San Francisco
County Transportation
Authority

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Memo

SUBJECT: Cover Memo Summarizing Findings from the SFCTA Decarbonizing Downtown Business Deliveries Study

BACKGROUND AND STUDY APPROACH

The Decarbonizing Downtown Business Deliveries Study brought together a working group of local merchant associations, community benefit districts, delivery companies, and environmental groups to identify and prioritize strategies for low- and zero-emission delivery. The study focused on commercial corridors in the downtown area of San Francisco. Working group structure is documented in detail in CNCA Deliverable 2. Detailed findings, conversation summaries, and strategy-specific presentations are summarized in the attached. Below are high level findings and next-steps identified for three strategies prioritized and discussed by the working group.

Off-Hours Delivery

Purpose and Need

Freight deliveries create congestion, emissions, and safety risks to pedestrians, cyclists, and others. These challenges are exacerbated when trucks operate during the busiest times of day.

An off-hours delivery program (OHD) seeks to shift delivery to off-peak hours when traffic is less intense and there is less demand for curb space. OHD programs can shift delivery times through a number of means, including by providing financial incentives to businesses to encourage adoption of OHD, adjusting curb access regulations, or providing technical assistance or OHD training programs

Key Strengths

Examples of OHD in peer cities have found different strengths for carriers, receivers, and the public. For carriers, OHD can lead to more efficient deliveries and truck utilization, as trucks spend more time making deliveries and less time in traffic. Making deliveries off-peak also makes it easier for drivers to find parking. Traveling during less congested times results in fuel savings and reduced costs.

For receivers, OHD can lead to more consistent and predictable delivery times. Having goods delivered outside of store hours can mean that deliveries are ready for businesses when they open, rather than businesses receiving deliveries during the day. This improves staff productivity by reducing business hour interruptions due to deliveries. OHD can also make more sidewalk space available for businesses and pedestrians to use during business hours, rather than the space being taken up by loading or unloading goods.

OHD also has benefits for the general public by reducing conflicts between delivery vehicles and pedestrians and cyclists during peak hours, and reduces conflicting demand for curb space between delivery and other uses. OHD can also reduce traffic congestion and emissions from delivery trucks.

In the working group, one participant shared that he and other hardware store owners started an OHD program in the 1980s. The program was well received by employees and the truck company because it allowed trucks to get into the city much faster without traffic. Other working group participants felt that shifting deliveries to off-hours or certain days of the week could enable other street changes, such as partial or temporary street closures.

Key Challenges

Examples of OHD in peer cities identified key challenges including coordination required between carriers and receivers. Receivers also need staff to work off hours to receive deliveries or set up a process to facilitate unattended deliveries. Off hours deliveries can also lead to noise complaints, particularly in residential areas. There may also be stipulations in building lease agreements or zoning regulations that restrict deliveries to occur only at certain hours.

In San Francisco, businesses may face challenges asking employees to work during late nights or early mornings due to personal safety concerns or lack of public transit service. Working group participants also stated that coordination with Public Works was needed to ensure that off-hours deliveries would not interfere with street cleaning activities. An OHD program would also require more parking enforcement to reduce overnight parking in loading zones.

Findings and Recommendations

Based on case studies of peer cities, off hours delivery has clear benefits over peak hours deliveries. OHD programs are popular among carriers and receivers and can also lead to greater societal benefits through reducing congestion and emissions. Working group participants generally thought that an OHD program could benefit San Francisco, but thought it was most likely to work for certain business types and felt that the City would need to play a coordinating role between shippers and receivers. At this time, the city of San Francisco does not have a good understanding of how many deliveries are happening

during peak hours or the magnitude of the impact of these deliveries on congestion or traffic circulation. Therefore, the extent of the benefits of an OHD program is unclear. Next steps include:

- Data collection to
  - Complete a full accounting of curb space (ongoing SFMTA curb digitization effort)
  - Understand the number of deliveries happening at peak hours in different parts of San Francisco
  - Understand delivery behavior at peak hours (eg. observed loading-zone capacity, survey of delivery drivers to understand behavior)

- SFMTA and SFCTA should make a series of determinations based on this data collection:
  - Are planned loading zones considered in forthcoming update of SF Curb Management Strategy adequate to handle delivery needs?
  - What is the magnitude of the impact on congestion and circulation if loading zones are inadequate or used improperly
- IF loading zones planned within SFMTAs curb management strategy update are inadequate and/or if the number of deliveries happening during peak hours impact circulation regardless of curb access, THEN SF should consider an off-hours delivery pilot.
  - Curb pilot development should begin with outreach to businesses. We found that shippers are likely willing to switch delivery windows if businesses are interested, but there are more barriers to OHD for businesses, such as staffing concerns. San Francisco should approach business consortiums either organized around location (e.g., community benefit districts), or business type (e.g., hardware stores) to identify pilot partners. incentive rates, and any infrastructure needed to support unattended deliveries (e.g., storage lockers). Chain stores with non-perishable goods appear the most likely to adopt an OHD program.
  - An off-hours delivery pilot in SF should include elements such as:
    - Noise mitigation education for participating shippers;
    - Coordination with SF Planning to ensure zoning regulations allow for appropriate late night business operations;
    - Coordination with Public Works regarding street cleaning hours;
    - Coordination with SFMTA regarding late-night or early morning transit which serves employees who receive deliveries;
    - Coordination with SFMTA on enforcement of loading zones to ensure they are free of obstructions during off-peak delivery hours;
    - Coordination with SFMTA around potential temporary street closures enabled by off-hours deliveries.

Microhubs

Purpose and Need

A microhub is a space located within the public or private right-of-way where goods are transloaded from larger freight vehicles to smaller electric vehicles or human powered modes (e.g., cargo cycles, hand carts, golf carts) for final delivery.

Current goods distribution methods cause double parking and circling in large, loud, polluting vehicles. This has congestion, safety, and public health impacts. Microhubs could make it easier and more cost effective to complete deliveries by sustainable modes.

Key Strengths

- For many delivery applications, a physical space is required to transload packages to small vehicles at the point where the urban fabric changes and becomes inappropriate for larger vehicles. Thus a microhub can be seen as a critical piece of sustainable freight infrastructure which enables a much wider variety of last-mile deliveries to be accomplished sustainably than would otherwise be possible.
- The concept is flexible, allowing the programming to shift between locations, or over time to meet needs. For example, members from working group recommended parcel pickup lockers be included at the microhub site.
- The strategy has the potential to be cost neutral or generate revenue for city (e.g., the New York City microhub demonstration pilot hypothesizes that shippers see the benefit and be willing to pay to rent microhub spaces.

Key Challenges

Likely applicable to some business types only

Findings and Recommendations

San Francisco Should implement a microhub transloading pilot. SFCTA and SFTMA should develop an in-depth site suitability analysis in partnership with fleet partners that explores locations and facilities in San Francisco best suited to support a microhub pilot, and identify up to 5 potential pilot locations the study should consider City-owned real estate such as vacant/off-market properties and underutilized off-street parking facilities, coordinating with SF Planning, the Real Estate Division of ADM, and other City agencies that track and manage City property. The study should also develop business plans for each recommended pilot location, which would include a description of roles/responsibilities for operations and financial arrangements as well as optimal site configurations and loading/unloading zones to support efficient access for smaller delivery vehicles.

E-bike Batter Swapping Lockers

Purpose and Need

In urban areas, e-bikes can deliver goods faster than motorized vehicles by using bike lanes and avoiding traffic congestion, parking closer to their destination, and reducing time spent looking for parking. E-bikes are also a sustainable, zero-emission option for goods delivery.

However, the downsides of e-bikes are that the battery charge is limited, with most e-bike models having batteries that last 4-6 hrs. This poses a challenge for e-bike delivery work as, depending on the type of bike, the bike may not operate after running out of charge. Losing charge can have serious ramifications for e-bike delivery work and workers have set their schedules and work expectations to avoid this happening. Riders will end their work day and stop accepting new orders if they're low on charge. Functionally, this means they may cut their delivery day short compared to if they had a longer battery life or the opportunity to recharge while delivering.

Key Strengths

An e-bike battery swapping program would increase delivery worker productivity by allowing workers to complete more deliveries without worrying about running out of charge. Battery swapping also improves fire safety because it reduces the need for delivery workers to charge lithium-ion batteries at home.

Key Challenges

E-bike delivery workers shared in a focus group that they were not willing to swap the battery on their e-bike for a different one at battery swapping lockers. Riders see the battery on the bike as "theirs" and are concerned about using a loaner battery because they don't know the usage history. Riders were also concerned about compatibility and swapping for a battery that fits their bike.

Findings and Recommendations

E-bike battery swapping lockers are not recommended for San Francisco at this time. E-bike delivery riders are not interested in battery swapping. This strategy could be revisited if San Francisco's e-bike delivery workforce expands or riders converge on a preferred bike/battery type.

Instead, there was more interest in public e-bike charging infrastructure (e.g., open-air charging plaza). Riders were interested in public charging facilities if they had secure places to lock their bikes, were in convenient, accessible locations, and had compatible chargers. Riders said that charging facilities should be located near frequent delivery order generators (e.g., near grocery store, commercial corridors or places with high concentration of restaurants). Riders were willing to pay a one-time fee to use chargers in case of emergency,

but less willing to pay a monthly subscription for access to charging facilities. There is the potential to co-locate this type of facility with a package transloading microhub.

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TECHNICAL MEMORANDUM

December 20, 2024 Project# 272160.006

To: Jonathan Long, Alex Pan
San Francisco County Transportation Authority
1455 Market Street, Suite 22
San Francisco, CA 94103

From: Kittelson & Associates, Inc.

RE: CNCA Decarbonizing Downtown Business Deliveries Study

E-Bike Delivery Rider Focus Group

Introduction and Background

On December 7th, 2024, Kittelson conducted an in-person focus group with five individuals who make deliveries by e-bike in San Francisco. The focus group was convened to support the SFCTA's Decarbonizing Downtown Business Deliveries study by hearing delivery riders' experiences and their perspectives on the potential for battery-swapping lockers to support their work.

