



Photo: Carolyn Kim, Pembina Institute

Modernizing urban freight deliveries with microhubs

Last-mile deliveries are being disrupted by e-commerce expansion, customer demands for faster delivery, population growth, rising urban land costs, and increasing congestion. Companies are acting quickly to develop new business models for transporting goods between producers, distribution centres, and consumers to respond to these trends.

A new approach for last-mile deliveries

Given that 48% of Canadian online shoppers live in dense urban areas,¹ there is a significant opportunity to disrupt the last mile through regulation and organization of distribution networks that make urban deliveries more efficient. Businesses can integrate urban logistics solutions to help them meet their corporate and customer demands while also reducing any negative environmental impacts to cities.

To respond to industry trends and convert potential threats into opportunities, businesses in many jurisdictions such as London, Amsterdam, Paris, and Berlin are redefining and improving existing business delivery models, and are implementing new urban logistics spaces to increase efficiency, reduce operational costs and mitigate adverse impacts on cities. While there is no one-size-fits all supply chain operating model or utilization of logistics spaces, our research shows there are opportunities across sectors to find further efficient deliveries and logistics models in Canadian cities.

Key trends in freight

- Goods movement is a backbone of Ontario's economy: 38% of the province's economy comes from freight-intensive industries, and trade between Ontario and the United States was worth \$284 billion in 2011.²
- The transportation sector is the largest source of emissions in Ontario, and the freight sector currently accounts for 10% of the province's greenhouse gas (GHG) emissions. Emissions from freight are projected to surpass passenger emissions by 2030 in Canada.³
- Canadians will continue to shop online in greater numbers, with sales in Canada to reach \$55.78 billion by 2020. As a comparison, in 2016 brick-and-mortar sales grew by 2%, while at the same time online retail sales grew by 15%.⁴
- The volume of road freight activity in Ontario grew by 242% from 1990 to 2014.⁵ Greater road freight volumes present impacts to public health, air quality and road safety.

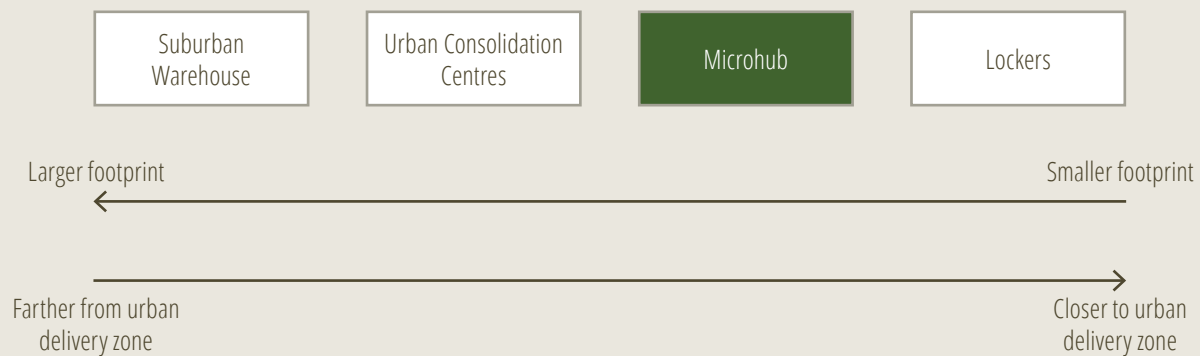
Types of Urban Logistics Spaces

Urban Consolidation Centres refer to larger, permanent facilities located in urban areas that allow businesses to consolidate and coordinate between freight carriers through the use of a consolidation centre/terminal.

Delivery microhubs are a form of an urban consolidation centre but a storage facility with a smaller physical footprint. They are located in an urban area, between a major suburban warehouse and final delivery destination point, to allow for a mode shift in last mile deliveries (typically more nimble,

clean vehicles such as electric assist cargo cycles and electric light-duty vehicles). A delivery microhub can be a building or mobile structure, operate on a permanent or temporary basis, and may be operated by one or more businesses in parallel.

Lockers are very small storage units that are located close to the final delivery point in urban or rural areas, and which can be conveniently accessed by customers. They are often co-located in retail banking locations, grocery stores, or condominium lobbies.



