



Geocoding in the Open

04-27-2016 // Diana Shkolnikov



Agenda

→ Mapzen

- *Mission*
- *Products*

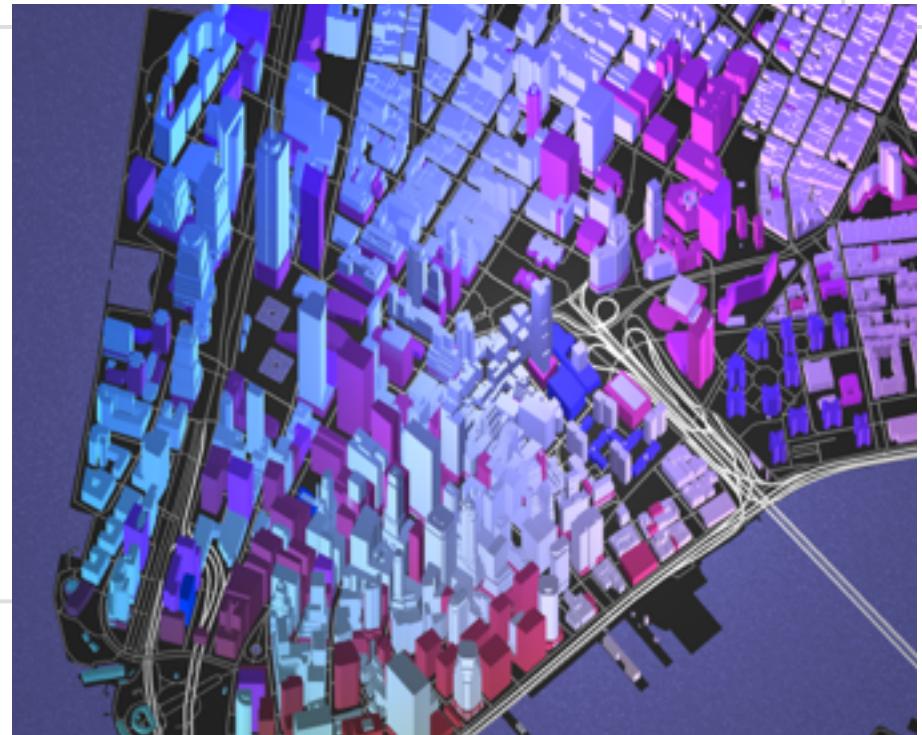
→ Geocoding

- *Key features*
- *Pelias engine*

→ Open Data

- *OpenStreetMap*
- *OpenAddresses*
- *Who's on First*

→ Demos: ooh, shiny!



