

# Using Open Data to Get from “Point A” to “Point B”

And to Improve Transportation Options Along the Way



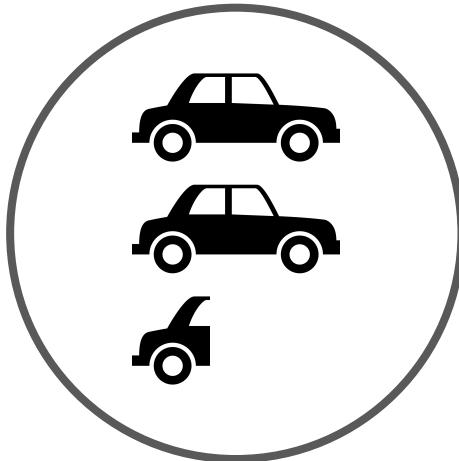
Drew Dara-Abrams, Ph.D.  
head of mobility products



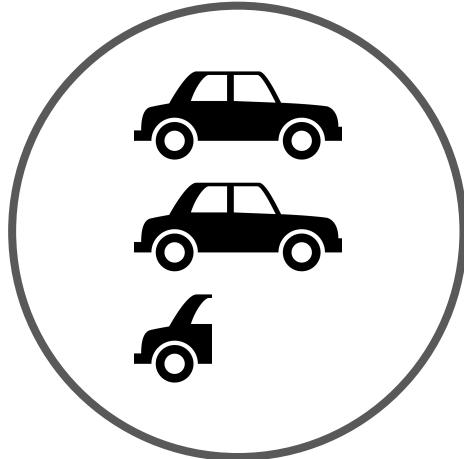
Mapzen

# Transportation of Yesterday (“Point A”)

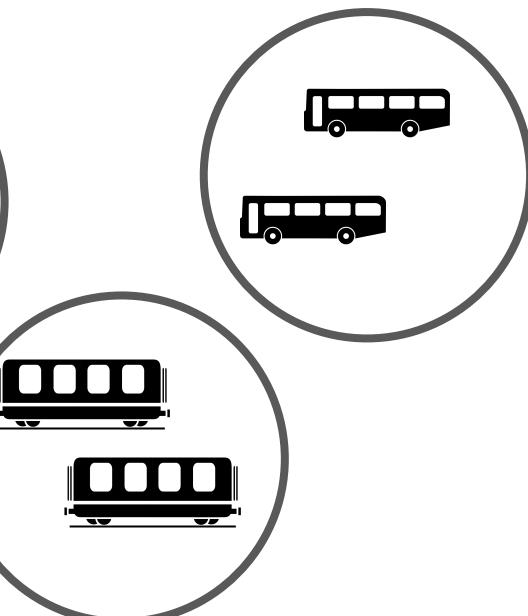
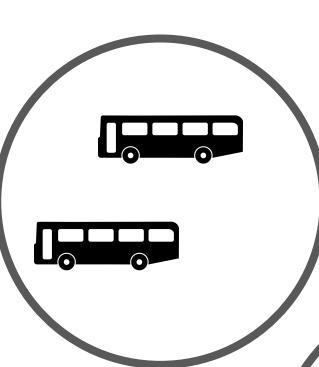
- Own your own car(s)
  - 2.28 cars per household
  - owner provides financing, insurance, etc.
  - 722,000 - 2,010,000 parking spots across U.S.



# Transportation of Yesterday (“Point A”)



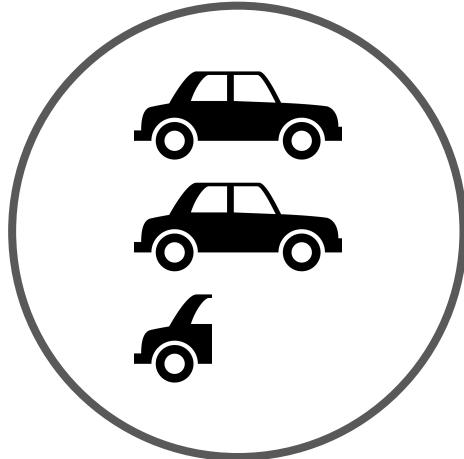
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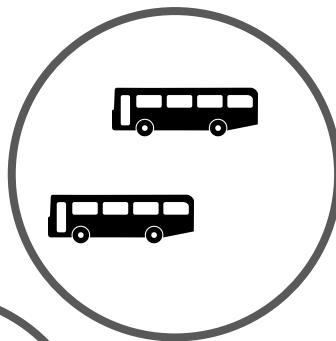
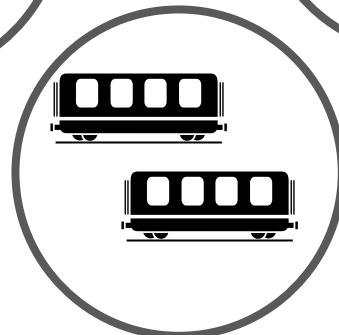
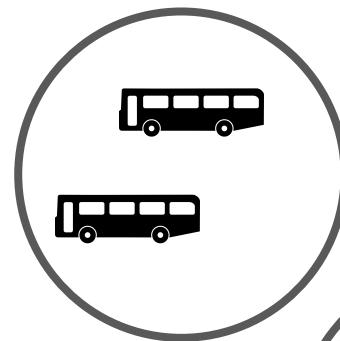
→ Ride public transit

- 6,804 public-transit agencies in the U.S.
- Each with its own schedules, ticketing, fares

