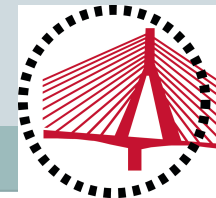


Custodianship and the Maintenance of the Urban Commons



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Initiative, Harvard University**



**Boston
Area
Research
Initiative**

2011 City Service Requests to Mayor's 24 Hour Service

REASON :

- Housing Concerns
- Code Enforcement
- Building Inspections
- Environmental Services
- General Request
- Tree Maintenance
- Park Maintenance & Safety
- Graffiti
- Sanitation
- Highway Maintenance
- Street Lights
- Recycling
- Street Cleaning
- Signs & Signals



ELECTRIC POLE SLANTING
Due to hurricane IRENE. This may cause major power outage in area if not attended too!

huge sink hole in front of vacant church formed

tree fallen on car blocking side walk, two handicap persons could not pass!

tree branch blocking avondale street

tree down blocking Ocean street—impassable to emergency vehicles

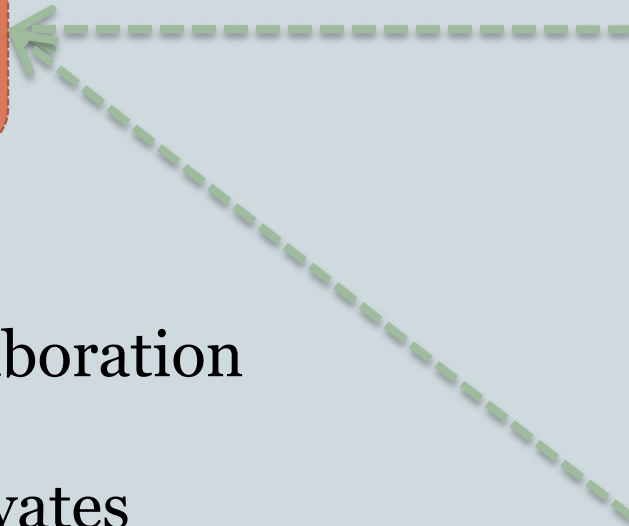
Neighbors moved a fallen tree to sidewalk it needs to be picked up.

Collaboratively Managing the Urban Commons



Infrastructural
Maintenance

Constituents



How does this collaboration
work?
i.e., What motivates
constituent participation?

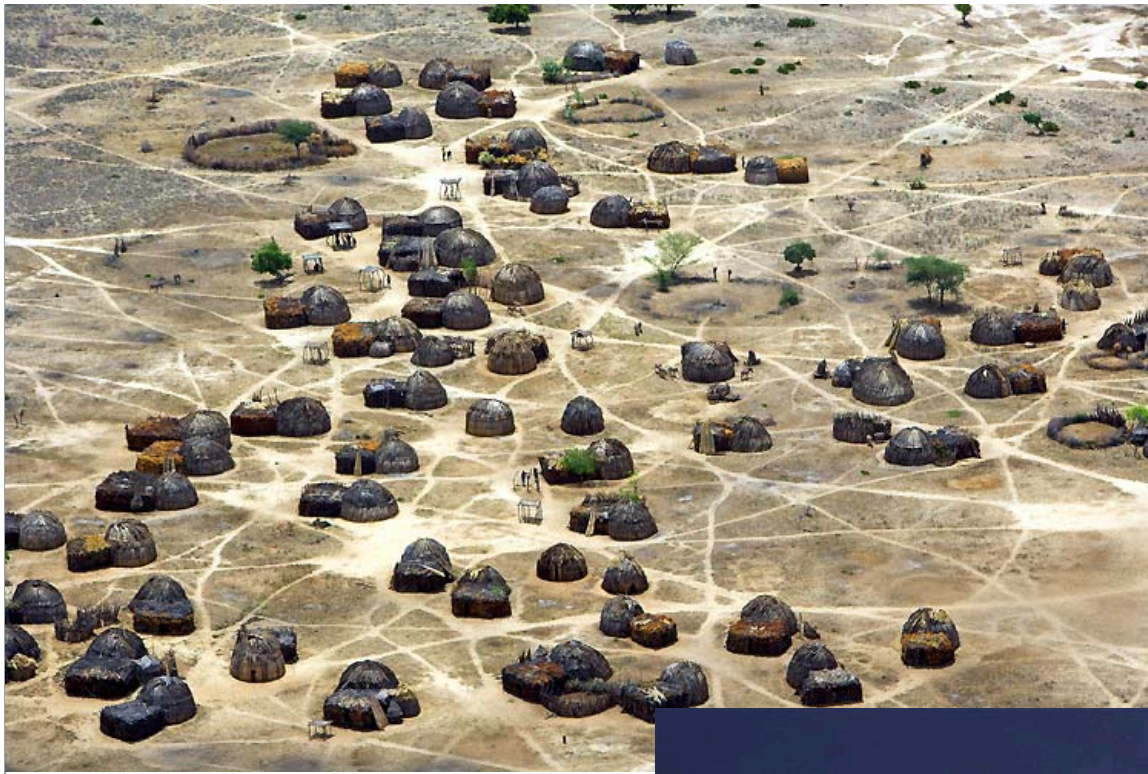
Overview



- The Territoriality Thesis
- Testing the Territoriality Thesis
- Division of Labor in the Urban Commons
- Conclusion

