

Mobility Data and Disasters  
What is the current state of data, policy, privacy, and practice?

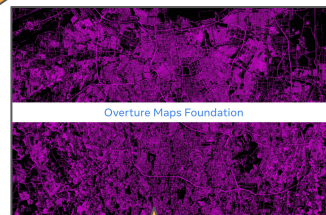
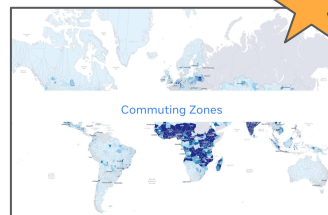
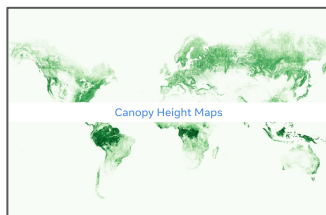
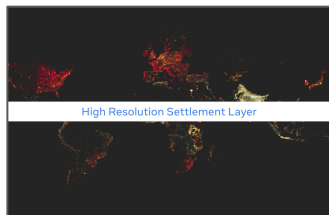
Understanding Risk 2024

# Privacy vs Utility

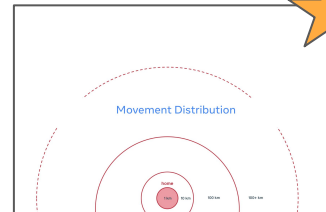
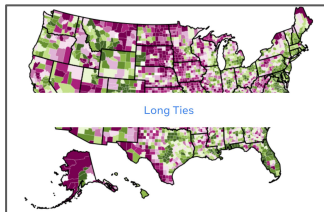
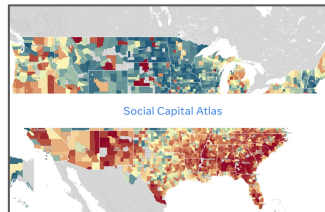
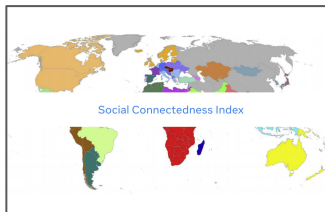
[alexpompe@meta.com](mailto:alexpompe@meta.com)  
[dataforgood.facebook.com](https://dataforgood.facebook.com)



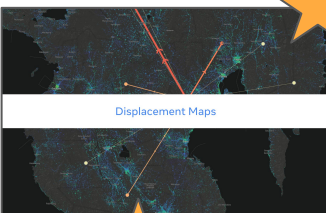
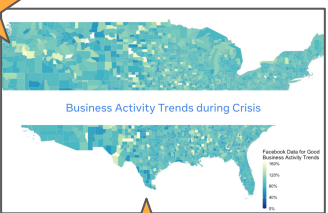
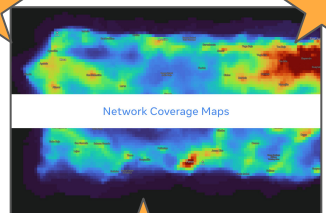
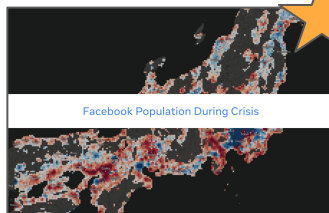
Built with AI



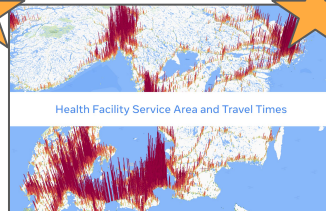
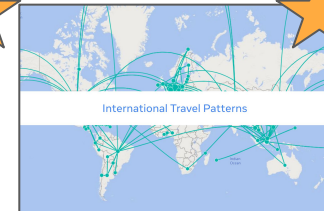
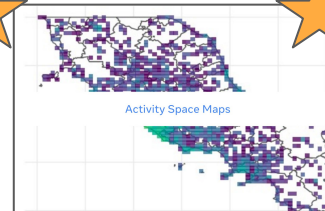
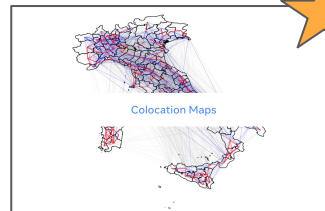
Social Capital



