

Small-Town Police Accountability: A Data Science Toolkit

SciPy 2023

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Seattle University
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Why policing?

Why policing?

1. Police continue to hide substantial amounts of data from the public

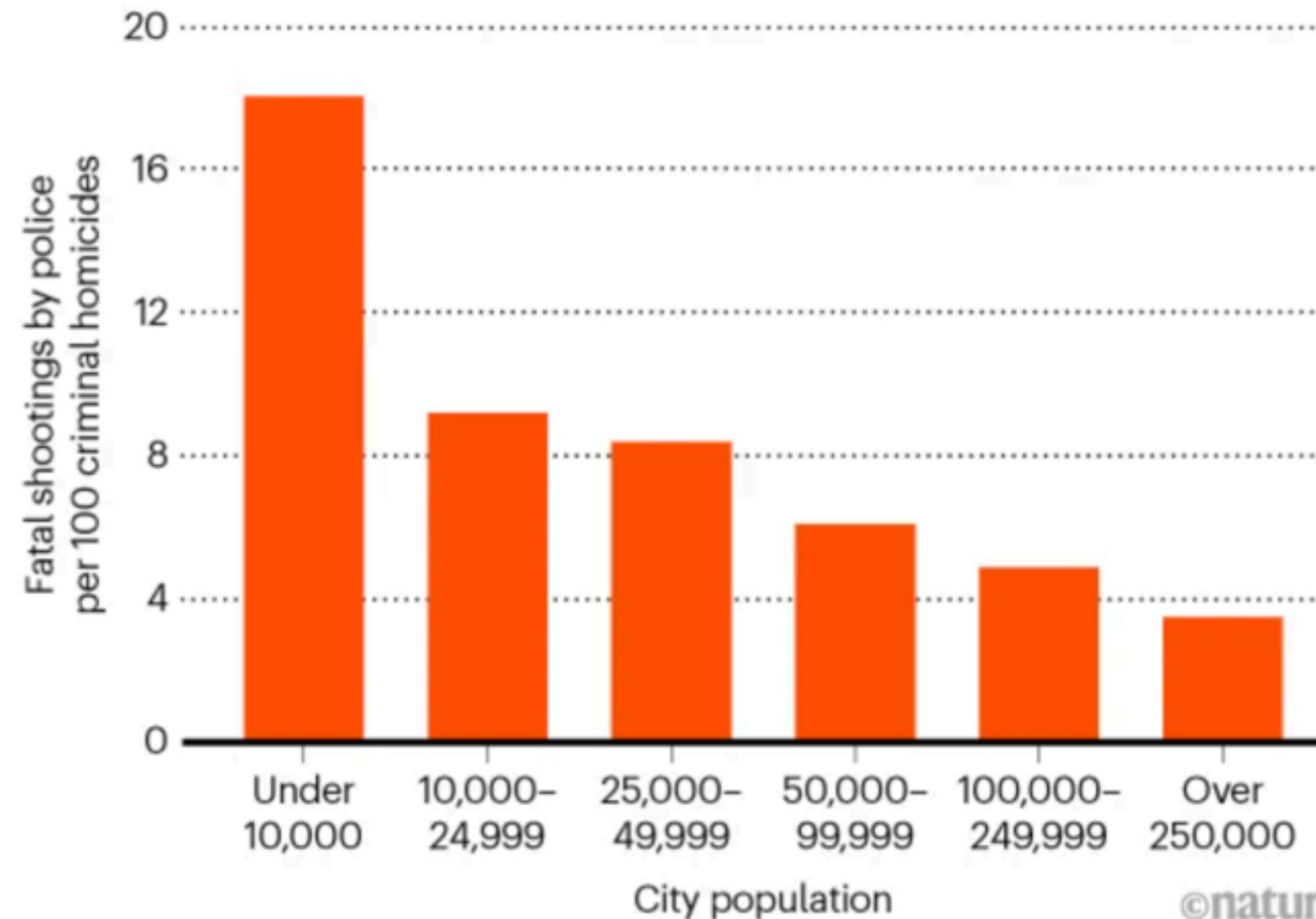
Why policing?

1. Police continue to hide substantial amounts of data from the public
2. Policing differs substantially depending where you live and who you are

Why small towns?

SMALL-TOWN PROBLEMS

Large cities account for about 30% of fatal police shootings, but the rate of police shootings per 100 homicides is much higher in smaller communities. Little research has been done to understand this relationship.



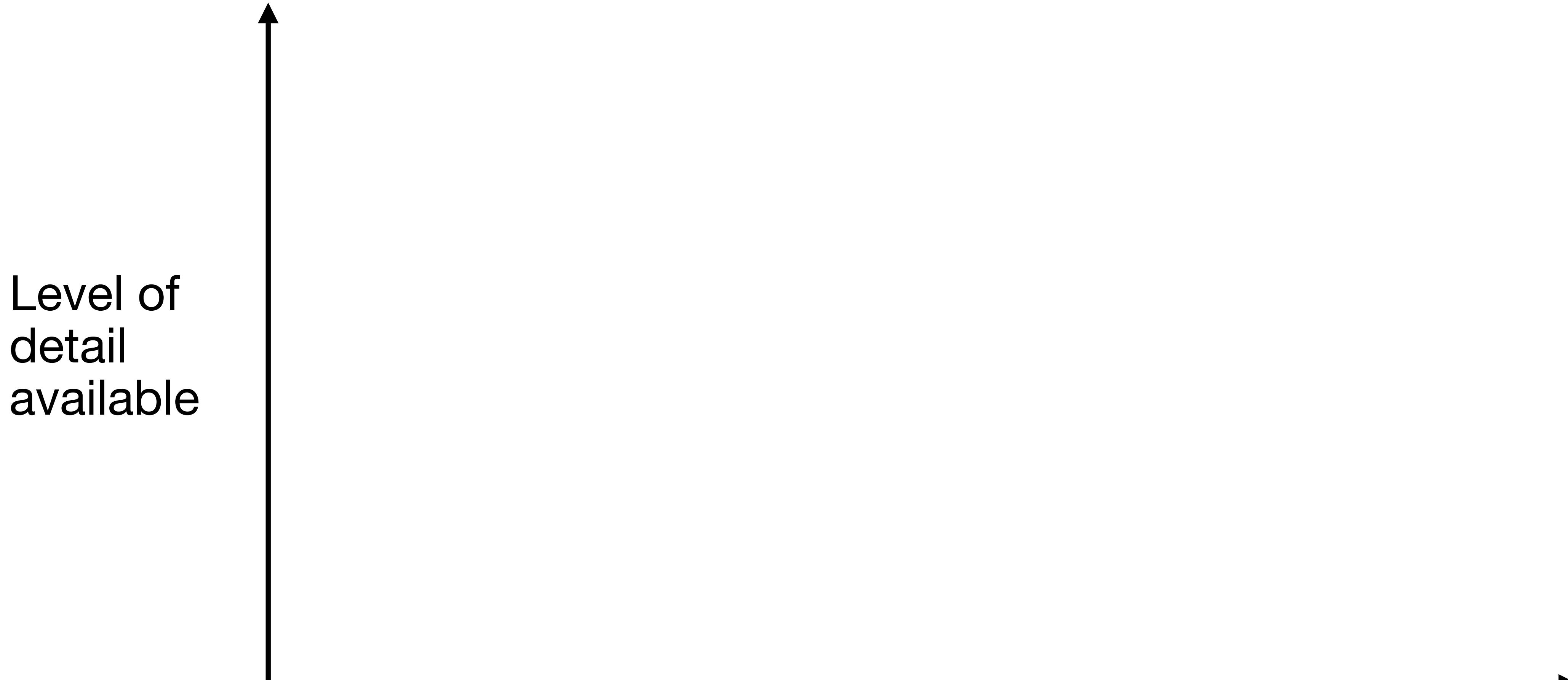
NEWS FEATURE | 19 June 2020 | Update [26 May 2021](#)

What the data say about police brutality and racial bias – and which reforms might work

Some interventions could help to reduce racism and rein in the use of unnecessary force in police work, but the evidence base is still evolving.

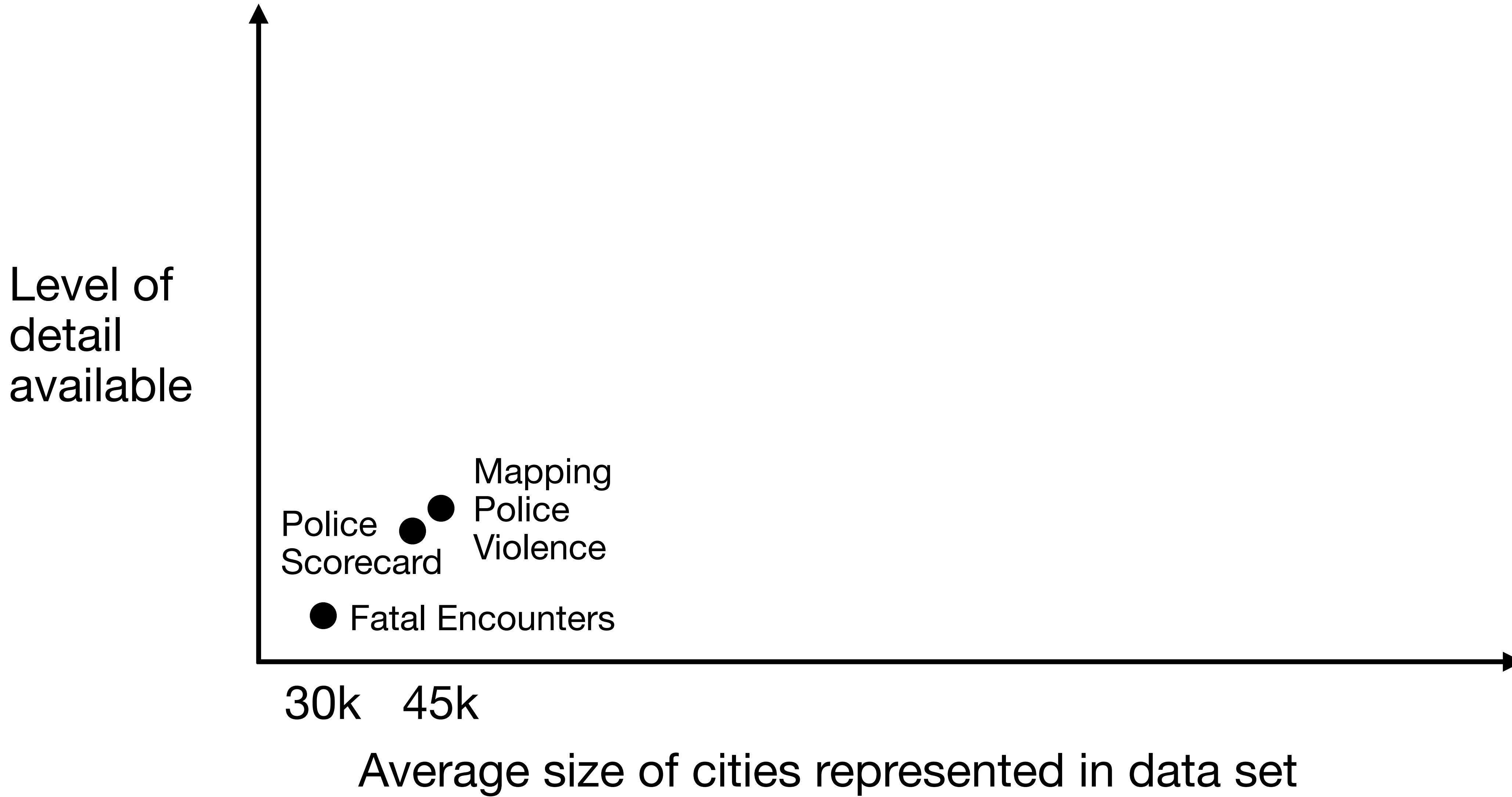
[Lynne Peeples](#)

Why small towns?

