Roadblocks to Sustainable Urban Freight

Tom Maxner, Giacomo Dalla Chiara, and Anne Goodchild

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Presentation Outline

I. Motivation and research overview
II. Methodology
III. Stakeholder interview results
   A. Motivations
   B. Strategies
   C. Roadblocks (Challenges)
IV. Summary & Conclusions
Motivation and research overview
Sustainable Urban Freight

Collected and synthesized expert views from both the private and public sectors on what is needed to sustainably deliver goods within cities and identifying the challenges towards this goal.

➢ Research Question: What are the roadblocks (challenges) to achieving a sustainable urban freight system?

➢ What motivates cities and companies to reduce emissions?
➢ What strategies are stakeholders using to reduce emissions?

Research boundaries:
➢ **Sustainable** urban freight was limited to carbon dioxide emissions.
➢ Focus on North American cities & companies
A multitude of challenges

• Urban freight is complex and disaggregated
• Sustainability in the sector is relatively new
• Most challenges faced by cities fall into two categories:
  • Lack of tools to effect change
  • A need for strong leadership and more resources
• Challenges faced by companies are more diverse:
  • Most companies cannot be agnostic about cost
  • There are many technological hurdles
  • Challenges are not limited to a single company
Methodology
Methodology

Findings:
- 2 bodies of work: government sponsored “roadmaps” and scientific research;
- Over 20 strategies identified
- Disconnect between research and what companies are currently and actively pursuing
- Scientific research focuses on one or a handful of strategies
- Emphasis on public-private coordination
Methodology

1. What motivates cities and companies to reduce emissions from urban freight?
2. What strategies are stakeholders trying to reduce emissions?
3. What are the challenges to achieve carbon-reduction goals set by companies and cities?

Purposeful and convenient sampling

- Literature review
- City ranking & plan review
- Public stakeholder selection
- Public stakeholder interviews
- Private stakeholder selection
- Private stakeholder interviews
Public stakeholder selection

Limitations:
• Lack of Midwest representation
• Concentration in California, Texas, and Florida.
# Interviews Performed

Table 1. Stakeholders interviewed for this study.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Stakeholders Group</th>
<th>Number of Interviews (Number requested)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>Carriers</td>
<td>4 (5)</td>
</tr>
<tr>
<td></td>
<td>Vehicle Manufacturers</td>
<td>3 (2)</td>
</tr>
<tr>
<td></td>
<td>Wholesalers/Distributors</td>
<td>2 (4)</td>
</tr>
<tr>
<td></td>
<td>Property Owners or Developers</td>
<td>1 (2)</td>
</tr>
<tr>
<td></td>
<td>Labor Unions</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Public</td>
<td>Departments of Transportation</td>
<td>6 (11)</td>
</tr>
<tr>
<td></td>
<td>Planning Department</td>
<td>3 (7)</td>
</tr>
<tr>
<td></td>
<td>Offices of Sustainability</td>
<td>3 (6)</td>
</tr>
<tr>
<td></td>
<td>Departments of Economic Development</td>
<td>1 (1)</td>
</tr>
<tr>
<td></td>
<td>Municipal Utilities</td>
<td>1 (2)</td>
</tr>
</tbody>
</table>
Stakeholder Interview Results
What motivates cities and companies to reduce emissions?

**Public sector (Cities)**
1. Follow leadership goals (e.g. Mayor’s office, city council)
2. Responsiveness to constituents
3. Reaction to private interests

**Private sector (Companies)**
1. Gain efficiency & reduce cost
2. Branding & customer loyalty
3. Corporate vision & company values
What strategies are stakeholders using to reduce emissions?

<table>
<thead>
<tr>
<th>Category</th>
<th>Strategy</th>
<th>Public Stakeholders (Cities)</th>
<th>Private Stakeholders (Companies)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Technology</td>
<td>Vehicle electrification</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Public charging</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>“Bridging” or alternative fuel vehicles</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Land use</td>
<td>Curb space management</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Microhubs/urban distribution centers</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Alternative delivery methods</td>
<td>Cargo bikes</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Parcel lockers</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Final 50 feet alternatives (drones, remote-operated delivery robots, etc.)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Operations</td>
<td>Efficient routing</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Packaging and vehicle loading</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Enforcement</td>
<td>Off-peak deliveries</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vehicle size restrictions</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low- or zero-emission zones</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

1 A check mark (✓) in these columns indicates the stakeholder group that was pursuing the strategy.
What are the roadblocks (challenges) to achieving a sustainable urban freight system?

Challenges for public and private stakeholders sometimes overlap but can be categorized in broad terms:

• **Technological**: specific to each strategy; can impact time of adoption
• **Financial**: faced by both large and small companies
• **Policy**: Cities may lack the knowledge and tools to impact urban freight
• **Workforce**: how can companies (and cities) reach workers or introduce new technology to their current workforce?
Figure 1. Challenges to achieving sustainable urban freight by category.

- **Technological**
  - Fitting new strategies into existing expectations
  - Piloting & testing/design of new technology

- **Financial**
  - Cost burden of new technology
  - Managing corporate risk
  - Market immaturity & concern for technology obsolescence

- **Policy**
  - Need for strong leadership
  - Lack of resources & industry knowledge
  - Federal & state preemption

- **Workforce-related**
  - Company-contractor relations
  - Labor agreements
  - Workforce outreach

Challenges to:
- **Companies**
- **Companies**
- **Cities**
- **Companies, Cities & Unions**
## Technological Challenges

| 1. Fitting new strategies into existing expectations | • Primarily challenging to companies  
| | • Customer expectations  
| | • Cost, efficiency, and timeliness  
| | • E.g., cargo bikes replacing vans or trucks  
| 2. Piloting and testing/design of new technology |
# Financial Challenges

| 1. Cost burden of new technology | • Primarily challenging for companies  
| 2. Market immaturity and concern for technology obsolescence | • Market immaturity manifests itself in cost and availability  
| 3. Managing corporate risk | • E.g., upgrading large fleets to battery-electric trucks or vans |
## Policy Challenges

| 1. Need for strong leadership                                                                 | • Primarily challenging to cities  
|                                                                                              | • Market signals                  
|                                                                                              | • Cities unable to take action / regulate  
|                                                                                              | • E.g., Clean Air Act and CAFE Standards (federal), public property laws (state) |
| 2. Lack of resources and industry knowledge                                                    |                                                                                   |
| 3. Federal and state preemption                                                              |                                                                                   |
# Workforce-related challenges

| 1. Company-contractor relations | • Challenging to cities, companies, labor unions, and the general workforce  
| 2. Labor agreements | • Cities do not know how to reach small companies  
| 3. Workforce outreach | • Companies must recruit from unfamiliar labor pools |
Conclusions
Conclusions

• Disconnect between researchers and urban freight industry

• There is a lack of coordination between the public and private sectors (they work at different speeds with different tools).

• Industry fragmentation

• Some challenges delay emission reduction strategies while others restrict stakeholders from even getting started.
Challenges to Sustainable Urban Freight

Thank you