The delivery riders work for a variety of services, including DoorDash, GrubHub, Uber Eats, and Instacart. The majority of participants work full-time as delivery riders. Participants described many benefits of delivering by e-bike: e-bikes are faster and more flexible than delivering by car for short trips, and they don't need to look for parking and won't get double parking tickets on e-bikes.

Findings

The following findings emerged from the focus group conversation:

- **Participants' work habits are shaped by the bike technology they utilize, especially battery life.** Their work shifts are planned around their estimated battery life, with most working shifts lasting between two and six hours. In other ways, the bike design and battery capability shapes delivery constraints. For example, one participant who delivers groceries through Instacart refuses large orders due to their bike's weight limitation and avoids large hills due to limited battery power. Another participant who delivers on a single-speed pedal bike mostly works in Downtown San Francisco to avoid having to bike up hills. Participants indicated that they would be able to make more deliveries and earn more money if they had access to cargo bikes, which are otherwise prohibitively expensive.
- **Riders expressed that they would likely be able to start delivering more orders if they knew that they could have a place to charge.** Participants note that they rarely, if ever, run out of charge

while working. Losing charge has serious ramifications for their work, so they set their schedules and work expectations to avoid having a battery die on the job. None of the e-bike delivery riders own spare batteries due to the prohibitively high cost of purchasing reliable and compatible spare batteries. In this regard, a battery charging opportunity could improve their working conditions.

- **Riders are more interested in battery charging than battery swapping.** Participants indicated that they would be hesitant to use loaner batteries out of concern for the quality and reliability of unfamiliar batteries. E-bike delivery drivers indicated that they would be interested in using public charging facilities if they were secure and located in convenient, accessible locations, similar to electric car chargers. Key features for the success of public charging facilities include compatible charging ports, secure places to lock bikes while charging, and proximity to frequent delivery order generators.
- **There was no clear consensus around riders' preferred business model for battery charging.** Participants were not certain how much they would be willing to pay. Some said they would be willing to pay significant one-time fees to use public chargers in an emergency (as much as $5 or more) but were less interested in monthly subscription models. All of the participants were renters who charge their bikes at home and have fixed utility costs or charge at outlets that they do not pay for directly. Therefore, they had no clear sense of their willingness to pay for charging. No participants were affected by restrictions in the SF Fire Code on charging lithium-ion batteries in multi-family dwellings.

Appendix A Focus Group Notes

Attendance:

- Mike Alston, Kittelson
- Shayda Rager, SFMTA
- Alexandra Pan, SFCTA
- Jonathan Zisk, Kittelson
- Anthony Wolfe, participant
- Laura Creelman, participant
- Keli Wu, participant
- Aliaksandr Arapinovich, participant
- Lexi McVay, participant

Major Takeaways:

- E-bike delivery riders rarely run out of battery charge while working because they plan their work to avoid it.
    - Losing charge can have serious ramifications for their work and workers have set their schedules and work expectations to avoid this happening.
    - However, riders expressed that they would likely be able to start delivering more orders if they knew they could charge if they ran out of battery charge.
- Participants are all able to charge their bikes at home, either in apartment building garages or personal garages.
    - All of the participants were renters and noted that they have fixed utility costs or charge at outlets that they don't pay for directly.
    - No participants are affected by restrictions in the SF Fire Code on charging lithium-ion batteries in multi-family dwellings.
- None of the e-bike delivery riders we spoke with own spare batteries.
    - They would be hesitant to use loaner batteries. They know how their batteries behave and would be concerned about the quality and reliability of a loaner.
    - Spare batteries are prohibitively expensive (several hundred dollars).
- E-bike delivery drivers would be interested in using public charging facilities if they were secure and located in convenient, accessible locations, similar to electric car chargers.
- Participants said they would be willing to pay significant one-time fees to use public chargers in an emergency (as much as $5 or more) but were less interested in monthly subscriptions of a fewer dollars per day.
- Key features for the success of public charging facilities include:
    - Compatible charging ports.
    - Secure places to lock bikes while charging.
    - Proximity to frequent delivery order generators.

Notes:

Introductions

- A pair of participants work for DoorDash based out of Japantown alone or as a couple. Work lunchtime and dinner, about 4 hours a day, for around 20 hours per week. They work all over San Francisco, but avoid North Beach for fear of getting orders from Treasure Island. They started deliveries by using a car but moved mostly to e-bikes after getting tickets. They still deliver by car sometimes.
- Participant works for Instacart. They works any day of the week from 2pm or 3pm on, for around 2-10 orders per day. They stays on the east side of the city and north of 29th St because their e-bike performs poorly on hills. Delivery is their full-time job.
- One participant has worked full time for six years for Uber Eats, DoorDash, and GrubHub. Her rides a single-speed pedal (not an e-bike) and deliverers to China Basin, Downtown, and SoMa (avoids hills). He works seven days a week: 6-8 hours on weekends, 4-5 on weekdays.
- One participant works part time for Uber Eats and DoorDash, for about 20 hours per week. He works mostly Downtown and wherever deliveries send them. He starts the app near home and then lets it guide their direction from there. He started delivering by car in college but returned to delivery when they got an e-bike through the GRID pilot program.

Q1. Describe Your Work as a Delivery Rider:

- Delivery ability is limited by bike configuration.
    - The Instacart rider can only accept certain grocery orders (i.e. no crates of water).
    - No riders had cargo bikes, which limit acceptable delivery loads.
- They need to be within a certain distance of pick-ups to get orders, so riders go to busy areas to increase rate of orders. They generally find that if they are on the move, they will get requests. As a result, they do not idle excessively in busy areas. The one person delivering through Instacart does report hanging out in a public space that is close to multiple grocery stores as a way to get orders.
- Using e-bikes is faster than delivering with a car.
    - Less impacts from traffic.
    - No time spent looking for parking.
    - Apps assume around 10mph when calculating delivery speeds, so e-bikes are easily able to outpace estimates.

Q2. Describe your E-Bike Equipment

- Bikes used include:
    - Several use Aventon Level 2 (bike distributed by the GRID Alternatives program).
    - Another rider uses a Lectric brand folding e-bike.
    - Others did not know the make and model of their bikes.
    - Heavy duty locks (like Kryptonite brand, as distributed by Grid) are essential for security.
    - Bikes charge using e-bike specific adaptors to connect to wall sockets.
- Battery charge tends to last 4-6 hours.

- Many would like to own cargo bikes but find them to be are prohibitively expensive. Cargo bikes would allow them to confidently deliver larger orders.

Q3. What are some challenges to picking up orders and making delivers

- Challenges are more often focused on the structure and incentives of apps than on roadways.
    - DoorDash gives riders a short window to accept or reject orders based on limited information (the app shows distances to pick-up and drop-off, but not actual locations, and has disincentives to rejecting orders).
    - GrubHub and DoorDash have delivery tiers based on order size and seniority. Most bike riders cannot access the higher tiers dur to equipment constraints, but might be able to with cargo bikes.
- Riders structure their delivery habits to accommodate e-bike charge.
    - Riders rarely run out of battery, if ever.
        - Battery charge is predictable and has not degraded over time.
        - Riders will end their work day and stop accepting new orders if they're low on charge. Functionally, this means they may cut their delivery day short compared to if they had a longer battery life or the opportunity to recharge while delivering.
    - Running out of battery can be incredibly disruptive – many e-bikes won't run without battery charge, have tires that don't fit on bus bike racks, and are incredibly heavy.

Q4. How would you want a public charging facility to work?

- Riders would not be interested in swapping batteries on their bikes. They trust the battery they own and would be concerned to use a loaner battery.
    - None of the riders owned spare batteries.
    - Riders would be more interested in swapping batteries if they were on a rented bike but are skeptical that rental bikes would be low quality and less convenient than owning their own (most riders turn on apps when they're home and can have flexibility as their first order arrives).

Q5. What specific features would make charging stations more successful?

- Riders compared their ideal e-bike charging facility to electric car charging stations, valuing:
    - Secure locations with public visibility.
    - Sturdy bike lock connections.
    - Protection from elements (parking garages mentioned) or indoors if possible.
    - Locations near destinations like grocery stores or commercial strips.
- Compatibility is a big concern.
    - Riders said they would be willing to carry adapters with them, but compatible chargers would be a big draw.
- Delivery hot spots are predictable enough to be able to reliably identify high-demand areas for charging.

Q6. Would you be willing to pay for a charging facility?

- Riders thought they would pay relatively high prices for one-time access to charging stations ($5 or more) but would not be interested if they had to sign up for a full month at a time, even if it meant the per day price was effectively lower.
- Riders pointed out other efforts at rental e-bike companies that weren't successful, including Zoomo, which closed its San Francisco operations
- Important to their consideration, none of the riders currently pay directly for the costs of charging. All participants explained that they charge in their (rented) homes in locations that either have fixed utility costs or are not charged directly to them.

Microhubs discussion - August 20th, 2024

Attended By:
Henry Karnilowicz, President Emeritus, San Francisco Council of District Merchants Association; President South of Market Business Association
Garrick Mitchler, Public Realm Maintenance and Operations Manager at East Cut CBD
Maura McKnight, Executive Director at Business Council on Climate Change
Paige Hopkins, Policy Associate at Brightline Defense
Quinta Chapman, Account Executive at Ground Floor Public Affairs (representing DoorDash)
Stephen Cornell, Owner of Brownies Ace Hardware in the Polk district, representing hardware store owners group
Eric D Rozell, Director of Safe Programs at Tenderloin Community Benefit District and co-chair at Tenderloin Traffic Safety Task Force

Key Takeaways:

- Existing delivery systems have major limitations: Participants observed e bikes in sidewalks doing food deliveries, delivery trucks entering garages taking up entire roads, trucks double parking in bike lanes, and private vehicles in loading zones.
- Participants witness large vehicles which take up significant road space (eg. vans) delivering small packages which could feasibly be delivered on smaller more eco-friendly vehicles
- Business type matters: Some businesses are more likely to be able to utilize a microhub, while some others have delivery needs it will struggle to accommodate. Consider targeting partnerships by business type.
- Topography matters: Eg. Cargo bikes could have difficulty in delivering large or difficult packages, like liquids, in sloped conditions.
- Participants had concerns over existing sidewalk and curb space designs and whether existing curbs would be able to handle more deliveries in small vehicles, citing a need for “last 30 feet” solutions.
- Many large employers, especially in the tech sector, have adopted sustainability goals. A pilot designed to help meet these could garner interest from potential partners..
- Participants were interested in citing lockers at a microhub where carriers could store goods for pickup by businesses/individuals.
- Receivers often don’t have control over when goods are delivered. Carriers would need to be engaged on this subject, but one potential benefit of a microhub for businesses would be more control/insight into timing.
- Noise impacts to neighbors need to be considered when citing a microhub
- Participants suggested that property owners might be willing to rent out their loading dock for microhub operations during certain hours.

