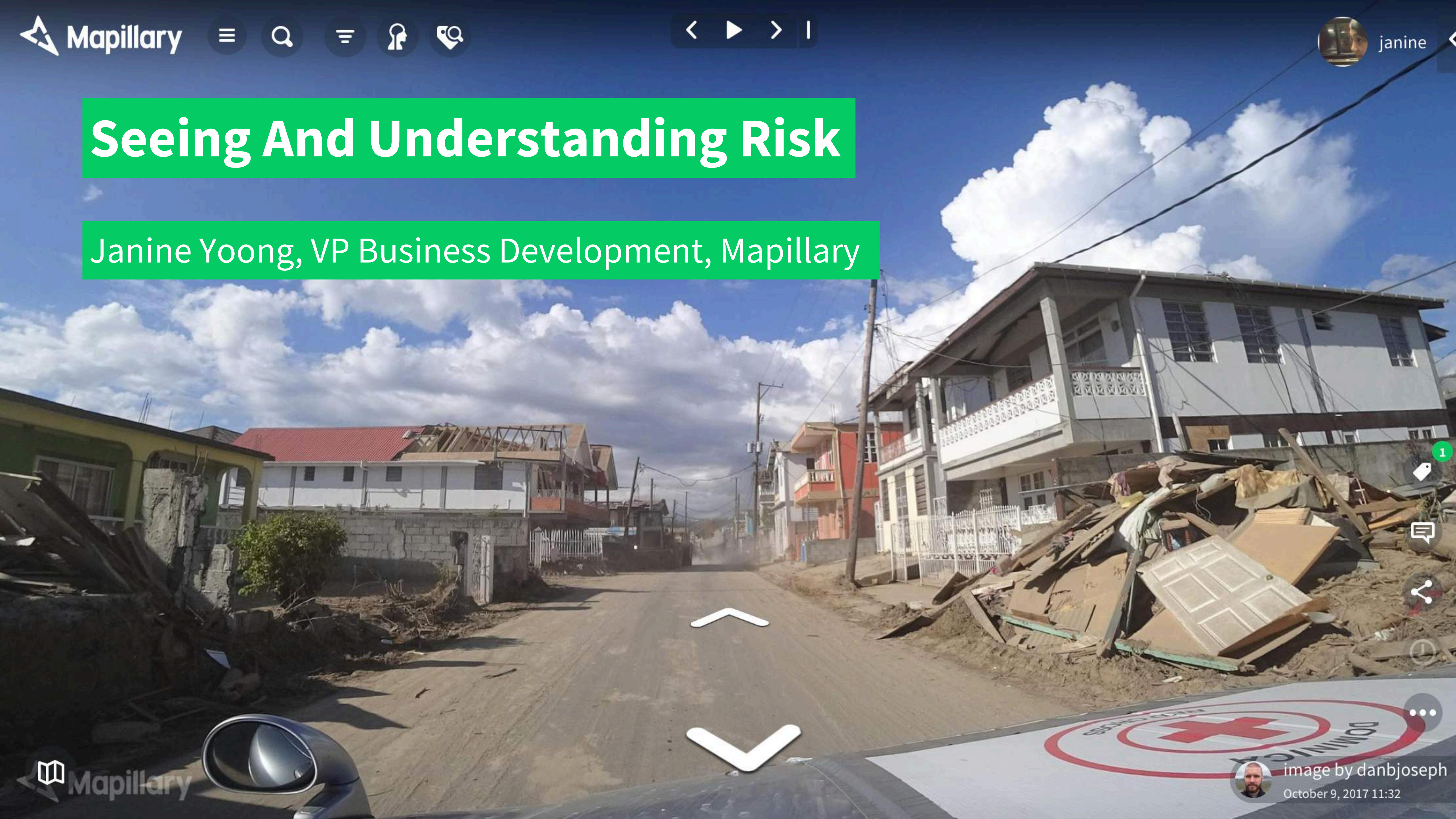


# Seeing And Understanding Risk

Janine Yoong, VP Business Development, Mapillary







Utility Pole



1





# From cats....

[bit.ly/ur-demo](https://bit.ly/ur-demo)

