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# Fostering Trust for Community Benefit Infrastructure for Privacy-Assured Computation

John Killeen  
*DataWorks NC*

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# Fostering Trust for Community Benefit Infrastructure for Privacy-Assured Computation



# Fostering Trust for Community Benefit *Infrastructure for Privacy-Assured Computation*

John Killeen, DataWorks NC

This project is supported by NSF grant OAC-1659367



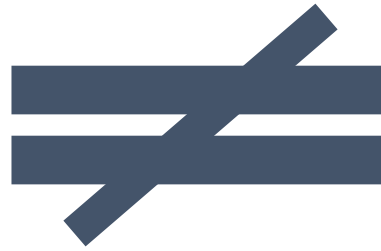
social science depends on data  
belonging to multiple stakeholders

governed by a variety of  
use policies

multi-institutional research  
requires cooperative analysis

balancing privacy concerns of  
data owners while producing  
interesting research outcomes

publicly available



publicly useful



Jon Crabtree  
Associate Director

Ilya Baldin  
Project Director

**Infrastructure  
WG**

Coordinator:  
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Jeff Chase  
Rachel Franke  
Charley Kneifel  
Mark McCahill  
Victor Orlikowski  
Erik Scott  
Don Sizemore  
Mike Wehrle

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Other Members  
Eric Huang  
Patrick Bayer  
James Moody

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Coordinators:  
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Charles Schmitt  
Mara Sedlins  
Ryan Thornberg

# How

- Creating relationship structures based on user type (or level of trust)
- Tagging data sets for how they can be accessed, combined, and summarized
- Building architecture for linking the above in single-use virtual environments
- In those virtual spaces, deploying standardized processes that create outputs at user-specific levels of granularity

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# How

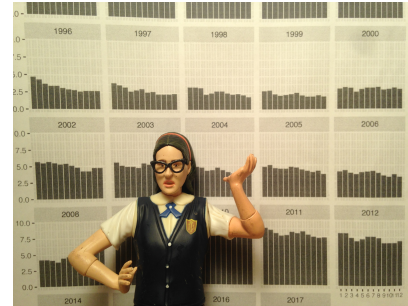
- Creating relationship structures based on user type (or level of trust)
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# How

- Creating relationship structures based on user type (or level of trust)
- Tagging data sets for how they can be accessed, combined, and summarized
- Building architecture for linking the above in single-use virtual environments
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# Users

