311 Exploratory Analysis

Michael Spencer,

11/21/2019

Checks

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## [1] "All services in the data have been classified!"
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Potential duplicates. These are only adressed if it is believed they would present a significant issue in analysis.

| address	req_dt	updt_dt	topic	instances
2647 W Potomac Ave	2018-07-06 19:13:48	2019-04-02 12:55:49	abandoned bike/vehicle	3
4858 N Winthrop Ave	2018-09-10 13:35:19	2019-04-02 12:41:46	abandoned bike/vehicle	3
5801 N Pulaski Rd	2019-11-06 15:44:05	2019-11-06 15:44:24	graffiti	3
1129 N Hamlin Ave	2019-10-31 08:55:47	2019-11-21 21:10:49	building concern/code violation	2
1236 N Paulina St	2018-09-11 08:01:49	2019-04-02 12:38:45	abandoned bike/vehicle	2
1415 W Polk St	2018-08-30 08:32:30	2019-04-02 14:29:08	abandoned bike/vehicle	2
1420 S Kenneth Ave	2018-09-11 07:59:31	2019-04-02 13:57:36	abandoned bike/vehicle	2
1508 W Chestnut St	2018-07-20 11:55:52	2019-04-02 09:56:24	abandoned bike/vehicle	2
1526 N Wicker Park Ave	2018-09-06 03:32:40	2019-04-02 12:52:20	abandoned bike/vehicle	2
1632 N Leavitt St	2018-08-07 09:11:05	2019-04-02 12:52:26	abandoned bike/vehicle	2
1634 W Roscoe St	2019-11-06 15:44:05	2019-11-06 15:44:24	graffiti	2
1869 N Halsted St	2019-11-12 10:55:08	2019-11-12 10:55:25	graffiti	2
2002 S Wentworth Ave	2019-09-25 12:03:06	2019-09-25 12:03:51	graffiti	2
2358 N Lincoln Park W	2019-03-11 14:23:54	2019-04-19 14:32:27	roadway/roadway lighting	2
2399 W 49 Th St	2018-07-06 10:05:23	2019-04-10 21:07:39	graffiti	2
2410 E 72 Nd St	2018-08-28 10:48:41	2019-04-02 09:56:22	abandoned bike/vehicle	2
2539 N California Ave	2018-09-11 08:05:16	2019-04-02 13:56:43	roadway/roadway lighting	2
2544 W Superior St	2018-10-02 12:26:03	2019-04-02 13:59:10	abandoned bike/vehicle	2
2642 N Washtenaw Ave	2018-09-25 10:48:09	2019-04-02 12:04:00	abandoned bike/vehicle	2
2652 N Clark St	2019-07-11 11:30:44	2019-07-11 11:31:17	graffiti	2
2655 W 72 Nd St	2018-07-04 18:11:31	2019-04-19 13:56:22	abandoned bike/vehicle	2
2659 N Clark St	2019-07-11 11:30:44	2019-07-11 11:31:17	graffiti	2
2665 N Clark St	2019-07-11 11:30:44	2019-07-11 11:31:17	graffiti	2
3036 W 19 Th St	2018-10-02 10:49:12	2019-04-02 13:59:10	abandoned bike/vehicle	2
320 W Ohio St	2018-07-20 08:01:59	2019-04-02 14:18:49	abandoned bike/vehicle	2
3200 N Kedzie Ave	2019-06-12 09:39:48	2019-06-12 15:59:16	graffiti	2
335 W Wellington Ave	2018-08-28 11:06:27	2019-04-17 13:12:22	abandoned bike/vehicle	2
3408 N Marshfield Ave	2019-11-06 15:44:05	2019-11-06 15:44:24	graffiti	2
3442 S Prairie Ave	2019-09-25 17:07:56	2019-11-12 09:22:22	roadway/roadway lighting	2
3442 S Prairie Ave	2019-09-25 17:10:13	2019-11-12 09:22:22	roadway/roadway lighting	2
3557 N Karlov Ave	2018-09-19 08:49:59	2019-04-10 21:33:05	abandoned bike/vehicle	2
3614 W 26 Th St	2019-06-13 11:05:24	2019-06-13 12:36:21	graffiti	2
4552 S Evans Ave	2019-07-17 07:29:26	2019-07-17 07:29:45	landscaping request/concern	2
4807 S Archer Ave	2018-09-05 11:34:42	2019-04-19 13:50:11	abandoned bike/vehicle	2
4855 S Lawler Ave	2018-08-27 06:30:02	2019-04-02 11:58:14	information request	2
4901 W Ohio St	2019-09-03 13:40:20	2019-09-03 13:40:28	landscaping request/concern	2
4940 W Ferdinand St	2019-09-03 13:40:20	2019-09-03 13:40:28	landscaping request/concern	2
5020 N Northwest Hwy	2018-10-02 10:34:21	2019-04-02 14:22:28	abandoned bike/vehicle	2
5353 N Lincoln Ave	2018-09-11 12:44:05	2019-04-02 13:55:00	graffiti	2

address	req_dt	updt_dt	topic	instances
5359 S Central Ave	2018-09-26 13:57:48	2019-04-02 13:16:30	roadway/roadway lighting	2
550 W Roscoe St	2018-07-17 13:06:02	2019-04-02 09:56:27	abandoned bike/vehicle	2
558 W Taylor St	2018-09-04 10:55:28	2019-04-02 12:44:20	abandoned bike/vehicle	2
6211 N Greenview Ave	2019-04-16 19:00:57	2019-06-05 07:47:53	roadway/roadway lighting	2
6802 S Clyde Ave	2018-08-09 10:53:44	2019-04-02 12:52:36	abandoned bike/vehicle	2
6928 S Winchester Ave	2019-06-20 08:33:48	2019-06-20 08:33:53	landscaping request/concern	2
7021 S Winchester Ave	2019-06-20 08:33:48	2019-06-20 08:33:53	landscaping request/concern	2
7032 S Campbell Ave	2018-08-28 20:51:50	2019-04-02 14:04:54	roadway/roadway lighting	2
7421 S Colfax Ave	2018-09-20 09:17:53	2019-04-02 14:03:48	abandoned bike/vehicle	2
7941 S Aberdeen St	2019-11-11 04:00:10	2019-11-11 04:00:19	landscaping request/concern	2
811 W Montrose Ave	2018-10-09 11:28:35	2019-04-02 11:56:40	abandoned bike/vehicle	2
837 N Leavitt St	2018-08-31 11:24:03	2019-04-02 12:34:35	abandoned bike/vehicle	2
8646 W Foster Ave	2018-08-14 06:55:39	2019-04-02 12:18:55	abandoned bike/vehicle	2
998 N Michigan Ave	2018-10-01 14:02:01	2019-04-10 21:24:13	abandoned bike/vehicle	2

Analysis

Base Benchmark Analysis (Non-Geographic)

What is the distribution of call by topic?

topic	n	prop_total
roadway/roadway lighting	173942	0.245
landscaping request/concern	99785	0.140
waste/cleanup services	93232	0.131
animal/pest	66695	0.094
utilities request/concern	52470	0.074
building concern/code violation	49198	0.069
city infrastructure	41180	0.058
graffiti	38794	0.055
abandoned bike/vehicle	28044	0.039
housing	12720	0.018
information request	10023	0.014
business	8527	0.012
blocked passage	8345	0.012
construction	7545	0.011
abandoned building	6190	0.009
taxi/ride-sharing	6070	0.009
health concern/public safety	5122	0.007
other/miscellaneous	1916	0.003
noise	958	0.001
city feedback	354	0.000

Most Frequent Request Topics
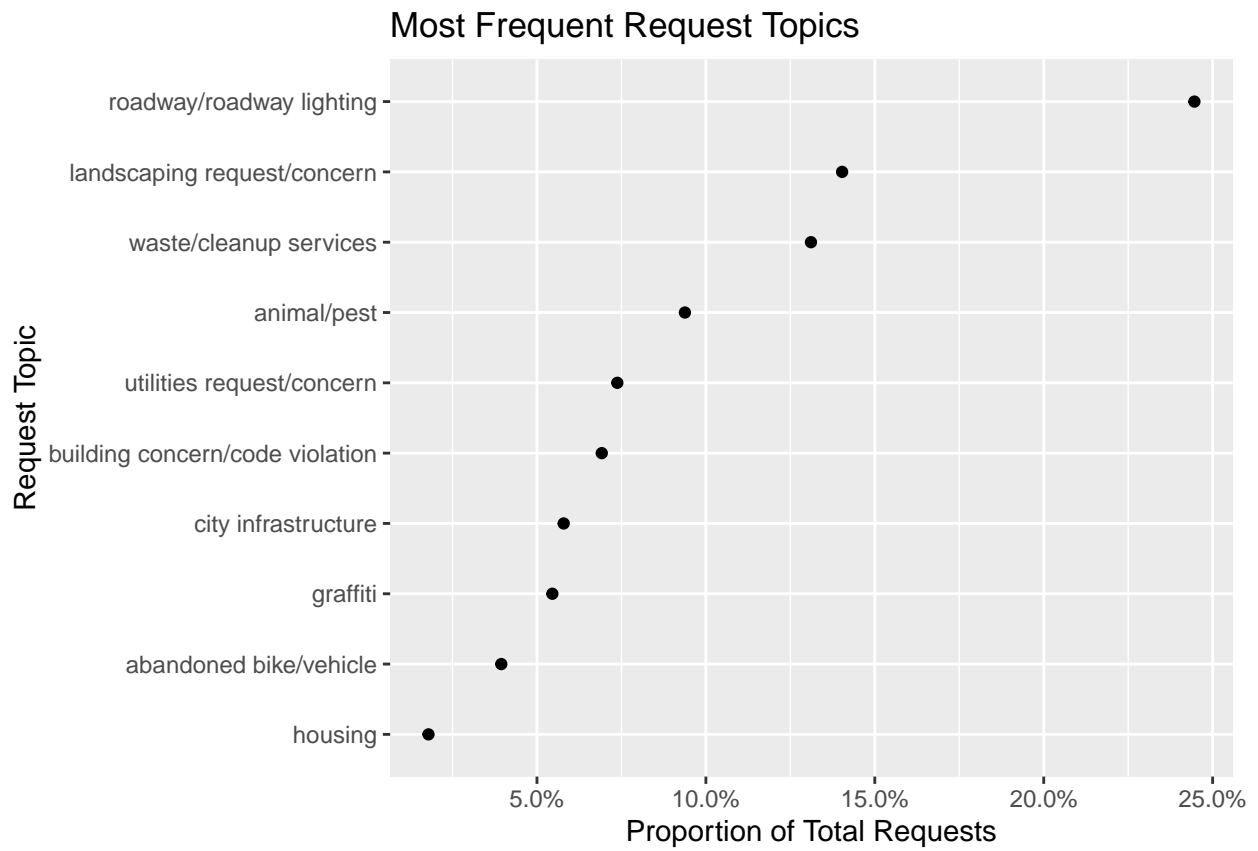
Within the top five topics, what are the most frequent services requested?