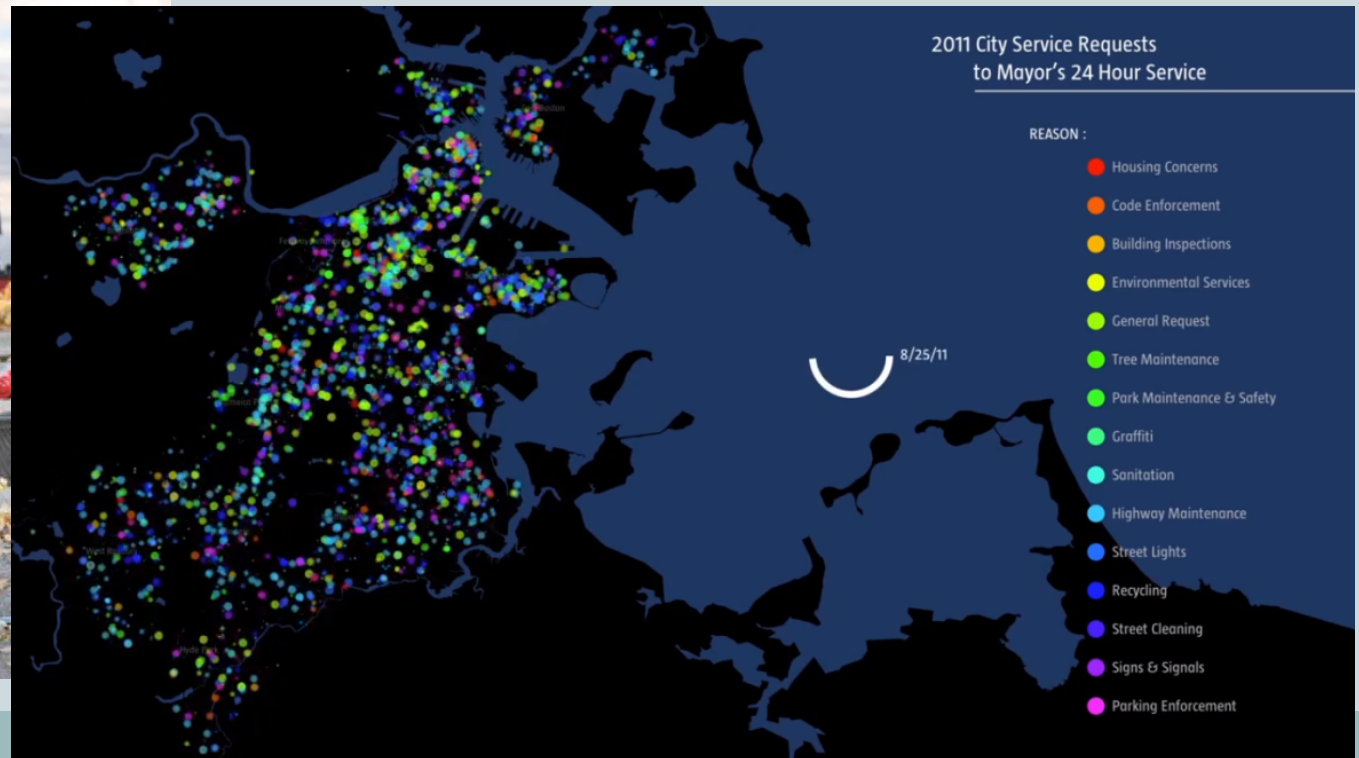
The Territoriality Thesis







Maintaining the Urban Commons

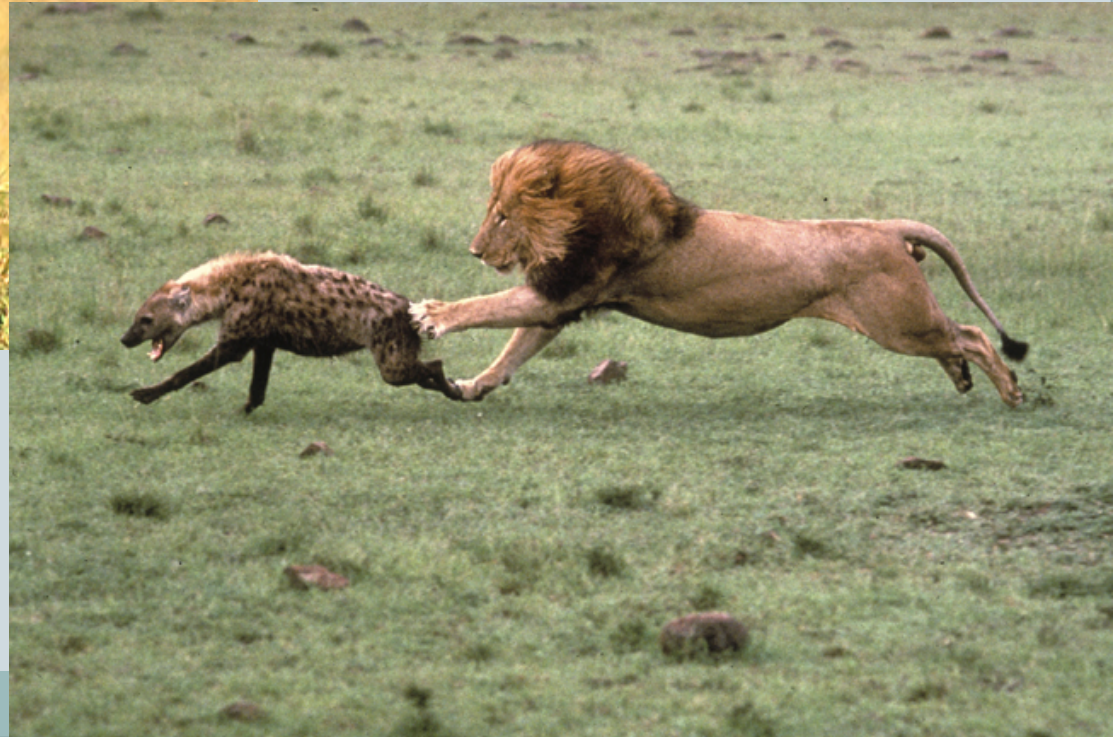


Custodianship

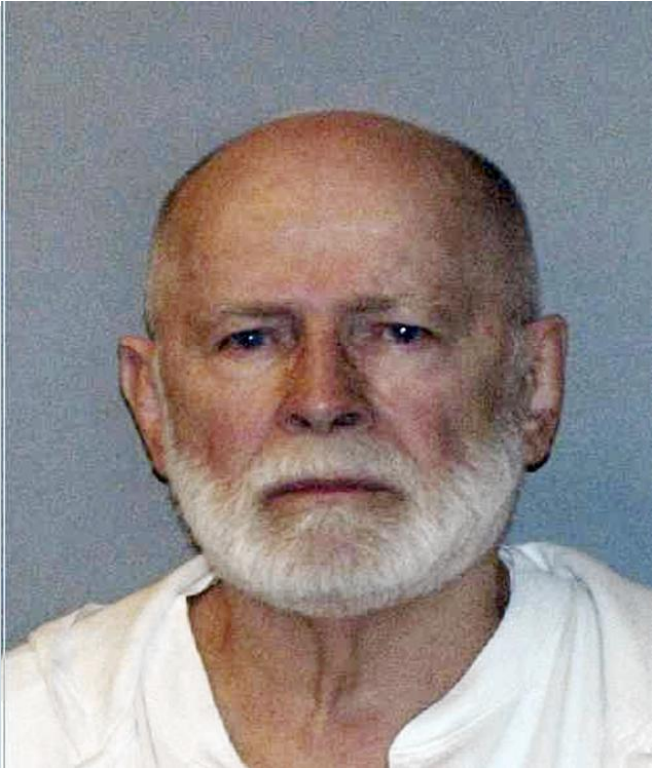


- Behaviors that serve to maintain the public space.
- 311 calls are an example of this.
- A manifestation of territoriality?

Custodianship: A Form of Territoriality?



Custodianship: A Form of Territoriality?



Custodianship: A Form of Territoriality?

- A suite of cognitions, attitudes, and behaviors that arise from a sense of ownership.
 - Manage social roles regarding objects and spaces.



Custodianship: A Form of Territoriality?



Testing the Territoriality Thesis

Pt. I



**THE GEOGRAPHIC DISTRIBUTION OF
REPORTING**

An Initial Hypothesis



- Territoriality is based in a sense of psychological ownership.
- If 311 reports are a manifestation of territoriality, then custodianship will be anchored by the home and surrounding neighborhood.
- Three studies
 - Analysis of geographical range of custodians
 - Analysis of geographical range with smart phone app
 - Public experiment on messaging

Using the 311 Database



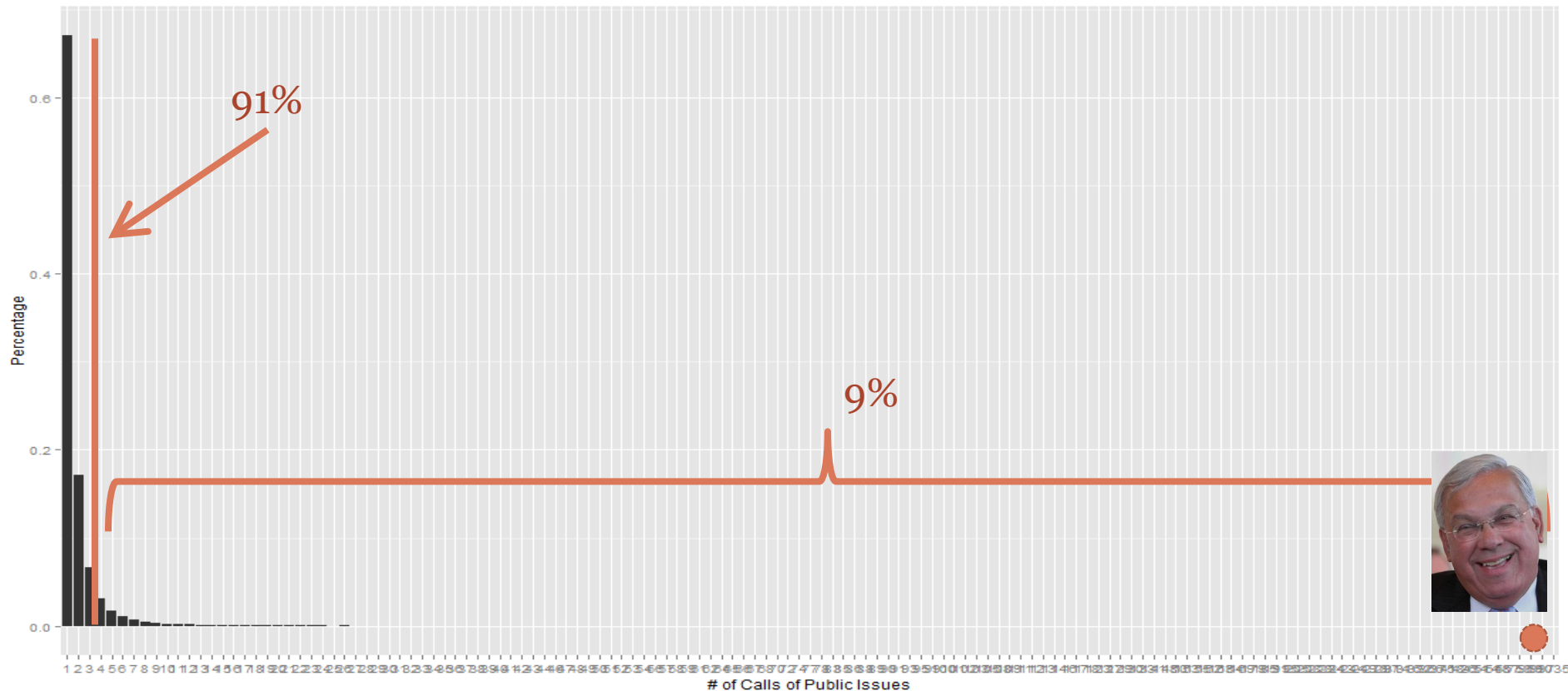
- Database from March 1, 2010-April 6, 2015.
 - 564,821 cases with geographical reference received by hotline and internet self-service.
- Each case includes:
 - Date and time.
 - Address or intersection.
 - Standardized case type (e.g., pothole, graffiti removal).
 - Anonymous caller identifier.

