

## Introduction

Cities are increasingly collecting unsurpassed quantities of data, including via requests for non-emergency city services. Similar to the 311 systems of many other cities, the City of St. Louis operates the Citizens' Service Bureau (CSB). From potholes to graffiti, the CSB forwards requests to appropriate departments. Over 1.3 million requests have been made in the last ten years.

Little is known about the degree to which these data reflect the actual incidence of problems, or whether they serve as a proxy for social capital and civic participation within neighborhoods.

## Data & Methods

A voter file indicating voting history and registered address was obtained from NationBuilder and geocoded. Multiple elections were chosen to account for the difference in types of elections (General, Primary and Non-Presidential Primary)

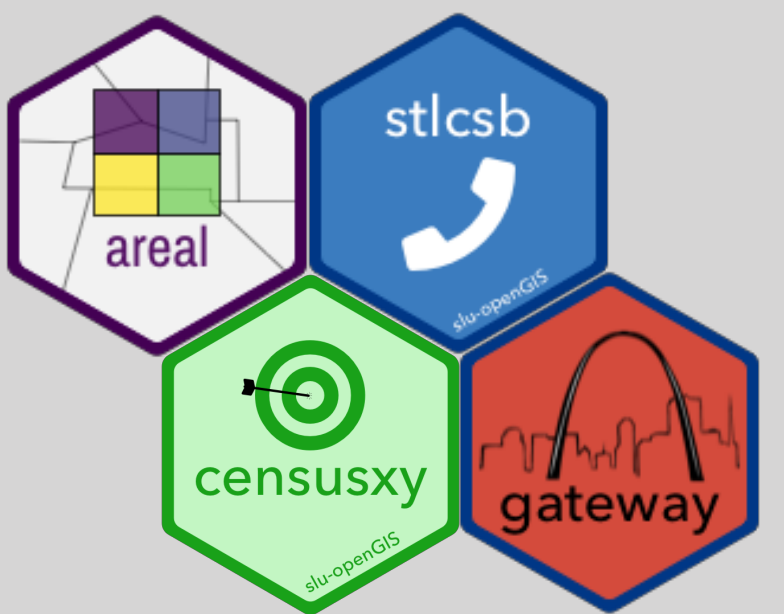
CSB calls in the 6 months surrounding (3 before, 3 after) the election date were obtained from the City of St. Louis.

Demographic data were obtained from American Community Survey 5-Year Estimates ending in the year of each election.

Data were aggregated to grid squares and appropriate OLS and spatial lag models were fit for each election.

## Software

This work is supported by the development of several R packages, all part of the **tidystl** ecosystem.



**areal** - Provides methods for areal weighted interpolation of incongruent polygons

**censusxy** - Provides the ability to geocode R data.frames using the Census Bureau geocoder

**stlcsb** - Provides access to and methods for working with Citizens' Service Bureau request data

**gateway** - Provides access to geospatial assets for mapping in the City of St. Louis

## Results

2014 Midterm Election

Variables	Main Effect (OLS)	Full Model (OLS)	Full Model (Spatial Lag)
Voter Turnout	4.071 (0.447)***	4.479 (0.466)***	4.336 (0.458)***
Total Population	-	-0.006 (0.006)	-0.012 (0.007)
Non-White	-	0.637 (0.386)	0.355 (0.403)
Rate of Poverty	-	-0.293 (0.806)	-0.180 (0.783)
High-school	-	1.957 (0.976)*	1.938 (0.946)*
Spatial Lag Term	-	-	0.040 (0.022)
Constant	51.549 (11.421)***	-31.223 (31.072)	-38.814 (30.388)
F-statistic	82.976***	23.066***	-
Adjusted R <sup>2</sup>	0.286	0.350	0.387
Spatial Pseudo R <sup>2</sup>	-	-	0.373
Breusch-Pagan	208.778***	308.167***	-
Diagnostic for Spatial Dependence	6.876**	4.786*	-