Crisis Response

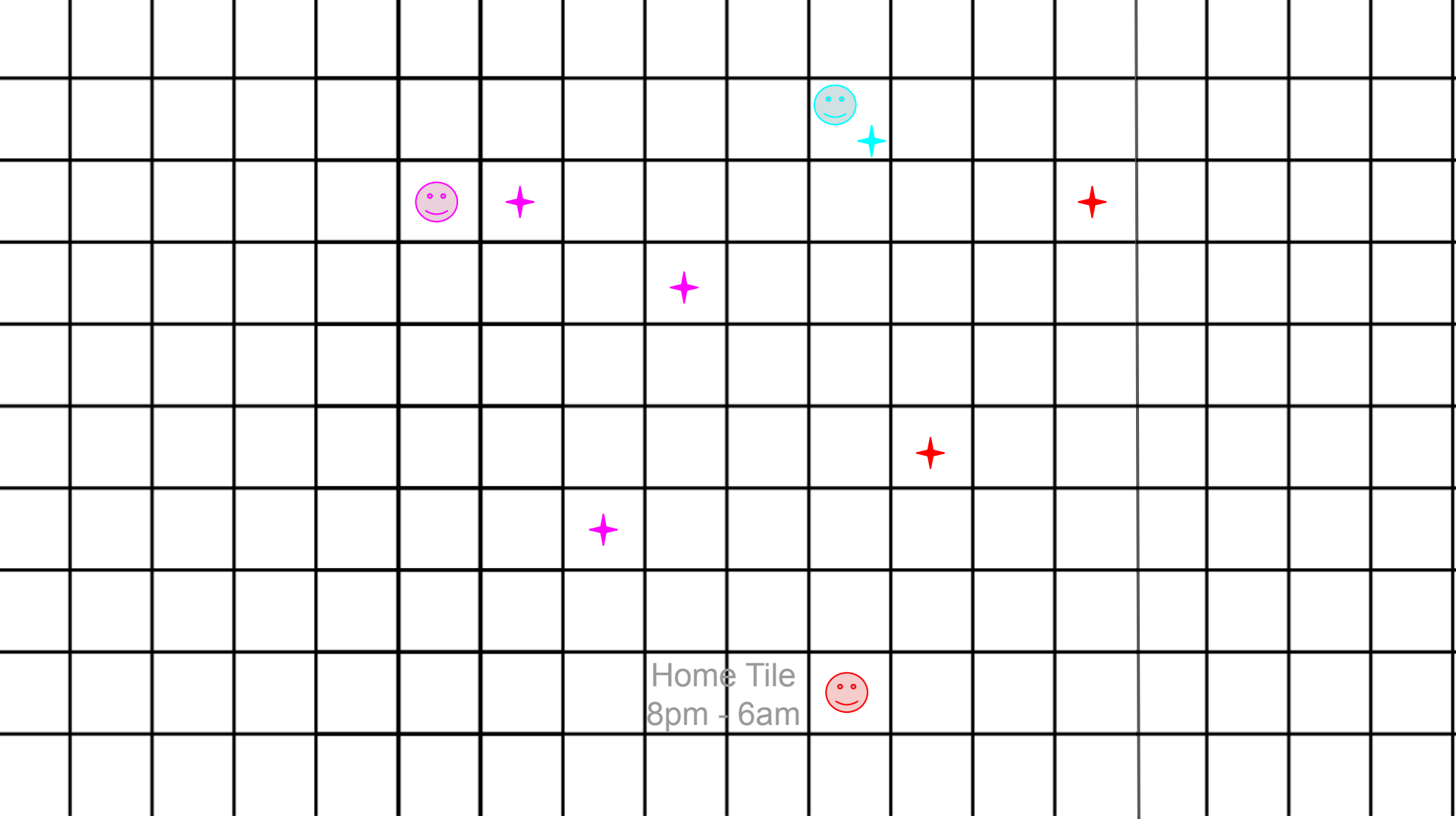


Public Health



Public

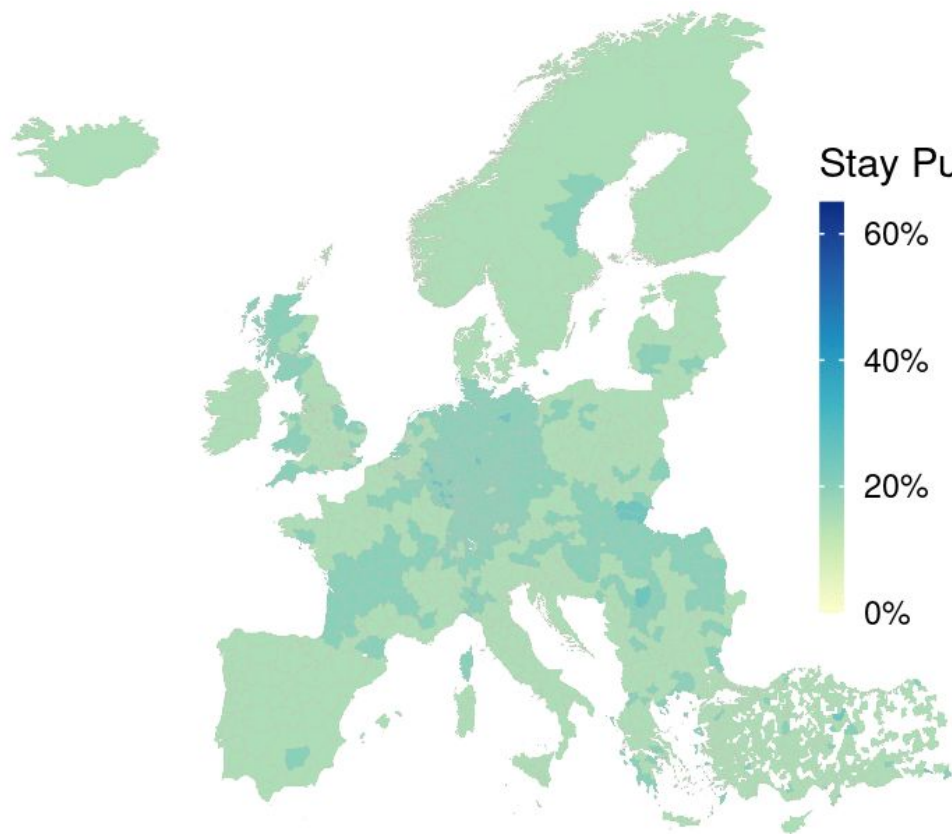
Controlled Access



Home Tile  
8pm - 6am



Date: 2020-03-04



## GLOBAL RELEASE OF 2 METRICS ESTIMATED FOR JUNE 3 2020

- CHANGE IN MOVEMENT