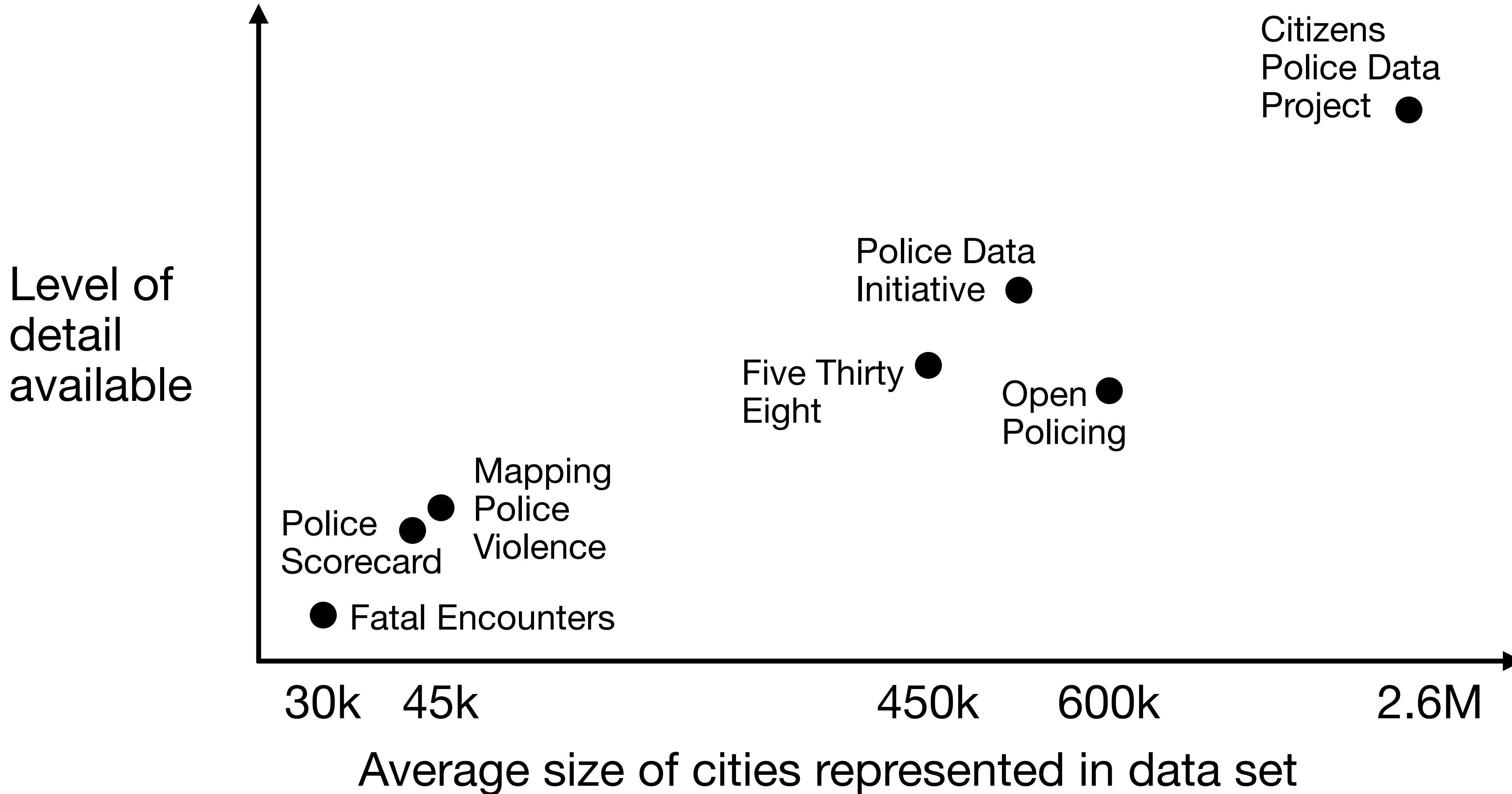


Average size of cities represented in data set

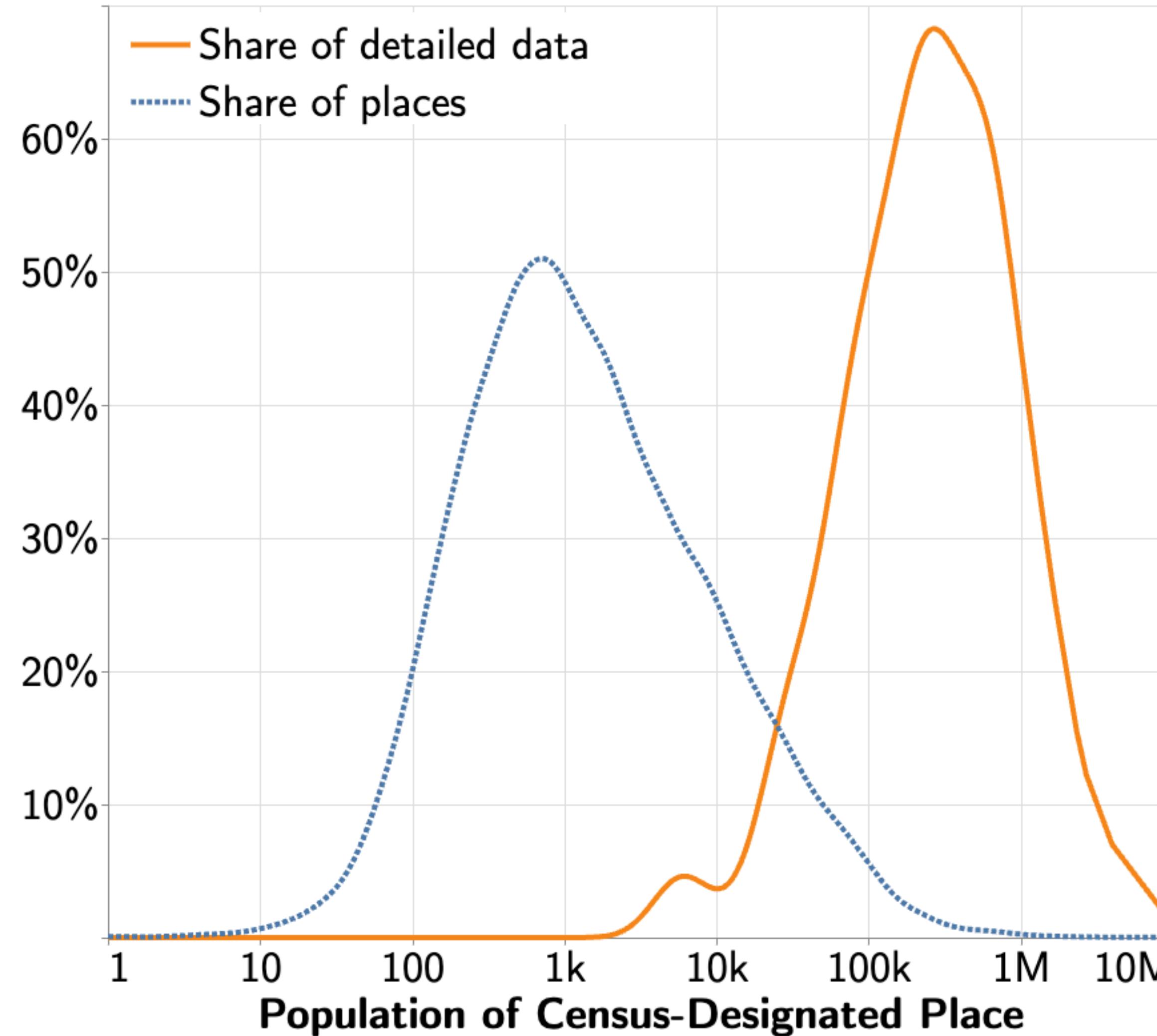
Why small towns?



Why small towns?



Information is not equally distributed



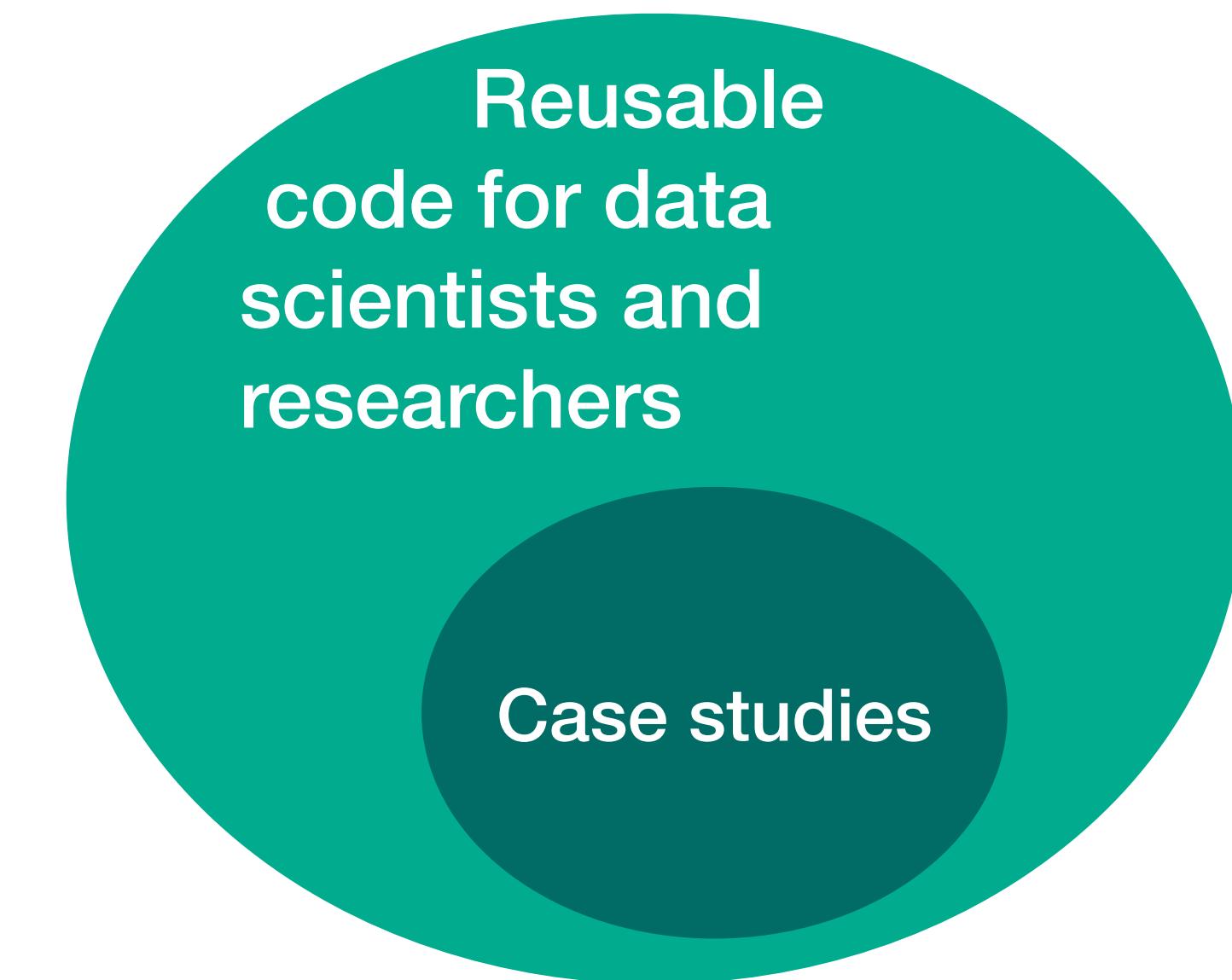
Small Town Police Accountability Research Lab SToPA

