CORPORATE EDITING IN OPENSTREETMAP

Jennings Anderson

Postdoc Researcher
University of Colorado Boulder

CORPORATE EDITING

Teams of employees editing the map as part of their profession.

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A form of *organized editing*

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The latest stage in the evolution of corporate involvement in OSM

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Contentious? The mailing list can be 🔥

International Journal of Geo-Information

MDPI

Article

Corporate Editors in the Evolving Landscape of OpenStreetMap

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check for updates

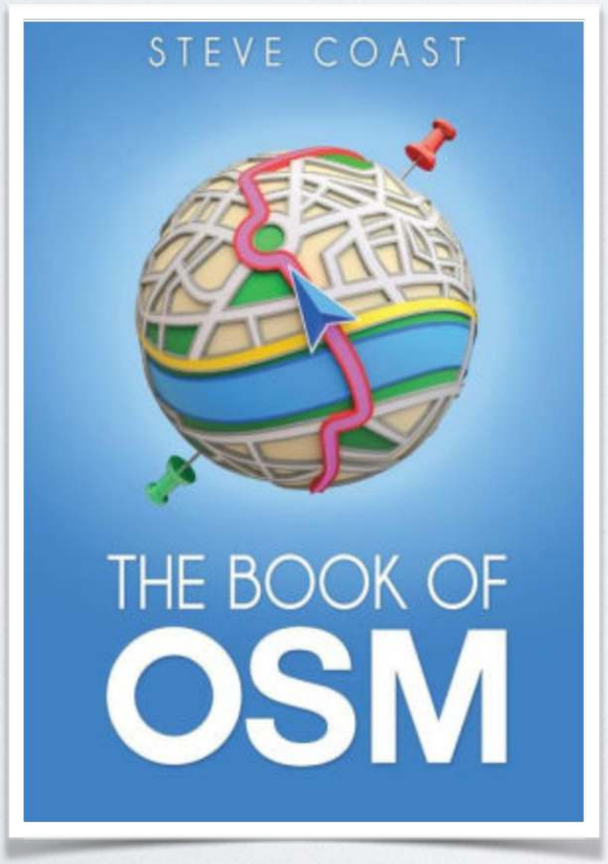
Abstract: OpenStreetMap (OSM), the largest Volunteered Geographic Information project in the world, is characterized both by its map as well as the active community of the millions of mappers who produce it. The discourse about participation in the OSM community largely focuses on the motivations for why members contribute map data and the resulting data quality. Recently, large corporations including Apple, Microsoft, and Facebook have been hiring editors to contribute to the OSM database. In this article, we explore the influence these *corporate editors* are having on the map by first considering the history of corporate involvement in the community and then analyzing historical quarterly-snapshot OSM-QA-Tiles to show where and what these corporate editors are mapping. Cumulatively, millions of corporate edits have a global footprint, but corporations vary in geographic reach, edit types, and quantity. While corporations currently have a major impact on road networks, non-corporate mappers edit more buildings and points-of-interest: representing the majority of all edits, on average. Since corporate editing represents the latest stage in the evolution of corporate involvement, we raise questions about how the OSM community—and researchers—might proceed as corporate editing grows and evolves as a mechanism for expanding the map for multiple uses.

Keywords: OpenStreetMap; corporations; geospatial data; open data; Volunteered Geographic Information

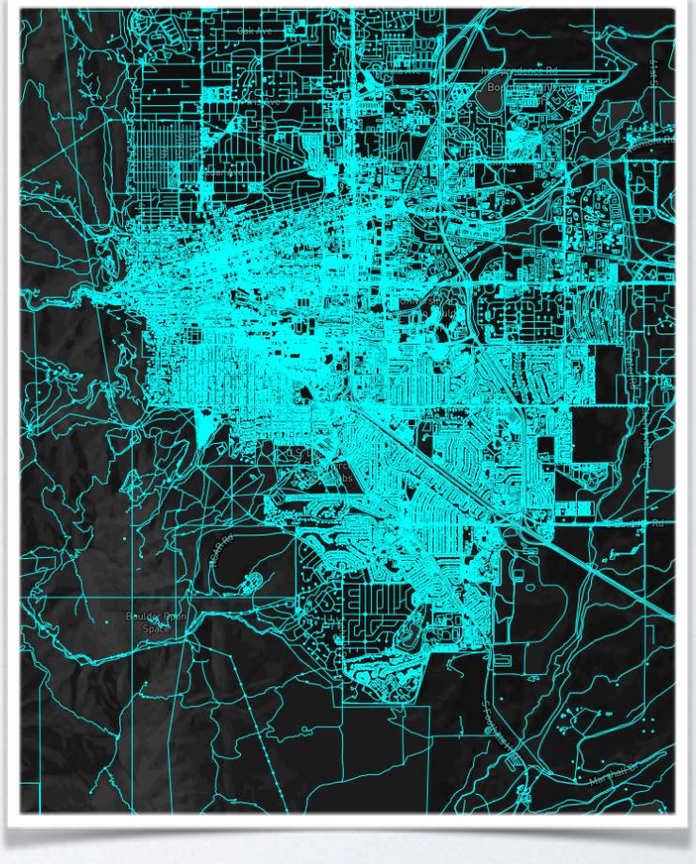
CORPORATIONS + OSM

Research Approach

- Wiki, Mailing list archives, blogs, stories



- Quantitative analysis of the OSM database

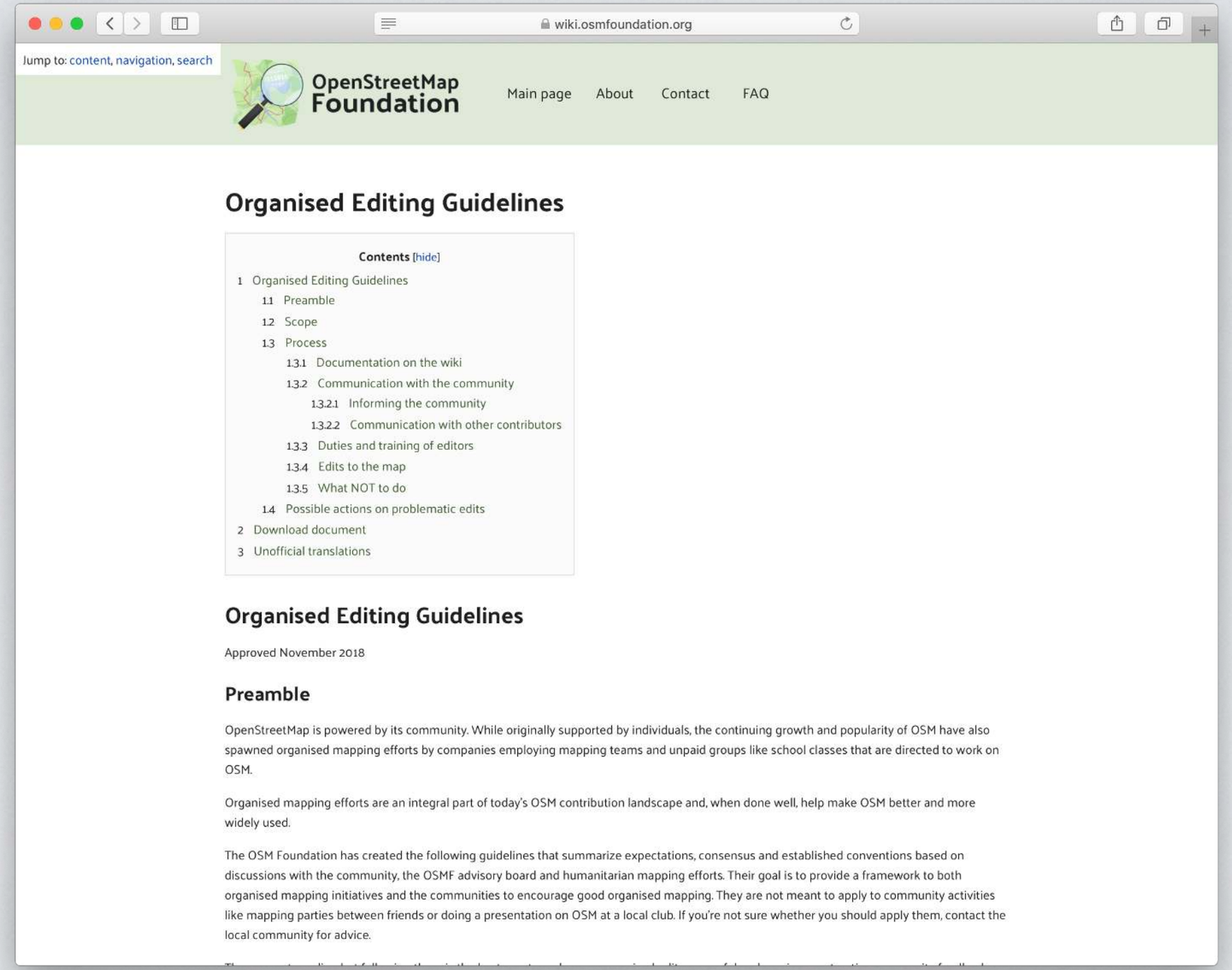


CORPORATIONS + OSM

Latest stage in the evolution of corporate involvement

- From very early: Aerial Imagery Providers (2006: Yahoo!)
- Cloudmade
- AND (Automotive Navigation Data)
- Satellite Imagery Providers: BING, ESRI, Digital Globe (Maxar)
- Not to mention governments, NGOS, and non-profits

ORGANIZED EDITING GUIDELINES



10 CORPORATIONS

Corporation	*Team URL*	*Team Size*	*Number of Edits*	*Road KM*	*Buildings*
Amazon	wiki.openstreetmap.org/wiki/Amazon_Logistics	*110*	388,000	120,000	1000
Apple	github.com/osmlab/appledata	*342*	3,944,000	1,643,000	1,156,000
Development Seed	wiki.openstreetmap.org/wiki/DevSeed-Data	*8*	488,000	62,000	269,000
Facebook	wiki.openstreetmap.org/wiki/AI-Assisted_Road_Tracing	*87*	1,106,000	821,000	1000
Grab	github.com/GRABOSM/Grab-Data	*124*	1,593,000	300,000	63,000
Kaart	wiki.openstreetmap.org/wiki/Kaart	*93*	2,887,000	484,000	702,000
Mapbox	wiki.openstreetmap.org/wiki/Mapbox	*40*	4,483,000	1,694,000	1,088,000
Microsoft (Bing)	github.com/Microsoft/Open-Maps/wiki/Open-Maps-Team-at-Microsoft	*29*	643,000	458,000	52,000
Telenav	wiki.openstreetmap.org/wiki/Telenav	*30*	963,000	336,000	5000
Uber	github.com/Uber-OSM/DataTeam	*91*	464,000	32,000	349,000

github.com

Data Team

appleosm edited this page 2 hours ago · 108 revisions

Below is a list of the team members supporting the mapping projects.

Name	Name
MikeDrop	feta2
cartogram	FlyTy
brittster	IWantToBelieve
katykiran	jaggededge
saranotsarah	JadeHeart
Mapintosh	HillShade20
g_art_k	bolalala
verafutbol	DaMopeyMapper
geo_roads	Mapperson
the_lerics	RockyRacoon
SaikatM	photogswa
Spidey10	Bhag_V
varP87	Deer_24
Brat_43	Umas2
18Vish	alekk
ballaris	puzzlefan

Pages 7

Find a Page...

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BuildingRoadIntersection Instructions

Data Team

Inline Validation Paint Style Information

Mapping and Community Tools Links from SOTM Africa 2017 Talk

MapRoulette Challenges

Minor Data Contributions

Clone this wiki locally

https://github.com/osmlat

github.com

osmlab / appledata

Sign up

Code Issues 149 Pull requests 0 Projects 0 **Wiki** Security Pulse

Data Team

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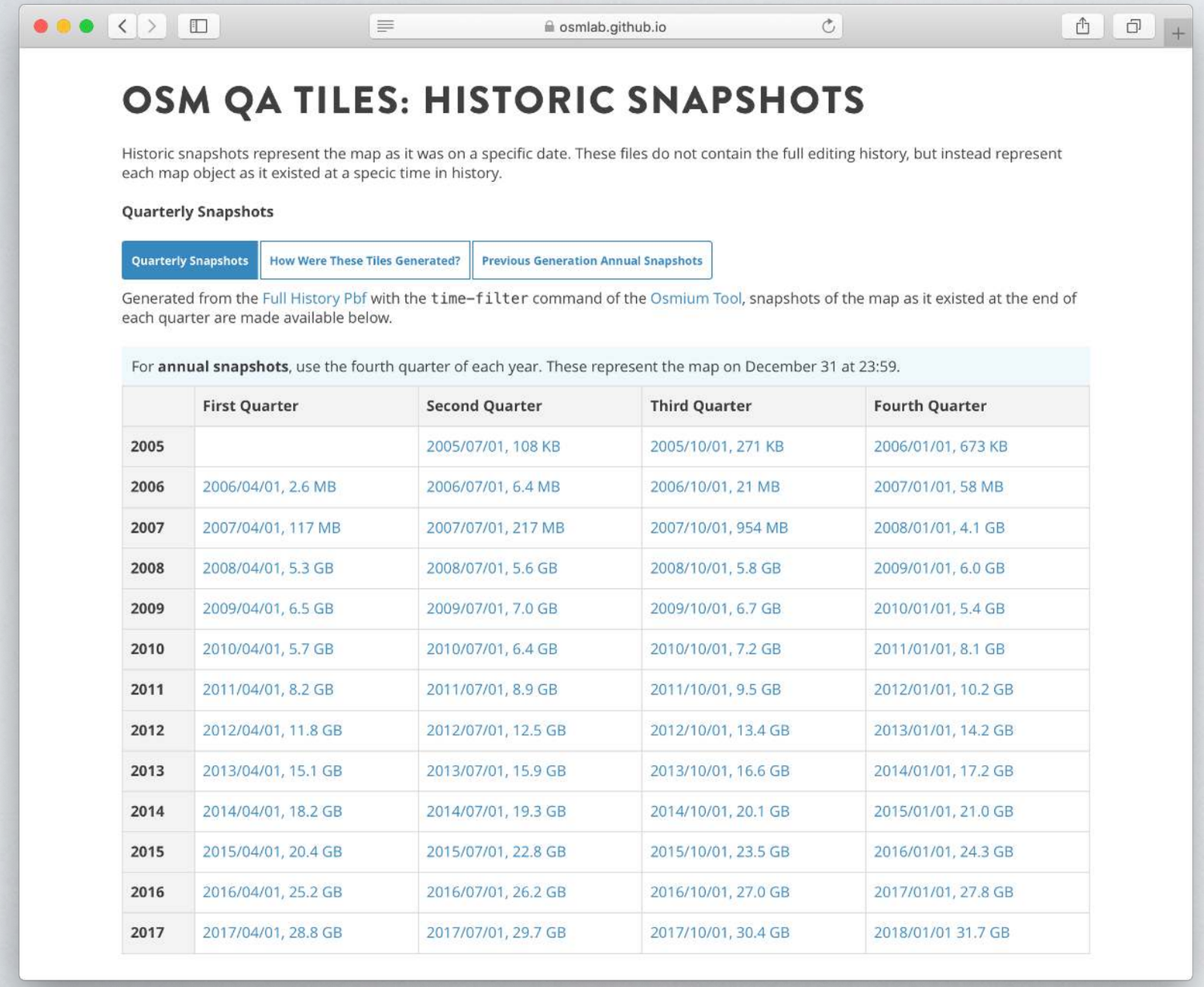
- Minor Data Contributions

Clone this wiki locally

https://github.com/osmlab

QUANTIFICATION



osmlab.github.io

OSM QA TILES: HISTORIC SNAPSHOTS

Historic snapshots represent the map as it was on a specific date. These files do not contain the full editing history, but instead represent each map object as it existed at a specic time in history.

