

Fantasmō

Self-Updating 3D Map of the World

Overview | Q2 2019



A dark blue background featuring a faint watermark of aerial surveying equipment, including a camera mounted on a tripod, resting on the roof of a vehicle. The equipment is angled downwards towards the ground.

Billions of dollars are being sunk into 3D mapping

Scaling map coverage is slow and expensive

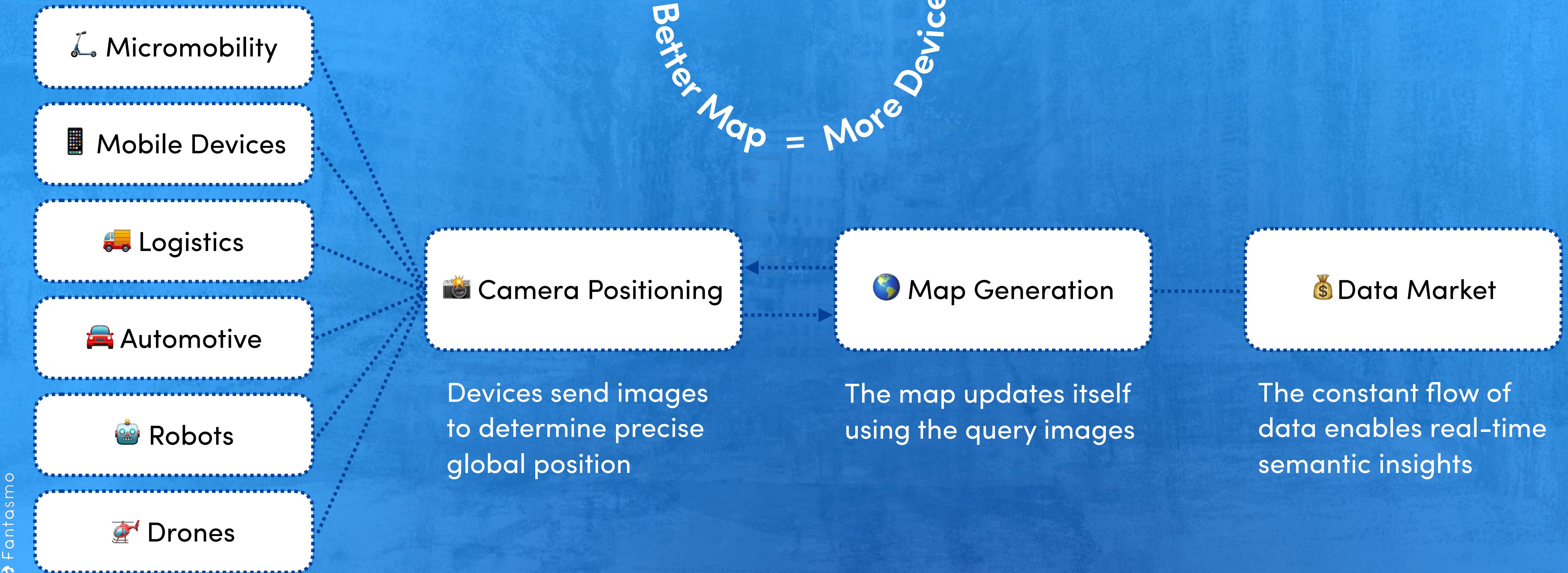
Keeping maps up to date is even harder

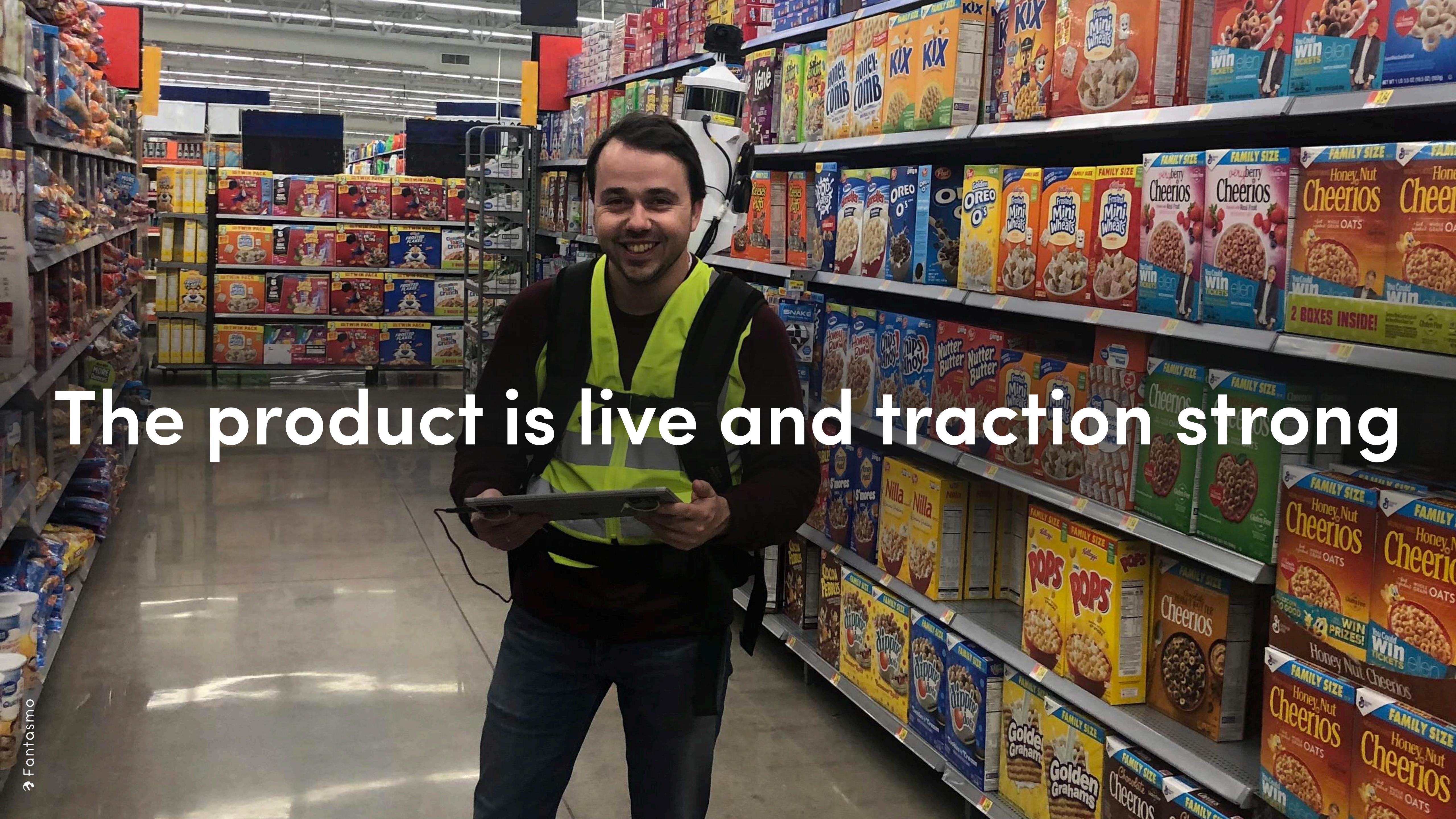


Fantasmo provides scalable, cost-effective 3D mapping and precise positioning:

- Hyper-accurate positioning – 10x better than GPS
- Works where GPS does not – cities and indoors
- Zero infrastructure – no satellites or beacons
- Self-updating – no need to remap