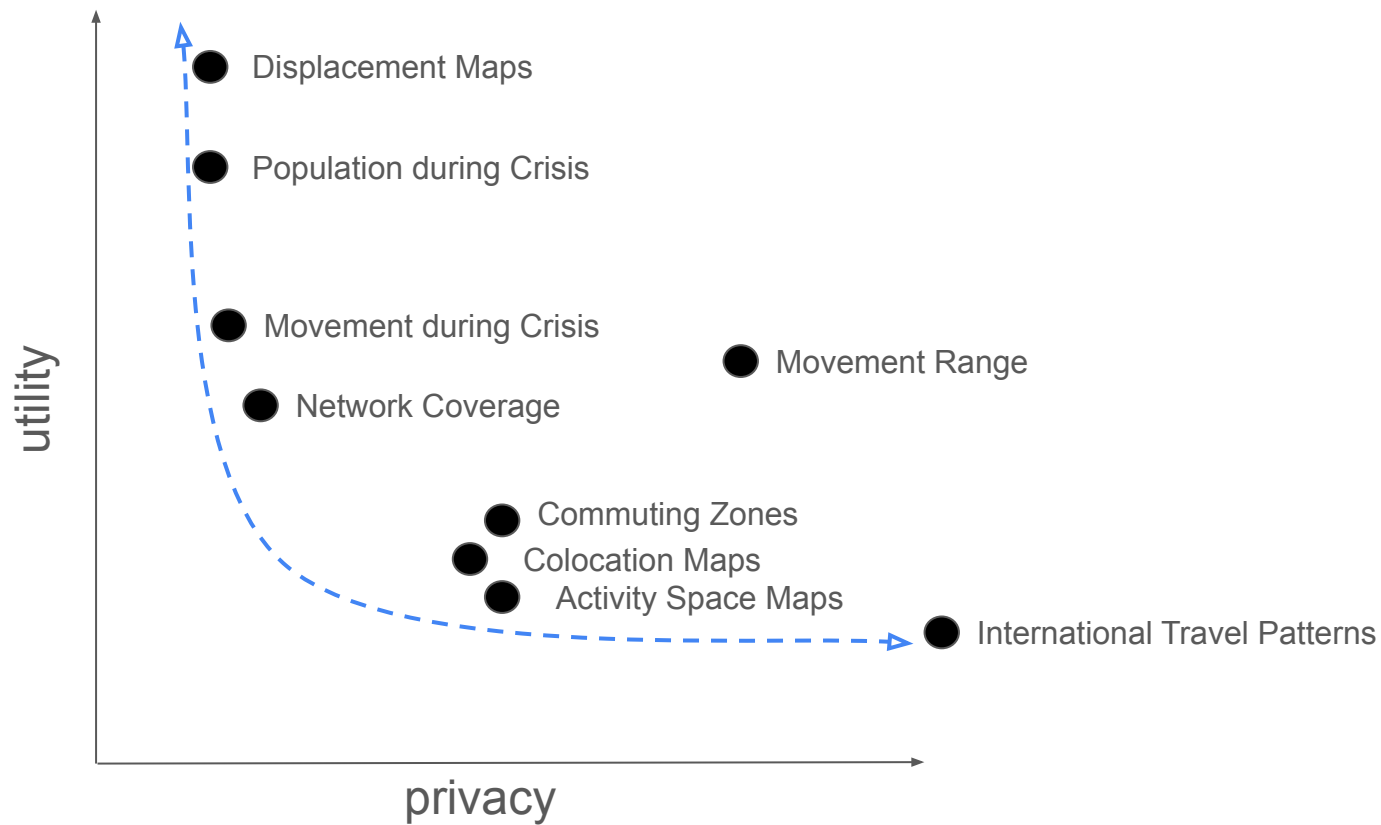
- THE AVERAGE NUMBER OF LEVEL 16 BING TILES (~0.6KM BY 0.6KM) THAT A FACEBOOK USER (WITH LOCATION HISTORY ENABLED) WAS PRESENT IN DURING A 24 HOUR PERIOD COMPARED TO PRE-CRISIS LEVELS.