Quarterly Snapshots

Quarterly Snapshots | How Were These Tiles Generated? | Previous Generation Annual Snapshots

Generated from the Full History Pbf with the `time-filter` command of the Osmium Tool, snapshots of the map as it existed at the end of each quarter are made available below.

For **annual snapshots**, use the fourth quarter of each year. These represent the map on December 31 at 23:59.

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
2005		2005/07/01, 108 KB	2005/10/01, 271 KB	2006/01/01, 673 KB
2006	2006/04/01, 2.6 MB	2006/07/01, 6.4 MB	2006/10/01, 21 MB	2007/01/01, 58 MB
2007	2007/04/01, 117 MB	2007/07/01, 217 MB	2007/10/01, 954 MB	2008/01/01, 4.1 GB
2008	2008/04/01, 5.3 GB	2008/07/01, 5.6 GB	2008/10/01, 5.8 GB	2009/01/01, 6.0 GB
2009	2009/04/01, 6.5 GB	2009/07/01, 7.0 GB	2009/10/01, 6.7 GB	2010/01/01, 5.4 GB
2010	2010/04/01, 5.7 GB	2010/07/01, 6.4 GB	2010/10/01, 7.2 GB	2011/01/01, 8.1 GB
2011	2011/04/01, 8.2 GB	2011/07/01, 8.9 GB	2011/10/01, 9.5 GB	2012/01/01, 10.2 GB
2012	2012/04/01, 11.8 GB	2012/07/01, 12.5 GB	2012/10/01, 13.4 GB	2013/01/01, 14.2 GB
2013	2013/04/01, 15.1 GB	2013/07/01, 15.9 GB	2013/10/01, 16.6 GB	2014/01/01, 17.2 GB
2014	2014/04/01, 18.2 GB	2014/07/01, 19.3 GB	2014/10/01, 20.1 GB	2015/01/01, 21.0 GB
2015	2015/04/01, 20.4 GB	2015/07/01, 22.8 GB	2015/10/01, 23.5 GB	2016/01/01, 24.3 GB
2016	2016/04/01, 25.2 GB	2016/07/01, 26.2 GB	2016/10/01, 27.0 GB	2017/01/01, 27.8 GB
2017	2017/04/01, 28.8 GB	2017/07/01, 29.7 GB	2017/10/01, 30.4 GB	2018/01/01 31.7 GB

Tile-based analysis:

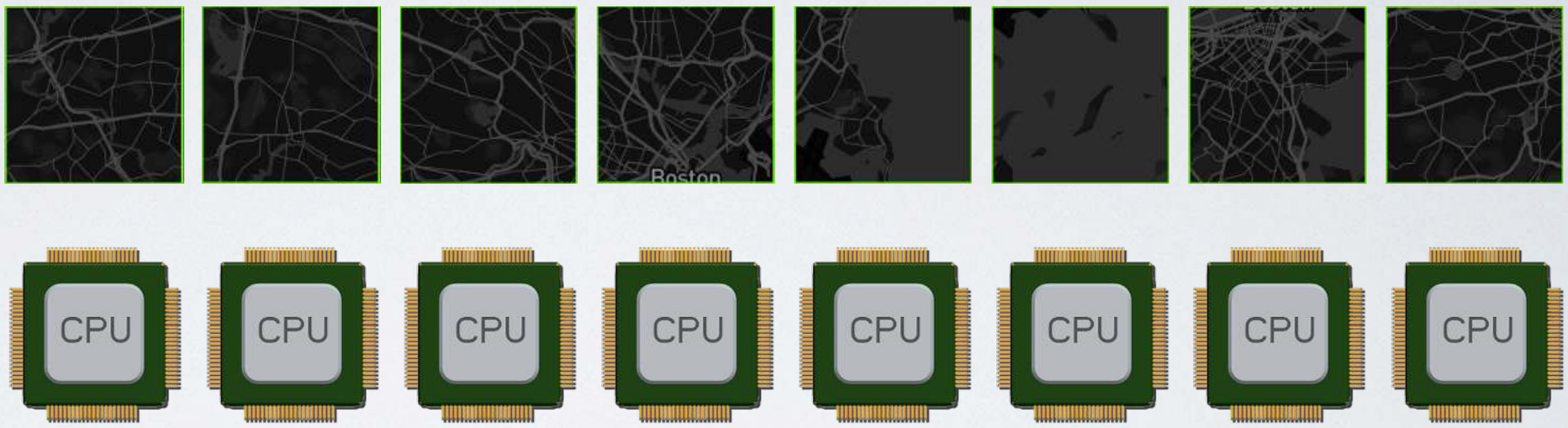
https://github.com/mapbox/tile-reduce

Tile-based analysis:

```
if ( user in
corporate_users ){

  corporate_edits++;

}
```



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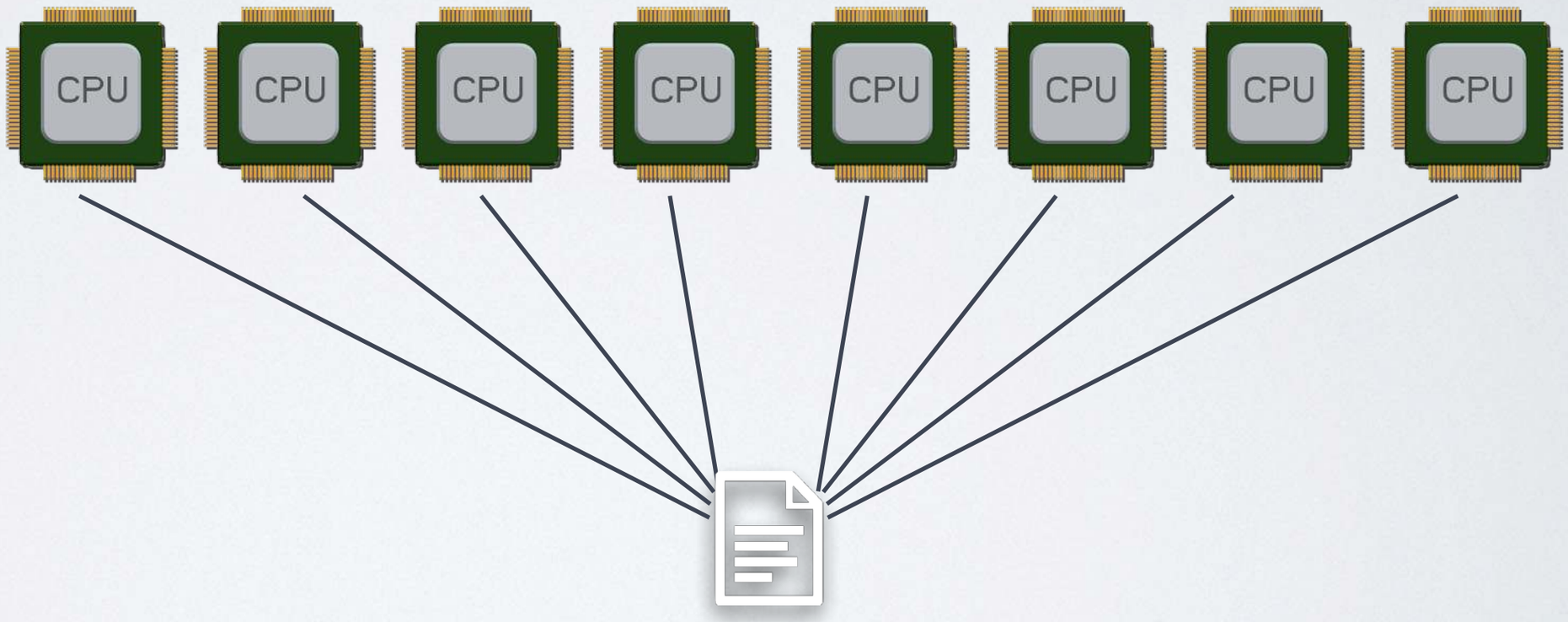
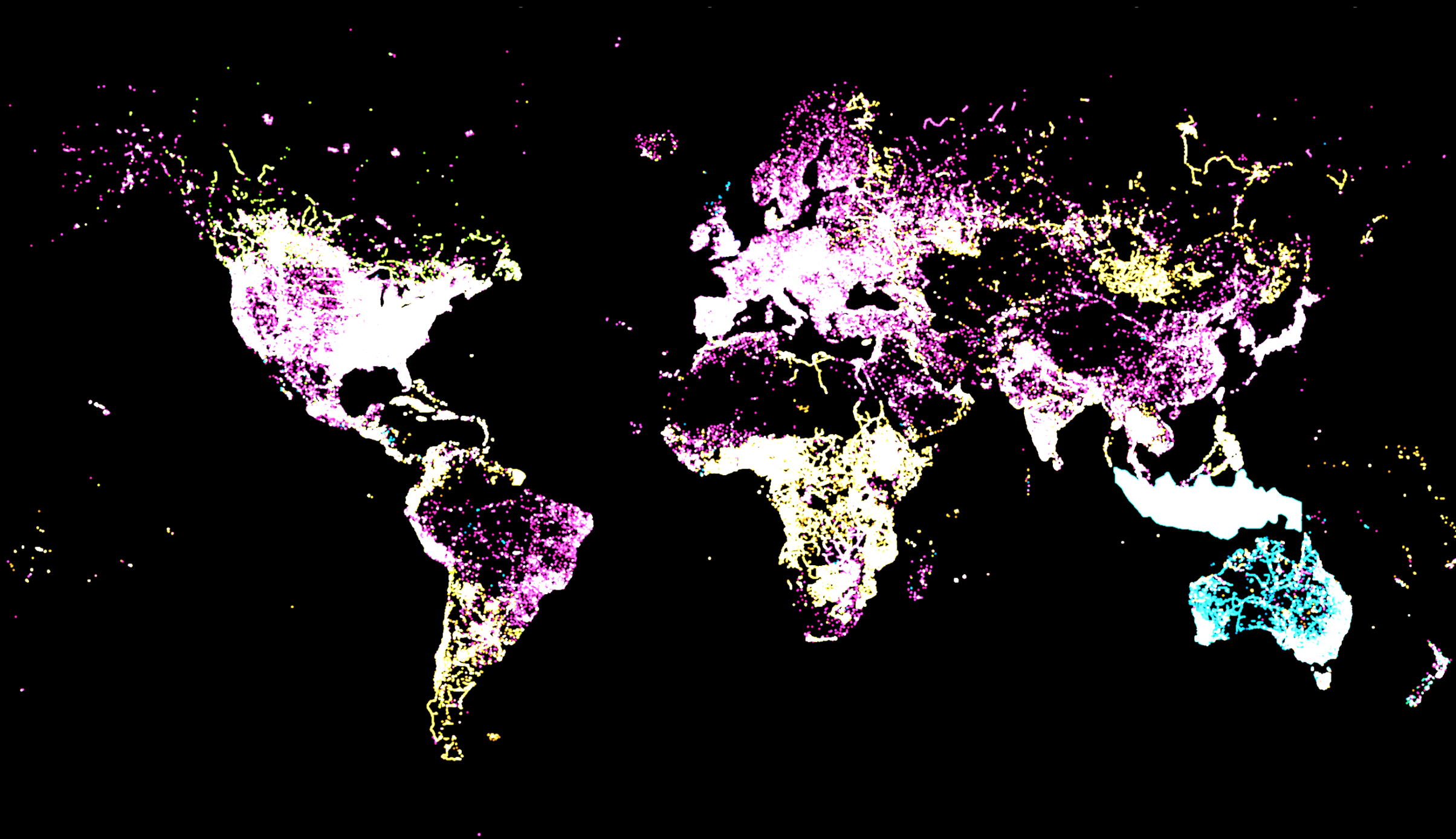
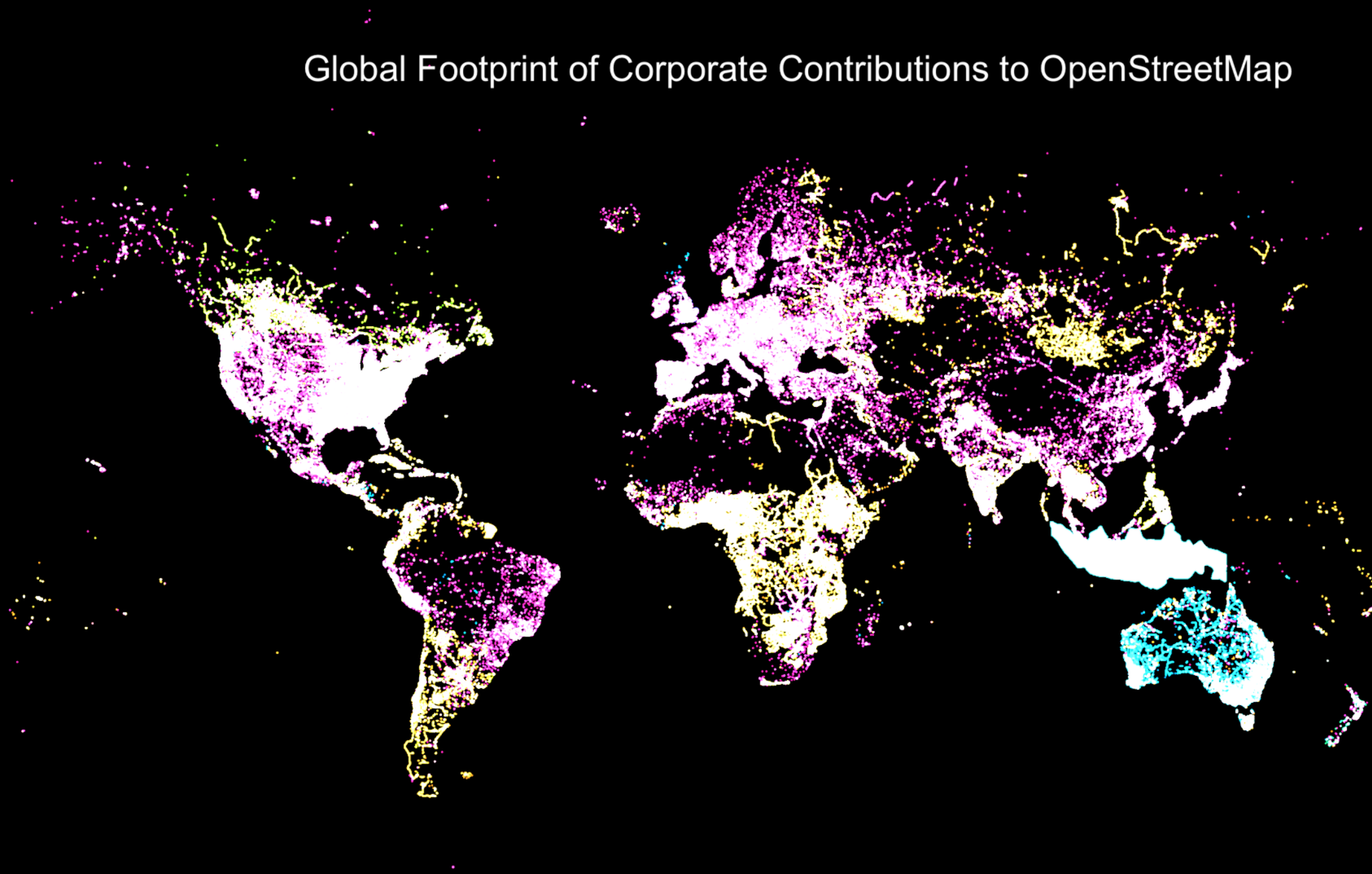