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## [[1]]
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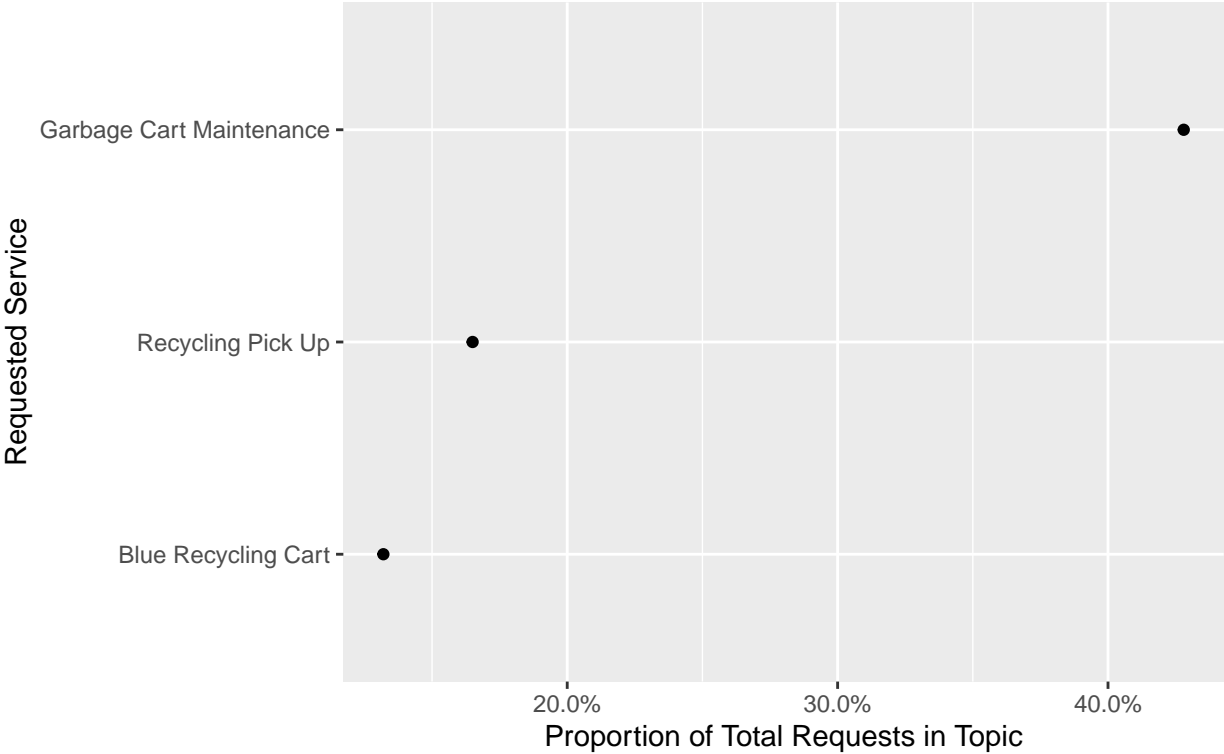## Frequently Requested Services:
Roadway/Roadway Lighting
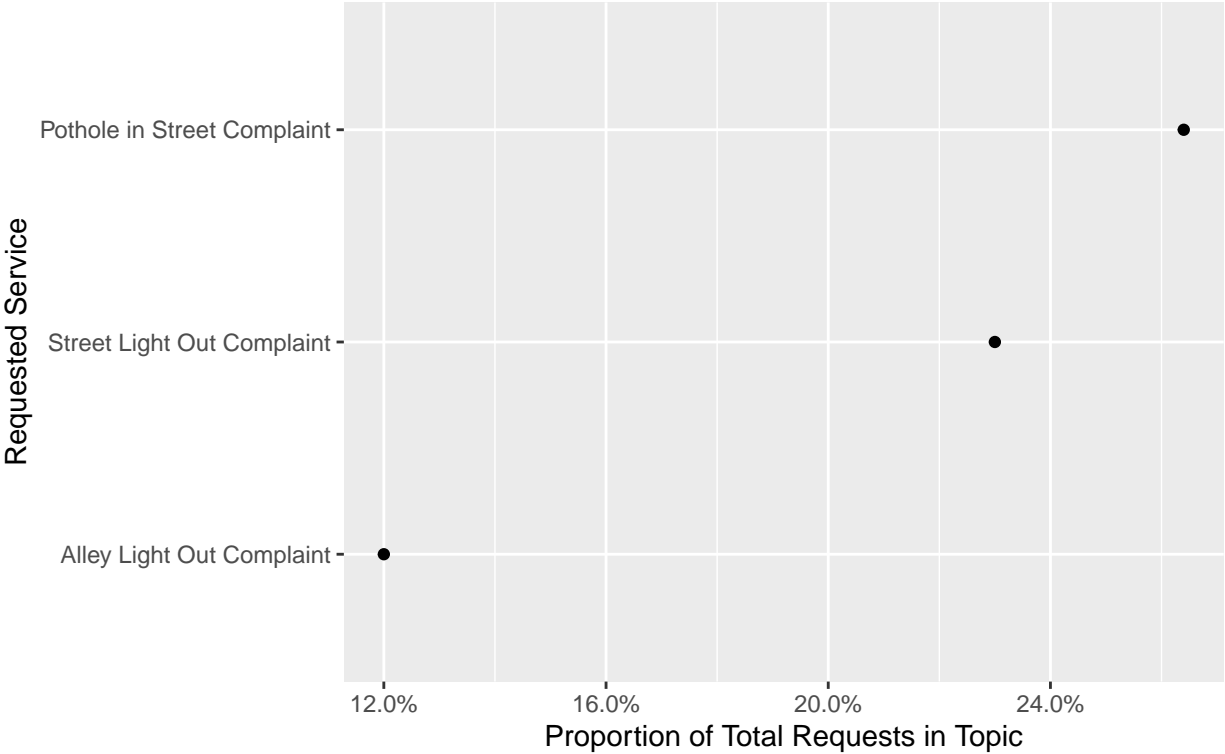

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## 
## [[2]]
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Frequently Requested Services:
Landscaping Request/Concern
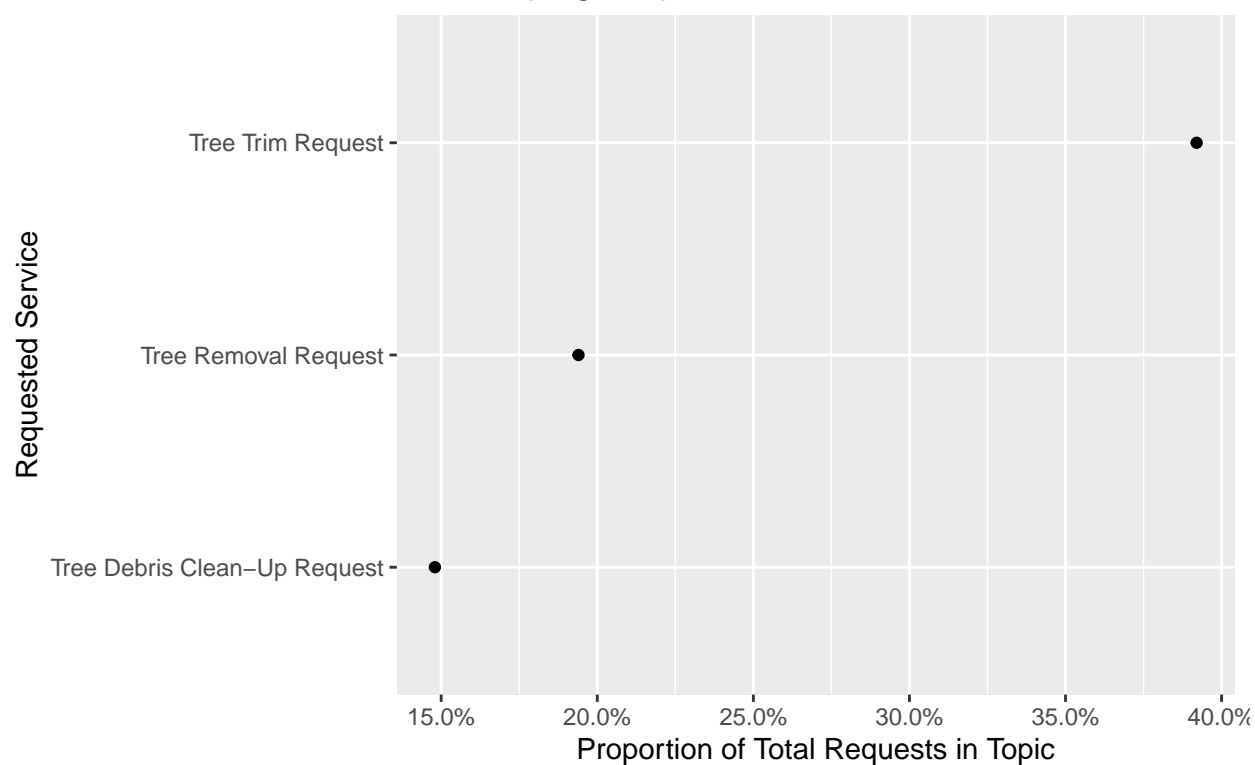

