



The freight of the West

The University of Washington's Supply Chain Transportation and Logistics Center has launched Urban Freight Lab to address Urban Delivery Challenges, as **Dr. Anne Goodchild, Barbara Ivanov, Jose Machado, Gabriela Giron** and **Haena Kim** report

More than 80 per cent of Americans have purchased goods online¹ and in 2016 over 8 per cent of all retail sales in the US took place online^{2, 3}. The growth of e-commerce is putting increasing pressure on local governments to rethink how they manage street curb parking and alley operations for trucks and other delivery vehicles. It is also forcing building developers and managers to plan for the influx of online goods.

To develop practical solutions to these problems, in 2016 the Supply Chain Transportation and Logistics (SCTL) Center at the University of Washington launched the Urban Freight Lab (UFL), a partnership between private and public industry stakeholders. The UFL provides a place for companies and public agencies to work together to develop and ground test low-cost, promising solutions to deliver these goods while maintaining livability and economic vitality.

As part of this research effort, a three-year strategic research partnership with the City of Seattle Department of Transportation (SDOT) has been established to advance understanding of urban goods movement in support of the City's goals for safe, predictable and efficient goods movement and economic vibrancy. By entering into a long-term strategic partnership with the university and industry, SDOT demonstrated its interest in developing innovative

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A cargo van at an on-street commercial vehicle loading zone in downtown Seattle

solutions to achieve their policy goals. The city's willingness to pilot test and potentially adopt solutions that provided both public and private good was essential in attracting private sector firms to engage fully in the work.

THE URBAN FREIGHT LAB

In 2016, the SCTL Center recruited founding industry members from Charlie's Produce, Costco Wholesale, Nordstrom, UPS, and the United States Postal Service (USPS) to develop solutions to improve the way goods are delivered in the urban environment.

Private sector members of the Urban Freight Lab at the University of Washington, in

partnership with SDOT, are using a systems engineering approach to solve delivery problems that overlap the spheres of control of the city and business sector.

The Lab has created a multi-year strategic research plan with principles and innovative approaches to produce evidence-based improvement strategies.

The role of the Urban Freight Lab is to be a living laboratory where potential solutions are generated, evaluated, and then pilot-tested on

real city streets. Members provide clear and open input as to whether proposed solutions are sustainable in their and other firms' business models.

THE FINAL FIFTY FEET PROJECT

Researchers at the SCTL Center, SCTL and Urban Freight members have defined and focused on the Final 50 Feet; the urban supply chain segment that begins where delivery vehicles park at the curb, alley or in a building's freight parking space. It tracks the delivery process inside buildings and ends at the receipt of goods by the receiver. The Final 50' concept represents the first time that researchers have identified the importance of analyzing deliveries moving along the street grid and in cities' vertical space (office, hotel, retail and residential towers) as a unified goods delivery system.

Development of the Final 50' concept is the necessary first step in defining rigorous, goal-oriented improvement teams that can take coordinated action to reduce truck trips, delivery delays, cost, emissions, and improve delivery service to tenants and consumers. It provides them with the ability to analyze and improve the process flows meaningfully from the beginning-to-end of the last piece of the urban goods system.

The Urban Freight Lab members and SDOT have identified two priority goals, with both public and private benefits, for the 2017-2020 research partnership:

1. Reduce the number of failed first delivery attempts.

The failed first delivery can be as high as 15 per cent. Benefits of reducing failed first deliveries include:

- Improve urban online shoppers' experiences and protect retailers' brands;
- Cut business costs for the retail sector and logistics firms;





A reduction in delivery vehicle dwell time is crucial to reducing traffic congestion in Seattle

- Lower traffic congestion in cities, as delivery trucks could make up to 15 per cent fewer trips while still completing the same number of deliveries.

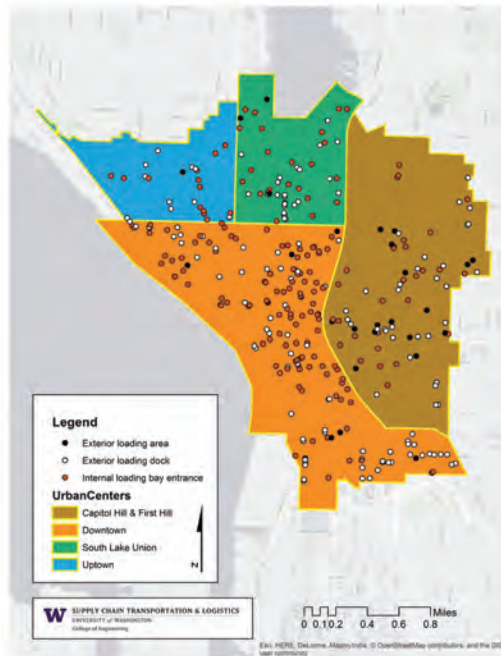
2. Reduce dwell time

The time a truck is parked in a load/unload space. There are both public and private benefits to reaching this goal, including:

- Lower costs for delivery firms, and therefore potentially lower costs for their customers;
- Better utilization of public and private truck load/unload spaces;
- Less congestion, as spaces turn over more quickly.