- PERCENTAGE STAYING PUT

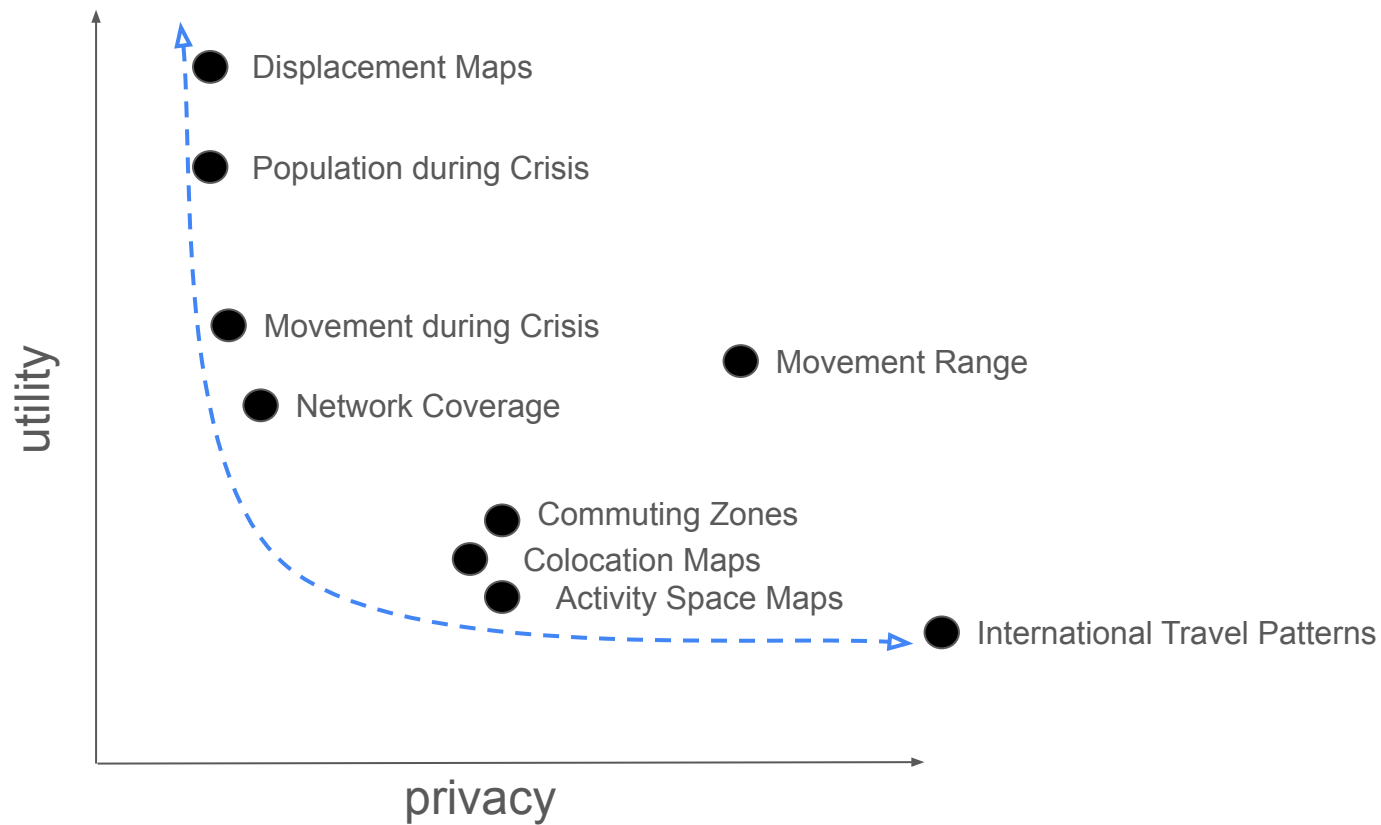
- THE PERCENTAGE OF FACEBOOK USERS (WITH LOCATION HISTORY ENABLED) THAT WERE PRESENT IN ONLY ONE LEVEL 16 BING TILE IN AT LEAST 3 DIFFERENT HOURS OF THE DAY.