corporate edits on each tile

https://github.com/mapbox/tile-reduce



Global Footprint of Corporate Contributions to OpenStreetMap

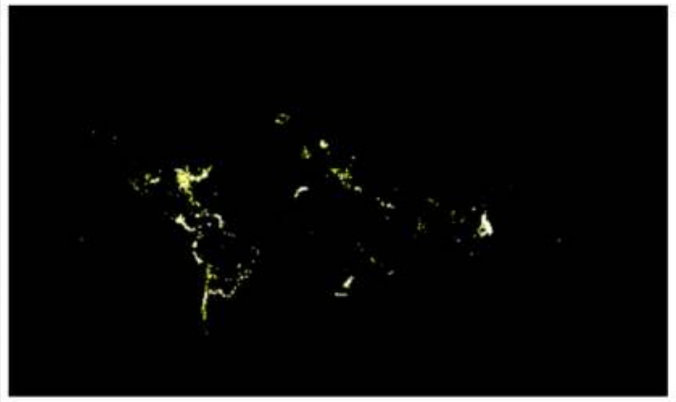


Corporations
- Telenav
- Kaart
- Apple
- Facebook
- Mapbox
- Devseed
- Amazon
- Microsoft
- Grab
- Uber

Anderson, Sarkar, & Palen 2019

BY CORPORATION

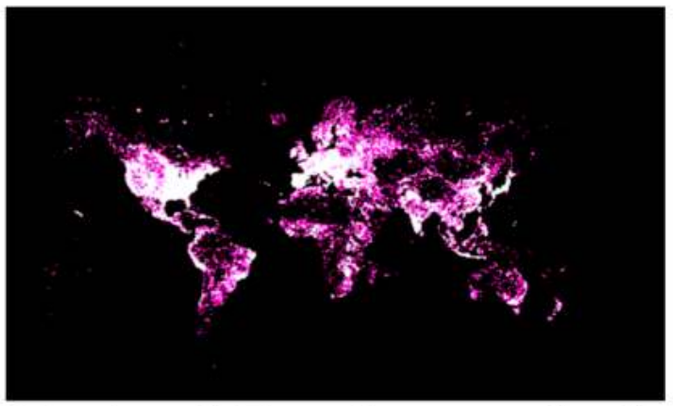
Telenav



Kaart

Apple

Facebook

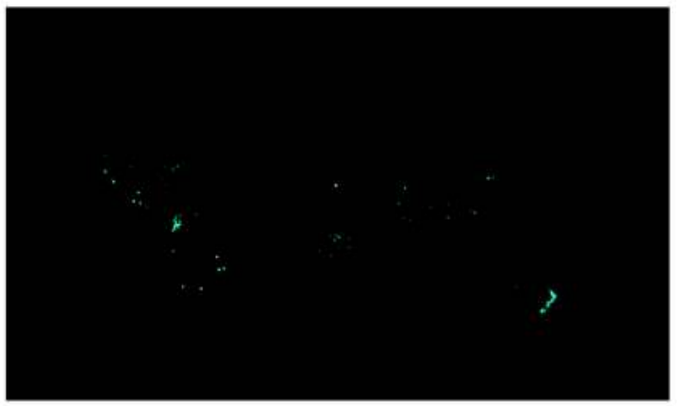


Mapbox & Development Seed

Amazon

Microsoft

Grab



Uber

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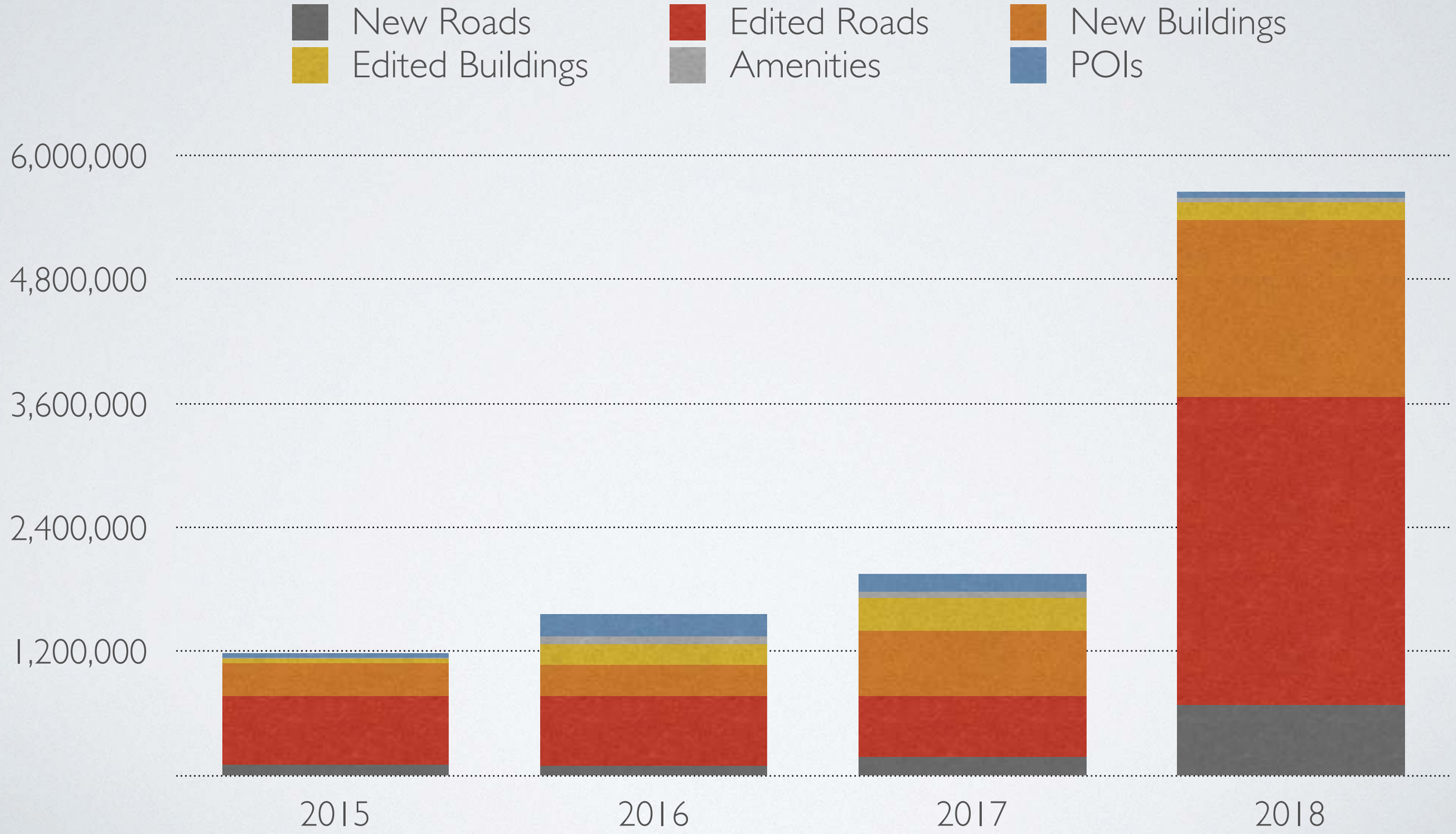
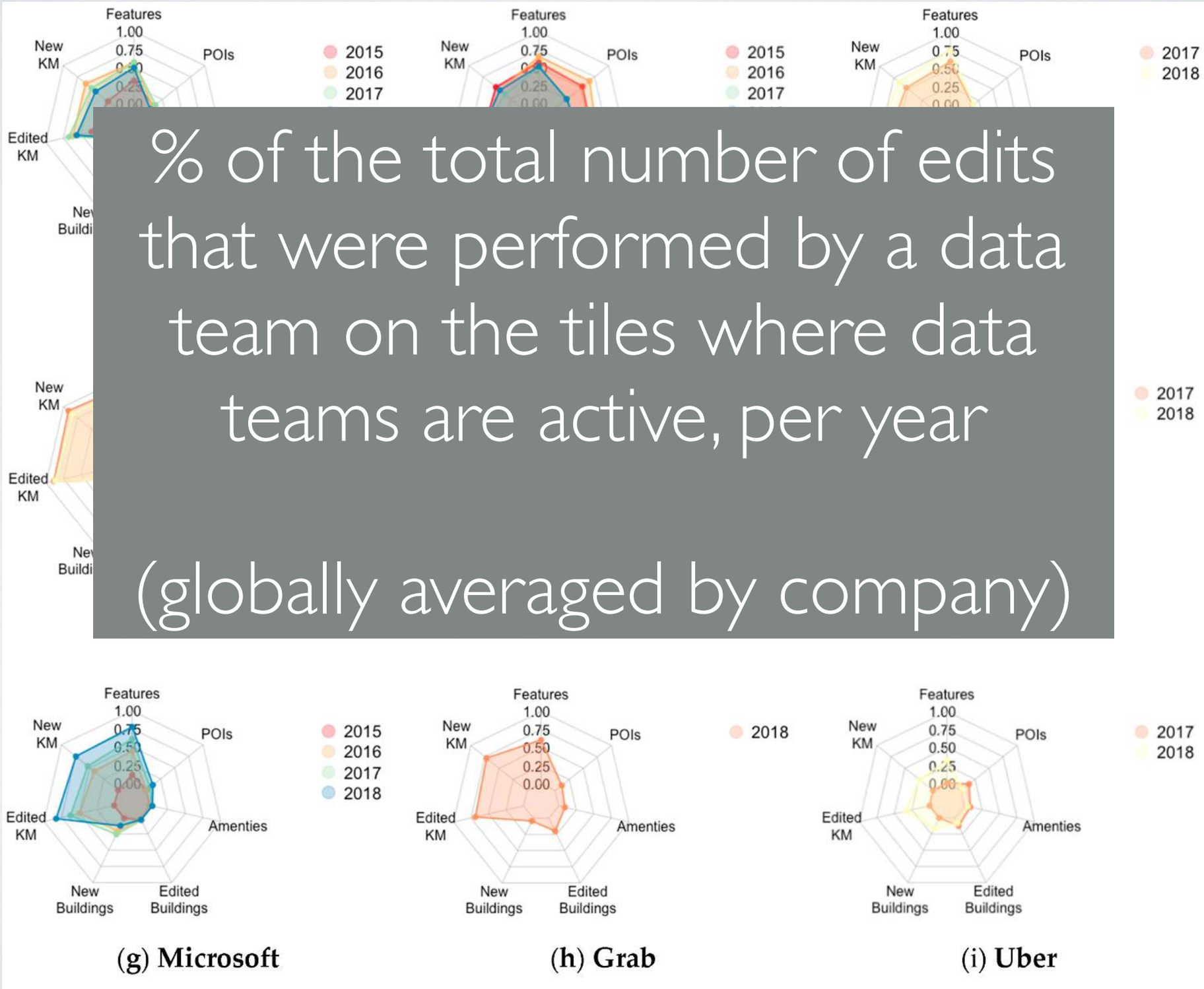
Mapbox	wiki.openstreetmap.org/wiki/Mapbox	40	4,483,000	1,694,000	1,088,000
		954	16,959,000	5,950,000	3,686,000

BY THE NUMBERS



TYPES OF EDITING?

