

# Mapillary

**Pau Gargallo**  
@paugargallo

SotM CAT, Octubre 2015

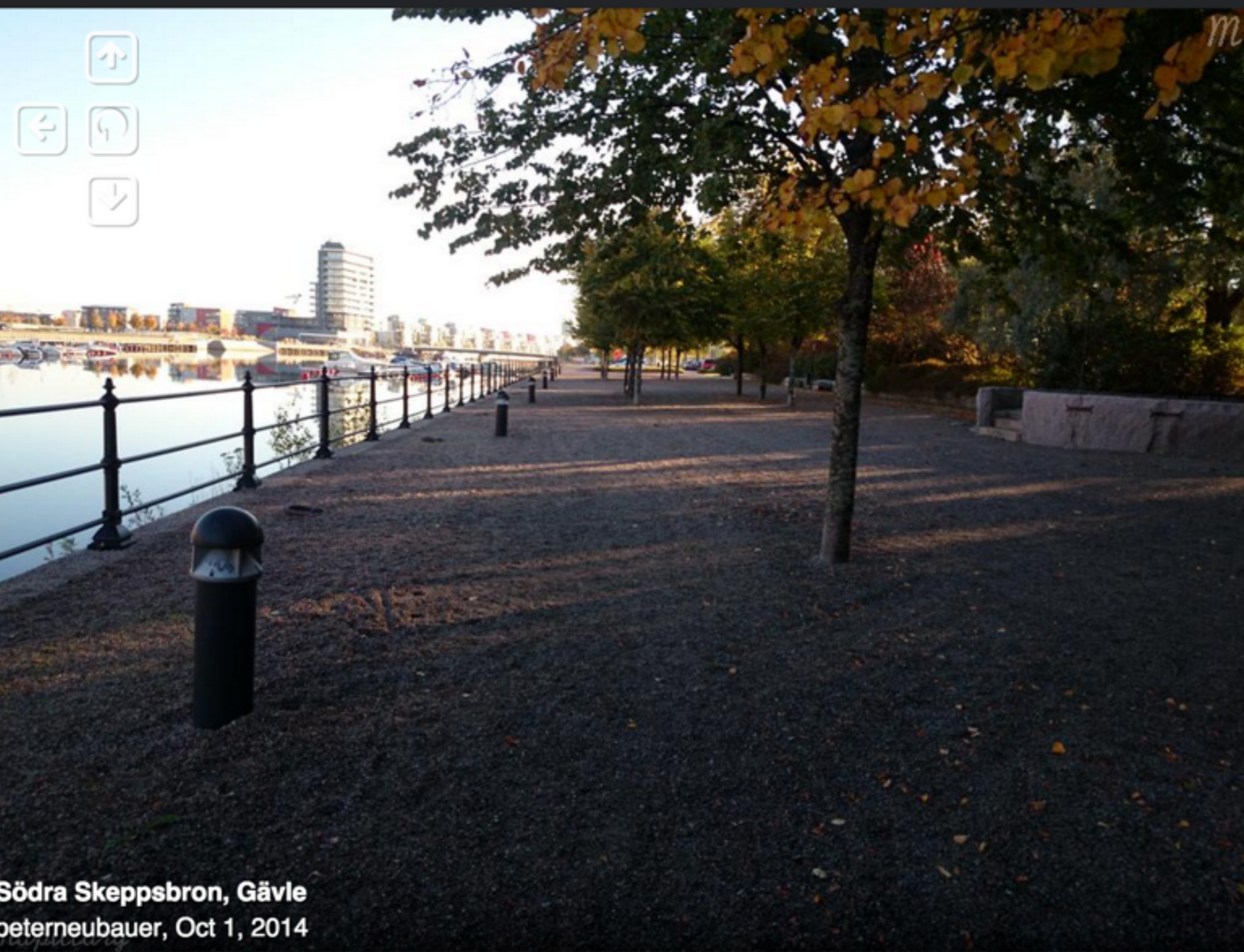


m

Mapillary is a service for crowdsourcing street level photos

Mapillary





Södra Skeppsbron, Gävle  
peterneubauer, Oct 1, 2014



© Mapbox © OpenStreetMap Improve this map

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✎ Edit

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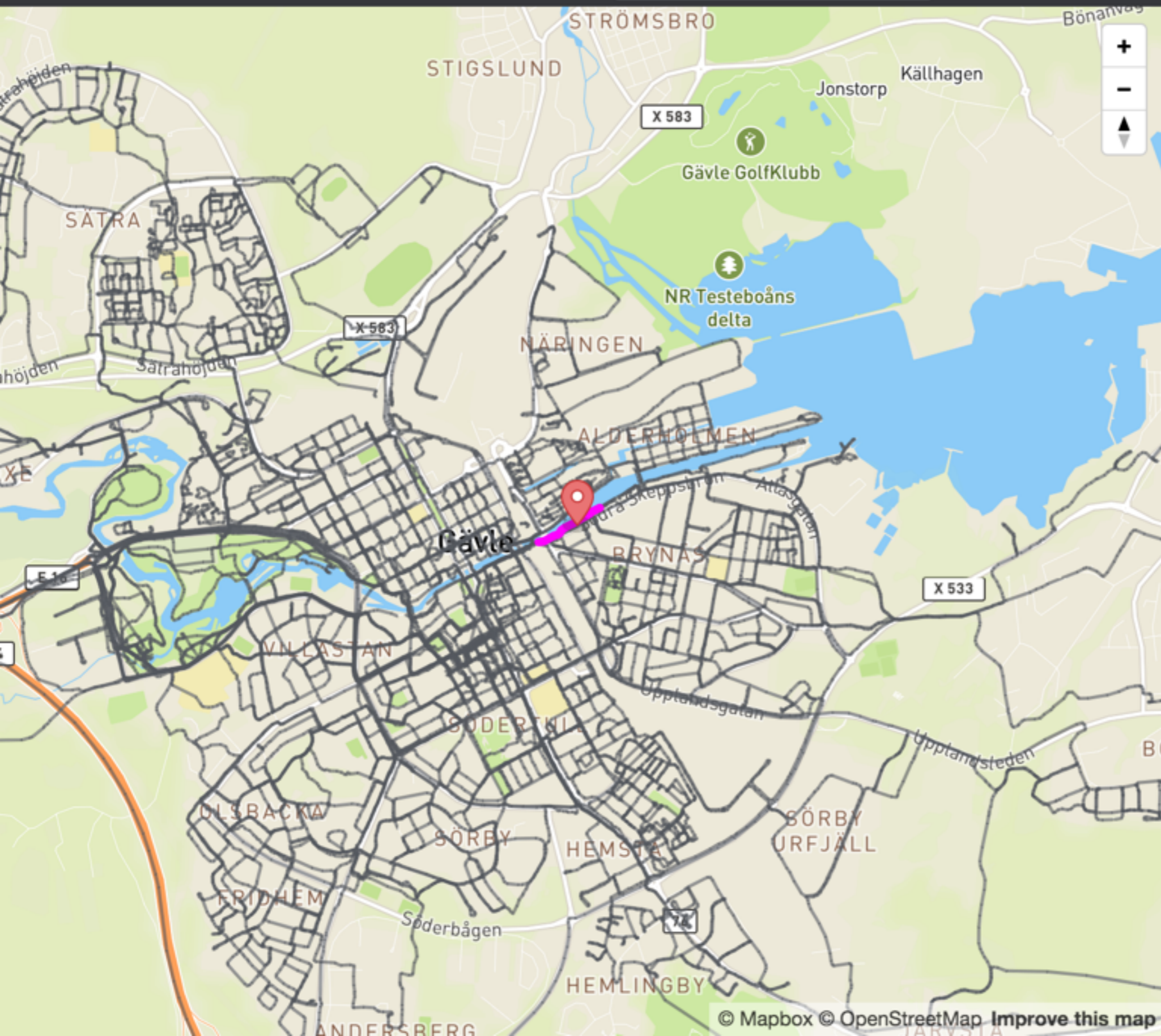
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The feature you're looking at is currently under development and might be rough around the edges. Feedback is always welcome. [Report Problem.](#)