Using the 311 Database



- Many calls reference issues in the public domain.
 - 77 case types (e.g., street light outage).
- Cases have an anonymous key code identifying caller, enabling a study of individual differences
 - $N = 131,010$
 - Some have home address and/or e-mail contact on file.

Evaluating the Territoriality Thesis: Frequency of Calling

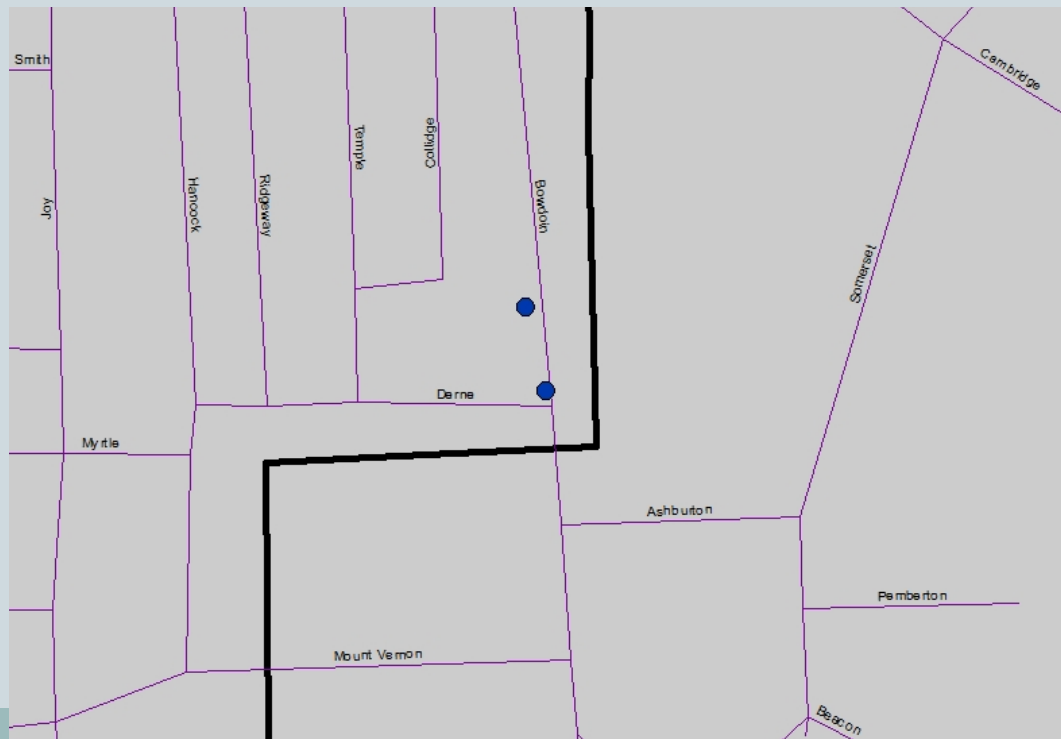


O'Brien (2015), *Environment & Behavior*

Evaluating the Territoriality Thesis: Geographic Range of Reporting

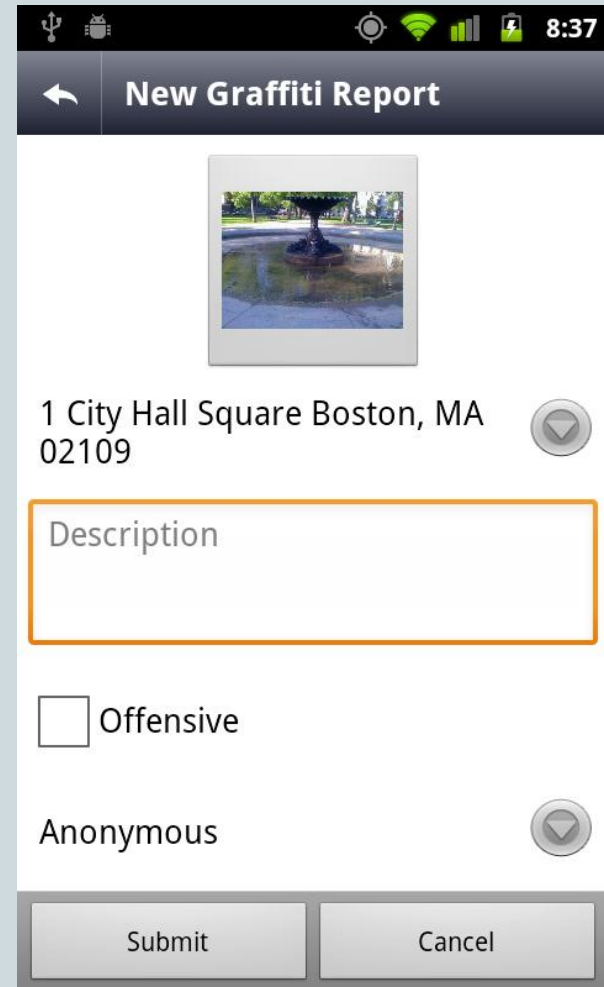


- Median distance from home was 7.3 m.
- 82% of individuals did not call beyond two blocks of their home (estimated as 150 m).



Evaluating the Territoriality Thesis: Reporting with a Smart Phone Application

- Could the geographic range of reporting be constrained by phones?
- A natural quasi-experiment to test
 - Citizens Connect, a smart phone application for reporting.



The screenshot shows a mobile application interface for reporting graffiti. At the top, the status bar displays various icons and the time 8:37. Below this is a dark header bar with a back arrow and the title 'New Graffiti Report'. The main content area features a photo of a fountain, the address '1 City Hall Square Boston, MA 02109' with a location pin icon, a text input field labeled 'Description', a checkbox for 'Offensive', and the word 'Anonymous' with a dropdown arrow. At the bottom are 'Submit' and 'Cancel' buttons.

Evaluating the Territoriality Thesis: Traditional vs. CC Users



Traditional

- One-time users: 67%
- ≤ 3 calls: 91%
- Estimated calls*: 1.95
- Estimated range**:
~0 m