Small Town Police Accountability Research Lab SToPA

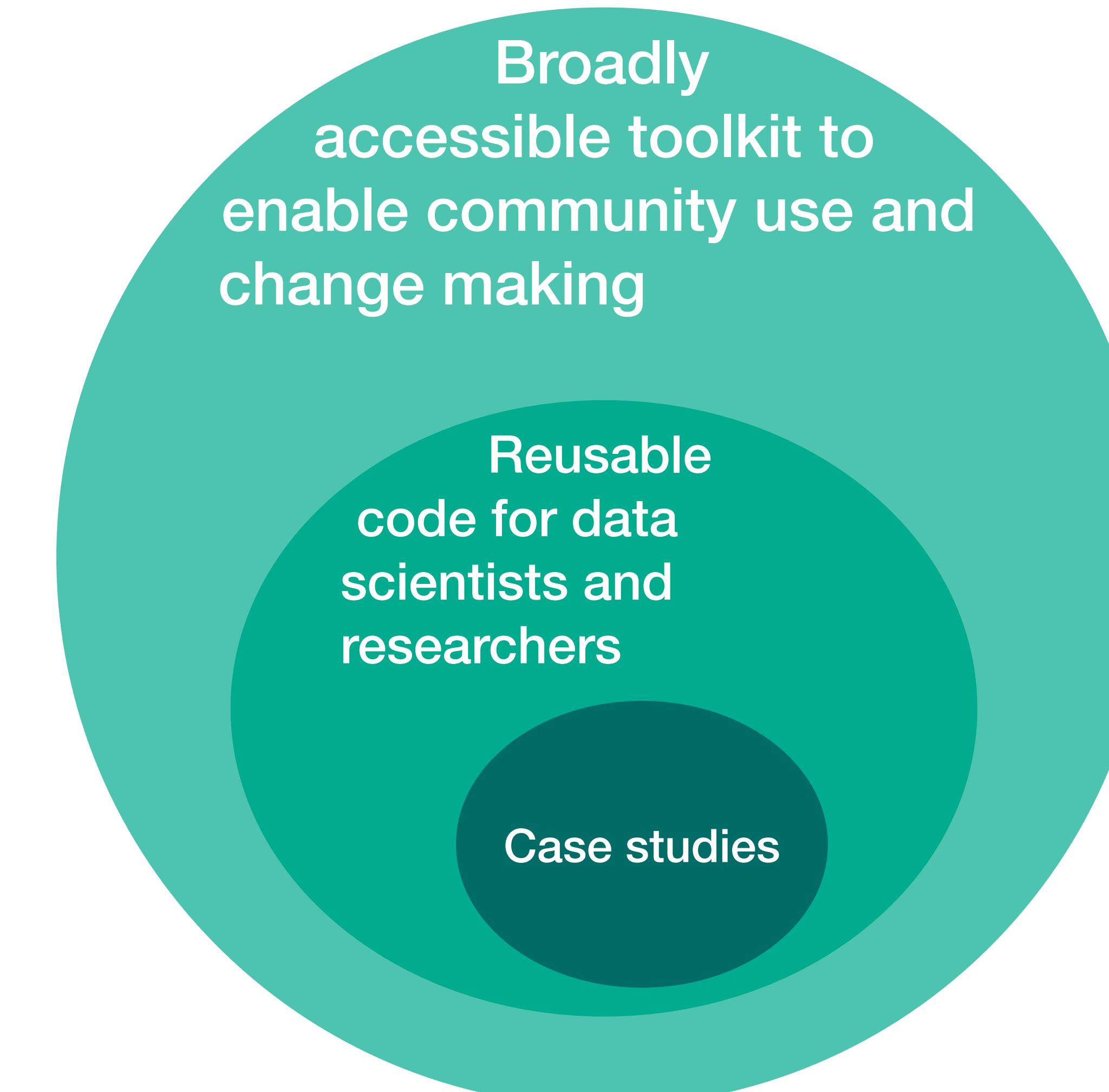


Case studies

Small Town Police Accountability Research Lab SToPA



Small Town Police Accountability Research Lab SToPA

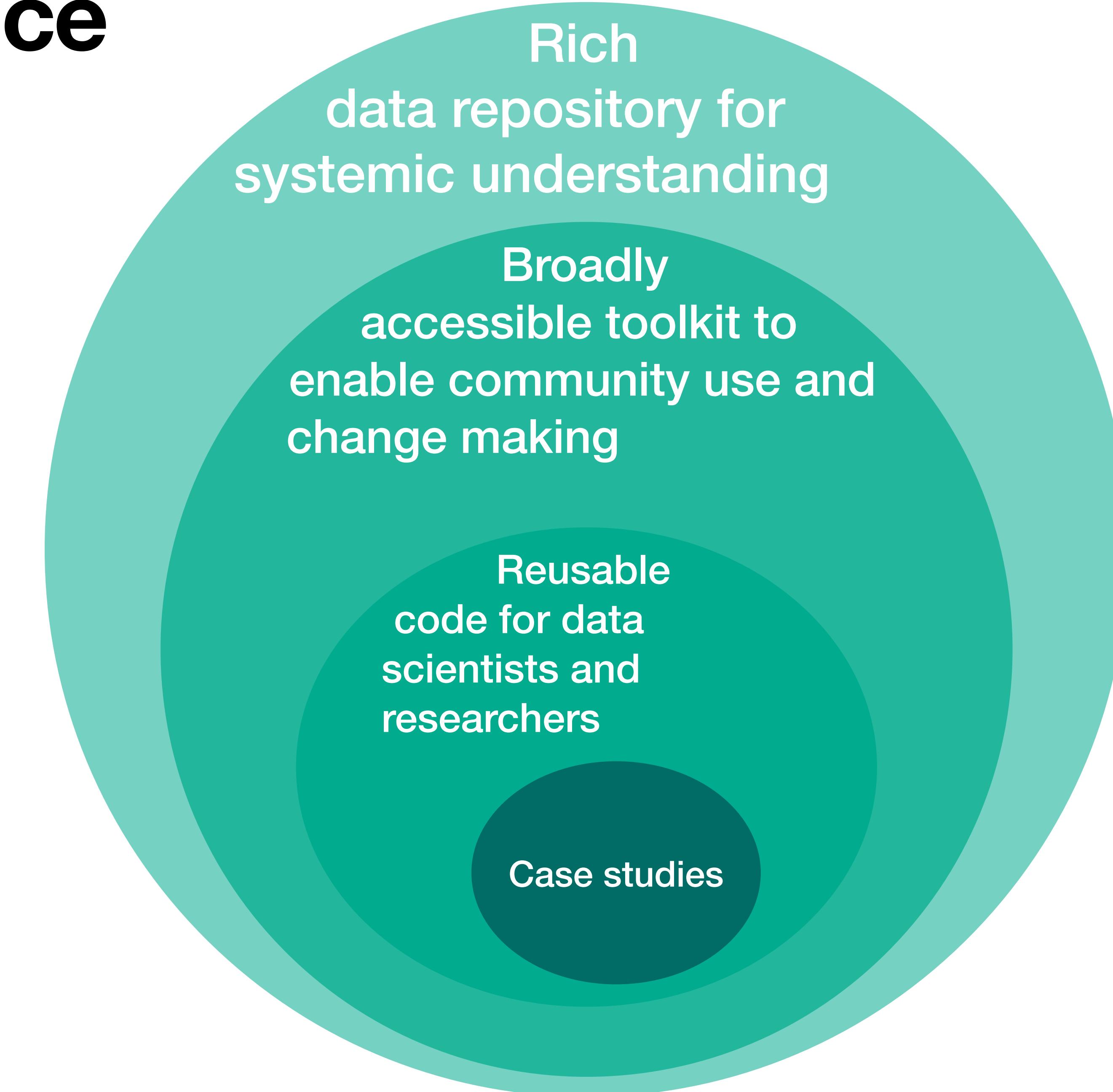


Broadly accessible toolkit to enable community use and change making

Reusable code for data scientists and researchers

Case studies

Small Town Police Accountability Research Lab SToPA



Step 1

Gather Data



Seattle Open Data

Welcome to the City's Open Data Portal. Here you can find, analyze, and download data published by City departments. All data on this portal is free to use and share.

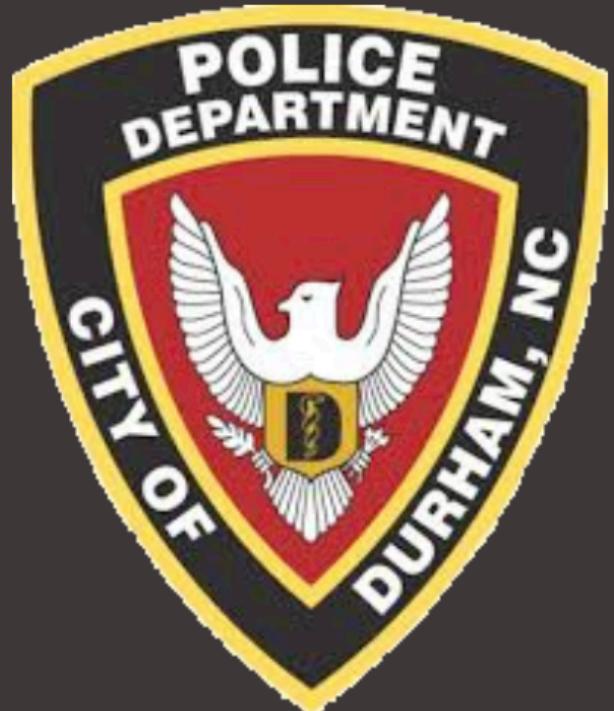
Search for Data

← Back to Primer		↔ Switch to Grid View						Search	X	Export	
T	CAD Event Number <i>cad_event_number</i>	T	Event Clearance Description <i>event_clearance_description</i>	T	Call Type <i>call_type</i>	T	Priority <i>priority</i>	T	Initial Call Type <i>initial_call_type</i>	T	Final Call Type <i>final_call_type</i>
	2013000433355		CITATION ISSUED (CRIMINAL OR NON-...)		ONVIEW		7		TRAFFIC STOP - OFFICER INITIATED O...		--ALARM-COMM (INC BAN
	2011000063255		ASSISTANCE RENDERED		ONVIEW		7		PREMISE CHECK, OFFICER INITIATED ...		--PREMISE CHECKS - BUSI
	2013000166741		ASSISTANCE RENDERED		911		2		SUSPICIOUS PERSON, VEHICLE OR IN...		--SUSPICIOUS CIRCUM. - S
	2019000215697		FALSE COMPLAINT/UNFOUNDED		ALARM CALL (NOT POLICE ALARM)		3		ALARM - RESIDENTIAL - BURGLARY, SI...		--ALARM-RESIDENTIAL BU
	2013000253830		REPORT WRITTEN (NO ARREST)		TELEPHONE OTHER, NOT 911		5		TRU - ACC - HIT AND RUN		--TRAFFIC - MV COLLISION
	2013000452309		REPORT WRITTEN (NO ARREST)		TELEPHONE OTHER, NOT 911		5		TRU - THEFT		--THEFT - CAR PROWL
	2011000200823		REPORT WRITTEN (NO ARREST)		TELEPHONE OTHER, NOT 911		3		BURG - RES (INCL UNOCC STRUCTURE...		--BURGLARY - RESIDENTIA