## PRIVACY PROTECTIONS

- AGGREGATED AT COUNTY (OR EQUIVALENT) LEVEL
- MINIMUM THRESHOLD OF 300 USERS
- DIFFERENTIAL PRIVACY NOISE ADDED



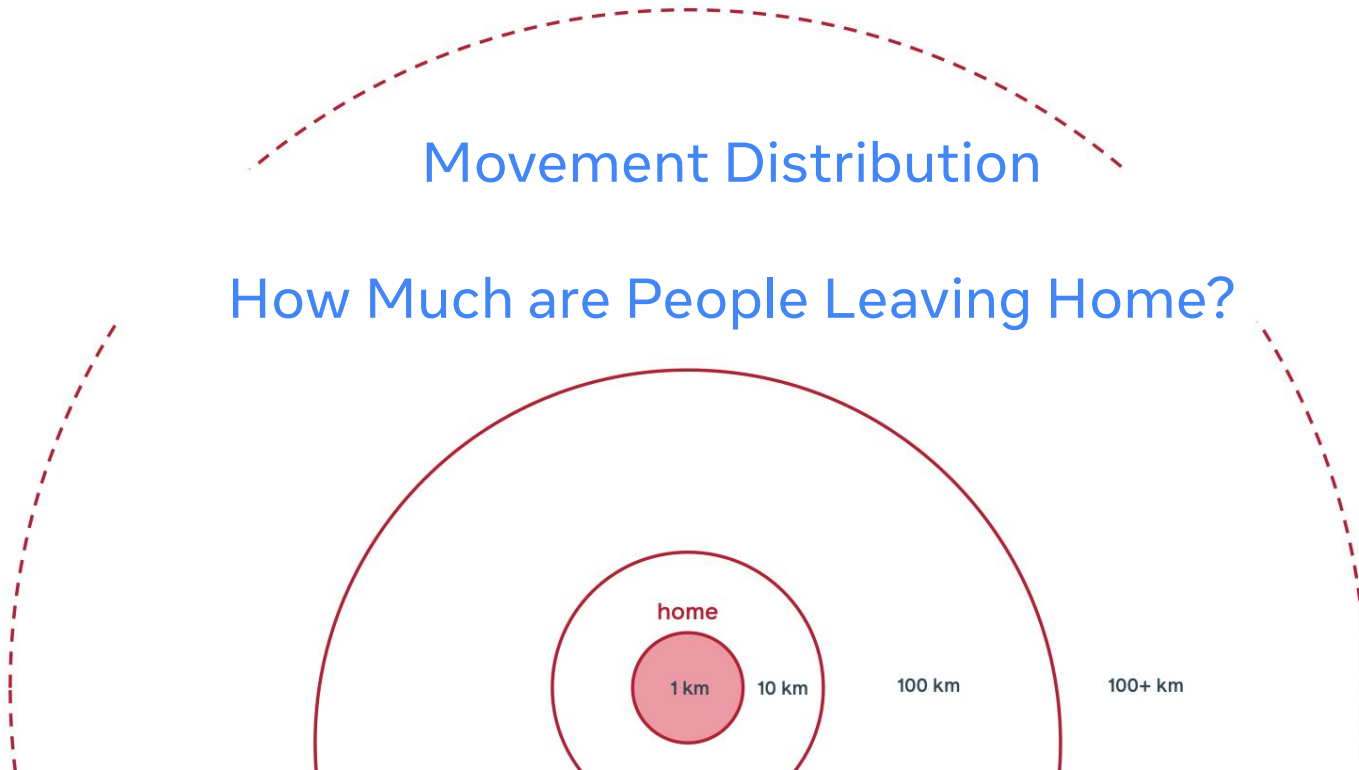
● ? Movement Distribution ?



● ? Movement Distribution ?

