Evaluation of Sound Transit Train Stations and Transit Oriented Development Areas for

COMMON CARRIER LOCKER SYSTEMS:

Phase 1 Research Project

EXECUTIVE SUMMARY

SUPPLY CHAIN TRANSPORTATION & LOGISTICS CENTER
UNIVERSITY of WASHINGTON
Urban Freight Lab

"These lockers may be able to reduce delivery truck traffic circulation around the neighborhoods Sound Transit serves, with reductions in roadway and curb space congestion as well as potential air quality improvements. These potential benefits are consistent with Sound Transit's mission. In addition, the convenience to users would benefit our riders and complement transit use."

BRIAN BROOKE, SENIOR MANAGER OF INNOVATION AND PERFORMANCE, SOUND TRANSIT

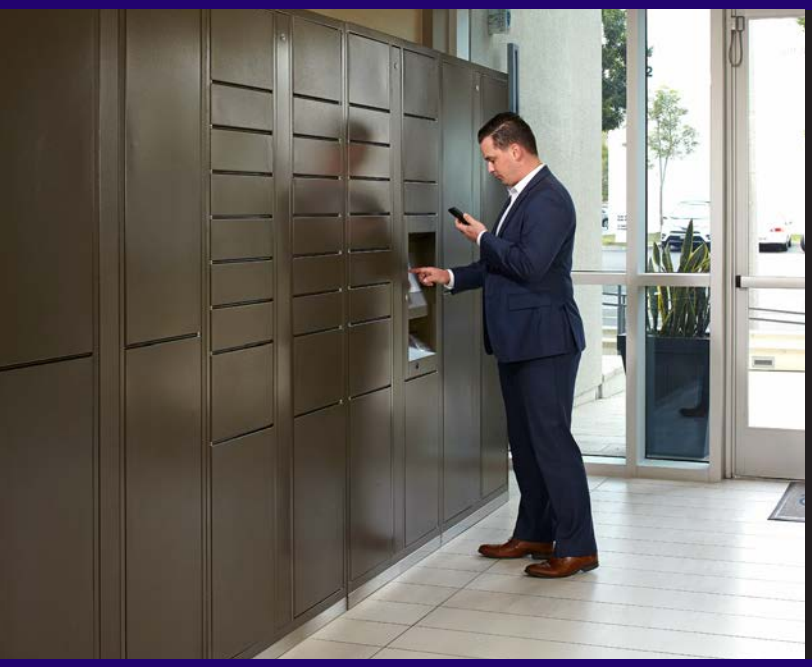


Photo owned by Parcel Pending.

Photo: Urban Freight Lab, University of Washington

"Common carrier lockers provide additional customer choice for how the customer wants the package delivered. The process is simplified when all carriers can have access to a locker, because then it doesn't matter which carrier delivers the package."

LOREN VANDENBERGHE, DIRECTOR OF TRANSPORTATION, NORDSTROM)

The rapid expansion of e-commerce has flooded American cities with delivery trucks, just as those cities are experiencing booming population growth. Retailers need a more efficient, reliable, and cost-effective way to deliver goods in increasingly crowded urban environments. For their part, cities like Seattle want to minimize traffic congestion, both to sustain quality of life for residents and to ensure a smooth flow of goods and services.

Common carrier parcel lockers hold tremendous potential for streamlining the urban goods delivery system and addressing these challenges. This research study explores the viability of providing public right of way for common carrier lockers at or near transit stations in Seattle, a ground-breaking step toward improving freight delivery in the city's fast growing urban core.

Urban Gridlock

With a density of 8,350 residents per square mile, Seattle is now the fourth most-congested city in the country. Delivery firms are trying to move more goods, more quickly through urban spaces teeming with cars, cyclists, and pedestrians, a situation exacerbated by online shoppers' rising expectations for fast, reliable service. The result is urban gridlock like never before.

These factors have especially impacted the tail end of the supply chain, a segment commonly referred to as the "Final 50 Feet." This segment begins when trucks pull into a parking space and stop moving (in public load/unload spaces at the curb or in an alley, or in a building's loading dock or internal freight bay), continues inside the building, and ends where the customer receives the package. The two thorniest challenges associated with the Final 50 Feet are 1) the need to reduce "dwell time," the time trucks are parked in limited load/unload spaces in the city, and 2) failed first deliveries.