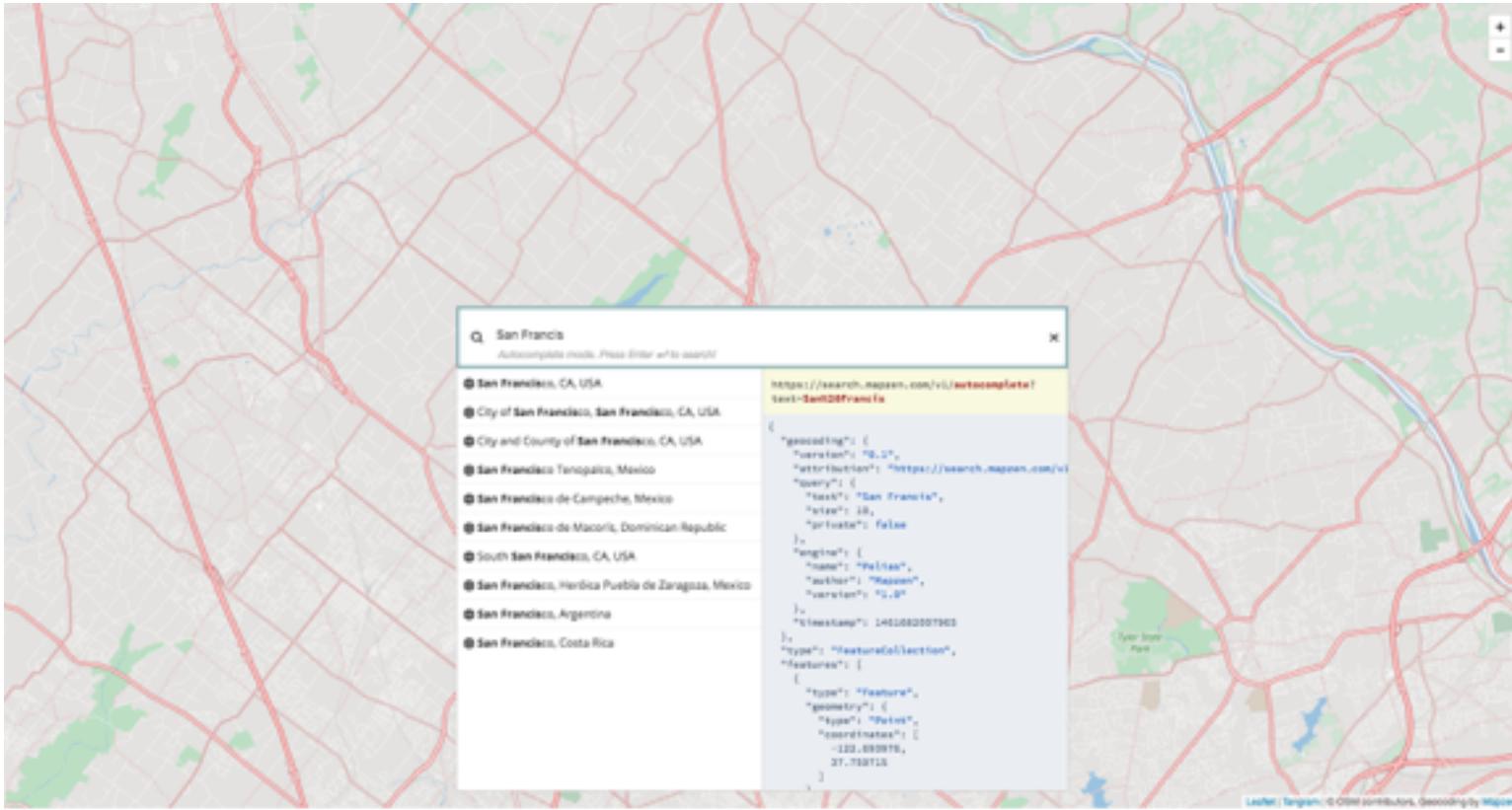
MAPZEN

an open-source mapping lab

builds open-source mapping tools and

collaborates on open geodata initiatives

Search



Turn-by-Turn

2801 Mission Street, San Francisco, CA

138 King Street, San Francisco, CA

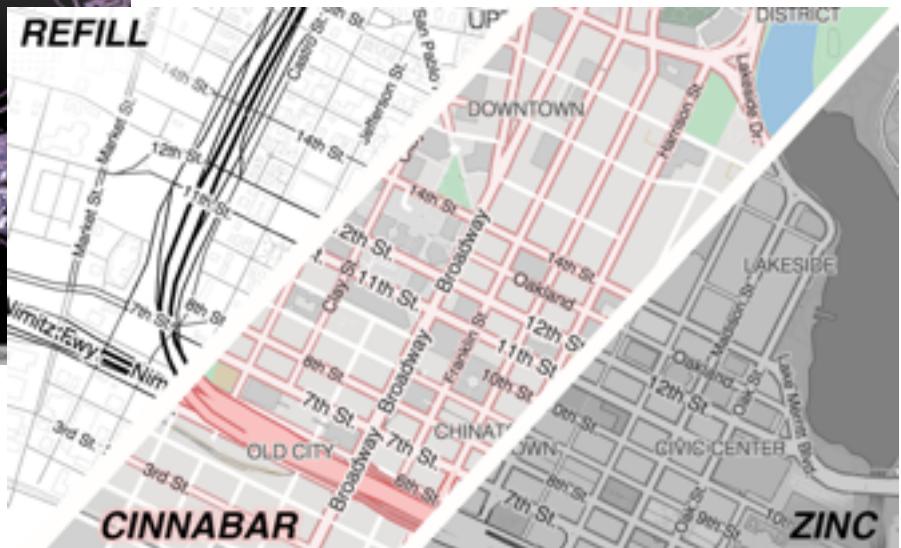
4.7 km, 56 min

- Head north on Lill Street. 30 m
- Turn right onto 24th Street. 142 m
- Turn left onto South Van Ness Avenue. 1.1 km
- Turn right onto 18th Street. 279 m
- Turn left onto Treat Avenue. 523 m
- Turn right onto 15th Street. 23 m
- Turn left onto Alabama Street. 90 m
- Bear right onto Treat Avenue. 148 m
- Continue on Division Street. 91 m
- Turn left onto Bryant Street. 42 m
- Turn right onto Division Street. 586 m
- Bear left to stay on Division Street. 46 m
- Enter the roundabout and take the 3rd exit. 18 m
- Exit the roundabout onto Townsend Street. 1.2 km

Tangram



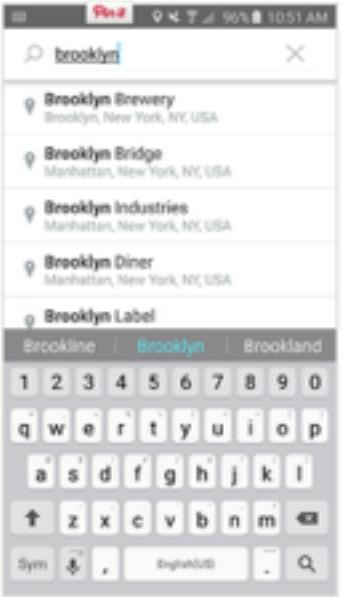
REFILL



Vector Tile Service



Mobile SDKs



AUTOCOMPLETE



MULTIPLE MODES



TURN-BY-TURN NAVIGATION



Geocoding

30 W 26th St, NY

SEARCH



new yo

SEARCH

New York, NY

Pennsylvania Station New York, NY

New York University, New York, NY

New York Penn Station, New York, NY



your current location

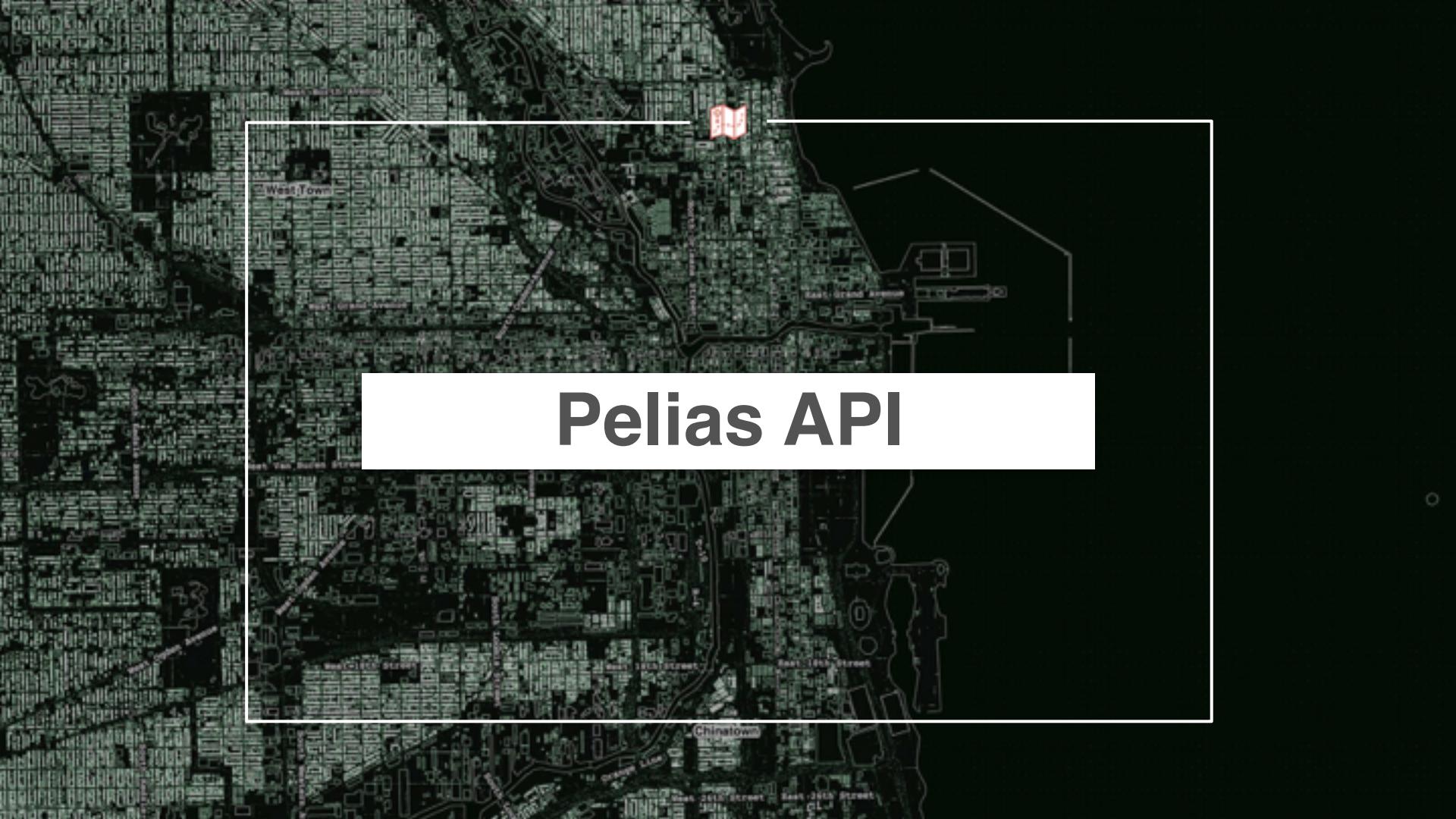
SEARCH

30 West 26th Street, Manhattan, NY

Hill Country Barbecue Market, Manhattan, NY

Samsung Accelerator, Manhattan, NY

Hanjn, Manhattan, NY



Pelias API

Endpoints

/autocomplete

/search

/reverse

/place

/autocomplete

api_key: free authorization key

text: input query text

sources: openstreetmap, openaddresses, geonames, whosonfirst

layers: address, venue, neighbourhood, locality, borough,
localadmin, county, macrocounty, region,
marcoregion, country, coarse