**Södra Skeppsbron, Gävle**  
peterneubauer, Oct 1, 2014

- ▼ User Filter
- ▼ Time Filter
- ▼ Objects



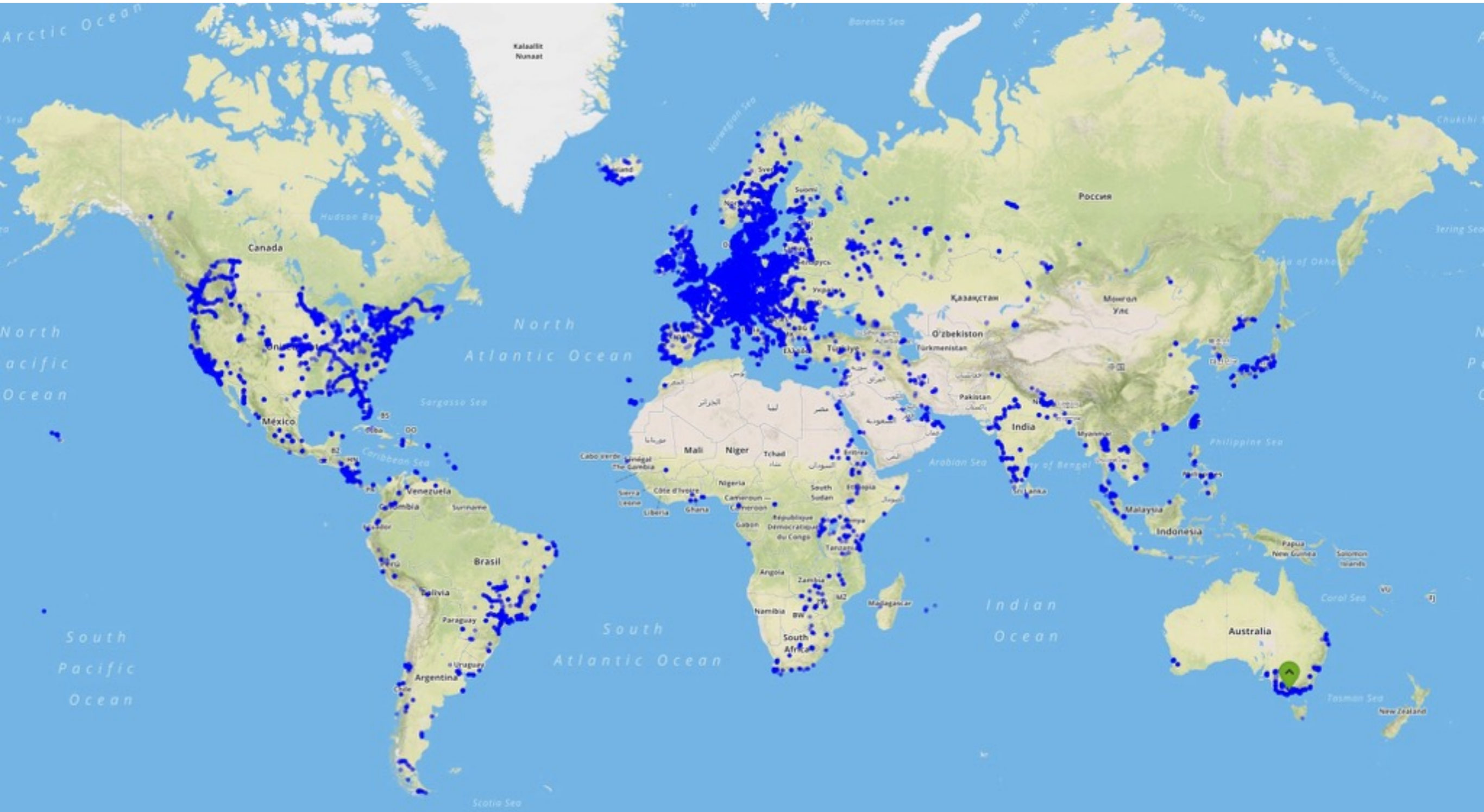


<http://vimeo.com/91600402>



A photo representation of the world that anyone can improve

37M photos 943000km



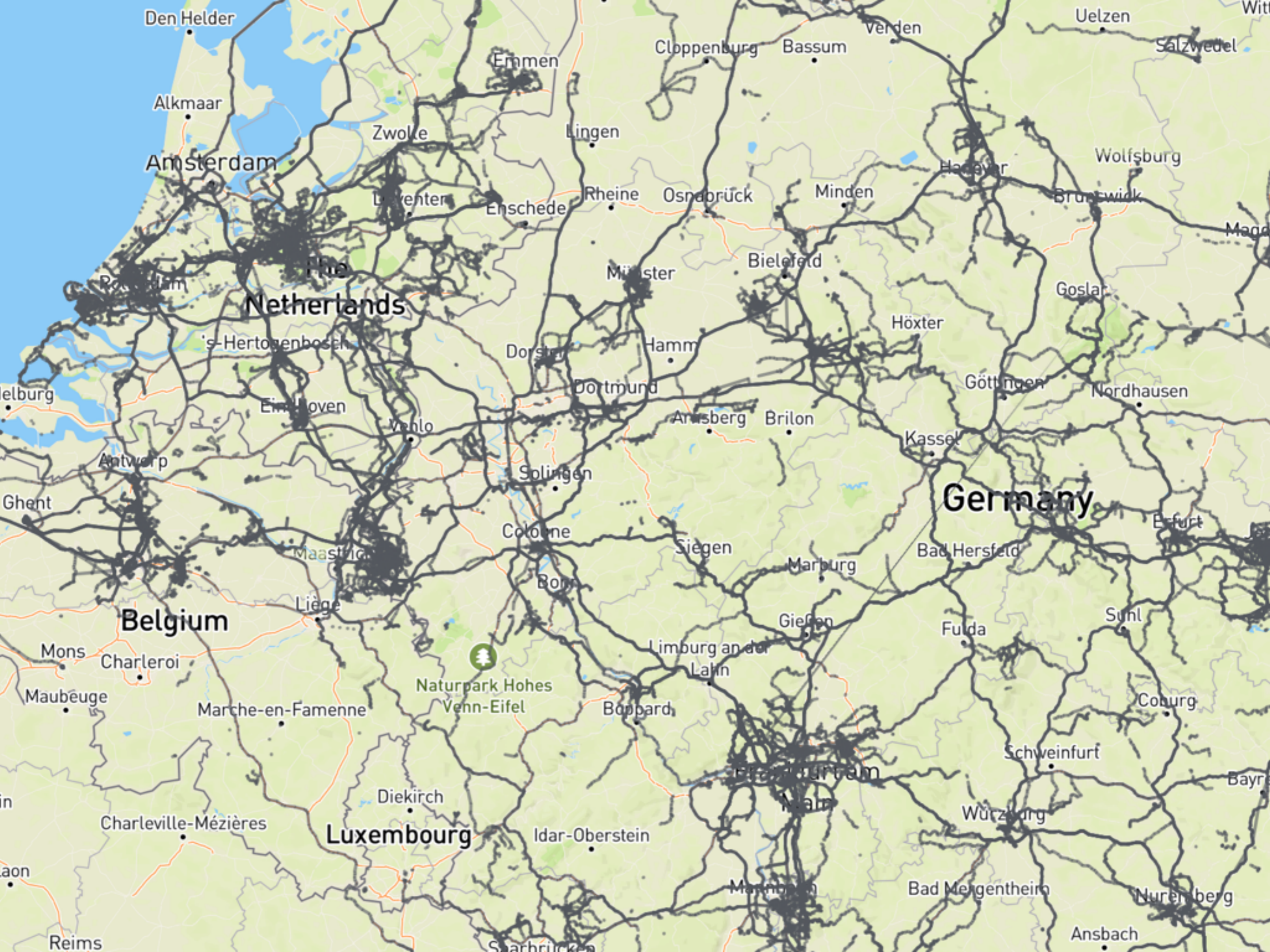


A photo representation of the world that anyone can improve