Fantasma Is Creating a Network Effect



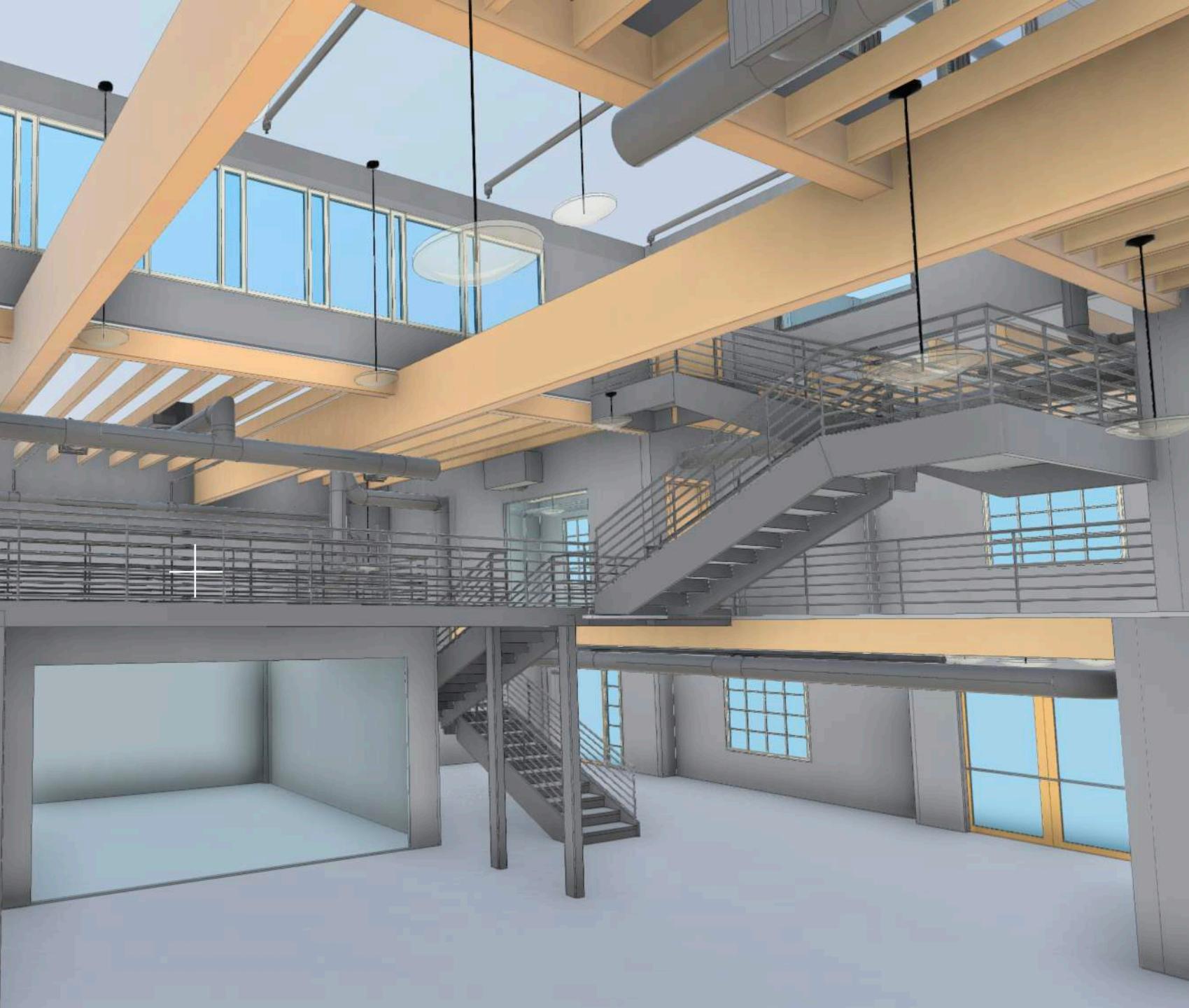


The product is live and traction strong

🏡 CRE Tech

Pain: Need as-built 3D BIM models fast

With Fantasmo: Quick, inexpensive mapping and 3D BIM conversion



😎 Smart Glasses

Pain: No solution for indoor maps & nav

With Fantasmo: Centimeter-level positioning and 2D-annotated floor plans

🤖 Robotics

Pain: Costly and slow to scale mapping

With Fantasmo: 50% cost and 75% time reduction



A photograph showing the lower halves of two people riding electric scooters. On the left, a woman in a white t-shirt, pink shorts, and white sneakers is captured mid-stride, her right leg lifted. On the right, a man in a blue plaid shirt, light blue jeans, and brown boots is also in motion. They are both riding black electric scooters. The ground beneath them is a large, semi-transparent pink circle with a grid pattern, centered on a grey paved surface. In the background, there's a modern building with large glass windows.

We found the most urgent need for our tech

As it develops rules of the road, L.A. County considers a voluntary ban on scooters

By MATT STILES JAN 11, 2019 | 4:30 PM



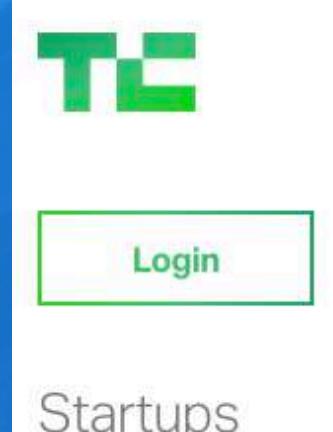
