



Mapping the Challenges to Sustainable Urban Freight

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Introduction

Just as there has been a push for more climate-friendly passenger travel in recent years, that same push is building for freight travel. At the same time e-commerce is booming and goods delivery in cities is rising, sustainability has become a policy focus for city governments and a corporate priority for companies.

Why? Cities report being motivated to be responsive to residents, businesses, and the goals of elected leaders. Companies report being motivated by cost reduction, efficiency, branding and customer loyalty and corporate responsibility.

For its part, Amazon in 2019 pledged to become a net-zero carbon business by 2040. In the wake of that pledge, Amazon financially supported this Urban Freight Lab research examining two key questions.

1. What is the current state of sustainable urban freight planning in the United States?
2. What are the challenges to achieving a sustainable urban freight system in the United States and Canada?

Because the research literature reveals that denser, more populous cities are the areas most impacted by climate change, we focused our analysis on the 58 cities representing the largest, densest, and fastest-growing cities in the US found within the nation's 25 largest, densest, and fastest-growing metro areas. Our population, growth and density focus resulted in heavy concentration in California, Texas and Florida and light representation in the Midwest.

Within those 58 cities, we reviewed 243 city planning documents related to transportation and conducted 25 interviews with public and private stakeholders. We intentionally sought out both the public and private sectors because actors in each are setting carbon-reduction goals and drafting plans and taking actions to address climate change in the urban freight space.

In our research, we found that:

1. The overwhelming majority of cities currently have no plans to support sustainable urban freight. As of today, ten percent of the cities considered in this research have taken meaningful steps towards decarbonizing the sector.
2. Supply chains are complex and the focus on urban supply chain sustainability is relatively new. This reality helps explain the myriad challenges to moving toward a sustainable urban freight system.
3. For city governments, those challenges include a need to adapt existing tools and policy levers or create new ones, as well as a lack of resources and leadership to make an impact in the industry.
4. For companies, those challenges include concerns about the time, cost, technology, and labor complexity such moves could require.

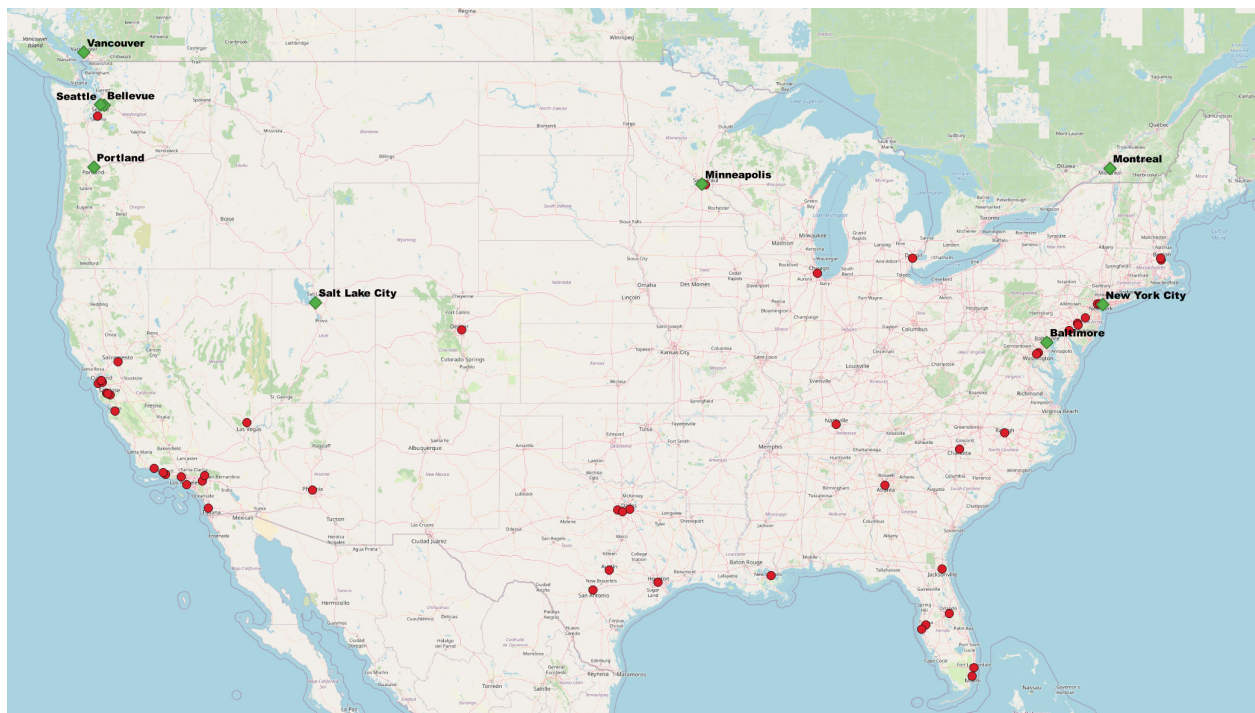
“Sustainability” can mean many things. In this research, we define sustainable urban freight as that which reduces carbon dioxide emissions, with their elimination—which we refer to as decarbonization—as the ultimate end goal. This definition represents just one environmental impact of urban freight and does not include, for example, noise pollution, NO_x or SO_x emissions, black carbon, or particulate matter.