# Transportation of Yesterday (“Point A”)

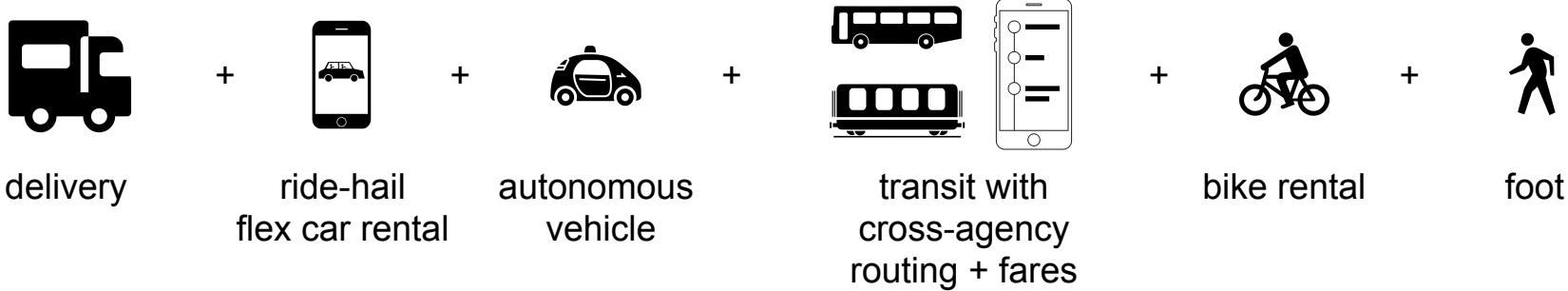


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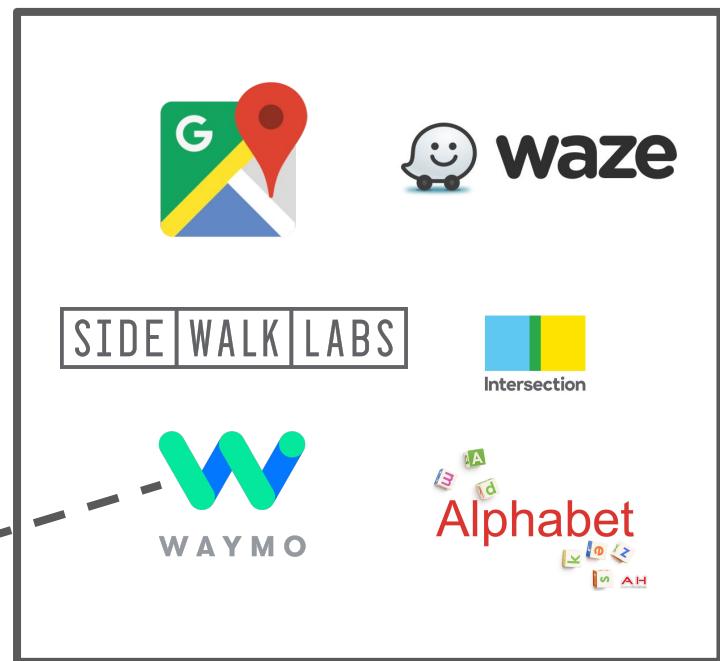
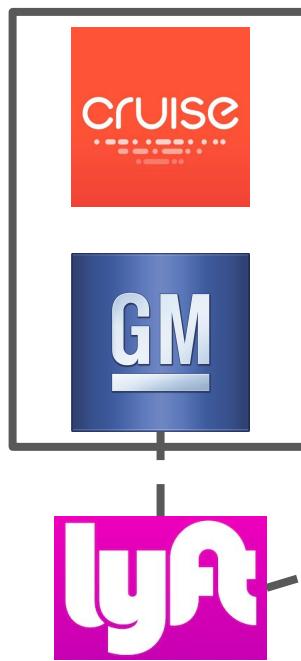
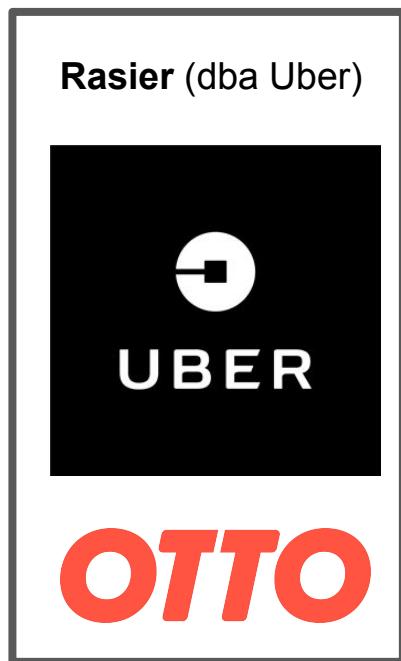
# Transportation of Tomorrow (“Point B”)

- On-demand mix-and-match of:



- Each has a different model of ownership, finance, insurance
- Each involve both public- and private-sector organizations
- Each depend upon geographic/map ***data***
- Each produce behavior/travel ***data***
- Each depend upon ***data*** sharing across organizational boundaries

# Starting to Get from “Point A” to “Point B” Today



# Getting from “Point A” to... Vertical Data Integration?

**Bloomberg Technology**

**Uber Doesn't Want to Give NYC (or Anyone) More Data**

Ride-hailing companies aspire to be something akin to public transportation, but that doesn't extend to sharing data with governments.

by **Joshua Brustein**  
January 5, 2017, 3:00 AM PST

A hand holding a smartphone displaying the Uber app interface, showing a map and a pickup location button.

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**recode**

**ALPHABET | GOOGLE | TRANSPORTATION**

**The Google Car was supposed to disrupt the car industry. Now Waymo is taking on suppliers.**

Waymo's move to bring its hardware manufacturing in-house shows the company's attempt to edge out suppliers like Delphi and Mobileye.