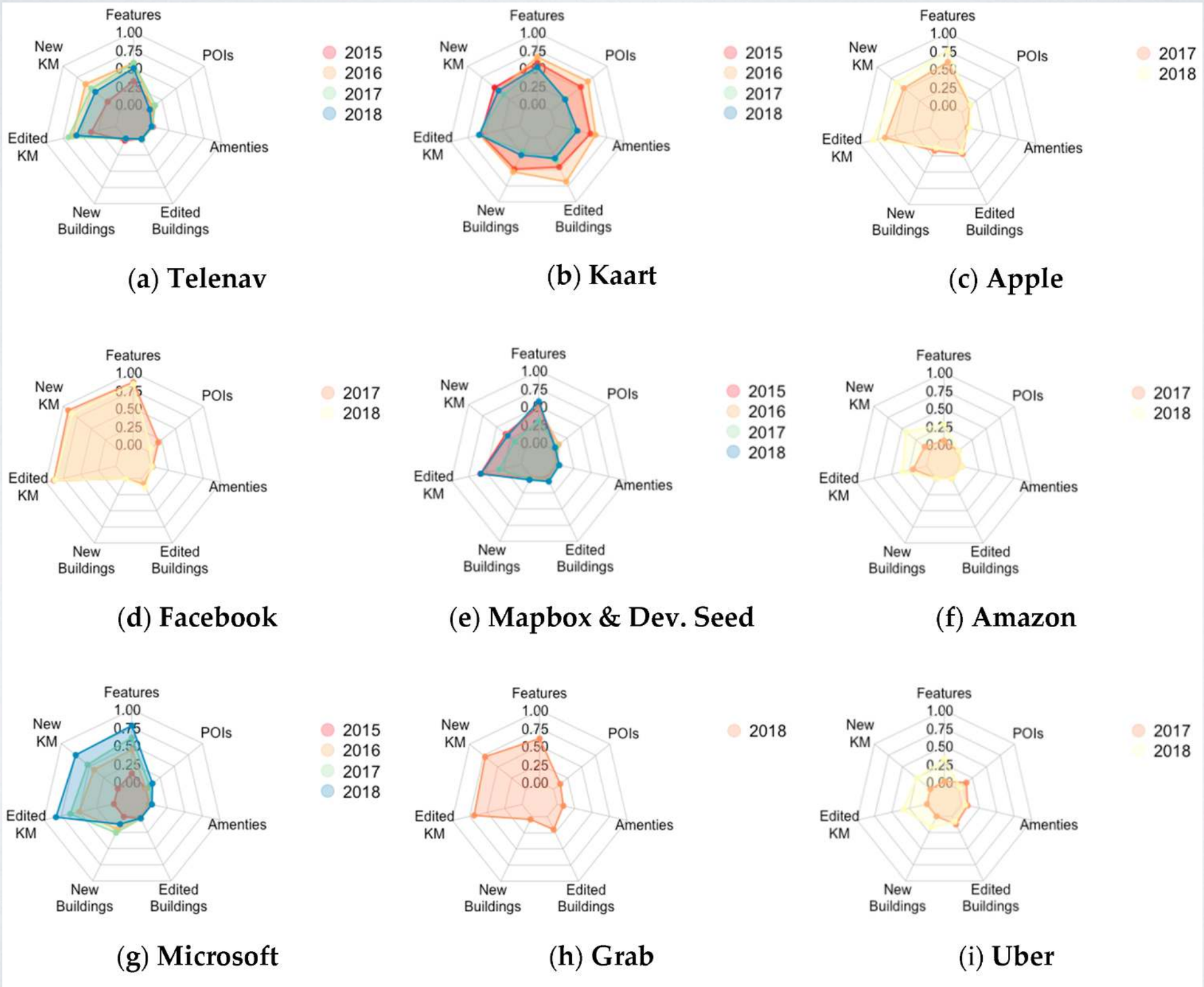


% of the total number of edits that were performed by a data team on the tiles where data teams are active, per year

(globally averaged by company)

(g) **Microsoft** (h) **Grab** (i) **Uber**

TYPES OF EDITING?

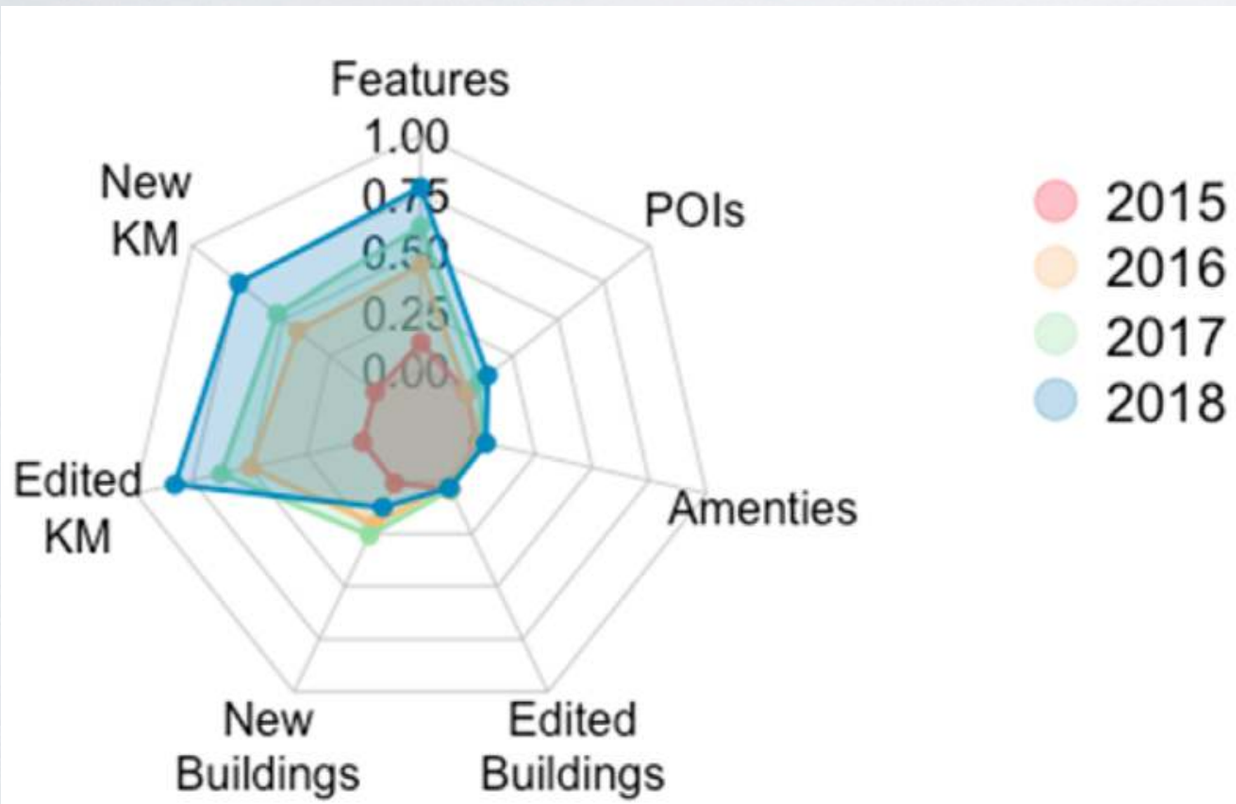


TYPES OF EDITING?

(a) Telenav

(b) Kaart

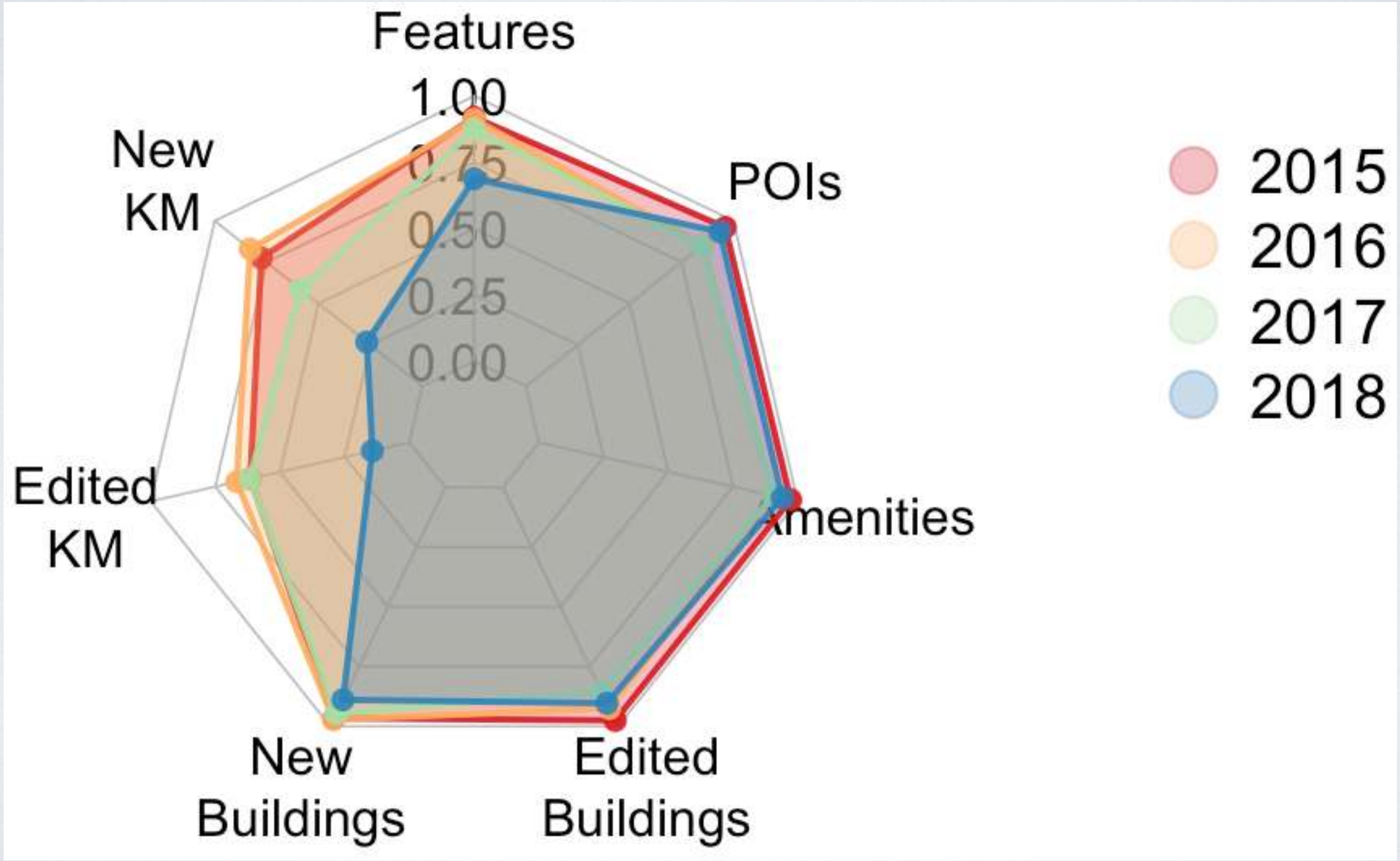
TYPES OF EDITING?



(g) Microsoft

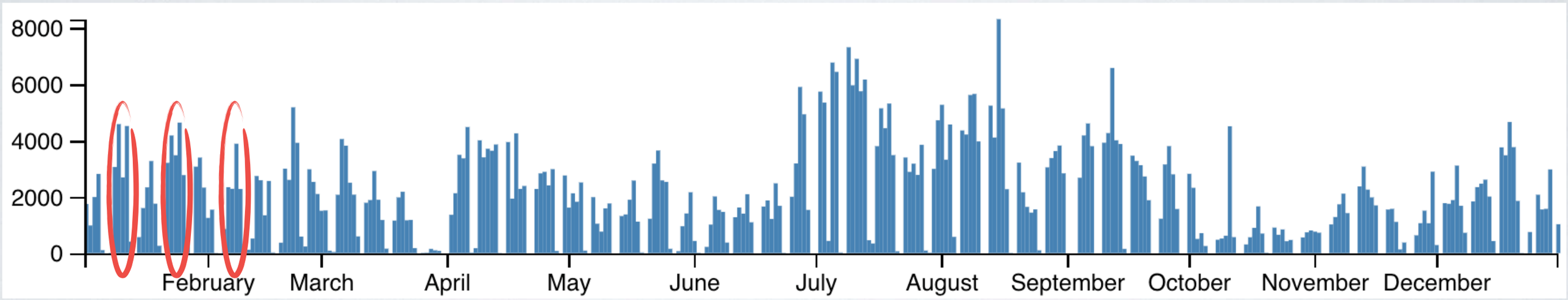
(h) Grab

NON-CORPORATE



WHEN?

Edits Per Day by Facebook Team



Dates of Editing

EXPANDING

- What is the larger *impact* to the map / local communities?
  - Not what was measured
  - Looking at per-edit interactions among contributors (full-history + context)

EXPANDING

- What is the larger *impact* to the map / local communities?
  - Not what was measured
- Looking at per-edit interactions among contributors (full-history + context)
  - Map Seeding?
  - Completing “the last mile”
  - Validation / Quality

HOW?