37M photos 943000km







**Netherlands**

**Germany**

**Belgium**

**Luxembourg**

Naturpark Hohes  
Venn-Eifel

Den Helder

Alkmaar

Amsterdam

Rotterdam

's-Hertogenbosch

Eindhoven

Venlo

Antwerp

Ghent

Maastricht

Liège

Mons

Charleroi

Maubeuge

Marche-en-Famenne

Charleville-Mézières

Diekirch

Reims

Emmen

Zwolle

Lingen

Leuven

Enschede

Rheine

Osnabrück

Minden

Münster

Bielefeld

Hildesheim

Wolfsburg

Brunswick

Dorsten

Hamm

Dortmund

Ansbach

Brilon

Höxter

Göttingen

Nordhausen

Kassel

Solingen

Cologne

Siegen

Marburg

Bad Hersfeld

Erfurt

Bonn

Gießen

Fulda

Suhl

Naturpark Hohes  
Venn-Eifel

Limburg an der  
Lahn

Boppard

Coburg

Frankfurt am  
Main

Schweinfurt

Würzburg

**Luxembourg**

Idar-Oberstein

Mainz

Bad Mergentheim

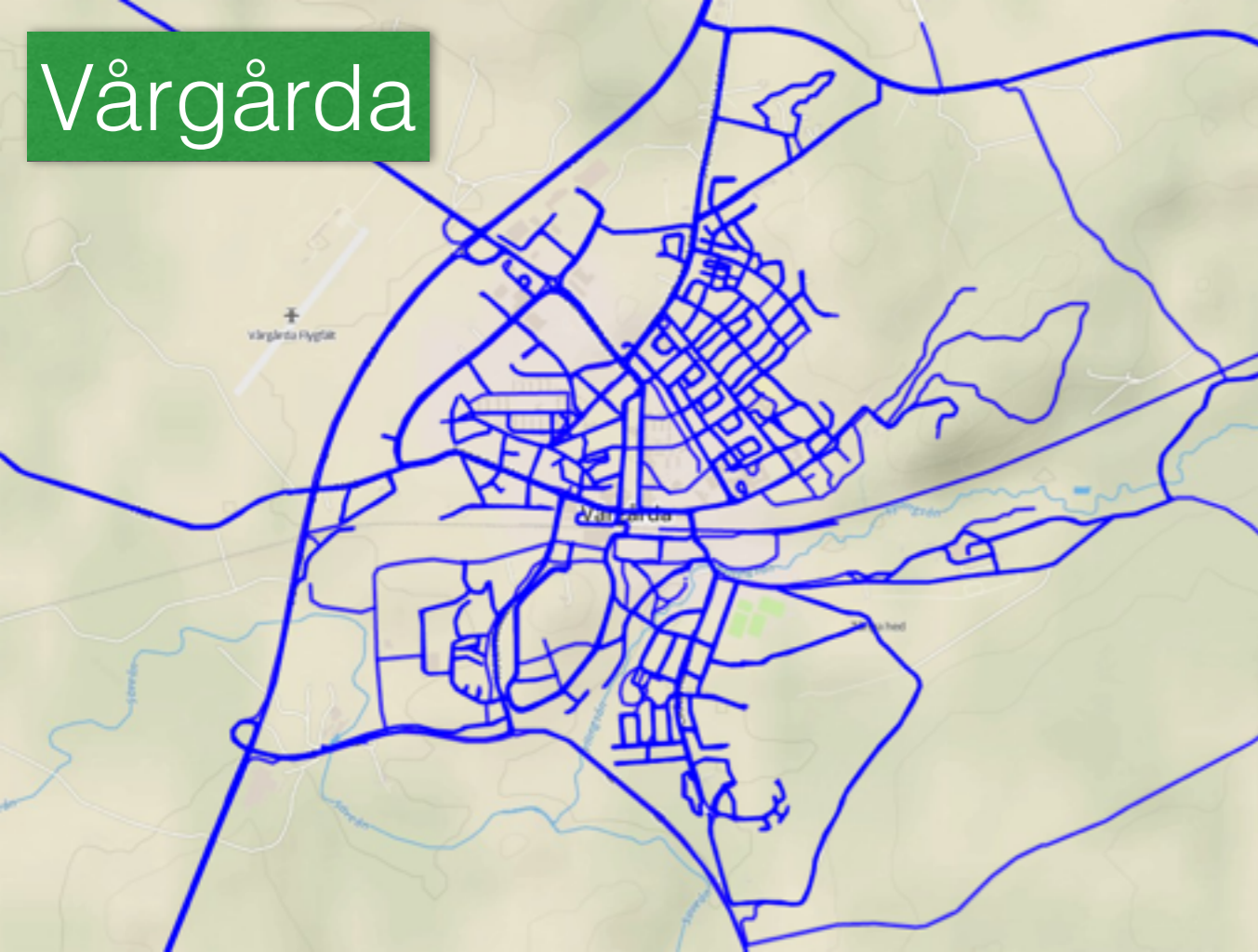
Nürnberg

Ansbach

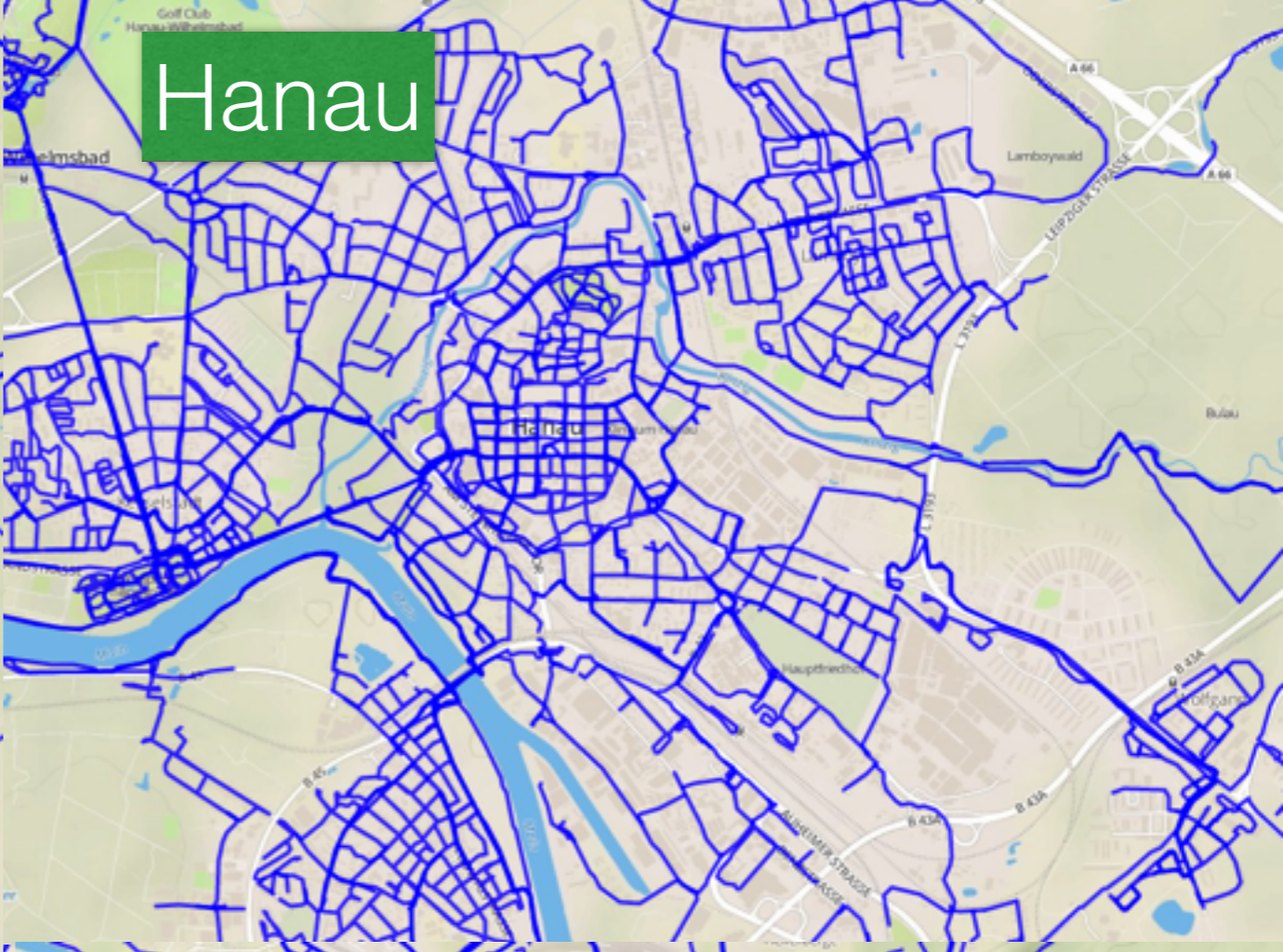
Saarbrücken



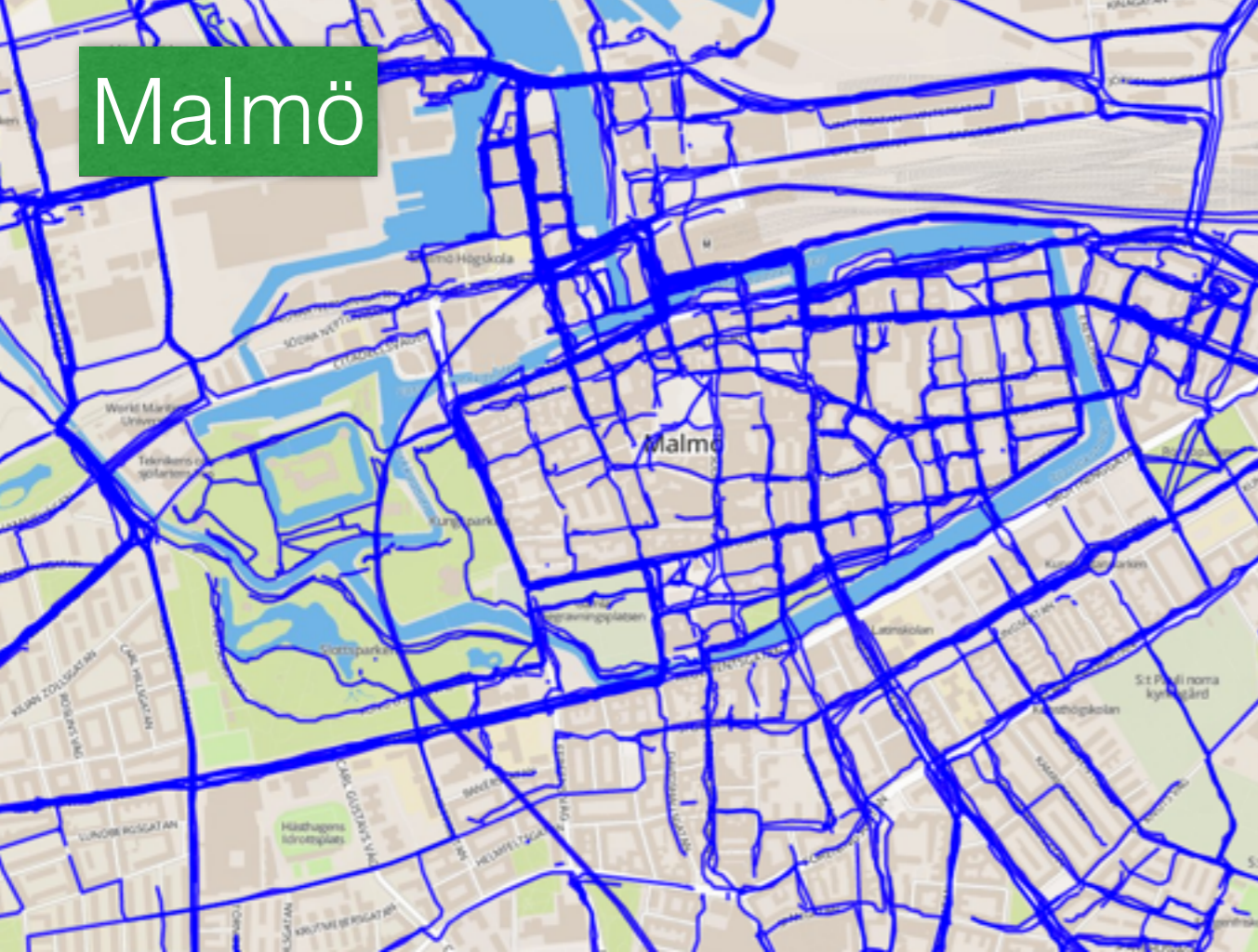
Vårgårda



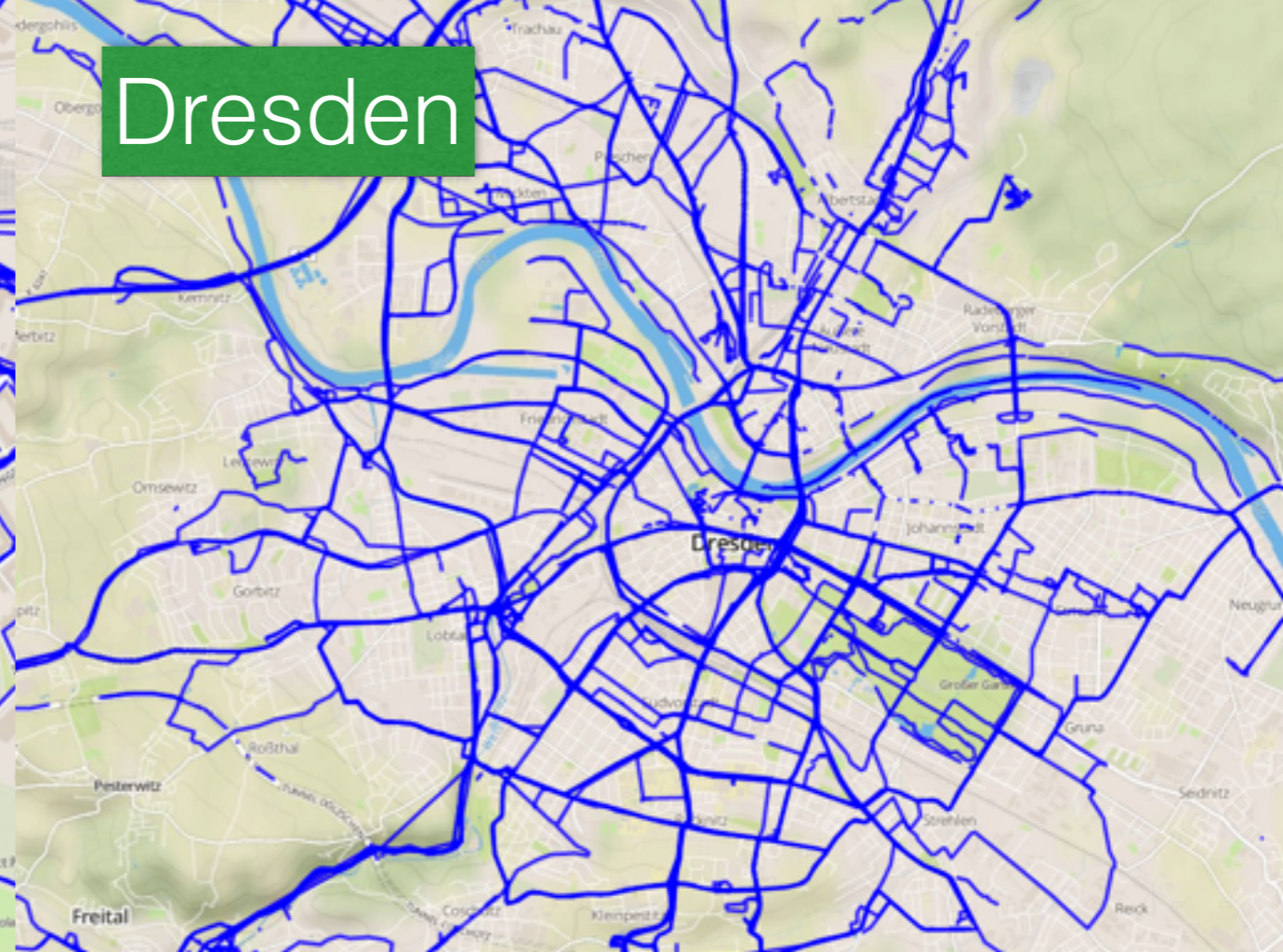
Hanau



Malmö

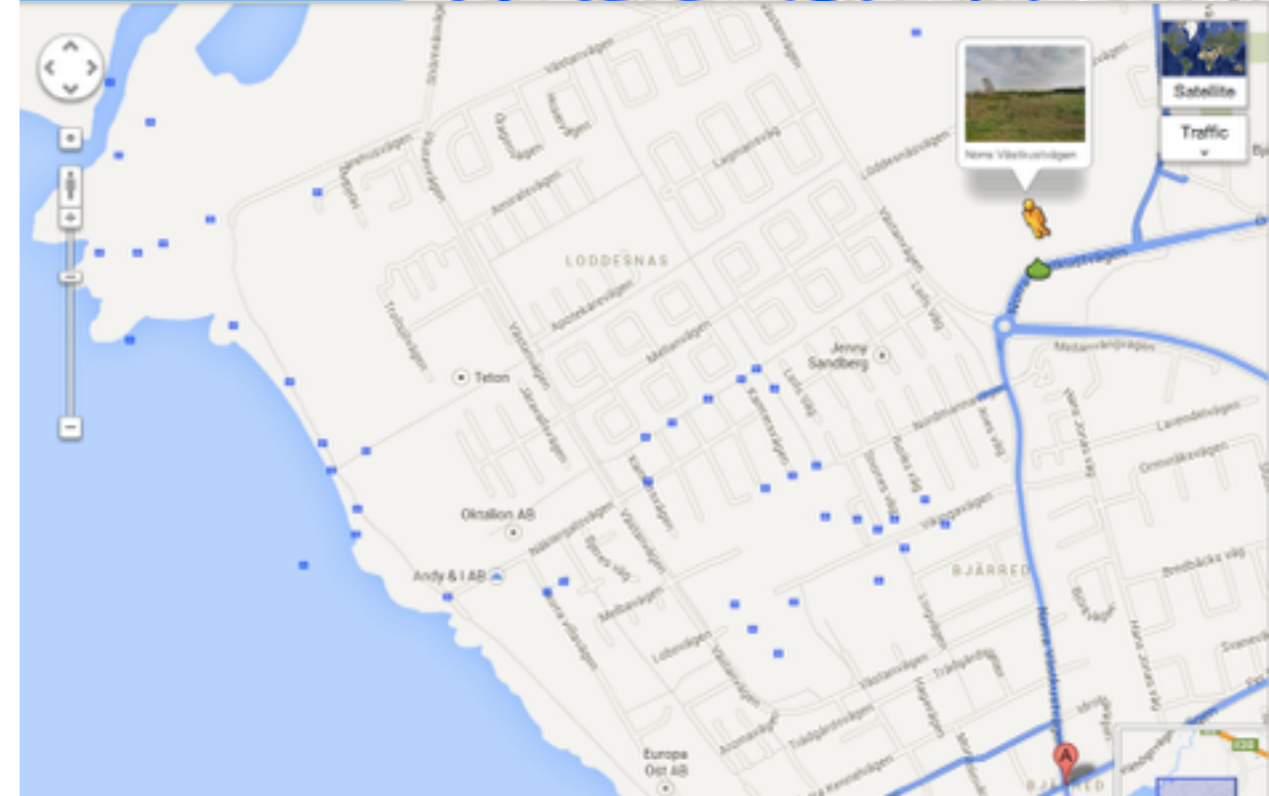


Dresden





# Better reach, fresher content





# Image Processing

Blur license plates