BY **JOHANA BHUIYAN** | @JMBOOYAH | JAN 27, 2017, 2:31PM EST

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Waymo

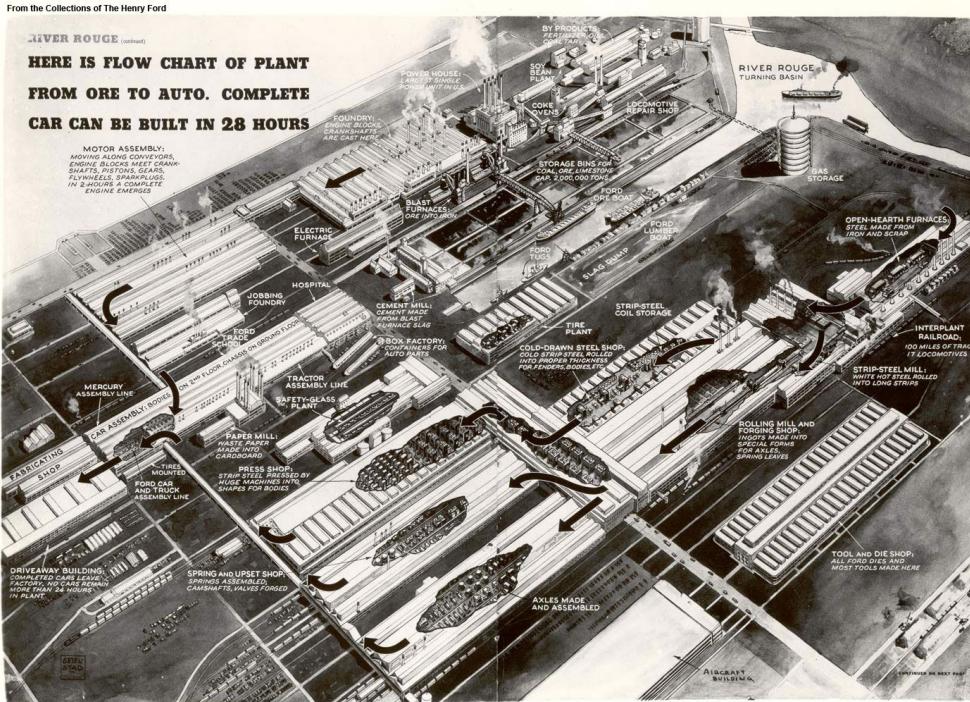
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**Marc Prioleau**  
Location services, GPS, wireless, mapping, M&A, Squaw Valley, bike riding sometimes, economic development in East Palo Alto community.  
1 hr ago · 4 min read

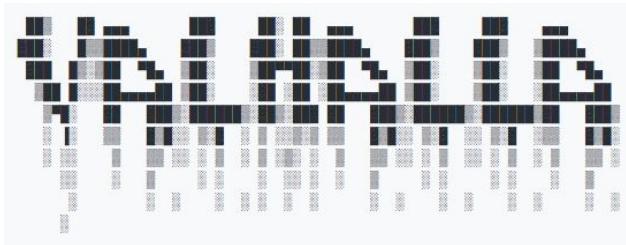
**Intel pays \$15B for Mobileye: A strategic play for data**

Hint: It's about maps (and Goldman nails it)

# Getting from “Point A” to... Vertical Data Integration?



# Getting from “Point A” to “Point B”... using Open Data!



the first **open-source routing engine** that can provide worldwide multimodal journey planning



the largest **open data platform for public transit** stop locations, route lines, and schedule data

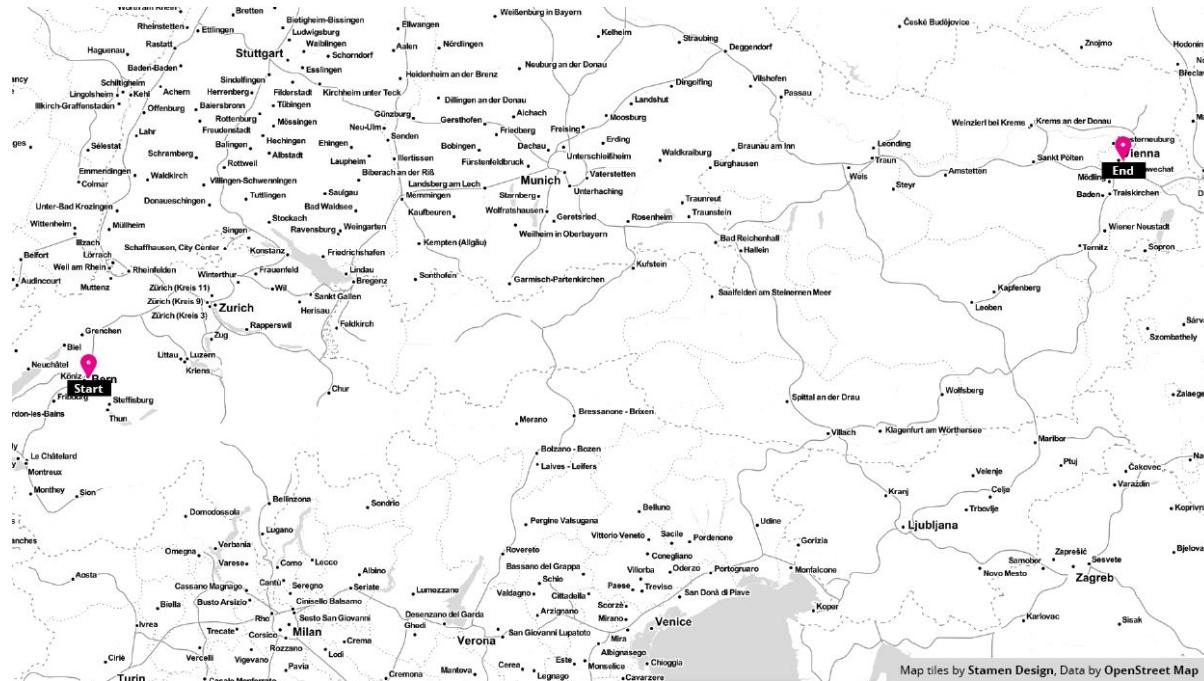


an open platform under development by the World Bank and Mapzen that **turns anonymous GPS locations into traffic speed statistics**