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## [[3]]
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Frequently Requested Services:
Waste/Cleanup Services

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##
## [[4]]
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Frequently Requested Services:
Animal/Pest
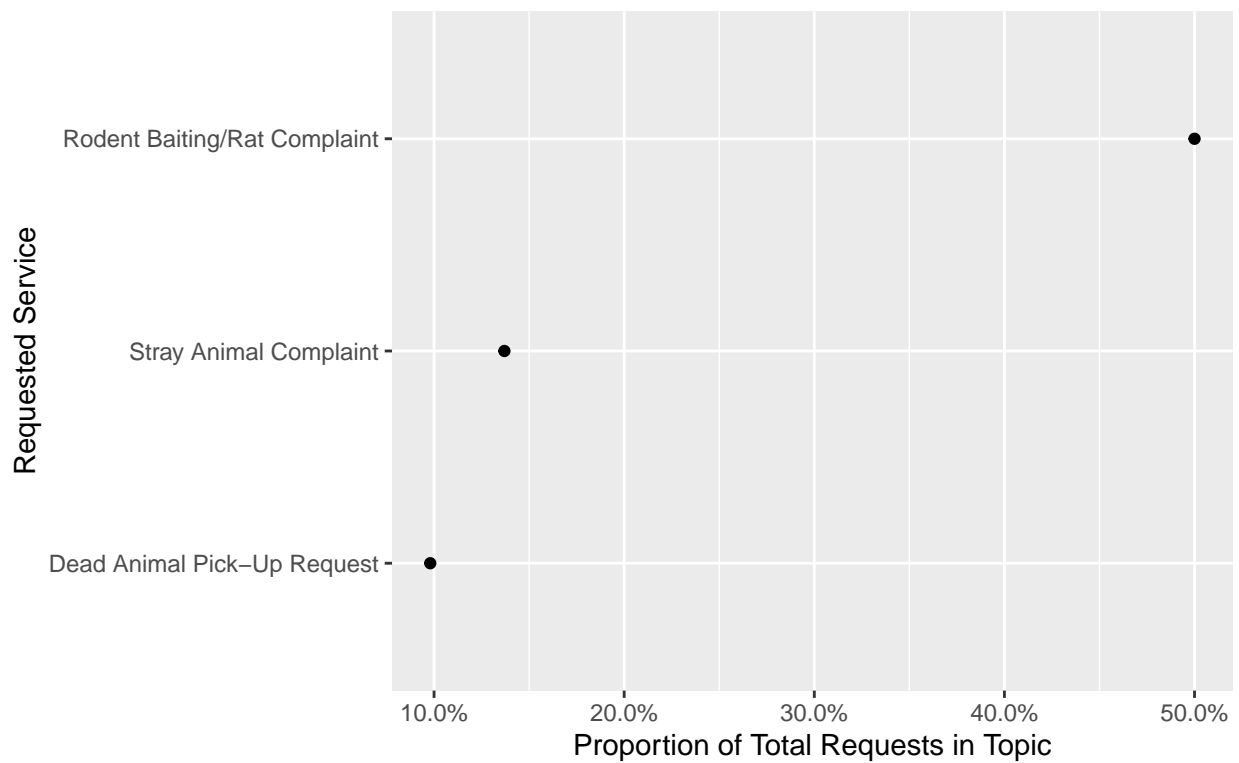

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## [[5]]
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Frequently Requested Services:
Utilities Request/Concern

[[6]]

Frequently Requested Services:
Building Concern/Code Violation
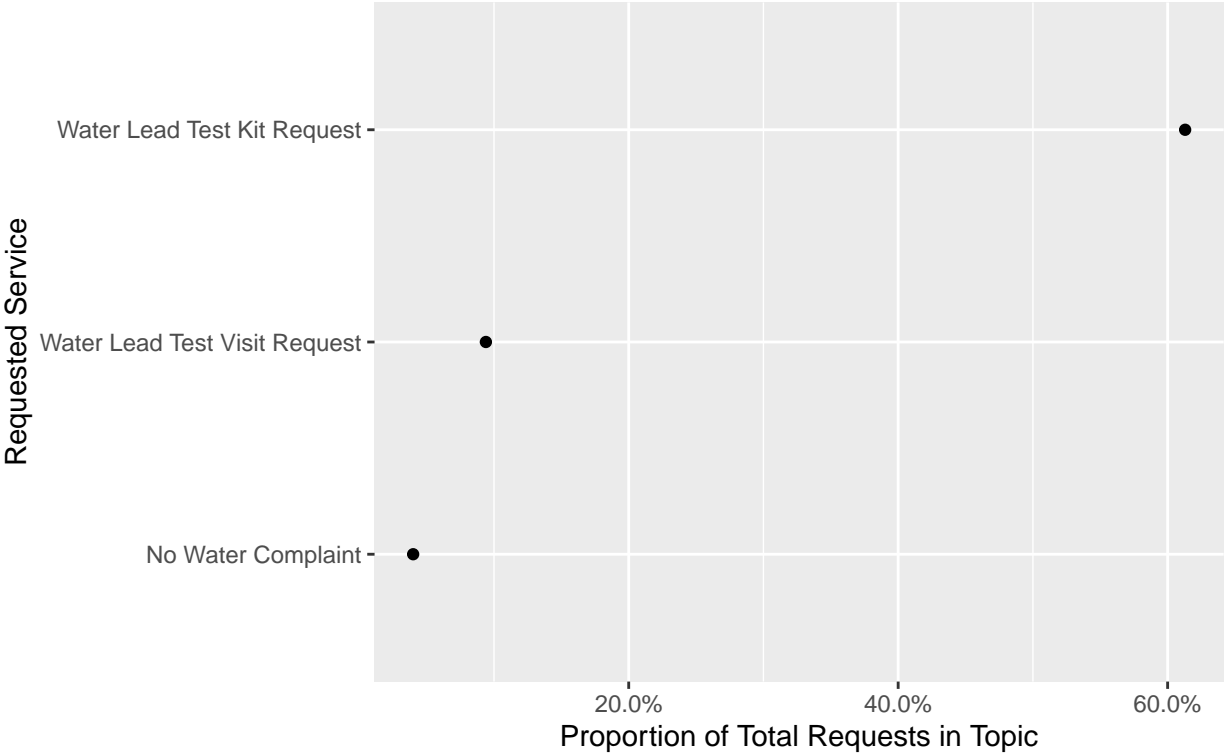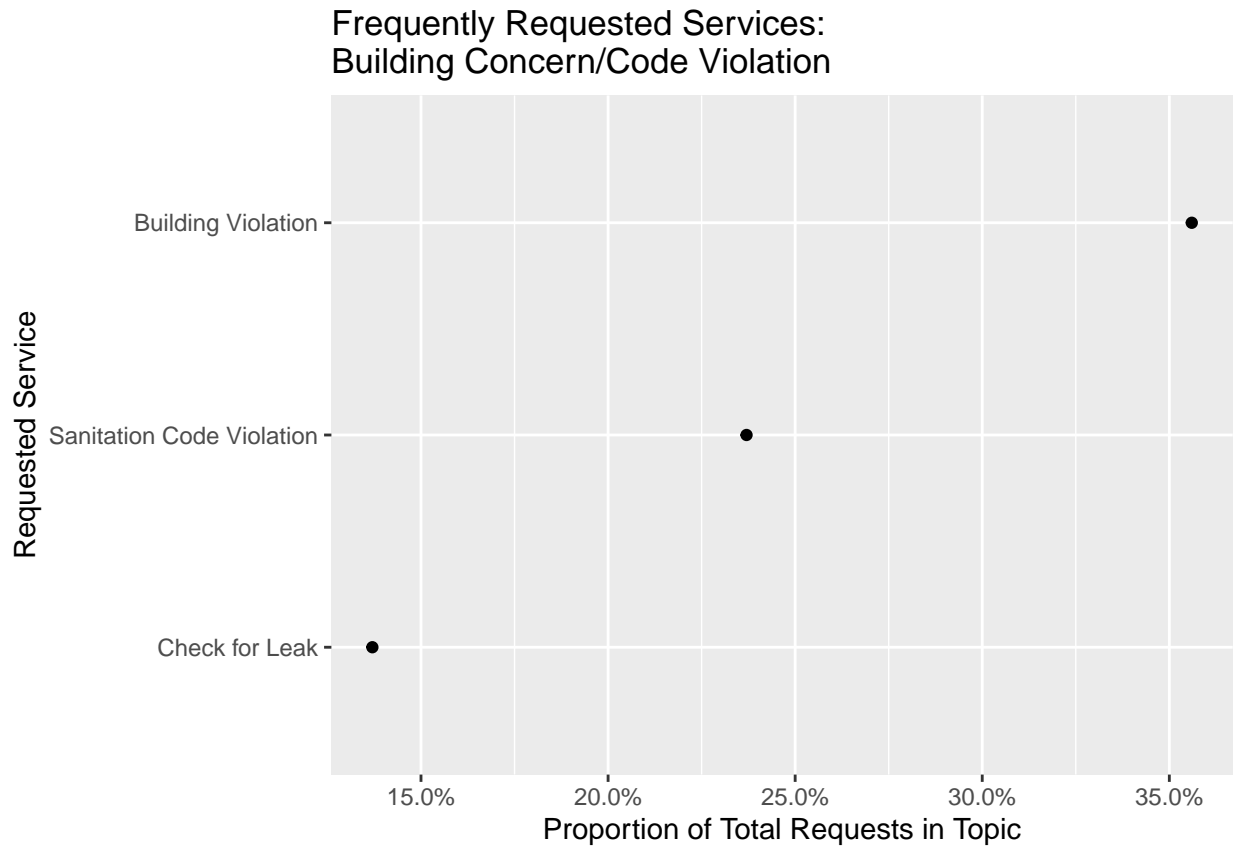
What is the proportion of requests that may be adversarial by topic?