1 – Most-trusted

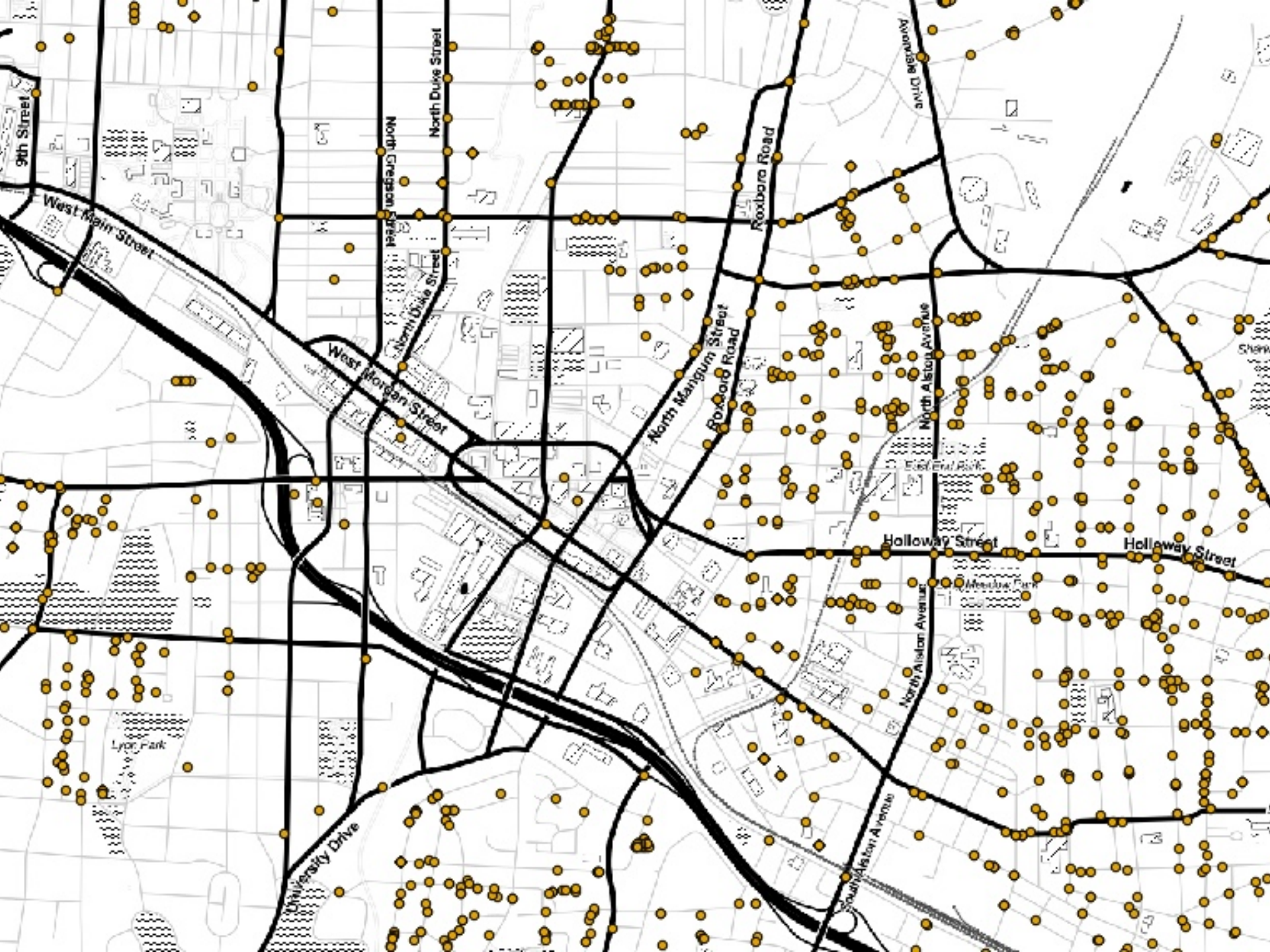


2 – Trusted 3<sup>rd</sup> party

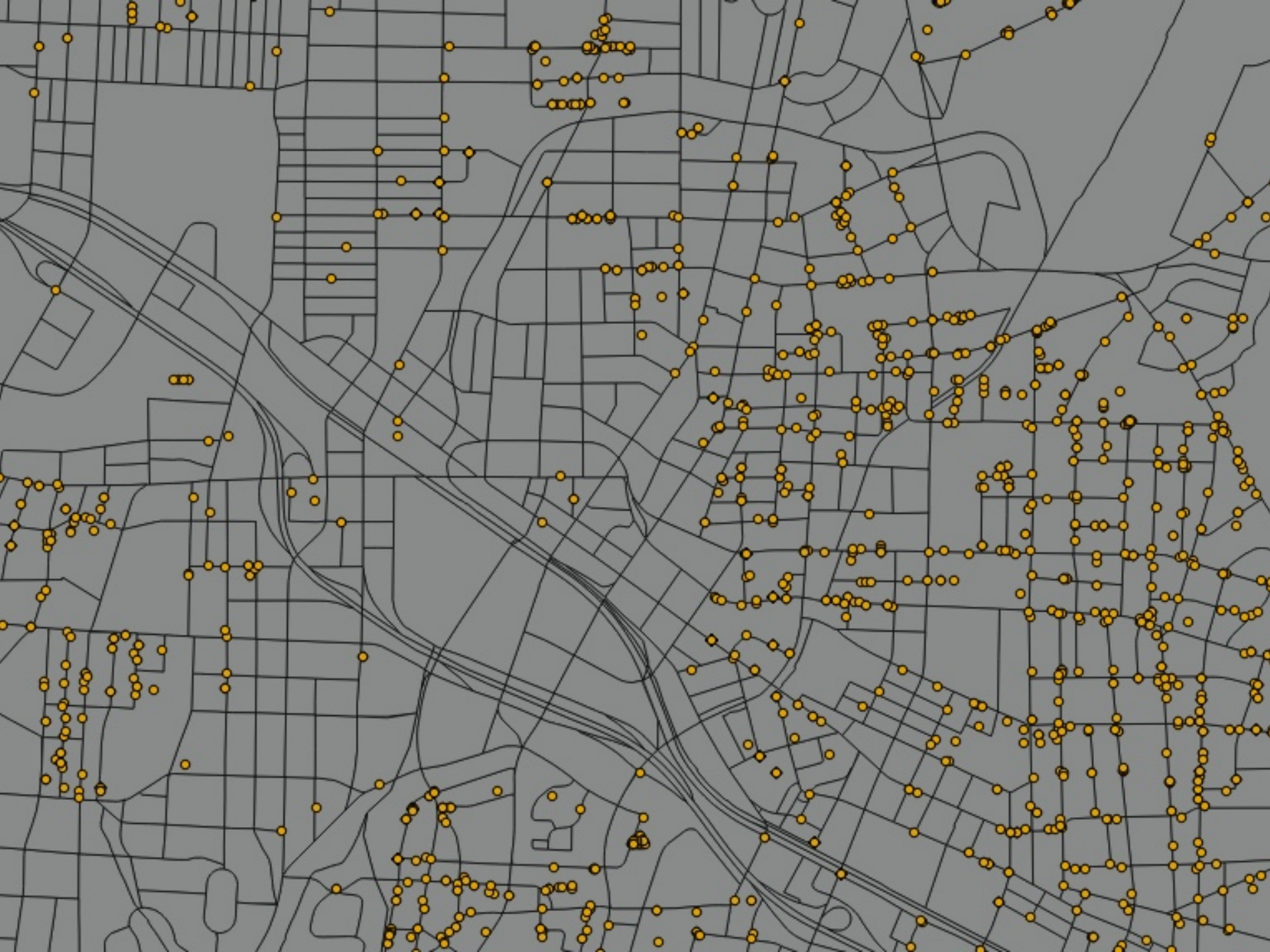


3 – Public user