# Valhalla

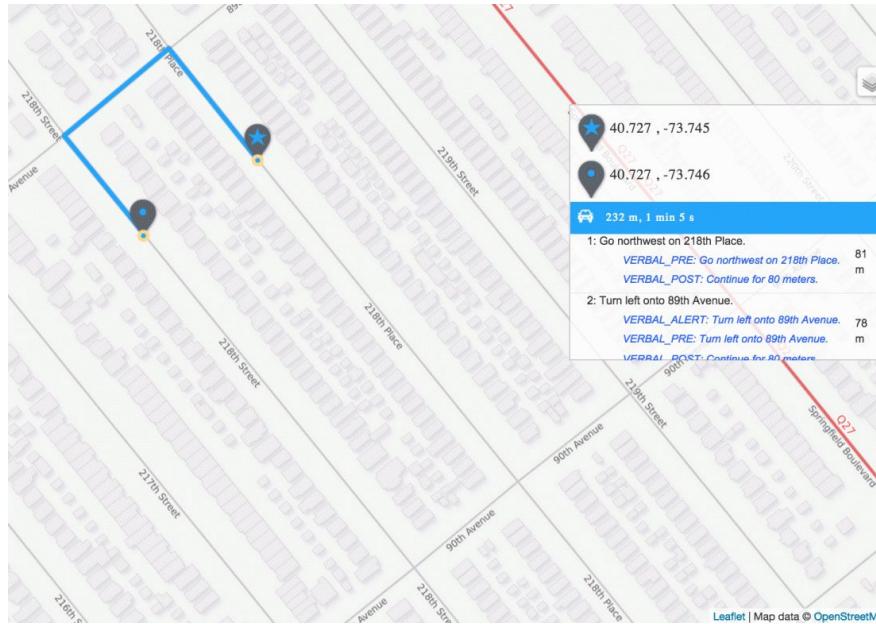
# Valhalla: How it provides worldwide multimodal routing

- Routing graph is tiled and hierarchical, based on OpenStreetMap



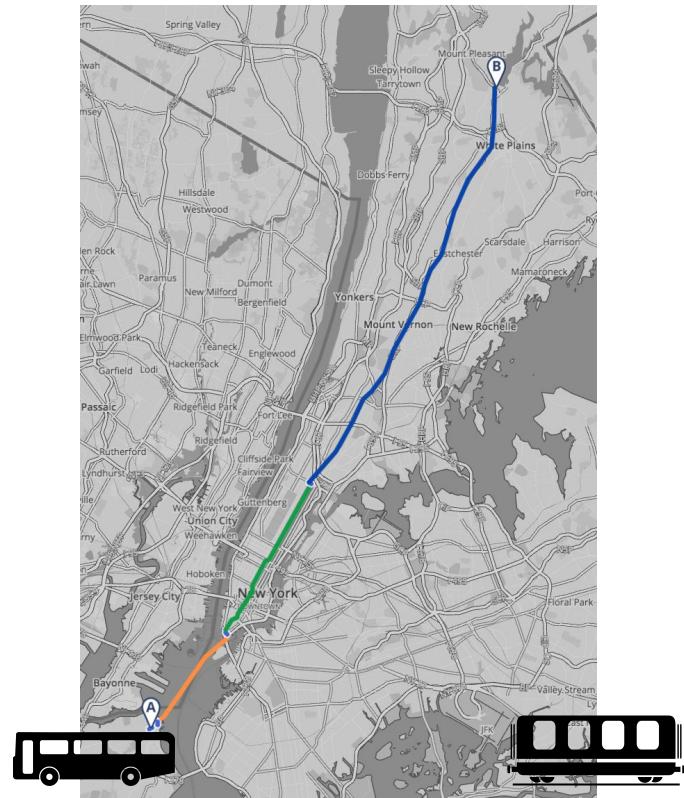
# Valhalla: How it provides worldwide multimodal routing

- Routing graph is tiled and hierarchical
- Costing is dynamic and applied at runtime



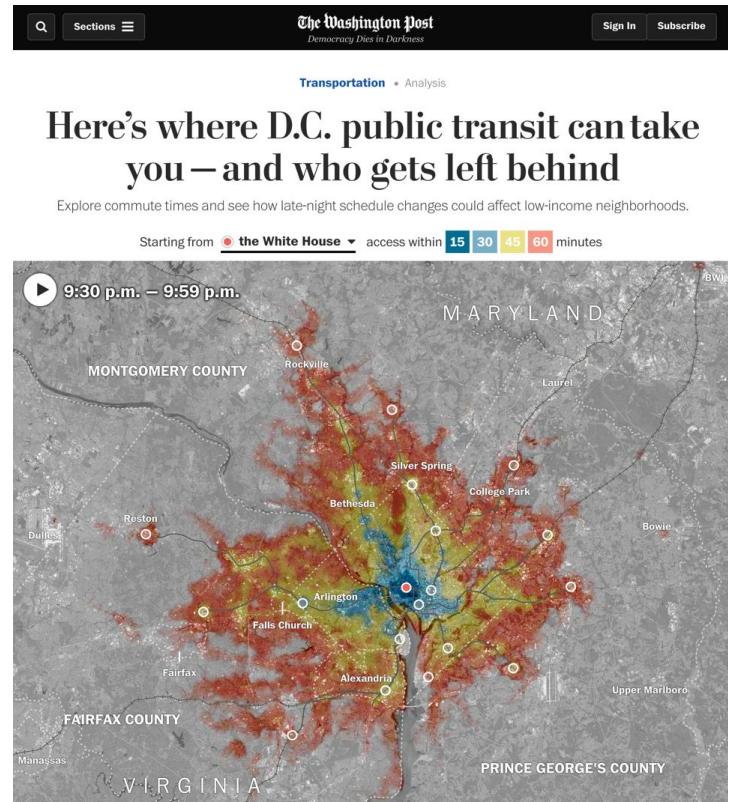
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# Valhalla: How it provides worldwide multimodal routing