Madrid authorities order Lime, Wind and Voi to halt e-scooter sharing in the Spanish city

Micromobility Operators Urgently Need to Improve Tracking & Control of Their Fleets

stuff ≡

business

The company has also been in talks about adding cameras to their scooters and bikes, for safety, as a deterrent for vandalism and to provide greater accuracy in tracking scooters for recharging.



[Update: Lime's VP of Global Expansion Caen Contee says that the personal vehicle rental giant has been looking at Fantasmo and researching similar technology. He provided this statement: "We believe that mapping, 3D-imaging, and AR are amazing tech levers to drive scooter behavior change in a scalable, low-infrastructure way. We have been investing in this area among others in our quest to create the best urban mobility experience." That means we might see cameras on Lime scooters and bikes at some point.]



Health » Food | Fitness | Wellness | Parenting | Live Longer

Live TV • U.S. Edition

That electric scooter might be fun. It also might be deadly

Micromobility

Pain Points

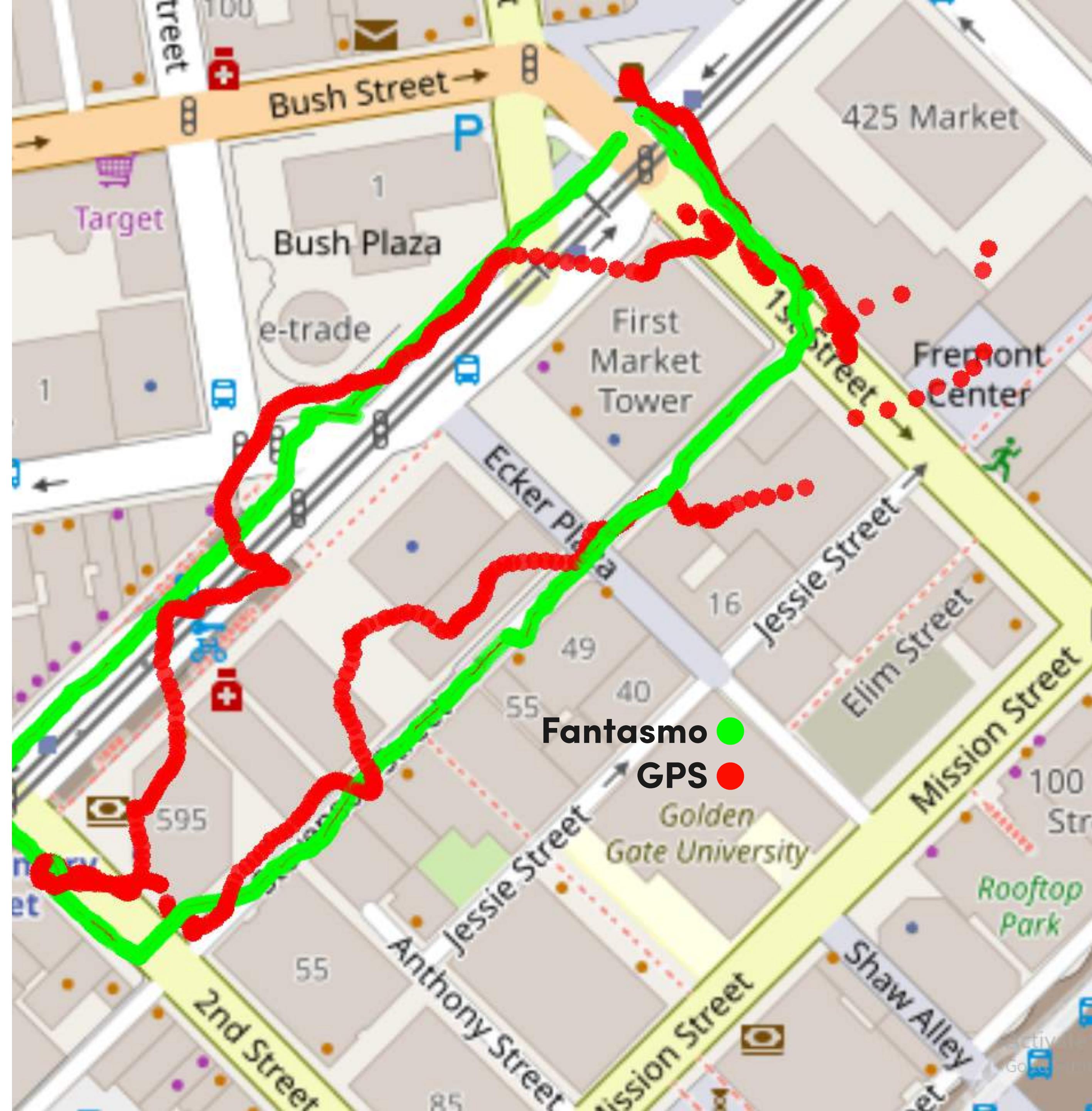
- Riders can't find vehicles
- Chargers can't find vehicles
- Vehicles are vandalized and stolen
- Riders break local laws (e.g.,  sidewalks)
- Rider and pedestrian safety