Short summary of discussion:

Background

Current goods distribution methods cause double parking and circling in large, loud, polluting vehicles. This has congestion, safety, and public health impacts. Microhubs could make it easier and more cost effective to complete deliveries by sustainable modes. Micro Hubs are last mile consolidation and distribution facilities that are adjacent or in close proximity to urban neighborhoods in order to complete the delivery, utilizing smaller and more environmentally conscious vehicles. Features that a Microhub could have consist of access to bike infrastructure, space for loading, sorting, and transferring packages, and safety barriers. These spaces would potentially be operated by a contracted third party logistics company, a collaboration with industry partners, or a private system.

Challenges and use-cases for Microhubs

Stephen raised concerns about how the addition of a microhub within the supply chain would affect shipping costs and how the micro hubs would deal with difficult contents like larger shipments, heavy items, and liquids. He also raised concerns with the lack of curb space and San Francisco's challenging topography. Stephen operates a hardware store, and within his business practices if the customer did not have a car, staff would provide a ride back home with the product. Within the Salesforce and high rise commercial neighborhood, Garrick observed multiple vehicles parked in spaces unintended for their use, in which private vehicles would park in loading zones and delivery drivers would rack up citations through double parking to unload, defeating the space's purpose. He noted the lack of loading-zone enforcement. Due to the multiple daily UPS and amazon trucks, Keith believed that consolidating into a singular warehouse would reduce the number of vehicles on the road and therefore traffic. It would be especially helpful for more easily manageable packages. While supportive of the hub, Stephen was interested in how it would be funded. David noted that cost of the hub would depend on provided features, ranging from loading dock to an offsite facility with e-bike charging. New York City's goal is for microhubs to eventually generate revenue for the city. From a more global perspective and individual business standpoint, Moura advised that it came down to the companies' sustainability goals and if the pilot aligned with them. A good pilot would be appreciated but it would not be a current priority. Another observation Garrick made was the times and mediums items should arrive in, suggesting incentives to concentrate on a day of the week and the usage of shared use lockers.

Appropriate Vehicles

Keith reiterated the usage of incentives when discussing the types of deliveries and necessary vehicles, noting the varying day to day packages but, regardless of size, delivery companies would use the largest vans available. With the prior in mind, the importance of being as dynamic as possible was emphasized, basing deliveries on need, incentivizing the concentration of certain days and size deliveries, and minimizing the number of deliveries by using smaller facilities and the vehicles as storage. Concerns about vehicles being in areas they should not be was brought up by Garrick. For example, the presence of e-bikes in sidewalks due to their ease of dismounting and cars in bike lanes given that they are wide enough. Eric emphasized this sentiment along with the lack of sidewalk and space in general, noting the already low amount of parking and curb space, and the size of paratransit and beverage transportation vehicles. The space shortage was reiterated by Stephen when reviewing the cargo bikes and how most of them will not fit in parking spaces or yellow zones. Henry brought up who would be in charge of coordinating microhub operations. David noted that there are several operational models available. Issues regarding the existing delivery system were considered, in which Stephen mentioned the lack of control in the time of day when the items are delivered, the congestion created by trucks entering a garage, and the noise lift gates make early in the morning, waking sleeping residents. Garrick suggested that property owners could be good partners if goals were aligned, and designating loading spaces with bollards. Stephen reminded everyone of the overall politics and costs.

Eco-friendly Downtown Deliveries Study

Microhubs

San Francisco
County Transportation
Authority

August 20, 2024

Agenda

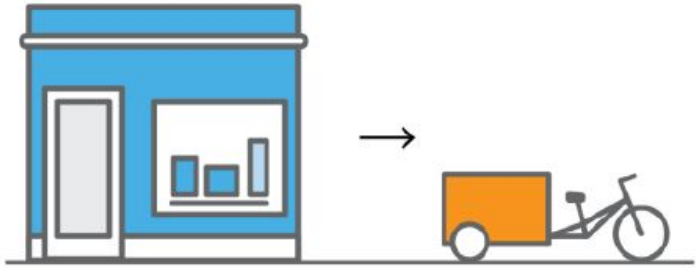
- **Welcome and Introductions**
- **Microhub Basics**
  - What is a microhub?
  - Potential benefits
- **Key Questions:**
  - What characteristics would make you or your constituents want to use a microhub?
  - Must-haves vs. Nice-to-haves?
- **Revisit Goal Alignment**

What is a Microhub?

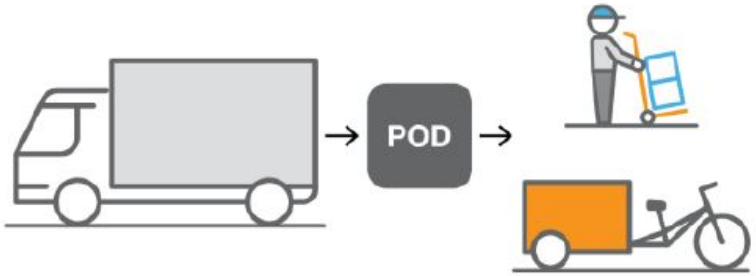
A micorhub is a logistics facility located within/close to the area it serves, supporting:

- Inbound unloading of vehicles
- Re-sorting into smaller loads
- Short-term inventory storage
- Overnight parking and charging

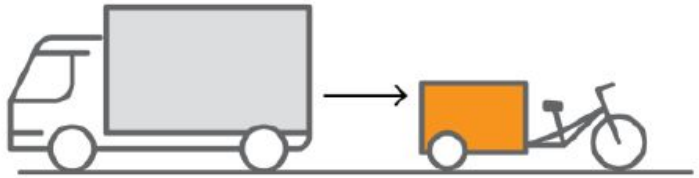
Why?: Increase (sustainable) choice for shippers and receivers



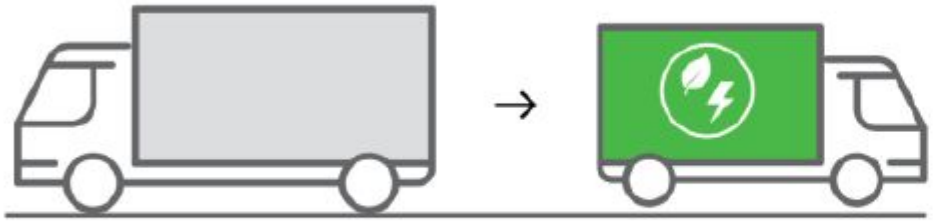
On-demand delivery/retail distribution



Truck-to-pod-to-cargo bike/handcart



Truck-to-bike/trailer

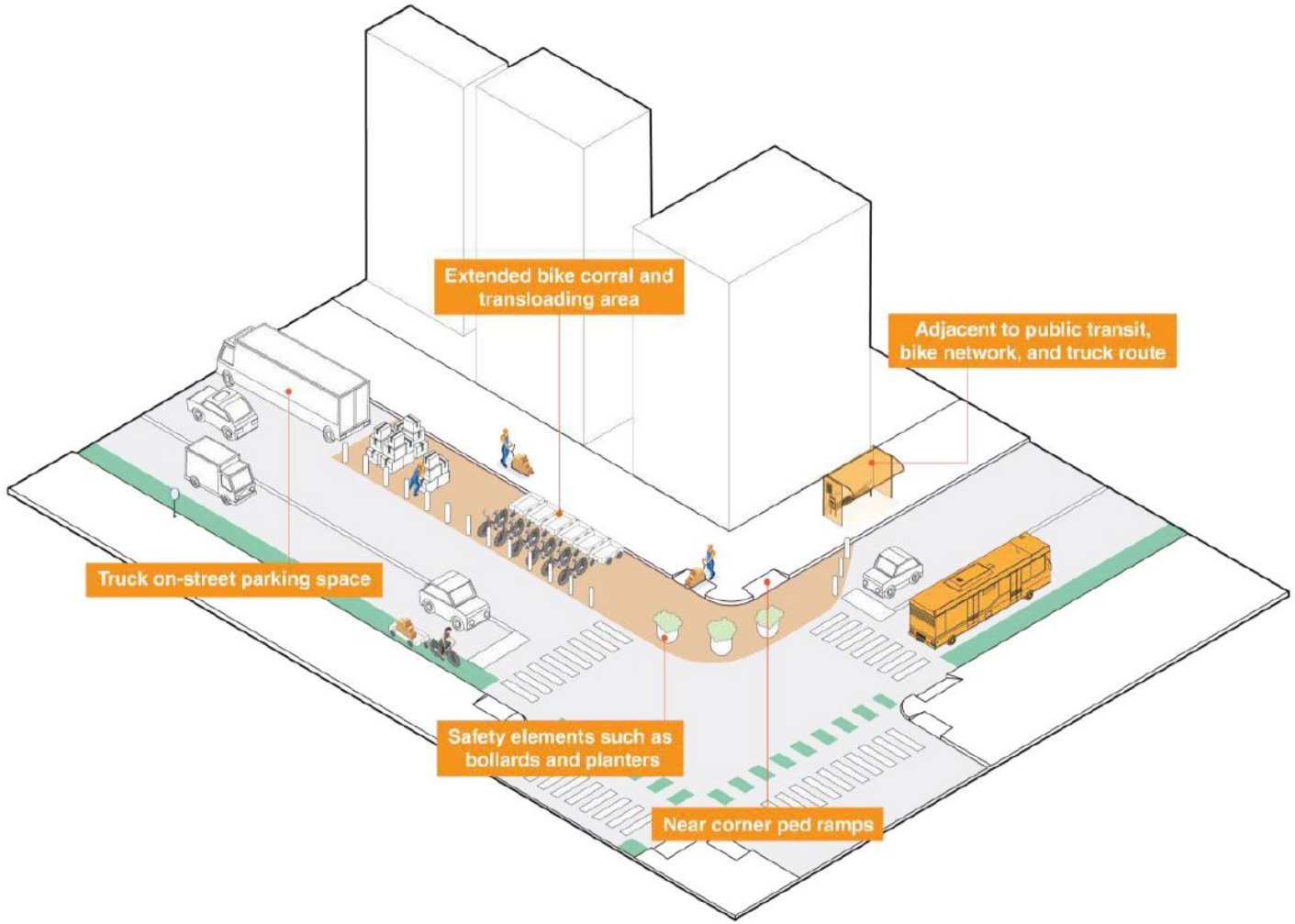


Box truck-to-EV van/sprinter van

Curbside box truck-to-handcart

What is a Microhub?