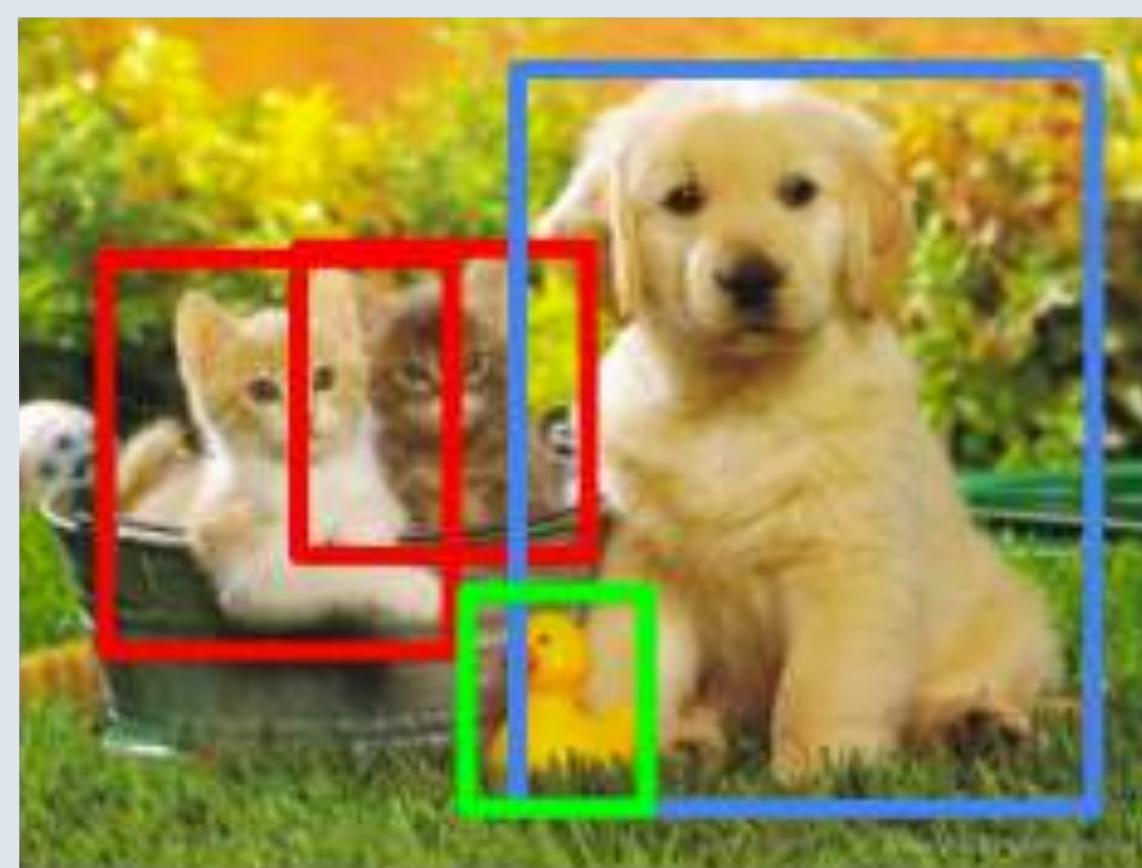


**Classification**

**Classification + Localization**

**Object Detection**

**Instance Segmentation**



CAT

CAT

CAT, DOG, DUCK

CAT, DOG, DUCK

Single object

Multiple objects

Source: Fei-Fei Li, Andrej Karpathy & Justin Johnson (2016) cs231n, Lecture 8 — Slide 8, Spatial Localization and Detection (01/02/2016). Available: [http://cs231n.stanford.edu/slides/2016/winter1516\\_lecture8.pdf](http://cs231n.stanford.edu/slides/2016/winter1516_lecture8.pdf)

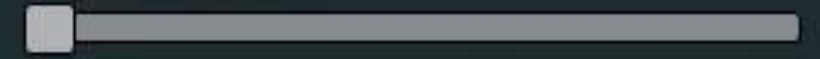


...to streets

- Point Clouds
  - empty
  - voxels
  - filtered
  - merged
  - cameras
  - banner
  - billboard
  - catch-basin
  - junction-box
  - manhole
  - mailbox
  - parking-meter
  - support-pole
  - support-utility-pole
  - street-light
  - traffic-light-general-upright-front
  - traffic-sign-front
  - traffic-sign-temporary-front
  - traffic-sign-direction-front
  - trash-can
  - traffic-sign-information-parking
- Measurements
- Annotations
- Other
  - Camera