topic	tot_adversarial	tot_not_adversarial	prop_adversarial	prop_not_adversarial
abandoned bike/vehicle	28044	0	1.0000000	0.0000000
abandoned building	6190	0	1.0000000	0.0000000
construction	7545	0	1.0000000	0.0000000
graffiti	38794	0	1.0000000	0.0000000
noise	958	0	1.0000000	0.0000000
taxi/ride-sharing	6070	0	1.0000000	0.0000000
business	7724	181	0.9771031	0.0228969
city feedback	329	25	0.9293785	0.0706215
health concern/public safety	2052	2844	0.4191176	0.5808824
building concern/code violation	12496	18923	0.3977211	0.6022789
utilities request/concern	7973	42649	0.1575007	0.8424993
animal/pest	7047	48801	0.1261818	0.8738182
housing	1424	11289	0.1120113	0.8879887
waste/cleanup services	7514	76812	0.0891066	0.9108934
blocked passage	332	8013	0.0397843	0.9602157
city infrastructure	248	38637	0.0063778	0.9936222
other/miscellaneous	2	1914	0.0010438	0.9989562
information request	0	9911	0.0000000	1.0000000
landscaping request/concern	0	99785	0.0000000	1.0000000
roadway/roadway lighting	0	173925	0.0000000	1.0000000

What is the proportion of requests that may involve illegal acitivity by topic?

topic	tot_illegal	tot_not_illegal	prop_illegal	prop_not_illegal
construction	4400	0	1.0000000	0.0000000
graffiti	38794	0	1.0000000	0.0000000
noise	958	0	1.0000000	0.0000000
abandoned bike/vehicle	22356	748	0.9676247	0.0323753
business	3267	618	0.8409266	0.1590734
building concern/code violation	38201	10736	0.7806159	0.2193841
other/miscellaneous	1082	567	0.6561552	0.3438448
health concern/public safety	2021	2399	0.4572398	0.5427602
waste/cleanup services	7514	85718	0.0805946	0.9194054
blocked passage	332	8013	0.0397843	0.9602157
animal/pest	20	66084	0.0003026	0.9996974
city feedback	0	354	0.0000000	1.0000000
city infrastructure	0	41014	0.0000000	1.0000000
housing	0	11886	0.0000000	1.0000000
information request	0	10019	0.0000000	1.0000000
landscaping request/concern	0	99785	0.0000000	1.0000000
roadway/roadway lighting	0	173897	0.0000000	1.0000000
utilities request/concern	0	51206	0.0000000	1.0000000
abandoned building	0	0	NaN	NaN
taxi/ride-sharing	0	0	NaN	NaN

What is the average time needed to close a request pertaining to something potentially illegal?

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## [1] "12460 calls took more than a year to fix and were thus filtered out here."
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illegal	avg_minutes_to_close	avg_hours_to_close	avg_days_to_close
maybe	170095.9	2834.932	118.12218
no	144499.6	2408.326	100.34693
yes	135090.4	2251.507	93.81279

What is the average time needed to close a request by topic?

| topic	total_num	avg_minutes_to_close	avg_hours_to_close	avg_days_to_close
other/miscellaneous	1361	107196.1	1786.601	74.44171
abandoned bike/vehicle	21285	108764.0	1812.733	75.53053
housing	11862	108970.3	1816.172	75.67383
animal/pest	65764	109076.4	1817.940	75.74751
noise	313	120022.1	2000.369	83.34869
blocked passage	6838	120137.2	2002.287	83.42861
building concern/code violation	45068	128080.0	2134.667	88.94446
construction	3671	131280.9	2188.015	91.16729
waste/cleanup services	87062	134043.4	2234.057	93.08571
utilities request/concern	17385	140914.6	2348.576	97.85733
roadway/roadway lighting	125400	145418.9	2423.648	100.98534
city feedback	194	153628.1	2560.468	106.68616

topic	total_num	avg_minutes_to_close	avg_hours_to_close	avg_days_to_close
graffiti	38779	163735.9	2728.931	113.70547
landscaping request/concern	72782	170817.7	2846.961	118.62339
health concern/public safety	2849	171211.7	2853.529	118.89705
business	2905	172027.4	2867.124	119.46350
city infrastructure	24488	181264.9	3021.081	125.87837
information request	7358	228097.1	3801.619	158.40077

Geographic Analysis

Volume of Calls

=>Relationship Between Race and Volume of Calls

White Population vs. Avg. Volume of 311 Requests in CHI
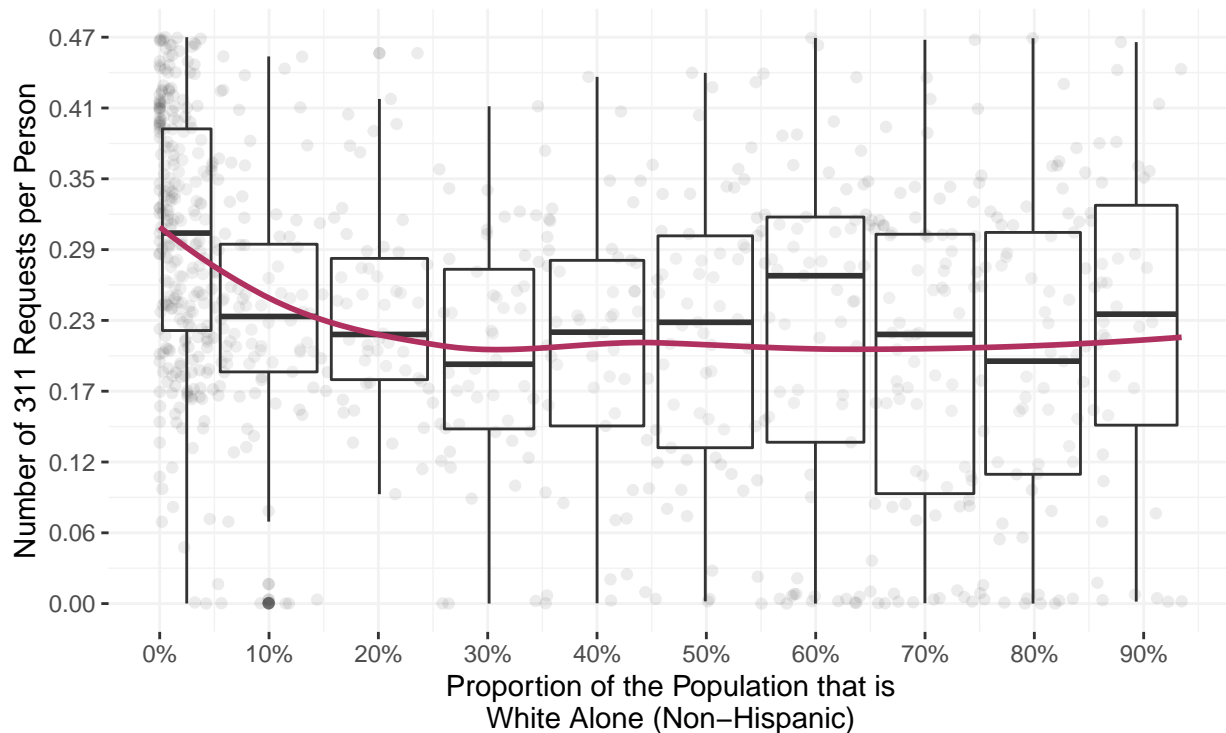
Note: Be wary of drawing comparisons to other cities as the data may come from different time periods.
Density of background points indicate sample size.