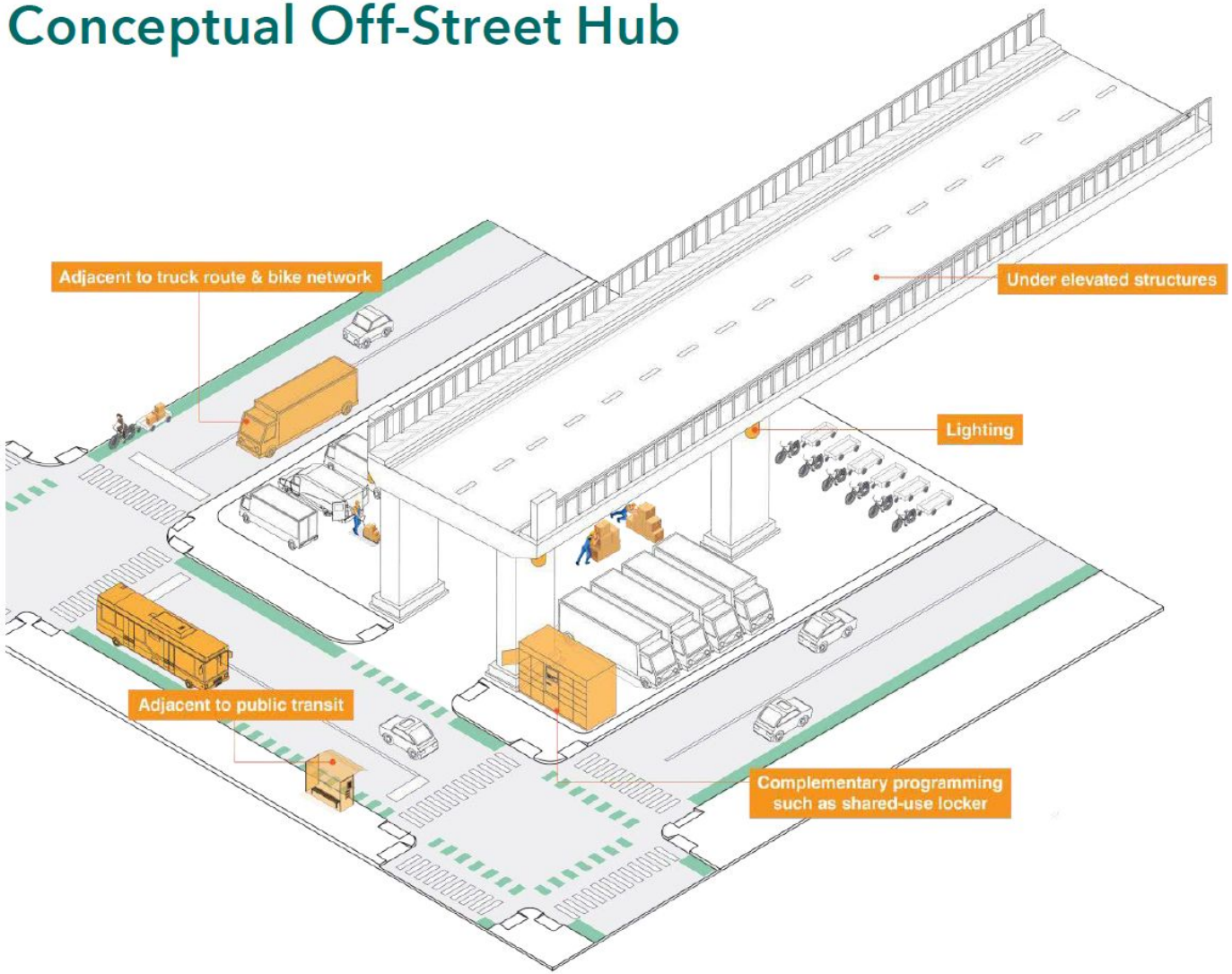
Conceptual On-Street Hub



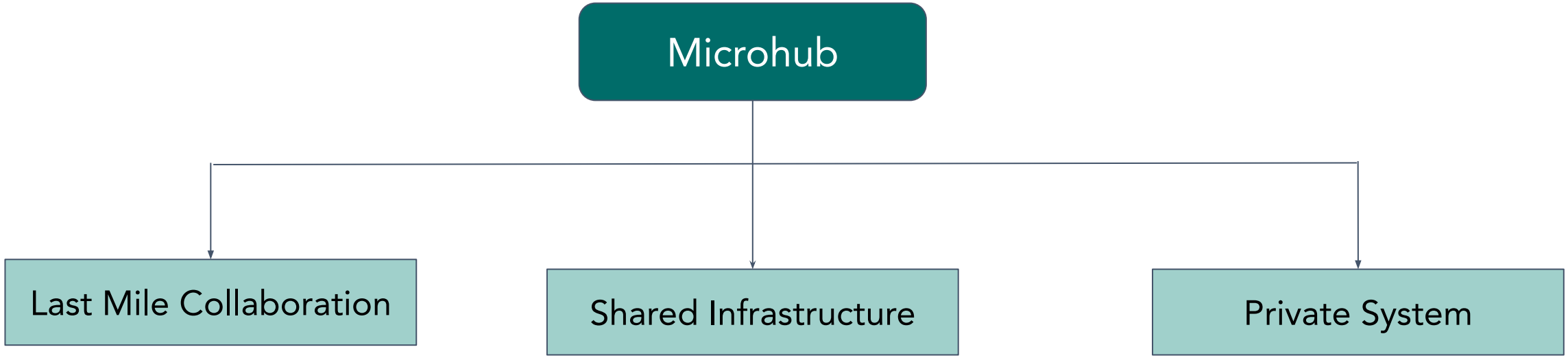
- 80 – 100 feet in length
- Regulatory signage and/or other markings designating it as a microhub
- Transloading space for package sorting and transfer to electric vehicles, bikes, and walkers
- (Cargo) bike corrals
- Upgraded safety barriers (flexible delineators, bollards, planters, etc.)

What is a Microhub?

Conceptual Off-Street Hub



- Variation in size based on site location
- Vehicle and goods storage
- Vehicle repair/maintenance
- Transloading space for package sorting and transfer to electric vehicles, bikes, and walkers
- Weather protection and lighting
- Opportunities for additional amenities and programming



Receiver-led collaboration

3rd party logistics companies;

Government supported logistics hotels or staging areas

Single carrier logistics facility

San Francisco County Transportation Authority

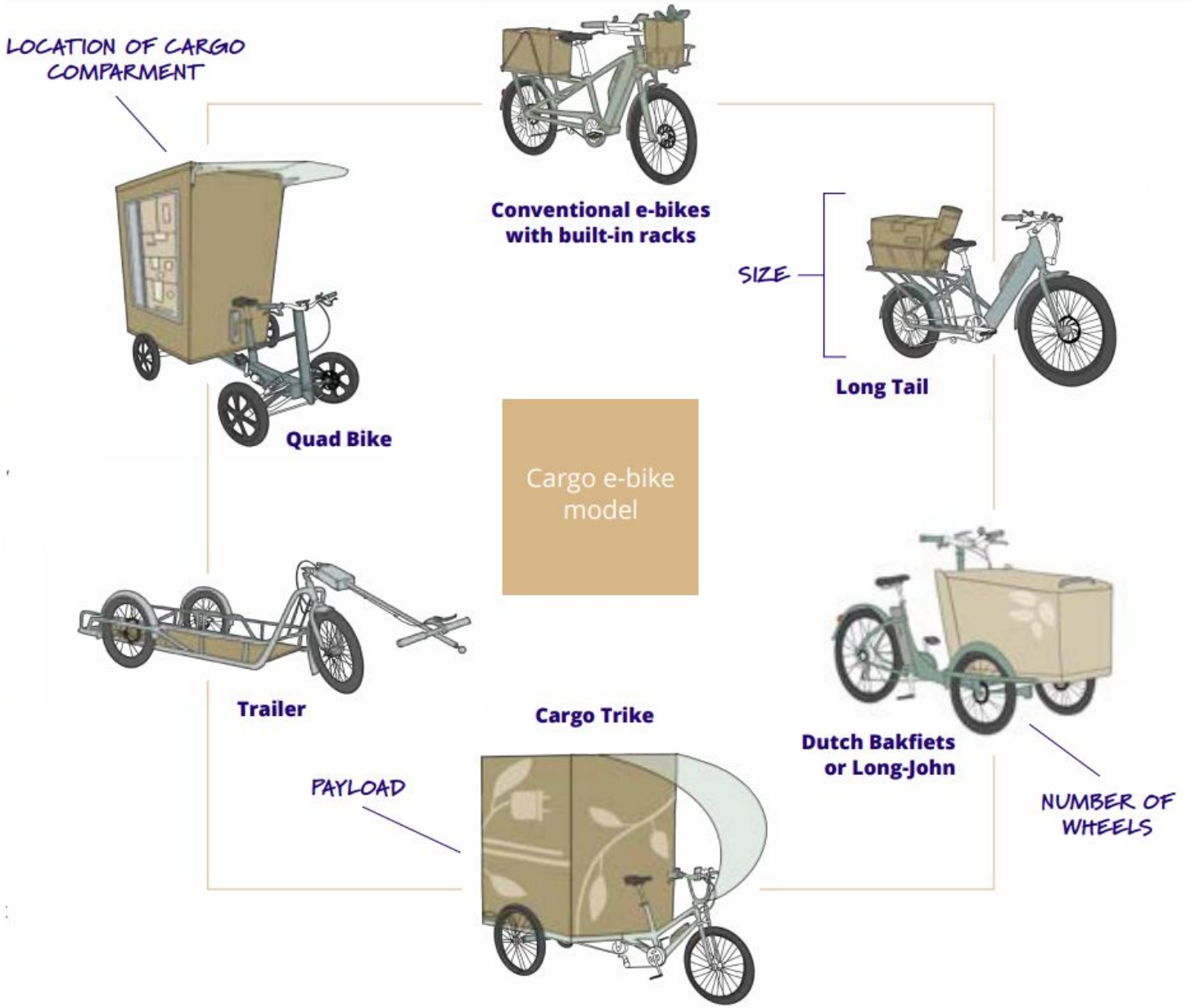
Key Questions: What would it take for you to participate in a Microhub Pilot?