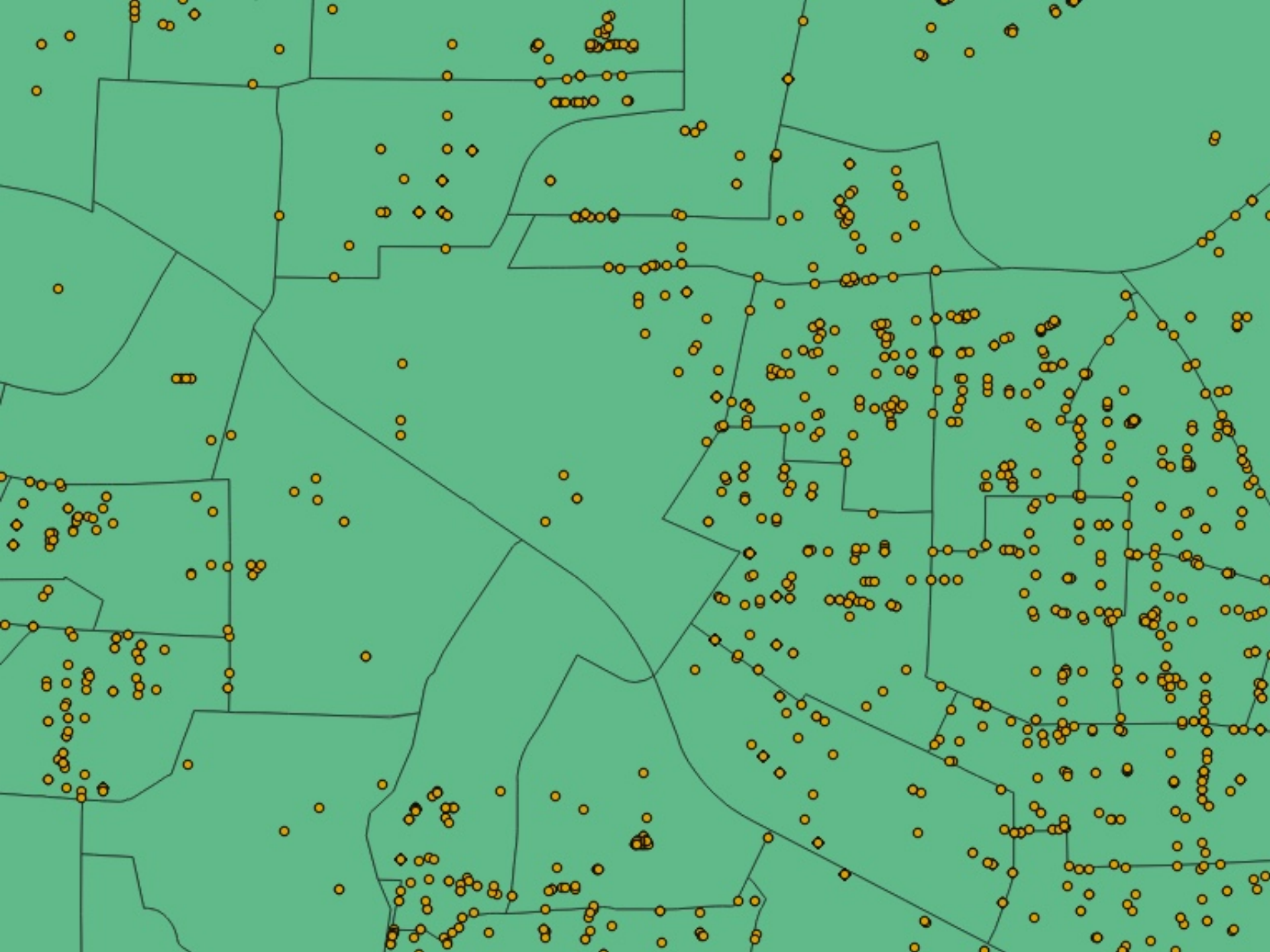












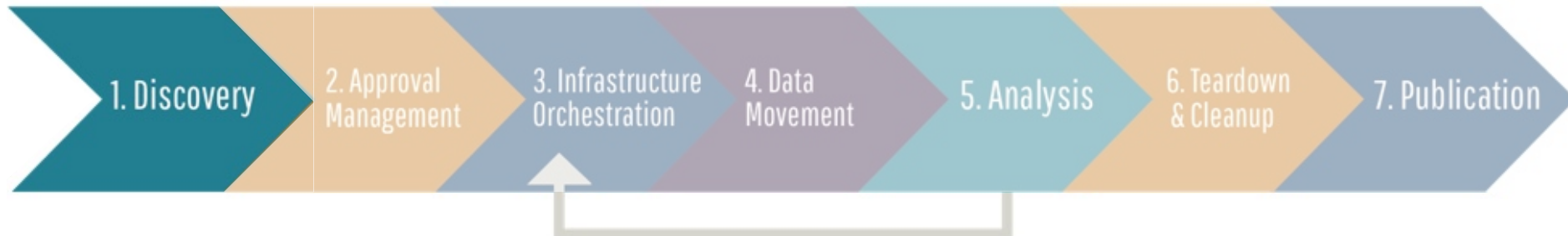




Open source research data repository software

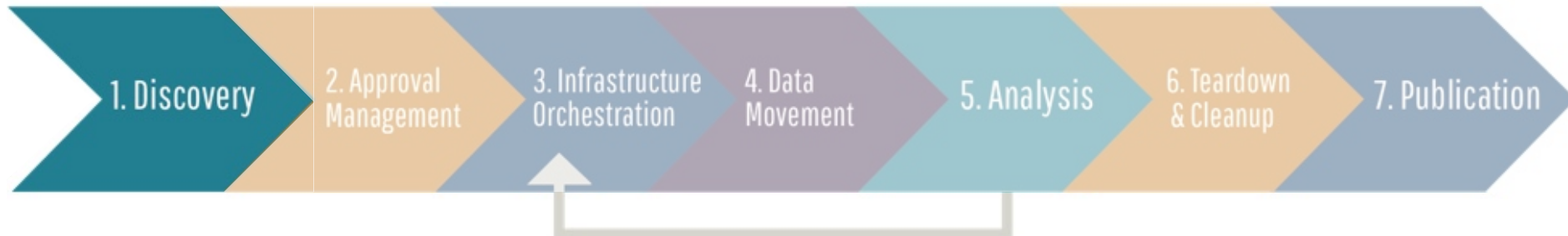
