The Urban Freight Lab:
Establishing a Well-Defined Working Partnership to
Analyze and Pilot Test Delivery System Solutions

Barbara Ivanov
Director, Urban Freight Lab
COO, Supply Chain Transportation and Logistics (SCTL) Center

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More online shopping means more delivery trucks. Are cities ready?

People want the urban goods delivery system to work so well that they get whatever they want, where they want it, in 1 to 2 hours.

This is causing tremendous pressure on local governments to rethink the way they manage street parking and alley operations for trucks.

What can City Departments of Transportation and Metropolitan Planning Organizations (MPOs) do to accommodate customer demand in valuable street, curb, and alley space?
How is e-commerce changing cities?
Thousands of customers in just one building

Photos by UW SCTL Center
The Urban Freight Lab

• Members of the Urban Freight Lab at UW, in partnership with the City of Seattle Department of Transportation, are using a systems engineering approach to solve delivery problems that overlap cities’ and businesses’ spheres of control.

• The Urban Freight Lab is a living laboratory where potential solutions are generated, evaluated, and pilot-tested inside urban towers and on city streets.

• Members of the Urban Freight Lab fund the Lab and dedicate senior executives’ time to it.
  • Charlie’s Produce
  • Costco Wholesale
  • Nordstrom
  • UPS
  • USPS
Final Fifty Feet Research Project

The final 50’ of the urban delivery system:

• Begins at the city-owned Commercial Vehicle Load Zone (CVLZ) or alley,

• Or in a privately-owned building’s loading bay or dock, and

• Ends wherever the owner takes receipt of goods.

Photo by University of Washington
The Final Fifty Feet is a New Research Field

The Final 50’ project is the first time that researchers have analyzed both the street network and cities’ vertical space as one unified goods delivery system.

It focuses on:
• The use of scarce curb, buildings’ internal loading bays, and alley space;
• How delivery people move with handcarts through intersections and sidewalks; and
• On the delivery processes inside urban towers.

Photo by Anna Bovbjerg, UW
Final 50’ Research Project Goal #1

Reduce dwell time, the time a truck is parked in a load/unload space.

Public and private benefits include:

• Lower costs for delivery firms, and therefore potentially lower costs for their customers;
• More efficient use of truck load/unload spaces creates more capacity without building additional spaces; and
• Room for other vehicles to move through alleys.
Final 50’ Goal #2

Reduce failed first deliveries to:

• Improve urban online shoppers’ experiences and protect retailers’ brands;

• Lower traffic congestion in cities, as delivery trucks could make up to 15% fewer trips while still completing the same number of deliveries;

• Cut costs for the retail sector and logistics firms;

• Cut crime and provide a safer environment;

• Ensure that all city neighborhoods can receive online orders, not just a few.
In 2016 the City of Seattle Department of Transportation’s geospatial databases included city curb parking spaces, but privately-owned loading docks and bays were missing.
Mapping Private Loading Bays and Docks

SDOT engaged the Urban Freight Lab to identify the geospatial locations and features of all private truck load/unload spaces in One Center City.

The urban centers include:

- Downtown
- Uptown
- South Lake Union
- Capitol Hill
- First Hill

Credit: http://onecentercity.org/
Collaborating with the Private Sector Greatly Reduced Uncertainty

• Data collectors in the field identified **548 potential loading bays**.

• However, in **206 cases the doors were closed**.

• UPS had their local drivers review the closed door locations, based on their extensive knowledge of the area. The Urban Freight Lab provided photos and location information.

• That review allowed the Lab to rule out 90% of the locations behind closed doors, **reducing uncertainty from 38% to <1%**.
Survey Results for One Center City

In Uptown, South Lake Union, Downtown, Capitol Hill and First Hill there are:

• 175 internal loading bay entrances;

• 137 exterior loading docks; and

• 26 loading exterior areas.

87% of all downtown buildings rely on deliveries from the City’s curbs and alleys.
Final 50’ Goods Delivery System Analysis

Key Finding:

Processes inside the City’s towers control the number of failed-first-deliveries, as well as the truck dwell time in curb, alley and private parking spaces.

Photo: Seattle Municipal Tower
Process Flow at the Seattle Municipal Tower

12 Major Process Steps

1. Park in freight bay
2. Get clearance from security guard
3. Unload goods on to cart
4. Wait for freight elevator
5. Take elevator to receivers’ floor
6. Deliver/pick up goods on receivers’ floor
7. Repeat process steps 5-6 for multiple deliveries
8. Wait for elevator to return to truck
9. Take elevator back to freight bay
10. Return security device to guard
11. Load hand cart onto truck
12. Maneuver truck out of freight bay

Enter:

- Park in freight bay
- Get clearance from security guard
- Unload goods on to cart
- Wait for freight elevator
- Take elevator to receivers’ floor
- Deliver/pick up goods on receivers’ floor
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Deliver:

Exit:
Final 50’ Project will Pilot Test a Common Carrier Locker System at the Muni Tower

Expected Results:
1. For firms carrying small-to-medium packages, significantly reduce:
   A. ‘Deliver’ tasks;
   B. Waiting for elevators.

2. Large goods still need to go to the receiver’s location.

Challenge:
1. Paying for the new system:
   A. Include in rent, or
   B. Pay a daily or weekly rate?
### Combined with New Security Process, Lockers Cut Delivery Time by 39%

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<thead>
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<th>Percent of Total Time</th>
<th>Enter</th>
<th>Deliver</th>
<th>Exit</th>
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<tr>
<td>33%</td>
<td>Mean: 7 min</td>
<td>Mean: 8 min</td>
<td>Mean: 5 min</td>
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Questions?

Please contact:
Barbara Ivanov
Urban Freight Lab Director
Supply Chain Transportation and Logistics Center COO
University of Washington
ivanovb@uw.edu
http://depts.washington.edu/sctlctr/