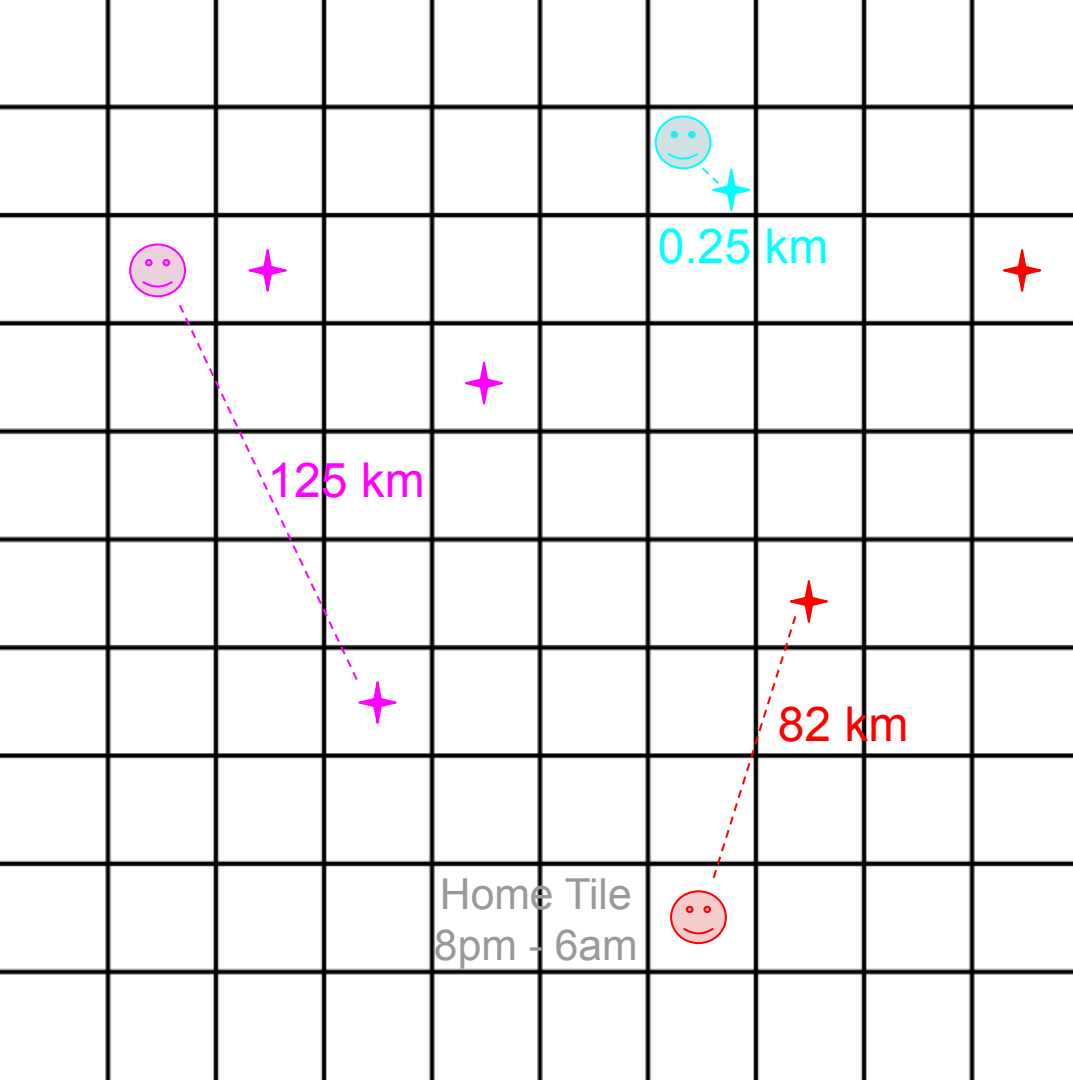
## Movement Distribution

How Much are People Leaving Home?



# Fake San Francisco County

March 26 2024



home\_to\_ping\_distance\_category

distance\_category\_ping\_fraction

0

0.33

(0,10)

0

[10,100)