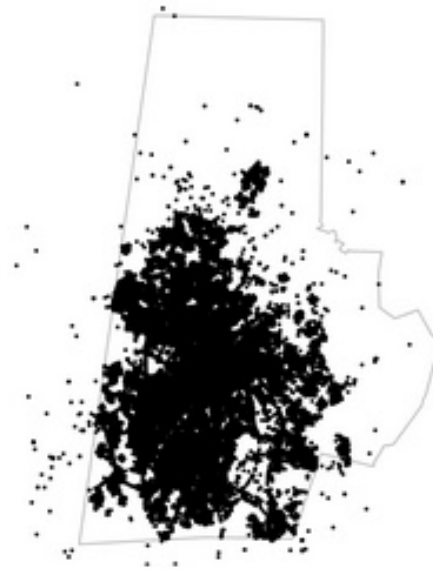


Share Sensitive Data with Confidence



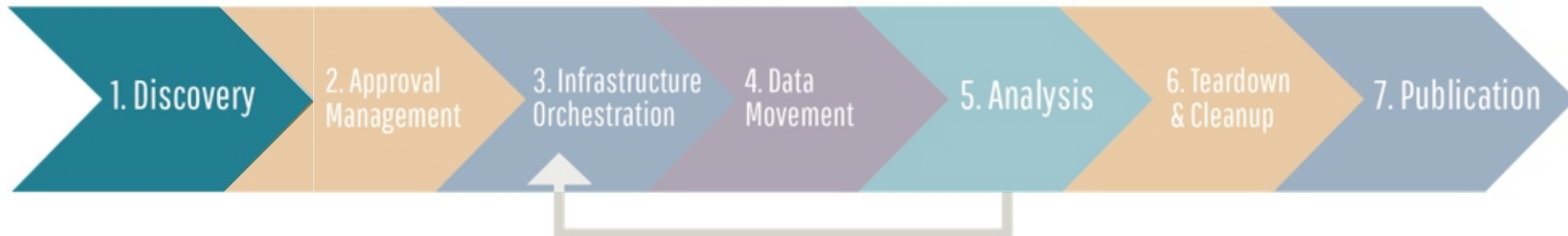
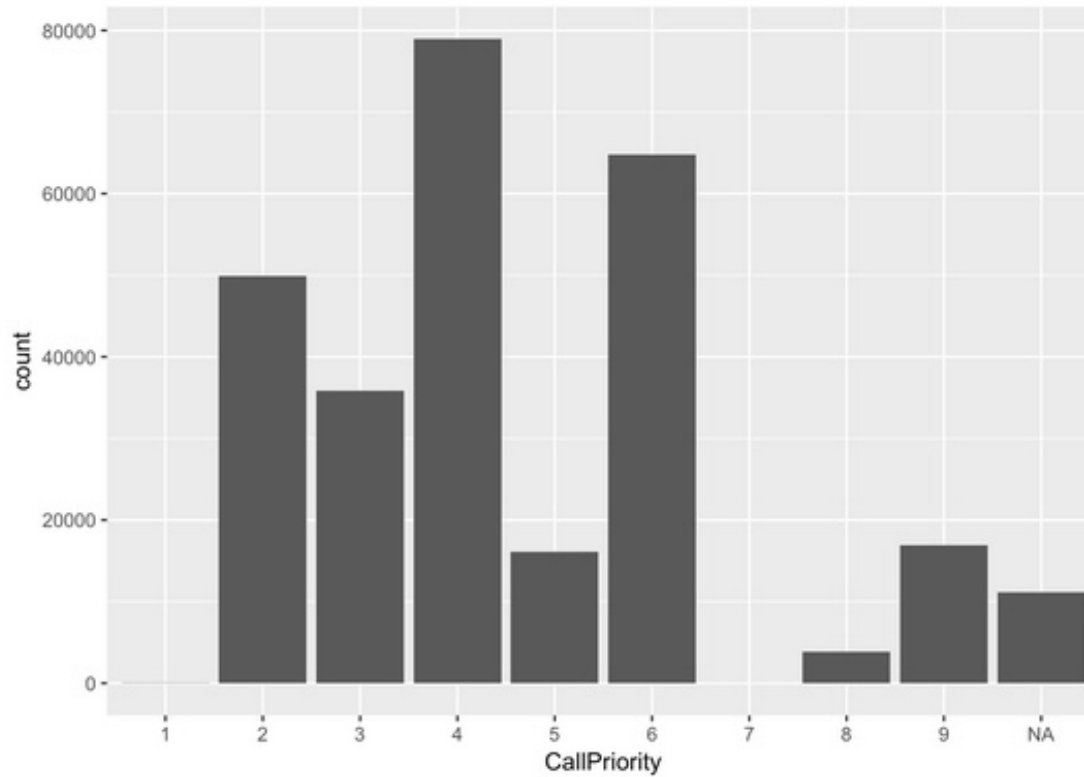
## Geographic Coverage