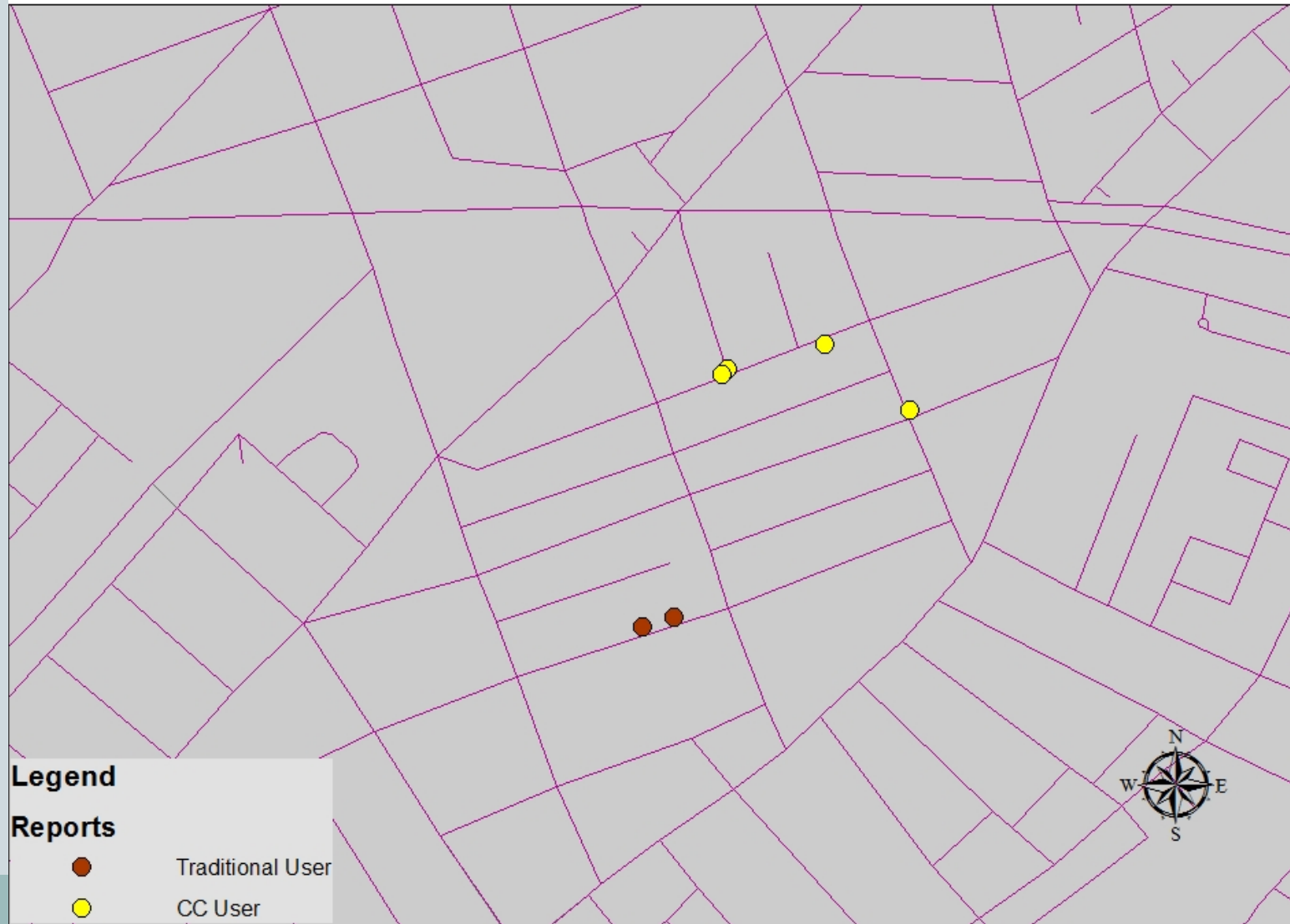
*-Based on HLM

** -Based on HLM; Only those with 2+ reports

CC Users

- One-time users: 54%
- ≤ 3 calls: 75%
- Estimated calls*: 5.74
- Estimated range**:
295 m

Evaluating the Territoriality Thesis: Traditional vs. CC Users



Evaluating the Territoriality Thesis: Messaging the System



- Flyers were distributed in 10 neighborhoods
 - 5 matched triplets: Boston vs. Neighborhood vs. Control

Potholes in Boston? Get Them Fixed!



Call Mayor Menino's 24-Hour Hotline

Thanks to calls from your residents, the City has fixed potholes like this one on Tremont St.

Potholes in Dudley Square? Get Them Fixed!



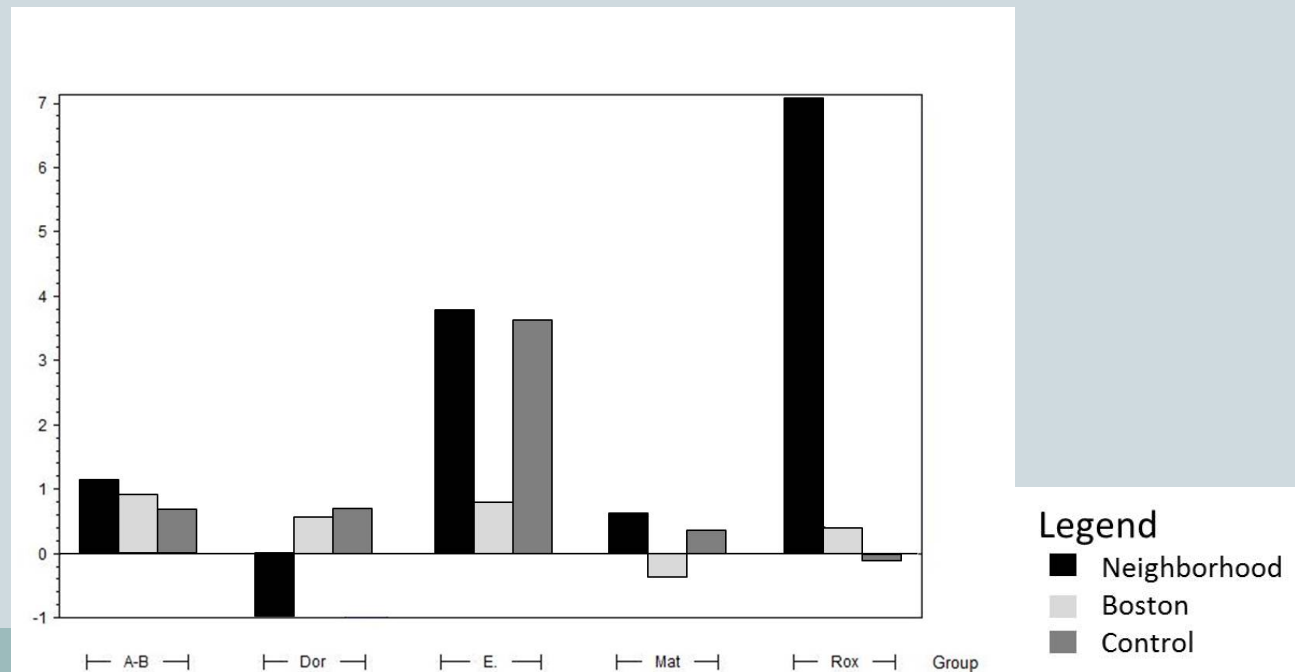
Call Mayor Menino's 24-Hour Hotline

Thanks to calls from your neighbors in Dudley Square, the City has fixed potholes like this one at Eustis & Harrison.

Evaluating the Territoriality Thesis: Messaging the System



- Standardized difference in public calls measured between spring 2011 and spring 2012.
- Regions with neighborhood-based message had greatest increase in 4 of 5 triplets (multinomial test: $p < .05$).



Evaluating the Territoriality Thesis Pt. I: Geographical Distribution of Reporting



- Reporting of public issues is anchored by the home.
- This remains true when using a mobile app.
- Messaging about neighborhoods is more effective than about the city.

Testing the Territoriality Thesis Pt. II



MOTIVATIONS FOR REPORTING

Evaluating Motivations



- Geographical ranges of reporting suggest a salient role for territoriality.
- We don't know yet that territorial motives are in fact responsible.
- *Have not* precluded the possibility that political participation also drives reporting.

A Survey of 311 Users



- Survey of 682 individuals who made at least one 311 report in 2012 ($N = 489$ hotline, 193 CC).
 - Assessed territoriality and civic engagement.
 - Responses were linked to calling patterns.
 - Also linked to voter records by names, addresses.
 - Possible to compare custodians to non-custodians.
 - Conducted w/ Emerson College's Engagement Game Lab.

A Survey of 311 Users



- Territorial motives for reporting:
 - Benefiting the community (2 items)
 - ✦ “Because it improves my community”
 - Enforcing social norms (2 items)
 - ✦ “Because it will make the neighborhood safer.”