- Routing graph is tiled and hierarchical
- Costing is dynamic and applied at runtime
- Costing is customizable per mode
- Routing graph also enables analysis:
  - time/distance matrix
  - optimized route
  - isochrones
  - map-matching



# Valhalla: How it provides worldwide multimodal routing

- Routing graph is tiled and hierarchical
- Costing is dynamic and applied at runtime
- Costing is customizable per mode
- Routing graph also enables analysis
- Public-transit schedule data is sourced from Transitland

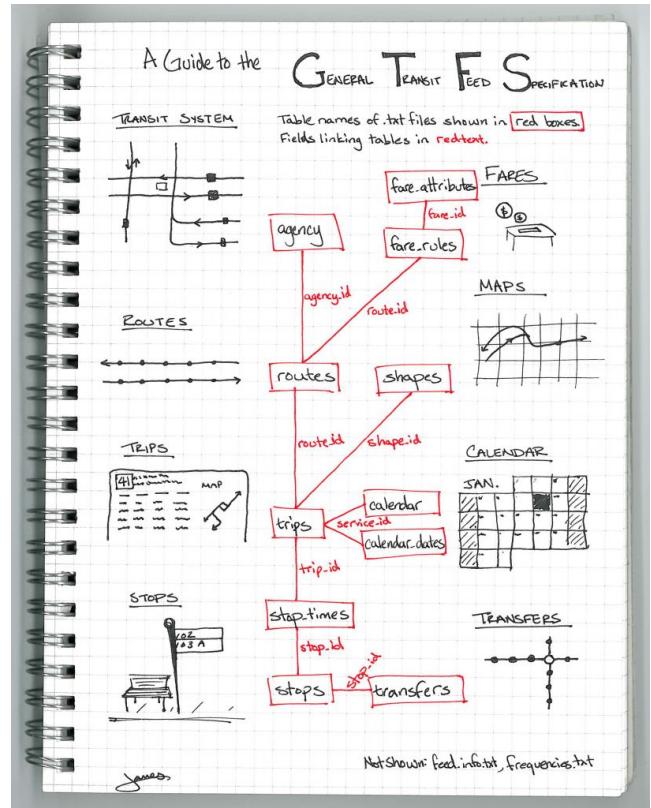


# Transitland

# Transitland: How it aggregates public-transit data

- GTFS (General Transit Feed Specification)
  - Created by Google and Portland TriMet 10+ years ago provides a common format for stops, routes, schedules, etc.
  - But the only way Google shares the data out is through its consumer routing app
  - Feeds have been aggregated in the open, but without sustainable support
  - Transitland as a “center of gravity” for GTFS

Graphic by:  
James Wong  
OpenPlans



# Transitland: How it aggregates public-transit data

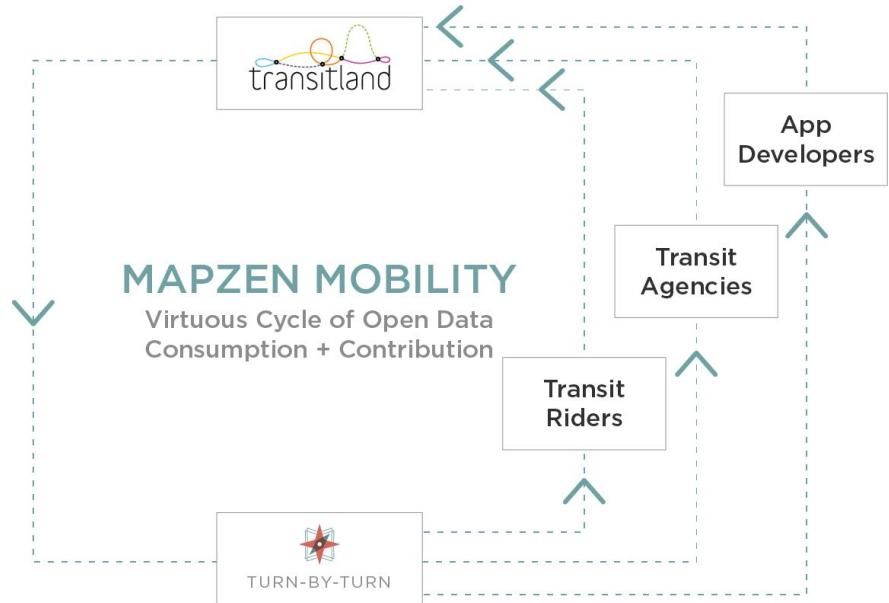
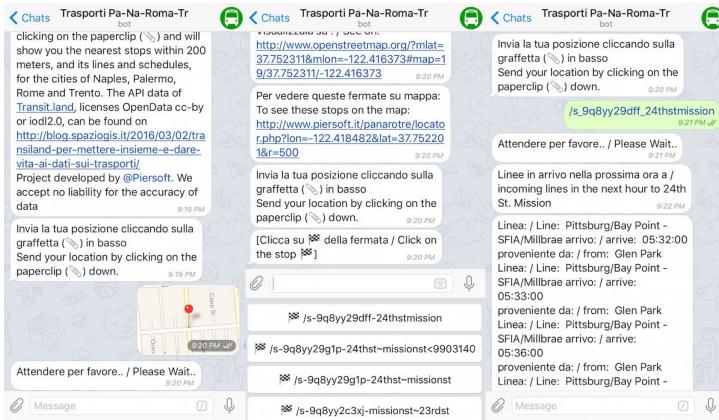
- GTFS (General Transit Feed Specification)
- Transitland Feed Registry lists 2,108 operators in 39 countries
  - Each feed is checked for updates daily
  - Stops can be merged across feeds
  - Edits and additions are also stored alongside imported entities in the Transitland Datastore