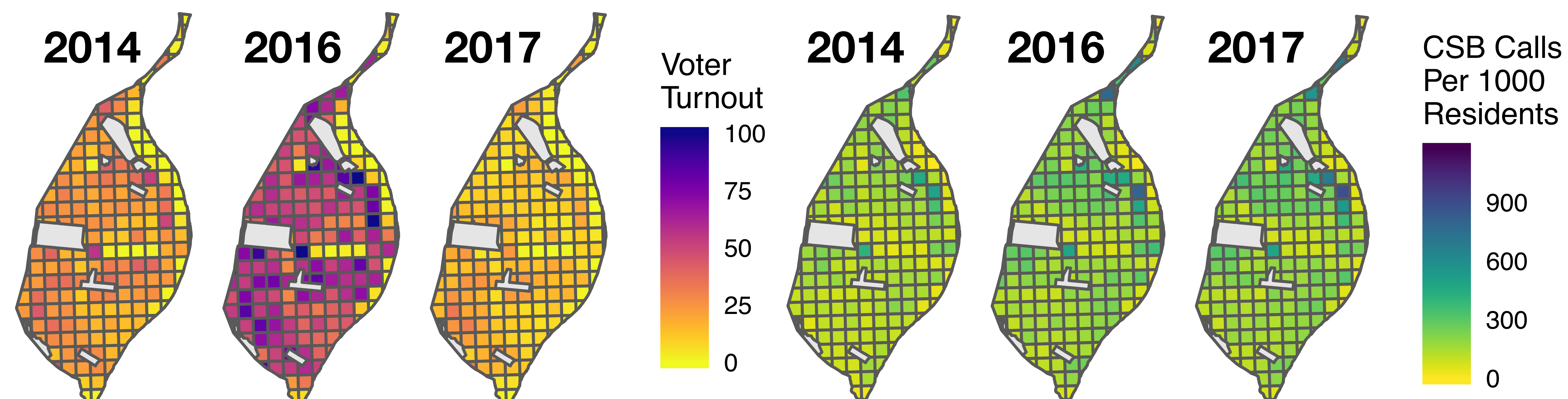
2016 Presidential Election

Variables	Main Effect (OLS)	Full Model (OLS)	Full Model (Spatial Lag)
Voter Turnout	2.138 (0.328)***	2.806 (0.347)***	2.578 (0.345)***
Total Population	-	-0.018 (0.008)*	-0.026 (0.008)**
Non-White	-	0.917 (0.479)	0.558 (0.483)
Rate of Poverty	-	-0.598 (1.042)	-0.638 (0.994)
High-school	-	2.643 (1.237)*	2.394 (1.185)*
Spatial Lag Term	-	-	0.050 (0.022)*
Constant	89.116 (16.868)***	-20.038 (39.634)	-28.823 (38.002)
F-statistic	42.498***	16.427***	-
Adjusted R <sup>2</sup>	0.168	0.273	0.336
Spatial Pseudo R <sup>2</sup>	-	-	0.300
Breusch-Pagan	0.260	127.669***	-
Diagnostic for Spatial Dependence	12.782***	9.792**	-

2017 Municipal Election

Variables	Main Effect (OLS)	Full Model (OLS)	Full Model (Spatial Lag)
Voter Turnout	4.947 (0.848)***	6.631 (0.861)***	6.013 (0.816)***
Total Population	-	-0.001 (0.007)	-0.019 (0.008)*
Non-White	-	1.345 (0.461)**	0.711 (0.452)
Rate of Poverty	-	0.111 (1.101)	-0.395 (1.033)
High-school	-	1.454 (1.218)	1.399 (1.137)
Spatial Lag Term	-	-	0.088 (0.019)***
Constant	130.052 (13.021)***	-11.169 (36.539)	-29.886 (34.356)
F-statistic	34.044***	14.912	-
Adjusted R <sup>2</sup>	0.139	0.253	0.346
Spatial Pseudo R <sup>2</sup>	-	-	0.313
Breusch-Pagan	3.160	105.100***	-
Diagnostic for Spatial Dependence	26.331***	17.514***	-

\* p<.05 \*\* p<.01 \*\*\* p<.001



## Discussion

For these data to be useful for research, it is imperative that we understand the degree to which these data reflect the actual incidence of problems in communities. This is also a question for policy makers who wish to see resources equitably distributed between neighborhoods.

These results suggest that call patterns are likely to mirror voting behavior to a degree. Lower turnout elections, particularly the 2017 municipal election, show the strongest relationship. However, over 60% of the variance in CSB calls remains unaccounted for. This suggests that voting behavior is indicative of everyday forms of civic participation, but is an insufficient proxy. Further work is needed to better understand these patterns and identify other factors, including objective measures of incidence, that explain CSB call rates.

## Future Directions

As we prepare these data for publication, we are experimenting with other municipal data, including crime and vacancy data, that may allow us to model related facets of neighborhood disorder and their effect on CSB call rates.

We are also using these data as predictors of vacancy themselves, as CSB data provide a large, untapped means for identifying vacant properties in the City of St. Louis.

Our analyses using CSB data to-date suggest that data including requests for non-emergency city services provides a unique means for researching and evaluating conditions in neighborhoods beyond their bureaucratic functions.



Find replication materials at:  
<https://osf.io/6ycrq/>