



The Final 50 Feet Research in the Urban Freight Lab

**Barbara Ivanov
Director, Urban Freight Lab**

**FHWA Talking Freight Webinar
January 17, 2018**

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.



What Defines the Urban Truck Load/Unload Space Network?



As do many cities today, in 2016 SDOT's geospatial databases included one part of the truck load/unload network: curb parking spaces including CVLZs, other load zones, and passenger spaces.

But the two other elements of the goods delivery network were missing:

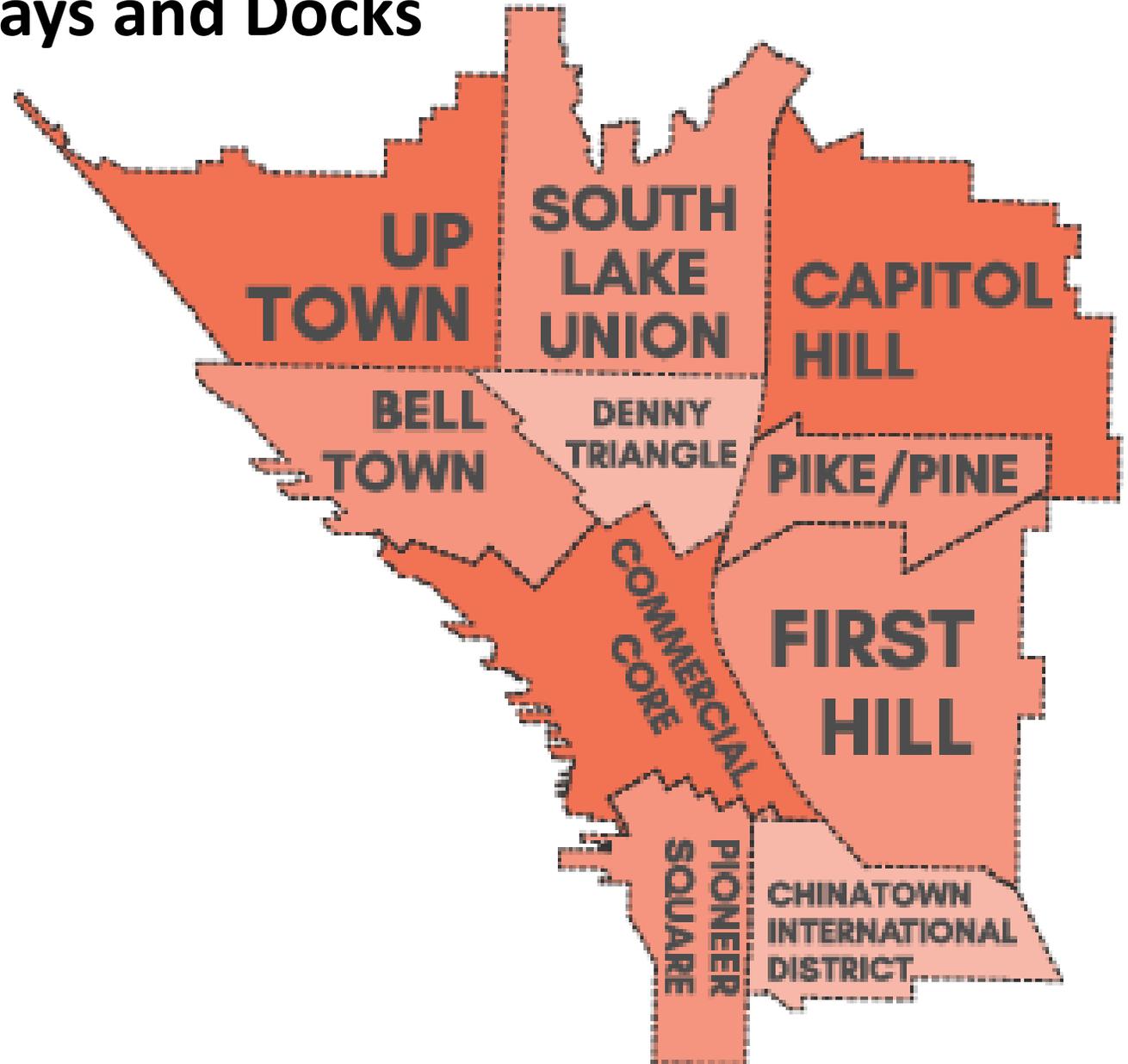
1. Privately-owned loading docks and bays, and
2. Truck spaces in alleys.

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%**.