A Survey of 311 Users



- Civic Behaviors in the Past Year ($\alpha = .75$)
 - Signed a petition
 - Volunteered with a civic group
 - Donated to a civic group
 - Used social media to engage with civic group
 - Contacted a government official
 - Participated in an online political discussion
 - Participated in a march or protest
 - Sent a Letter to the Editor
 - Attended community meeting

Comparing the Two Models



	Custodians	Non-Custodians
Signed a petition	48%	49%
Volunteered	45%	44%
Donated	56%	52%
Used social media	35%	38%
Contacted a government official	73%	67%
Participated online	29%	29%
March or protest	6%	8%
Letter to the Editor	8%	13%
Community meeting	51%	47%
Voted in 2011	42%	36%
Benefit Community	4.40 (0.78)	4.21 (0.90)
Enforce Norms	3.44 (1.21)	3.39 (1.28)

Comparing the Two Models



	Custodians	Non-Custodians	Significance
Signed a petition	48%	49%	<i>Null</i>
Volunteered	45%	44%	<i>Null</i>
Donated	56%	52%	<i>Null</i>
Used social media	35%	38%	<i>Null</i>
Contacted a government official	73%	67%	<i>Null</i>
Participated online	29%	29%	<i>Null</i>
March or protest	6%	8%	<i>Null</i>
Letter to the Editor	8%	13%	<i>Null</i>
Community meeting	51%	47%	<i>Null</i>
Voted in 2011	42%	36%	<i>Null</i>
Benefit Community	4.40 (0.78)	4.21 (0.90)	$P < .01$
Enforce Norms	3.44 (1.21)	3.39 (1.28)	<i>Null</i>

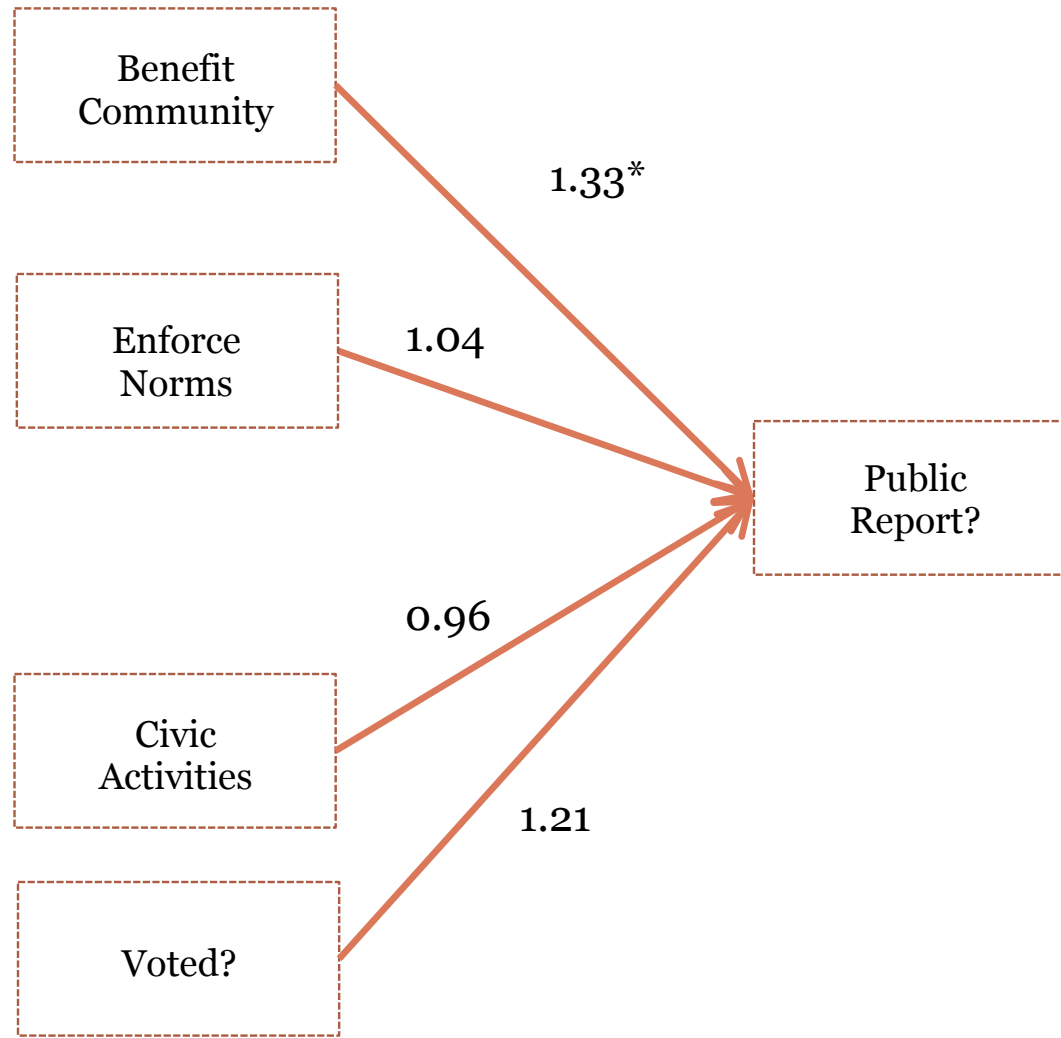
Multivariate Analyses



- **Hierarchical Linear Models**
 - Control for varying opportunities to report across neighborhoods.
 - Compare individuals to their neighbors to assess the explanatory power of a particular motivation.
 - Also control for sex, ethnicity, age, and education level.

Attitudes/Behaviors

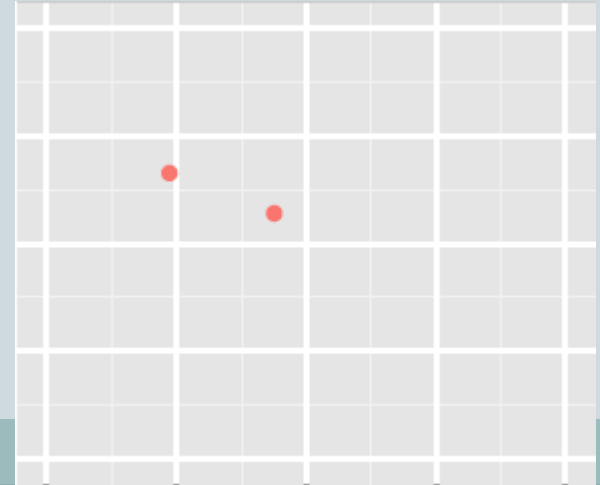
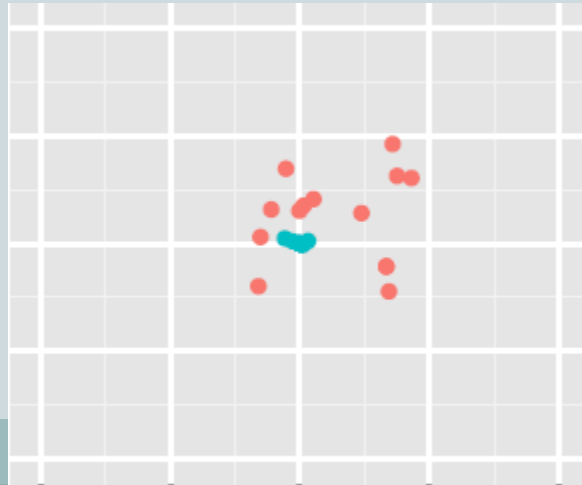
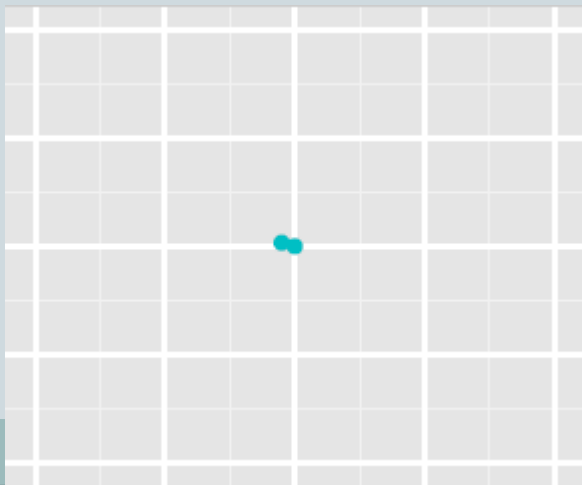
Calling Patterns



Reporting and the Urban Landscape



- How do these motivations interact with the varied geography of the city?
- Home
 - Clustering algorithm permits the estimation of “home neighborhood” from behavior.
 - ✦ 93% of custodians had a home cluster.