focus.point.lat, focus.point.on:
geolocation for focusing results

/search

api_key: free authorization key

text: input query text

size: number of results to return

sources: openstreetmap, openaddresses, geonames, whosonfirst

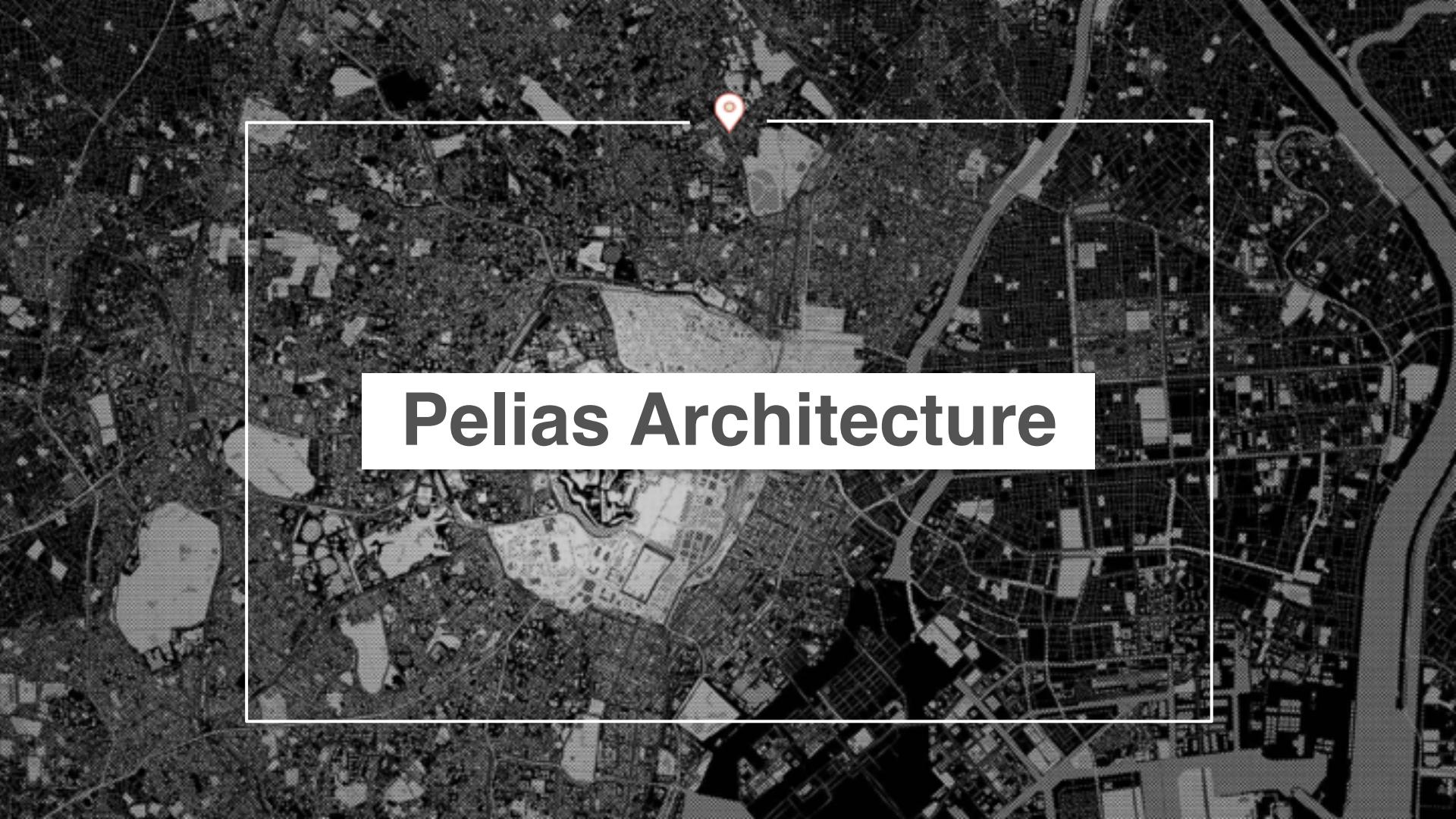
layers: address, venue, neighbourhood, locality, borough,
localadmin, county, macrocounty, region,
marcoregion, country, coarse

focus.point.lat, focus.point.on:
geolocation for focusing results

boundary.country

boundary.circle [lat,lon,radius]

boundary.rect [min_lat, min_lon, max_lat, max_lon]
hard filters for limiting the scope of the search



