# The Final 50 Feet of the Urban Goods Delivery System

Anne Goodchild

SCTL Director

Total U.S. Retail Sales
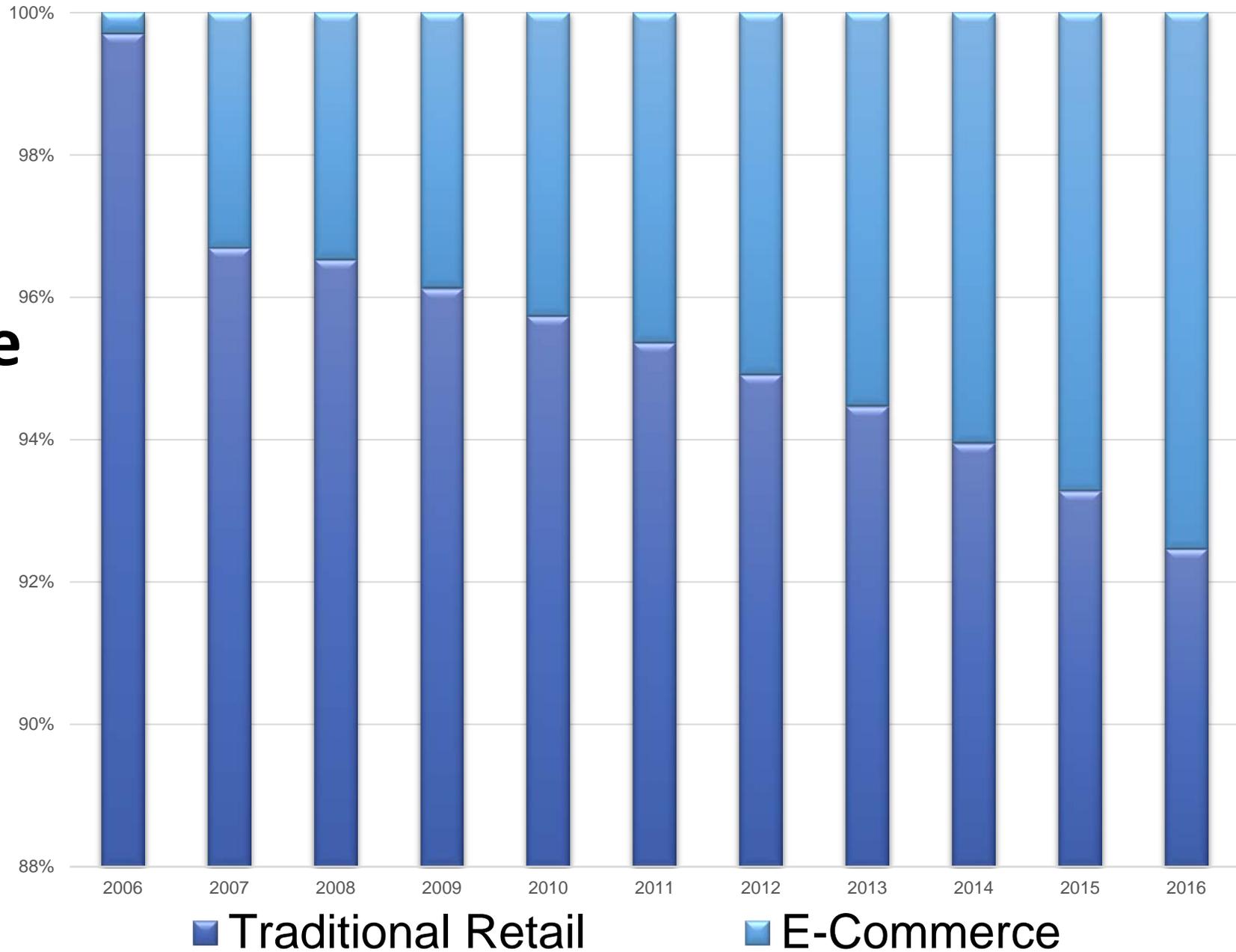
How is e-commerce changing cities?

