



Legislative Background
BOS File No. 170599

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Name: Public Works, Police Codes - Prohibiting Autonomous Delivery Devices on Sidewalks and Right-of-Ways

Legislation Overview:

Ordinance amending the Public Works Code to prohibit the operation of autonomous delivery devices on sidewalks and right-of-ways within the jurisdiction of Public Works, amending the Police Code to provide for administrative, civil, or criminal penalties for unlawful operation of autonomous delivery devices; and affirming the Planning Department’s determination under the California Environmental Quality Act.

Sponsor(s): Yee
Date Introduced: 5/16/17
Date Referred: 5/23/17
Scheduled for BOS Committee:

Existing Law

There is no current law that addresses Autonomous Delivery Devices on sidewalks and right-of-ways.

Amendments to Current Law

Prohibit any person (natural person and businesses) from operating an Autonomous Delivery Device in or on any public sidewalk or right-of-way.
Autonomous Delivery Device would be categorized as a public nuisance.

Autonomous Delivery Device (ADD)

A motorized device used to transport items, products, or any other materials, and guided or controlled without a human operator sitting or standing upon and actively and physically controlling the movements of the device.

A.k.a. “robotic courier” or “robot”

In the News

- 9/20/16: [Starship robots try out deliveries on SF sidewalks](#)
- 4/12/17: [Marble debuts its autonomous food-delivery robots in partnership with Yelp](#)
- 4/12/17: [Delivery robots: a revolutionary step or sidewalk-clogging nightmare](#)
- 4/21/17: [Robots are now delivering food in San Francisco](#)
- 5/17/17: [Video: The Robot That's Roaming San Francisco's Streets to Deliver Food](#)

How the Autonomous Delivery Devices (“robots”) work

- Customers use a smartphone app to track the robot’s location: they receive an alert when the robot arrives and a code to unlock the compartment containing their purchase.
- Designed for autonomous operation, but Starship robots can be remotely controlled (1 human / 100 robots). During the present test phase, robots must be accompanied by a human at all times.
- Practical for short-distance deliveries; humans would focus on longer-distance deliveries.
- The robots use cameras and lasers to sense their surroundings.
- They can cross streets, but can’t climb stairs.
- Video: <https://www.wired.com/2017/04/crazy-hard-technical-challenges-robots-delivering-falafel/>

Background Information

- Until recently, no regulatory structure existed: the robots were neither legal nor illegal on the sidewalks.
- About 1 year ago, the Department of Public Works (DPW) approved a 1-day pilot program for Starship. Starship went through the permit process and was insured.
- After receiving additional inquiries/requests, the Director of DPW signed [Public Works Order No. 185922](#) on May 11, 2017, thereby establishing a pilot program for the permitting of delivery robots. Requirements include:
 - Application for Temporary Occupancy Permit
 - Scaled site plan depicting docking area (docking area must meet certain criteria)
 - Authorization from property owner (if a tenant or agent is the applicant)
 - Current and valid San Francisco business license
 - Valid Certificate of Insurance showing general liability coverage of at least \$1 million, naming City as additionally insured.
 - Evidence of public outreach. At a minimum, a notification must be posted a minimum of 72 hours prior to the proposed start date.
- The permit duration is limited to 14 consecutive calendar days, with a 14-day gap before issuance of a subsequent permit, and a maximum of 3 permits for the same permit holder and parcel.
- The program will end on December 31, 2017 or when legislation is passed to adopt regulations, whichever occurs earlier.
- At the moment, there is 1 permit issued to Marble (6/13/17-6/27/17) for a robot that is docked at Truly Mediterranean at 3109 16th Street (cross street: Valencia).

Arguments regarding the use of Autonomous Delivery Devices

Arguments in Favor	Arguments Against
<ul style="list-style-type: none"> • Reduces delivery costs by reducing reliance on human labor? • Environmental benefits? • Reduces congestion on street lanes? • Longer delivery hours (if permitted by law)? 	<ul style="list-style-type: none"> • Accessibility issues on narrow sidewalks? • Safety concerns? • Opens the door for Amazon?¹ • Privatization of the public right of way?² • Privacy issues from more cameras?