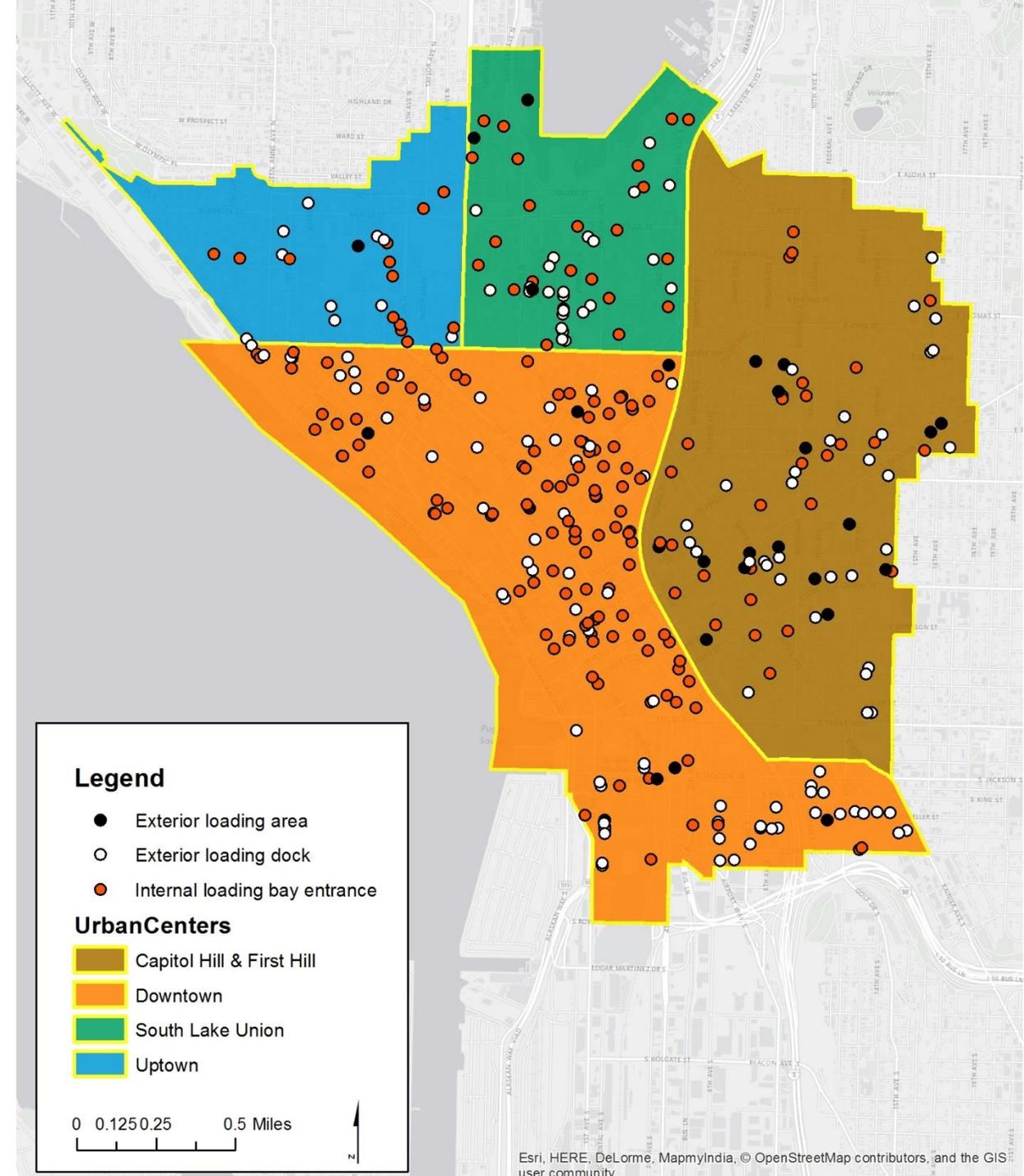


87% of Seattle's Towers Rely on Deliveries from Curb and Alley Spaces

In Seattle's Center City there are:

- 175 internal loading bay entrances;
- 137 exterior loading docks; and
- 26 loading exterior areas.

Only 13% of all downtown buildings have private loading bays or docks.



Alley Purpose and Design

Alley grids were originally built to provide access to the backs of buildings for:

- Goods deliveries,
- Electrical, plumbing and other service calls,
- Trash pick up, and
- Fire/emergency services.

Many major U.S. cities have alley grids including:

- Seattle
- Chicago (1,900+ miles)
- Detroit
- Minneapolis



Both of these alleys have:

- Overhead sky bridges,
- Truck loading bays,
- Electrical panels,
- Waste container storage.

But one alley offers:

- Wider 2-way access,
- Pedestrian walkway between adjoining buildings,
- Diagonal turn into loading bays.



How Does the Truck Load/Unload Network Connect to Buildings?