Scrape from online

Durham Police To Citizen | Polic x +

← → C durhampdnc.policetocitizen.com/eventsearch#search



Event Search

← BACK

By Report Information

Events

Arrests Incidents

Date

Occurred Reported

Start date * End date *

Specify Date ▾ 7/4/2023 ▾ 7/11/2023 ▾

Name

Person Name Business Name

First name Middle name Last name

Address

Home

Event Map

Event Search

Report Incident

Missing Persons

Daily Bulletin

Contact Us

FAQ

Scrape from online

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 Event Search ← BACK

INCIDENT/INVESTIGATION REPORT

Agency Name <i>Durham Police Department</i>	Case# 23-024503		
ORI <i>NC 0320100</i>	Date / Time Reported <i>07/05/2023 11:34 Wed</i>		
I N C I D E N T D A T A MO	Last Known Secure <i>07/04/2023 21:33 Tue</i>		
Location of Incident <i>1500-BLK Mathison St, Durham NC 27701</i>	Gang Relat NO	Premise Type <i>Home Of Victim-multi</i>	N/A/Beat 413
#1	Crime Incident(s) <i>Larceny - From Motor Vehicle LARFMV</i>	(Com)	Weapon / Tools
		Entry	Exit
			Security
#2	Crime Incident	()	Weapon / Tools
		Entry	Exit
			Security
#3	Crime Incident	()	Weapon / Tools
		Entry	Exit
			Security

Address

Scrape from online



Durham Police To Citizen | Polic x +
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POLICE DEPARTMENT Event Search ← BACK

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#2 Crime Incident	() Weapon / Tools Entry Exit Security		
#3 Crime Incident	() Weapon / Tools Entry Exit Security		
MO			

Manual Collection

1. Decide if you are comfortable working *with* your local PD.
2. Ask for the data and fill out necessary forms.
3. If met with resistance, file a written FOIA/FOIL or Open Records Request.
4. If non-compliant, elevate to State's Attorney General's Office.

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Step 2

Extract and Transform Data

FOIA Records Request (3,844 Printed Pages)

19-17 1150 Initiated - BUILDING CHECK BUILDING CHECKED/SECURED

Call Taker: OFFICER BERB MORRIS
Location/Address: SOUTH RD
Unit: 33

Arvd-12:18:44 Clrd-12:18:50

Narrative:
Part of fence is down on sidewalk. GC advised.

Narrative:
On scene fixing fence.

Narrative:
checked

Narrative:
01/02/2019 0239 Checked S3

fence is down

19-15 1201 Initiated - MOTOR VEHICLE STOP CITATION - WARNING

Call Taker: OFFICER BERB MORRIS
Location/Address: MAIN ST
Unit: 33

Arvd-12:01:24 Clrd-12:11:28

Vehicle: RED 2005 FORD CO FOCUS Reg: PC ST 2SMLY4U VIN:AHG4H7234HDJFPG
Operator: OSCAR GROUCH @ 123 SESAME ST SMALLTOWN, ST 12345-7890

Race: U Sex: M
Refer To Citation: T0905978

Owner: OSCAR GROUCH SR @ 285 NORTH LN - MINIVILLE, ST 12345-7890
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Scanning
Boundary

Grainy and noisy

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Slight rotation,
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Printer
Residue

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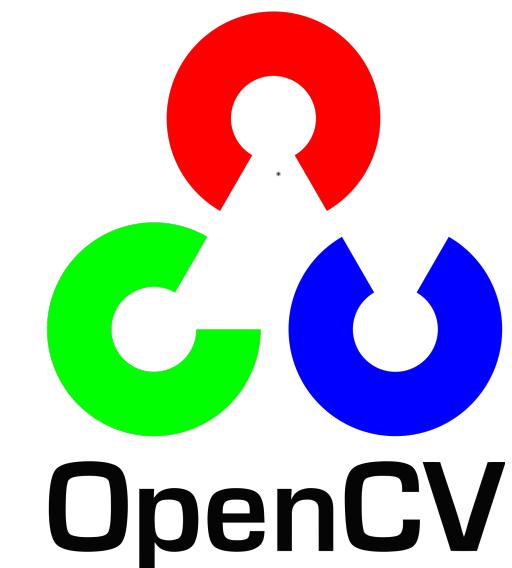
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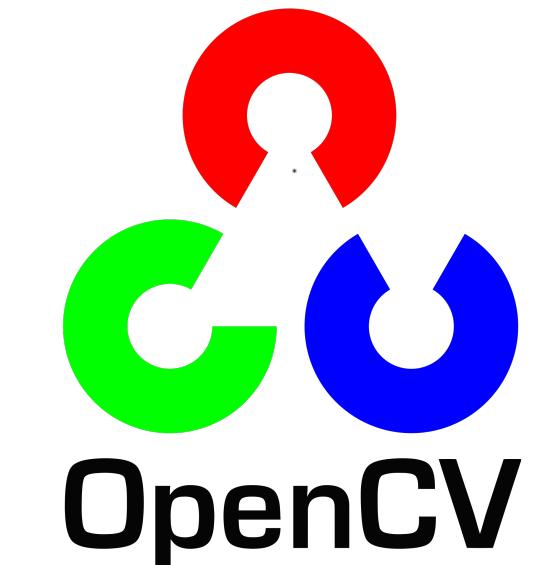
Call Taker: OFFICER BERB MORRIS
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Inconsistent
Entries





Tesseract OCR
pytesseract

Detect text with optical character recognition





Tesseract OCR
pytesseract

Detect text with optical character recognition



regex

Organize text with bounding box locations and pattern detection

19-205 ... | 19-206 ... | 19-207

For Date: \d{2}/\d{2}/\d{4}



Tesseract OCR
pytesseract

Detect text with optical character recognition



regex

Organize text with bounding box locations and pattern detection

19-205 ... | 19-206 ... | 19-207

For Date: \d{2}/\d{2}/\d{4}

fuzzywuzzy

Correct common misspellings with fuzzy matching

MA1N 5T → MAIN ST

Final Form

19-17	1150	Initiated - BUILDING CHECK	BUILDING CHECKED/SECURED
Call Taker:	OFFICER BERB MORRIS		
Location/Address:	SOUTH RD		
Unit:	33		
		Arvd-12:18:44	Clrd-12:18:50
19-15	1201	Initiated - MOTOR VEHICLE STOP	CITATION - WARNING
Call Taker:	OFFICER BERB MORRIS		
Location/Address:	MAIN ST		
Unit:	33		



		date	log_num	call_datetime	call_reason	call_type	call_action	call_taker	street	call_category	responding_units	disp_datetime	clrd_datetime
24	2019-01-02	19-39	2019-01-02 02:24:00	SUSPICIOUS MOTOR VEHICLE	Initiated	LOG ENTRY REQUEST	18.0	53.0		Initiated	9.0	2019-01-02 02:24:00	2019-01-02 02:27:01
25	2019-01-02	19-40	2019-01-02 03:57:00	PARKING CHECK	Initiated	SERVICES RENDERED	8.0	109.0		Initiated	1.0	2019-01-02 03:57:00	2019-01-02 03:57:43
26	2019-01-02	19-41	2019-01-02 06:38:00	ROAD CONDITIONS	Initiated	SERVICES RENDERED	1.0	30.0		Initiated	3.0	2019-01-02 06:38:00	2019-01-02 06:40:18
27	2019-01-02	19-42	2019-01-02 06:44:00	NOISE COMPLAINT	Phone	SERVICES RENDERED	6.0	107.0	Nonemergency Service		8.0	2019-01-02 06:47:25	2019-01-02 06:57:29
28	2019-01-02	19-43a	2019-01-02 07:20:00	TRAFFIC CONTROL	Initiated	SERVICES RENDERED	14.0	30.0		Initiated	6.0	2019-01-02 07:20:00	2019-01-02 07:27:37

Step 3

Ask Questions & Analyze Data

What can we learn from free-form narratives? What patterns or themes emerge?

Narrative:

CP reports that a vehicle was tail-gating her and acting somewhat aggressively (waving hands, attempting to pass). Vehicle is no longer behind cp but was said to have continued southbound on Coffee road towards the rotary. Vehicle is said to be a navy blue Hyundai.

Narrative:

Drove through the lot and staff outside, all flowing good.

Narrative:

Checked

Narrative:

checked

Narrative:

done

Narrative:

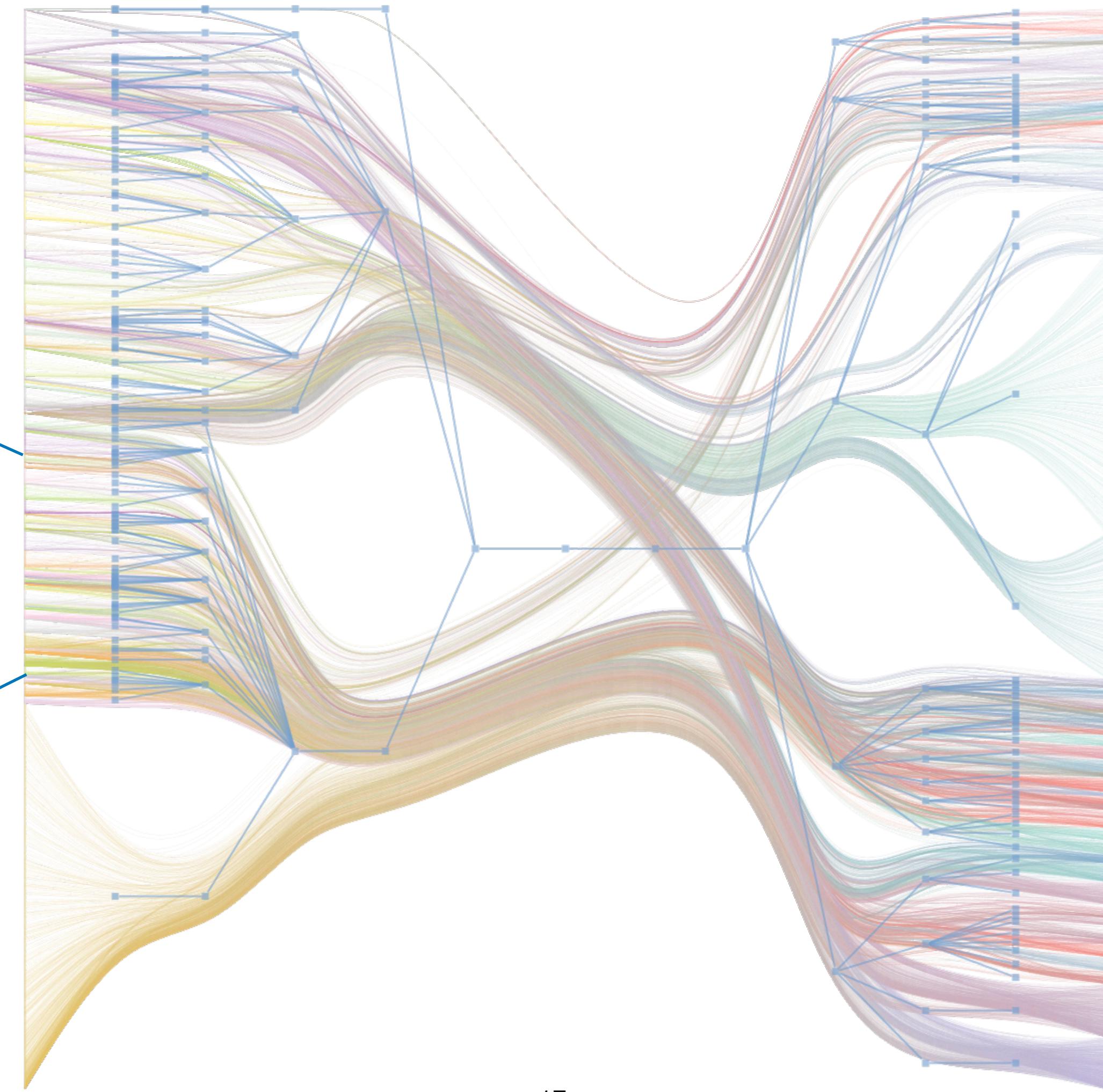
01/04/2019 0030 Checked S3

What can we learn from free-form narratives? What patterns or themes emerge?

Topics:

vehicle, operator,
involved,
parked, lot,
parking

notified,
scene, tree,
grid, lane,
power,
pole, wires



Incident
Narratives:

19-189

19-2345

What spatial patterns exist? How do they vary across various facets?
How can this be made usable for the public?

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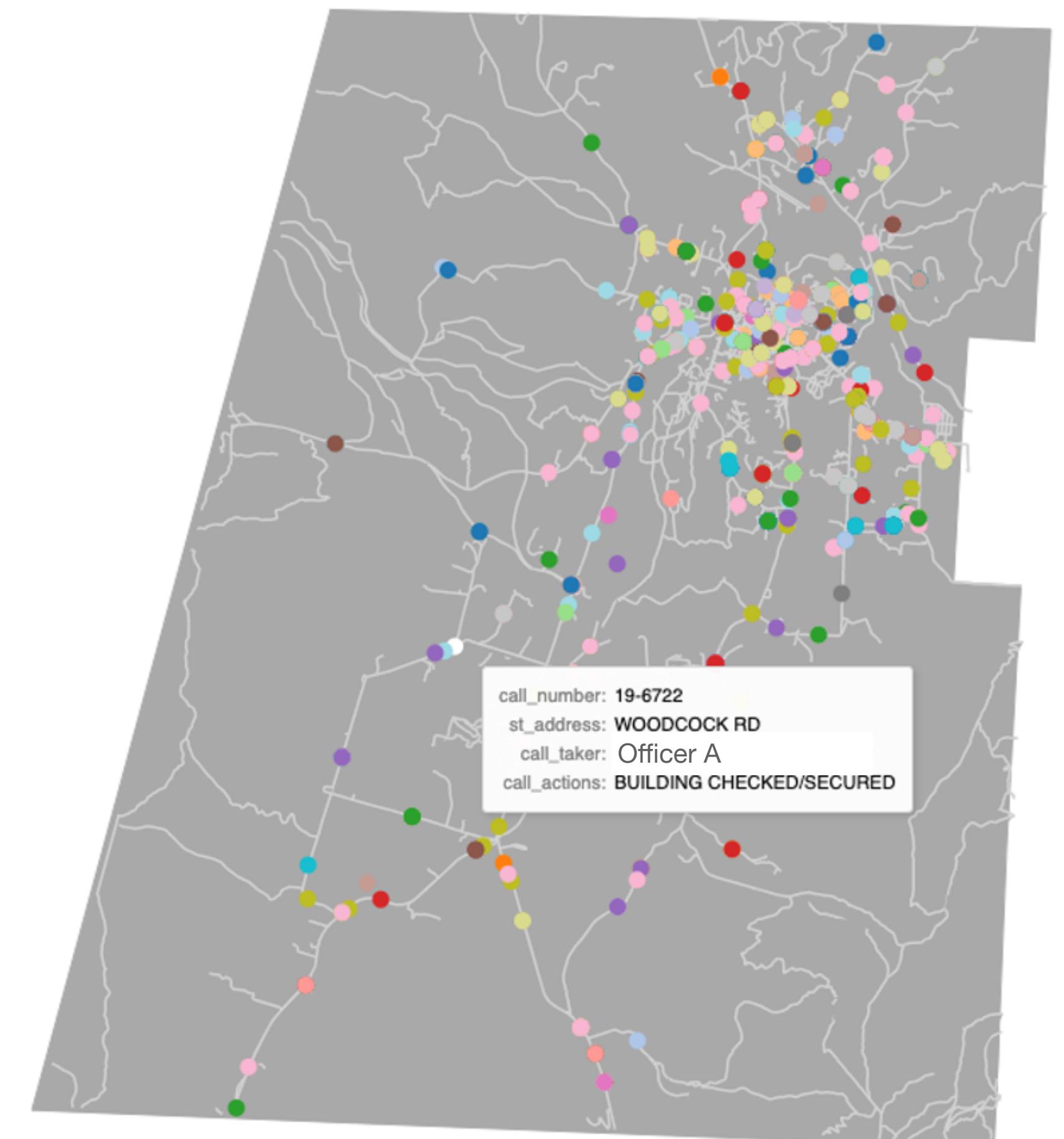
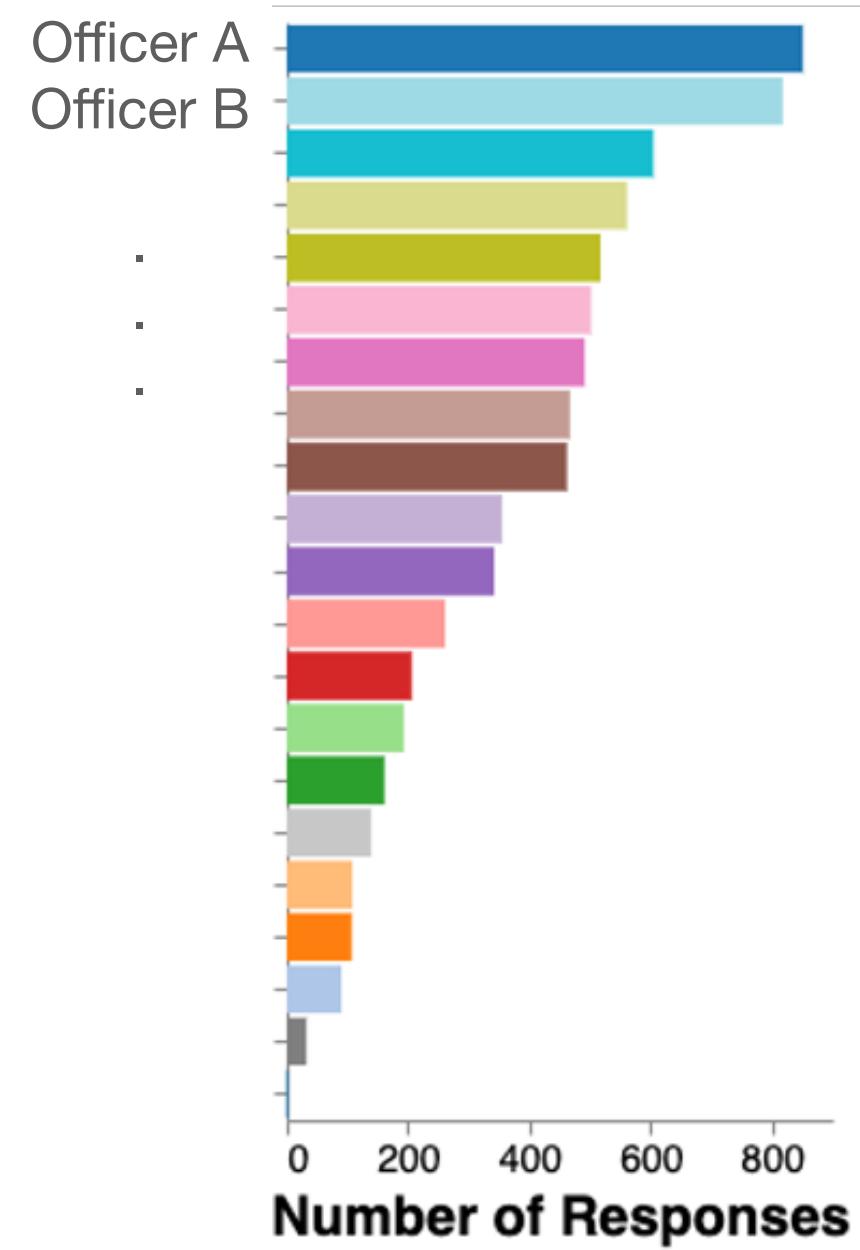
maptools