- We need the complete editing history of the map (full-history planet)

- We need to know which usernames are associated with data teams

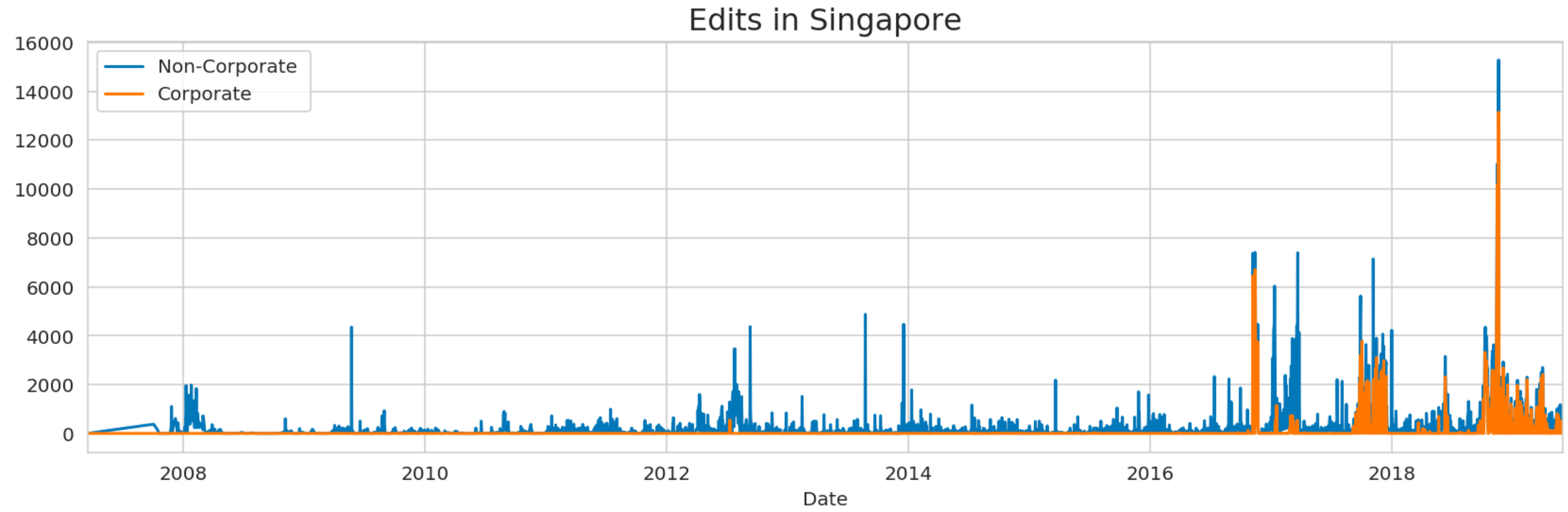
- Reconstruct the history in a way that lets us first explore the interactions to know what patterns we should be looking for?

GRAB SINGAPORE (2018)

Corp

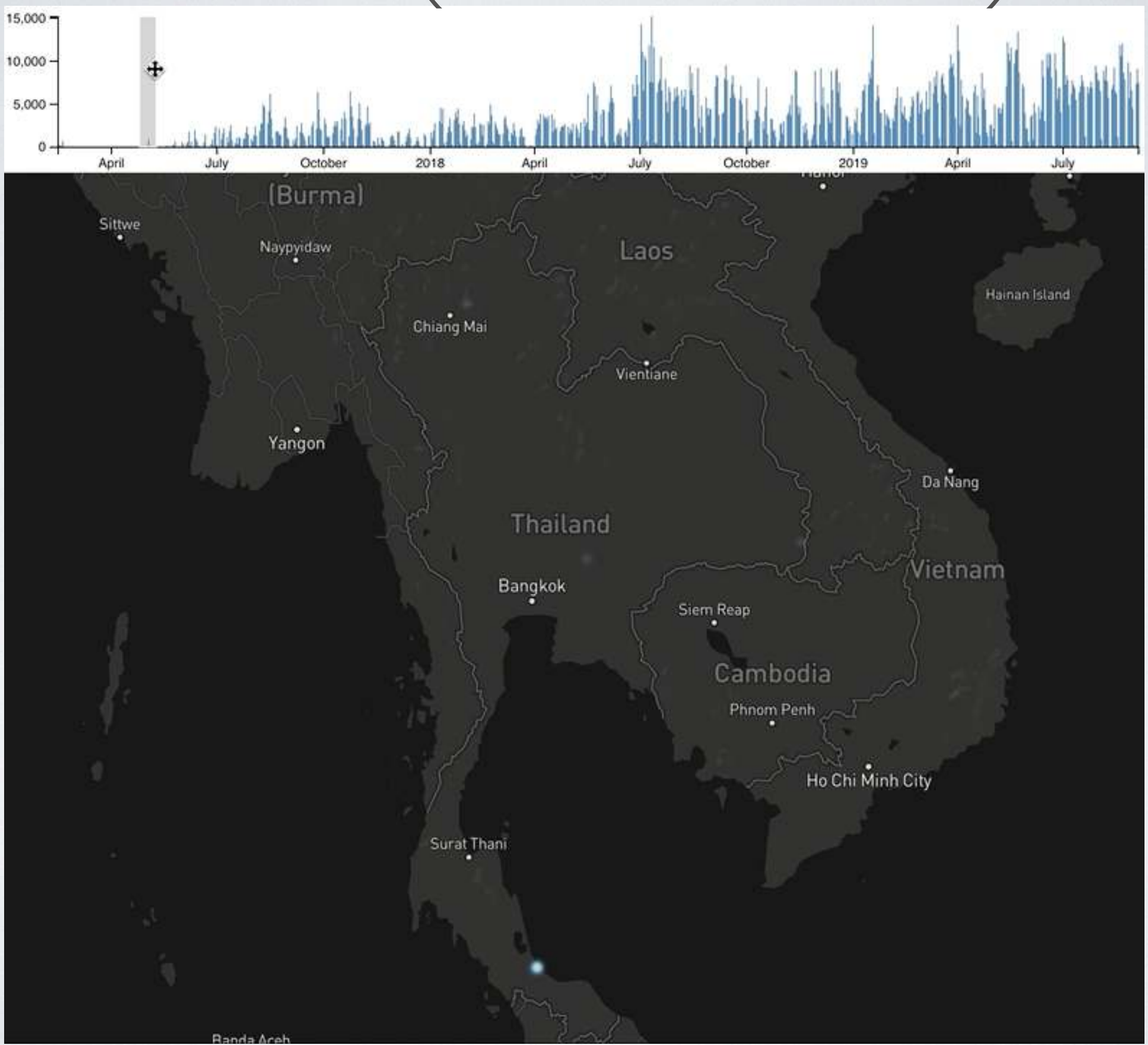
Non-Corp

MAP GARDENING?



All Edits in Singapore

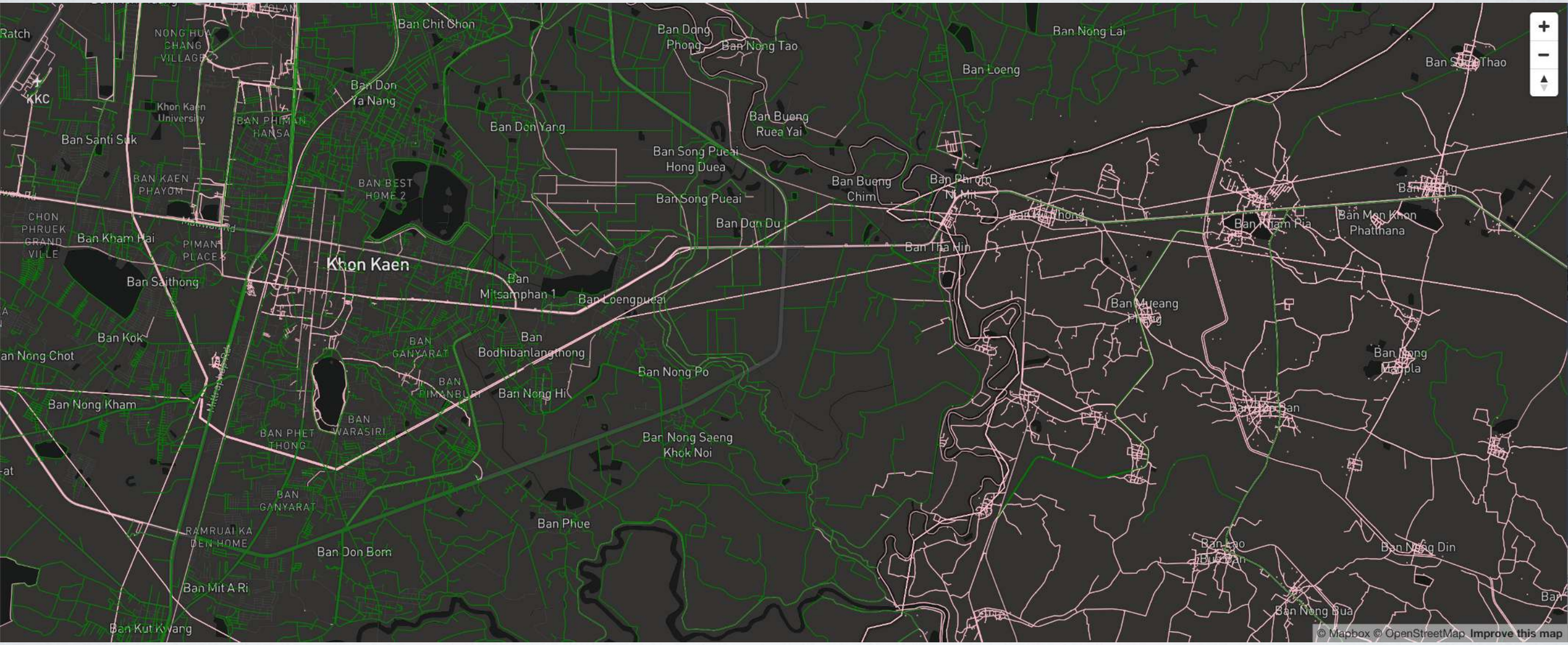
FACEBOOK (THAILAND)



FACEBOOK THAILAND (>2017)

Corp

Non-Corp

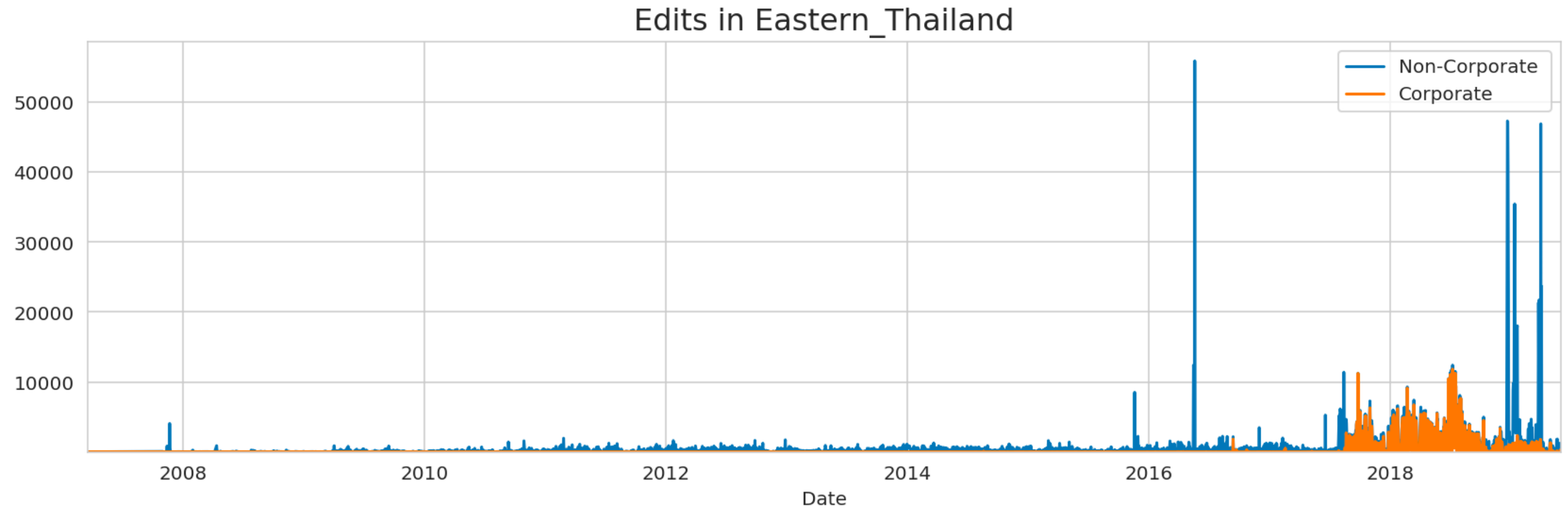


FACEBOOK THAILAND (>2017)

Corp

Non-Corp

FILLING IN AND/OR MAP SEEDING?



All Edits in Eastern Thailand

(not Bangkok or Chiang Mai)