Blur faces

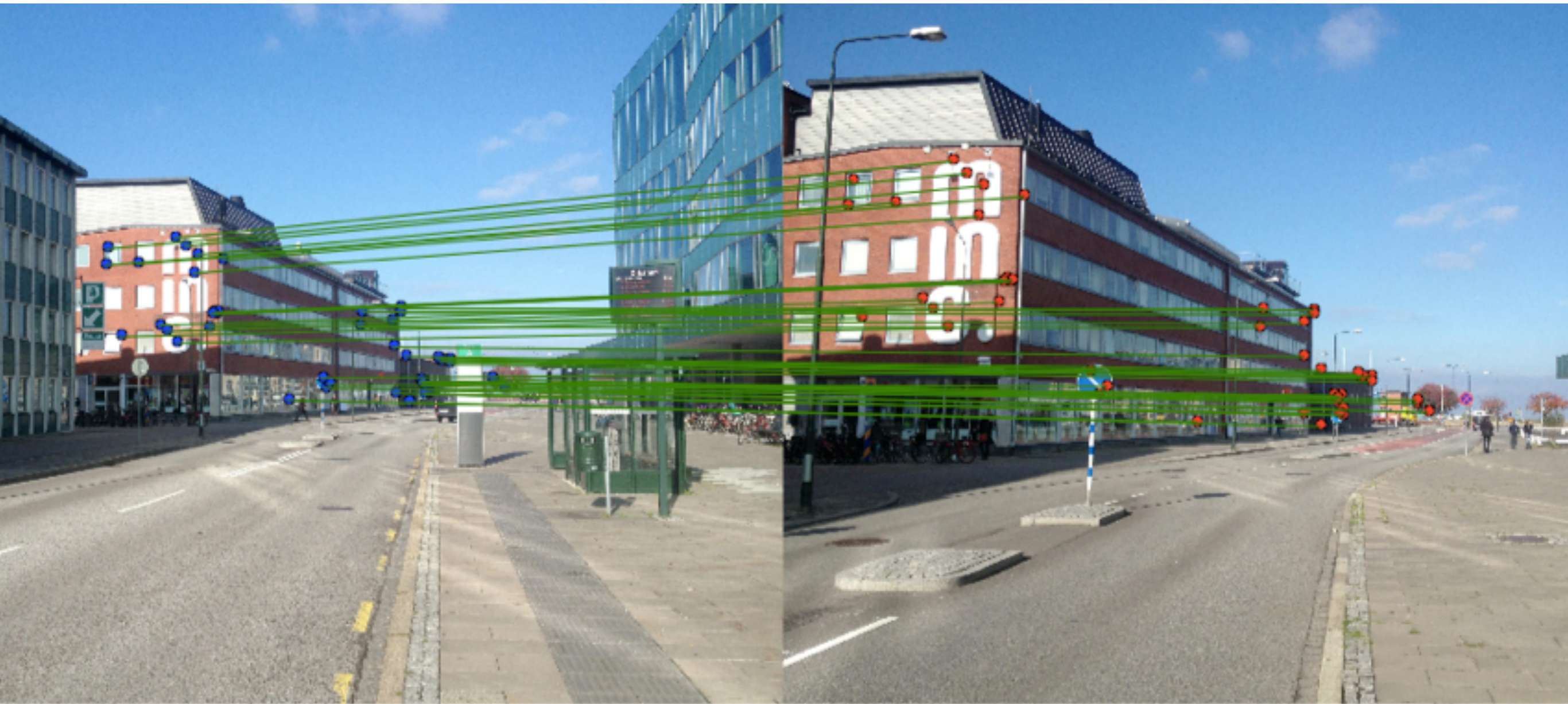


Detect traffic signs



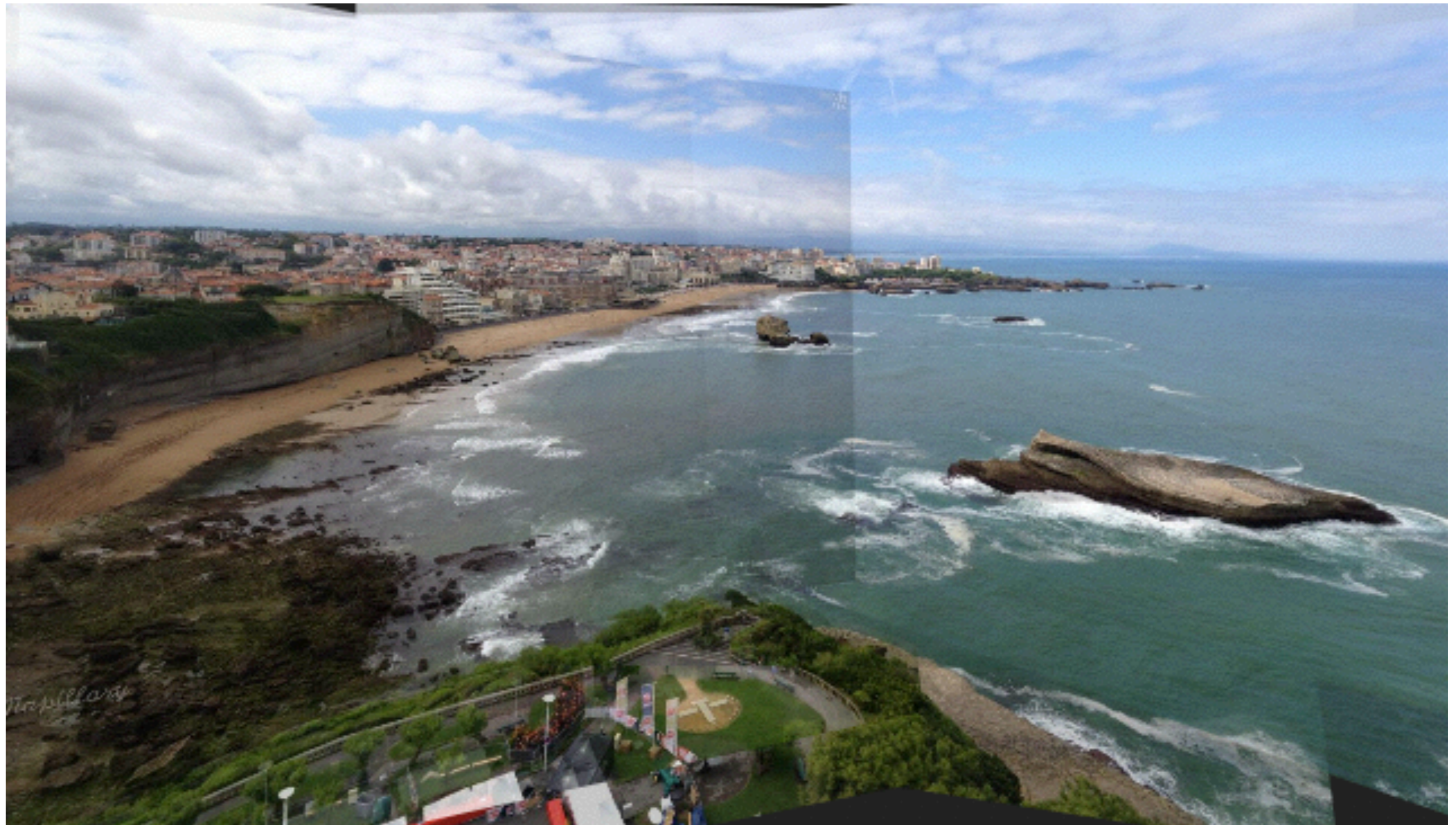


# Image Matching





# Image Stitching



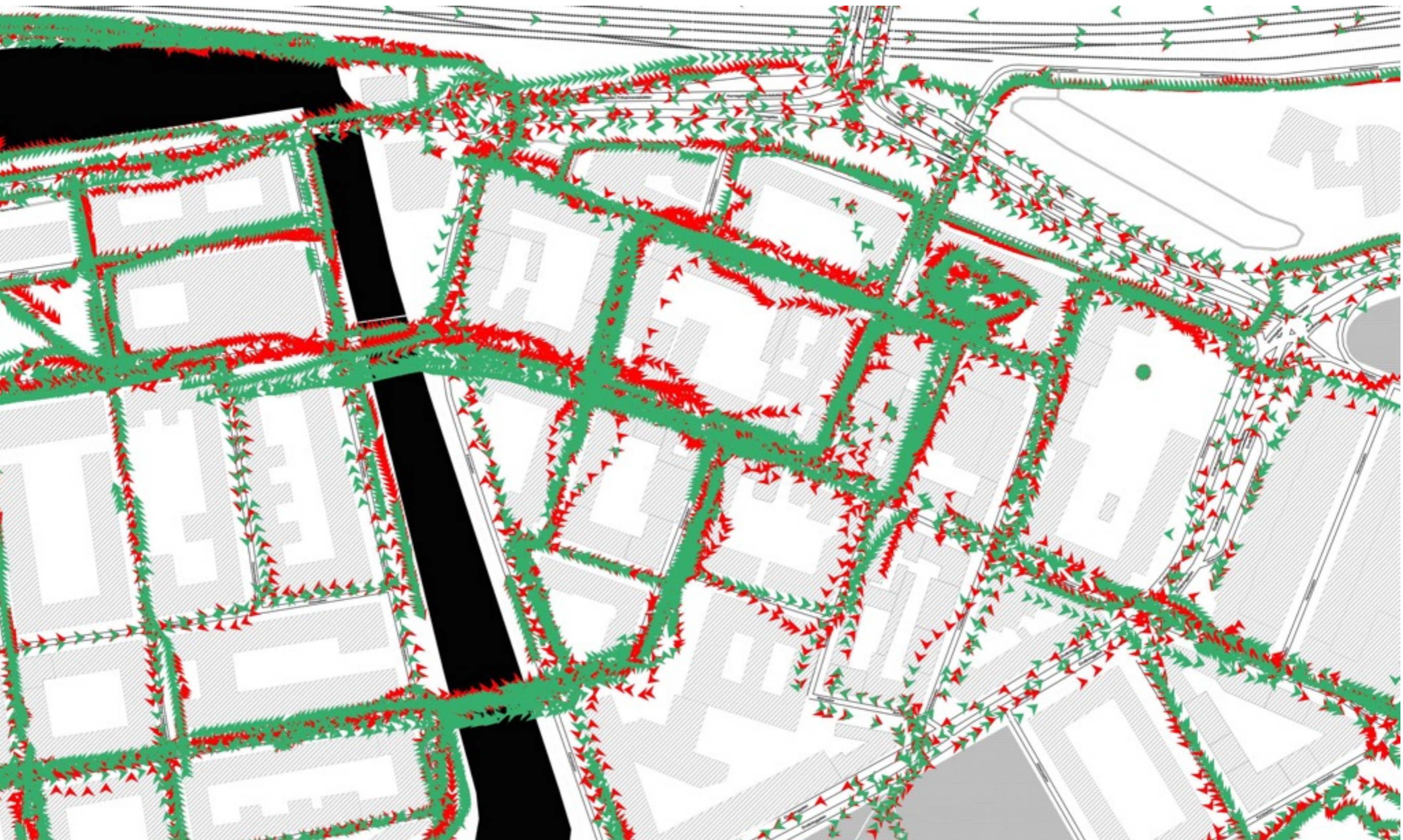




Started to 3D map cities using OpenSfM  
<https://github.com/mapillary/OpenSfM>

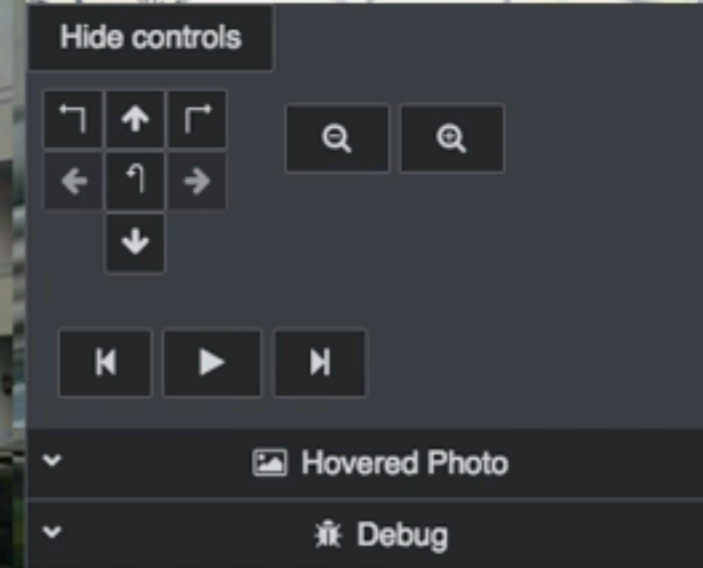
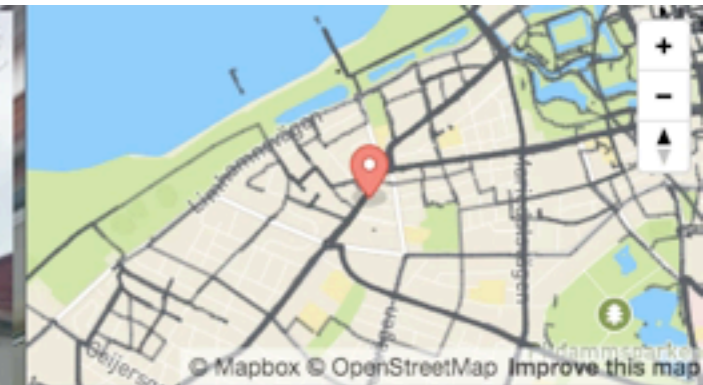