With Fantasmo

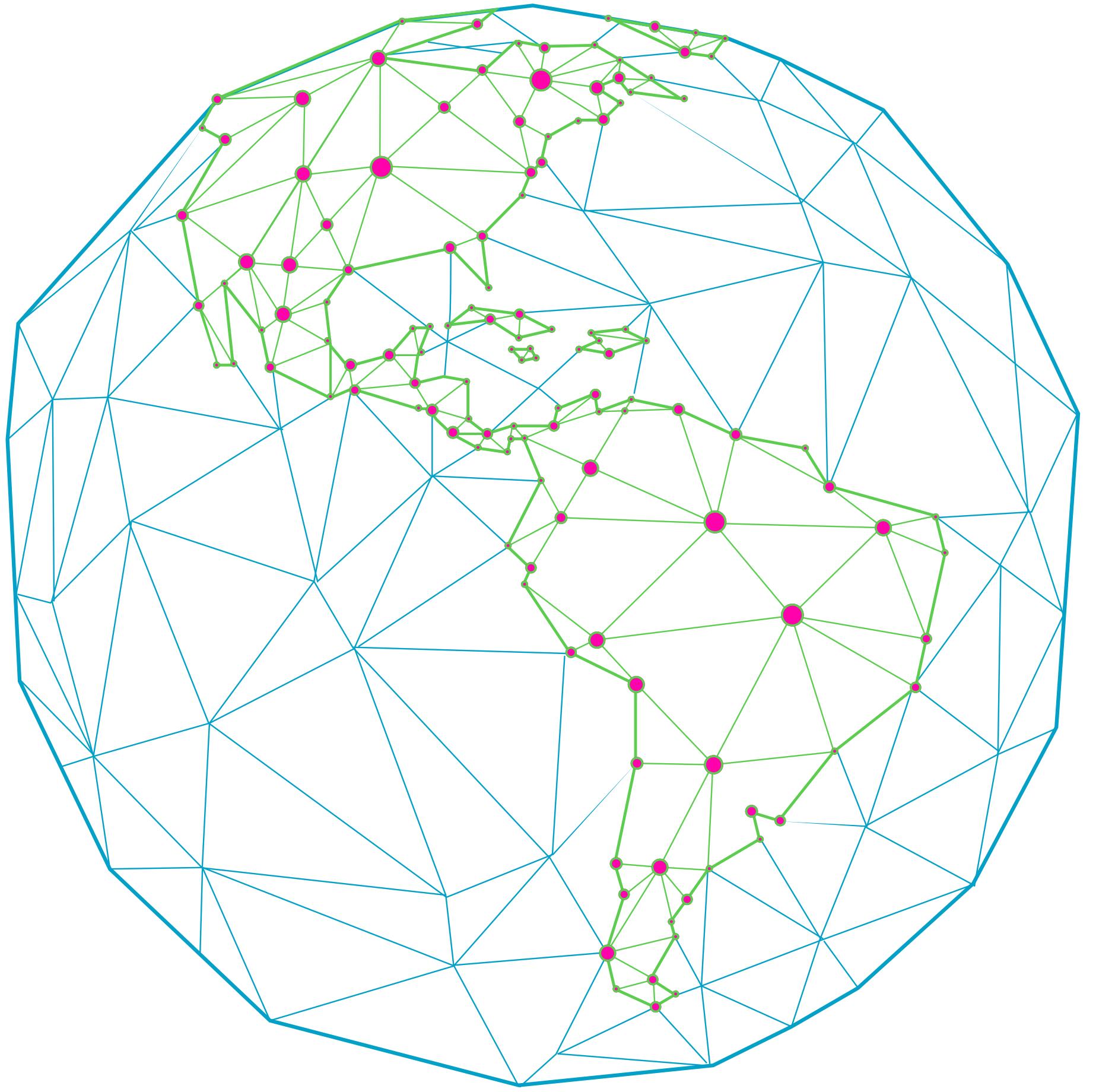
- Increased ridership
- Decreased operational expenses
- Increased vehicle lifetime
- Improved compliance with local laws
- Improved safety