KAART
KINGSTON, JAMAICA

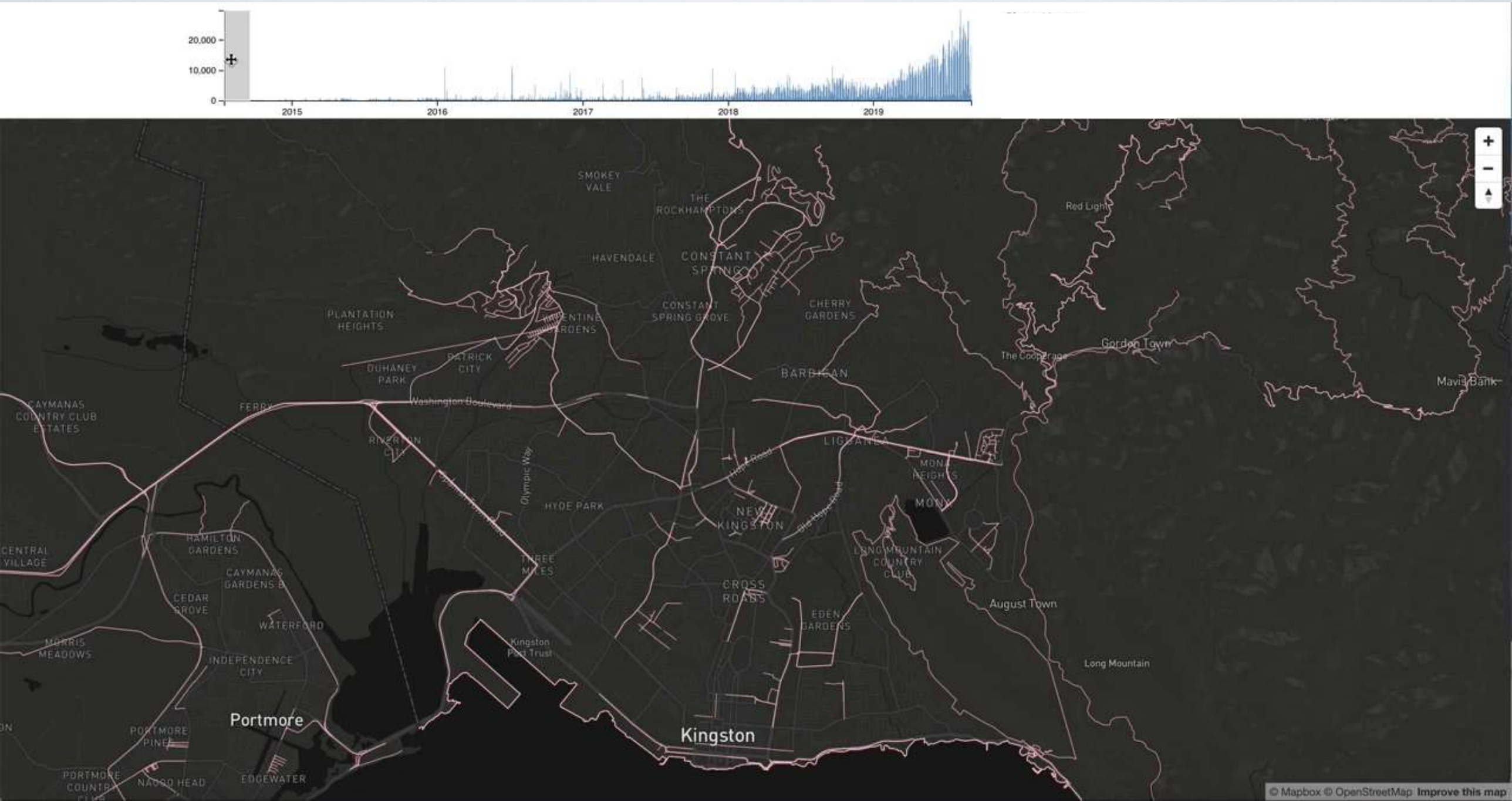
Corp

Non-Corp

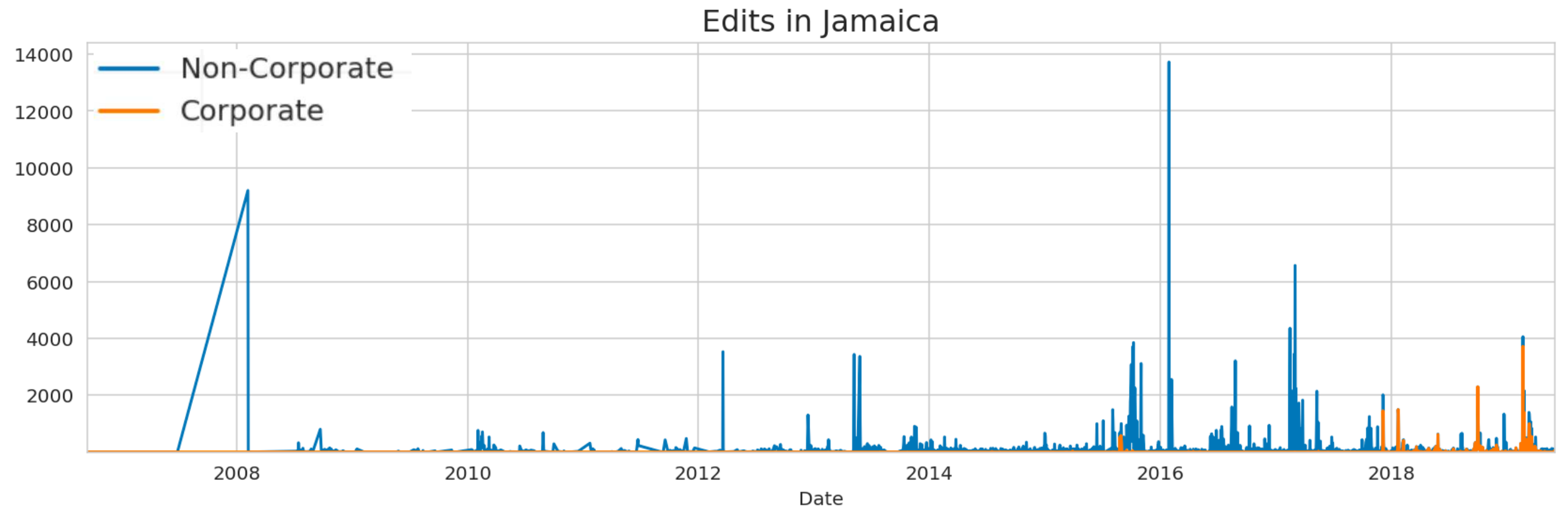
KAART
KINGSTON, JAMAICA

Corp

Non-Corp



COMPLETING THE LAST MILE?



All Edits in Jamaica

APPLE
LAGOS, NIGERIA
> MID-2017

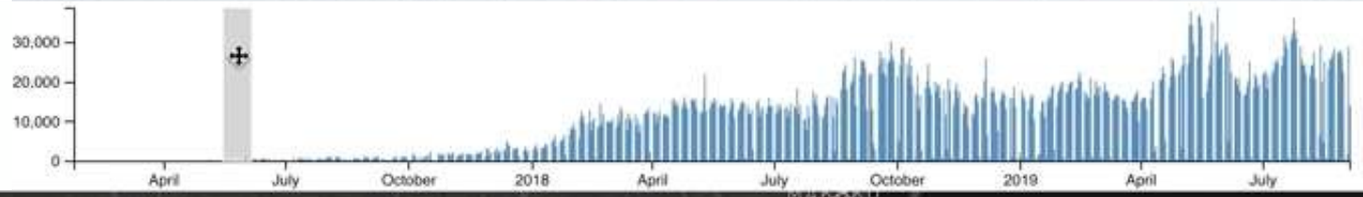
Corp

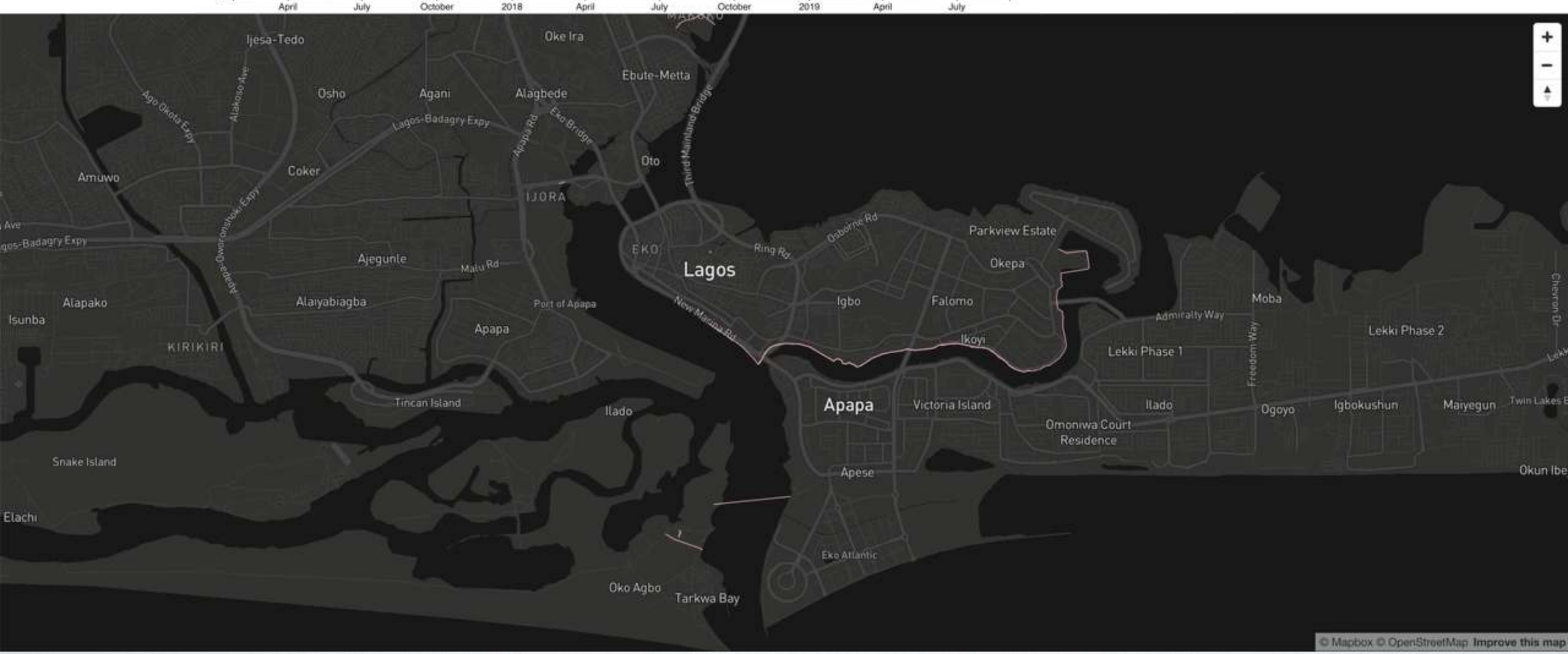
Non-Corp

APPLE
LAGOS, NIGERIA
> MID-2017

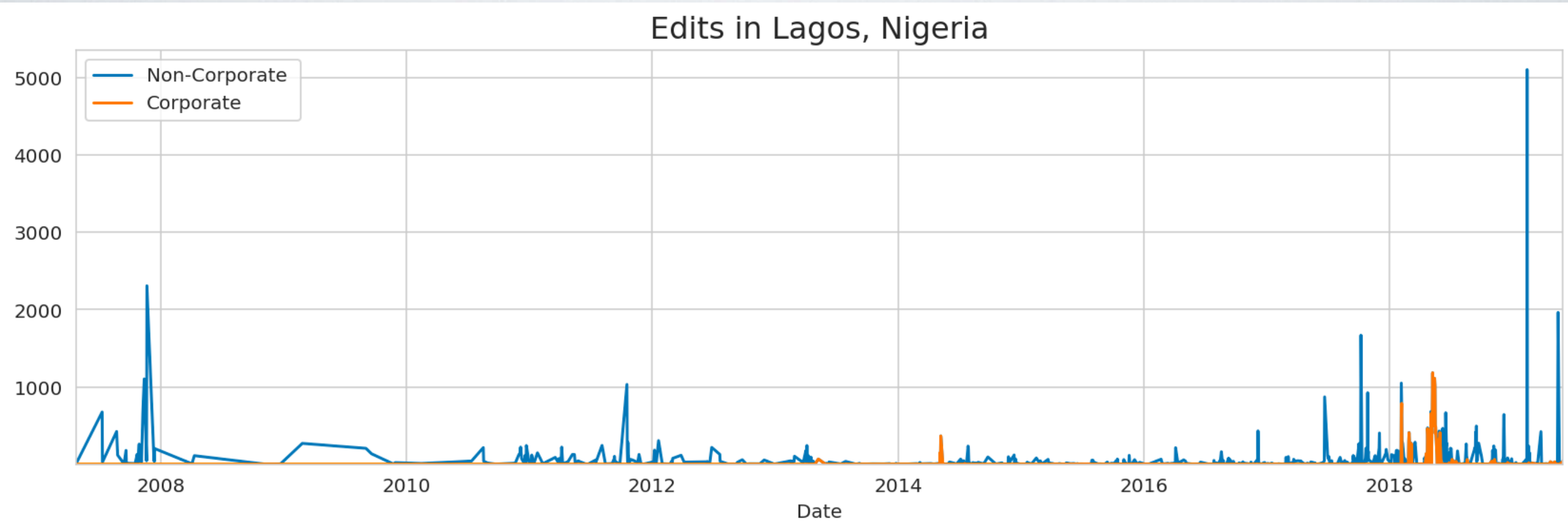
Corp

Non-Corp

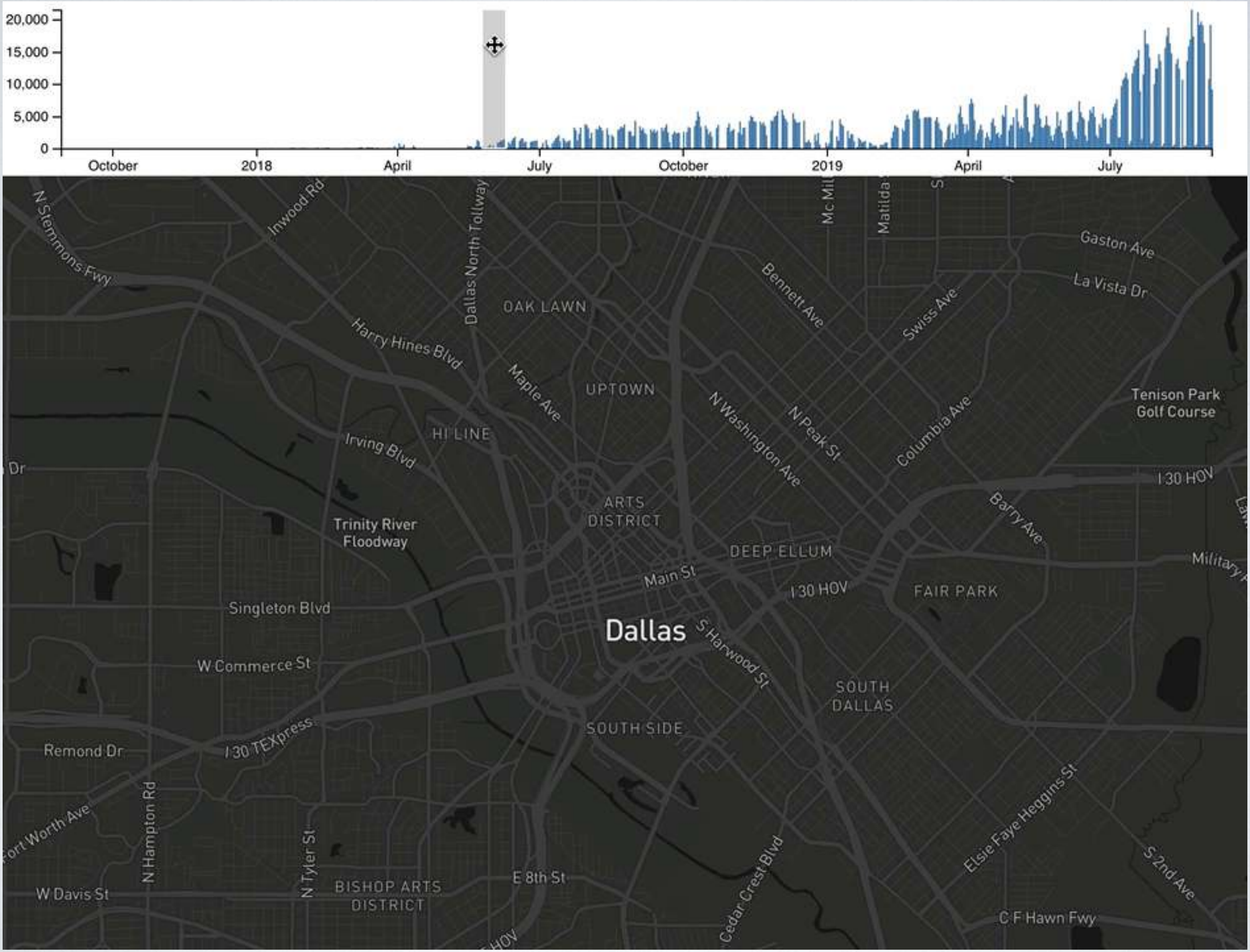




MAP GARDENING? VALIDATION?