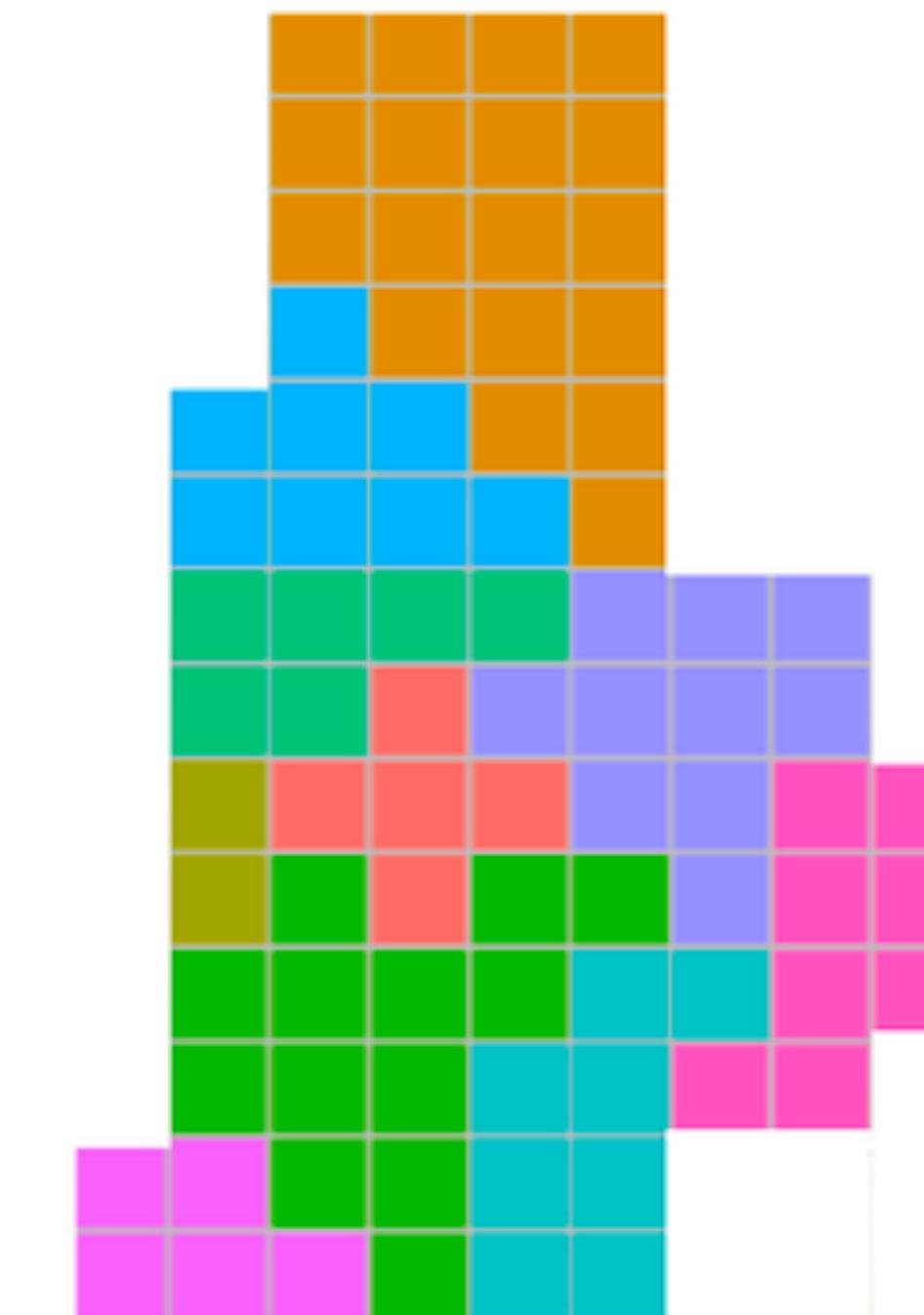
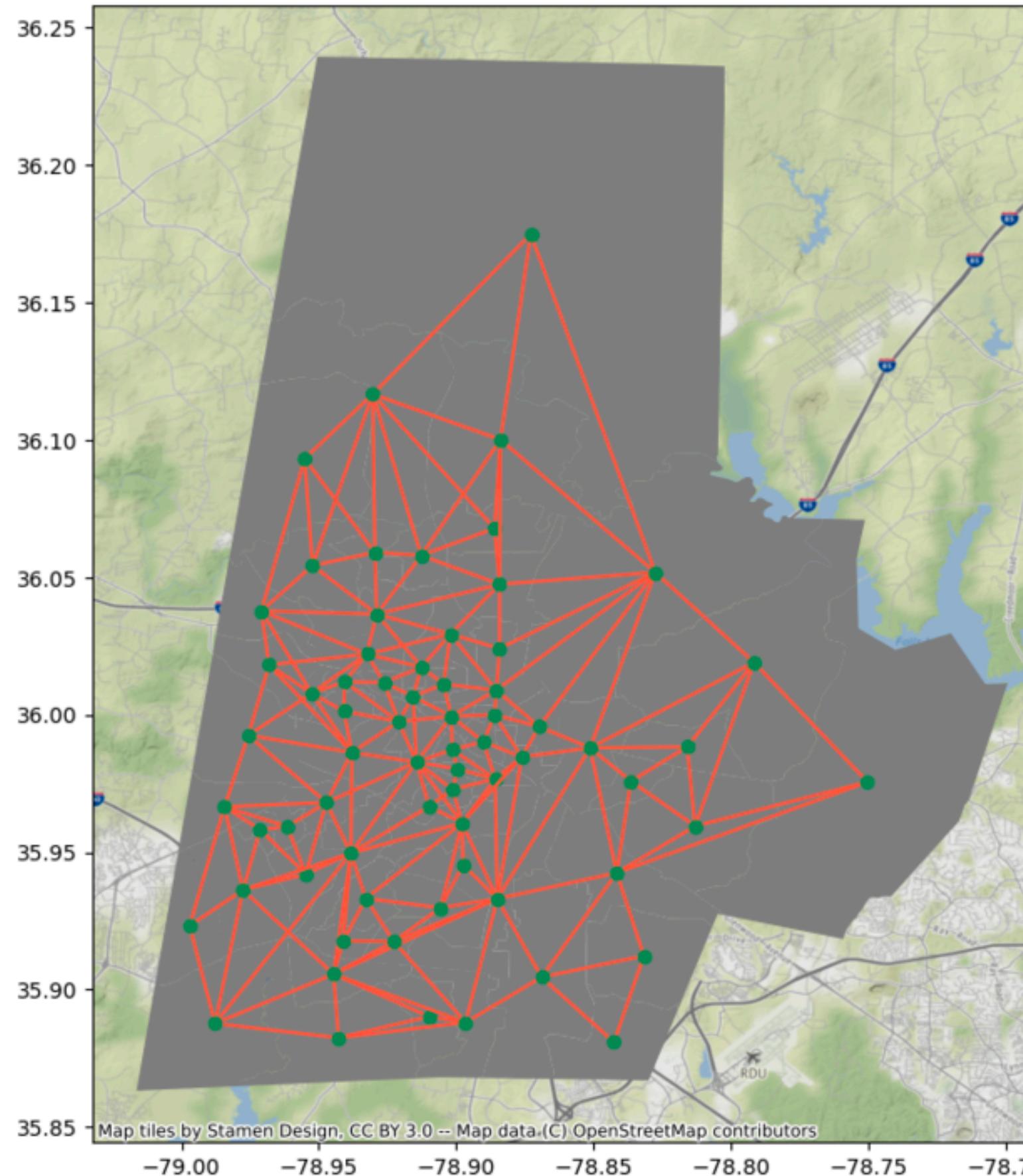
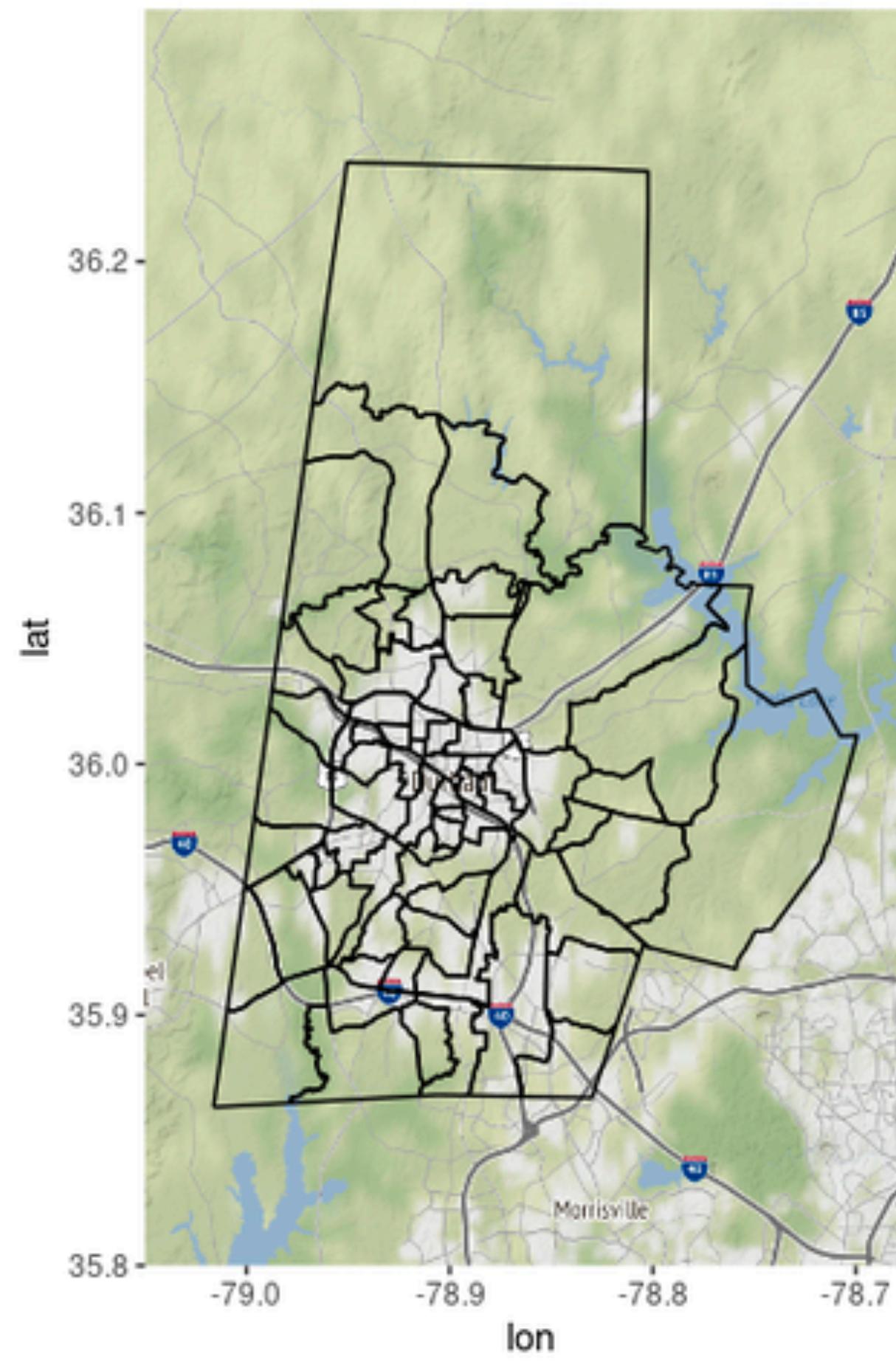
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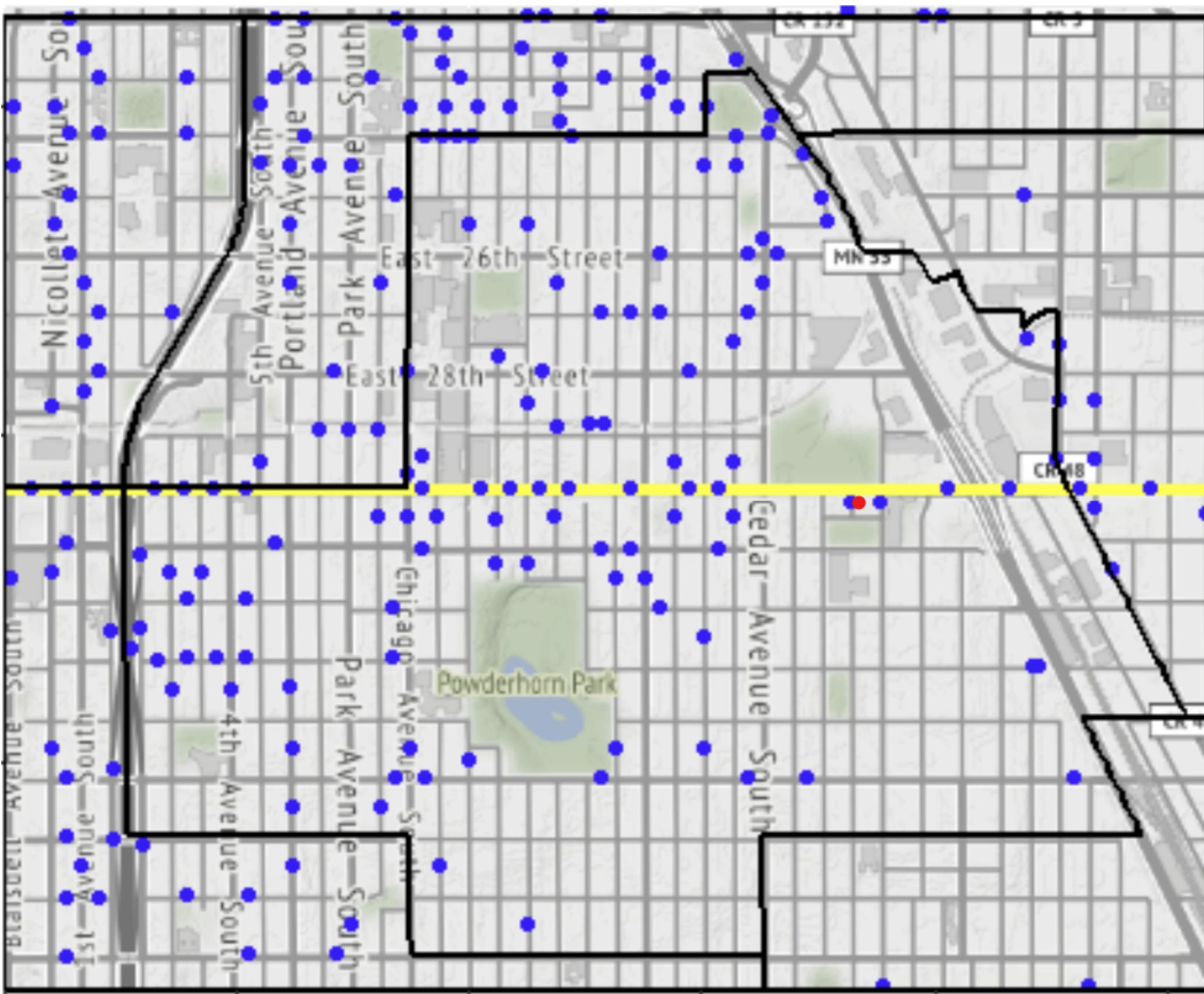
maptools