We define urban freight as last-mile delivery within cities, including parcel deliveries made by companies like Amazon and UPS and wholesale deliveries made by companies like Costco and Pepsi. We do not include regional or drayage/port freight as those merely transit through cities and face distinct sustainability barriers.

Methodology

As shown on the map below, our inquiry focuses on 58 cities representing the largest, densest, and fastest-growing cities in the US found within the nation's 25 largest, densest, and fastest-growing metro areas. We also include two Canadian cities (Montréal and Vancouver).

To understand the degree to which cities are making sustainable urban freight policy, 243 planning documents from the 58 cities were searched for keywords related to urban freight in general or emission-reduction strategies specifically. In addition to analyzing these planning documents, we interviewed 14 officials from municipal agencies in areas such as transportation, planning, sustainability, and economic development and 11 representatives from private industry such as carriers, wholesalers and distributors, vehicle manufacturers, and labor unions. We drew on both the document analysis and interviews to address each of our two key research questions.



Findings

What is the current state of sustainable urban freight planning?

We would describe the current state of sustainable urban freight planning as being in its infancy.

Of the cities analyzed, 60% consider urban freight in some way in their policy documents. When it comes to sustainable urban freight, the share who consider it at all is 45%. Just 28% of cities outline measurable goals or concrete actions toward achieving sustainable urban freight. But these are goals, and plans are quite limited in scope and scale.

Cities that stand out for having more complete urban freight sustainability plans (which may include piloting demonstration projects, changing curb policies and sending market signals to urban freight companies) are Austin, TX; Los Angeles; Minneapolis; **New York City**; **Portland, OR**; **Seattle**; and **Washington, DC**. Notably, only those in bold have stand-alone urban freight plans, along with Atlanta. This represents just 9% of the cities reviewed.

Also worth noting: Municipal planning documents commonly included an assumption with little evidence—that reducing travel-lane congestion will reduce emissions from urban freight. But we know that while congestion delays freight vehicles in urban areas, trucks spend most of their time parked and over one-quarter of their time between deliveries seeking parking¹. Therefore, more pressing issues related to sustainability include curb space availability, as truck-circling behavior increases miles traveled and emissions released. As public agency knowledge of freight operations is limited, some proposed urban freight sustainability solutions may be of limited value, while other solutions that may lead to more significant benefits are not addressed.



What are the challenges to achieving a sustainable urban freight system?

Challenges for Cities

As noted in the prior section, 40% of cities analyzed do not consider urban freight at all in their policy making, let alone sustainable urban freight. Below, we identify the commonly surfaced challenges to progressing toward sustainable urban freight from our interviews and document review. The first two challenges deal with **a lack of vision and resources**. The next three deal with **insufficient tools for action**.

1. Lack of strong, consistent leadership

A lack of leadership or leadership turnstile leads to no action; strong leadership can make progress and build toward success. Mayors and city councils can dictate policy directions but rely on agency heads to put policy into action and build the public and private sector relationships to enable it.

1 Dalla Chiara, G. and Goodchild, A. "Do commercial vehicles cruise for parking? Empirical evidence from Seattle." *Transport Policy*, Vol 97, 2020, Pages 26-36. <https://doi.org/10.1016/j.tranpol.2020.06.013>.

2. **Conflicting priorities and competition for resources within and across agencies**

Most cities do not have a single staffer dedicated to freight. Cities want to be responsive to the public; when the public's complaints about freight focus on noise and road degradation that is what the city focuses on, making it difficult to prioritize sustainability. Similarly, it is difficult to reallocate resources from areas like road repair toward sustainability. While the city transportation agency might emphasize the need to reduce urban freight emissions, if the city sustainability office does not, action is made more difficult.