The screenshot shows the Transitland website's Feed Registry page. The header features a colorful logo with overlapping circles in blue, yellow, and pink, followed by the word "transitland". Below the logo is a navigation bar with links: HOME, FEED REGISTRY (which is highlighted in red), PLAYGROUND, DOCUMENTATION, and NEWS & UPDATES. The main content area is titled "FEED REGISTRY". A descriptive text explains that the Feed Registry lists all transit operators and feeds, and provides links to details about each operator's license. Below this is a search bar labeled "Search by operator name or location". A table lists five transit operators:

Operator Name	Metro	State or Province	Country	License	License Details ⓘ
128 Business Council	Waltham	Massachusetts	United States		
360 Discovery	Auckland	Auckland	New Zealand		
9 Town Transit	Centerbrook	Connecticut	United States		
Aachener Verkehrsverbund (AVV)	Aachen	Nordrhein-Westfalen	Germany		
Aachener Verkehrsverbund - West		Nordrhein-	Germany		

# Transitland: How it aggregates public-transit data

- GTFS (General Transit Feed Specification)
- Transitland Feed Registry lists 2,108 operators in 39 countries
- Promotes a “virtuous cycle”:
  - the consumers of data are empowered to add/fix/improve data for themselves
  - they help others in the process



# Transitland: How it aggregates public-transit data

- GTFS (General Transit Feed Specification)
- Transitland Feed Registry lists 2,108 operators in 39 countries
- Promotes a “virtuous cycle”
- Transitland Datastore API allows a wide variety of queries
  - Try it using the Mapzen Mobility Explorer <https://mapzen.com/mobility/explorer>
  - Then copy the API queries to get JSON or GeoJSON for use in your own apps, maps, or analyses

The screenshot shows the Mapzen Mobility Explorer web application. At the top, there's a browser header with the URL <https://mapzen.com/mobility/explorer/#/stops?bbox=-122.27600812911987%2C37.79986175324021%2C-122.2695976495743%2C37...>. Below the header is the Mapzen logo. The main interface is titled "Mobility Explorer" and has a sub-header "Visualize public transit networks". There are four buttons: "SHOW ROUTES" (light gray), "SHOW STOPS" (dark teal, currently selected), "SHOW OPERATORS" (light gray), and "GENERATE ISOCRHONES" (light gray). A note below the buttons says "Hover over a stop for more information". To the right of the buttons is a map of a city area with street names like 11TH STREET, 12TH STREET, CLAY STREET, WASHINGTON STREET, and BROADWAY. Numerous red dots represent transit stops, clustered along major streets. A legend in the bottom right corner indicates that red dots represent "TRANSIT STOP". The footer of the page includes the text "Leaflet | © OpenStreetMap contributors | Mapzen | Transitland | Imagery © CARTO".

# Open Traffic

# Open Traffic: Overview

- Traffic data is currently collected by commercial providers with expensive sensors or vertically-integrated consumer apps
- Mapzen has partnered with the World Bank, ride-sharing companies, and NGOs around the world to form the Open Transport Partnership
- The Open Traffic platform turns anonymous GPS data from smartphones into traffic statistics
- Real-time traffic statistics will improve the accuracy of all Mapzen Mobility APIs
- After a delay, historical traffic statistics will be free for all to use