Calls are sourced predominantly from within the City boundaries (264,691/277,611), the Durham County boundaries from outside of Durham boundaries. The latter of these include calls such as assistance to adjacent jurisdicatio



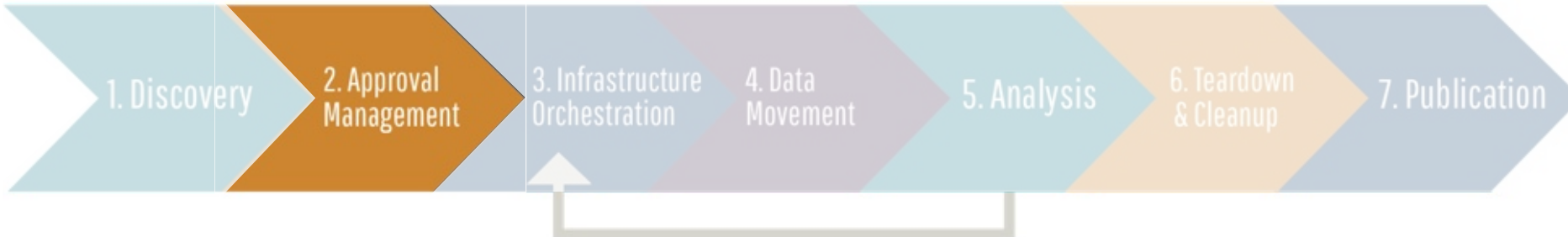
## Count by Priority

1:51 | 2:49,873 | 3:35,799 | 4:78,992 | 5:16,107 | 6:64,811 | 7:5 | 8:3,852 | 9:16,942 | NA:11,179





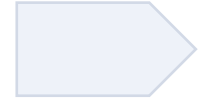
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1	2	100002	0822-15-53-...	50.00	0.158000000...	0.159000000...	002-01-002 -	NULL	NULL	6205400	SCANLON R...	NULL
2	3	100004	0822-15-53-...	50.00	0.159000000...	0.159000000...	002-01-004 -	NULL	NULL	8634077	CARDINAL ...	LLC
3	4	100005	0822-15-53-...	50.00	0.159000000...	0.159000000...	002-01-005 -	NULL	NULL	8308171	DARD PRO...	NULL
4	5	100006	0822-15-53-...	50.00	0.159000000...	0.159000000...	002-01-006 -	NULL	NULL	2922990	HALL PAUL B	HALL LOU
5	6	100016	0822-15-53-...	50.00	0.105000000...	0.106000000...	002-01-013 -	NULL	NULL	8403598	ROBINSON ...	INVESTME
6	7	100018	0822-15-53-...	50.00	0.102000000...	0.101000000...	002-01-014 -	NULL	NULL	8631467	LEE RENTA...	NULL
7	8	100019	0822-15-53-...	50.00	0.159000000...	0.160000000...	002-01-015 -	NULL	NULL	8036236	CUTICK GA...	WILLIAMS
8	9	100021	0822-15-53-...	50.00	0.159000000...	0.159000000...	002-01-017 -	NULL	NULL	8029134	DANIELS R...	NULL
9	10	100023	0822-15-53-...	50.00	0.158000000...	0.159000000...	002-01-019 -	NULL	NULL	8254367	KRUSE MA...	NULL
10	11	100024	0822-15-53-...	50.00	0.158000000...	0.159000000...	002-01-020 -	NULL	NULL	8575726	WINNER LA...	NULL
11	12	100028	0822-15-53-...	50.00	0.158000000...	0.158000000...	002-01-022 -	NULL	NULL	0132004	MCKEEL CH...	MCKEEL P
12	13	100030	0822-15-53-...	50.00	0.158000000...	0.158000000...	002-01-023 -	NULL	NULL	8628883	REID DAVID...	ALEXY EL
13	14	100031	0822-15-53-...	50.00	0.157000000...	0.158000000...	002-01-024 -	NULL	NULL	8527225	NEAL DOMI...	NULL
14	15	100052	0822-15-53-...	50.00	0.160000000...	0.161000000...	002-02-003 -	NULL	NULL	8171313	DAYE JOSE...	NULL
15	16	100054	0822-15-53-...	50.00	0.160000000...	0.161000000...	002-02-005 -	NULL	NULL	8545814	CHUMLEY J...	NULL
16	17	100055	0822-15-53-...	50.00	0.160000000...	0.161000000...	002-02-006 -	NULL	NULL	0030957	LIBRA PRO...	NULL
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18	19	100061	0822-15-53-...	47.00	0.160000000...	0.160000000...	002-02-012 -	NULL	NULL	8622289	WEIN GARY...	NULL
19	20	100063	0822-15-53-...	70.00	0.160000000...	0.160000000...	002-02-014 -	NULL	NULL	8612340	SCHMITZ J...	SCHMITZ