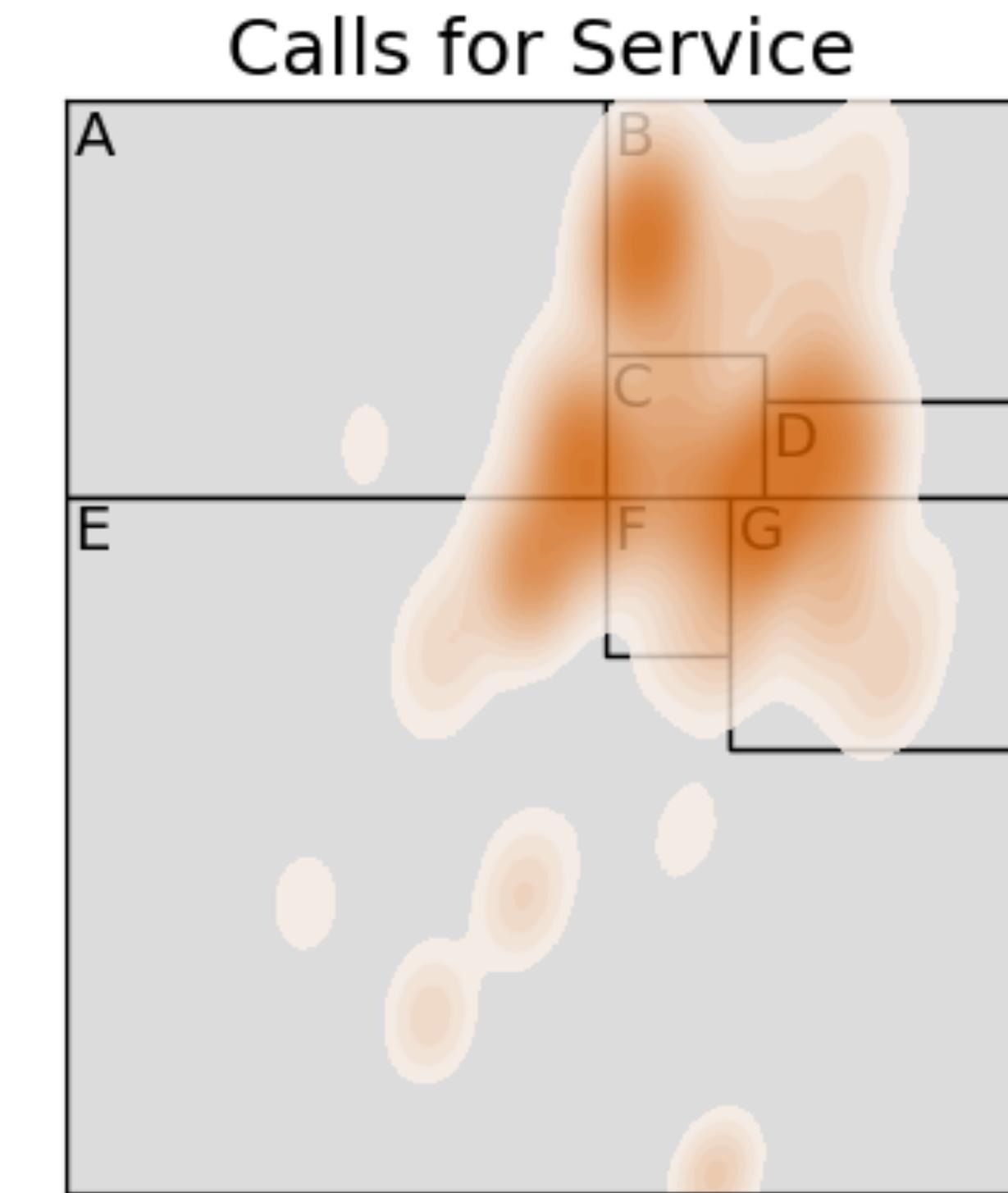
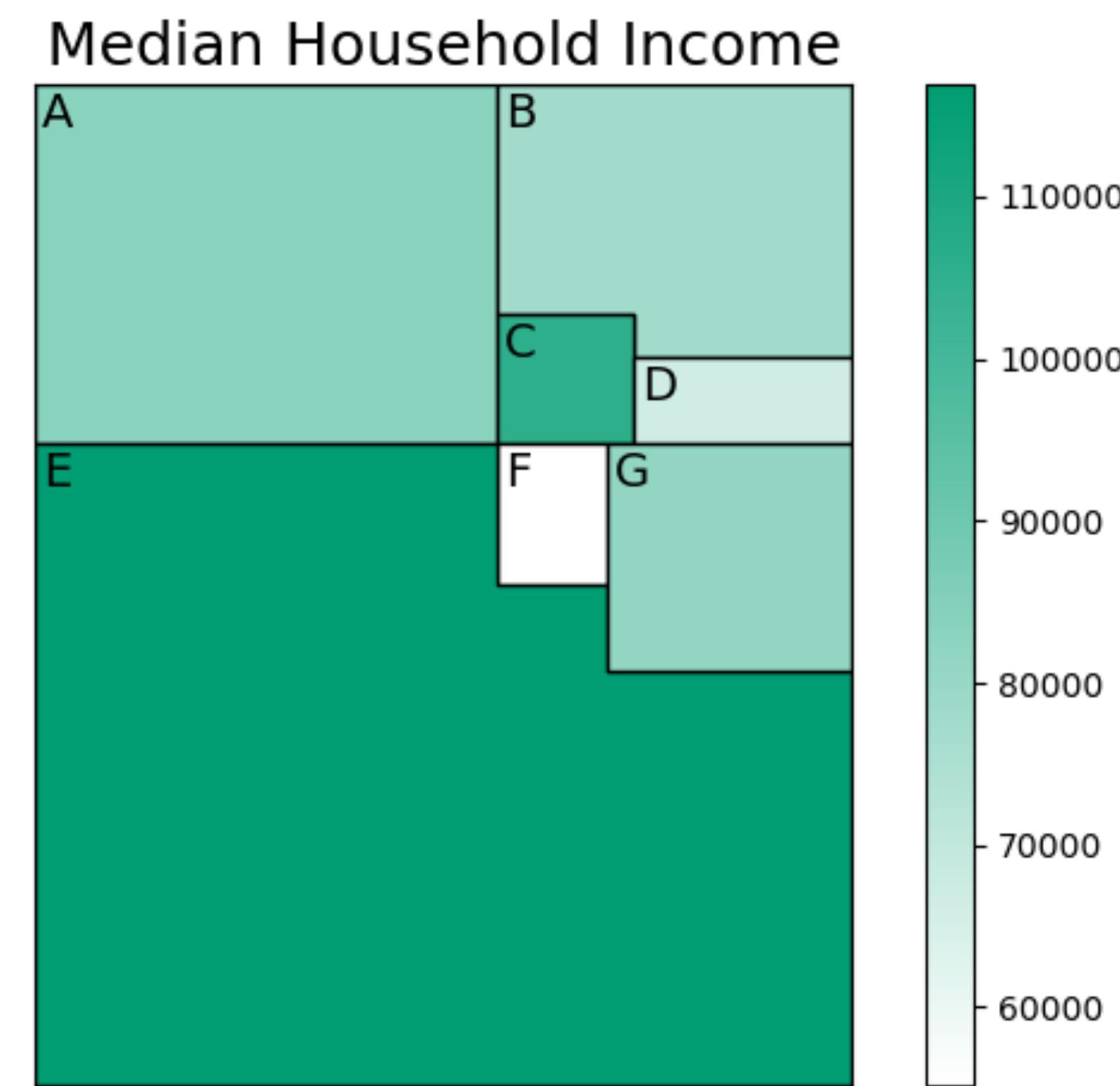
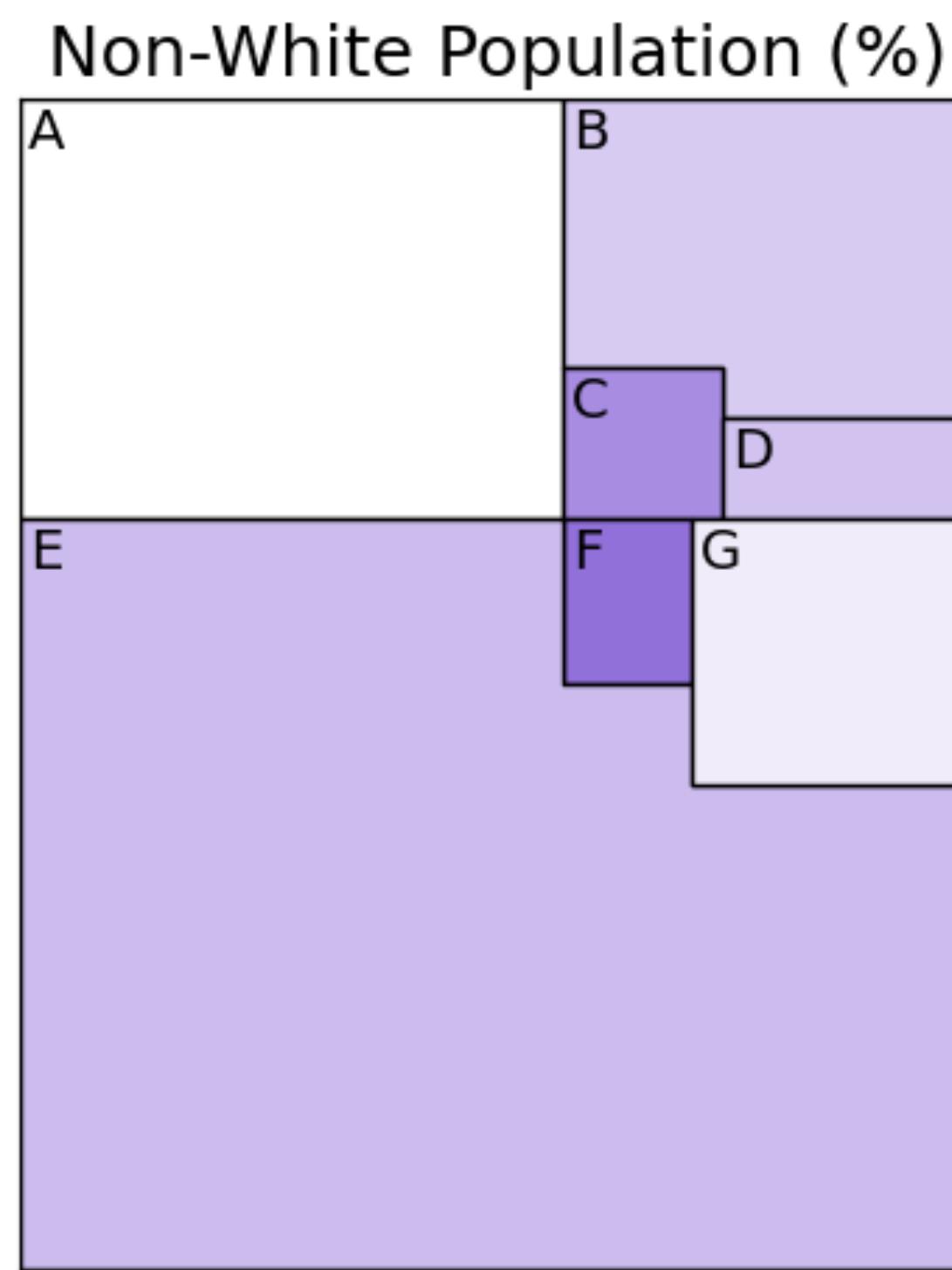
How do we analyze and share findings without retraumatizing communities that have been overpoliced?