Other considerations

- Context: the City has had negative experiences with other technology companies (such as Uber) who were essentially unregulated in their ascendance and have created a set of new challenges on the streets of San Francisco. City government has encountered resistance as it tries to catch up by implementing regulations after an innovation has already taken hold. Given this experience, the City may wish to prohibit or control the rollout of robotic deliveries before it is commonplace and difficult to scale back.
 - Supervisor Yee: “It’s all about trying to get ahead of the curve before it gets out of hand. Basically when you give them space, you never get it back.”³
- Limitations
 - Accompanied by human chaperone for now. Eventually, there could be many robots with no chaperones.
 - Can’t climb stairs.
 - Not accessible to all (disabled may have trouble opening the heavy compartment door, for example).
- Which is a delivery robot more similar to?
 - Mobile pushcarts (recommended sidewalk width: 15 ft.)⁴ – allowed on sidewalks
 - Bikes, scooters or skateboards; Segway scooters⁵ -- not allowed on sidewalks
- States that allow delivery robots
 1. Virginia (February 2017): 50-lb. weight limit; 10-mph speed limit⁶
 2. Idaho (March 2017): 80-lb. weight limit⁷
 3. Wisconsin: 80-lb. weight limit; 10-mph speed limit⁸
 4. Pilot programs in Washington, D.C. and Redwood City, CA (restaurant food delivery using Starship’s 40-lb. robots)

¹ In 2012 Amazon bought robotics company Kiva Systems for nearly \$1B. <http://www.cnbc.com/2017/04/21/robots-are-now-delivering-food-in-san-francisco.html?view=story&%24DEVICE%24=mobile>

² <https://www.theguardian.com/technology/2017/apr/12/delivery-robots-doordash-yelp-sidewalk-problems>

³ <https://www.wired.com/2017/05/san-francisco-wants-ban-delivery-robots-squash-someones-toes/>

⁴ <http://sfpublicworks.org/services/permits/mobile-food-facilities>

⁵ In 2002, the Board of Supervisors banned Segways from sidewalks. See <http://sfbos.org/banning-segways-sidewalks>

⁶ <https://www.engadget.com/2017/03/02/virginia-is-the-first-state-to-legalize-delivery-robots/>

⁷ <https://www.recode.net/2017/3/27/15075048/idaho-unmanned-robots-law-delivery-starship>

⁸ <https://www.usnews.com/news/best-states/wisconsin/articles/2017-05-10/assembly-set-to-vote-on-robot-delivery-bill>

Policy Options

a. Research and Development (R&D) phase

b. Post-R&D

Option 1: Recommend that SF prohibit Automatic Delivery Devices (ADDs).

1a. Prohibit R&D in the early stages. R&D would occur in other cities. Reconsider allowance of ADDs after technology has matured.

1b. Prohibit ADDs altogether.

Option 2: Recommend that SF allow ADDs.

2a. Allow some/all stages of R&D.

2b. Allow ADDs.

Option 3: Recommend that SF allow ADDs under certain conditions.

3a. Allow some/all stages of R&D.

3b. Allow ADDs under specified conditions.

Possible conditions:

- Limit the size of robots.
 - Width limit to ensure that humans can pass by on the sidewalk.
 - Height minimum to reduce tripping hazards. Height maximum to ensure that humans can see over and behind the robot.
 - See photos on next page for photos of two robot models that could be used in San Francisco. The Marble robot is significantly larger than that of Starship.
- Limit the weight of a robot if it is to operate autonomously (no limit or a different limit for a human-accompanied robot).
 - May address some public safety concerns related to collisions with humans and flying projectile if a robot is struck by an automobile.
 - A heavier or larger robot could be practical for grocery or larger load deliveries, with a human chaperone to prevent safety hazards.
- Limits hours of operation.
 - May be indirectly limited already by the business' hours of operation.
- Require adherence to all laws that apply to cars/pedestrians.
- Display contact information prominently, in case someone needs to report a malfunction, accident, etc.

Enforcement

- Criminal penalty: misdemeanor for each trip; fine not more than \$1k and/or imprisonment in County Jail for up to 6 months.
- Civil penalty
 - Injunction to restrain or summary abatement to cause the correction or abatement of the violation (and assessment and recovery of a civil penalty and reasonable attorney’s fees).
 - \$0-\$500/day for each day of violation.
- Administrative penalty: \$0-\$1,000/day for each violation.

Community Input

- Support legislation: Walk SF.
 - “The sidewalks are for walking. That’s why they’re called side walks,” says Cathy DeLuca, interim executive director of Walk SF, which strongly supports Yee’s legislation. “I don’t think it’s asking too much to examine our public spaces and what we want to use them for.”⁹
- The SF Chamber of Commerce has expressed opposition.

Photos:



(Source: <https://sf.eater.com/2017/4/12/15274476/robots-yelp-cat24-san-francisco>)

⁹ <https://www.citylab.com/tech/2017/05/san-francisco-to-delivery-robots-get-off-the-damn-sidewalk/527460/>