0.33

100+

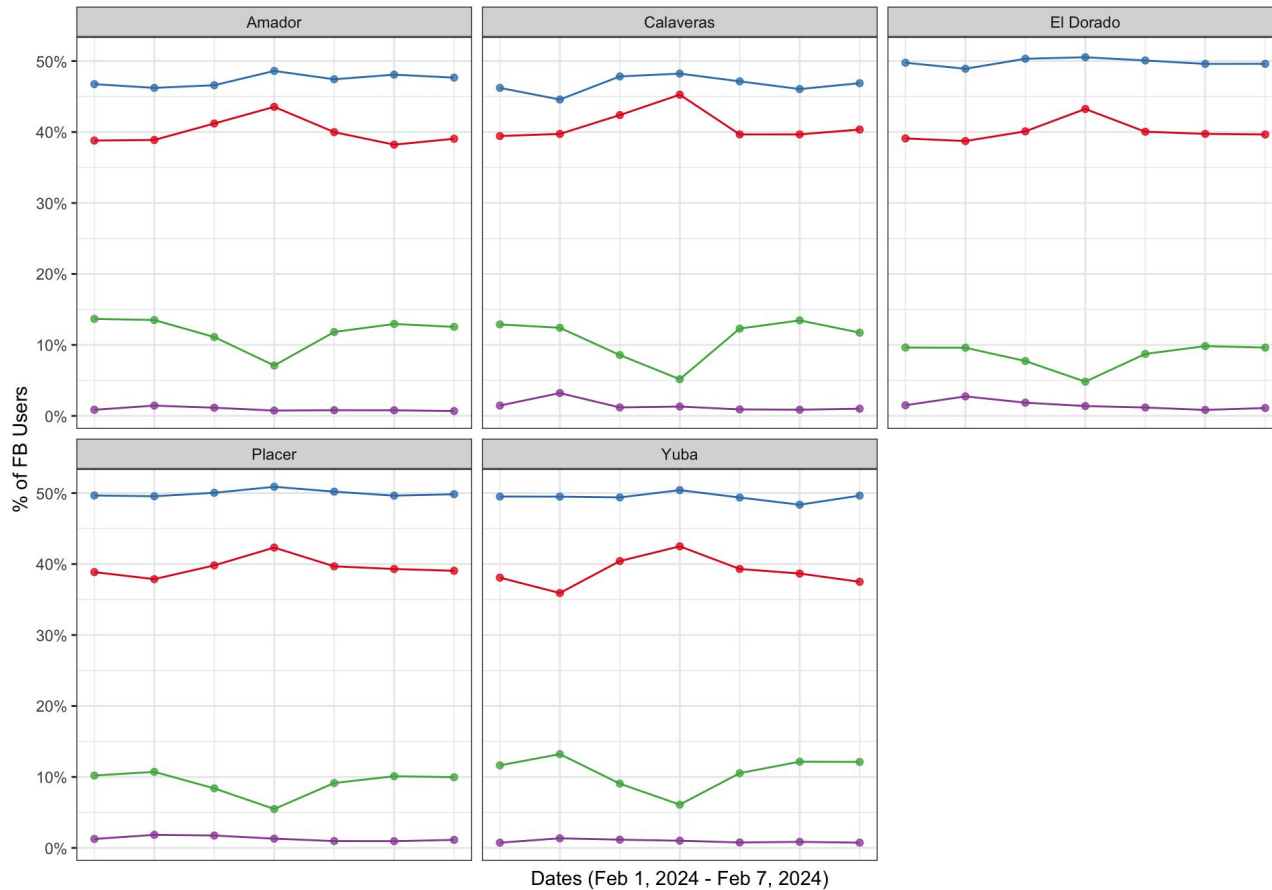
0.33

Added Differential Privacy  
Noise Means Sum may not  
equal exactly 1.0



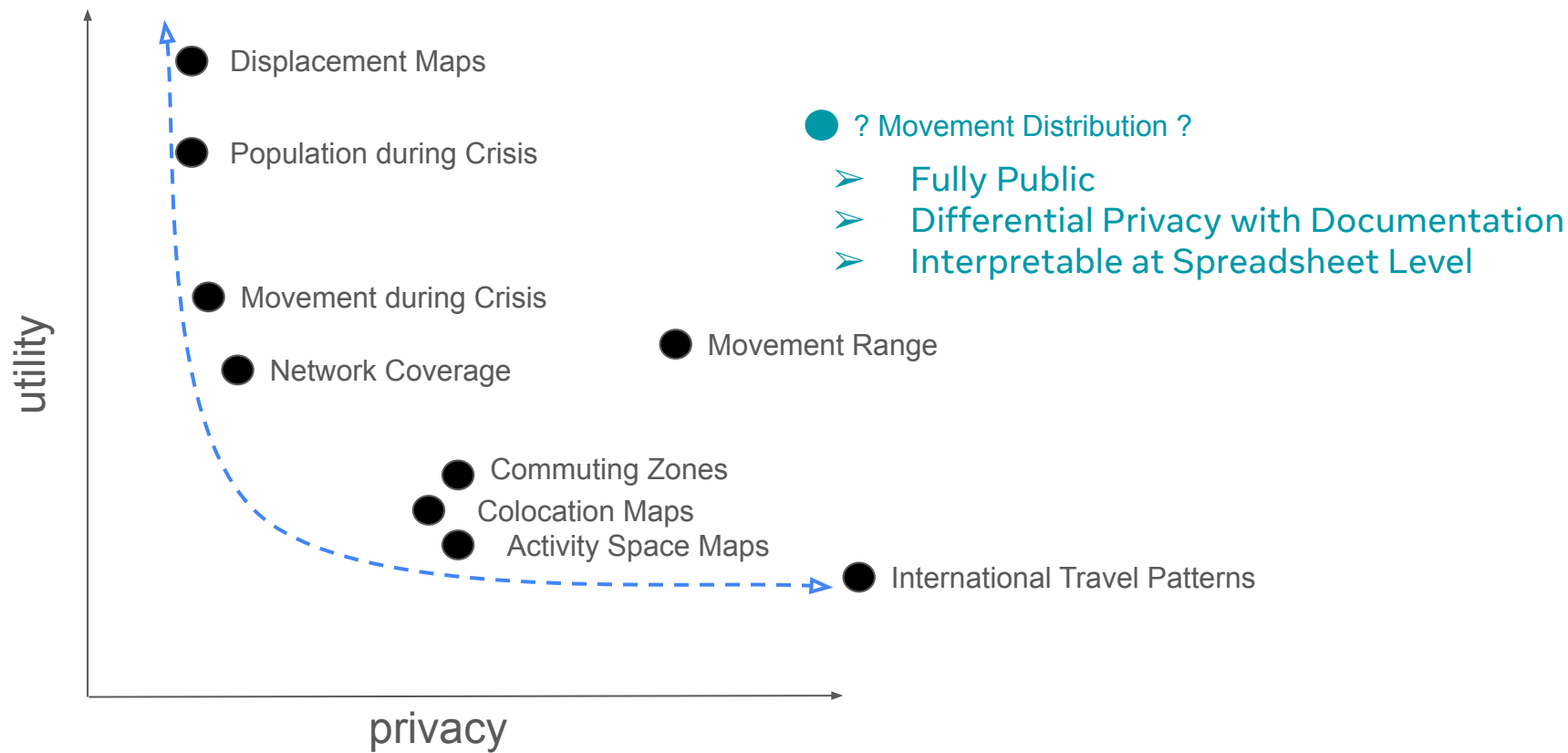
## Movement Distribution of FB Users in select California counties