Traditional Retail E-Commerce

Cities struggling

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?

Thousands of customers in just one building

Photos by UW SCTL Center

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.

# The Truck Load/Unload Space Network in the City of Seattle

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/ 9
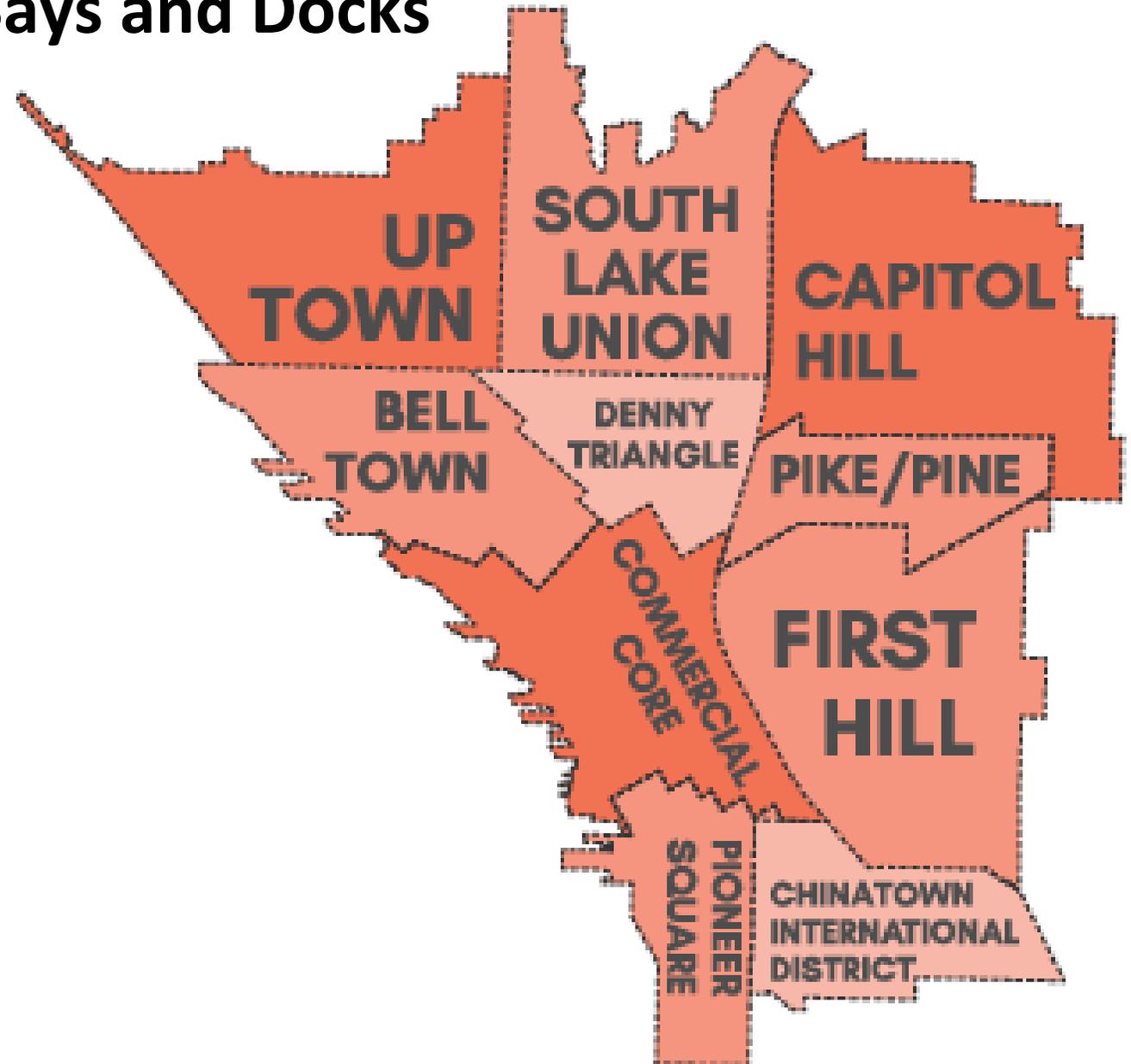
Collaborating with the Private Sector Greatly Reduced Uncertainty

- 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.