Properties

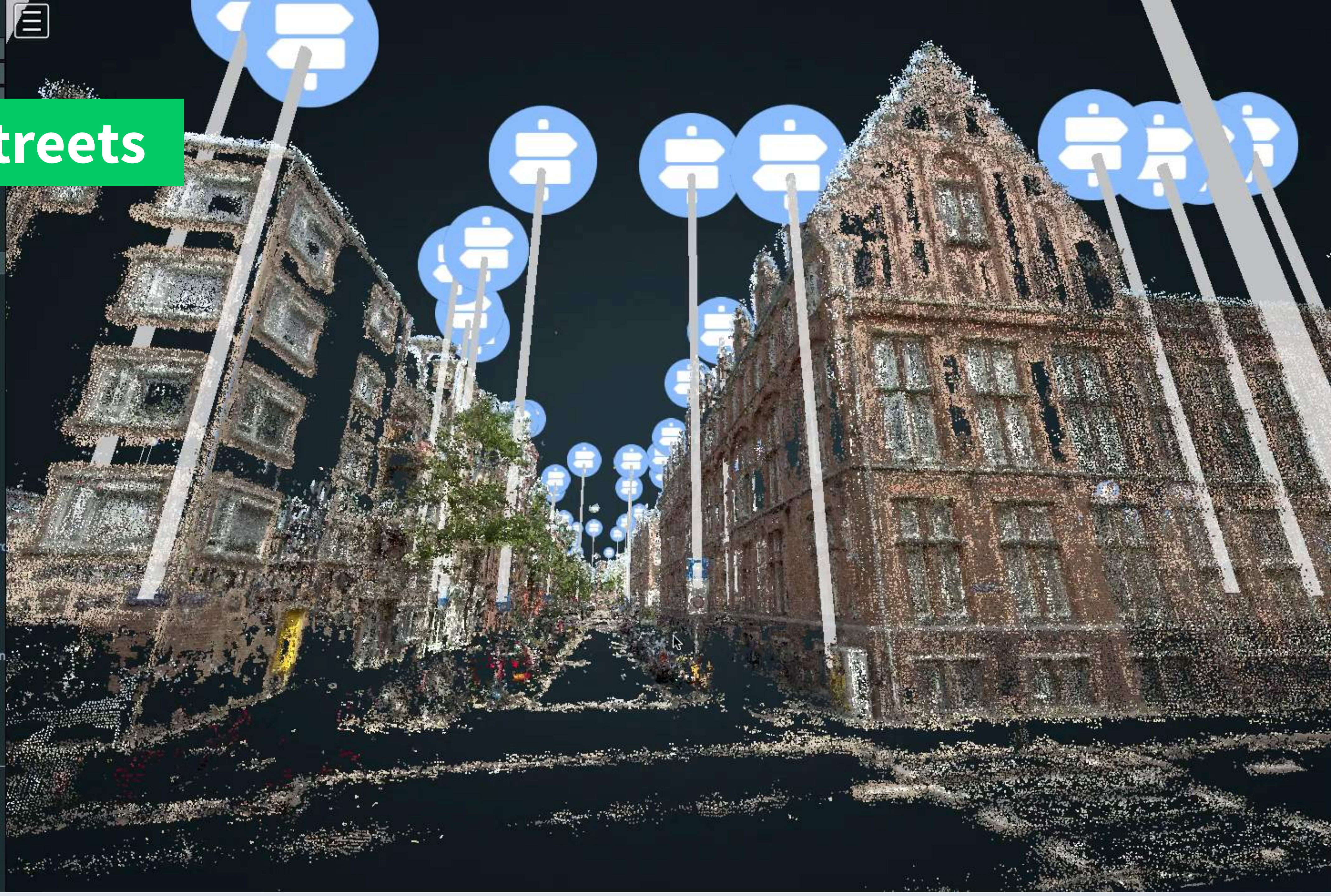
Point size:0.00



Point sizing

ADAPTIVE

Shape







# Risk Mapping: Imagery Challenges



**Not open**

**Not fresh**



**Not enough**





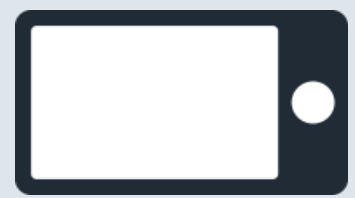
# A New Approach To Street-Level Imagery