## Open Transport Partnership (OTP) Members

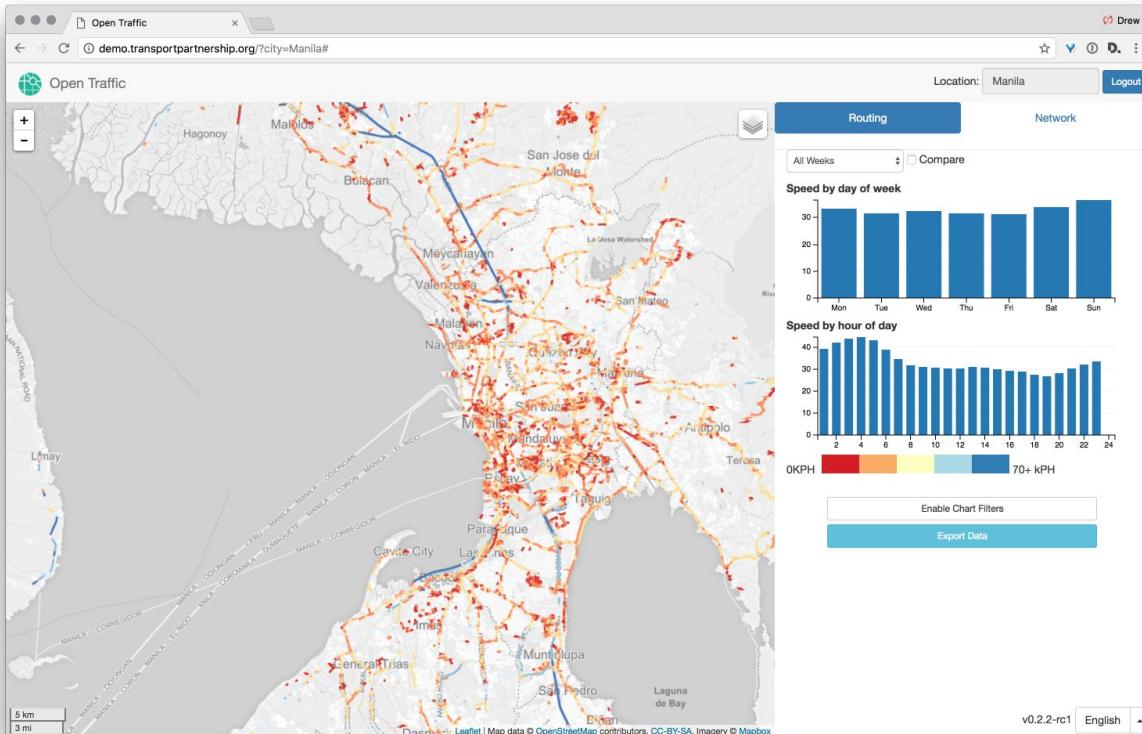


# Open Traffic preview 1/3: A day of traffic in Manila

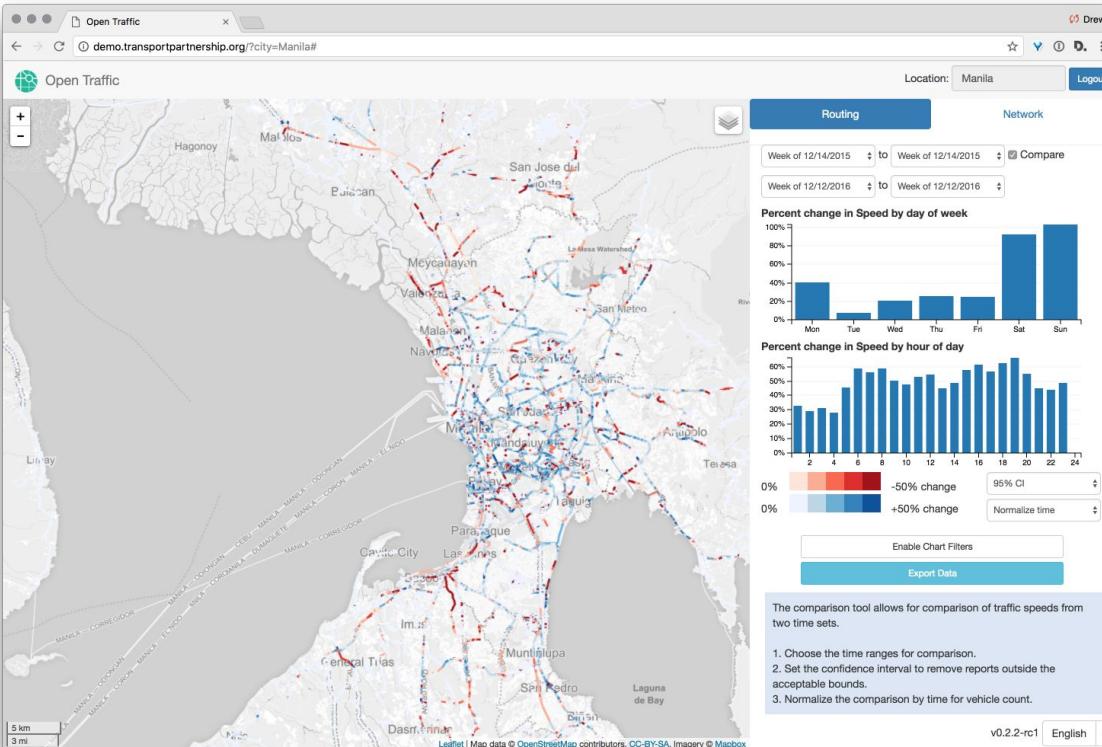


<https://mapzen.com/blog/announcing-open-traffic/>

# Open Traffic preview 2/3: road network analysis

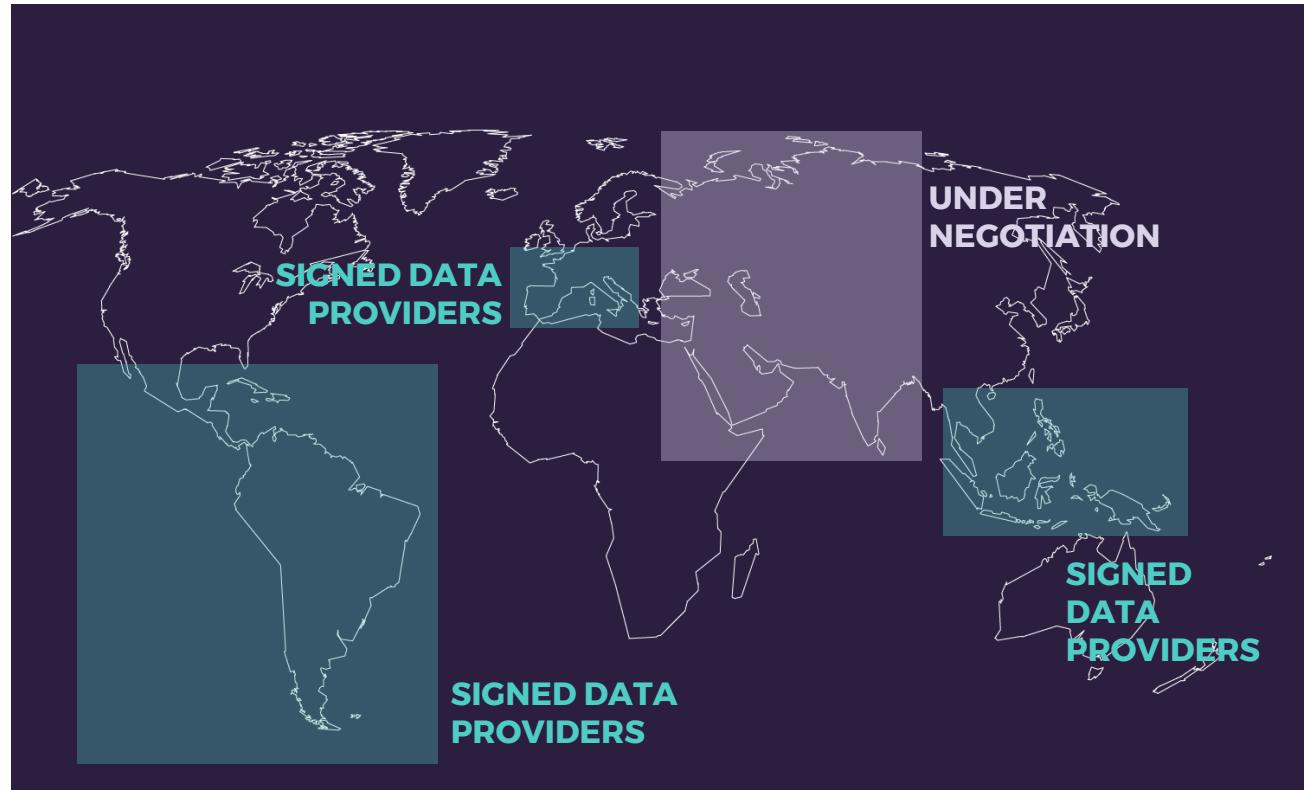


# Open Traffic preview 3/3: timeframe comparison



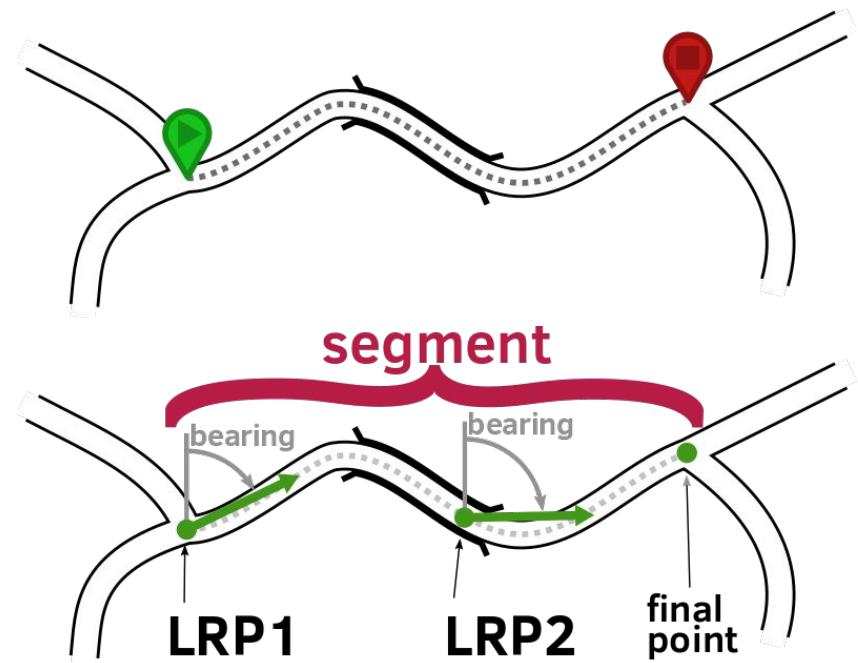
# Open Traffic data providers

- Open Transport Partnership has signed data providers in:
  - Southeast Asia
  - Latin America
  - Southern Europe
- Under negotiation in:
  - Middle East
  - Central Asia
- Working with relevant associations:
  - NATCO in North America
  - Northern Europe



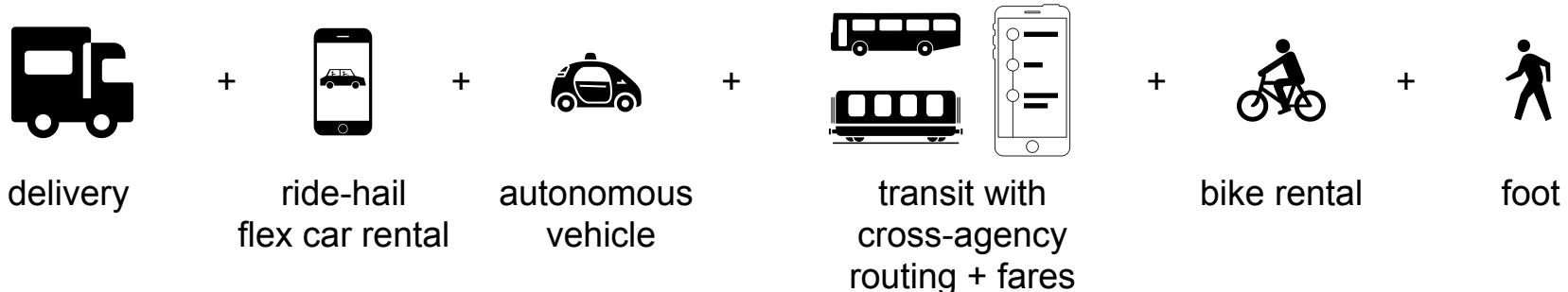
# OSMLR linear-referencing toolkit

- OSMLR is a linear-referencing toolkit for associating data with stable roadway segments in OpenStreetMap and other basemaps
- Necessary for sharing traffic data
- Inspired by TomTom's OpenLR scheme
- Open Transport Partnership is investigating how to use OSMLR as open and share more transport data:
  - Roadway incident and closure reports
  - Driver/vehicle/cyclist/pedestrian behavior data -- for safety analysis
  - On-street parking inventory, usage, pricing, and enforcement
  - Right-of-way ownership and jurisdiction
  - Public-transit and TNC integrations
  - Interoperability between OSM, ARNOLD, and other linear referencing systems



<https://mapzen.com/blog/open-traffic-osmlr-technical-preview/>

# Let's get to “Point B” together using open data



I welcome your questions: [drew@mapzen.com](mailto:drew@mapzen.com)

For (free) developer API keys and links to code:

<https://mapzen.com/developers>

Basemaps by:  
OpenStreetMap  
Stamen  
Carto  
Mapzen

Transport icons by:  
Guillaume Berry  
L Recker  
Joel Wisneski  
Arosh Khan

P.S. I have stickers