at each admin 2 level region



Distance (km from home): — 0 — (0, 10) — [10, 100] — 100+

gadm_id	gadm_name	country	polygon_level	home_to_ping_distance_category	distance_category_ping_fraction	ds
<chr>	<chr>	<chr>	<chr>	<chr>	<dbl>	<chr>
USA.48.31_1	Snohomish	USA	2	(0, 10)	0.490482965	2023-11-23
USA.48.31_1	Snohomish	USA	2	0	0.409168993	2023-11-23
USA.48.23_1	Mason	USA	2	(0, 10)	0.482018652	2023-11-23
USA.48.29_1	Skagit	USA	2	0	0.369140120	2023-12-07
USA.48.29_1	Skagit	USA	2	100+	0.006303257	2023-12-07
USA.48.29_1	Skagit	USA	2	(0, 10)	0.504863171	2023-12-07
USA.48.12_1	Garfield	USA	2	100+	0.023817389	2023-11-23
USA.48.8_1	Cowlitz	USA	2	100+	0.012657098	2023-11-23
USA.48.8_1	Cowlitz	USA	2	(0, 10)	0.502166352	2023-11-23
USA.48.8_1	Cowlitz	USA	2	0	0.406244917	2023-11-23
USA.48.30_1	Skamania	USA	2	[10, 100)	0.083761492	2023-11-23
USA.48.30_1	Skamania	USA	2	0	0.404992931	2023-11-23
USA.48.8_1	Cowlitz	USA	2	[10, 100)	0.078900016	2023-11-23
USA.48.34_1	Thurston	USA	2	[10, 100)	0.085429498	2023-11-23
USA.48.34_1	Thurston	USA	2	(0, 10)	0.495817309	2023-11-23
USA.48.34_1	Thurston	USA	2	100+	0.010039848	2023-11-23
USA.48.34_1	Thurston	USA	2	0	0.408733786	2023-11-23
USA.48.38_1	Whitman	USA	2	[10, 100)	0.071210292	2023-12-06
USA.48.38_1	Whitman	USA	2	0	0.382898584	2023-12-06



# Mobility Dataset Comparison

Name	Access	Spatial Coverage	Spatial Resolution	Temporal Resolution	Sample
Commuting Zones	Public (HDX)	Global	Admin level 2	6 Months	All Facebook Users with Home and Work Estimates
Movement Distribution	Public (HDX)	Global	Admin level 2	24 Hours (monthly uploads to HDX)	Facebook Users who have opted-in to Location Services
Facebook Population During Crisis	Controlled Access (Partner Portal)	Crisis Area & Time	2.4 km <sup>2</sup> Tile	8 Hours	Facebook Users who have opted-in to Location Services
Facebook Movement During Crisis	Controlled Access (Partner Portal)	Crisis Area & Time	2.4 km <sup>2</sup> Tile	8 Hours	Facebook Users who have opted-in to Location Services
Colocation Maps	Controlled Access (Partner Portal)	Global	Admin level 2	7 Days	Facebook Users who have opted-in to Location Services
Activity Space Maps	Controlled Access (Custom)	Global	1.7 km <sup>2</sup> Tile	3 Weeks	Facebook Users who have opted-in to Location Services
International Travel Patterns	Controlled Access (Partner Portal)	Global	Country	24 Hours	Facebook Users who have opted-in to Location Services

## Movement Distribution

The Movement Distribution dataset shows the range of movement of people away from the area where they live on a daily basis. These maps are useful for projects focused on transportation, tourism, displacement, and other areas.

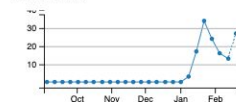
More info available here: <https://dataforgood.facebook.com/dfg/tools/movement-distribution-maps>



100+ Downloads | This dataset updates: Every month

[Contact the contributor](#) | [X](#) [f](#) [v](#)

### DOWNLOADS



### RELATED SHOWCASES

There are no showcases for this dataset.

### ACTIVITY



### Data and Resources

### Metadata



#### Movement Distribution Readme - Data for Good... (118.0K)

Modified: 18 January 2024

Documentation for the Movement Distribution Data

[DOWNLOAD](#)[MORE](#)

#### Movement Distribution - Data for Good at... (382.9M)

Modified: 11 January 2024

December 2023

[DOWNLOAD](#)[MORE](#)

#### Movement Distribution - Data for Good at... (370.3M)

Modified: 18 January 2024

November 2023

[DOWNLOAD](#)[MORE](#)

#### Movement Distribution - Data for Good at... (382.6M)

Modified: 18 January 2024

October 2023

[DOWNLOAD](#)[MORE](#)

#### Movement Distribution - Data for Good at... (370.3M)

Modified: 18 January 2024

September 2023

[DOWNLOAD](#)[MORE](#)

#### Movement Distribution - Data for Good at... (381.6M)

Modified: 18 January 2024

August 2023

[DOWNLOAD](#)[MORE](#)



Thank You!

[dataforgood.facebook.com](https://dataforgood.facebook.com)