Pelias Architecture

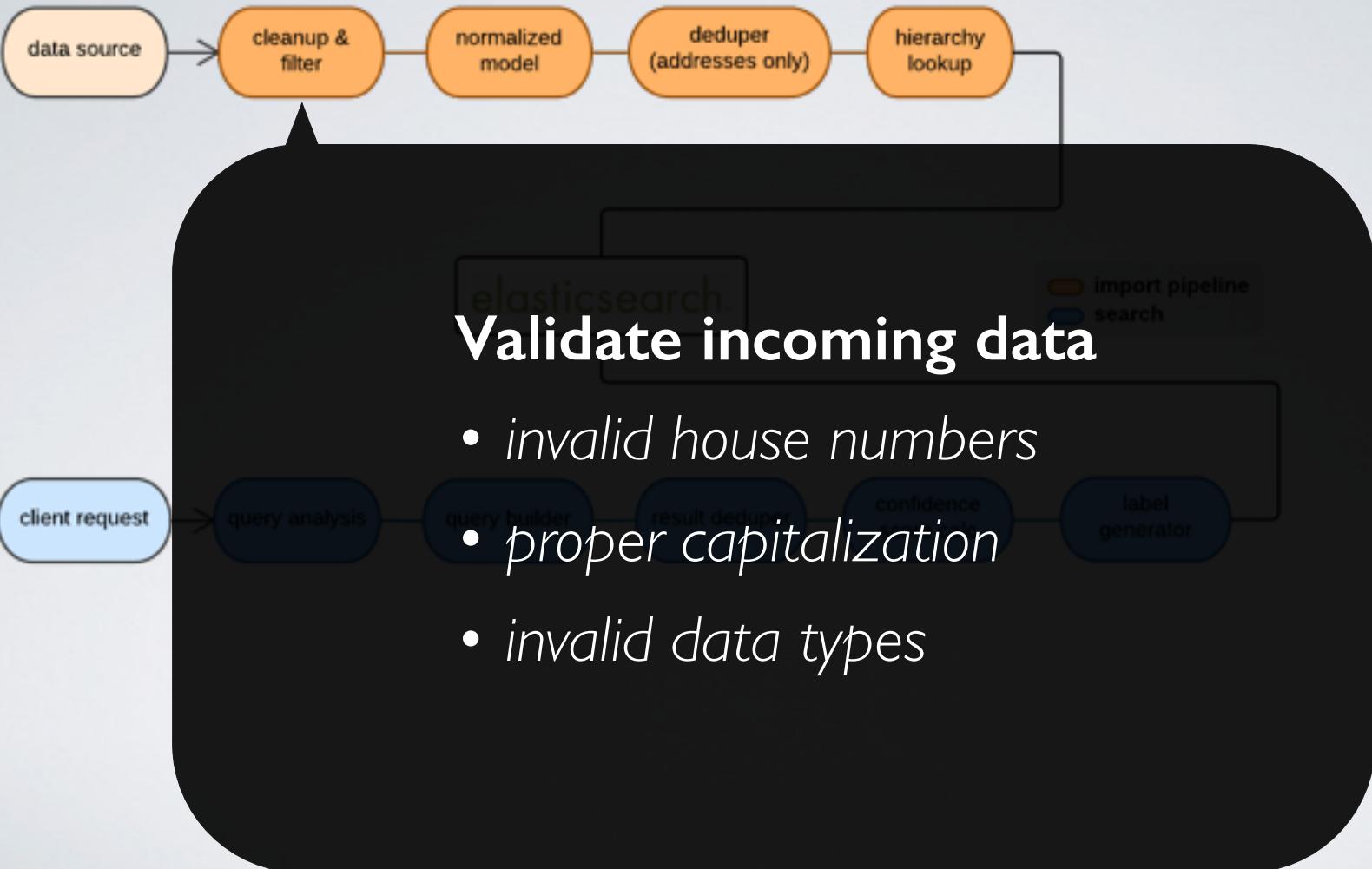


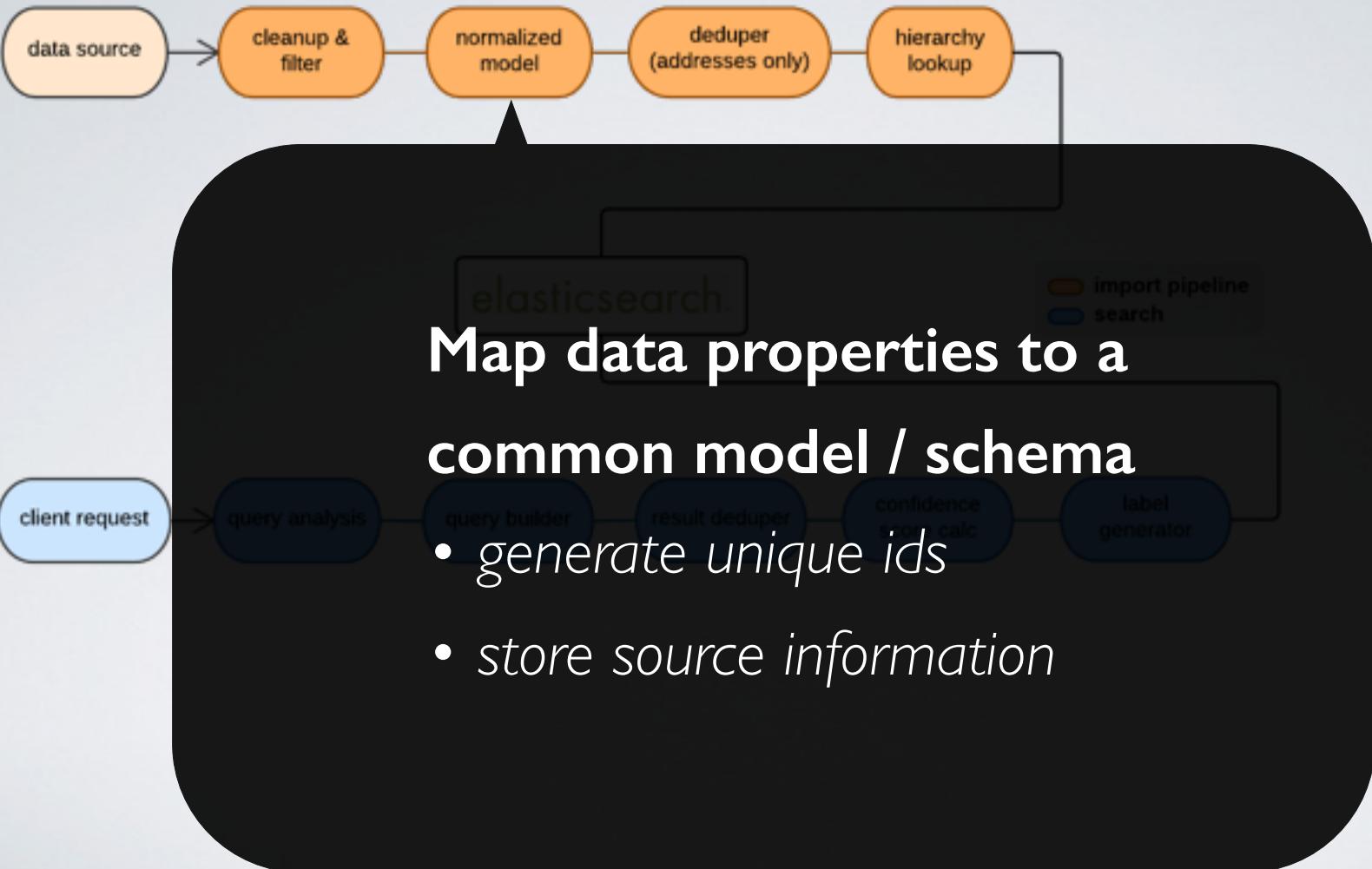
Elasticsearch

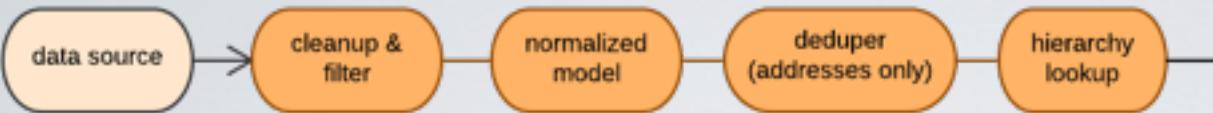


node.js









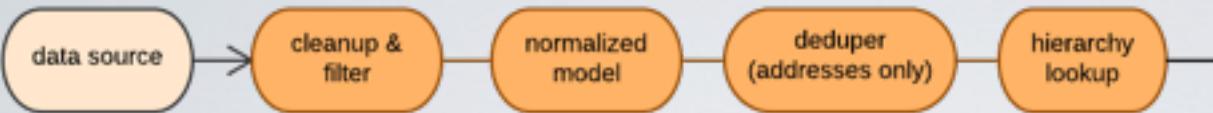
elasticsearch.