0	1	100001	0822-15-53-...	50.00	0.158000000...	0.159000000...	002-01-001 -	NULL	NULL	8395631	WILKERSO...	NULL
1	2	100002	0822-15-53-...	50.00	0.158000000...	0.159000000...	002-01-002 -	NULL	NULL	6205400	SCANLON R...	NULL
2	3	100004	0822-15-53-...	50.00	0.159000000...	0.159000000...	002-01-004 -	NULL	NULL	8634077	CARDINAL ...	LLC
3	4	100005	0822-15-53-...	50.00	0.159000000...	0.159000000...	002-01-005 -	NULL	NULL	8308171	DARD PRO...	NULL
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5	6	100016	0822-15-53-...	50.00	0.105000000...	0.106000000...	002-01-013 -	NULL	NULL	8403598	ROBINSON ...	INVESTME
6	7	100018	0822-15-53-...	50.00	0.102000000...	0.101000000...	002-01-014 -	NULL	NULL	8631467	LEE RENTA...	NULL
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13	14	100031	0822-15-53-...	50.00	0.157000000...	0.158000000...	002-01-024 -	NULL	NULL	8527225	NEAL DOMI...	NULL
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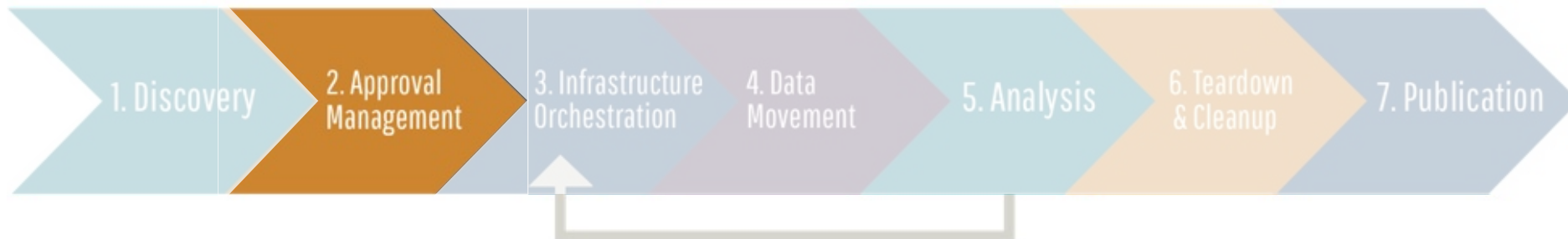
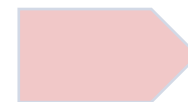




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2	3	100004	0822-15-53-...	50.00	0.159000000...	0.159000000...	002-01-004 -	NULL	NULL	8634077	CARDINAL ...	LLC
3	4	100005	0822-15-53-...	50.00	0.159000000...	0.159000000...	002-01-005 -	NULL	NULL	8308171	DARD PRO...	NULL
4	5	100006	0822-15-53-...	50.00	0.159000000...	0.159000000...	002-01-006 -	NULL	NULL	2922990	HALL PAUL B	HALL LOU
5	6	100016	0822-15-53-...	50.00	0.105000000...	0.106000000...	002-01-013 -	NULL	NULL	8403598	ROBINSON ...	INVESTME
6	7	100018	0822-15-53-...	50.00	0.102000000...	0.101000000...	002-01-014 -	NULL	NULL	8631467	LEE RENTA...	NULL
7	8	100019	0822-15-53-...	50.00	0.159000000...	0.160000000...	002-01-015 -	NULL	NULL	8036236	CUTICK GA...	WILLIAMS
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9	10	100023	0822-15-53-...	50.00	0.158000000...	0.159000000...	002-01-019 -	NULL	NULL	8254367	KRUSE MA...	NULL
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12	13	100030	0822-15-53-...	50.00	0.158000000...	0.158000000...	002-01-023 -	NULL	NULL	8628883	REID DAVID...	ALEXY EL
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18	19	100061	0822-15-53-...	47.00	0.160000000...	0.160000000...	002-02-012 -	NULL	NULL	8622289	WEIN GARY...	NULL
19	20	100063	0822-15-53-...	70.00	0.160000000...	0.160000000...	002-02-014 -	NULL	NULL	8612340	SCHMITZ J...	SCHMITZ











OBJECT	PARCEL_ID	PIN	FRONT_DIM	POLY_ACRE	SUM_ACRE	OLD_ID	USERENT	CITY_CODE	ACCT.	OWNNAM	OWNAD
1	100001	000-15-53...	80.00	0.150000000	0.150000000	002-01-001	NEEL	NEEL	806601	WALKERS...	NEEL
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5	100008	000-15-53...	80.00	0.150000000	0.150000000	002-01-008	NEEL	NEEL	2922000	HALL PAUL B	HALL LOU
6	100016	000-15-53...	80.00	0.150000000	0.150000000	002-01-016	NEEL	NEEL	840506	ROBINSON...	INVESTOR
7	100018	000-15-53...	80.00	0.150000000	0.150000000	002-01-014	NEEL	NEEL	8621487	LES RENTA...	NEEL
8	100019	000-15-53...	80.00	0.150000000	0.150000000	002-01-015	NEEL	NEEL	806606	CUTICK GA...	WILLIAMS
9	100021	000-15-53...	80.00	0.150000000	0.150000000	002-01-017	NEEL	NEEL	8029134	DANIELS R...	NEEL
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13	100030	000-15-53...	80.00	0.150000000	0.150000000	002-01-023	NEEL	NEEL	802660	REED DAVID	ALEXY D
14	100031	000-15-53...	80.00	0.150000000	0.150000000	002-01-024	NEEL	NEEL	8027225	NEAL DOWN...	NEEL
15	100032	000-15-53...	80.00	0.150000000	0.150000000	002-02-003	NEEL	NEEL	8171315	DAVE JOSE...	NEEL
16	100034	000-15-53...	80.00	0.150000000	0.150000000	002-02-002	NEEL	NEEL	8404914	CHURKAT J...	NEEL
17	100055	000-15-53...	80.00	0.150000000	0.150000000	002-02-006	NEEL	NEEL	0006067	LIBRA PRO...	NEEL
18	100060	000-15-53...	47.00	0.150000000	0.150000000	002-02-011	NEEL	NEEL	8622287	WEN GARY...	NEEL
19	100061	000-15-53...	47.00	0.150000000	0.150000000	002-02-012	NEEL	NEEL	8622289	WEN GARY...	NEEL
20	100063	000-15-53...	79.00	0.150000000	0.150000000	002-02-014	NEEL	NEEL	8612540	SC-BITZ J...	SC-BITZ