- Could you see your business using a microhub? How?
- What types of vehicles should be accommodated?
- Indoor vs. Outdoor?
- What other features or design considerations will be important?
- Where should a microhub be located?
- What implementation challenges do you see?

Vehicle Types?

Electric Van

Handcart



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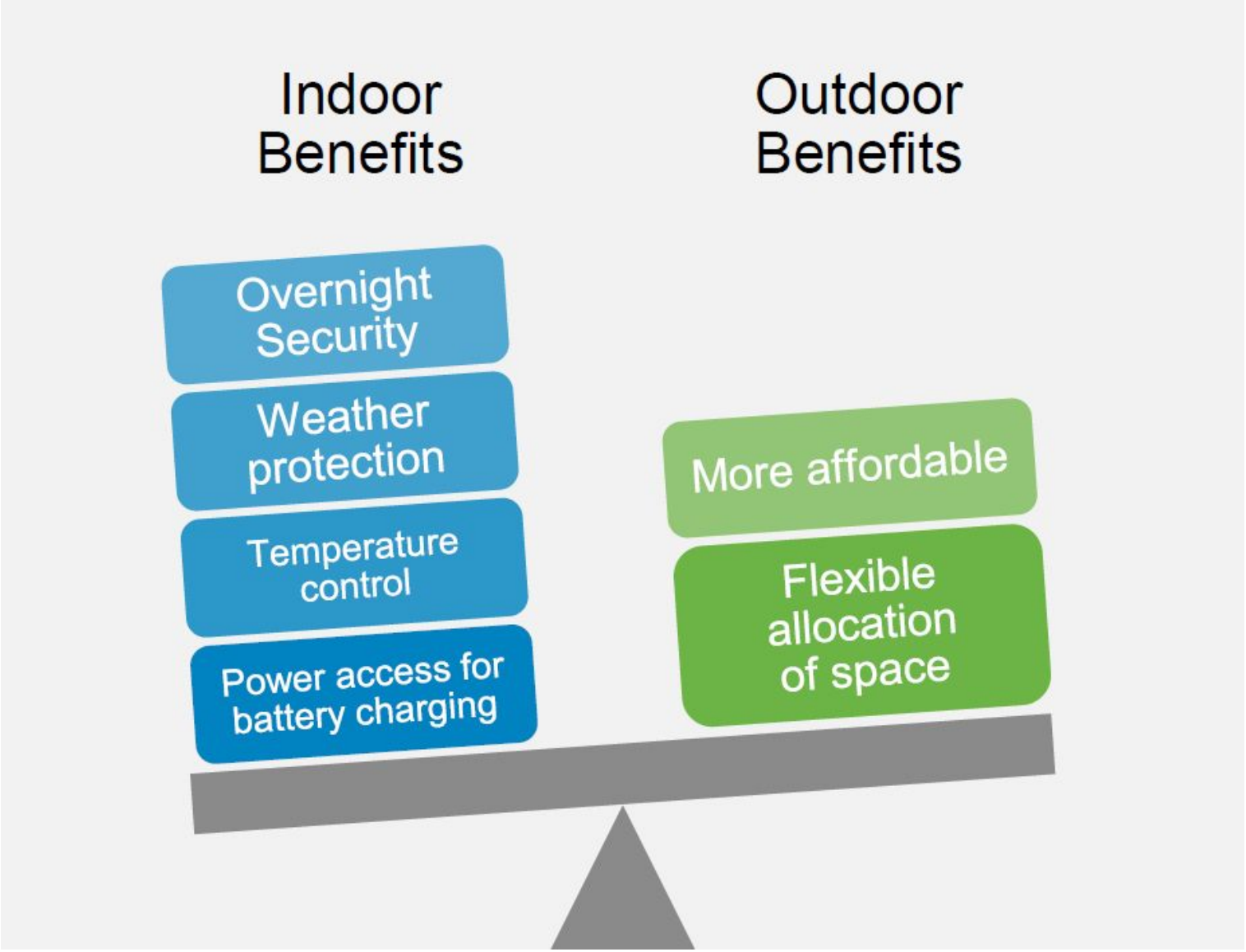
Site Selection

- Relevance
- Suitability
- Feasibility



Potential Challenges

- High cost of space
- Limited availability of dedicated parking
- Conflicts with other street and sidewalk users
- Bike lanes too narrow to accommodate wider cargo bikes
- Bathroom access for workers

How important is:

- Good lighting infrastructure
- On-site storage
  - What needs to be stored?
- Hours of operation
- Trade secret challenges to shared facility
- Bathroom access for workers

Draft Goal Alignment:

Microhub Consolidation Center

Public Safety	Transit First	Sustainability	Congestion	Accountability
				
Reduction in double parking	Supports transition of trips from vehicles to smaller vehicles	Supports transition of trips from vehicles to smaller vehicles	Supports smaller vehicles	

Supply Chain	Regulatory Clarity	Accessible Curb	Cost	Driver Safety	Public health	Disaster Resilience
						
Increased flexibility and complexity			Increases worker efficiency, reduced fuel costs, potential to add steps to delivery process	Opportunity for programming, amenities, lighting	Reduction in noise, pollutants within EPC	

Next Steps

- Focused meetings on additional strategies
  - Off-hours delivery program
  - EV-preferential loading spaces
  - Battery charging lockers for e-bikes
- Final Report which documents promising strategies
- Develop and implement a pilot or demonstration project for promising strategies

Thank you.

sfcta.org/projects/eco-friendly-downtown-delivery-study

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Microhub Pilot

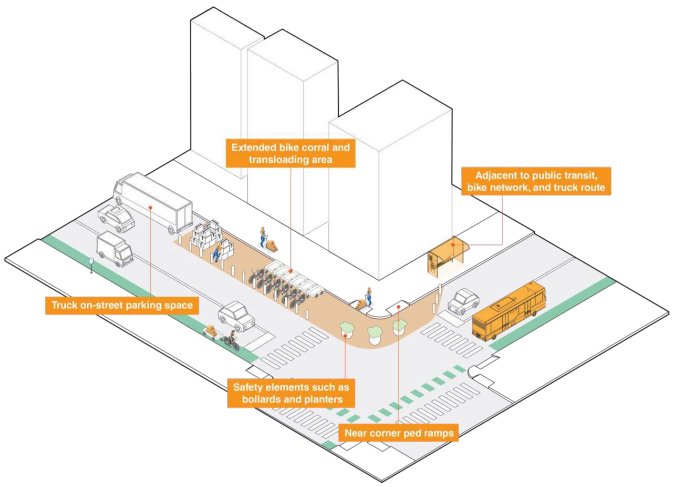
IN BRIEF

A microhub is a space located within the public or private right-of-way where goods are transloaded from larger freight vehicles to smaller electric vehicles or human powered modes (e.g., cargo cycles, hand carts, golf carts) for final delivery. A complimentary or stand-alone treatment option is to make curb modifications throughout downtown which better accommodate cargo bicycles without providing a microhub for parcel transloading.

WHY?

Current goods distribution methods cause double parking and circling in large, loud, polluting vehicles. This has congestion, safety, and public health impacts. Microhubs could make it easier and more cost effective to complete deliveries by sustainable modes.

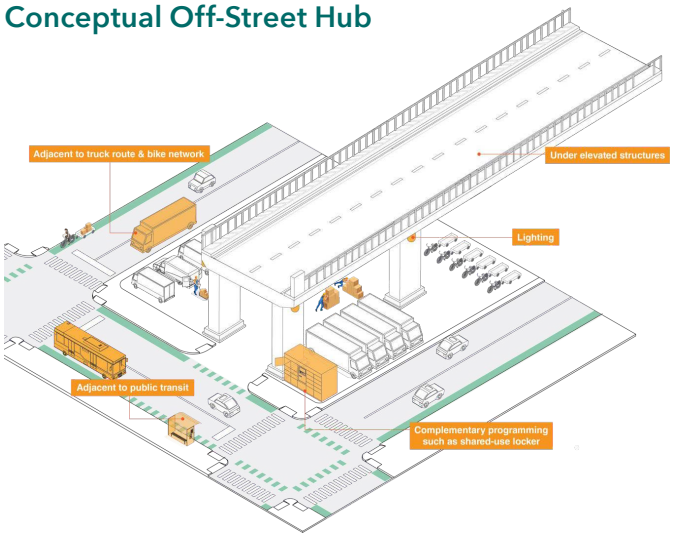
Conceptual On-Street Hub



On-Street Hub Features

- 80 – 100 feet in length
- Regulatory signage and/or other markings designating it as a microhub
- Transloading space for package sorting and transfer to electric vehicles, bikes, and walkers
- (Cargo) bike corrals
- Upgraded safety barriers (flexible delineators, bollards, planters, etc.)