# Localizing with 3D



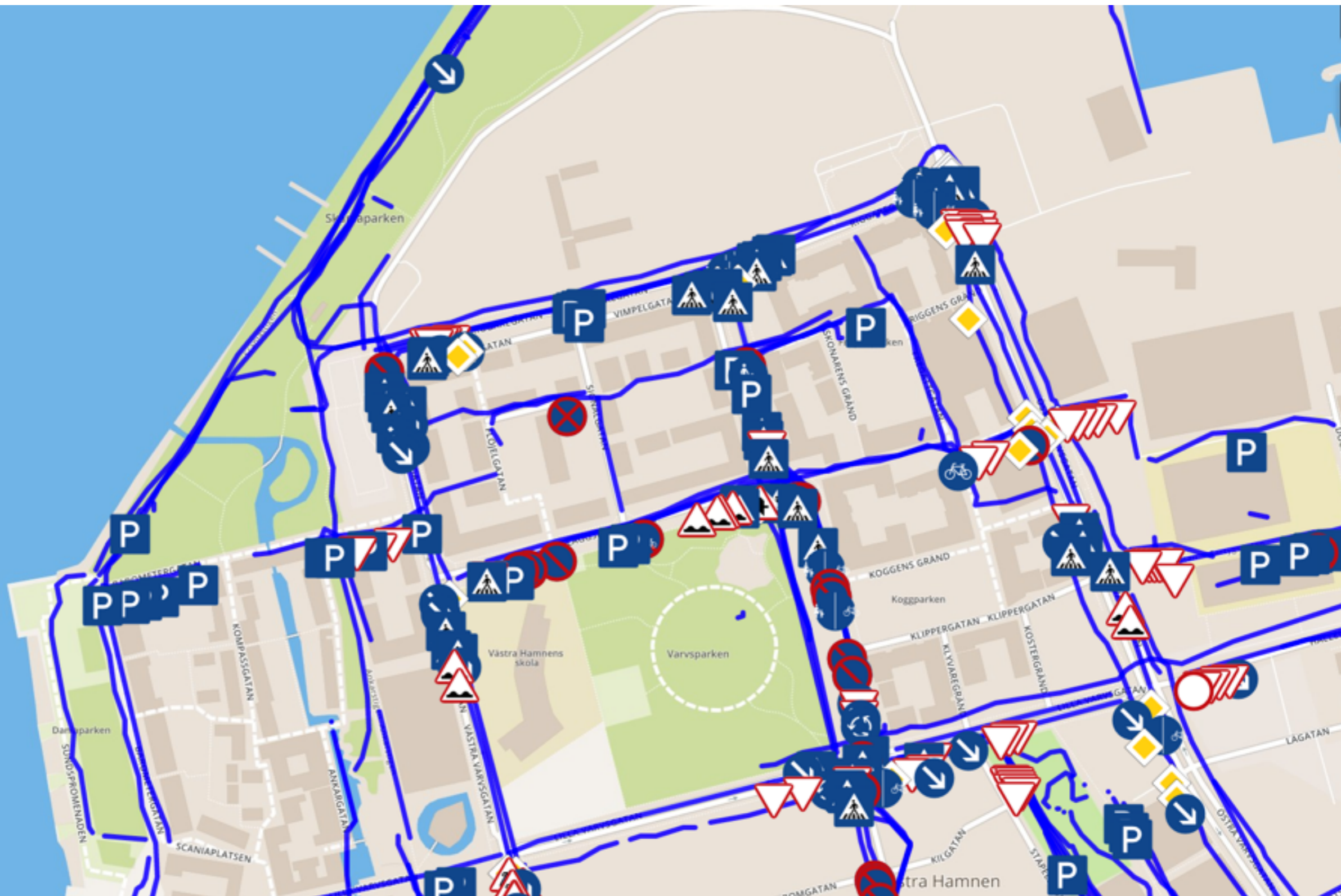


# Vector Data & 3D





# Traffic Sign Recognition

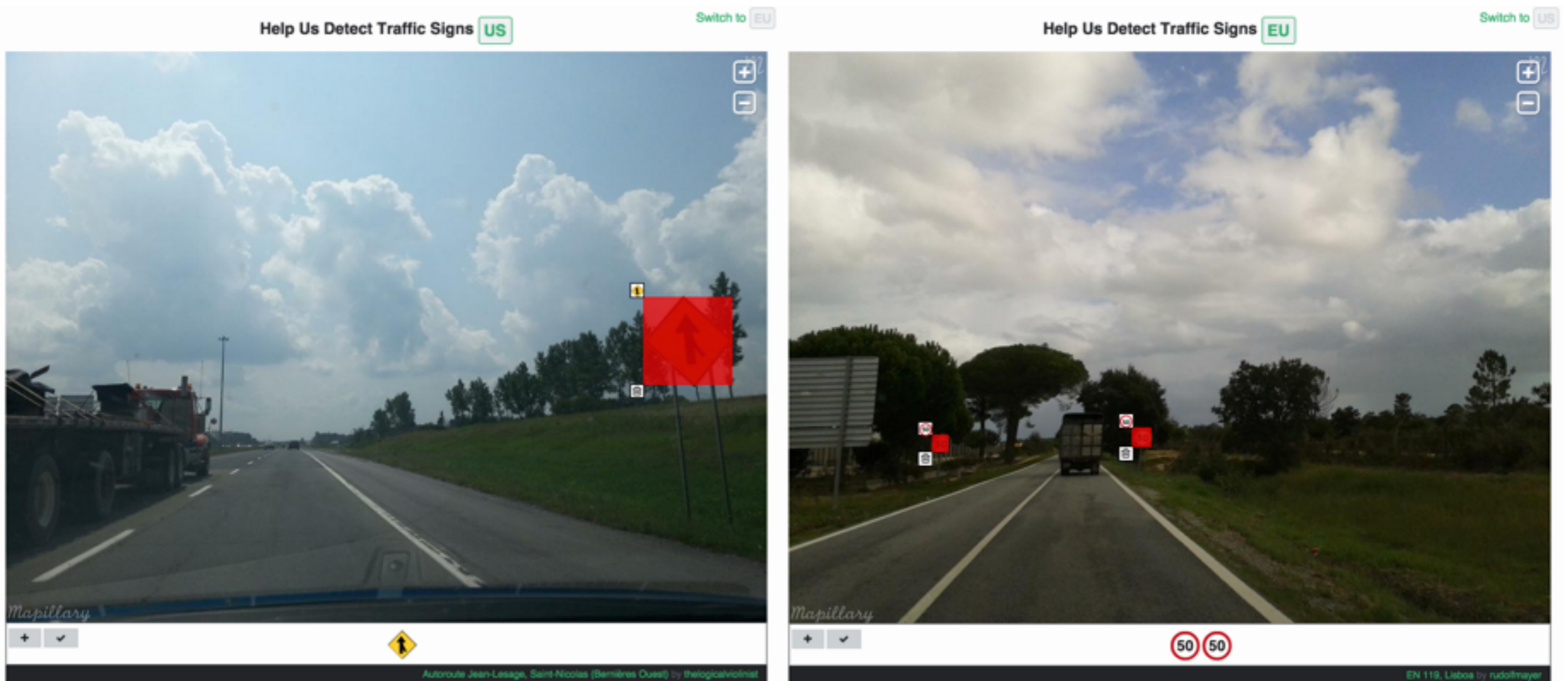




# Traffic Sign Game

6M signs detected  
EU (3.6 M), AU(1.5M), US (610K), ...

125k images verified/edited using the game





# Traffico

Open source traffic sign icon font  
(MIT license)

<http://traffico.io/>



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Made with ♥ at [Mapillary](https://www.mapillary.com/)



# Mapillary uses

- OSM is allowed to use Mapillary for ALL derived data
- All processed thumbnails are under CC BY-SA license (Wikipedia etc)
- HOT, MissingMaps, Red Cross (Haiti, Lesotho, ...)
- Bike lanes, pedestrian streets and hikes
- Speed limits, Lanes, Fire hydrants
- Private projects



# Mapillary OpenStreetMap

Derive data from Mapillary photos  
(street numbers, signs, objects, road details)

Use data extracted from photos  
(traffic signs, etc)

Use GPS traces from photo sequences

Examples and details

<https://www.mapillary.com/osm.html>



# Mapillary ♥ iD

## Mapillary iD Editor for OpenStreetMap



Peter Neubauer

🕒 Posted on 19 Aug 2014

We have been working closely with the [OpenStreetMap](#) community in order to find the best way to leverage all the fantastic coverage that is starting to emerge on Mapillary to improve OpenStreetMap data.

## Mapillary in the OpenStreetMap iD Editor



Peter Neubauer

🕒 Posted on 21 Oct 2014

As we have written in an [earlier blog post](#), we have been working with the OpenStreetMap iD editor developers to integrate Mapillary as a source for editing OpenStreetMap.

## Mapillary Traffic Signs in iD



Peter Neubauer

🕒 Posted on 02 Jun 2015

After the first steps of [integrating iD and Mapillary](#), we are happy to announce that we have integrated the Mapillary Street Signs as a layer into [our fork of the iD editor](#). This was done together with the help of the OpenStreetMap community and the fantastic developers at



# Mapillary ♥ iD

### Edit feature

Point Line Area

**Residential Road**

Name: Adelgatan

One Way:  Yes

Speed Limit: 40, 50, 60... km/h

Structure:  Bridge  Tunnel  Embankment  Cutting  Ford

Access:

|                |     |
|----------------|-----|
| General        | yes |
| Foot           | yes |
| Motor Vehicles | yes |
| Bicycles       | yes |
| Horses         | yes |

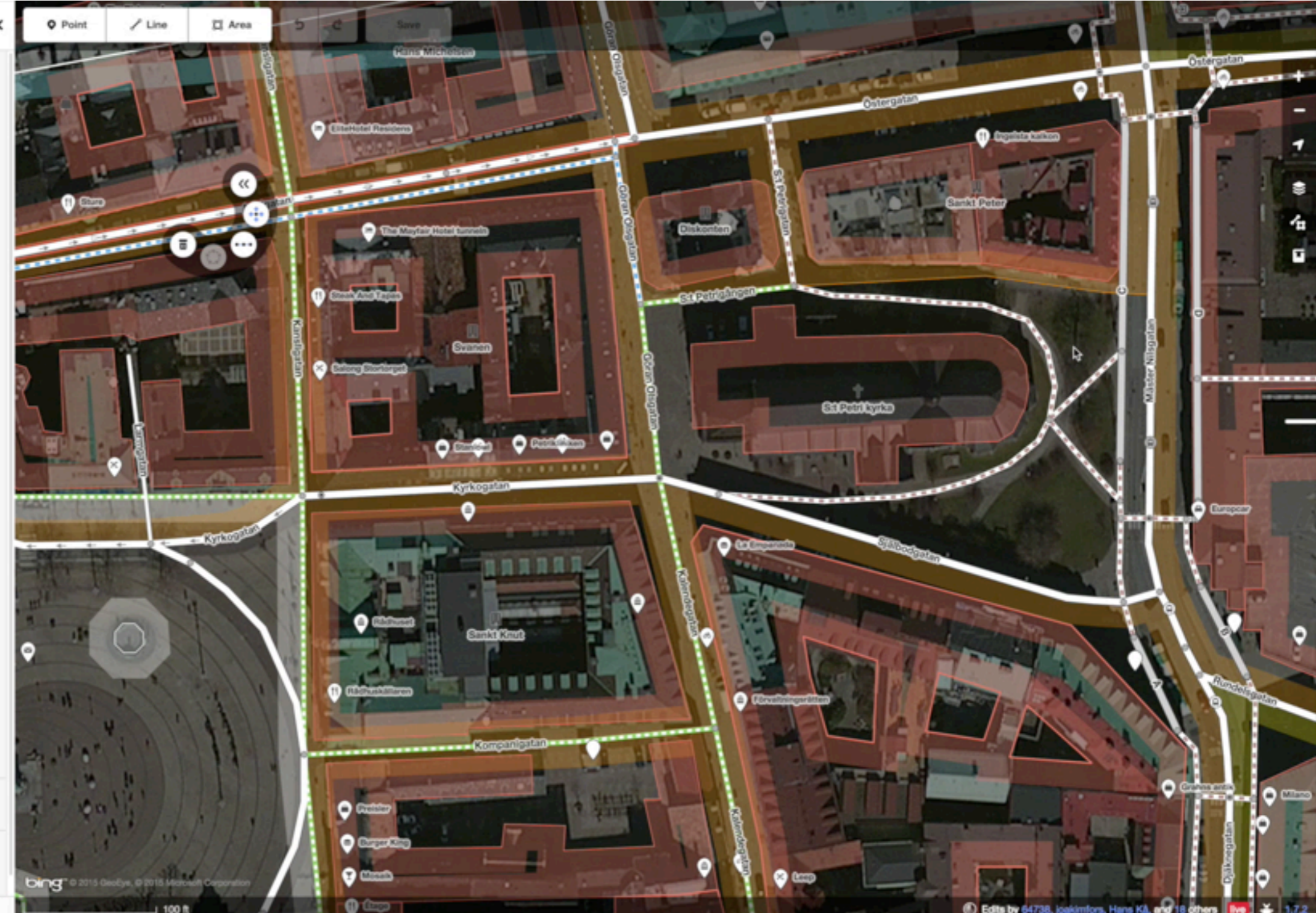
Surface: cobblestone

Add field: Address, Elevation, Note...