All Edits in Lagos, Nigeria


20,000
15,000
10,000
5,000
0
October
2018
April
July
October
2019
April
July
N Stemmons Fwy
Inwood Rd
Dallas North Tollway
Harry Hines Blvd
OAK LAWN
Maple Ave
UPTOWN
Bennett Ave
Swiss Ave
Gaston Ave
La Vista Dr
Tenison Park
Golf Course
Columbia Ave
N Peak St
N Washington Ave
HI LINE
Irving Blvd
ARTS
DISTRICT
I 30 HOV
Barry Ave
Trinity River
Floodway
DEEP ELLUM
Main St
FAIR PARK
Singleton Blvd
Dallas
S Harwood St
W Commerce St
SOUTH
DALLAS
SOUTH SIDE
I 30 TEXpress
Remond Dr
Elsie Faye Heggins St
S 2nd Ave
N Hampton Rd
N Tyler St
E 8th St
W Davis St
BISHOP ARTS
DISTRICT
Cedar Crest Blvd
C F Hawn Fwy

CORPORATIONS + OSM

Latest stage in the evolution of corporate involvement

Community

?

Corporations

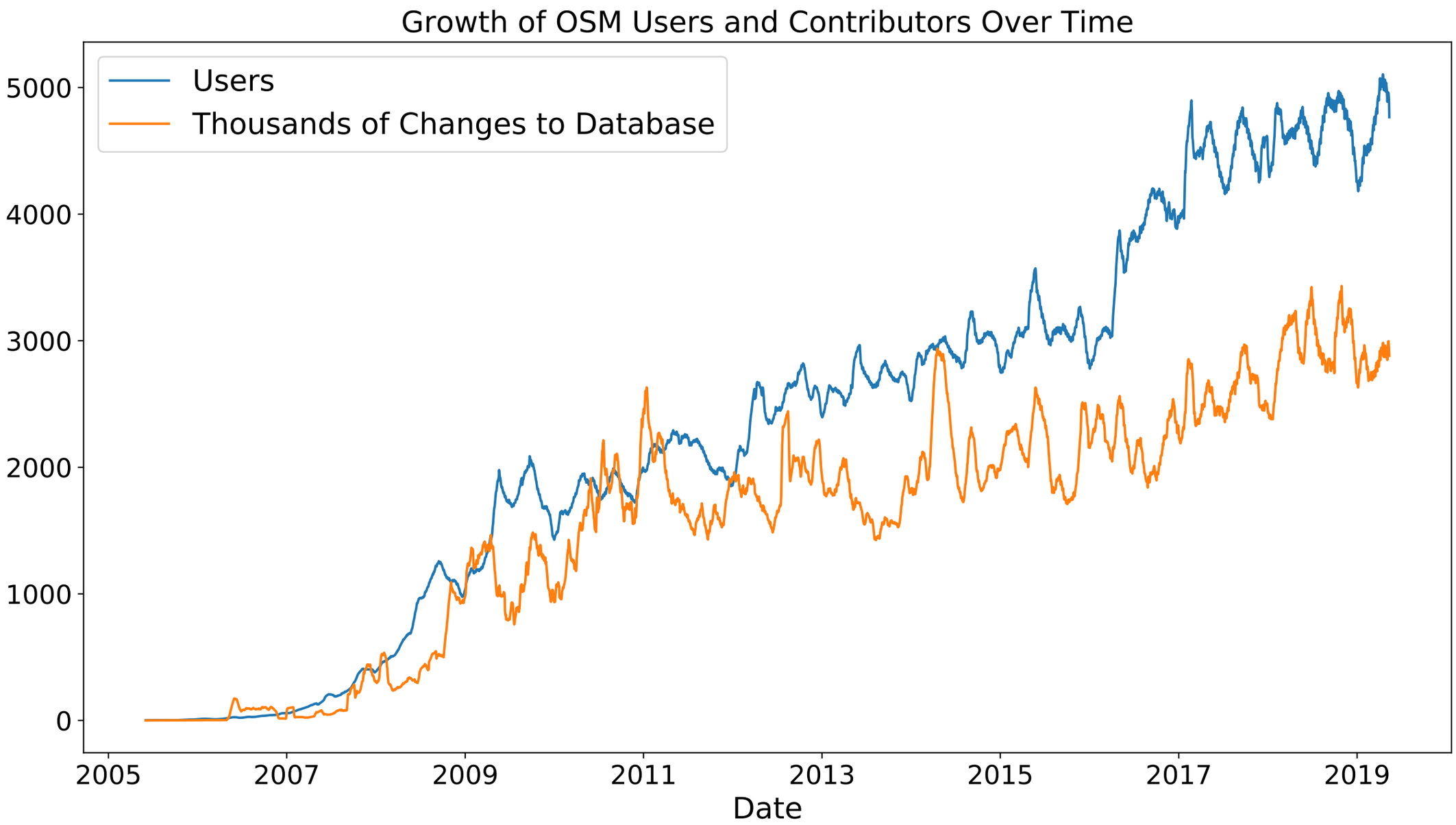
CORPORATIONS + OSM

Latest stage in the evolution of corporate involvement

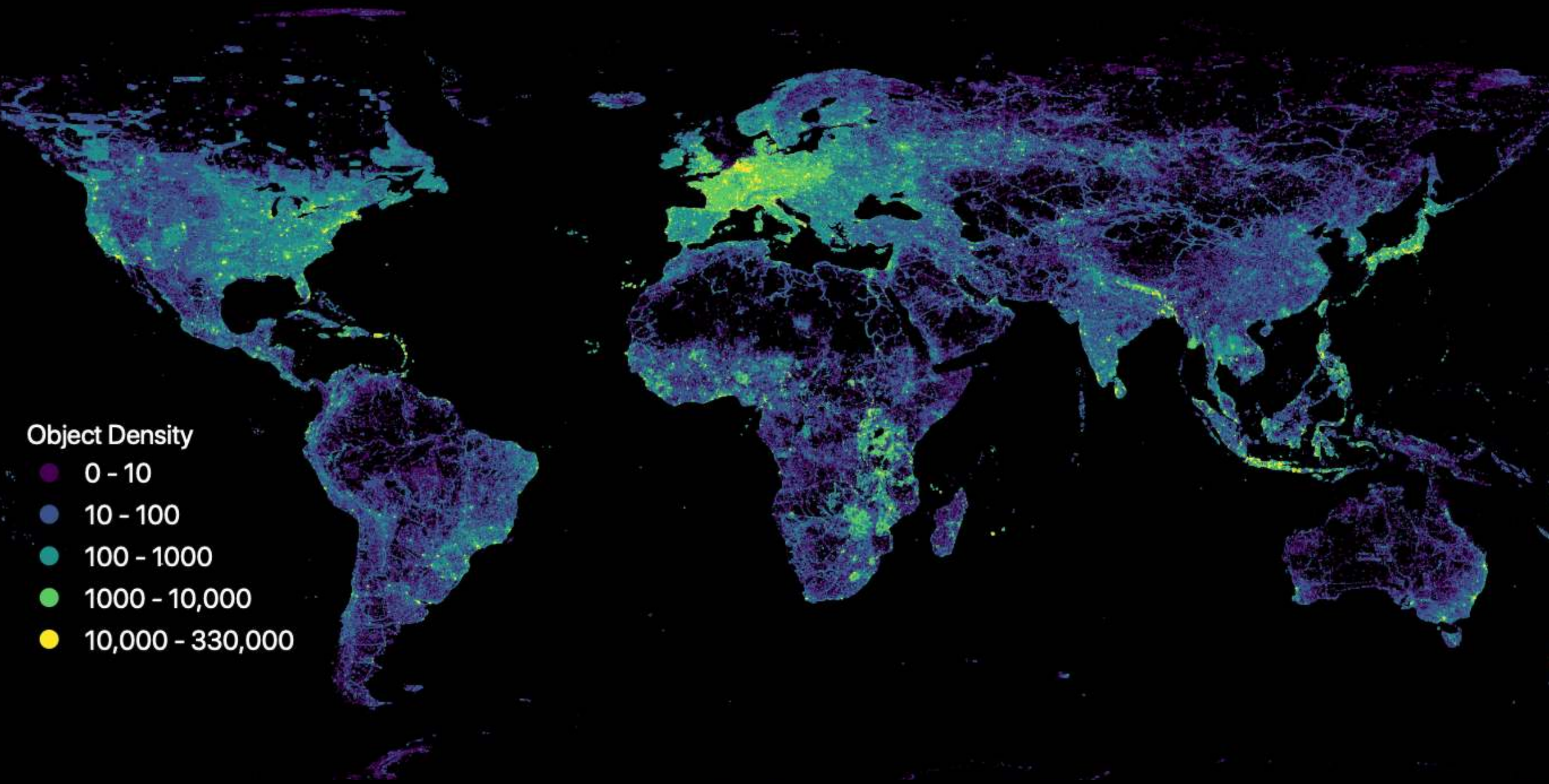
OSM Community

Humanitarian Mappers	craft/hobby mappers	Student groups
Government editors?	Localized editing communities	NGOs / Non-profits
Adhoc editing groups	Corporate Editors	. . .

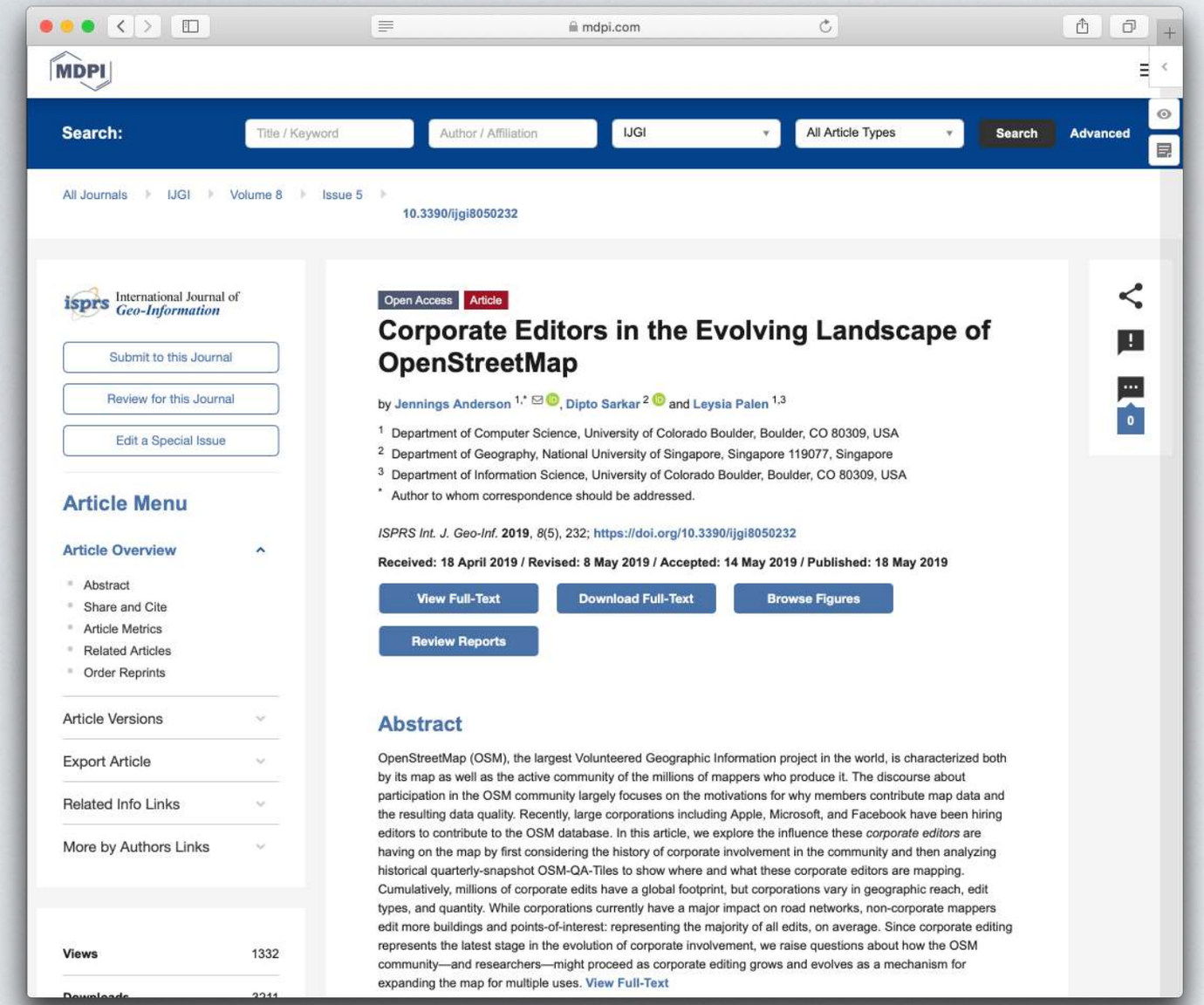
OSM GROWTH


Growth of OSM Users and Contributors Over Time
Users
Thousands of Changes to Database
5000
4000
3000
2000
1000
0
2005
2007
2009
2011
2013
2015
2017
2019
Date