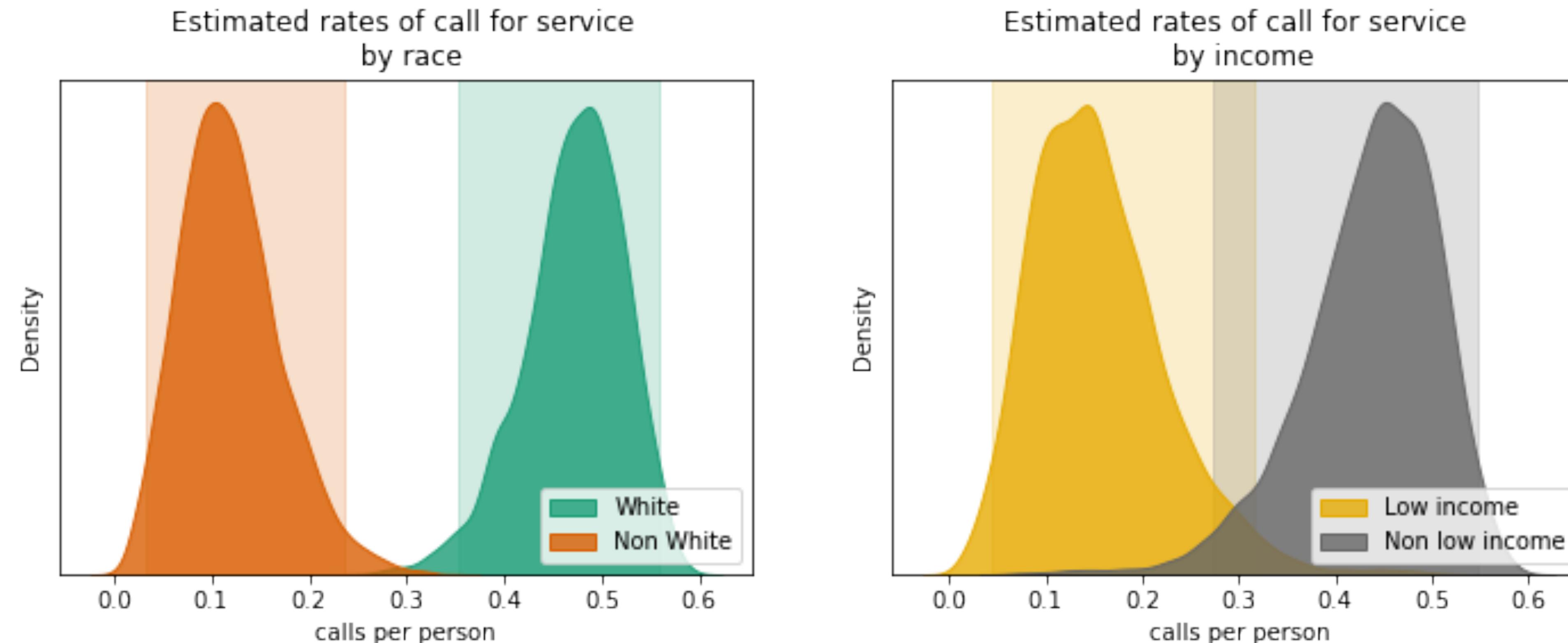
How do we manage geographically anonymized data?



Can we learn which racial and demographic groups are placing calls for service at higher rates?



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Posterior distributions of aggregated mean calling rates by demographic group with 95% confidence interval.

Step 4

Act

How can / take action?

How can I take action?

Small-Town Police Accountability: Challenges and Recommendations

Claire Kelling*, Anna Haensch^{†‡}, Ariana Mendible[§],
Spencer Brooks[¶], Alex Wiedemann^{||}, Manuchehr Aminian^{**},
Wade Hasty[¶], Jude Higdon^{¶¶}

A Multi-Method Data Science Pipeline for Analyzing Police Service in the Presence of Misconduct

Anna Haensch^{1*†}, Daanika Gordon^{2†}, Karin Knudson³
and Justina Cheng¹

¹Data Intensive Studies Center, Tufts University, 419 Boston Ave, Medford, 02155, MA, USA.

²Department of Sociology, Tufts University, 419 Boston Ave, Medford, 02155, MA, USA.

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Create and share
new knowledge

How can I take action?

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Join a QSIDE Research Lab



Create and share
new knowledge

How can I take action?

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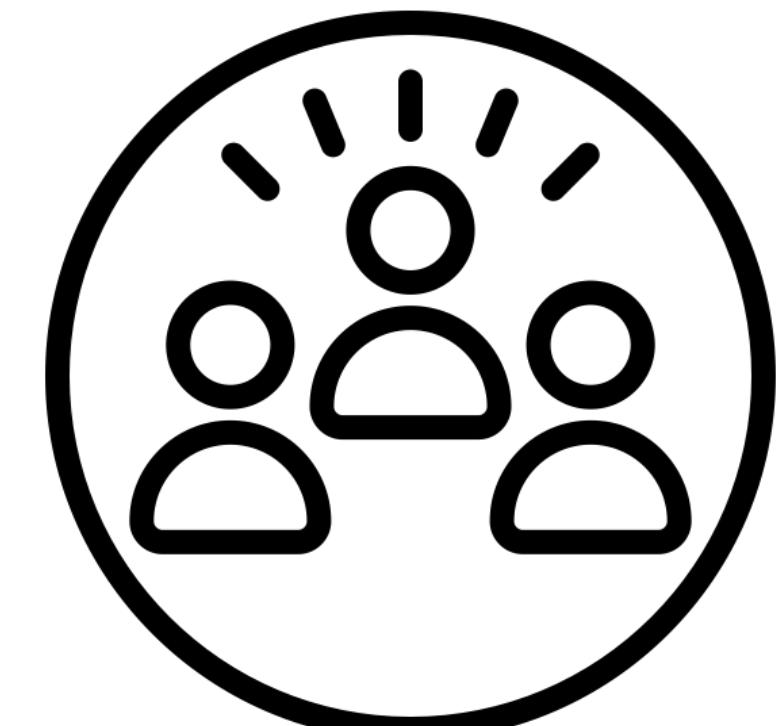
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Create and share
new knowledge

Join a QSIDE Research Lab



Partner with
communities throughout
the process



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How can I take action?

Small-Town Police Accountability: Challenges and Recommendations

Claire Kelling*, Anna Haensch^{†‡}, Ariana Mendible[§],
Spencer Brooks[¶], Alex Wiedemann^{||}, Manuchehr Aminian^{**},
Wade Hasty[¶], Jude Higdon^{¶¶}

A Multi-Method Data Science Pipeline for Analyzing Police Service in the Presence of Misconduct

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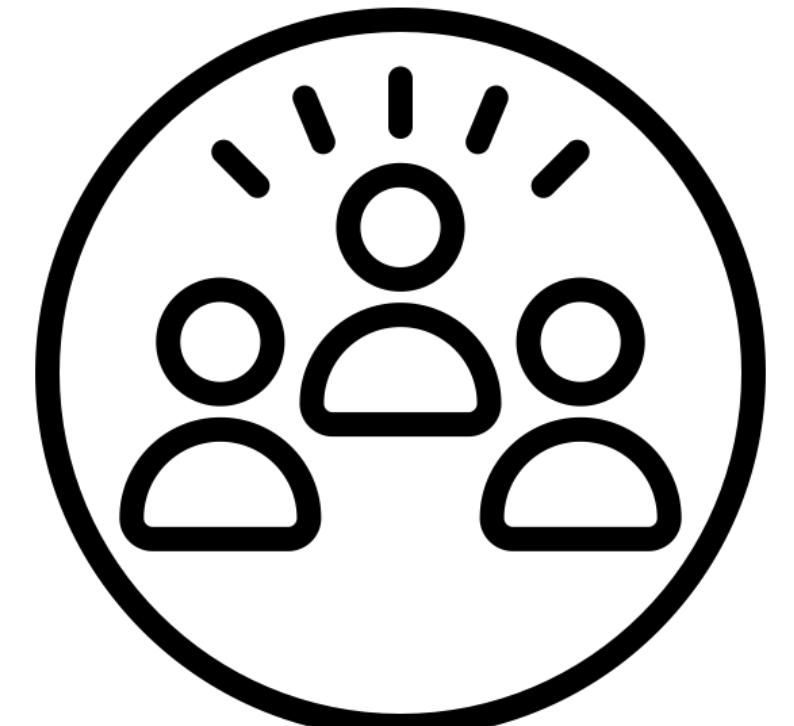
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Create and share
new knowledge

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Partner with
communities throughout
the process



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Advocate for policy change

Thank you!

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The SToPA Project Repository
<https://qsideinstitute.github.io/SToPA/>