OVERVIEW OF THE INNOVATIVE APPROACHES

By applying systems engineering and evidence-based planning, we can make receiving online goods as efficient as ordering them – without clogging city streets and curb space



Private freight parking infrastructure found in five urban centers in the Seattle area

TAKEN TO IDENTIFY AND QUANTITATIVELY ASSESS THE FINAL 50' OF THE URBAN GOODS DELIVERY SYSTEM

Building the first comprehensive database of urban off-street infrastructure for delivery and pick-up operations

The urban goods delivery system includes both public and private facilities. While on-street parking facilities are well documented in Seattle's databases, facilities out of the public right of way (i.e. privately held) are not. SCTL research assistants, developed a ground-truthed data collection method to build a comprehensive



database inventory, capturing geo-spatial locations and documenting the visible features of all private freight parking infrastructure in five urban centers in the Seattle area (see graphic, right).

For this task, the team collaborated with one of the private carrier members of the Urban Freight Lab to further improve the accuracy of the data collection method. Carrier drivers with deep knowledge of city routes and infrastructure, review the closed door locations.

This review allowed the Lab to rule out 98 per cent (206) of the locations behind closed doors, reducing uncertainty in the final database from 38 per cent to less than 1 per cent.

Researchers found that 87 per cent of buildings in the City's dense urban centers are completely reliant on nearby public commercial vehicle load zones (CVLZs) and alley truck load/unload spaces to receive goods deliveries. These buildings do not have underground or adjacent freight bays on their property.

Building a delivery process flow for delivery inside the building environment



Photo: Anna Bovbjerg, University of Washington

the most significant ability to achieve project goals (13). Based on this analysis, the researchers found that the greatest opportunities to reduce the number of failed first deliveries and dwell time in truck load/unload spaces are inside buildings when delivery persons:

- a. Interact with security personnel; and
- b. Attempt to locate tenants.

In the next phase of the Final 50' project, the Urban Freight Lab and SDOT will pilot test promising improvement strategies in and on the streets around the Seattle Municipal Tower over four weeks.

BENEFITS

The Final 50' project findings will be used to provide decision support to city officials and private-sector firms managing scarce resources. By applying systems engineering and evidence-based planning, we can make receiving online goods as efficient as ordering them – without clogging city streets and curb space.

We have received requests from many other cities, including Washington, DC, to share results and lessons learned during the Freight Master Plan development process and early actions coming out of this three-year program. Seattle is committed to being a leader in urban goods policy and problem-solving and keeping our economy thriving.

According to City of Seattle officials Mr. Christopher Eaves and Ms. Jude Willcher, "Seattle is one fastest growing cities in the country. The Seattle

Department of Transportation is committed meeting the urban goods delivery challenges facing most big cities in the U.S. We know that issuing parking tickets to companies who are simply trying to meet the daily delivery needs of residents and businesses isn't the right solution. So, our goal is to identify and implement scalable strategies that improve deliveries at existing building, as well as initiate strategic research to mine new data to improve and inform new construction designs that support freight and delivery in the city. And we are incredibly grateful to have found a strong and innovative partner in the UW Freight Lab and SCTL".

The SCTL researchers created detailed process flow maps of the Final 50' in and around five prototype city buildings in Seattle, Washington. The team collected original data by following delivery persons from the buildings' freight bays or nearby commercial vehicle zones (CVLZs) into each of the buildings, until delivery was completed or the return to the truck when there was a failed delivery. SCTL researchers designed and built an application for collectors to enter the precise time that the delivery people began and ended each process step.

The team then collected data for up to a week in peak delivery periods for each building. They analyzed the range and average of delay in the process steps to understand where improvement strategies will have

FYI

Urban freight lab: <https://depts.washington.edu/sctlctr/members/urban-freight-lab>

Last 50 Feet Project: <https://www.seattle.gov/transportation/projects-and-programs/programs/freight-program/final-50-feet-program>

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LINKS

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