Conceptual Off-Street Hub



Off-Street Hub Features

- Variation in size based on site location
- Vehicle and goods storage
- Vehicle repair/maintenance
- Transloading space for package sorting and transfer to electric vehicles, bikes, and walkers
- Weather protection and lighting
- Opportunities for additional amenities and programming

Images in this paper are included for illustrative purposes only and do not reflect final microhub design.
All images in this paper originally appear in NYC DOT 2023 Microhubs Pilot Report: www.nyc.gov/html/dot/downloads/pdf/microhubs-pilot-report.pdf

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ECO-FRIENDLY DOWNTOWN DELIVERIES STUDY

Microhub Pilot

Typical Logistics Process

Supplier
Inbounds goods are delivered to the nearest warehouse.

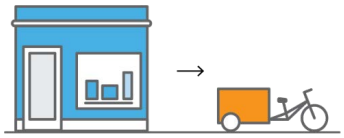
Warehouse
Inventory is stored before customer orders are received.

Fulfillment Center
Once an order is placed, goods are moved to the fulfillment center for sorting and packing.

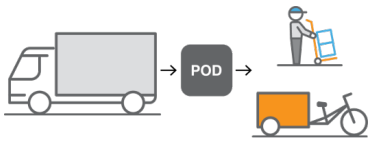
Carrier
Parcels are given to a carrier to be delivered to customers.

The microhubs pilot focuses on the last leg of the process, the movement of goods from a local distribution point to a final receiver.

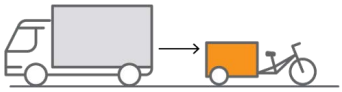
Microhubs have a variety of models to complement multiple programs:



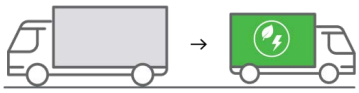
On-demand delivery/retail distribution



Truck-to-pod-to-cargo bike / handcart



Truck-to-bike/trailer



Box truck-to-EV van / sprinter van

Curbside box truck-to-handcart

WHO'S INVOLVED?

- SFMTA, SFPW (likely structure owner)
- Freight carriers, large and small
- Individual businesses

KEY QUESTIONS:

- What locations, or location characteristics would be good to test a microhub?
- What features or design considerations will be important?
- How could you see your business or representatives using a microhub?
- Preference for indoor vs outdoor facility?
- Does the facility need to be open 24/7 or are limited hours more appropriate? What hours?
- What types of vehicles should be planned for?
- What challenges do you see for implementation?
- What does success look like? How can we evaluate the pilot program?
- After this discussion, any adjustments to our Draft Goal Alignment?

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GOAL ALIGNMENT

GOAL	POTENTIAL TO ADVANCE GOAL	NOTES
Public Safety	↑	Reduction in double parking
Transit First	↑↑	Supports transition of trips from vehicles to smaller vehicles
Sustainability	↑↑	Supports transition of trips from vehicles to smaller vehicles
Congestion	↑	Supports smaller vehicles
Accountability		
Supply Chain		Increased flexibility and complexity
Regulatory Clarity		
Accessible Curb		
Cost	↑	Increases worker efficiency, reduced fuel costs, potential to add steps to delivery process
Driver Safety	↑	Opportunity for programming, amenities, lighting
Public health	↑↑	Reduction in noise, pollutants within EPC
Disaster Resilience		

Off Hours Delivery Discussion - October 11th, 2024

Attended by:
Stephen Cornell, Polk Hardware Store, CAC of the MTA, Polk District merchants association
Lloyd Silverstein, Hayes Valley Merchants Council
Amy Cleary, GGRA: Golden Gate Restaurant Association
Quinta Chapman, Ground floor public affairs, (representing DoorDash)
Eric Rozell, TLCBD, tenderloin community benefit district

Key Takeaways:

- Off-hours deliveries are more feasible for some business types/industries than others.
    - For example, restaurants receive deliveries which need to be refrigerated. Alcohol deliveries cannot be left unattended. Evening hours may be "off-peak" for other industries, but is the busiest time for restaurants.
    - On the other hand, in the 80s San Francisco hardware store owners were able to organize getting deliveries earlier. Employees and the truck company loved the program, in part because it allowed trucks to get into/out of the city much faster without traffic.
    - Participants suggestions of types of businesses to work with
        - Grocery stores
        - Walgreens
        - Hardware stores
        - Bi-Rite food distributor
        - GreenLeaf food distributor
- Some sectors, especially small businesses need coordination/ support to organize or engage with carriers to shift delivery times
- Size and frequency of deliveries matter: More occasional, bulk deliveries are easier to shift than frequent, small deliveries
- Participants hoped that an off-hours delivery program could enable other kinds of beneficial street changes. Eg. the Hayes Valley Merchants Council: is interested in a one block permanent street closure but the problem is deliveries. Merchants may be more open to this idea if they know they could get deliveries off hours
- Participants noted a number of challenges to off-hours deliveries:
    - Noise in residential neighborhoods
    - Street cleaning in the mornings which could interfere with truck parking (need coordination with street-cleaning services)
    - Unhoused residents may block access to stores in early morning
    - Limited public transit options in off-hours make it difficult for employees to get to work early to receive deliveries

    - Additional cost of having an employee or delivery person come off hours to receive deliveries
    - Increased risk of internal theft
- Participants noted opportunities for city/county coordination:
    - Connecting small business with carriers
    - Delivery times and street cleaning
    - Enforcement of loading zones (i.e., vehicles parked in loading zones overnight)
- Participants suggested that incentive rates could be tied to the costs of keeping one employee available prior/past normal hours to receive the delivery.

Short summary of discussion:

Background:

An off-hours delivery program seeks to shift deliveries to off-peak times when traffic is less intense. A program could offer financial incentives, supportive curb changes, technical assistance for noise mitigation, or a trusted vendor or shipper program to businesses. Shifts in delivery times reduce congestion and double parking, decrease emissions due to faster deliveries, less idle time, and reduce conflicts with other road users. Potential benefits for carriers include more roadway and curb space, ease of parking, and lower delivery costs due to fewer parking tickets. Receivers get a consistent delivery time, and the opportunity to receive deliveries outside of business hous which could improve staff productivity or customer service. Overall, there would be reduced conflicts at the curb. However, off-hours delivers face challenges including staffing needs, unattended deliveries, coordination, and noise impacts.

Numerous off-hours delivery pilots have been run in Belgium, Brazil, France, the United Kingdom, and the United States. Manhattan partnered with the New York Department of Transportation (NY DOT) and piloted off-hour deliveries between 2009 and 2010 to 25 receivers and 8 carriers, providing financial incentives to carriers and receivers. The off-hours deliveries resulted in benefits like increased travel speeds, eliminated parking fines, and increased staff productivity. The program has expanded since 2010, with some participants continuing off-hours deliveries after incentives expired. New York has acquired funding to introduce a new incentive program.

Off-Hours Delivery System Business Types, Challenges, Opportunities

Stephen ran a hardware business and preferred off-hours deliveries. He recalled a time in 1988 in Rockland, California, where he experienced early truck deliveries, noting the benefits of a predictable delivery time and time saved.. However, these deliveries experienced multiple conflicts. These conflicts ranged from street cleaners to noise complaints from residents, and unhoused residents blocking entrances. Hiring employees to arrive at the designated time was an issue, with safety being the main concern. Due to the early hours, public transit was not readily

available, making the employee walk to work. Another solution was to provide delivery drivers with the keys so that employees did not have to be present nor did they have to travel.

Amy didn't see much promise in off-hours deliveries for restaurants. One challenge for restaurants was deliveries later in the day. The staff could not deal with the packages since evening is their peak service hours/busiest part of the day. Deliveries earlier in the day would require a dedicated staff member, running into the issue of additional payments and the possibility of theft. Unattended deliveries would not be possible given the nature of restaurant goods. They consist of perishable items that must be checked and refrigerated and alcohol cannot be left unattended. The bigger problem would be controlling when trucks will arrive. Restaurants do not have a say since they do not own the delivery vehicles. These trucks deliver to multiple places, needing multiple restaurants to band together to justify changes to the distributor.

Lloyd was excited about the pilot idea. He focused on how contentious shared streets were, and for a pedestrian-friendly corridor to occur, parking and curb management must come first. His concerns relating to deliveries were the double parking caused by delivery vans and how they affected transportation. He shared that businesses in Hayes Valley were open to off-hours deliveries since most were not open until 11 am. Lloyd emphasized street closures. Currently, the area does partial closures but most merchants would be open to permanently closing streets if they knew they could get their deliveries.

Stephen reinforced concerns regarding unattended deliveries. While Stephen could dictate to a certain extent when interacting with their main carriers, groups like UPS, FedEx, and others are entirely independent of them, allowing them to do as they please. Various carriers were problematic for unattended and heavy deliveries, bringing in challenges like the necessity of a dedicated employee and the possibility of theft..

Coordination, enforcement, incentives

Amy suggested contacting Greenleaf and BuyRight to discuss the pilot. Lloyd noted that delivery drivers get harassed due to double parking, but all the parking spaces are available during a full street closure, allowing for quick deliveries. Amy brought up doordash. She said that deliveries that go straight to the customer through mopeds and electric bikes are be important to restaurants. They will increase the importance of parking, which should be easier than truck deliveries.

Stephen noted the issue of enforcement in yellow zones and delivery drivers. While yellow zones are open to commercial vehicles and trucks, contractors and workers will leave their trucks there for hours and even all day, blocking off the zone for everyone else. He said SFMTA will often give them the pass, demonstrating a lack of policing and continued blockage of the zone. In addition to blocked yellow zones, popular restaurants create congestion through delivery drivers. While they may vary in vehicle, ranging from mopeds to automobiles, they never get ticketed.

Amy reinforced her point in hiring dedicated staff to manage the early deliveries. She maintains the aforementioned concerns and the challenges of commuting at such an early time

due to safety reasons and the lack of public transportation. However, the biggest challenge would be the expenses associated with hiring a dedicated staffer. She suggested an incentive should be the assistance in hiring and paying a dedicated staff member.