African American Population vs. Avg. Volume of 311 Requests in CHI
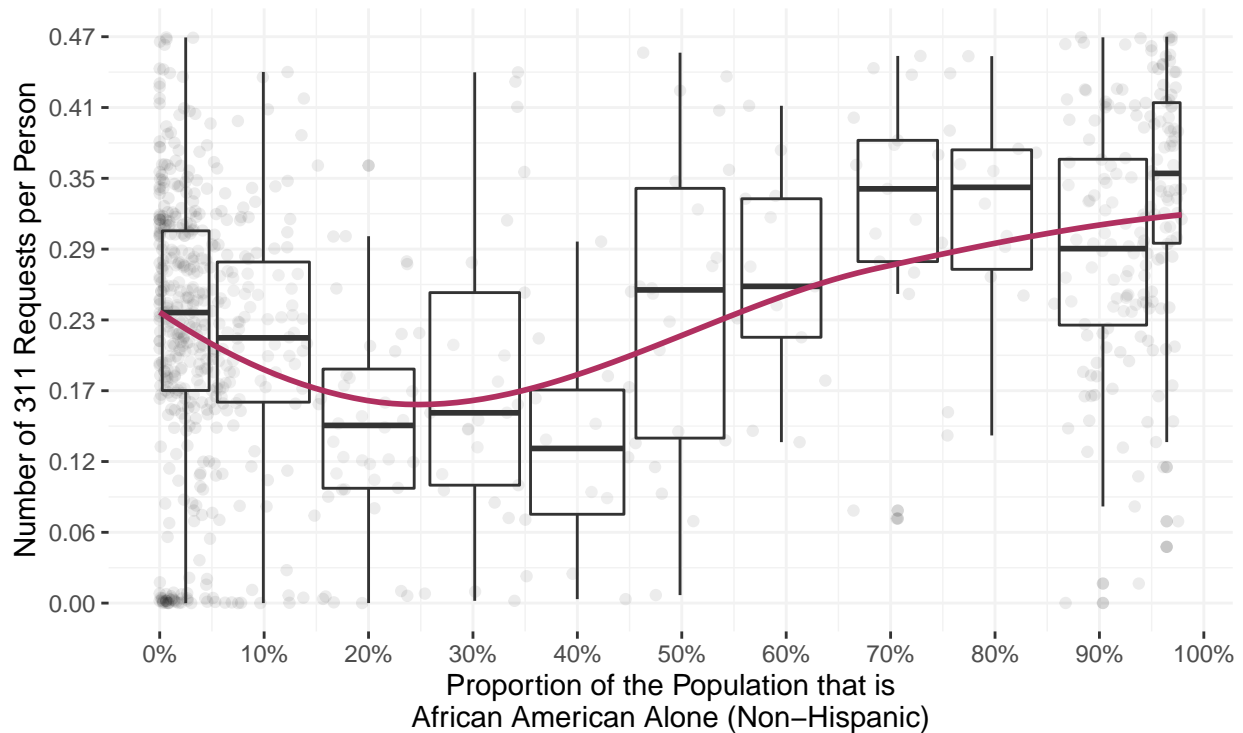
Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.
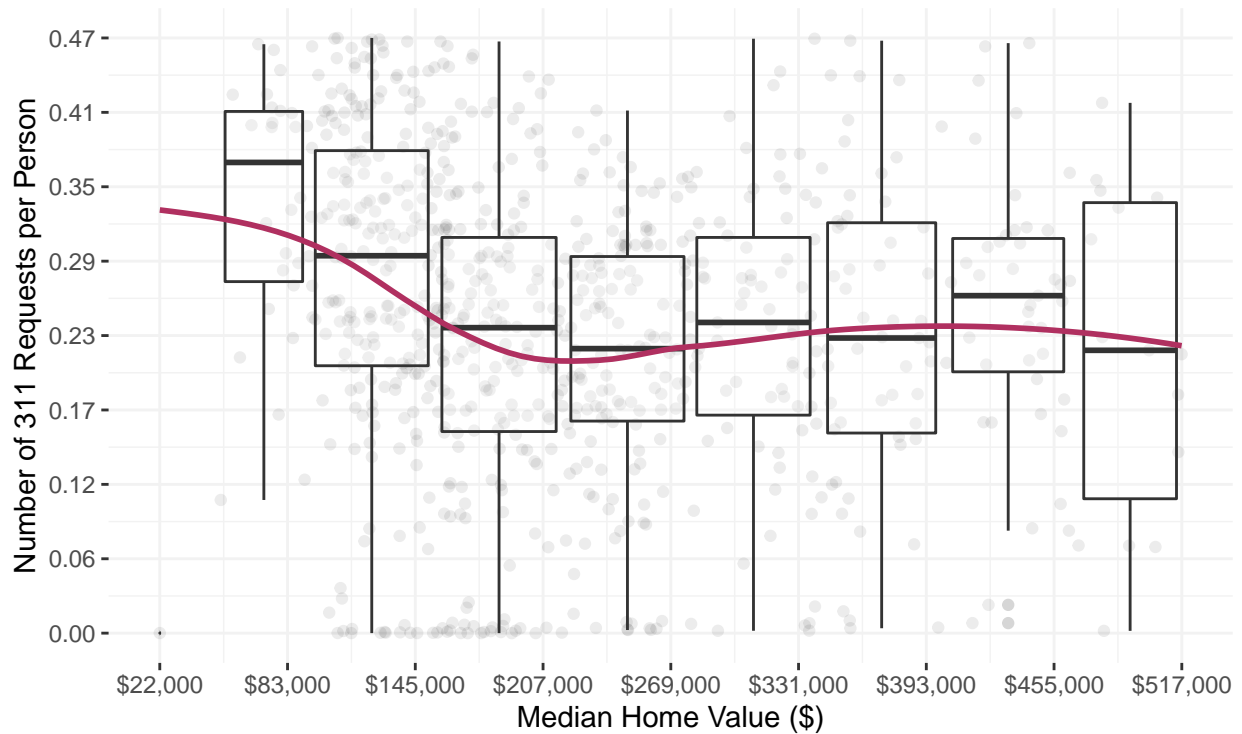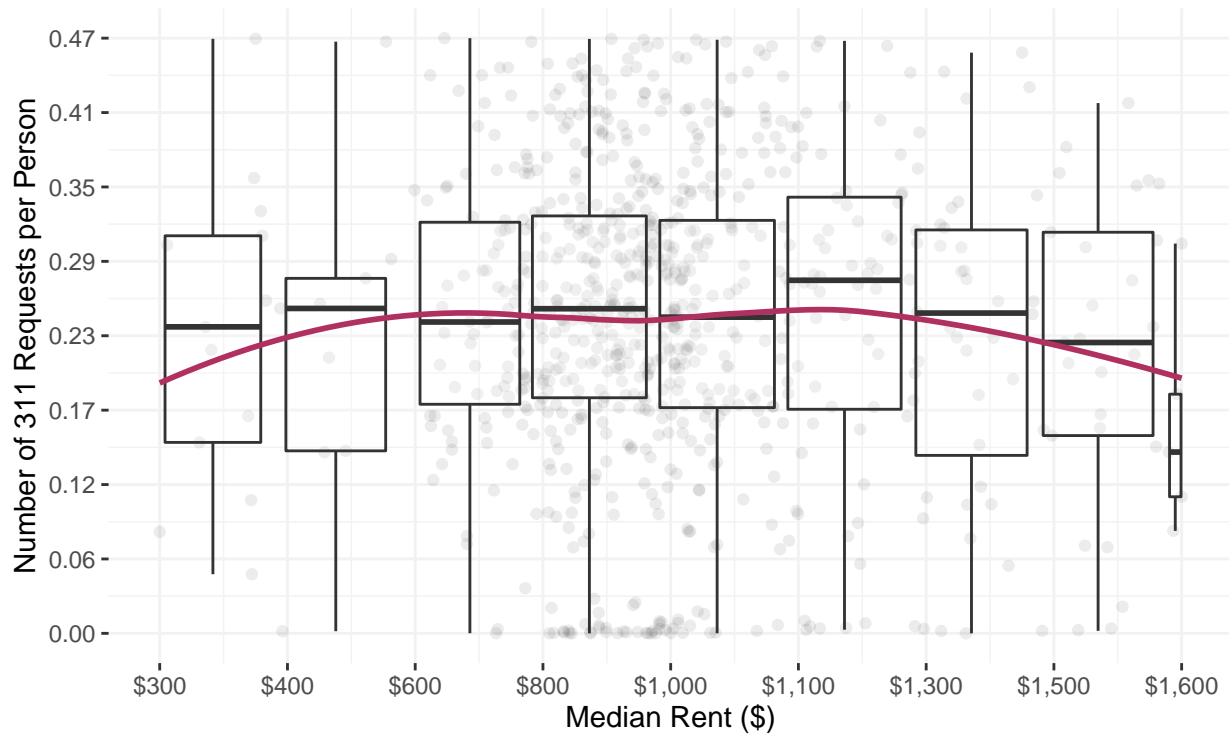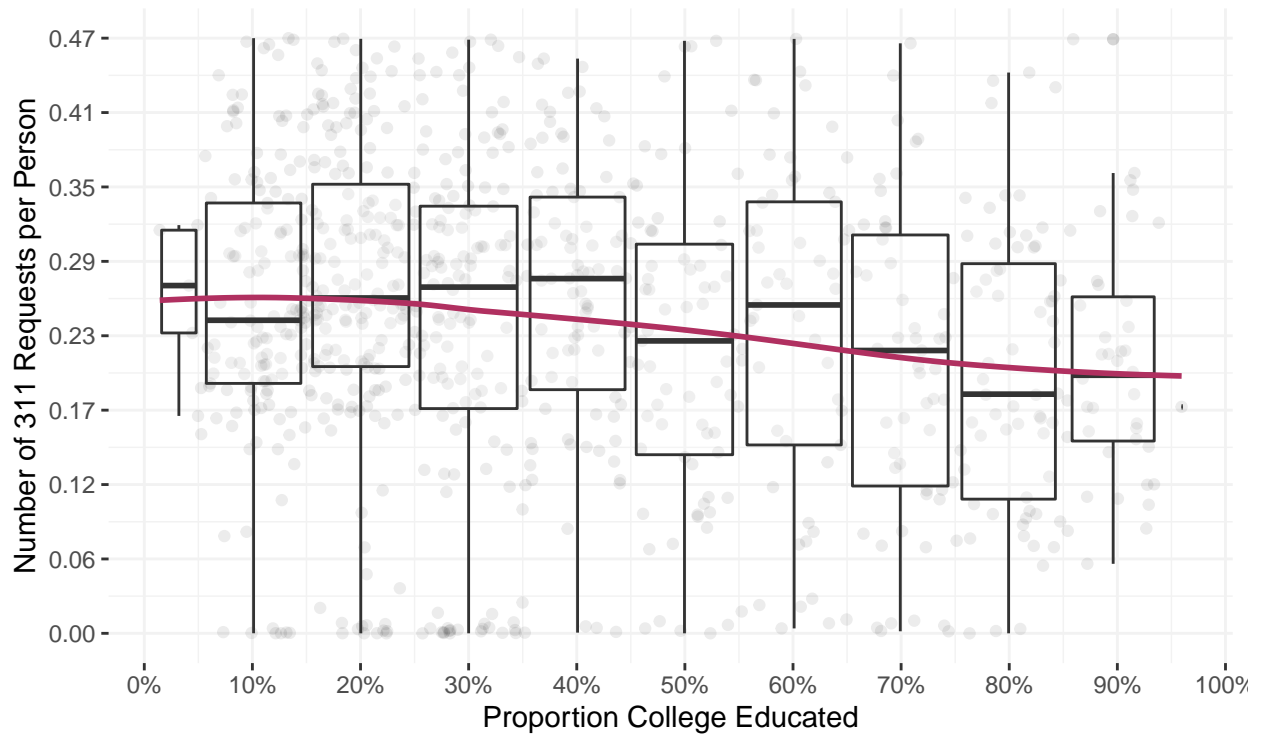