OBJECT	PARCEL_ID	PIN	FRONT_DIM	POLY_ACRE	SUM_ACRE	OLD_ID	USERENT	CITY_CODE	ACCT.	OWNNAM	OWNAD
1	100001	000-15-53...	80.00	0.150000000	0.150000000	002-01-001	NEEL	NEEL	806601	WALKERS...	NEEL
2	100002	000-15-53...	80.00	0.150000000	0.150000000	002-01-002	NEEL	NEEL	806602	SCALON R...	NEEL
3	100004	000-15-53...	80.00	0.150000000	0.150000000	002-01-004	NEEL	NEEL	806407	CARDINAL...	LLC
4	100005	000-15-53...	80.00	0.150000000	0.150000000	002-01-005	NEEL	NEEL	8066171	DAVID PRO...	NEEL
5	100006	000-15-53...	80.00	0.150000000	0.150000000	002-01-006	NEEL	NEEL	8029090	HALL PAUL B	HALL LOU
6	100016	000-15-53...	80.00	0.150000000	0.150000000	002-01-016	NEEL	NEEL	840506	ROBINSON...	INVESTOR
7	100018	000-15-53...	80.00	0.150000000	0.150000000	002-01-014	NEEL	NEEL	8621487	LES RENTA...	NEEL
8	100019	000-15-53...	80.00	0.150000000	0.150000000	002-01-015	NEEL	NEEL	806606	CUTICK GA...	WILLIAMS
9	100021	000-15-53...	80.00	0.150000000	0.150000000	002-01-017	NEEL	NEEL	8029134	DANIELS R...	NEEL
10	100023	000-15-53...	80.00	0.150000000	0.150000000	002-01-019	NEEL	NEEL	8543087	KRUSE MA...	NEEL
11	100024	000-15-53...	80.00	0.150000000	0.150000000	002-01-020	NEEL	NEEL	8017078	WENGER LA...	NEEL
12	100028	000-15-53...	80.00	0.150000000	0.150000000	002-01-022	NEEL	NEEL	0120204	MOEHL CH...	MOEHL
13	100030	000-15-53...	80.00	0.150000000	0.150000000	002-01-023	NEEL	NEEL	802660	REED DAVID	ALEXY D
14	100031	000-15-53...	80.00	0.150000000	0.150000000	002-01-024	NEEL	NEEL	8027225	NEAL DOWN...	NEEL
15	100032	000-15-53...	80.00	0.150000000	0.150000000	002-02-003	NEEL	NEEL	8171315	DAVE JOSE...	NEEL
16	100034	000-15-53...	80.00	0.150000000	0.150000000	002-02-002	NEEL	NEEL	8404914	CHURKAT J...	NEEL
17	100055	000-15-53...	80.00	0.150000000	0.150000000	002-02-006	NEEL	NEEL	0006067	LIBRA PRO...	NEEL
18	100060	000-15-53...	47.00	0.150000000	0.150000000	002-02-011	NEEL	NEEL	8622287	WEN GARY...	NEEL
19	100061	000-15-53...	47.00	0.150000000	0.150000000	002-02-012	NEEL	NEEL	8622289	WEN GARY...	NEEL
20	100063	000-15-53...	79.00	0.150000000	0.150000000	002-02-014	NEEL	NEEL	8612540	SC-BITZ J...	SC-BITZ

1. Discovery

2. Approval Management

3. Infrastructure Orchestration

4. Data Movement

5. Analysis

6. Teardown & Cleanup

7. Publication

OBJECTID	PANEL_ID	PIN	FRONT_DM	POLY_ACRE	SUM_ACRE	OLD_ID	USERENT	CITY_CODE	ACCT.	OWNNAM	OWNADR
1	100001	0002-15-53	50.00	0.190000000	0.190000000	002-01-001	NEGL	NEGL	8096001	WALKERSON	WALKERSON
2	100002	0002-15-53	50.00	0.190000000	0.190000000	002-01-002	NEGL	NEGL	8094000	SCALZON R.	SCALZON R.
3	100004	0002-15-53	50.00	0.190000000	0.190000000	002-01-004	NEGL	NEGL	8040077	CARDONAL	LIC
4	100005	0002-15-53	50.00	0.190000000	0.190000000	002-01-005	NEGL	NEGL	8006171	DAVID PRO.	NEGL
5	100006	0002-15-53	50.00	0.190000000	0.190000000	002-01-006	NEGL	NEGL	2902900	HALL PAUL B	HALL LDO
6	100016	0002-15-53	50.00	0.100000000	0.100000000	002-01-016	NEGL	NEGL	8400008	ROBMONSON	ROBMONSON
7	100018	0002-15-53	50.00	0.100000000	0.100000000	002-01-018	NEGL	NEGL	8091467	LEE RENTAL	NEGL
8	100019	0002-15-53	50.00	0.190000000	0.190000000	002-01-019	NEGL	NEGL	8096006	CUTCOCK GA.	WILLIAMS
9	100021	0002-15-53	50.00	0.190000000	0.190000000	002-01-017	NEGL	NEGL	8009104	DANIELS R.	NEGL
10	100023	0002-15-53	50.00	0.190000000	0.190000000	002-01-019	NEGL	NEGL	8043407	KRUSE MA.	NEGL
11	100024	0002-15-53	50.00	0.190000000	0.190000000	002-01-020	NEGL	NEGL	8017000	WENDEL LA.	NEGL
12	100028	0002-15-53	50.00	0.190000000	0.190000000	002-01-022	NEGL	NEGL	0100004	MOCKEL CH.	MOCKEL
13	100030	0002-15-53	50.00	0.190000000	0.190000000	002-01-023	NEGL	NEGL	8006660	REED DAVID	ALEXYS E
14	100031	0002-15-53	50.00	0.190000000	0.190000000	002-01-024	NEGL	NEGL	8007205	NEAL DOWD	NEGL
15	100032	0002-15-53	50.00	0.190000000	0.190000000	002-01-023	NEGL	NEGL	8171919	DAVE JOSE	NEGL
16	100034	0002-15-53	50.00	0.190000000	0.190000000	002-01-025	NEGL	NEGL	8040014	CHARLEY J.	NEGL
17	100055	0002-15-53	50.00	0.190000000	0.190000000	002-01-006	NEGL	NEGL	0000007	LIBRA PRO.	NEGL
18	100060	0002-15-53	47.00	0.160000000	0.160000000	002-02-011	NEGL	NEGL	8002287	WEN GARY.	NEGL
19	100061	0002-15-53	47.00	0.190000000	0.190000000	002-02-012	NEGL	NEGL	8002290	WEN GARY.	NEGL
20	100063	0002-15-53	70.00	0.190000000	0.190000000	002-02-014	NEGL	NEGL	8017000	WEN GARY.	NEGL