All tags (4)

All relations (0)

[View on openstreetmap.org](#)



bing™ © 2015 GeoEye, © 2015 Microsoft Corporation

100 ft

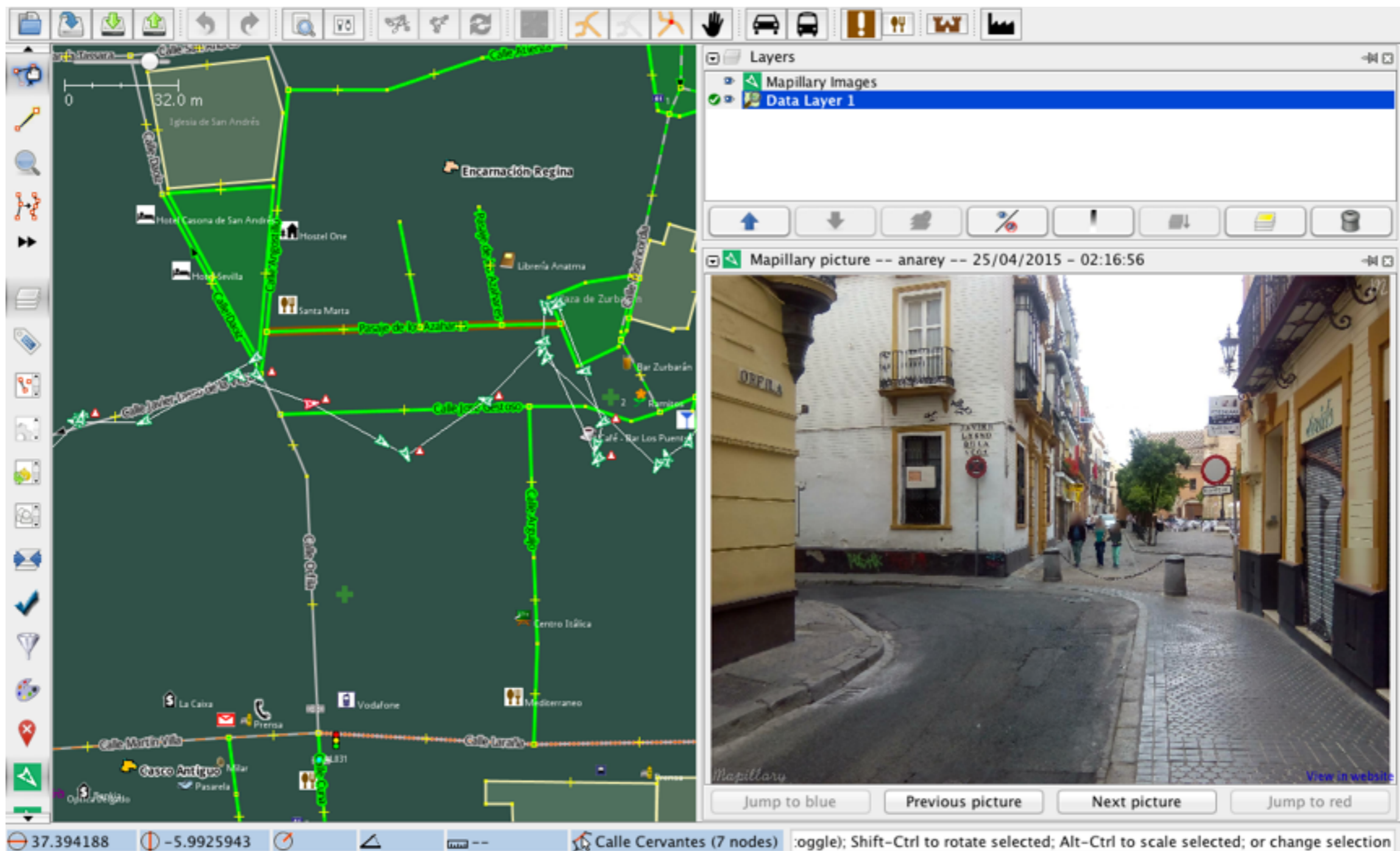
Edits by 64738, joakimfors, Hans KÅ, and 18 others live 1.7.2



# JOSM Integration

by **Jorge López (Nokutu)** with mentor **Polyglot**

[http://wiki.openstreetmap.org/wiki/Google\\_Summer\\_of\\_Code/2015/Mapillary\\_plugin\\_for JOSM](http://wiki.openstreetmap.org/wiki/Google_Summer_of_Code/2015/Mapillary_plugin_for JOSM)





# Red Cross / Missing Maps



<http://www.mapillary.com/map/im/g85s3WTI5EQD3SnKeuQZGg>



# Red Cross / Missing Maps

The screenshot displays the Mapillary web interface. At the top, the navigation bar includes the Mapillary logo, links for 'How It Works', 'Explore', 'Developers', 'Business', and 'Blog', and a user profile for 'paulinus'. Below the navigation bar are tabs for 'Photo', 'Map', and 'Search', along with a 'BETA' badge. The main content area is split into two sections. On the left is a large street view photo showing a dirt road with a Red Cross vehicle in the foreground. The vehicle's logo is clearly visible. On the right is a map inset showing the location of the photo, with a red pin and labels for 'CANAAN', 'Hatte', 'Route Gorail', and 'Usine Nadal'. Below the map are controls for zooming and a 'BETA' badge. A metadata panel on the right side of the photo includes buttons for 'Share', 'Edit', and 'Blur', as well as expandable sections for 'Related Photos', 'Comments', and 'Photo Details'. A message at the bottom of the metadata panel states: 'The feature you're looking at is currently under development and might be rough around the edges. Feedback is always welcome. Report Problem.'

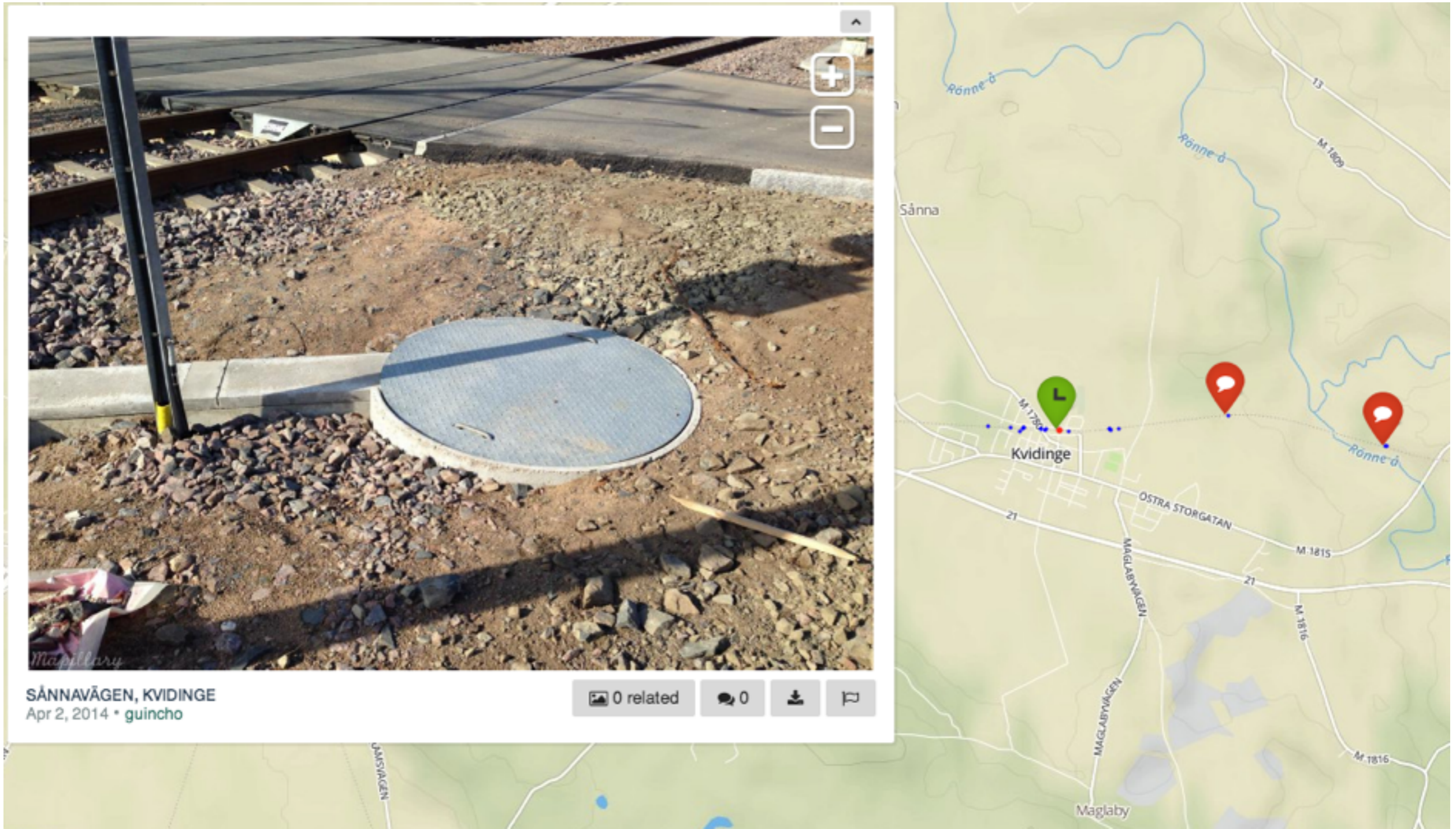
Rue Canaan, Commune Croix-des-Bouquets  
calimapnerd, Feb 5, 2015

<http://www.mapillary.com/map/im/g85s3WTI5EQD3SnKeuQZGg>



# Private street view

Access control and ArcGIS integration





# A look ahead

- **Recognizing more**
  - Road markings
  - Frequent stationary objects  
(bus stop, fire hydrant, mail box, trash bin, lights, ...)
  - OCR and highway signs
- **Recovering 3D and measurements**
  - Improving localization
  - Connecting photos and better viewing
  - Measure distances and positions



# Thanks

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mapillary.com

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