import pipeline
search

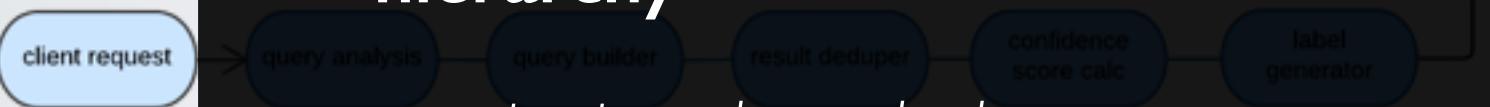
Duplicate data is very common

- filter out duplicate addresses only
- duplicates checked within a specified radius



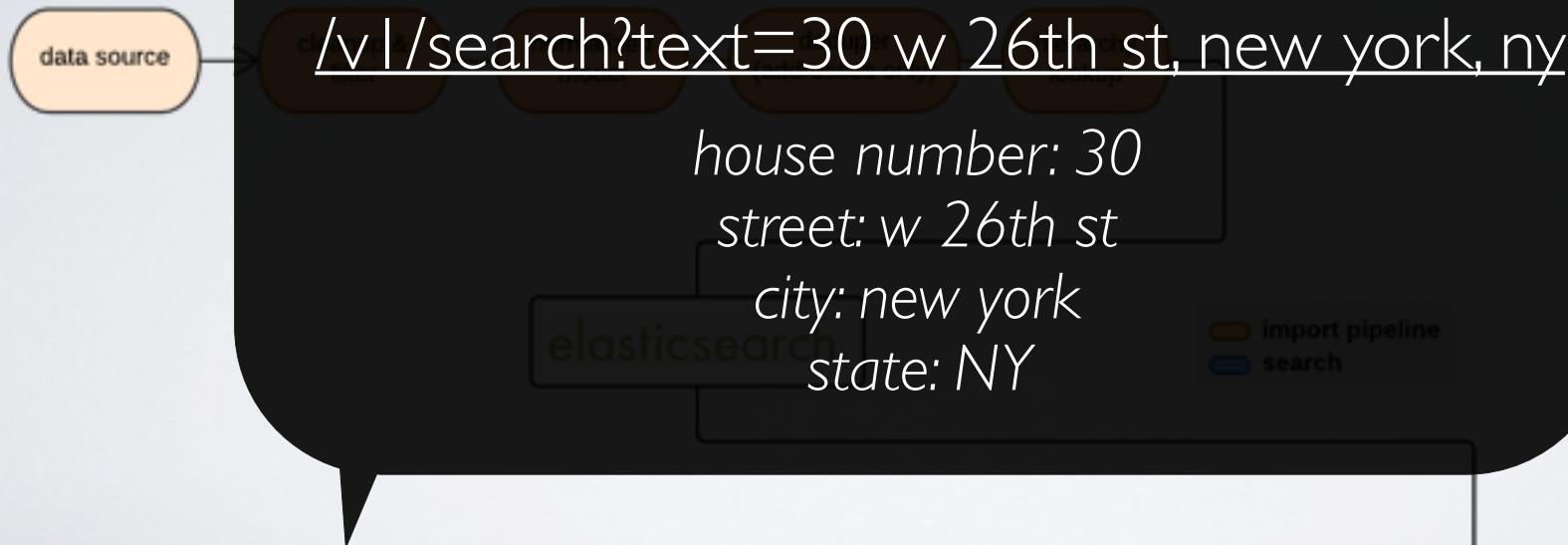


Venue and address data lacks
consistent administrative
hierarchy



- *point-in-polygon lookup*
- *disregard source hierarchy data*

Parse and analyze the incoming query parameters