Legend
- ● Exterior loading area
- ○ Exterior loading dock
- ● Internal loading bay entrance

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

0 0.125 0.25   0.5 Miles

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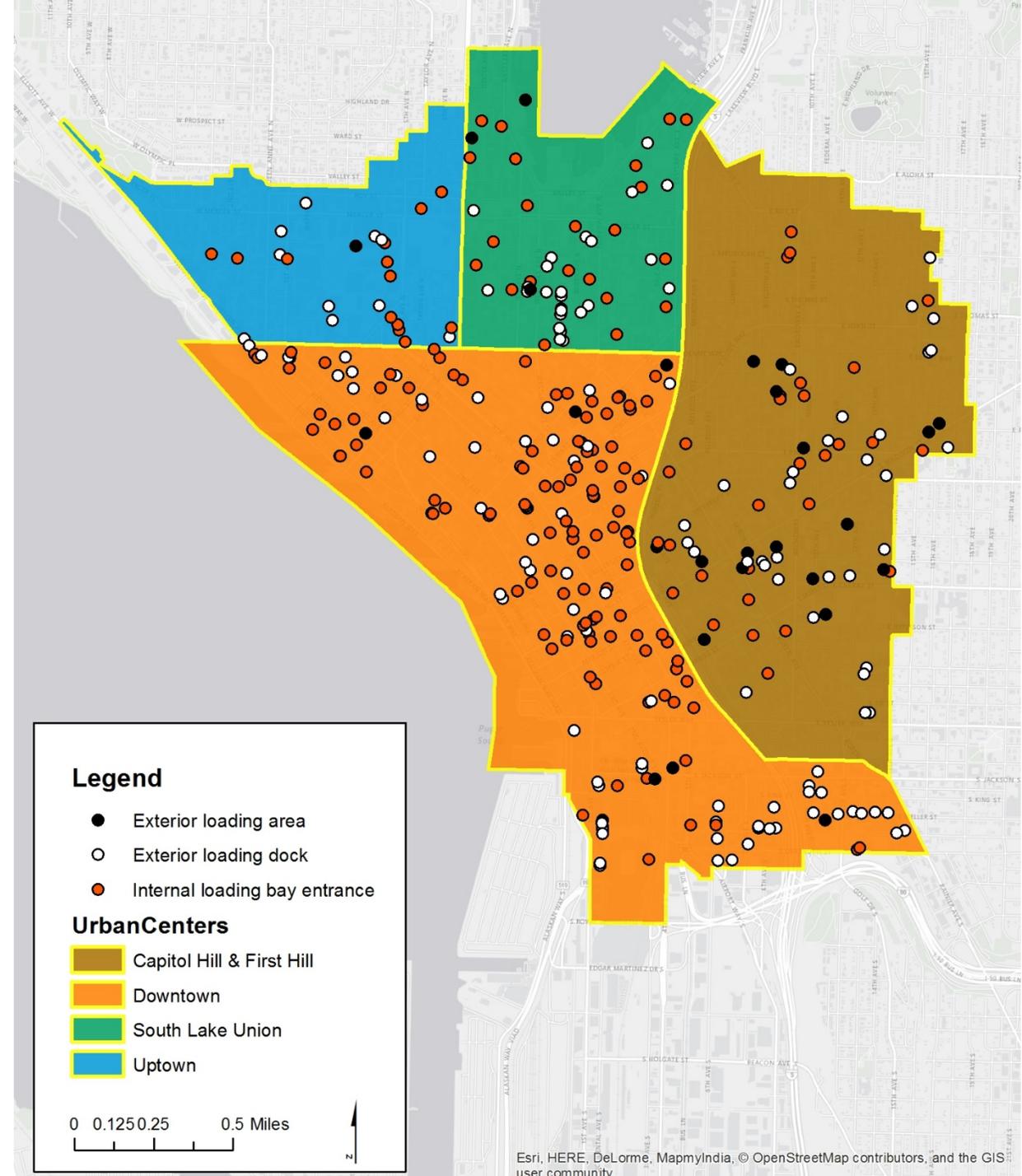
Final 50' Goods Delivery System Analysis