Racial Makeup vs. Avg. Volume of 311 Requests in CHI
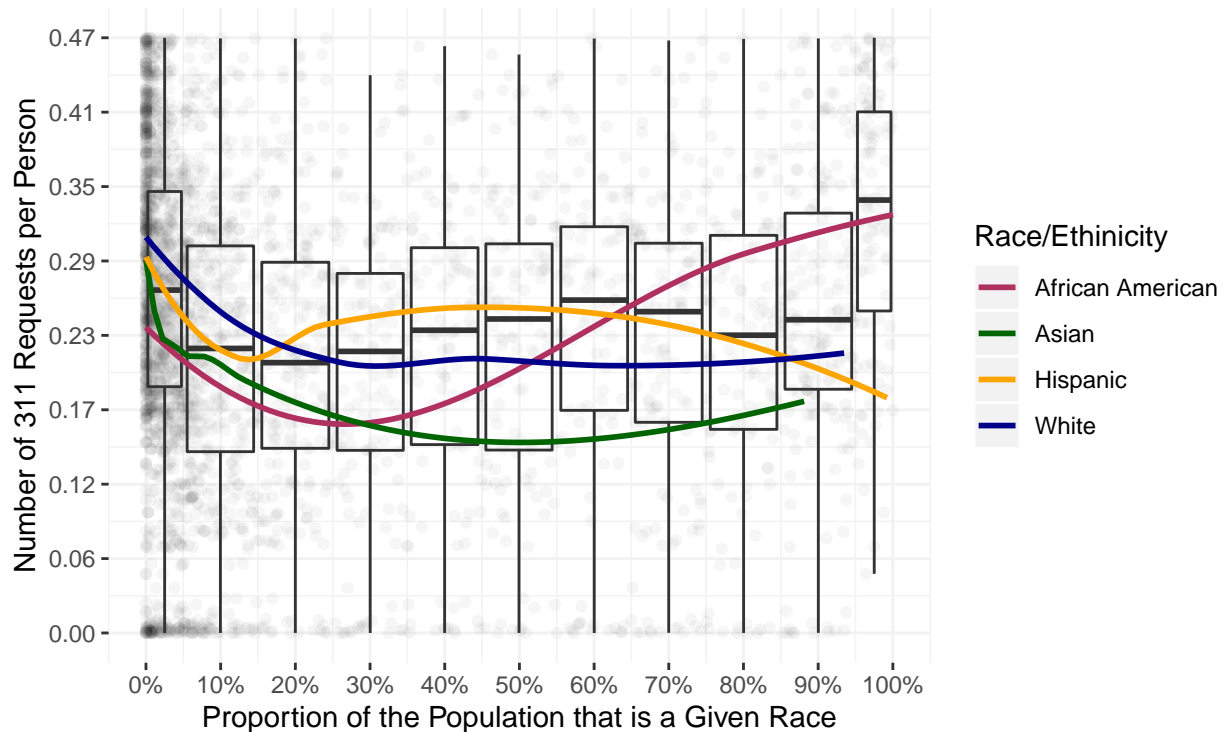
Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.

Median Home Value vs. Avg. Volume of 311 Requests in CHI

Note: Be wary of drawing comparisons to other cities as the data may come from different time periods.
Density of background points indicate sample size.

Median Rent vs. Avg. Volume of 311 Requests in CHI

Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.
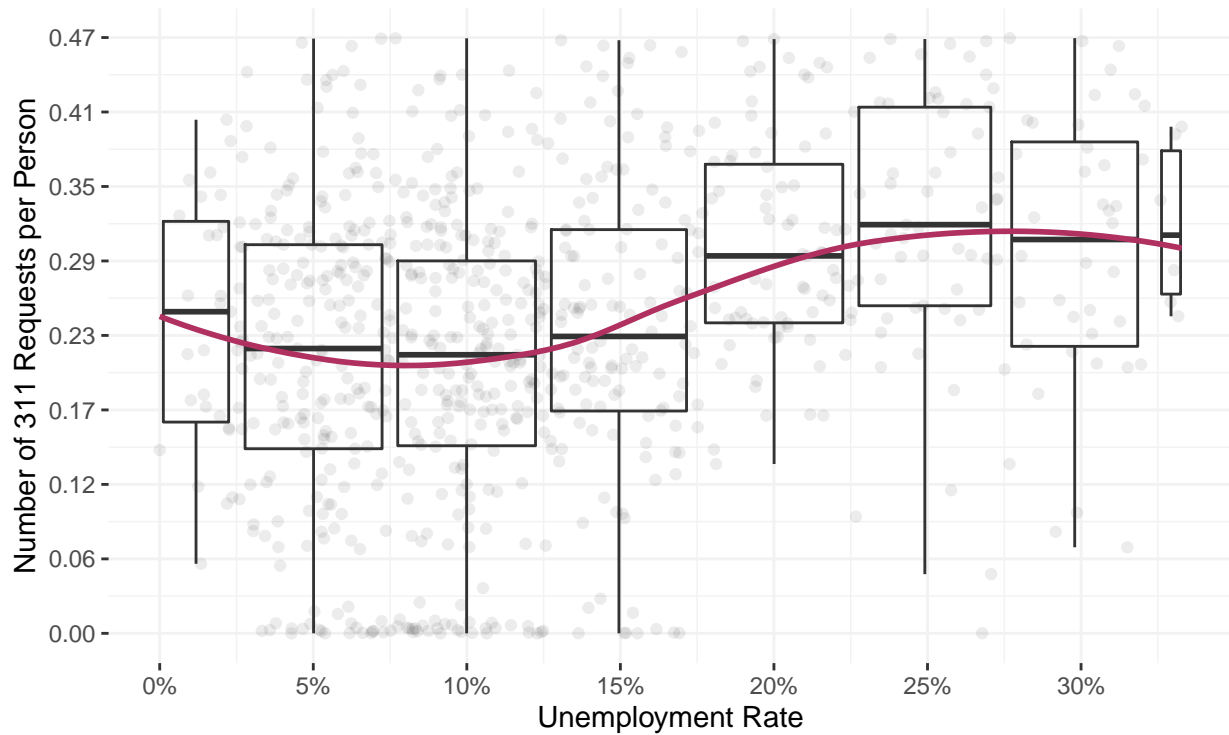
=>Relationship Between Education and Volume of Calls

Proportion College Educated vs. Avg. Volume of 311 Requests in CHI

Note: Be wary of drawing comparisons to other cities as the data may come from different time periods.
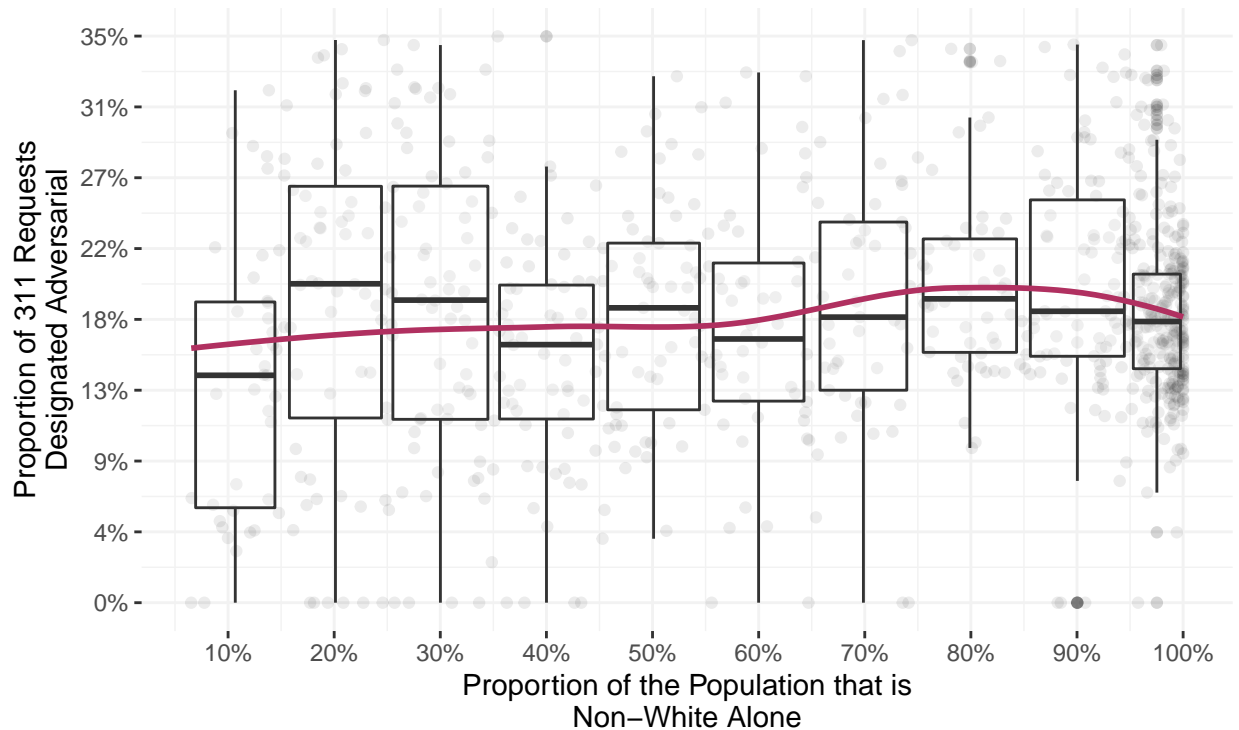Density of background points indicate sample size.