Traction

- Paid pilot with a top player
- Pipeline of interested companies



Micromobility Is Exploding



💰 \$5.7B invested since 2015

| | | |
|------|---------|---------|
| Jump | Donkey | Scoot |
| Lyft | Movo | Koko |
| Spin | Cabcar | Wind |
| Bird | Cabify | Tier |
| Lime | Taxir | Mobike |
| Voi | Mygo | Acciona |
| Skip | Ari | Eskay |
| Grin | Alma | Taxify |
| Hopr | Motit4u | Ufo |

Micromobility Is Just the Start

Today



Micromobility (now)



Logistics (6-24 months)



Automotive (1-5 years)



Robotics (1-5 years)



Drones (3-7 years)

- Increased efficiency
 - Fleet monitoring
- Precise positioning
 - Self-updating HD maps

- Precise positioning
- Navigation
- Environmental awareness

2024

Phase 1: Prove Tech ✓

- Map generation from 2D Images
- Map generation from lidar
- Precise camera positioning



Phase 2: Get Paid to Scale Data

- Integrate directly with micromobility vehicles
- Map major metros
- Plug and play camera module

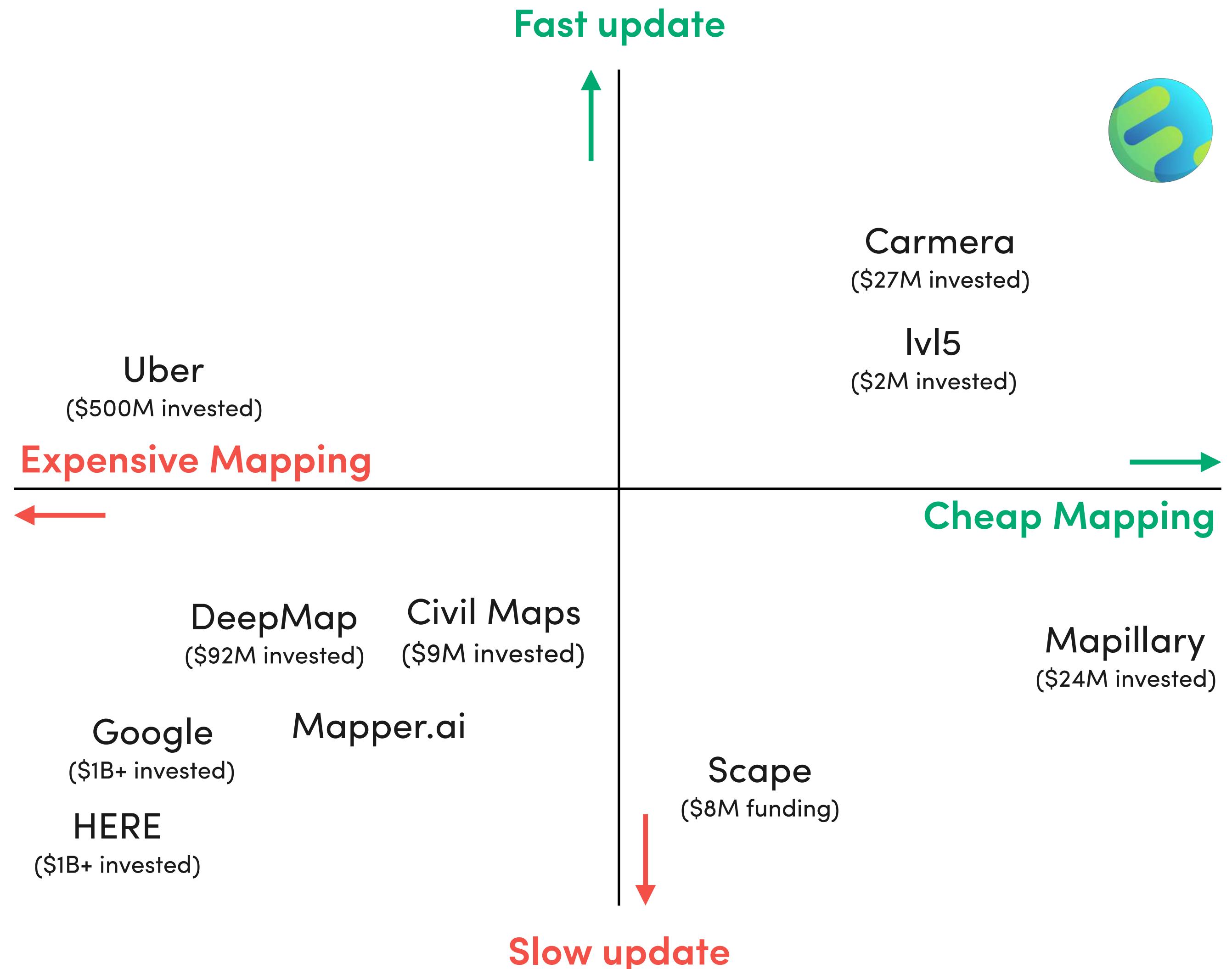


Phase 3: Network Effect

- Marginal cost of mapping goes to zero
- Map is updated in real-time
- Shared spatial memory for machines