Benefits and success factors for microhubs

Benefits

- **Operational cost savings:** the use of more efficient urban delivery systems that consolidate and coordinate between freight carriers through the use of a consolidation centre/terminal can lead to 12-14% of operational cost savings for businesses.⁶
- **Reductions in air pollution and GHG emissions:** Some examples have demonstrated significant reductions in transportation-related emissions and air pollution by decreasing urban/last-mile vehicle-kilometer-travelled, “empty” truck distances, and by facilitating a shift to a lower-emitting mode.⁷

- **Flexibility:** Delivery microhubs can be used to meet business-to-customer and/or business-to-business needs, may accommodate a range of goods, and a model that enables zero-carbon vehicles such as electric cargo cycles to be integrated into the system.

Success Factors

Based on a review of urban logistics operational models in other jurisdictions, there are three common factors that influence the design, size and scale, and viability of urban logistics spaces.

1. Population density of delivery district

- Moderate to high density range: from 10,000 to up to 150,000 people per square kilometre.

2. Public and private partnerships

- Business involvement to support technical planning of delivery routes, parcel delivery, operations and maintenance of microhubs, bundling/consolidating parcels, data collection for performance reporting; personnel planning
- Government support to: fund microhub pilots and evaluations; fund technical and environmental analysis; subsidize urban logistic spaces; enact supportive regulations and policies; flexibly regulate commercial vehicles
- Third party involvement (academic and research institutions) to support program design, evaluation and outreach

3. Enabling public policy support for low-emission goods movement

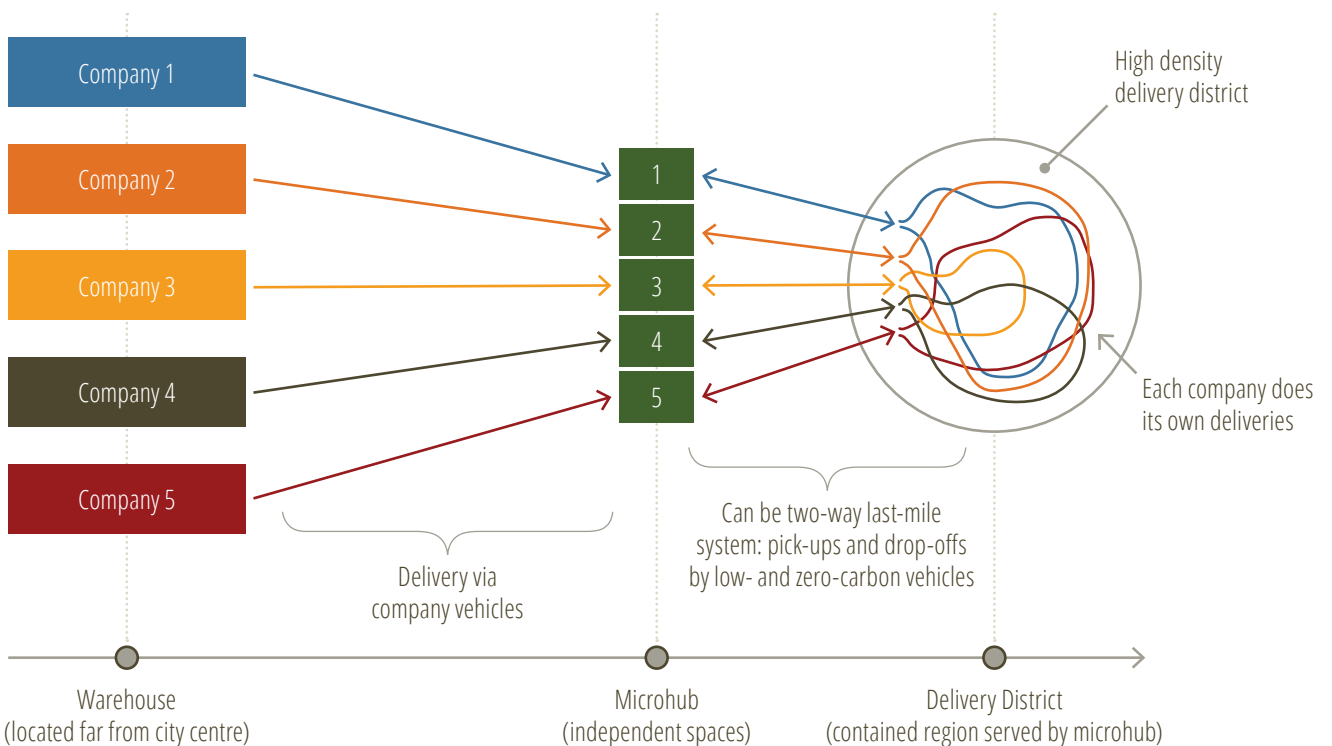
- Designation of low emission zones in high density urban centres to limit access for high-polluting vehicles
- Policies supporting electric cargo cycles and low-carbon (electric) light-duty vehicles