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

Final 50 Feet Research Questions

1. What are the steps the delivery process?
2. How long do each of these steps take?
3. What are the opportunities for reducing the amount of time for each step, or eliminating steps?
4. How does our infrastructure delay drivers?

5-Step Approach

1. Select 5 prototype buildings and obtain permissions
2. Recruit and train data collection team
3. Collect data using a customized application
4. Create a process flow map
5. Quantify delay & find opportunities for improvement

Step 1 – Select 5 Prototype Buildings
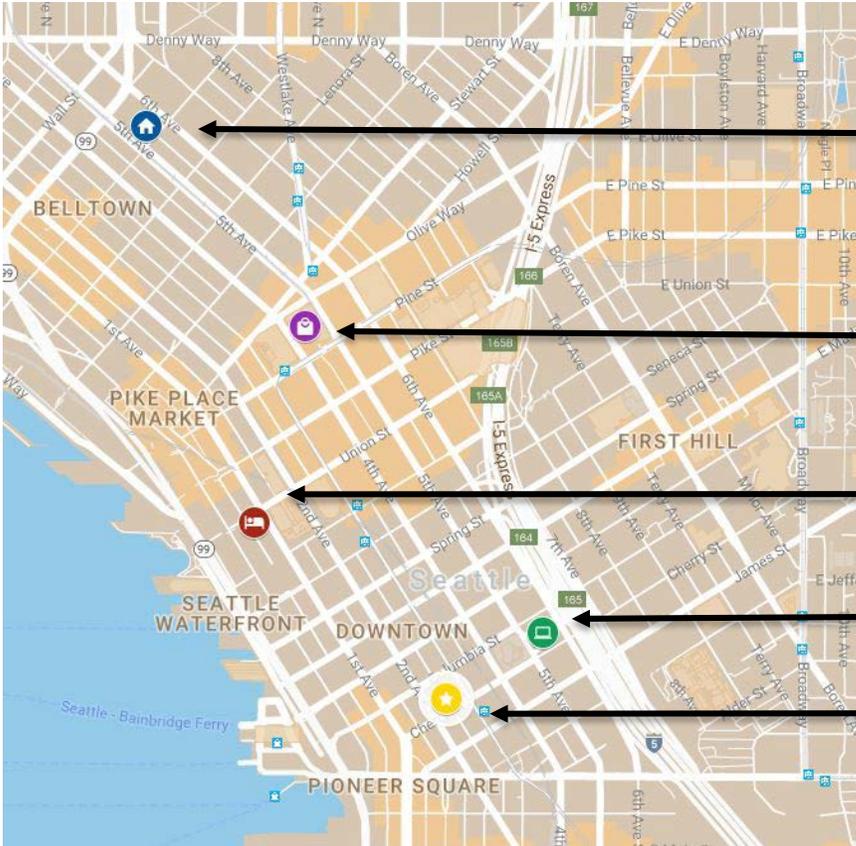
Building Types
Residential Tower
Retail Building
Hotel
Office Building
Historical Building

15

General Delivery Process Flow

Enter:

1. Entering

Source: Clipart library

Deliver:

2. Delivering

Exit:

3. Exiting

Source: Clipart library
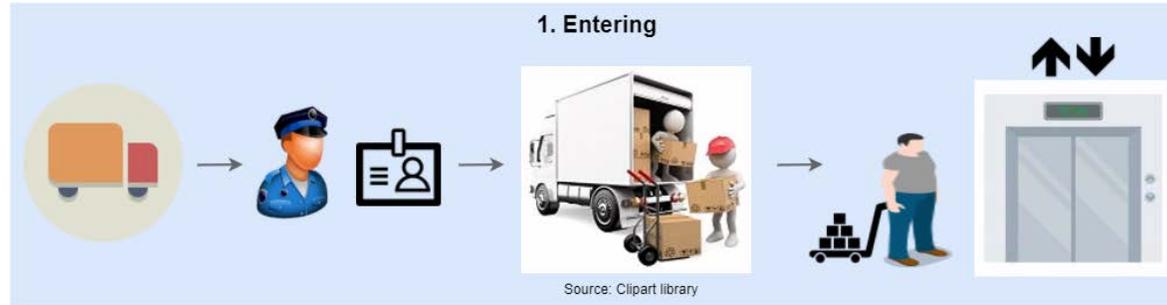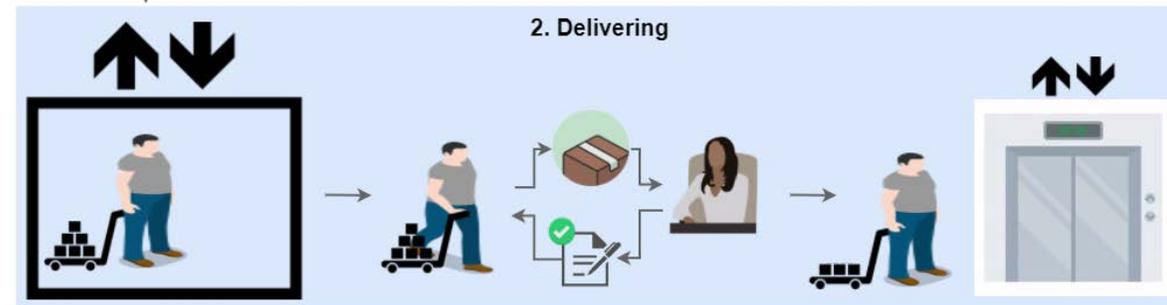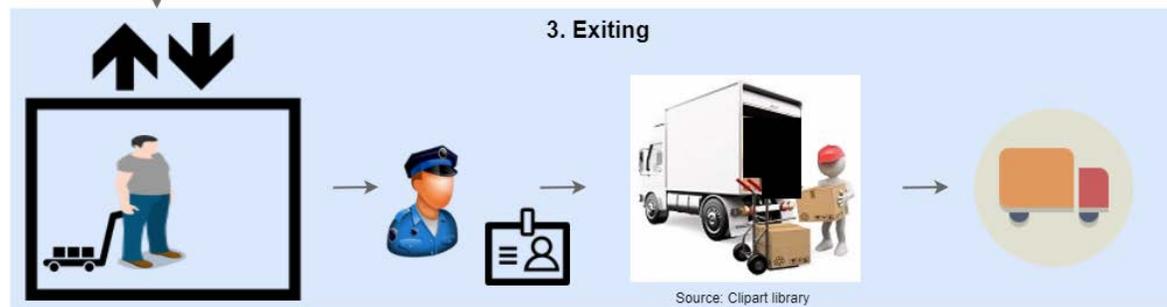
Step 3 – Collect Data Using a Customized Application

| App Button	Time Stamp
Security Check-In Start	01-30-2017 9:26:06 AM
Security Check-In End	01-30-2017 9:29:10 AM

- SCTL developed an app that records a time stamp for each goods delivery process step