The Space Is Heating Up



Our Advantages

Best tech

Cost-efficient map generation

Best approach

Crowdsource through camera positioning

Best go-to-market strategy

Micromobility has scaled urgency today

Best team

Pound-for-pound

Notable Exit - BlueVision (\$17M funding, Acquired by Lyft \$72M)

Our Team

Venice, CA

- HQ
- Product
- Ops

Munich, Germany

- R&D
- Computer Vision Experts



Ryan Measel, PhD

Co-Founder // CEO

PhD, Electrical Engineering, Drexel University



Jameson Detweiler

Co-Founder // Product & Marketing

Founder & CEO, LaunchRock (Sold in 2014)



Rolf Lakaemper, PhD

Head of Research & Development



Tolga Birdal, PhD

Senior Computer Vision Engineer



Gordan Ristovski, PhD

Senior Computer Vision Engineer



Jan Elseberg, PhD

Senior Computer Vision Engineer



TenOneTen

freestyle★

LDV CAPITAL



#maptheplanet

Fantasmō

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Appendix

Roadmap

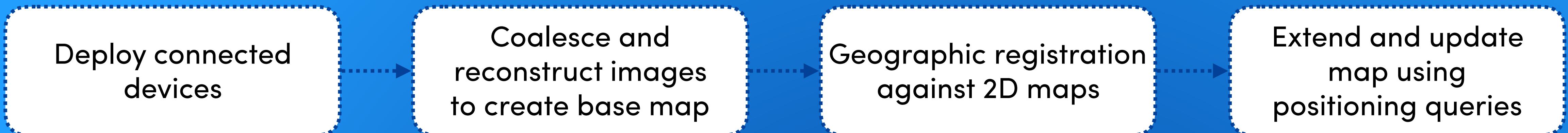
| | Q1 2019 | Q2 2019 | Q3-Q4 2019 | 2020 |
|-----------------|---|---|--|---|
| Pipeline | <ul style="list-style-type: none">• Pilot with top micromobility company ✓• Pilot with big box retail robotics company ✓ | <ul style="list-style-type: none">• Pilot Phase 2 with top micromobility company• 2 micromobility pilots• Deploy with big box retail robotics company | <ul style="list-style-type: none">• Deploy with top micromobility company• Expand micromobility sales | <ul style="list-style-type: none">• Deploy with 5 micromobility companies• Expand sales<ul style="list-style-type: none">- logistics- automotive- robotics |
| Product | <ul style="list-style-type: none">• CPS v1.0 ✓• HD map pipeline v1.0 ✓ | <ul style="list-style-type: none">• Positioning mobile app• Terra Explorer prototype | <ul style="list-style-type: none">• Terra Explorer release• Terra Scout prototype | <ul style="list-style-type: none">• Terra Scout release• Terra Scout OEM release• Semantic HD maps• Data marketplace |

Kickstarting the Map: Solving the Chicken and the Egg

Using Terra Explorer (recommended):



Using Images:



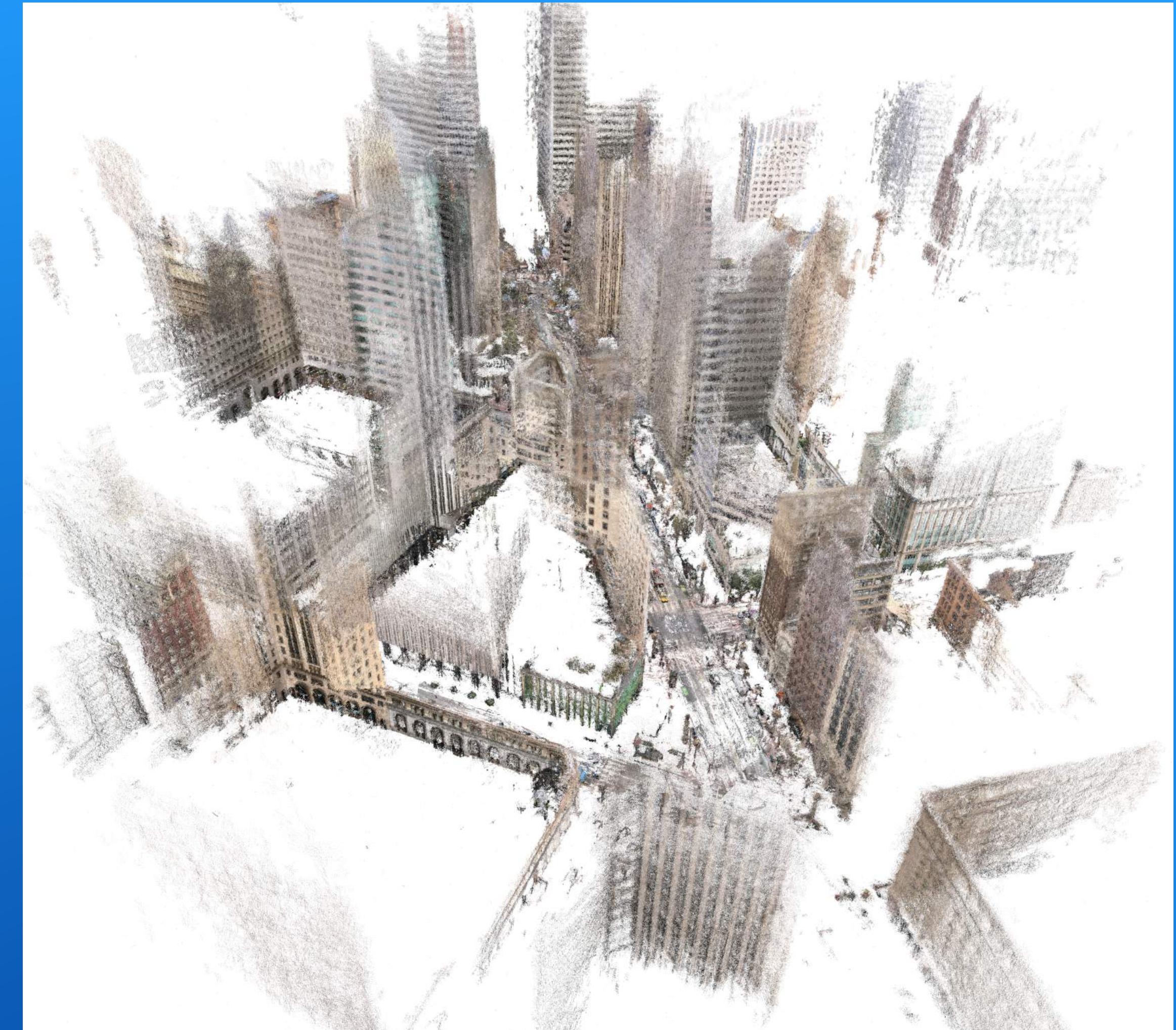
Product: HP Map Pipeline

- Turn 2D images into world-scale maps
- Crowdsource from anywhere
- Generates
 - 3D reconstructions
 - CPS maps

Close up render of SF Market St



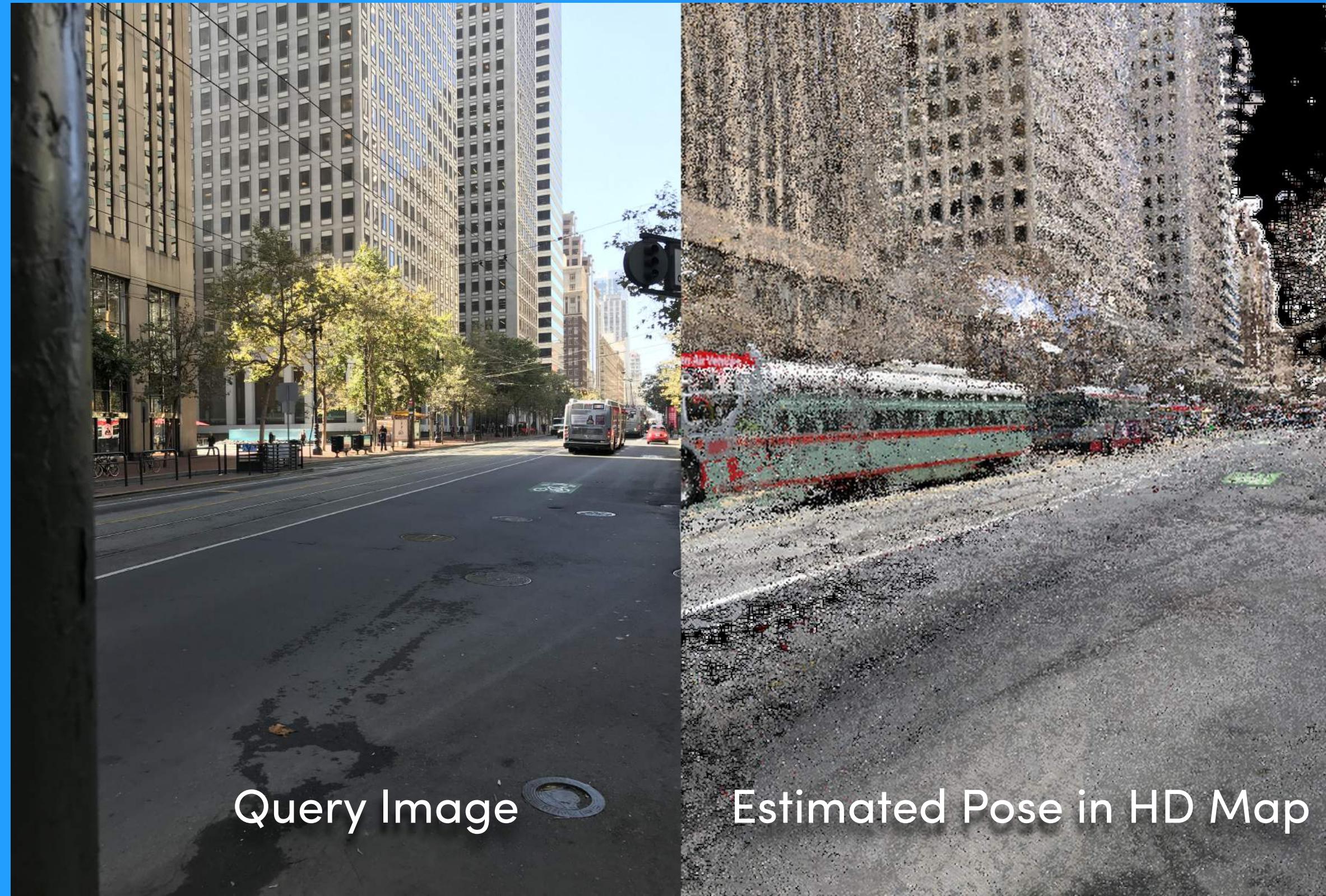
SF Market St – Generated from 33,000 images