- Goods movement planning and strategies including curbside management practices that permit efficient deliveries
- Standards that protect for delivery facilities in areas that generate high volumes of freight
- Charging/fueling infrastructure for low- and zero-carbon vehicles
- Regulated deliveries and vehicle types in urban centres
- Enabling bylaws for off-peak deliveries where appropriate

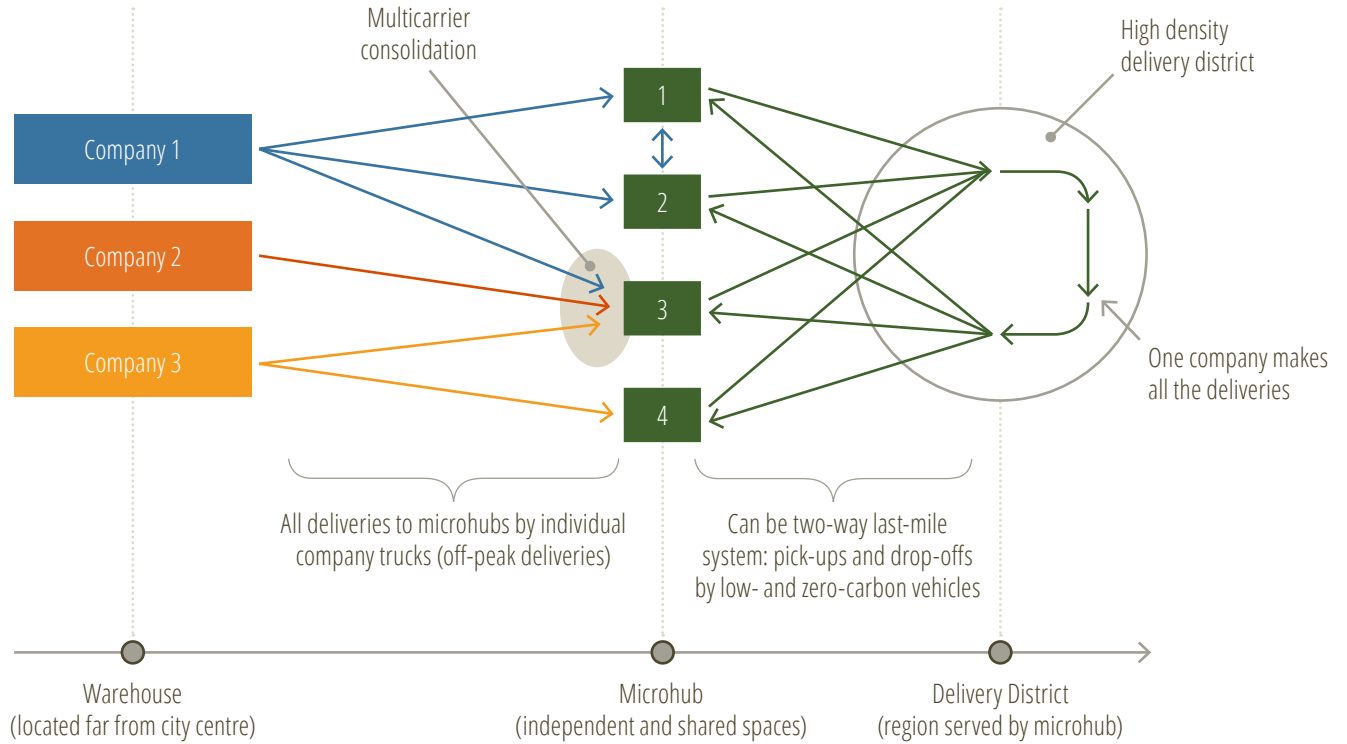
Businesses can choose from a wide range of operational models to integrate microhubs into their logistics and supply chain operations. A key design element is whether microhubs are used solely for one business or designed in a manner that allows a mix of multi-carrier consolidation efforts.