Key Finding: Goods delivery policies and processes inside the towers control the number of failed-first-deliveries, as well as the truck dwell time in the network.

Photo: Seattle Municipal Tower



Process Flow at the Seattle Municipal Tower

Enter:



Deliver:



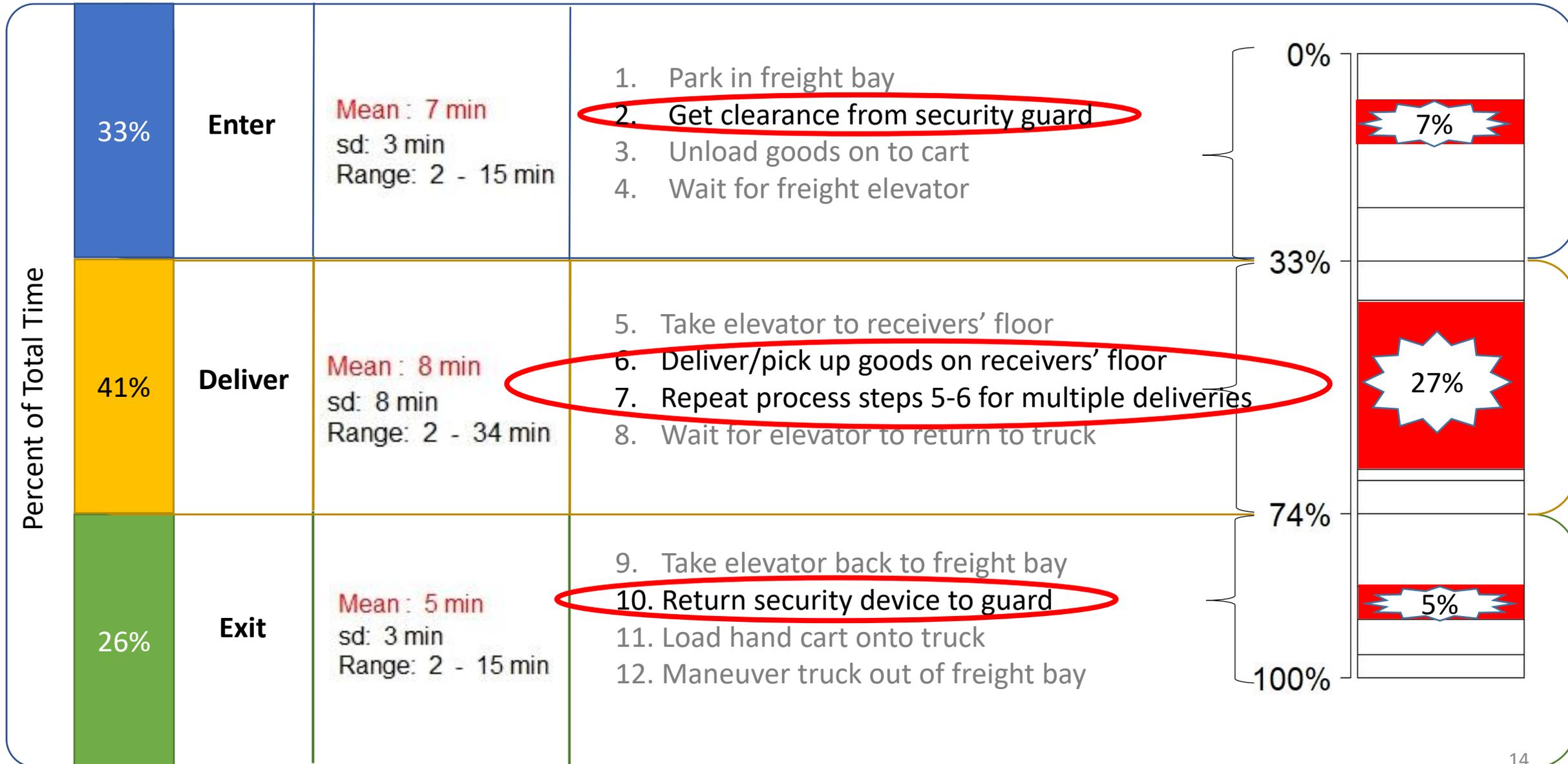
Exit:



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

Combined with New Security Process, Lockers Cut Delivery Time by 39%



City Incentives and Building Code Changes Can Improve Network Productivity

1. Provide 'Goods Trip Reduction' incentives for building managers to provide:

- Mini-distribution nodes (locker system, mailroom, or concierge) as close as possible to truck load/unload locations;
- Rapid, automated security clearance system;
- Use of faster elevators.

2. Update building codes so new construction includes private loading bays and/or docks.



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/>