Stephen stated that businesses that deal with large deliveries would benefit from off-hours deliveries the most. Restaurants get multiple kinds and types of deliveries, coordinating for them to arrive at a specific time. He believed Walgreens would be a good company to talk to since they deal with large deliveries. A notable observation he had was from an Ace Truck Driver delivering in Chinatown since the streets were narrow and hard to maneuver. However, through communal effort and communication, everyone would get out of the way and make it work.

Eco-friendly Downtown Deliveries Study

Off-Hours Deliveries Program

San Francisco
County Transportation
Authority

October 11, 2024

Agenda

- **Welcome and Introductions**
- **Off-Hours Basics**
  - What is an off-hours delivery program?
  - Potential benefits
  - Potential challenges
  - NYC Case Study
- **Key Questions**
- **Revisit Goal Alignment**

What is an off-hours delivery program (OHD)?

Freight deliveries create congestion, emissions, and safety risks to pedestrians, cyclists, and others. These challenges are exacerbated when trucks operate during the busiest times of day.

An off-hours deliveries program could seek to shift deliveries to off-peak hours by:

- Providing financial incentives to businesses to encourage OHD
- Adjusting curb access regulations to support OHD
- Providing technical assistance, e.g., noise mitigation technology research/procurement, OHD training programs
- Publicly recognizing participating firms or Business Improvement Districts
- Establishing a “Trusted Shipper” program

What are the benefits of OHD for ***carriers***?

- More efficient deliveries and predictable delivery windows
- Improved truck utilization

- Easier to find parking

- Fuel savings and reduced delivery costs

Anything missing?

What are the benefits of OHD for *receivers*?

- Consistent delivery arrival time

- Improved staff productivity

- Improved customer service

- Makes sidewalk space more available for businesses and pedestrians

Anything missing?

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What are the benefits of OHD for the public?

- Reduces conflicts with pedestrians and cyclists

- Reduces traffic congestion

- Reduces emissions

- Reduces conflicting demand for curb space among delivery and other uses

Anything missing?

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Challenges

- Rescheduling work shifts or facilitating unattended deliveries
- Stipulations in lease agreements
- Coordination between carriers and receivers
- Noise impacts
- OHD programs could require ongoing financial incentives from public sector
- Others we anticipate in SF?

OHD in practice – Case Study of NYC

- OHD has been piloted in cities in Europe, South America, and US
- Pilot in Manhattan, Oct 2009 - Jan 2010
  - 25 receivers (retail, food stores, restaurants) and 8 carriers participated for at least one month
  - Participants received financial incentives
  - Deliveries occurred from 7 pm to 6 am
  - NYSDOT facilitated unassisted delivery systems

Making a day-time delivery on 3rd Avenue at 39th Street in Manhattan.


Making an off-hour delivery at the same location on 3rd Avenue and 39th Street.

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OHD in practice – Case Study of NYC

- Results
  - Increased travel speeds
  - Decreased service times
    - 25 min per delivery off-hours vs. 1+ hour per delivery from 7am - 4 pm
  - No parking fines reported
  - Drivers overwhelmingly supported the program
  - Restaurant receivers also saw benefits from the program

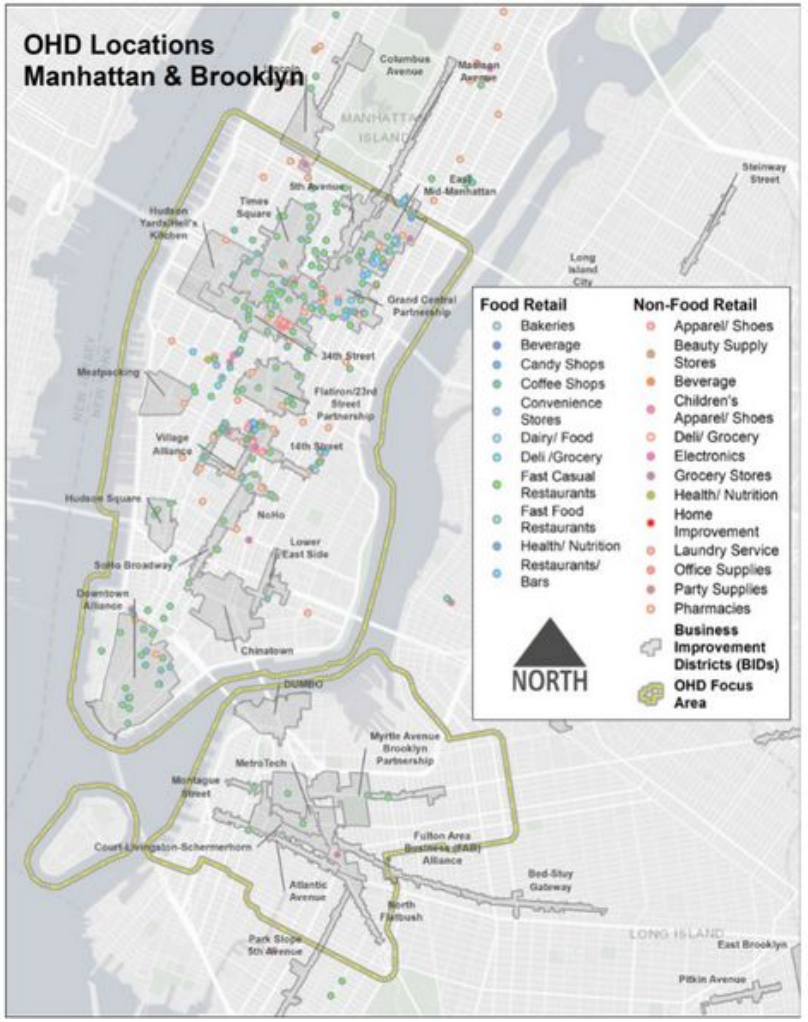
Customer to Customer Median Speeds (in m.p.h.) in Manhattan by Time Of Day

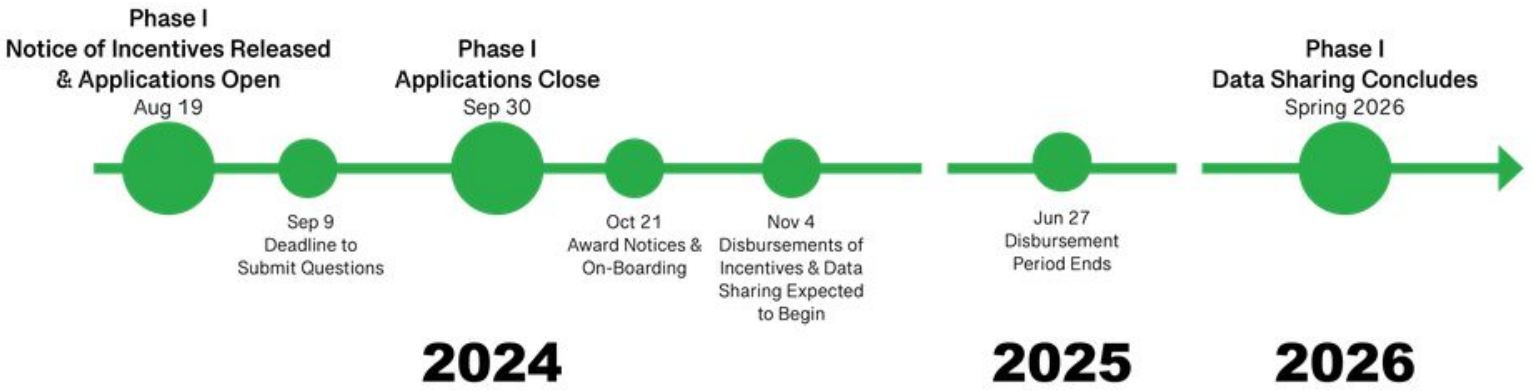
Time of Day	Speed	% Change in Speed Compared to Off-Hours
All Day (24 hours)	3.3	109%
AM Period (8 a.m. - 10 a.m.)	4.6	50%
MidDay Period (10 a.m. - 4 p.m.)	3.0	130%
PM Period (4 p.m. - 10 p.m.)	3.0	130%
Off-Hours (10 p.m. - 8 a.m.)*	6.9	-

Data collected from November 2009 - January 2010.
*Note: Peak traffic periods occur later and last longer in Manhattan compared to the rest of the city. Off-hours for Manhattan were found to occur from 10 p.m. - 8 a.m.

OHD in practice – Case Study of NYC

- Program has expanded since 2010
  - 2021: Secured funding for $6M Incentive Program
  - Added ~615 new OHD locations (total of over 1,000 citywide)
  - Planned for 2024: launch Incentive Program and Marketing Campaign, onboard program participants and distribute incentive funds





Evaluating

Receivers

WHAT TO MEASURE?	INDICATORS
☐ **Reliability**	☐ Percentage of on-time deliveries
☐ **Productivity**	☐ Average labor manpower hours used to receive deliveries
☐ **Visibility**	☐ Visibility level of obstruction to the display windows
☐ **Property damage**	☐ Property damage occurrence
☐ **Delivery errors**	☐ Frequency of delivery errors
☐ **Deliveries stolen**	☐ Frequency of deliveries stolen
☐ **Costs**	☐ Costs for participating in OHD
☐ **Benefits**	☐ Other benefits for participating in OHD

Carriers

WHAT TO MEASURE?	INDICATORS
☐ **Loading/unloading operations**	☐ Average loading/unloading times
☐ **Dwell times**	☐ Time spent looking for a suitable parking space
☐ **Parking fines**	☐ Number and cost of parking fines
☐ **Travel Time**	☐ Time to complete a route
☐ **Reliability**	☐ Percentage of deliveries made on tim
☐ **Truck safety**	☐ Number of truck accidents
☐ **Fuel consumption**	☐ Average fuel usage (gallons)
☐ **Fuel costs**	☐ Average fuel costs ($)
☐ **Driver stress**	☐ Level of stress of drivers

Evaluating

Public

WHAT TO MEASURE?	INDICATORS
☐ **Public image**	☐ Effects of OHD on enhancing city's public image ☐ Perception of plazas and bikes lanes users
☐ **Total costs**	☐ Cost to support OHD programs
☐ **Safety**	☐ Number of accidents
☐ **Noise**	☐ Noise levels
☐ **Air quality**	☐ Emission levels
☐ **Congestion**	☐ Traffic congestion
☐ **Travel speed**	☐ Reliability ☐ Bus speeds

Key Questions: What would it take for you to participate in an off-hours delivery program?