Below, we illustrate three possible microhub operational models. They are inspired by the following projects: Berlin – KoMoDo (Example 1), Central London – Newt Cargo (Example 2) and Paris – La Petite Reine (Example 3).

Example 1: Independent Microhub Containers



Example 2: Mixed Multicarrier Consolidation



Example 3: Full Multicarrier Consolidation

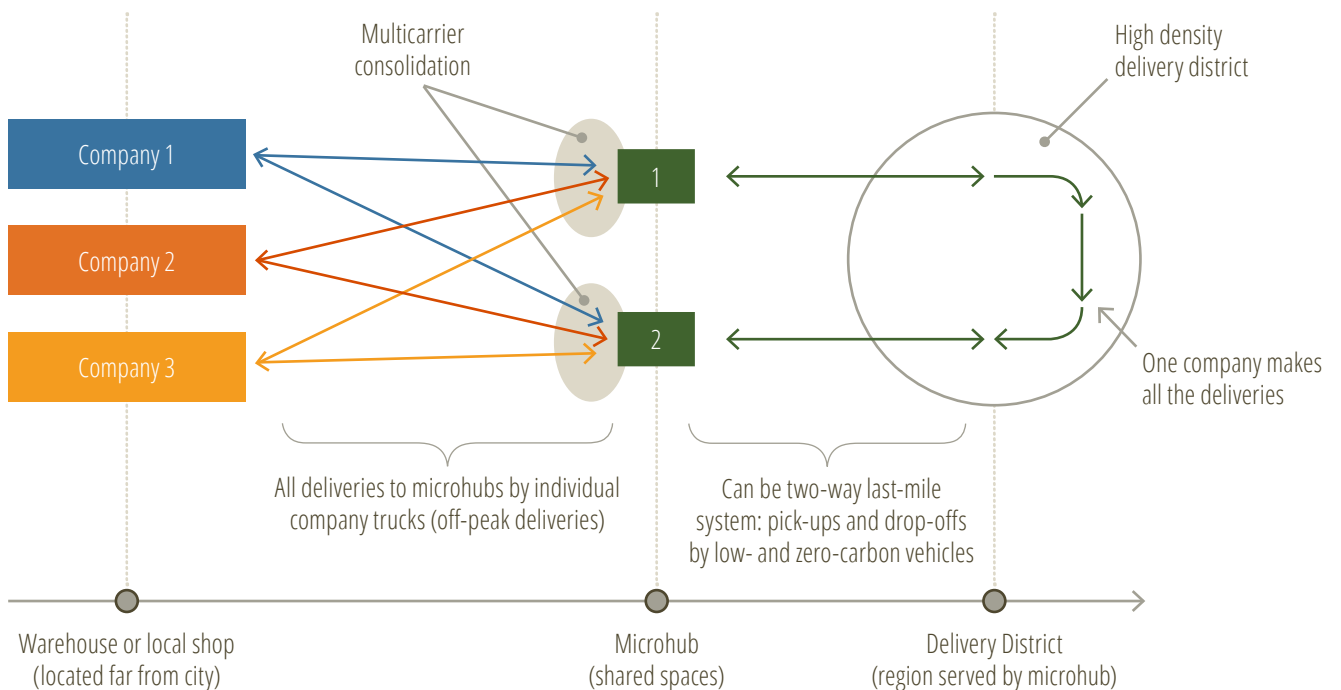




Photo: Roberta Franchuk, Pembina Institute

Endnotes

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Carolyn Kim, Nitish Bhatt
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