Traditionally, parcels are delivered one at a time to individual homes or offices, a time-consuming practice that involves driving to multiple locations and parking in multiple spaces. This not only ties up limited urban truck parking spaces – often blocking alley access to other vehicles – but it also results in failed first delivery rates of up to 15 percent in parts of some cities. A study conducted in the United Kingdom reported that the cost of failed first deliveries was more than $950 billion in 2014.

Photo: Manali Sheth

The Promise of Common Carrier Parcel Lockers

The Urban Freight Lab is a strategic public-private research work group composed of leading retail, logistics and delivery firms (including Charlie's Produce, Expeditors International of Washington, Kroger, Nordstrom, USPS, and UPS) and the Seattle Department of Transportation. Part of the Supply Chain Transportation and Logistics Center at the University of Washington, the UFL works to solve urban delivery issues by gathering and analyzing data, developing low-cost, high-value strategies, and pilot testing those strategies on the street. In 2017, the UFL analyzed the Final 50 Feet of the urban goods delivery system and developed a strategy focused on common carrier parcel locker systems.

Common carrier lockers are secure, automated, self-service storage systems designed to accommodate multiple delivery firms and a range of parcel sizes. They create delivery density so that trucks can transport many packages to one stop rather than multiple stops, effectively reducing both dwell time and failed first deliveries. These reductions would benefit everyone. For example:

Faster dwell times would:

- Lower costs for delivery firms and potentially for customers as well
- Make urban truck parking spaces more efficient, lessening the need to build more of them
- Create room for other vehicles to use alleys

Fewer failed first deliveries would:

- Lower traffic congestion, as delivery trucks could make up to 15% fewer trips while completing the same number of deliveries
- Improve online shoppers' experiences and protect retailers' brands
- Cut business costs for retailers and logistics firms

Locating common carrier lockers specifically at or near transit stations would have the additional benefits of:

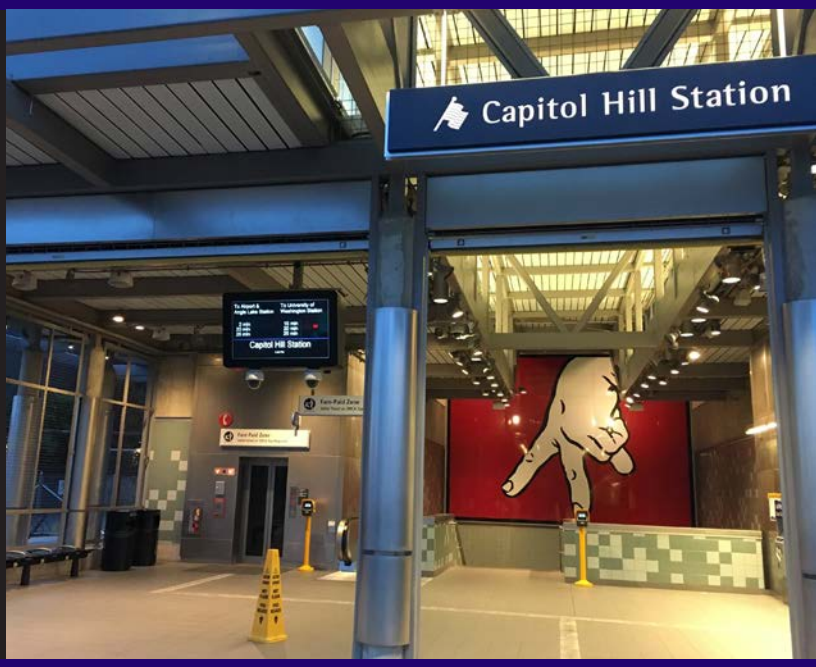
- Improving an amenity that adds value to transit stations and the Transit Oriented Development (TOD) areas near them, by ensuring that riders can get their online orders when expected in a secure, convenient place
- Cutting crime and providing a safer environment for residents and workers
- Ensuring that all neighborhoods can receive online orders, not just a few

This study explores locating common carrier lockers at or near three of Seattle's Link Light Rail stations. Accordingly, the stewards of those stations and TOD area right of way, King Country Metro Transit, the Seattle Department of Transportation, and Sound Transit, joined the UFL in this research. The agencies, like the UFL, want to reduce traffic congestion and increase the efficiency of urban parking spaces. Additionally, common carrier locker systems support these agencies' mobility hub policies, which call for rider amenities that create lively public spaces. Mobility hubs aim to consolidate multiple modes of transportation – bicycles, ride shares, trains, buses – within well-designed, well-connected public spaces containing ample community amenities.