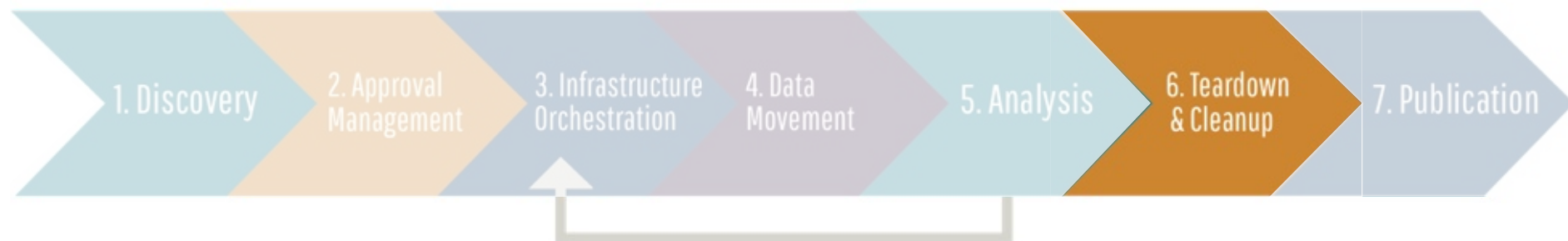
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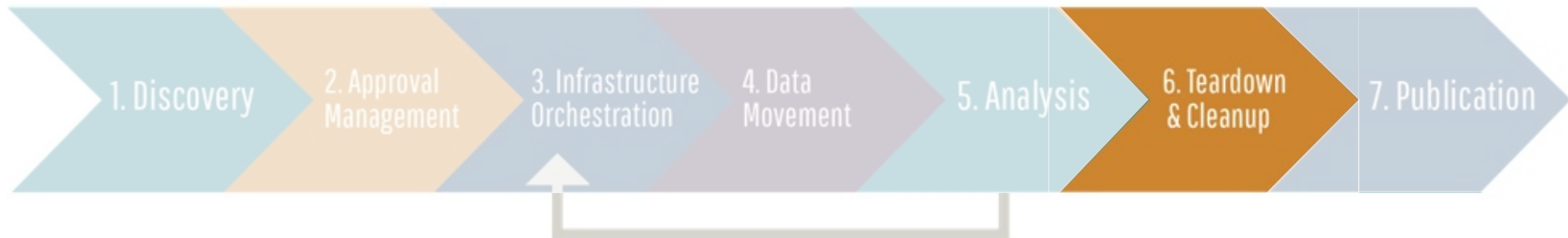
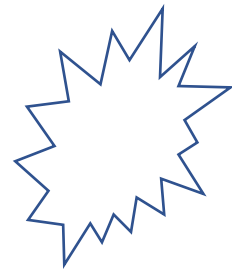
1 library(magrittr)
2 library(tidyverse)
3 library(reshape)
4 library(reshape2)
5 library(data.table)
6
7 vcap <- read.csv("vcap_issue_filings_order_results_fy16-17-1.csv", head=1000)
8
9 se <- vcap %>%
10   filter(Issue_Text=="SUMMARY EJECTMENT") %>%
11   group_by(County) %>%
12   mutate(total=as.numeric(gsub(" ", "", Total_Cases_Filed)),
13          July16=as.numeric(gsub(" ", "", July_Case_Issue_Filed)),
14          Aug16=as.numeric(gsub(" ", "", August_Case_Issue_Filed)),
15          Sep16=as.numeric(gsub(" ", "", September_Case_Issue_Filed)),
16          Oct16=as.numeric(gsub(" ", "", October_Case_Issue_Filed)),
17          Nov16=as.numeric(gsub(" ", "", November_Case_Issue_Filed)),
18          Dec16=as.numeric(gsub(" ", "", December_Case_Issue_Filed)),
19          Jan17=as.numeric(gsub(" ", "", January_Case_Issue_Filed)),
20          Feb17=as.numeric(gsub(" ", "", February_Case_Issue_Filed)),
21          Mar17=as.numeric(gsub(" ", "", March_Case_Issue_Filed)),
22          Apr17=as.numeric(gsub(" ", "", April_Case_Issue_Filed)),
23          May17=as.numeric(gsub(" ", "", May_Case_Issue_Filed)),
24          Jun17=as.numeric(gsub(" ", "", June_Case_Issue_Filed))) %>%
25   select(4,35:46) %>%
26   setDT() %>%
27   melt.data.frame(id="County") %>%
28   cast(County~variable, fun.aggregate=sum)

```

OBJECTID	PANEL_ID	PIN	FRONT_DM	POLY_ACRE	SUM_ACRE	OLD_ID	USERENT	CITY_CODE	ACCT.	OWNNAM	OWNADR
1	100001	0002-15-53	50.00	0.190000000	0.190000000	002-01-001	NEGL	NEGL	8096001	WALKERSON	WALKERSON
2	100002	0002-15-53	50.00	0.190000000	0.190000000	002-01-002	NEGL	NEGL	8094000	SCALZON R.	SCALZON R.
3	100004	0002-15-53	50.00	0.190000000	0.190000000	002-01-004	NEGL	NEGL	8040077	CARDONAL	LIC
4	100005	0002-15-53	50.00	0.190000000	0.190000000	002-01-005	NEGL	NEGL	8006171	DAVID PRO.	NEGL
5	100006	0002-15-53	50.00	0.190000000	0.190000000	002-01-006	NEGL	NEGL	2902900	HALL PAUL B	HALL LDO
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13	100030	0002-15-53	50.00	0.190000000	0.190000000	002-01-023	NEGL	NEGL	8006660	REED DAVID	ALEXYS E
14	100031	0002-15-53	50.00	0.190000000	0.190000000	002-01-024	NEGL	NEGL	8007205	NEAL DOWD	NEGL
15	100032	0002-15-53	50.00	0.190000000	0.190000000	002-01-023	NEGL	NEGL	8171919	DAVE JOSE	NEGL
16	100034	0002-15-53	50.00	0.190000000	0.190000000	002-01-025	NEGL	NEGL	8040014	CHARLEY J.	NEGL
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19	100061	0002-15-53	47.00	0.190000000	0.190000000	002-02-012	NEGL	NEGL	8002290	WEN GARY.	NEGL
20	100063	0002-15-53	70.00	0.190000000	0.190000000	002-02-014	NEGL	NEGL	8017000	WEN GARY.	NEGL











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Replication Data for "The Impact of Text Message Reminders on Adherence to Antimalarial Treatment"



Nov 9, 2017

Raifman, Julia, 2017, "Replication Data for "The Impact of Text Message Reminders on Adherence to Antimalarial Treatment"", doi:10.7910/DVN/FOMQOO, Harvard Dataverse, V1, UNF:6:nLbJwF3TujBdv3lY0zf8Pg==

Unidentified data from malaria patients in Northern Ghana

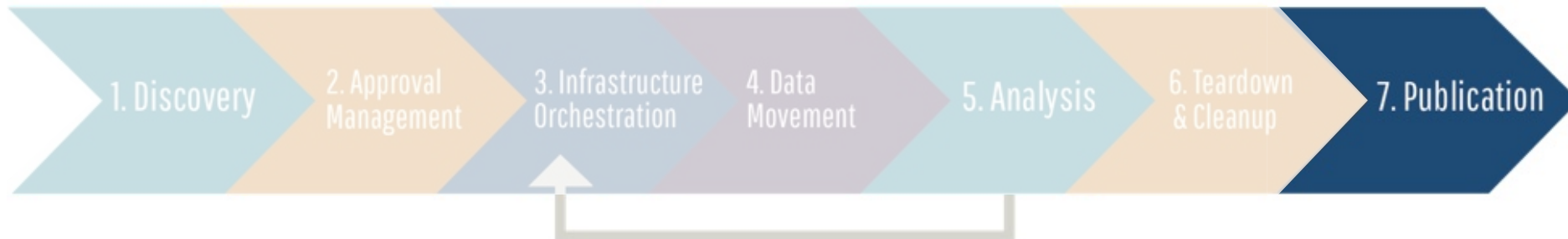
Replication Data for: "Estimating Spatial Preferences from Votes and Text"



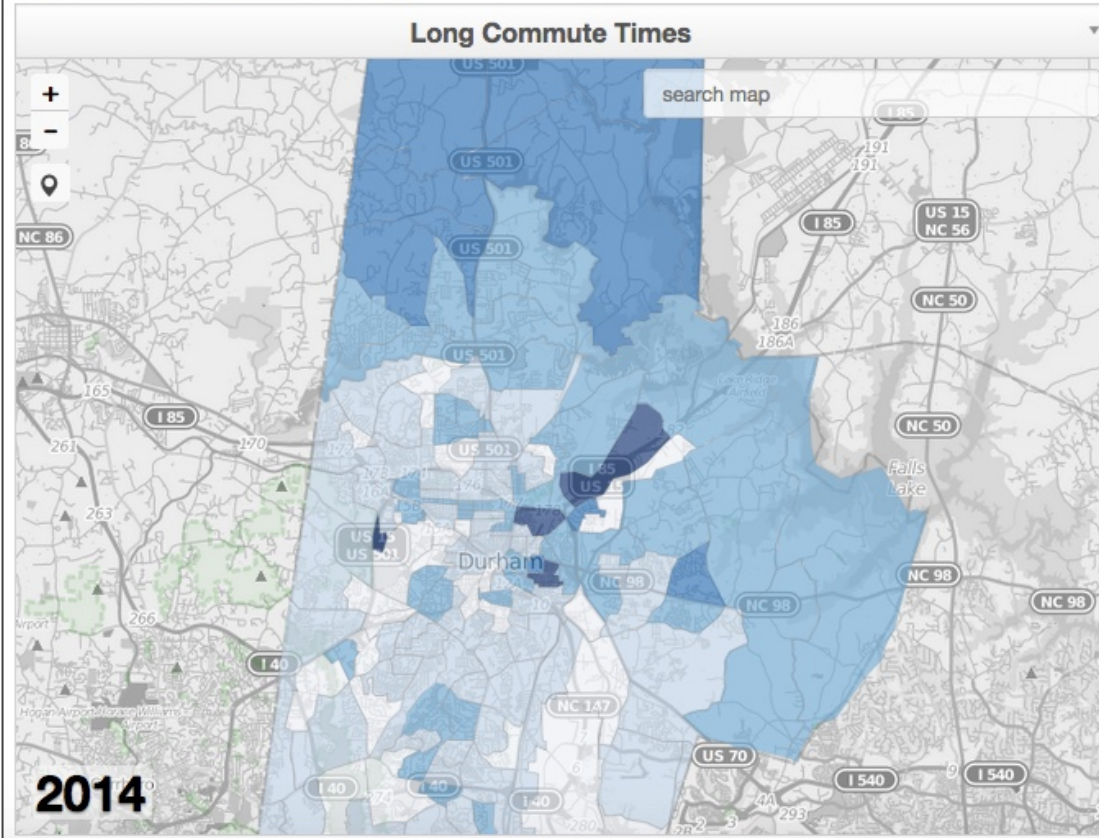
Nov 9, 2017 - Political Analysis Dataverse

Kim, In Song; Londregan, John; Ratkovic, Marc, 2017, "Replication Data for: "Estimating Spatial Preferences from Votes and Text"", doi:10.7910/DVN/AGUVBE, Harvard Dataverse, V1, UNF:6:WRLinz7H2upXFRIxSOIOBg==

This folder contains the scripts and data necessary to implement Sparse Factor Analysis (SFA) as outline in Kim, Londregan, and Ratkovic (2017).



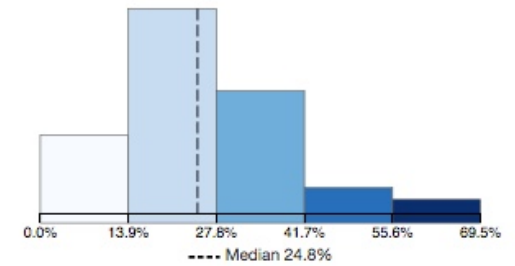
Blockgroups:  Neighborhoods:  Tracts:



Commuting 30 Minutes or More

SELECTED s  
N/A

COUNTY  
25.6%



1. Discovery

2. Approval Management

3. Infrastructure Orchestration

4. Data Movement

5. Analysis

6. Teardown & Cleanup

7. Publication



# A use case

Census data

+

Voter registration

+

Births and deaths

+

{analytical wizardry}

=

Annual subcounty population estimates

who benefits?

trust