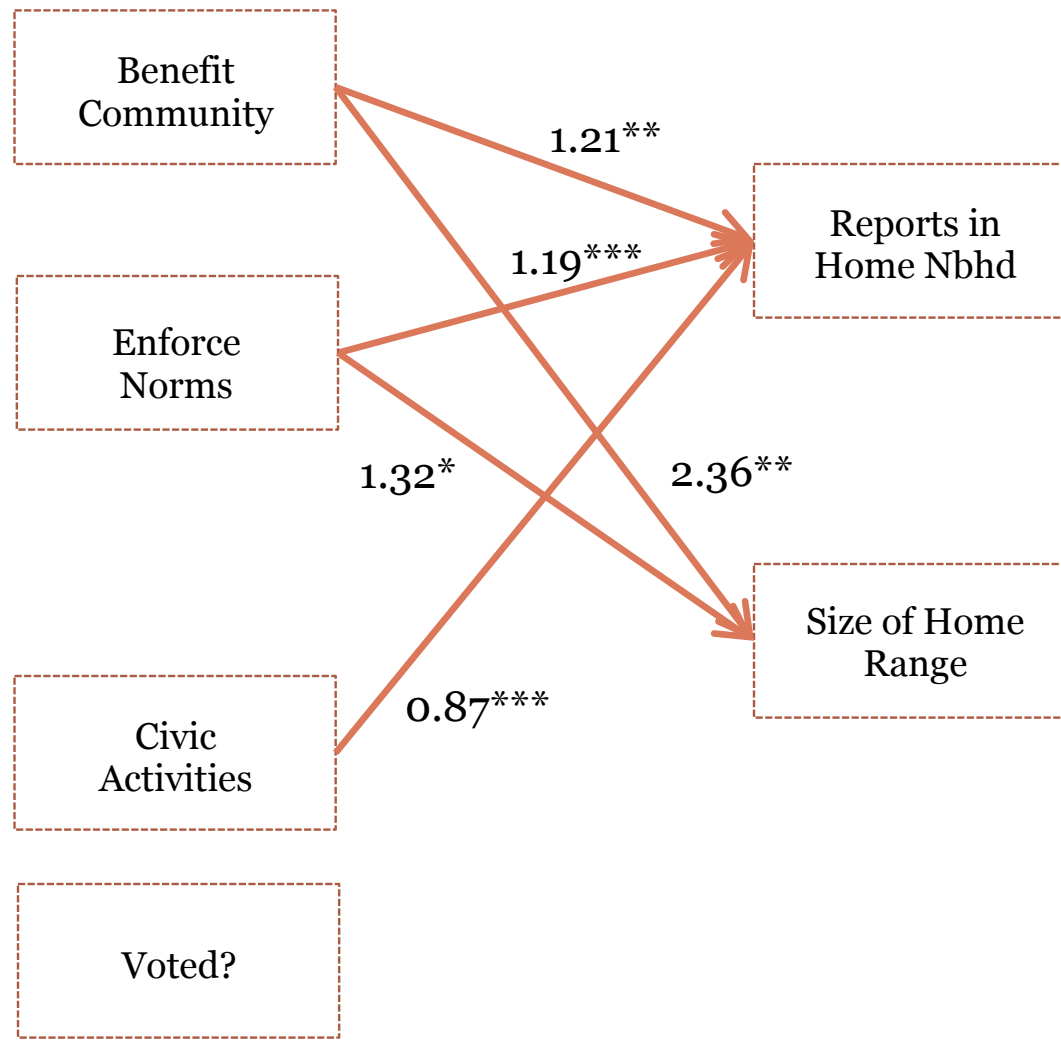
Reporting and the Urban Landscape



- How do these motivations interact with the varied geography of the city?
- Home
 - Reports in neighborhood
 - Size of home range
- Survey items: Do you report from...
 - Work?
 - Your commute?
 - Neighborhoods of friends and family?