**Open**

**Fast**

**Scalable**





# Mexico City: Pedestrian Walk





# Full pixel-wise labelling (“Semantic Segmentation”)





# Full pixel-wise labelling (“Semantic Segmentation”)



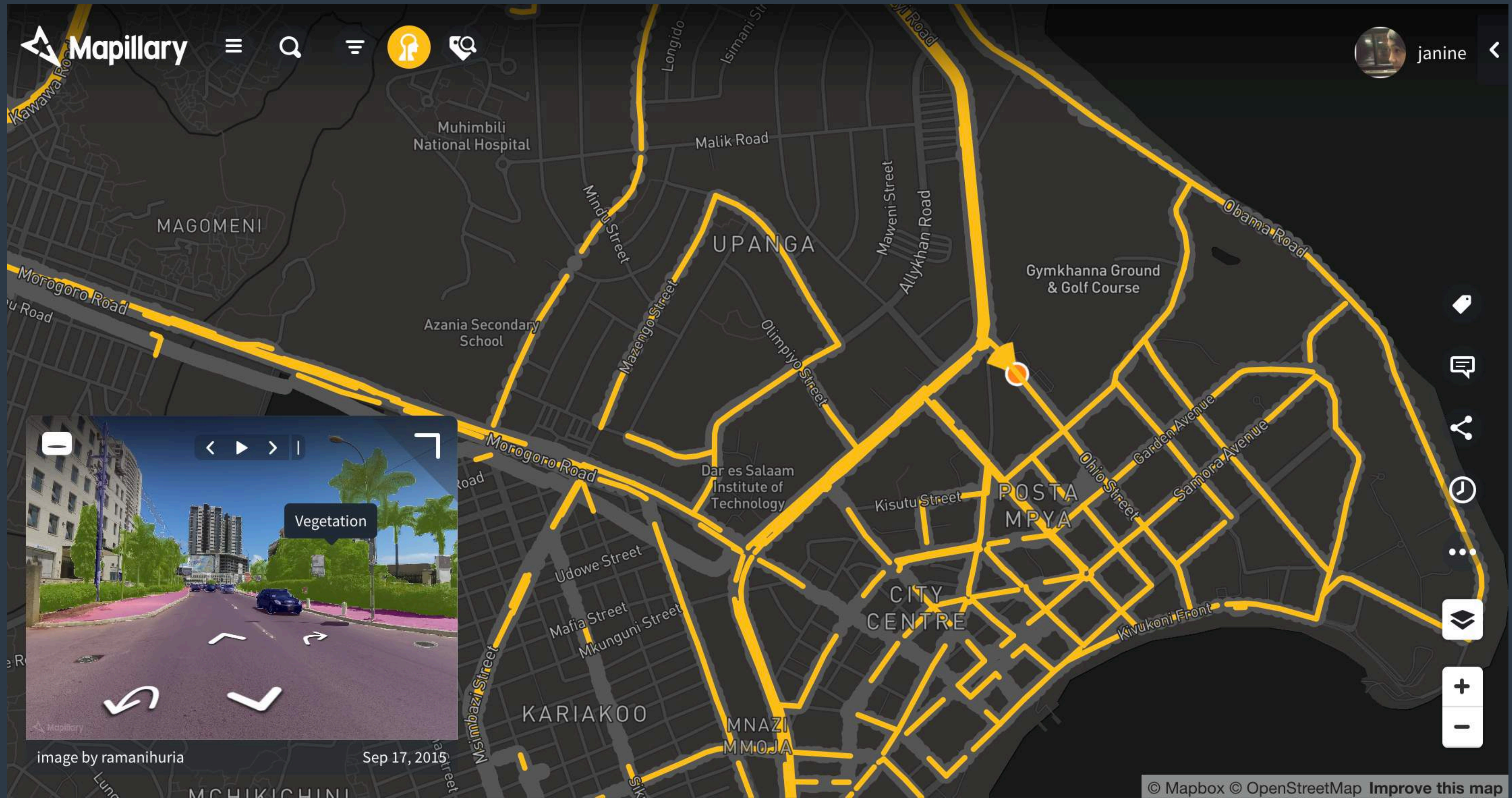


# 3D reconstruction of the scene (“Structure from Motion”)





# An automated workflow for generating map data





To date:

