td></td>
</tr>
<tr>
<td>e.g., 1000 m²</td>
<td>1 HR</td>
<td></td>
<td>e.g., 5000 m²</td>
<td>1 A + 1 HR</td>
<td></td>
</tr>
<tr>
<td>e.g., 2000 m²</td>
<td>1 A + 1 HR</td>
<td></td>
<td>e.g., 10000 m²</td>
<td>2 A + 1 HR</td>
<td></td>
</tr>
<tr>
<td>e.g., 4000 m²</td>
<td>2 A + 2 HR</td>
<td></td>
<td>Others</td>
<td>General</td>
<td>1/2000 m²</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minimum</td>
<td>1 HR</td>
<td></td>
</tr>
</tbody>
</table>

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The table above details the minimum number of bays required for different land uses, with specific examples provided for each category.
3. Vehicle Related Strategies

- Seek to improve environmental conditions by fostering the use of technologies and practices leading to reductions of negative impacts related to freight vehicles.

- Classified in:
  - Emission Standards
  - Low Noise Delivery Programs / Regulations
4. Traffic Management

- Conditions under which freight vehicles can circulate

- Classified in
  - Access and Vehicle-Related Restrictions
  - Time Access Restrictions
  - Traffic Control and Lane Management
4a. Access and Vehicle-Related Restrictions

- Vehicle Size and Weight Restrictions
- Truck Routes
- Engine-Related Restrictions
- Low Emission Zones
- Load Factor Restrictions
4b. Time Access Restrictions

- Daytime Delivery Restrictions
- Daytime Delivery Bans
- Nighttime Delivery Bans
4c. Traffic Control and Lane Management

- Restricted Multi-Use Lanes
- Exclusive Truck Lanes (Dedicated Truck Lanes)
- Traffic Control
Chief Findings
Performance criteria

- Geographic scope of the initiative
  - Statewide, Citywide, Area, Corridor, or Point...

- Investment required
  - Very High, High, Moderate, Low...

- Time required for implementation
  - Long, Medium, Short...

- Target of the strategy
  - Through traffic, Urban Deliveries, LTGs, Large Trucks...

- Anticipated impacts
  - Congestion, Pollution, Noise, Safety...

- Potential for unintended consequences:
  - Very High, High, Moderate, Low, None...
In Conclusion

- A wide range of initiatives could be used to maximize net benefits of freight activity
- In some cases, initiatives can be implemented without major efforts, as in the case of traffic management
- In other cases, like major infrastructure improvements, detailed planning and design considerations are required
- Unintended effects could be identified and accounted for using stakeholder outreach
- Further research in the field is needed
Thanks!
Questions?

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The CoE for Sustainable Urban Freight Systems and the Importance of Governance

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Main Goal
CoE-SUFS

- Funded by the Volvo Research and Educational Foundations (VREF)

Main Goals:
- 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

- To maximize the economic benefits of production and consumption of freight, and minimize the negative externalities produced by freight traffic
Congestion problems are not new...

37th Street and 7th Ave, New York City, 1945
Collaboration is key to our approach...

- 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:
Why Must We Work on Urban Freight?
The Good...

- Freight is the physical expression of the economy, **impeding freight flows = impeding the economy**

- All the goods we consume, and the trash we produce, is moved in and out by the freight system:
  - Every day about 45Kg/person of cargo enters NYC, about 25kg/person or cargo enters Medellin, Colombia
  - Without that incessant flow of cargo, urban economies come to a halt

- Between 5-10% of GDP is related to freight / logistics

- 1/10 of employees are in freight / logistics
The Bad...

- Freight traffic is a major consumer of resources and a major producer of environmental externalities

- Transportation consumed:
  - 28.5% of the total energy & 67.9% of the petroleum

- Transportation produced:
  - 54% of carbon monoxide & 36% of nitrogen oxide
  - 22% of volatile organic compounds
  - 1.4% of the Sulfur dioxide

- Freight transport contributes a large portion of these numbers
The Ugly...

- **Freight is good, freight traffic creates problems**
- There are no easy solutions, no Magic Bullets
- The system is complex and not well understood
  - Multiple agents: shippers, carriers, receivers
  - Multiple ways to measure freight
- Solutions are complex and involve multiple partners: public and private sectors, communities, etc.
- Proper governance is required
- This is why multi-stakeholder cooperation between academia and public/private sectors is required
Core Industry Partners
Core Industry Partners (Selected)

- Australia: Truck Industry Council
- Belgium: European Shippers Council
- Brazil: CNT - National Confederation of Transport, Sindicato das Empresas de Transporte de Cargas do Estado de Minas Gerais
- Dominican Republic: National Federation of Transport Companies
- United Kingdom: Freight Transport Association
- USA: American Trucking Associations, Owner-Operator Independent Drivers Association Foundation, New York Motor Truck Association
- TNT Express, Sysco, DHL...
Partner Cities
Role of Partner Cities

- To pilot test and consider innovative practices
  - Definition
  - Implementation
  - Monitoring
  - Evaluation

- To share with others good practices / lessons learned
- To support the research partners
- To commit to innovate
City Partners (selected)

- Amsterdam and Rotterdam, The Netherlands
- Bogota, Colombia
- London, United Kingdom
- Melbourne, Australia
- Nanjing and Dalian, China
- New York City and Albany, United States
- New Delhi, Mumbai, and Chennai, India
- Osaka, Japan
- Pretoria, South Africa
- Belo Horizonte, Brazil
- Singapore, Singapore
- Toronto, Canada
Main Benefits to Academic and City Partners

- **Academic partners will:**
  - Be proactive partners of a world research enterprise
  - Build up expertise on urban freight research
  - Enhance educational opportunities for local students

- **City partners will:**
  - Obtain designs of new urban delivery strategies
  - Reduce congestion produced by freight traffic
  - Improve their economic competitiveness
  - Reduce environmental impacts of freight
Examples of Successful Projects
From Atlanta 1996 ... to 2012 London Olympics
Suggested actions to during Games

- TfL guidance to organisations:
  - Reduce activity
  - Re-time activity
  - Re-route activity
  - Revise transport delivery mode

- Existing night restrictions on heavy goods vehicle less strictly enforced

- Guidance via workshops, meetings, web, printed material and trade associations

- Aimed to ensure all links in supply chain received relevant guidance
The Off-Hour Delivery Project in New York City

- Rensselaer Polytechnic and New York City Dept. of Transportation:
  - Designed incentives to induce shift to off-hours
  - Reduced congestion and pollution
  - Increased competitiveness of the urban core
Pathway from innovation to implementation

TIME magazine listed the OHD project as a “Top 10 Ideas” March 25th, 2013
Events in Progress
Next events

- Regional workshops intended to:
  - Stimulate decision makers and researchers to adopt state of the art/practice of urban freight policy/programs
  - Grow the freight research community
  - Create an international network of researchers/practitioners
  - Next workshop: Mexico City in June 2014

- NSF PASI on Sustainable Urban Freight Systems
  - Colombia August 3-14th 2014

- Collaborative research projects ongoing with
  - Indian universities
  - Colombian universities
Thanks!

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