State of the Map: Density



THANK YOU

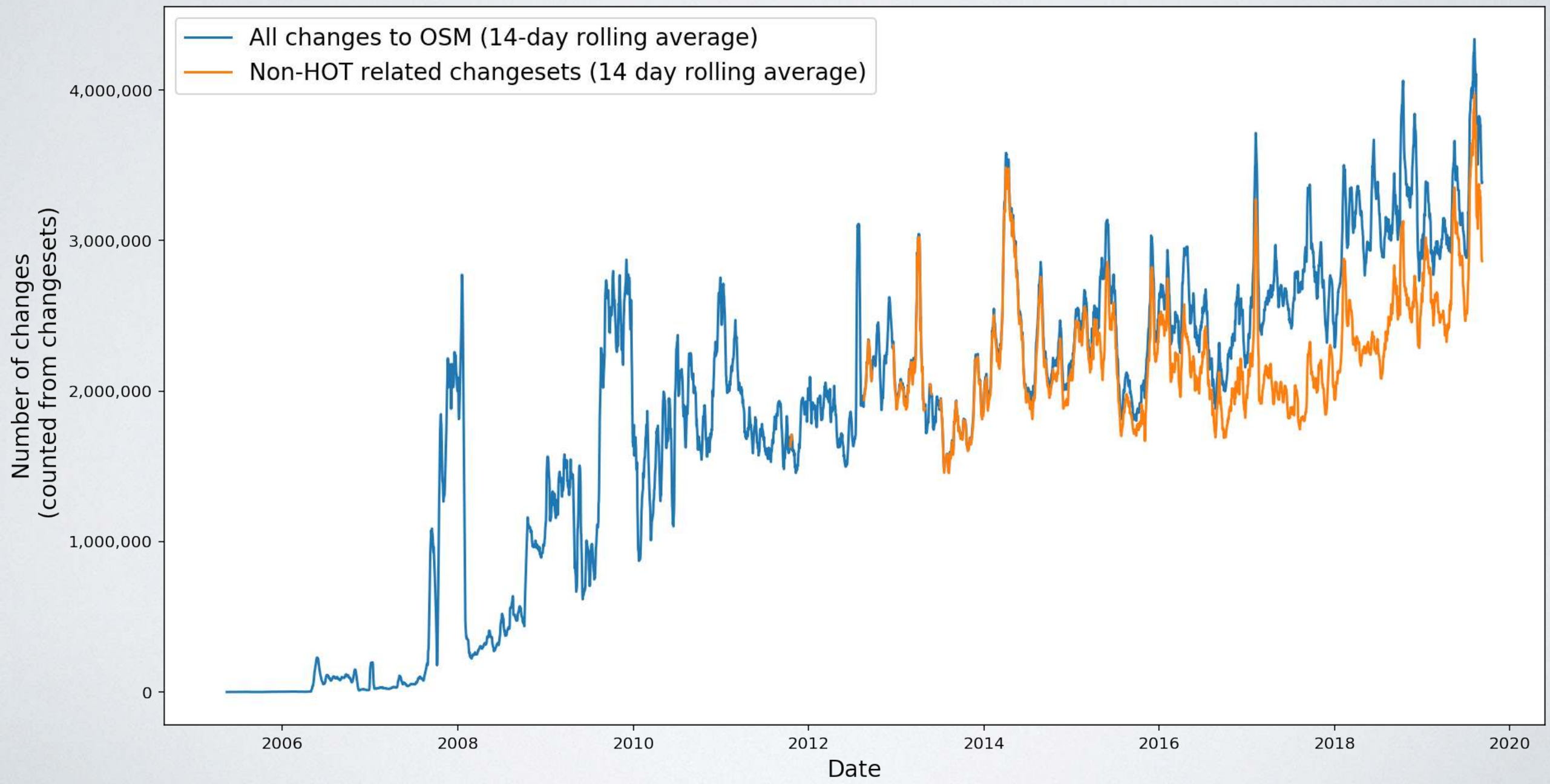


Dipto Sarker
Leysia Palen
Mikel Maron
Jubal Harpster
Jinal Foflia

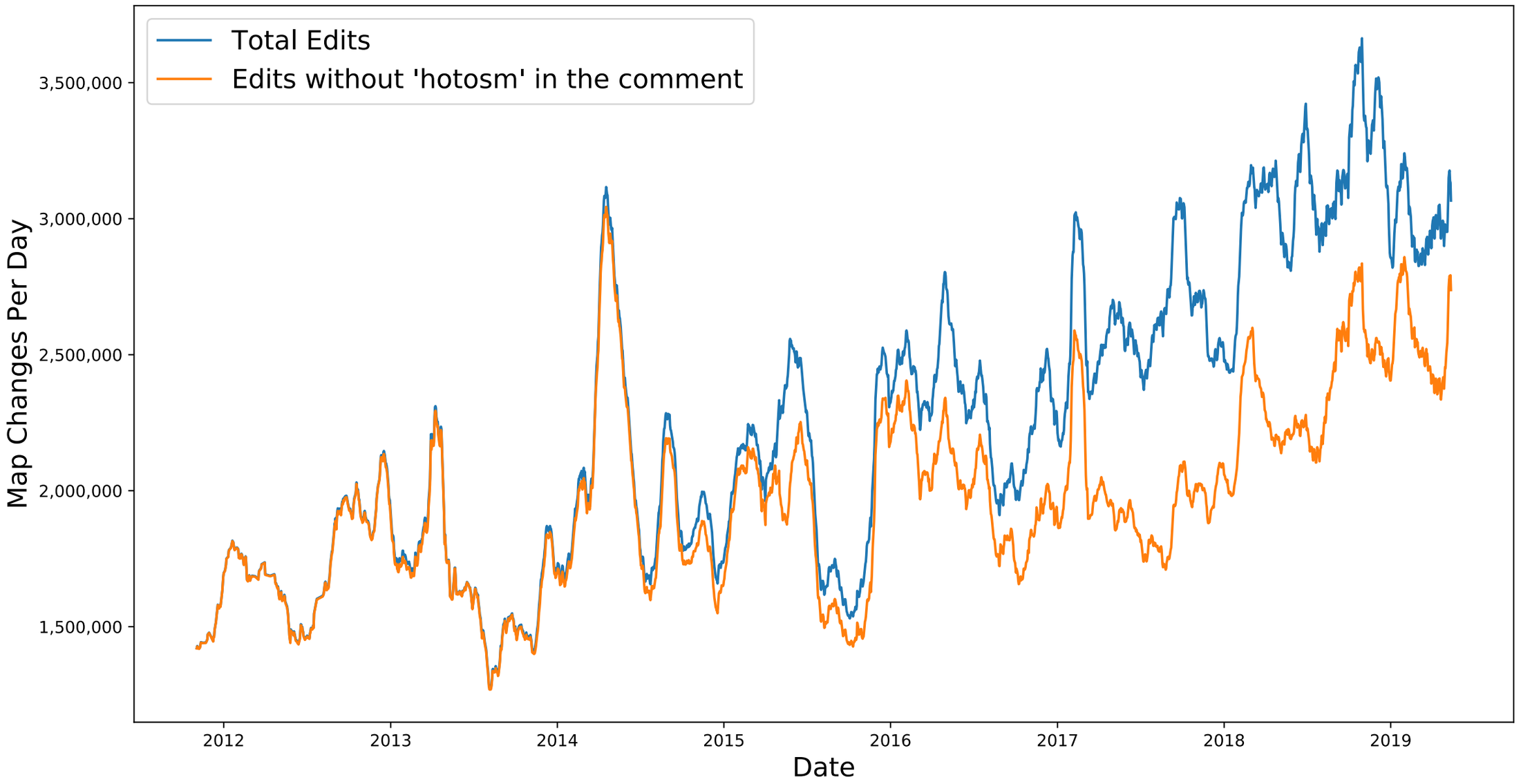
bit.ly/osm-corp-editing

additional material

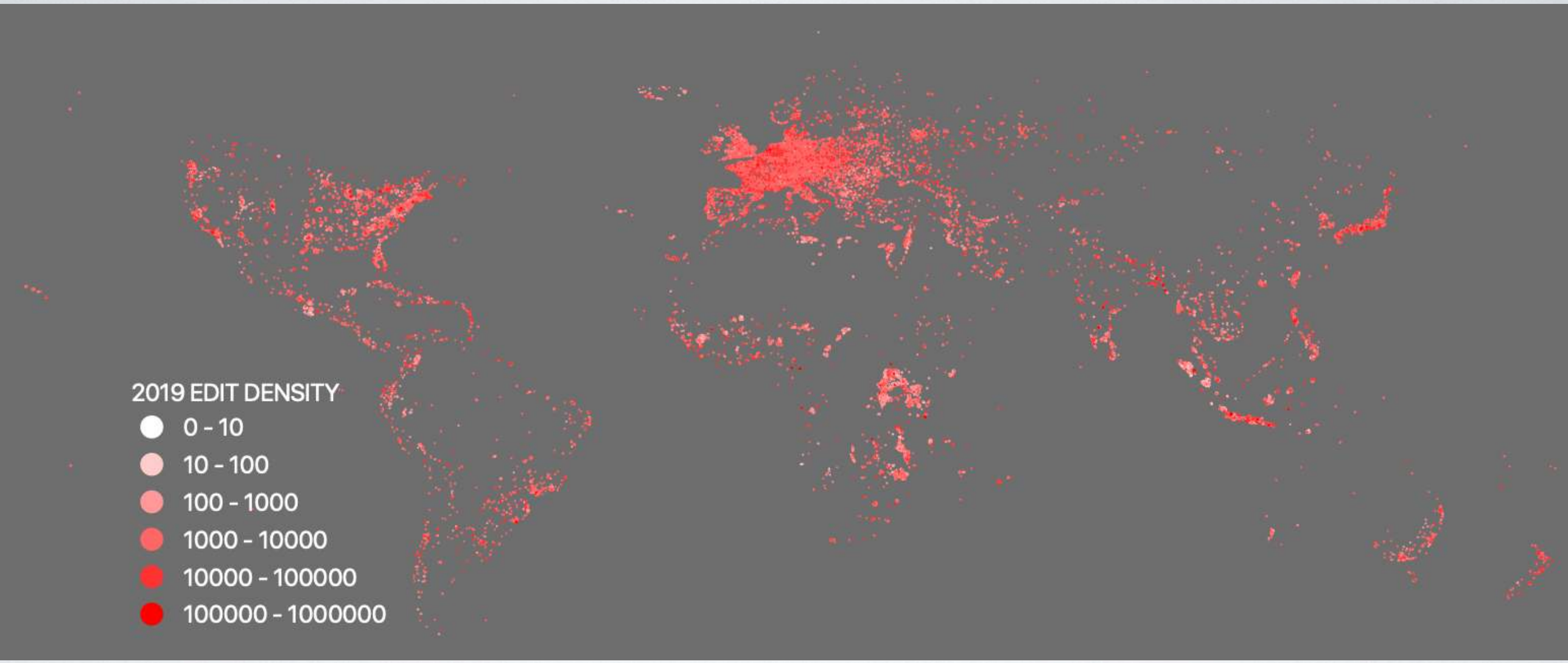
Edits with HOT Humanitarian OpenStreetMap Team



Edits with HOT Humanitarian OpenStreetMap Team

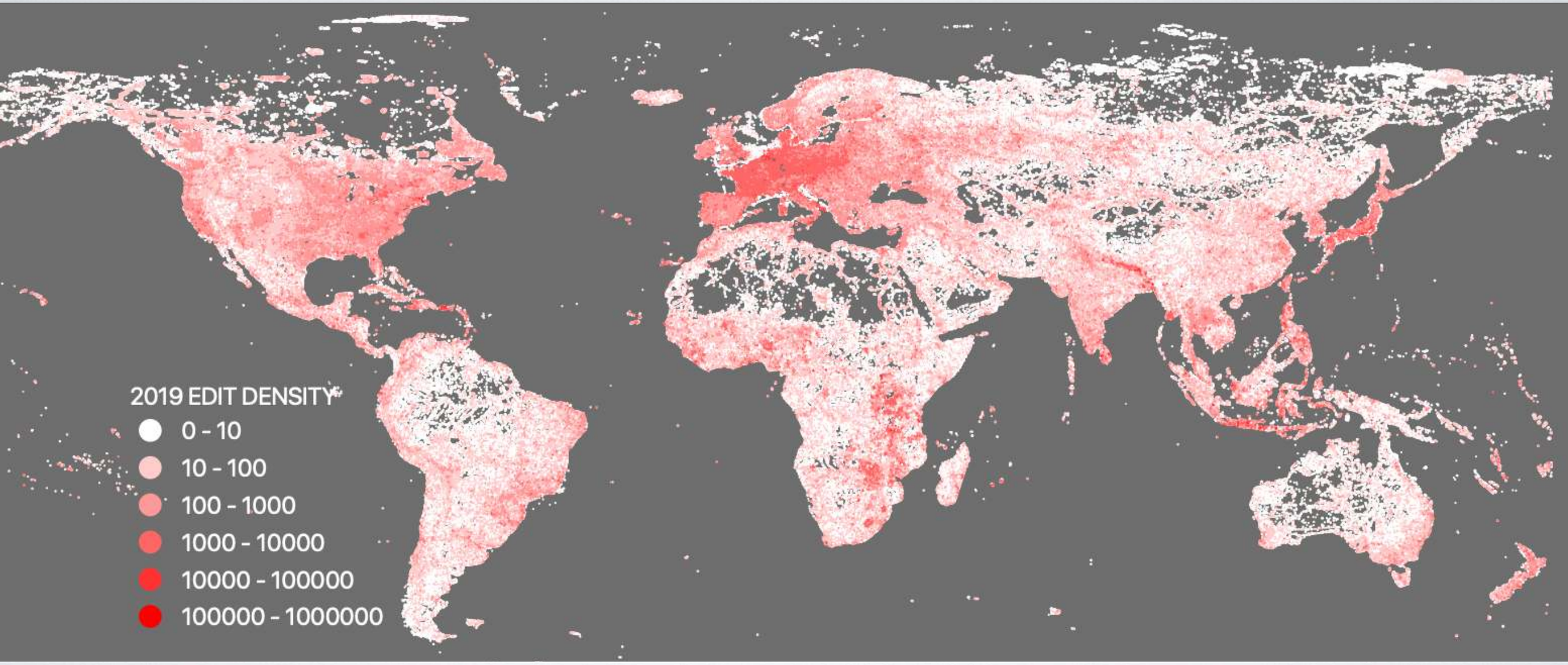


Object density where more than 10 mappers have been active since 2018



Represents 91% of all mapped objects

Object density where 10 mappers or fewer have been active since 2018



Represents 9% of global data