- Students entered the data into the app as they walked behind delivery people

- The app transmitted info to a database in real time

Step 4 –Create a Process Flow Map

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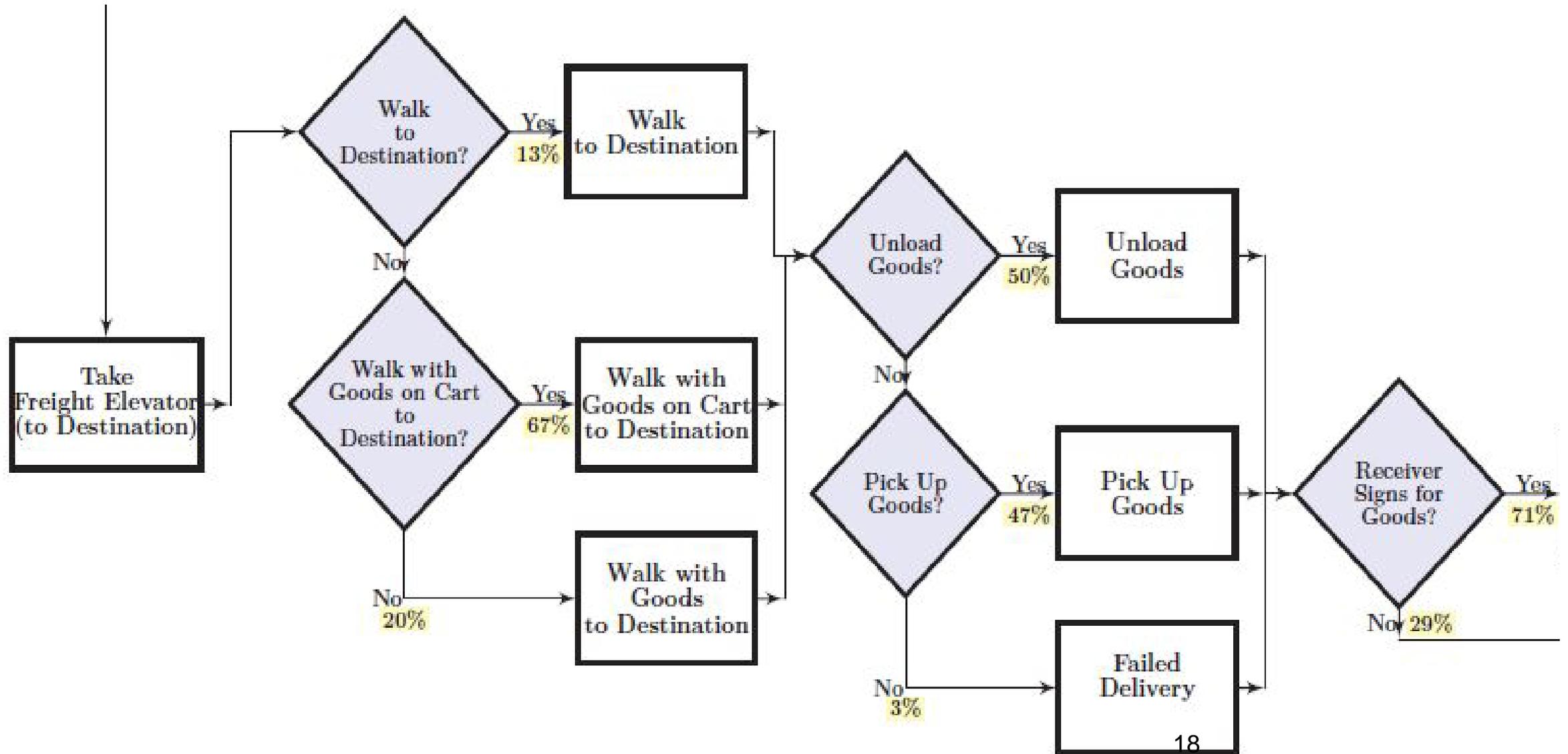
Step 5 - Quantify Delay, and Find Opportunities for Improvement

Percent of Total Time

35%	**Enter**	Mean : 7 min sd: 3 min Range: 2 - 15 min	1. Park in freight bay 2. Get clearance from security guard 3. Unload goods on to cart 4. Wait for freight elevator
40%	**Deliver**	Mean : 8 min sd: 8 min Range: 2 - 34 min	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
25%	**Exit**	Mean : 5 min sd: 3 min Range: 2 - 15 min	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