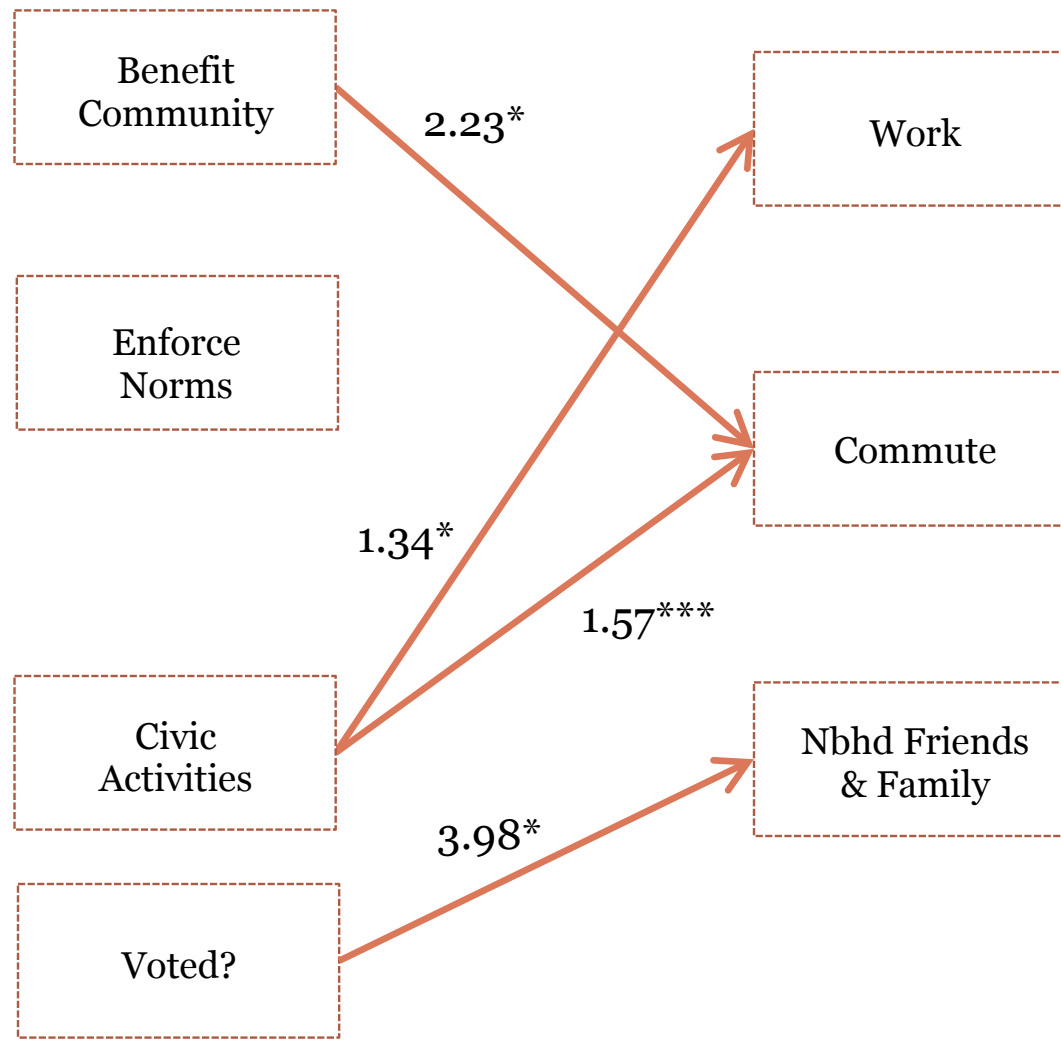
Attitudes/Behaviors

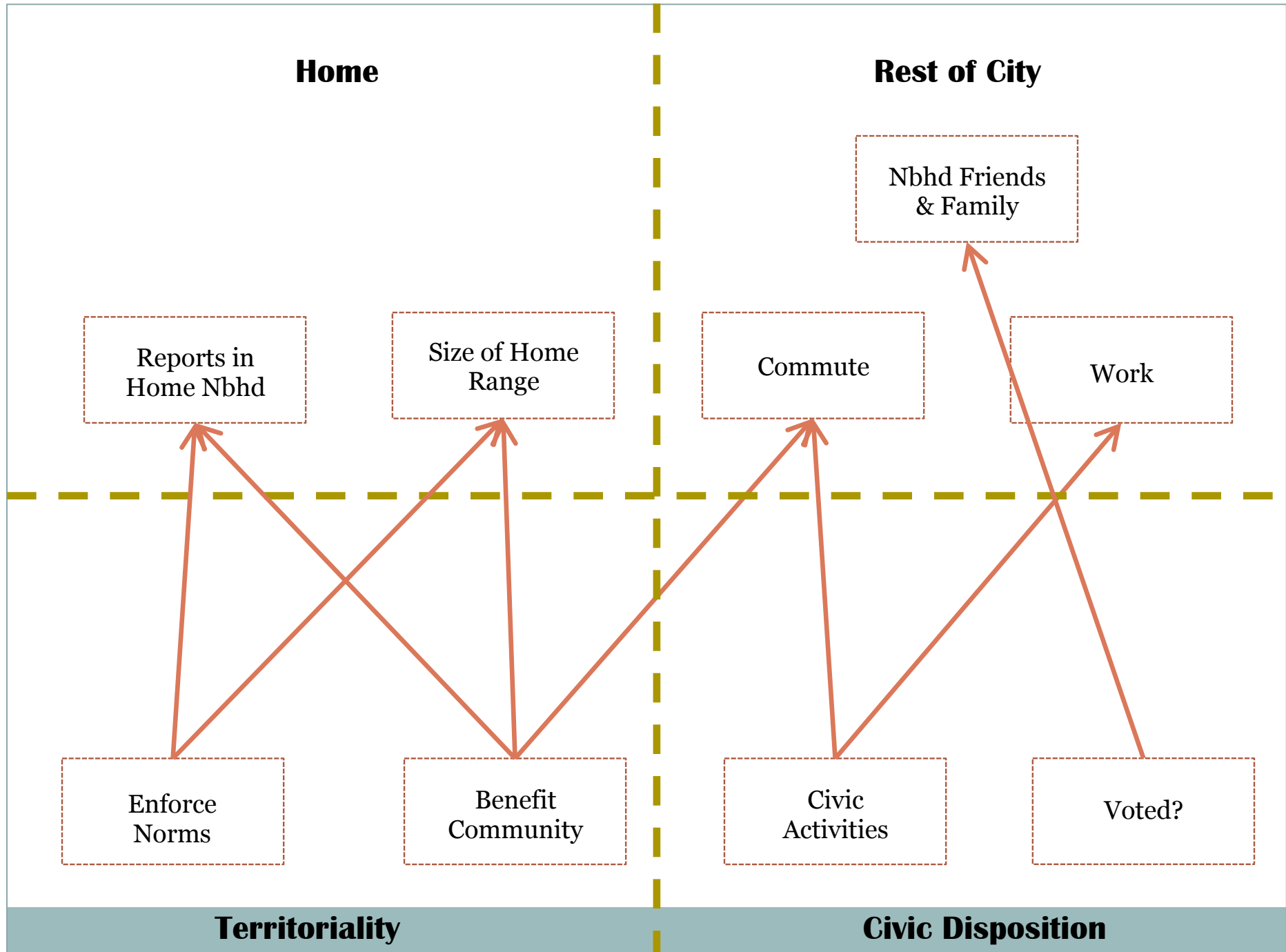
Calling Patterns



Attitudes/Behaviors

Calling Patterns





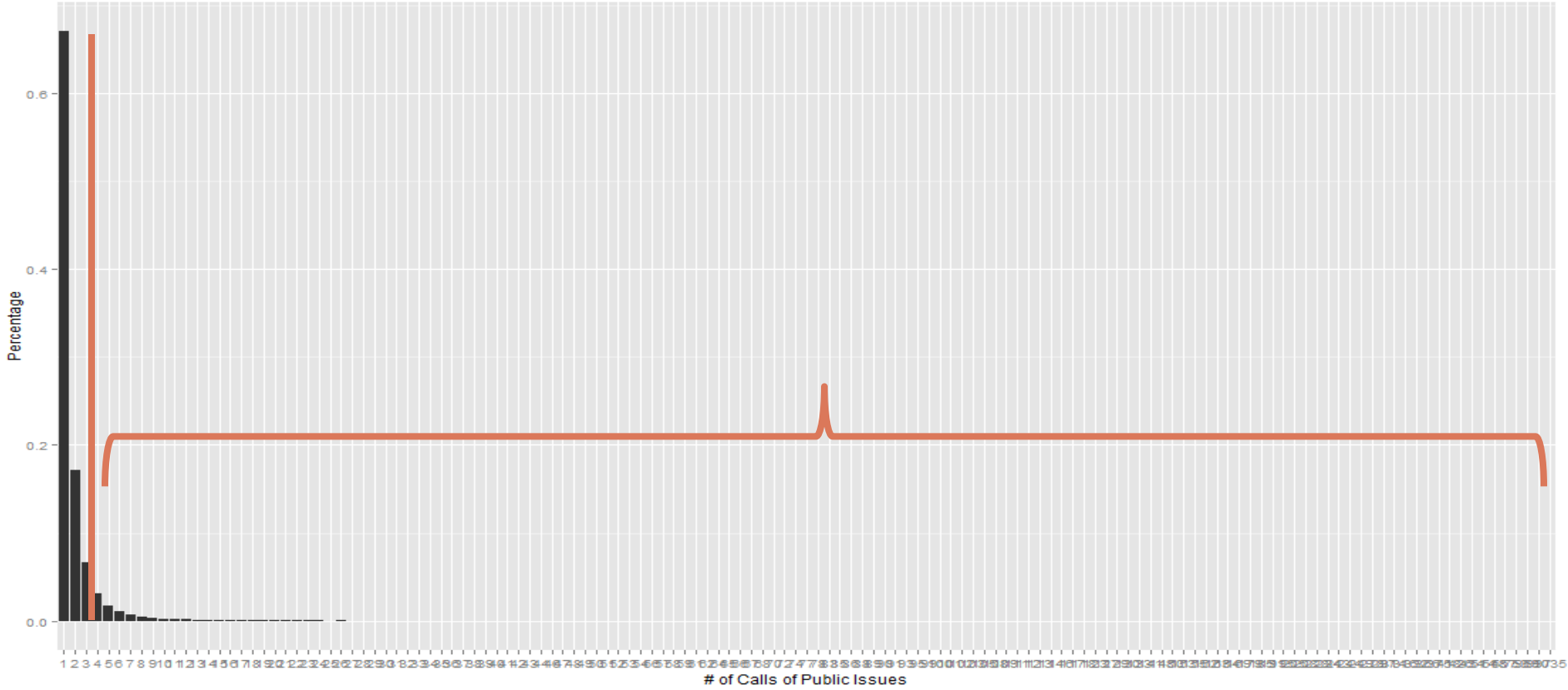
Summary



- Territorial motives were predominant in explaining:
 - Being a custodian or not.
 - Reporting activity within neighborhood.
- Political participation explained
 - Reporting at or on the way to work.
- Suggests a geographic division of motivations.
 - Political participation limited to broader city.