3. **Lack of clearly defined city role to support last-mile delivery and influence company behavior**

There is no universal definition of urban freight; some reasonably include middle-mile trucks and port drayage. The lack of differentiation makes it difficult to develop support programs or regulations specific to last-mile delivery. While cities universally said their job is to send market signals to companies and not necessarily to regulate, their efforts to send such signals are frequently limited. Cities often are unclear about the most effective way to send those signals to induce changes in company behavior. Pilot programs, when undertaken, are often left unevaluated, which slows adoption in a city or scaling across the industry and multiple cities.

4. **Lack of critical data**

American cities do not know how many last-mile delivery vehicles are operating within their boundaries, which makes setting emissions-reduction goals difficult. New York City was the sole exception in our analysis. Cities also lack of data and understanding on the duty cycles for logistics companies, making it difficult to develop practical sustainability strategies and targets and support companies in enacting them. Exacerbating the data issue is the disaggregated nature of the freight industry, with multitudes of small players cities must understand, communicate with and work with to make progress on decarbonization.

5. **Jurisdictional conflicts that limit city authority and action**

Both Congress and state legislatures can strip regulatory authority from cities or otherwise pass laws that prevent them from taking certain actions. While desired, zero-emission zones have no clear path forward, as one city cited that federal law prohibits it from regulating vehicle emissions on its streets. Another city wants to run a sustainability pilot using city-owned parking garages but first must ask the state to repeal a law restricting private revenue generation on public lands. Many cities cited the need for a regional approach to sustainability, which can slow the process when sustainability is not an equally shared priority.

Challenges for Companies

The first three challenges deal with **cost constraints**, a major concern for the companies interviewed. The fourth deals with the **long time horizon companies see for decarbonization**, which complicates their decision making and triggers concerns around technology obsolescence. The fifth deals with **workforce issues**.

1. **New technology is costly**

Small companies and owner-operators lack access to capital to buy new vehicles and/or invest in other carbon-saving technology. Cities do not have the resources to subsidize fleet replacement, with most state and federal aid targeting sustainability improvements in passenger versus freight vehicles. The market

for more sustainable fleets (e.g., electric vehicles) needs to mature to allow for greater supply at a lower upfront cost. Currently, the carriers that are choosing to invest are competing for the same set of limited vehicles. Companies reported that just testing new technology is costly enough to be a barrier (those costs include installing charging infrastructure for testing electric vehicle models.)

2. Customers expect a certain delivery price that efficiency tradeoffs make tougher

Companies are challenged to fit new technology into existing delivery standards. Some new technology raises the question of efficiency tradeoffs. For example, cargo bikes cannot carry the same capacity by volume as delivery vans, which may lead to higher costs. And electric vehicles have yet to demonstrate the same carrying capacity by weight as traditional fossil fuel vehicles.

3. Fear of technology obsolescence is delaying investment and action

Companies worry about investing big to convert their fleets to electric only to find a year later that the trucks they bought have a smaller range or cost more than the newer models.

4. Testing and piloting new sustainable technology takes a long time

Many new sustainable technologies are inherently untested. Companies must find suitable, generalizable testing grounds and run tests long enough to get usable results. Carriers and wholesalers interviewed are actively testing multiple vehicle types in multiple locations to find the best fit for the company. Each time a new model is introduced, or vehicles are tested in a city with a different geography/topography, the testing duration extends. This trial-and-error process inherently takes time.

5. Labor issues

Freight's disaggregated nature means that some companies do not own their own vehicles but work with contractors. As such, the companies have limited control over what vehicles contractors use. Some new technologies, such as cargo bikes, may require a different driver workforce. It takes time to negotiate collective bargaining agreements to include new technology and/or workforce requirements.

Conclusion:

There is a clear need for more planning for sustainable urban freight

Cities are just now starting to plan for sustainable urban freight. They have tended to focus on reducing emissions from passenger vehicles, overlooking the freight piece of the puzzle. Our findings show a clear need for more cities to be planning for sustainable urban freight—and be doing so in collaboration with the private sector.

We have identified myriad challenges to developing sustainable urban freight for both cities and companies. Ideally, they would help each other scale technology. But a lack of coordination between the public and private sectors—and fragmentation within the industry—makes the decarbonization challenge greater. And, toward that coordination, cities reported that they do not have the resources to do outreach to companies; they want companies to approach them and tell cities what they need. The challenges identified suggest that cities need legislative and financial support from their state and federal government to decarbonize urban freight.

Both cities and companies have clear motivations for pursuing decarbonization. But they work at different speeds and with different tools in building a road to achieve it. It seems the road would be smoother and the speed faster with better public-private coordination.

The Urban Freight Lab would like to thank Amazon for their support of this research in examining the current state and challenges in sustainable urban freight planning, which helps inform their efforts in becoming a net-zero carbon business by 2040.



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