**285 million images**

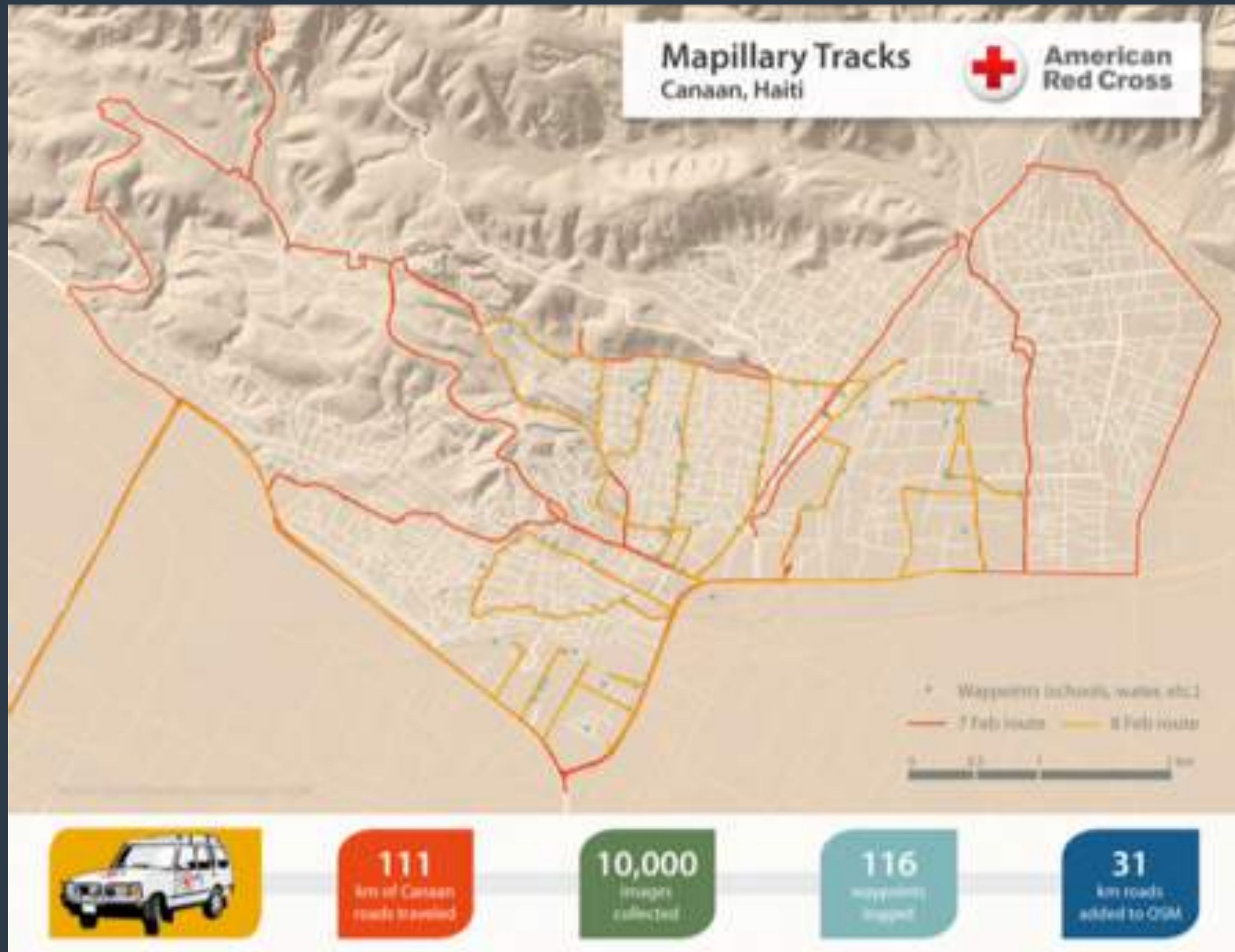
**4.5 million km mapped**

**24 billion objects**

**190 countries**



# Haiti: Exposure Mapping

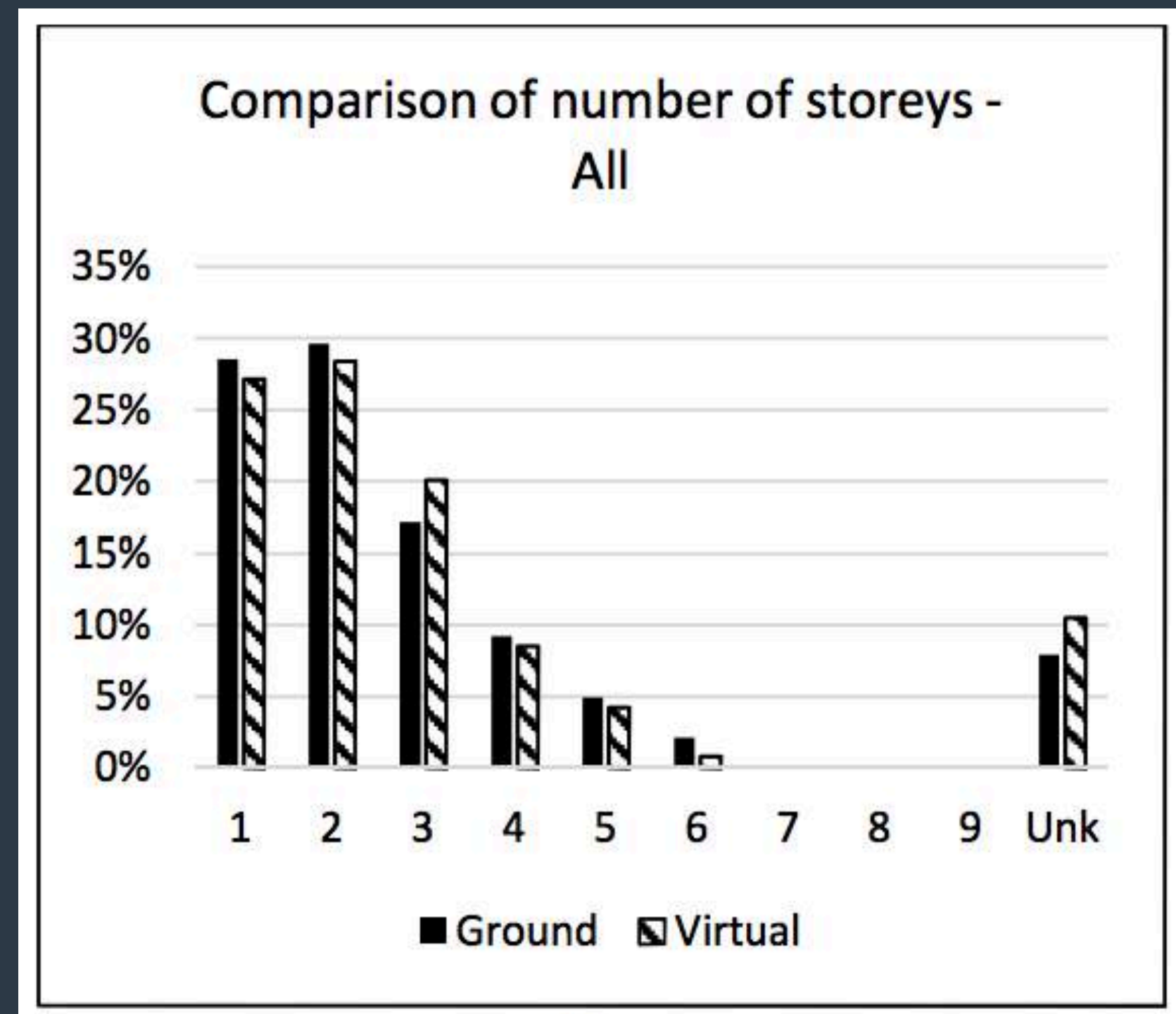


## Missing Maps





# Ecuador: Damage Assessment

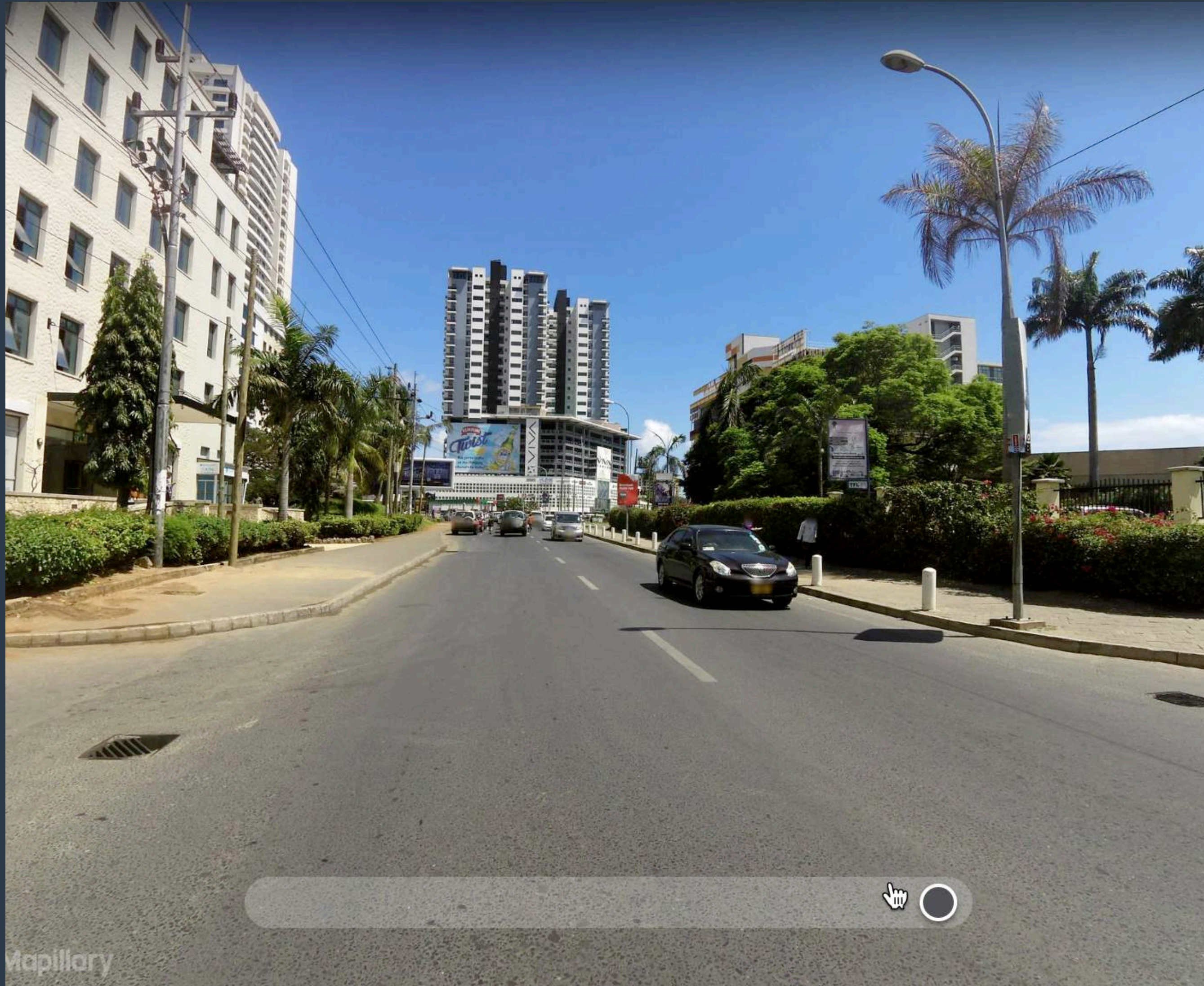


**Source:** Harriette Stone, Dina D’Ayala, Sean Wilkinson — The use of emerging technology in postdisaster reconnaissance missions (2017).

Available: <https://www.istructe.org/getattachment/resources-centre/technical-topic-areas/eefit/EEFIT-Research-Grant-Scheme/Stone-D-Ayala-final-report.pdf?lang=en-GB>



# Tanzania: Urban Growth Monitoring







# Guatemala: Windows, Garages, Logos, Soft story

Exit

SELECT A TAG

Logo Tigo

Add image tag

Or select a region to add an object tag

Tags

IMAGE TAGS

No image tags added

OBJECT TAGS

Help

Select a tag to start

Hold **ctrl** and drag to pan. **Scroll** to zoom. **Shift** to hide or show the arrows.





# Demo: Teach A Computer To See

The interface displays a camera view of a store display. A red bounding box highlights a 'tigo' logo on a sign. A white bounding box highlights another 'tigo' logo on a sign above it. Below the camera view are four circular buttons: a back button, a thumbs-down button, a thumbs-up button, and a skip button.

LEADERBOARDS

RANK	USERNAME	POINTS
1	@sarahantos	136
2	@chrisbeddow	87
3	@lndauphine	42
4	@eneerhut	21
5	@katrin	16
6	@synap	16



**Thank you!**

 @janineyoong

 janine@mapillary.com

Universidad  
Mariano Gálvez



image by sarahantos

Jan 11, 2018

GUATEL