client request

query analysis

query builder

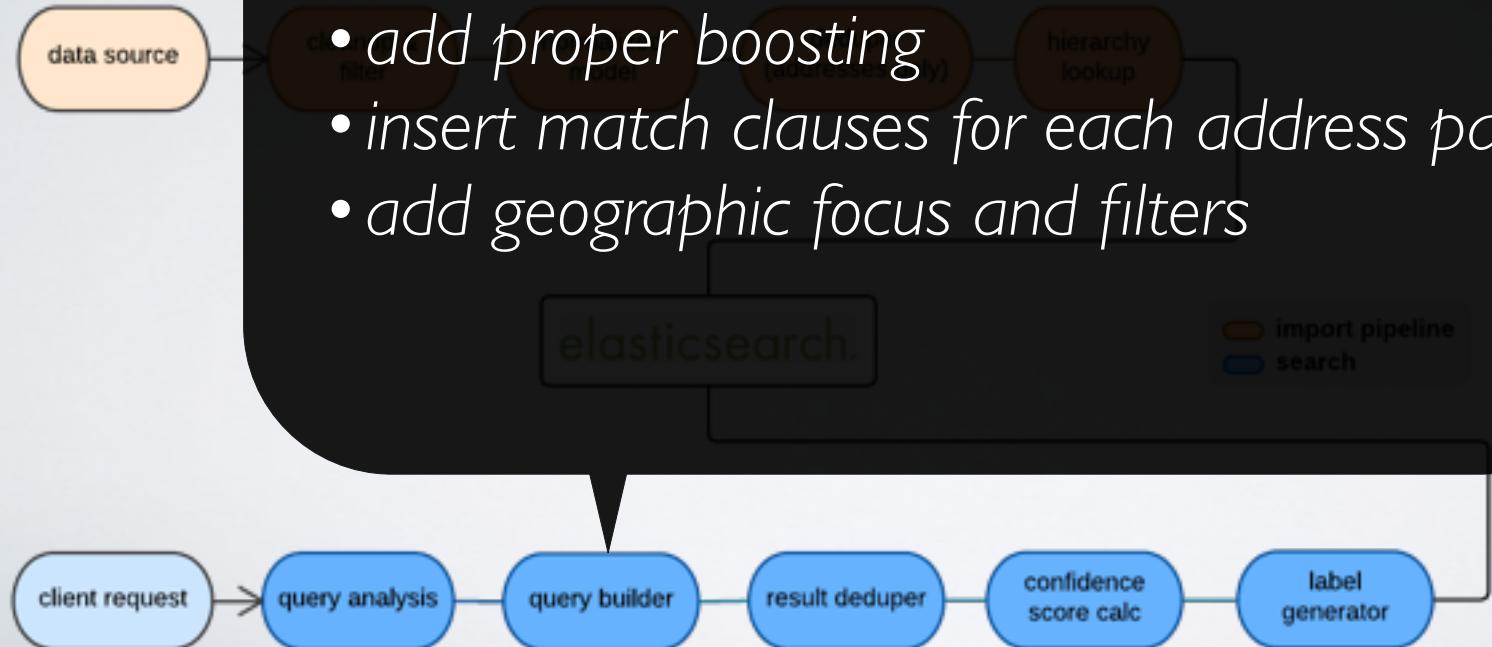
result deduper

confidence
score calc

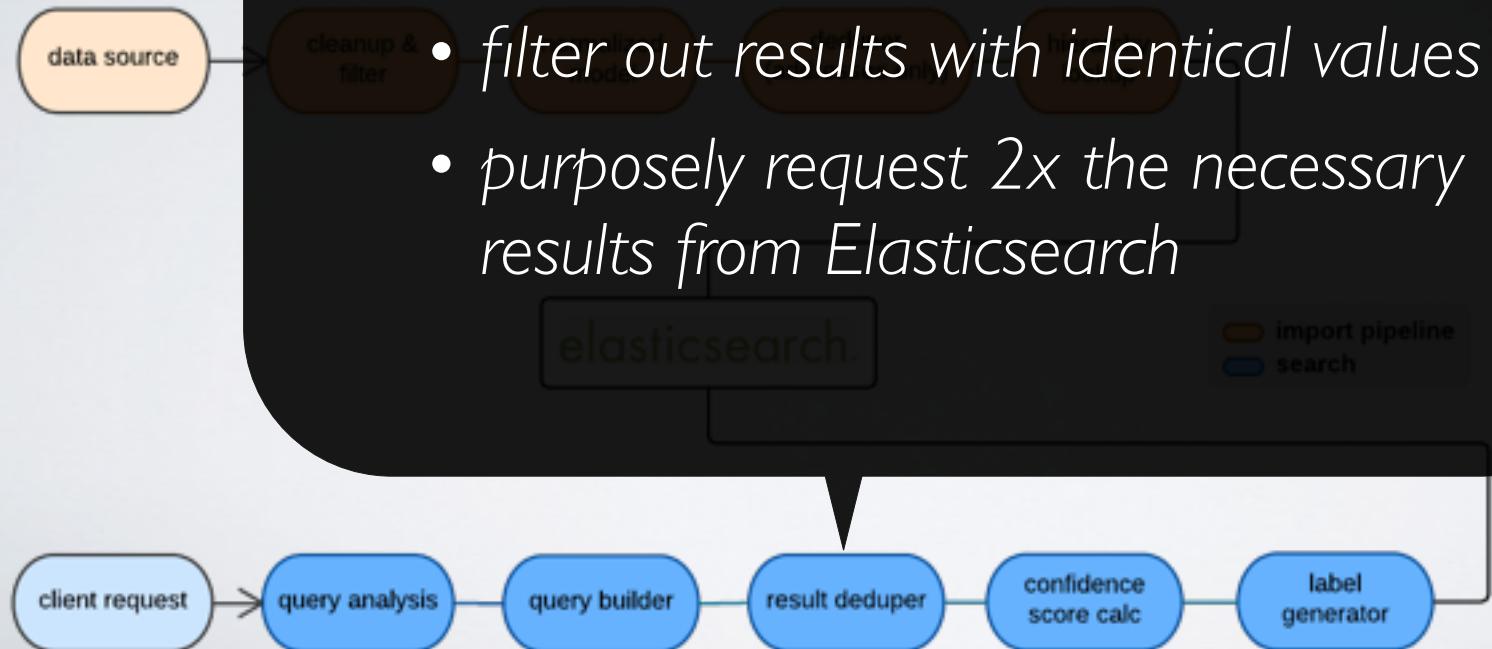
label
generator

Generate the Elasticsearch query

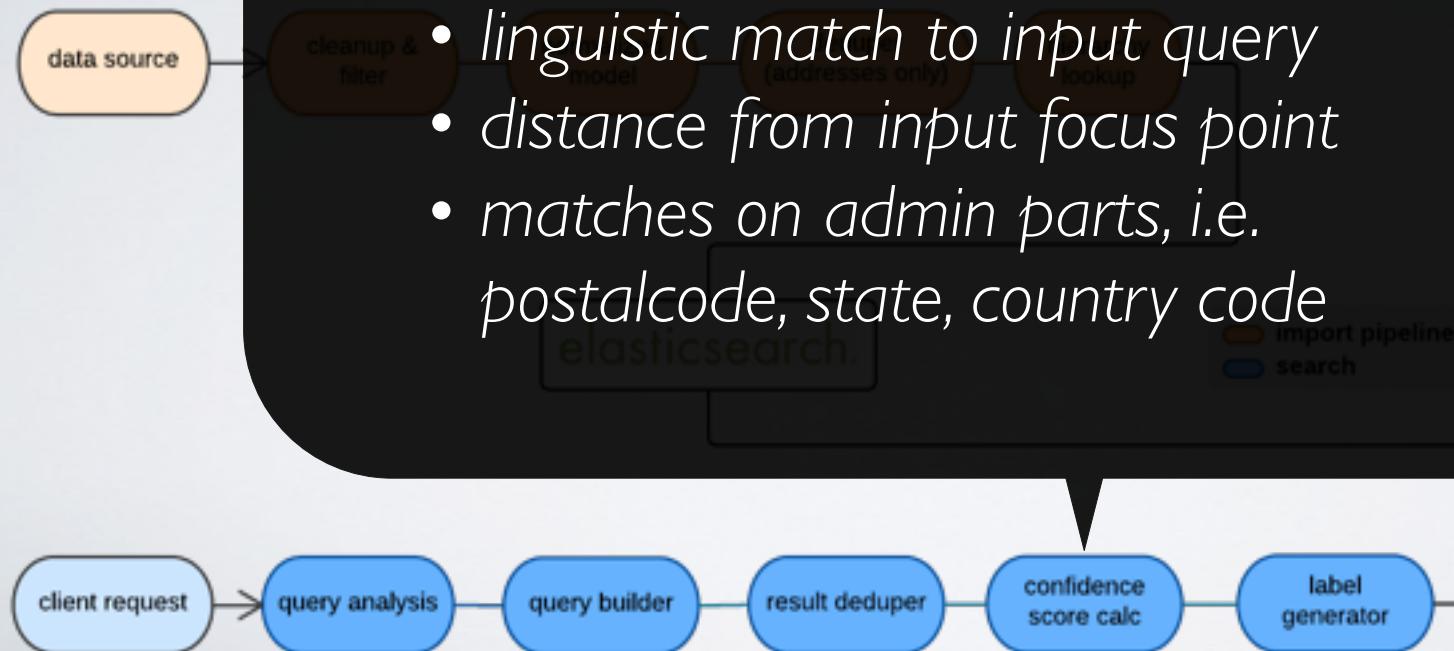
- *add proper boosting*
- *insert match clauses for each address part*
- *add geographic focus and filters*