0%

7%

33%

27%

74%

5%

100%

19

Buildings' Delivery Policies Drive Dwell Time

Retail Building (n = 38)	**Residential Building** (n = 41)

Retail Building — Mean: 28 min, sd: 24 min, Range: 3 - 107 min

Residential Building — Mean: 8 min, sd: 6 min, Range: 1 - 23 min
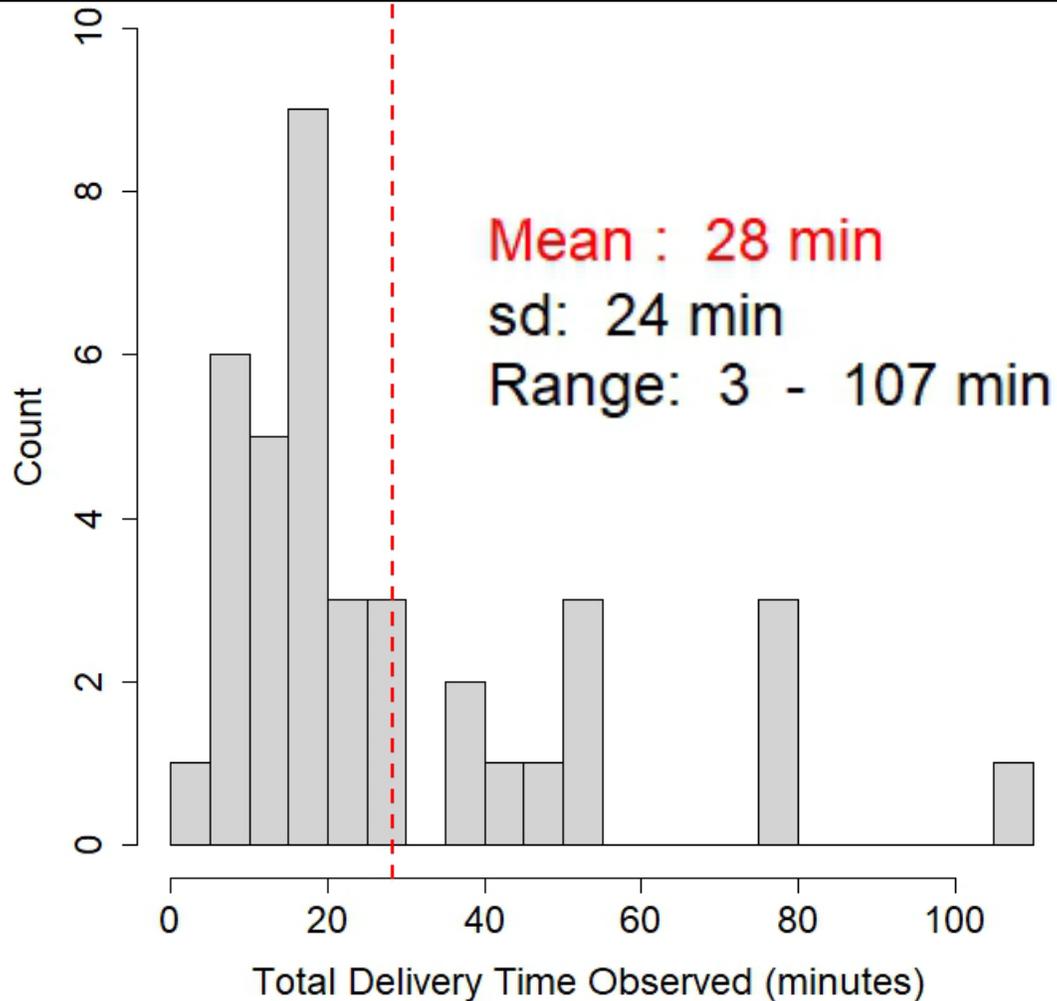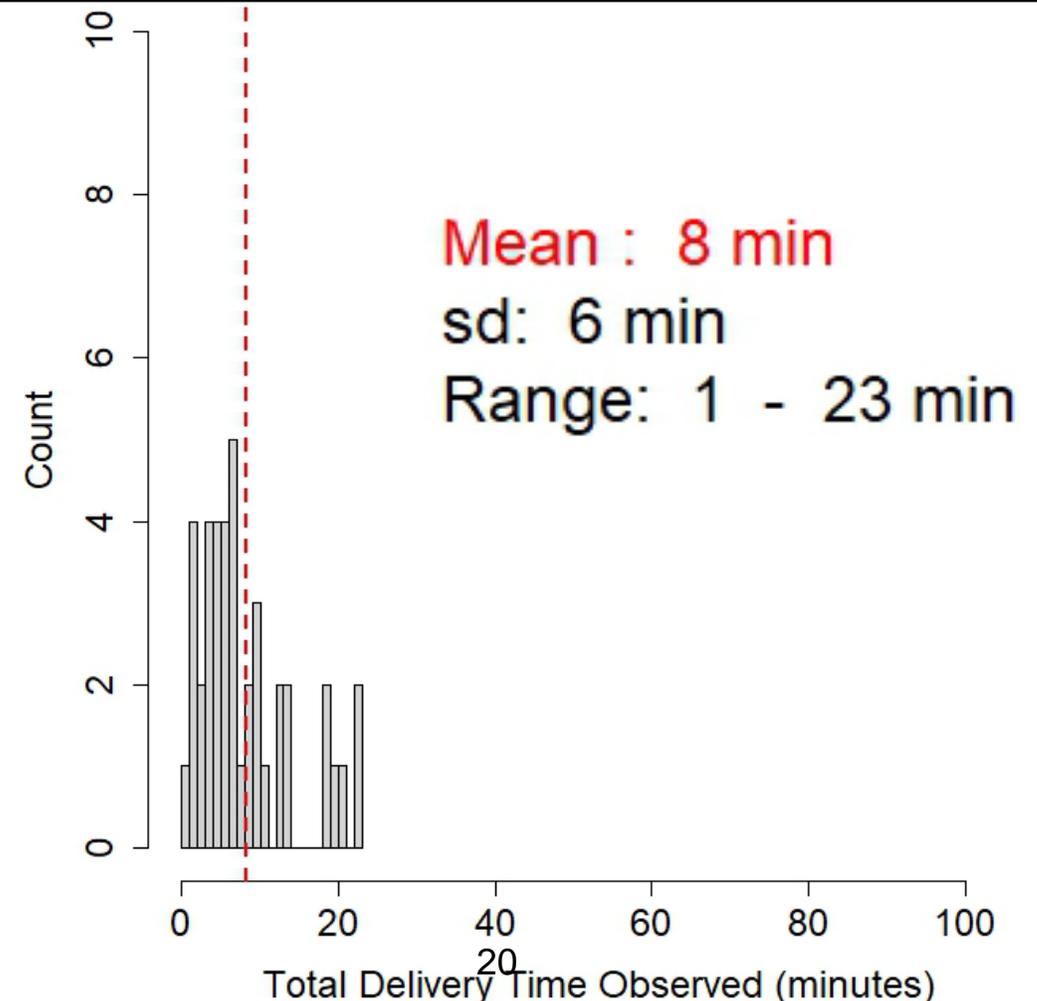
Lessons Learned:

➢ Delivery time can be improved by:
  ➢ Better communication methods between carriers and receivers
  ➢ The location of receiving goods
  ➢ Building policies

➢ Process Flow Map visualizes the components and gaps in delivery
  ➢ Provide time measures for each process steps
  ➢ Find areas for improvements in terms of total delivery time
  ➢ Performance of new system can be measured by time data before and after

➢ Process Flow Map shows % of first failed delivery
  ➢ Discover characteristics of failed delivery
  ➢ Propose solutions to improve the current system with data

Questions?

Please contact:

Anne Goodchild

Supply Chain Transportation and Logistics Center Director

University of Washington

annegood@uw.edu

http://depts.washington.edu/sctlctr/