Photo: Via UPS - https://goo.gl/images/6xnWUz

"E-commerce growth has brought a number of changes to our normal distribution methods. We've adapted from serving customers primarily in stores at the case level, to serving customers making individual transactions with higher variable costs."

LOREN VANDENBERGHE, DIRECTOR OF TRANSPORTATION, NORDSTROM



Photos: Urban Freight Lab, University of Washington

"The Postal Service provides fast, accurate, convenient service for our customers. We support the common carrier locker system concept for packages as a positive enhancement to the final 50 feet of city delivery."

KEVIN MCADAMS, VICE PRESIDENT, DELIVERY, U.S. POSTAL SERVICE

Study Findings

PIONEERING RESEARCH AND SOLUTION

An exhaustive literature review reveals that **there are no common carrier parcel locker systems on public property in the U.S. or Europe, nor has the topic ever been studied.** While firms like Amazon operate their own locker systems across the country, these systems are not designed to serve the public with all retail goods, nor are they all located in publicly accessible areas.

STRONG TRANSIT RIDER INTEREST

A survey of 185 riders at three Link Light Rail stations – University of Washington Station, Capitol Hill Station, Westlake Station – shows **strong rider interest in common carrier lockers**. Sixty-seven percent of respondents at the UW Station said they would use common carrier lockers located at that station, and nearly half the respondents at the other two stations said they would use lockers or consider using them. The vast majority of these riders expressed a willingness to carry a package three to six blocks, and 24-42% of riders reported a willingness to walk with a package seven or more blocks.

MULTITUDES OF POTENTIAL USERS

Approximately 137,000 people live within a 30-minute walk of one of these three stations. Each station has residential housing within a five-minute walk or less. From two of the stations – Capitol Hill and Westlake – the majority of housing is less than a 15-minute-walk away. This suggests that, since a significant percentage of riders expressed willingness to walk considerable distances with packages, **tens of thousands of Seattle's urban residents would be willing to use common carrier parcel locker systems located at transit stations**.

LOCATION CRITERIA

Researchers and stakeholders **devised criteria for locating lockers at or near transit stations**. These criteria are built around four central categories: location and logistics, market demand, operations, and legal considerations.

FIVE POTENTIAL LOCKER LOCATIONS

The criteria in the "location and logistics" category – lighting, electricity, visibility, ADA standards, commercial vehicle access, commercial vehicle parking, live ethernet/strong cellular, vehicle traffic flow management, pedestrian traffic flow management – proved especially helpful to researchers and stakeholders in evaluating potential sites. Based largely on these criteria, **they identified five viable pilot locker locations:**

- **Husky Train**
- **Capitol Hill Bikes Under Cover (Cap Hill #1)**
- **Capitol Hill Streetscape (Cap Hill #2)**
- **Capitol Hill Mural Interior (Cap Hill #3)**
- **Westlake Retail Hub**

Conclusion and Future Reseach

King County Metro Transit, Sound Transit, and the Seattle Department of Transportation, working with the UFL, have demonstrated national leadership in conducting this first-ever study of locating common carrier lockers on public right of way at or near transit stations. This study reveals strong interest among both potential locker users (Link Light Rail riders) and carriers (UPS and USPS, both UFL members). Researchers selected five potential locker sites, one or all of which will be pilot tested in future research. Pilot tests will provide an opportunity to see how riders respond to the lockers and to what extent lockers reduce dwell times and failed first deliveries. No single solution can solve all of the challenges that plague the Final 50 Feet of the urban goods delivery system. But common carrier parcel lockers are a promising first step in improving freight transport in urban areas.

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Seattle Department of Transportation

SoundTransit

King County Metro

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Cover photos:

Top: Kevin Scott. Sound Transit U Link University of Washington Station. Seattle : 2016.

Bottom: Manali Sheth