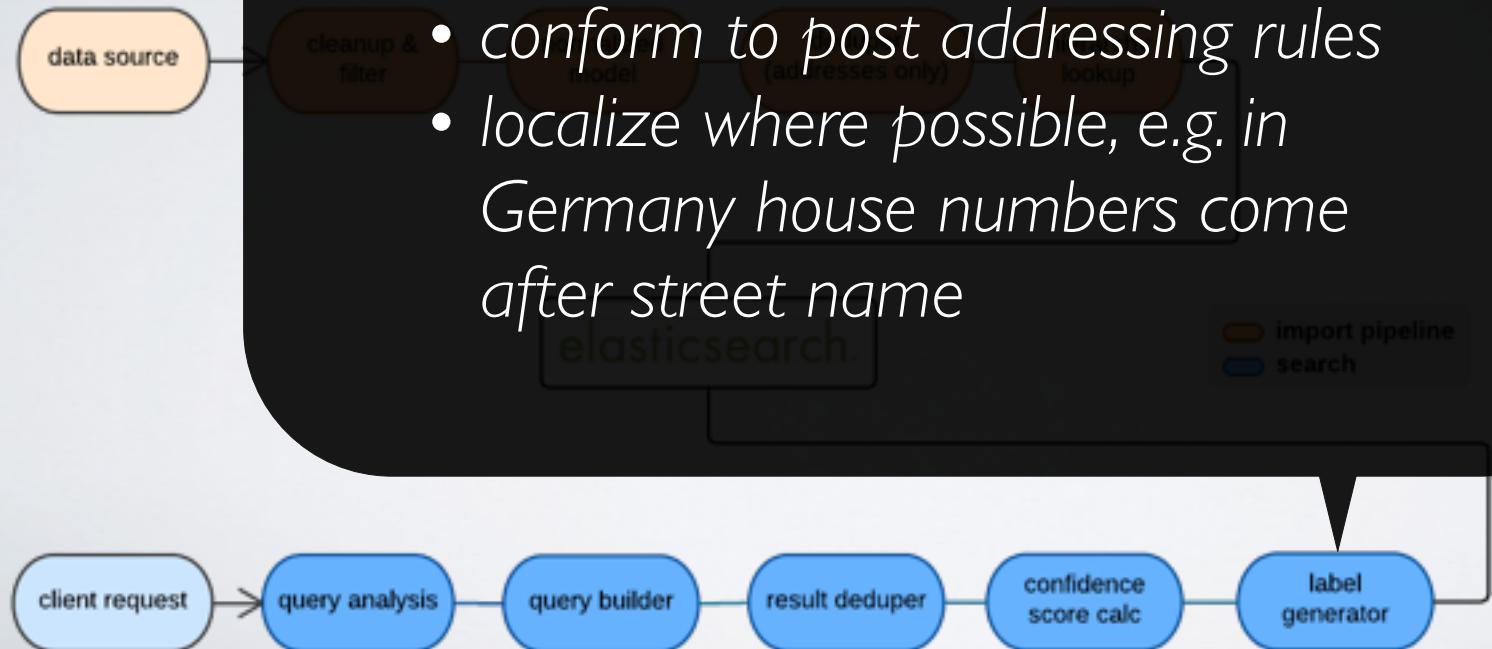
Combined data sources allow for duplicates in results



Compute the confidence score based on various factors



Generate result labels for easy presentation to end-user





data = ground truth

“

You are what you eat!

— Mom



Open Data: WHY?

FREE

Accessible

Community maintained

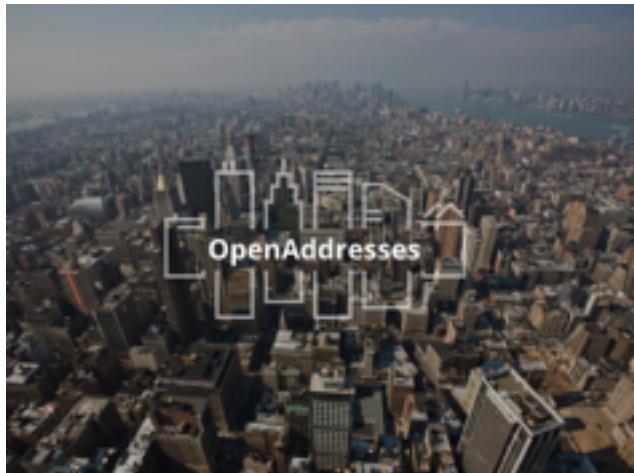
Open Data: WHERE?



OpenStreetMap

openstreetmap.org

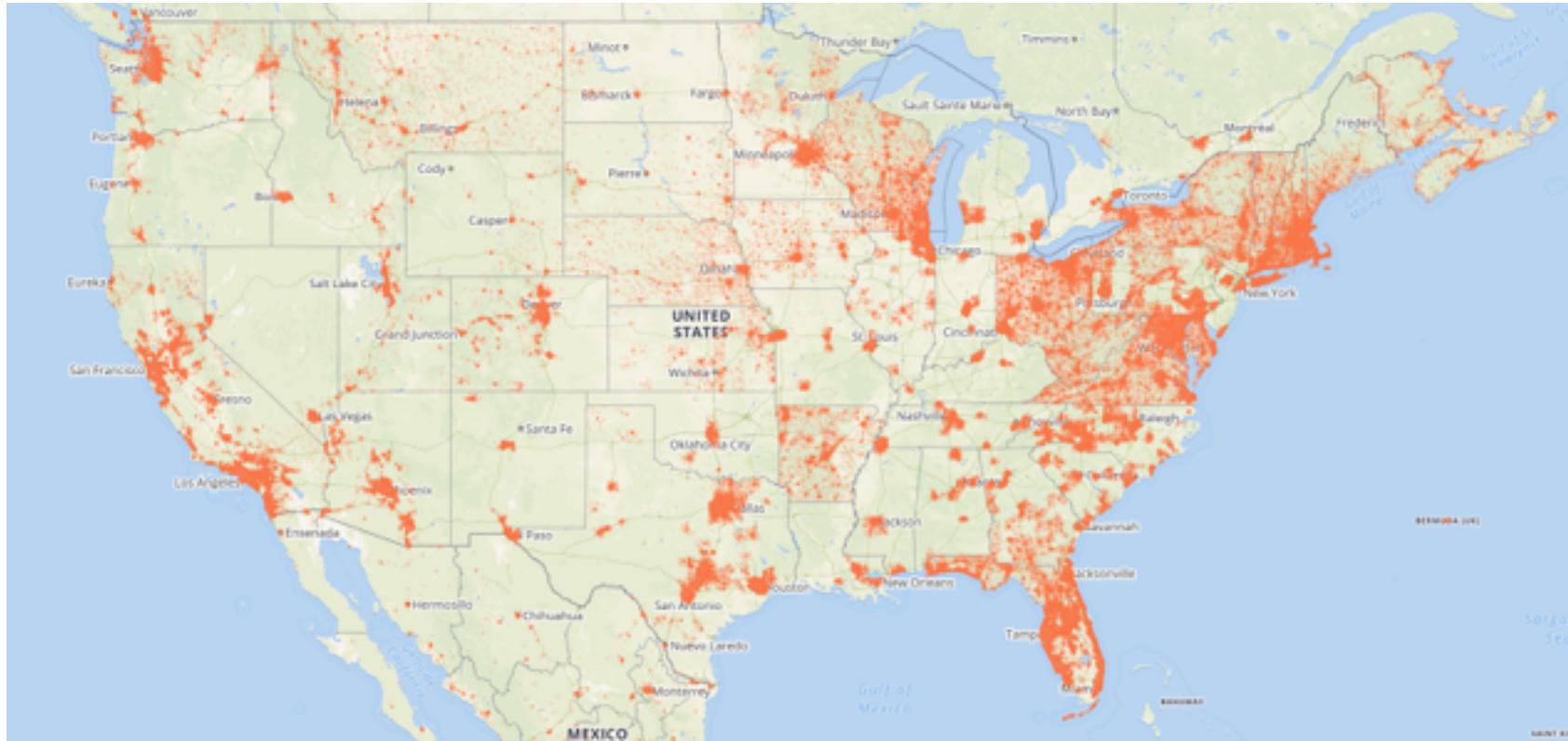
Open Data: WHERE?