- Could you see your business or businesses in your network shifting deliveries to off-peak hours?
- What locations, or location characteristics would be good for a targeted OHD program?
- Are there particular business types for whom OHD would have a particularly positive effect, either on the business or the street?
- How important will incentives be to business participation?
    - What do you think the incentive structure or amount should be?
- If you were to participate in OHD, what would the implications be for your staff?
- What does success look like? How should we evaluate a pilot program?

Draft Goal Alignment:

Off-Hours Delivery Program

Public Safety	Transit First	Sustainability	Congestion	Accountability
				
Reduced interactions with vulnerable road users		Reduced fuel consumption and increased truck utilization	Reduces truck traffic on city streets during congested hours	Improves understanding of loading activity and needs

Supply Chain	Regulatory Clarity	Accessible Curb	Cost	Driver Safety	Public health	Disaster Resilience
						
NYC experience suggests much faster deliveries	Potential for additional requirements and incentive structures	Provides better curb access and reduces circling	NYC experience suggests cost savings for many stakeholders; improves on-time deliveries; reduced likelihood of parking tickets		Reduction in idling, however potential for increased night-time noise	

Thank you.

sfcta.org/projects/eco-friendly-downtown-delivery-study

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San Francisco
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Authority

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Off-Hours Delivery (OHD) Pilot

Making a day-time delivery on 3rd Avenue at 39th Street in Manhattan.

Making an off-hour delivery at the same location on 3rd Avenue and 39th Street.

IN BRIEF

Freight deliveries create congestion, emissions, and safety risks to pedestrians, cyclists, and others. These challenges are exacerbated when trucks operate during the busiest times of day.

An off-hours deliveries (OHD) program could seek to shift deliveries to off-peak hours by:

- Providing financial incentives to businesses to encourage OHD
- Adjusting curb access regulations to support OHD
- Providing technical assistance and training programs for participants
- Publicly recognizing participating firms or Business Improvement Districts
- Establishing a "Trusted Shipper" program for participating carriers

WHY

When deliveries are made during the busiest hours, delivery vehicles contribute to congestion, carbon emissions, and create safety risks to pedestrians, cyclists, and others. Shifting deliveries to the times of day when traffic volumes are lowest can reduce these negative impacts, improve the economic efficiency of freight operations, and reduce conflicting demand for curb space among delivery and other uses.

San Francisco County Transportation Authority

ECO-FRIENDLY DOWNTOWN DELIVERIES STUDY

Off-Hours Delivery (OHD) Pilot

BENEFITS

What are the benefits of OHD for carriers?

- More efficient deliveries and predictable delivery windows
- Improved truck utilization
- Easier to find parking
- Fuel savings and reduced delivery costs

What are the benefits of OHD for receivers?

- Consistent delivery arrival time
- Improved staff productivity
- Improved customer service
- Makes sidewalk space more available for businesses and pedestrians

What are the benefits of OHD for the public?

- Reduces conflicts with pedestrians and cyclists
- Reduces traffic congestion
- Reduces emissions
- Reduces conflicting demand for curb space among delivery and other uses

CHALLENGES

Some challenges identified through OHD pilot demonstrations include:

- Needing to reschedule work shifts or facilitate unattended deliveries
- Stipulations in lease agreements only allowing deliveries at certain times of day
- Coordination between carriers and receivers
- Noise impacts
- OHD programs could require ongoing financial incentives for participants

WHO'S INVOLVED?

The three main stakeholder groups for off-hour deliveries are:

- **Shippers:** Produce or ship freight
- **Carriers:** Transport goods from their origin (the shipper) to the destination (the receiver)
- **Receivers:** Receive cargo that was shipped, including both intermediate and end destinations

The City of San Francisco also has a role to play in facilitating OHD by coordinating across stakeholders, providing technical assistance (e.g. education about noise mitigating technologies), and potentially by providing incentives for receivers.

KEY QUESTIONS:

- Do you receive deliveries during off hours now (7pm – 6am)?
  - » If not, why not?
- Could you see your business or businesses in your network shifting deliveries to off-peak hours?
- What locations, or location characteristics would be good for a targeted OHD program?
- Are there particular business types for whom OHD would have a positive effect, either on the business or the street?
- How important will incentives be to business participation?
  - » What do you think the incentive structure or amount should be?
- What are the implications for your workers?
- What does success look like? How should we evaluate the pilot program?
- Should we make any adjustments to our Draft Goal Alignment?

OHD in Practice – Case Study of NYC

The New York State DOT conducted a pilot in Manhattan between October 2009 and January 2010 with 25 receivers, including retail stores, food stores, and restaurants, and eight carriers. During the pilot, participants shifted deliveries to off-hours (7 pm to 6 am). Receivers were given a $2,000 incentive and carriers were given $300 per truck.

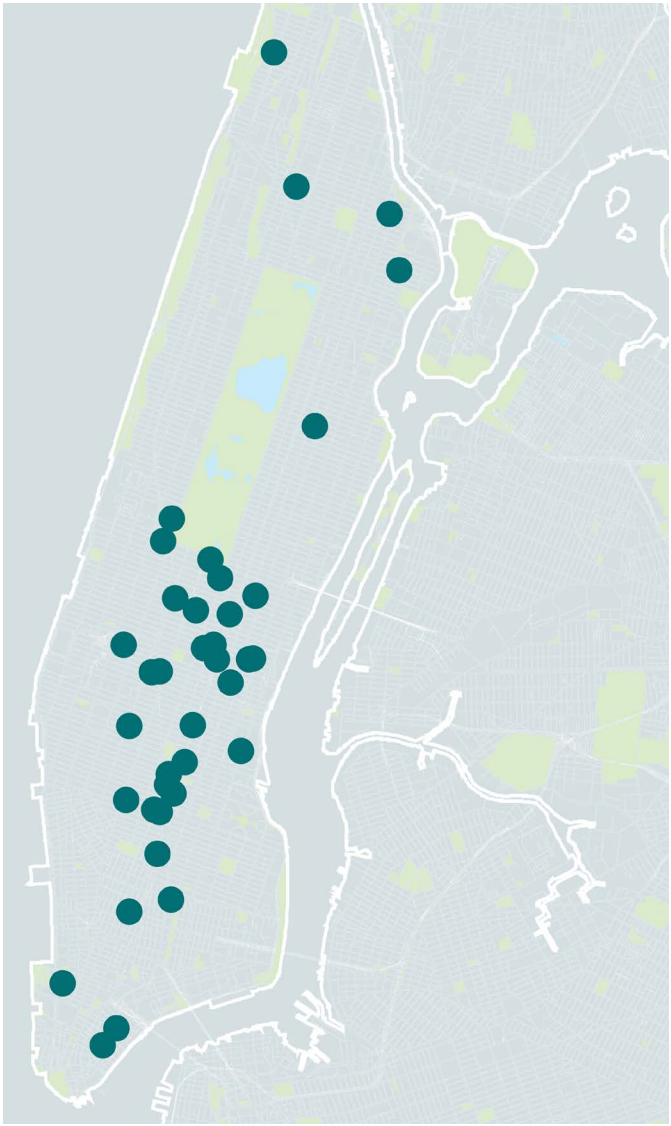
OHD can be either staffed or unassisted. For staffed OHD, receivers had staff stay late to receive deliveries off hours. For unassisted OHD, drivers were provided a key to a storage area or delivery locker, minimizing the evening staff needed by the receiving business. Other unassisted delivery systems could include double doors or container/ storage pods.

The results of the pilot were:

- **Increased travel speeds:** Speeds for trucks traveling between customers was almost twice as fast during off-hours compared to the mid-day or evening period.
- **Decreased service times:** Median service times in the off-hours were as low as 25 minutes for one delivery whereas median service times from 7 a.m.- 4 p.m. all exceed one hour for one delivery
- **No parking fines reported:** Before the pilot, trucks would frequently incur parking fines of up to $1,000 per truck.

Drivers overwhelmingly supported OHD, citing ease of delivery, reduced congestion, and lower stress levels. Restaurant receivers also preferred having products waiting for them in the morning rather than anticipating the arrival during the day. These receivers found that OHD improved staff productivity since food preparation was not delayed by late daytime deliveries. Several participants have considered maintaining or expanding OHD programs after the conclusion of the pilot, even without a financial incentive.

The OHD program in NYC has expanded since 2010, and now has over 1,000 OHD locations citywide, focused in Midtown, Lower Manhattan, and downtown areas of Brooklyn and Jamaica. In 2021, NYCDOT secured funding for a $6 million incentive program supporting OHD. The program officially launched in 2024 and will conclude in 2026.



Location of businesses that participated in the 2009 OHD pilot in Manhattan

Off-Hours Delivery (OHD) Pilot

GOAL ALIGNMENT

GOAL	POTENTIAL TO ADVANCE GOAL	NOTES
Public Safety	↑	Reduced interactions with vulnerable road users
Transit First		
Sustainability	↑	Reduced fuel consumption and increased truck utilization
Congestion	↑↑	Reduces truck traffic on city streets during congested hours
Accountability	↑	Improves understanding of loading activity and needs
Supply Chain	↑↑	NYC experience suggests much faster deliveries
Regulatory Clarity	↑	Potential for additional requirements and incentive structures
Accessible Curb	↑	Provides better curb access and reduces circling
Cost	↑	NYC experience suggests cost savings for many stakeholders; improves on-time deliveries; reduced likelihood of parking tickets
Driver Safety		
Public health	↑	Reduction in idling, however potential for increased night-time noise
Disaster Resilience		