=>Relationship Between Employment and Volume of Calls

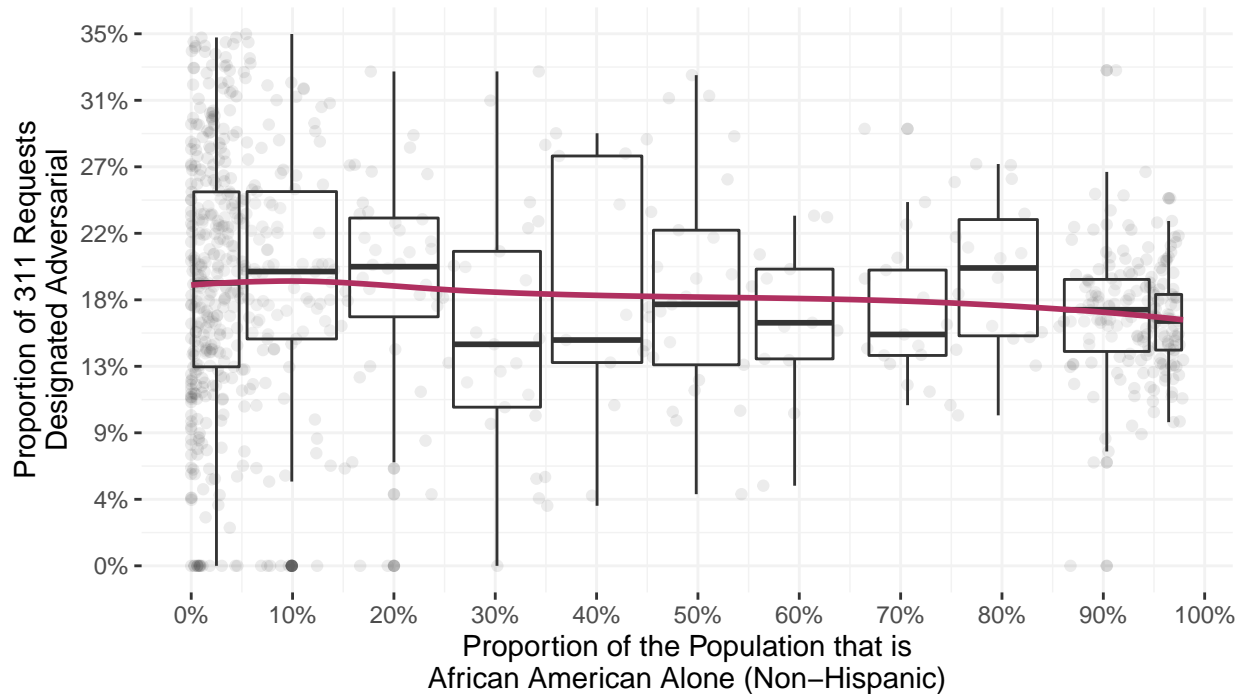Unemployment Rate vs. Avg. Volume of 311 Requests in CHI

Note: Be wary of drawing comparisons to other cities as the data may come from different time periods.
Density of background points indicate sample size.

Adversarial Calls

=>Relationship Between Race and Adversarial Calls

White Population vs. Proportion of Adversarial 311 Requests in CHI
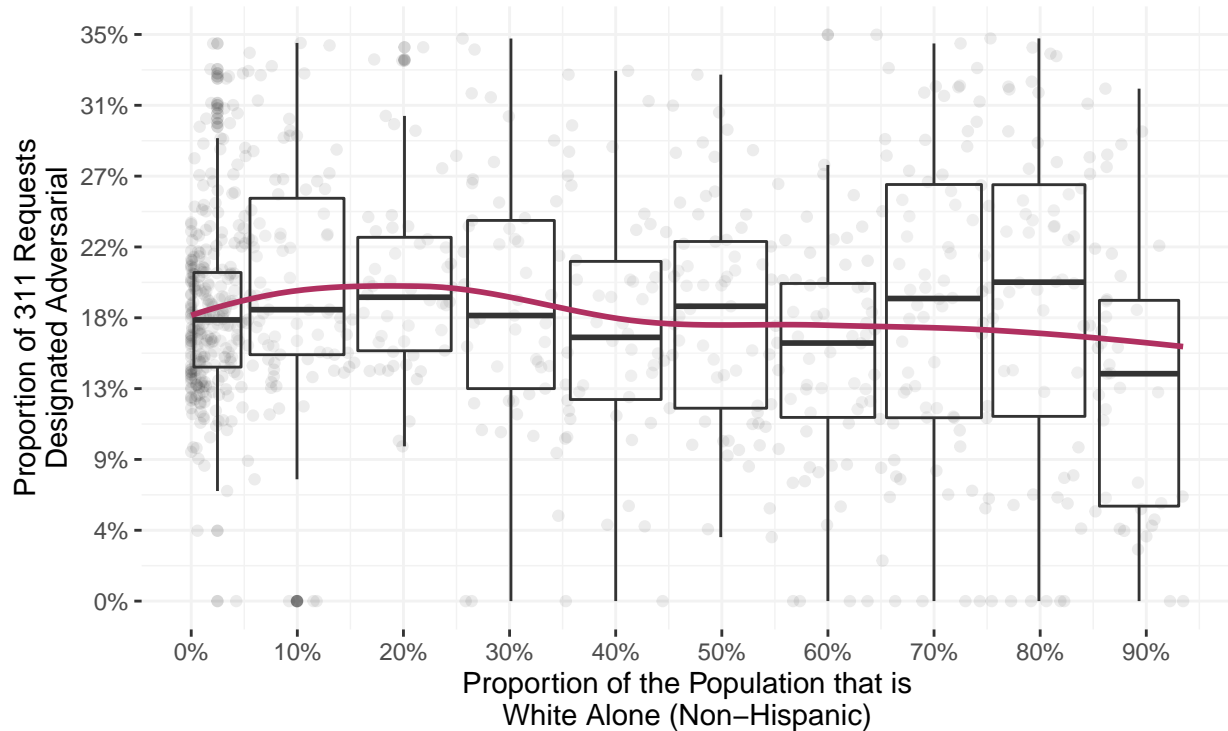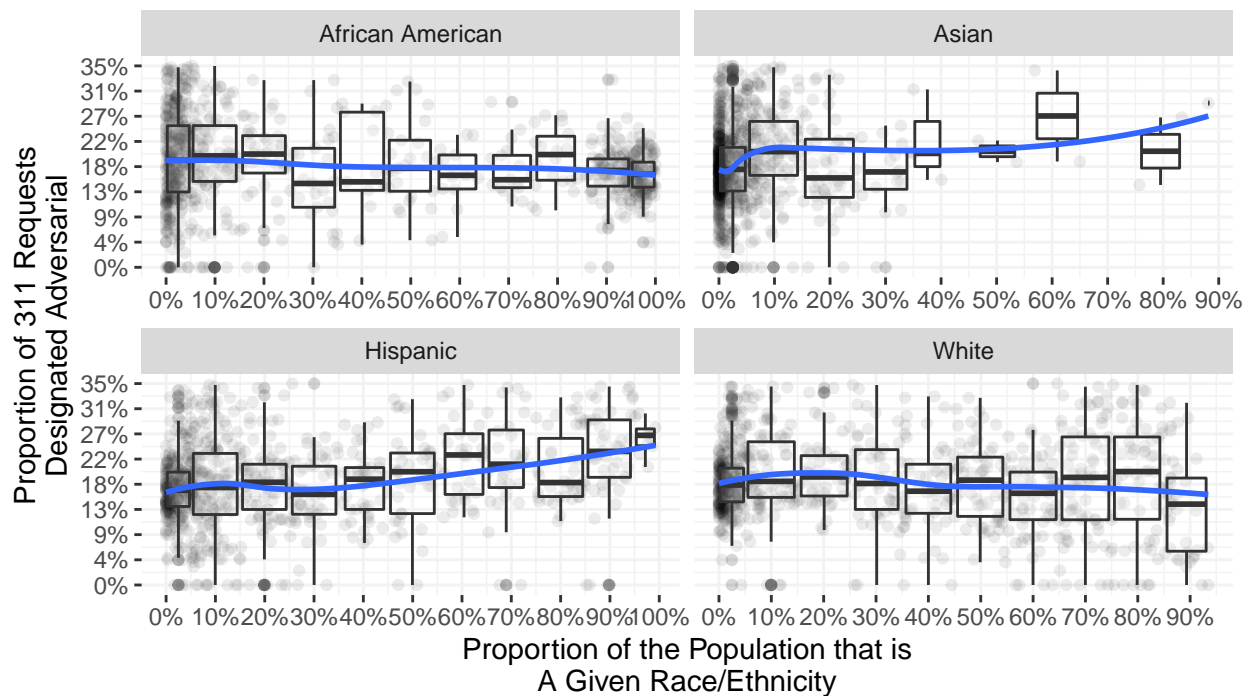
Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.

Non−White Population vs. Proportion of Adversarial 311 Requests in CH

Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.

African American Population vs. Proportion of Adversarial 311 Requests in CHI

Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.
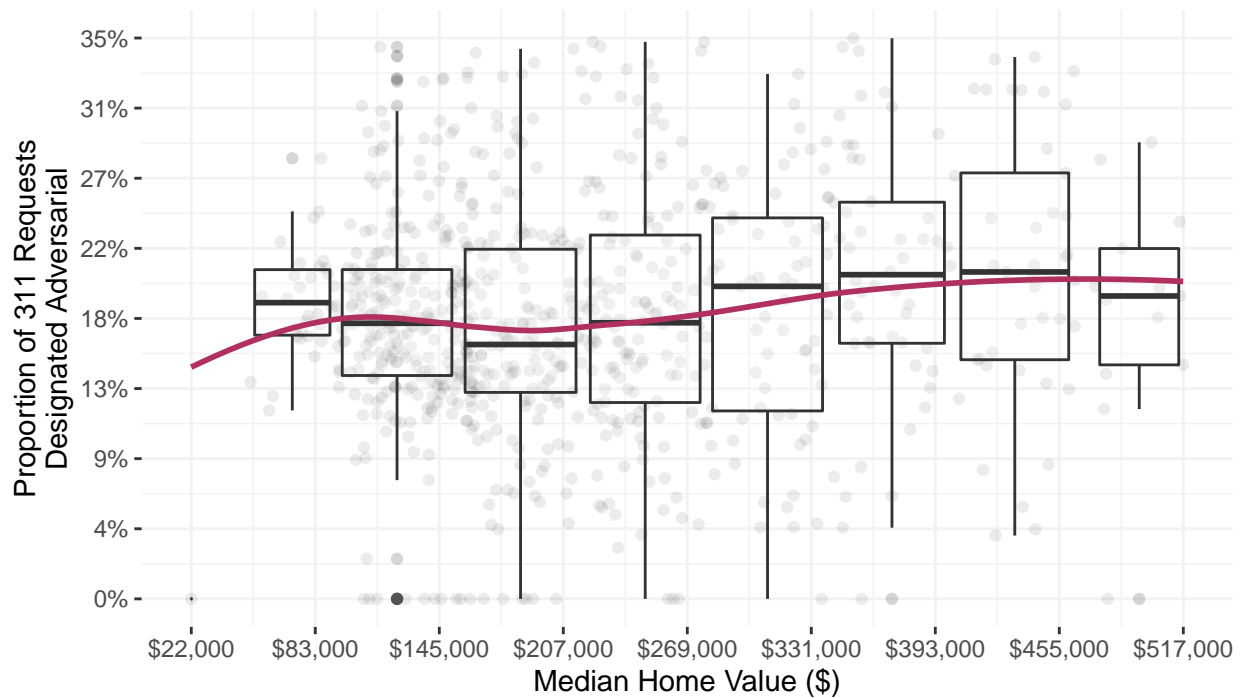
Racial/Ethnic Population vs. Proportion of Adversarial 311 Requests in CHI

Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.
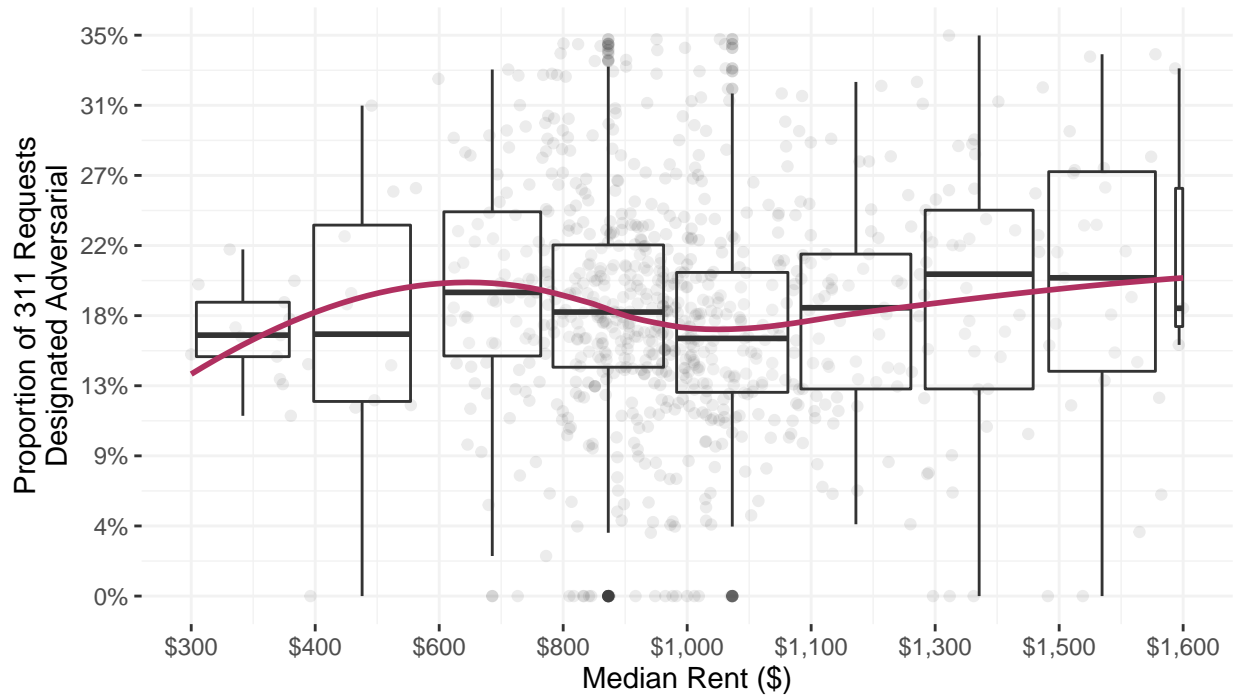
Median Home Value vs. Proportion of Adversarial 311 Requests in CHI

Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.
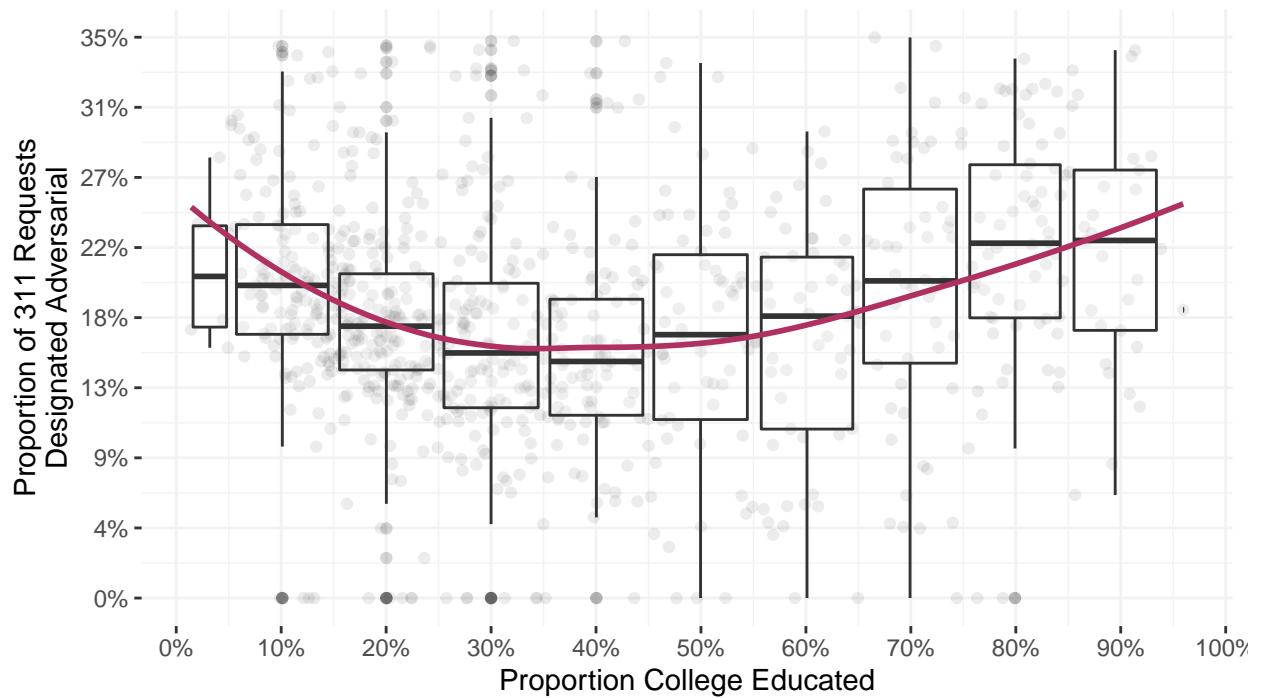
Median Rent vs. Proportion of Adversarial 311 Requests in CHI

Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.

=>Relationship Between Education and Adversarial Calls

Proportion College Educated vs. Proportion of Adversarial 311 Requests in CHI

Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.

=>Relationship Between Employment and Adversarial Calls

Unemployment Rate vs. Proportion of Adversarial 311 Requests in CHI
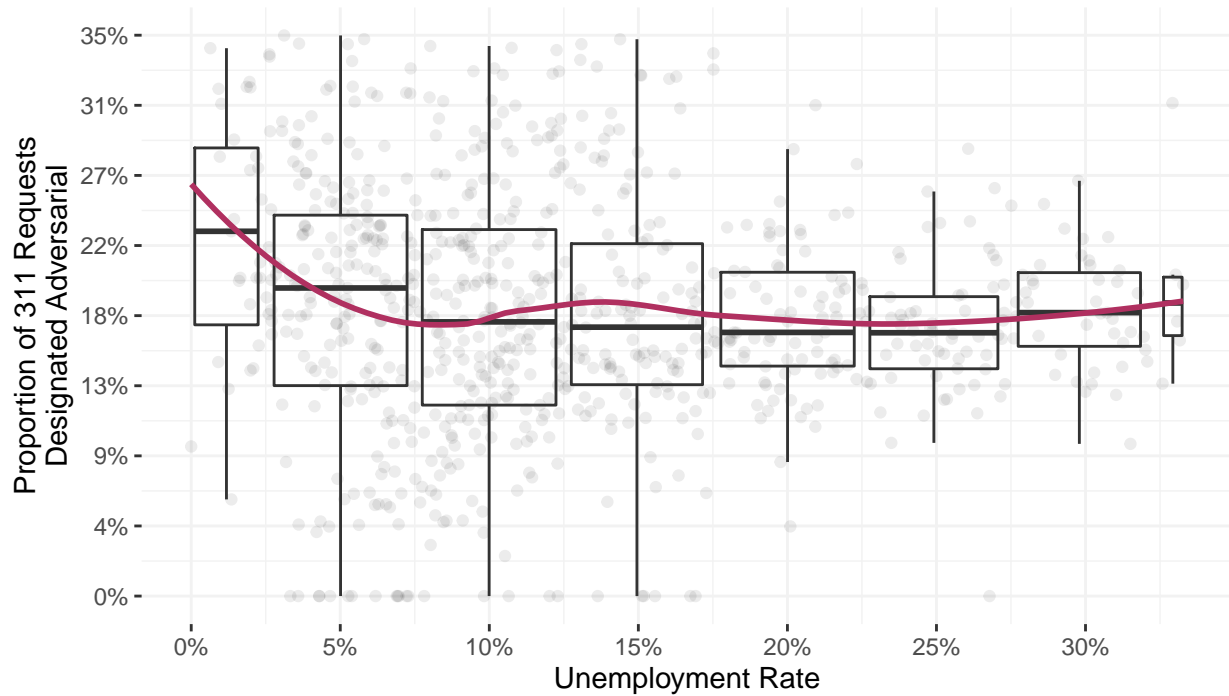
Note: Be wary of drawing comparisons to other cities as the data may come from different time periods. Density of background points indicate sample size.

Mapping