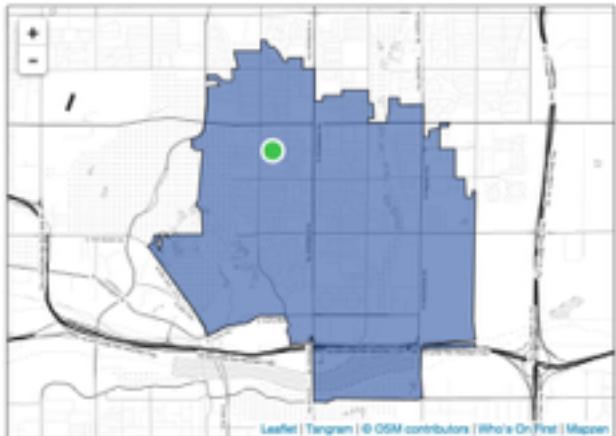
OpenAddresses

openaddresses.io

OpenAddresses



Open Data: WHERE?



Who's On First
whosonfirst.mapzen.com

Mapzen Search

Q: new york
Search mode: Start typing to autocomplete

- ① New York, USA
- ② New York, NY, USA
- ③ City of New York, Brooklyn, New York, NY, USA
- ④ New York City, Manhattan, New York, NY, USA
- ⑤ New York County, NY, USA
- ⑥ East New York, Brooklyn, New York, NY, USA
- ⑦ West New York, NJ, USA
- ⑧ Little New York, Guntersville, AL, USA
- ⑨ East New York, Brooklyn, New York, NY, USA
- ⑩ Town of West New York, West New York, NJ, USA

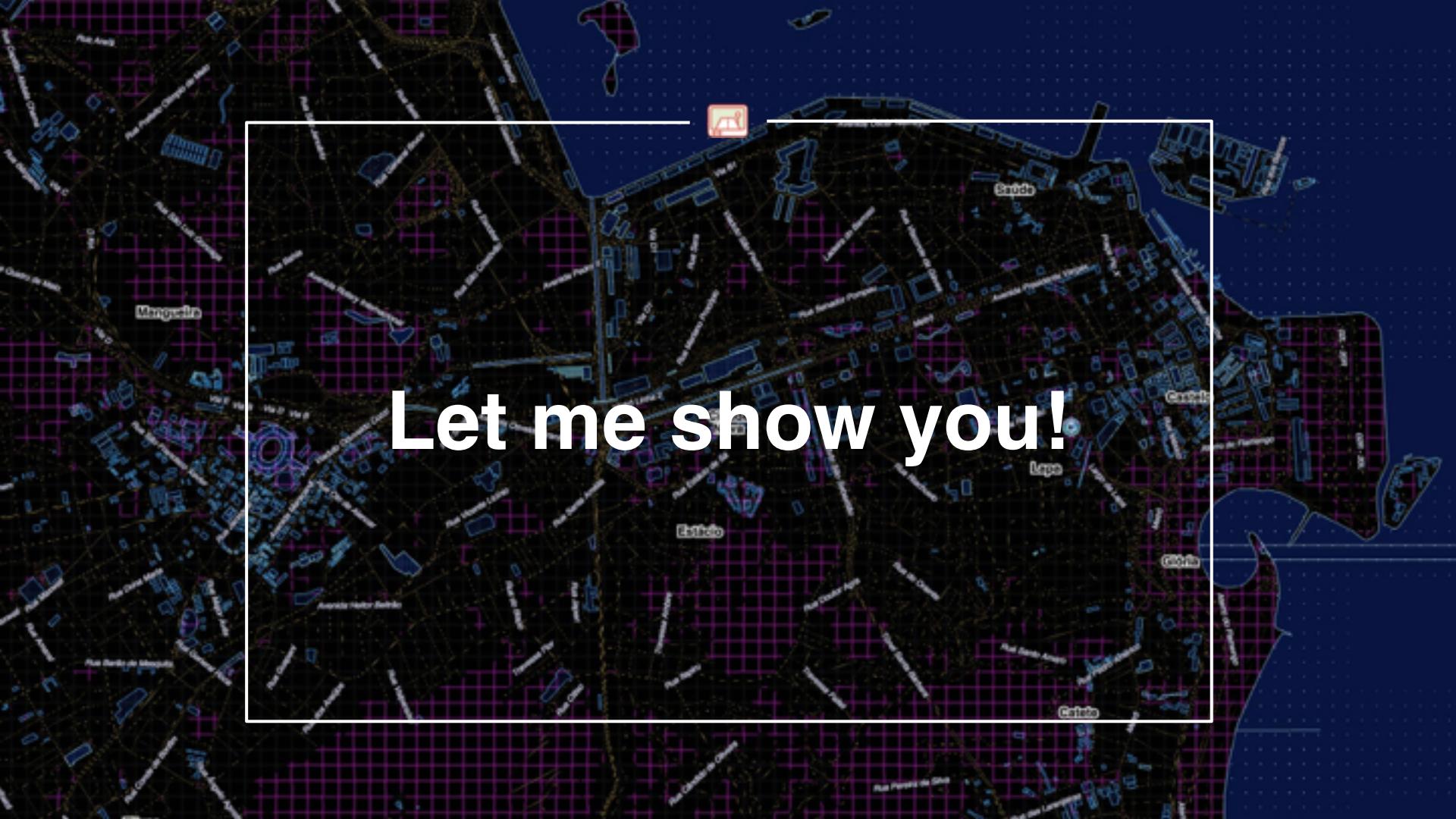
https://search.mapzen.com/v1/search?text=new%20york

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```

Flushing Park

Tylers River Park

Layer | Program | © OSM contributors. Drawing by Mapzen



Let me show you!

Mapzen Search

<https://mapzen.com/projects/search>

Mapzen Search API Documentation

<https://mapzen.com/documentation/search/>

Add the Mapzen Search geocoder to a map

<https://mapzen.com/documentation/search/add-search-to-a-map/>