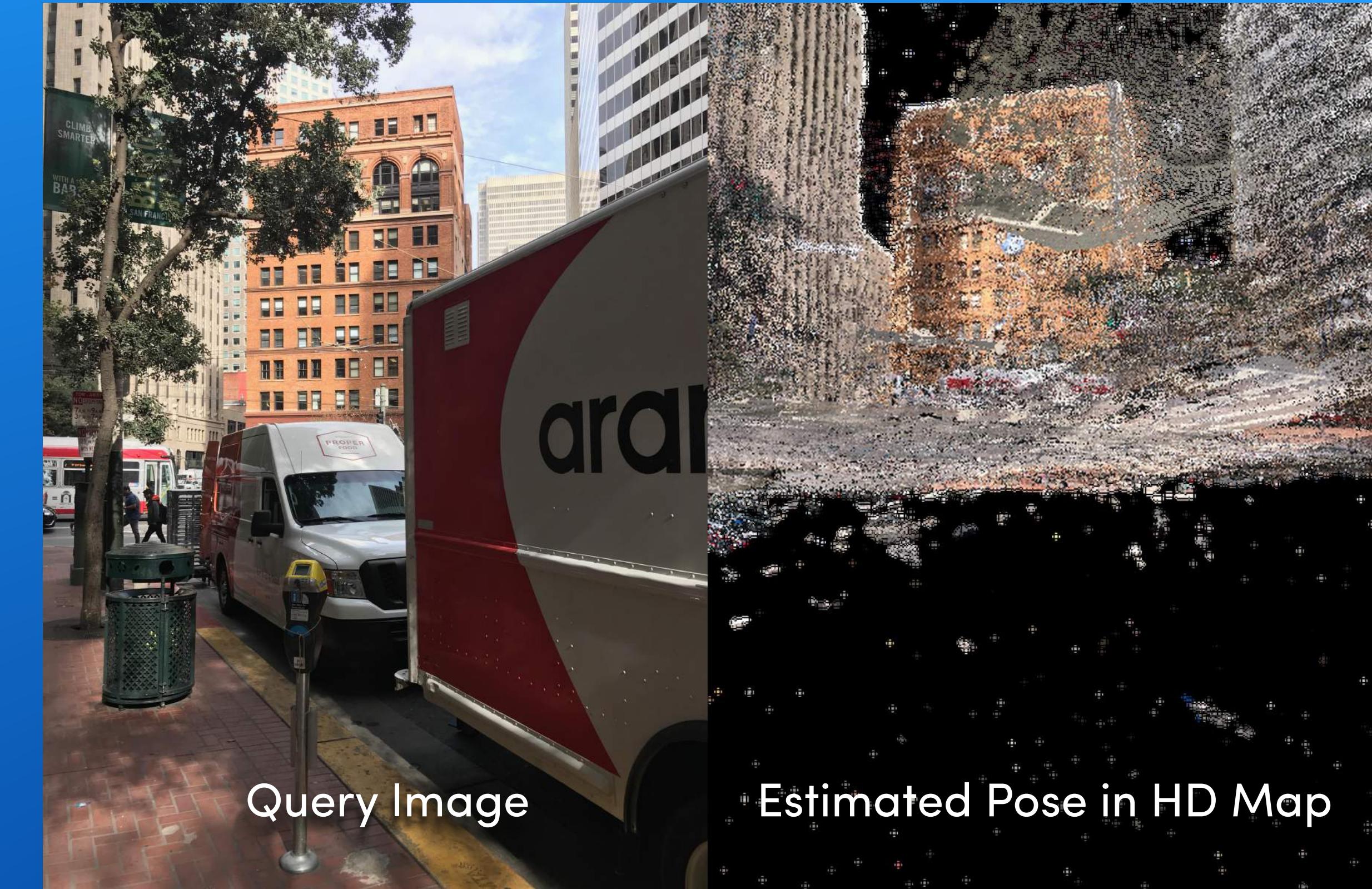
Product: Camera Positioning System (CPS)

- Compute 6 DoF pose (position and orientation) from a 2D image
- Compatible with nearly any camera
- Works where GPS does not — Cities and indoors
- Pose can be transformed into any coordinate system (e.g., GPS)
- Enables localization and drift correction for local tracking systems
- Computation can be performed on a server or client with suitable hardware

Normal Example



Occluded Example



Product: Terra Explorer

- Lidar mobile mapping system
- Quickly capture large-scale maps
- Generates
 - Dense 3D reconstructions
 - CPS maps
 - Registered 360 imagery



Section of Venice, CA – Mapped in 35 minutes



Product: Terra Scout

Features

- “Map-on-chip” plug and play camera module
- Store maps locally
- USB connectivity and control
- Integrate directly into vehicles and robotic platforms

Development timeline

- Now: Design and specification
- Q3 2019: Prototype
- Q1-Q2 2020: Full release
- Q3-Q4 2020: OEM release