Consequences of Territoriality: A Division of Labor



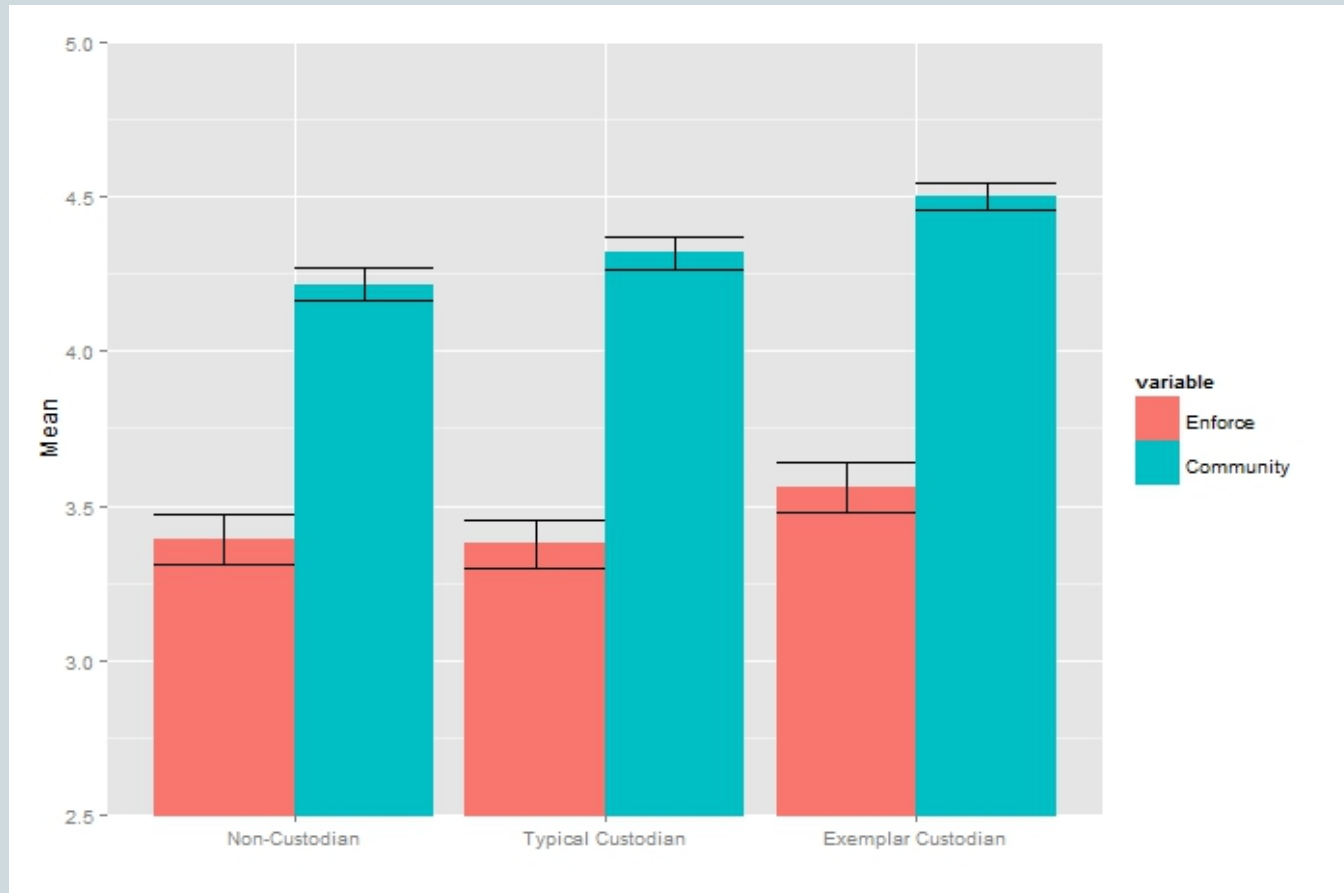


Is There a Division of Labor?



- “Typical” custodians
 - 1-2 reports of public issues/yr.
 - Hyperlocal attention
- “Exemplar” custodians
 - 3+ reports of public issues/yr.
 - Broader coverage in the neighborhood

Is There a Division of Labor?



Is There a Division of Labor?



- *Division of labor*: members of a group specializing in different tasks contributing to collective goals.

Study 1. Are typical and exemplar custodians both required for the maintenance of the urban commons?

Study 2. Do typical and exemplar custodians (and city employees) fulfill different roles in the maintenance of the urban commons?

Study 1:

Behavioral Composition and Neighborhood Maintenance

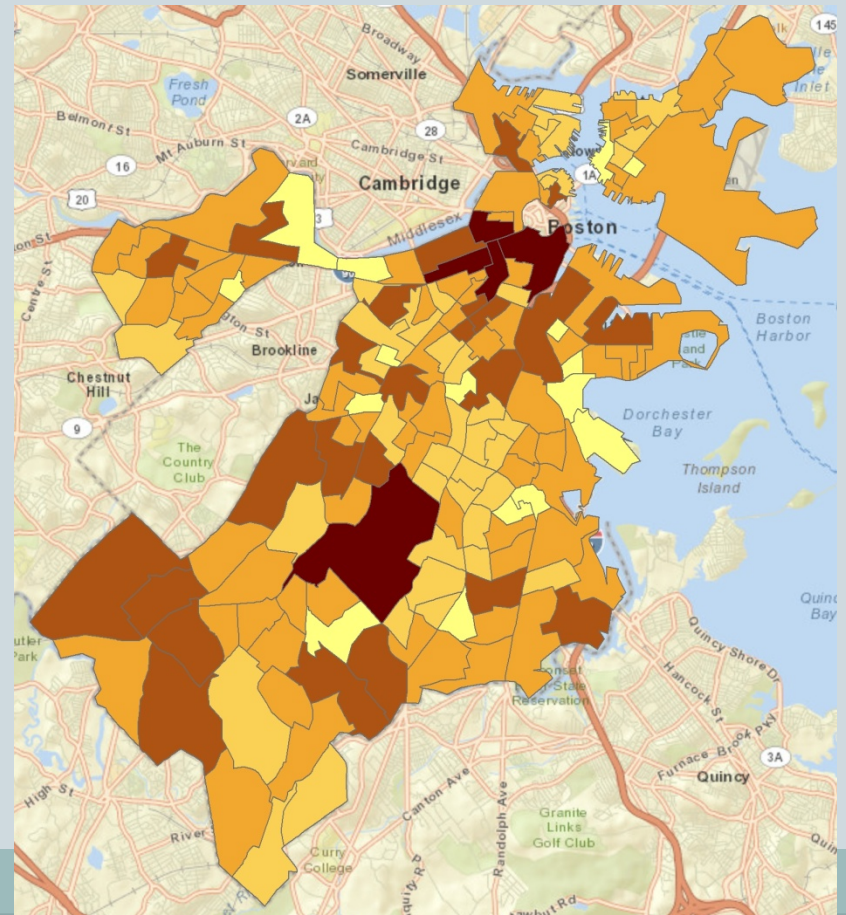
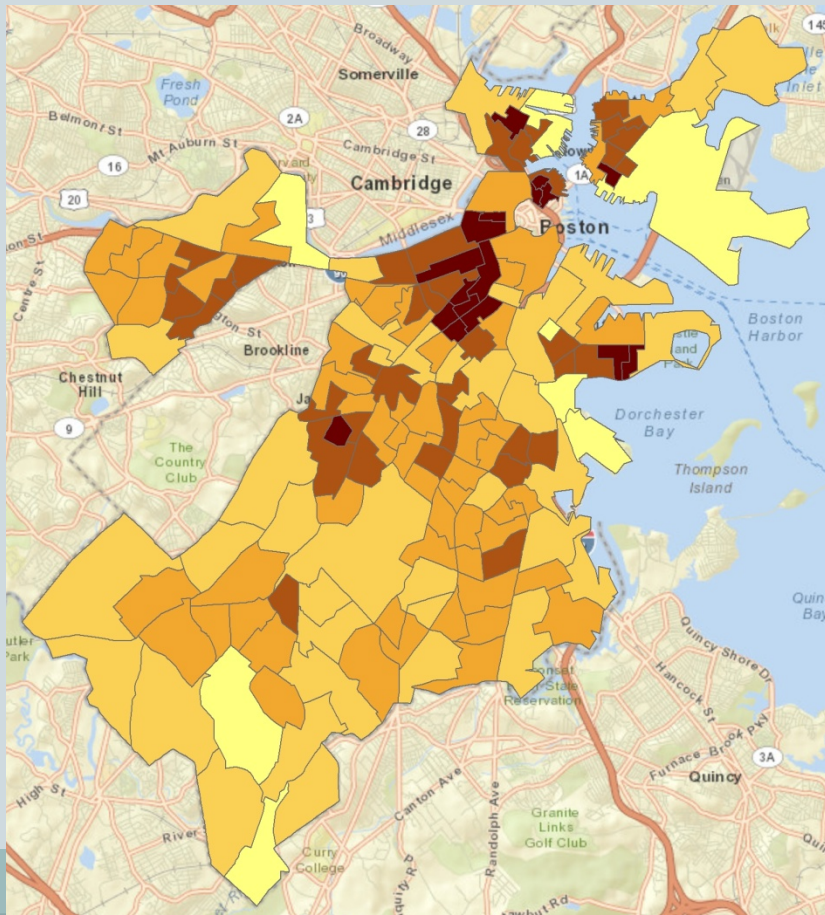


- An objective measurement of maintenance.
 - Identified 244 street light outages across Boston.
 - Public Works assessed quality of all sidewalks.
 - Issues were cross-referenced with 311 reports to assess effectiveness in maintenance across neighborhoods.
- Measured the distribution of custodians.
 - Based on home addresses, as reported to the 311 system.
 - Missing home addresses imputed as census tract where the individual made the most reports (89% accuracy; $r = .97$).
- All measures from 2011.

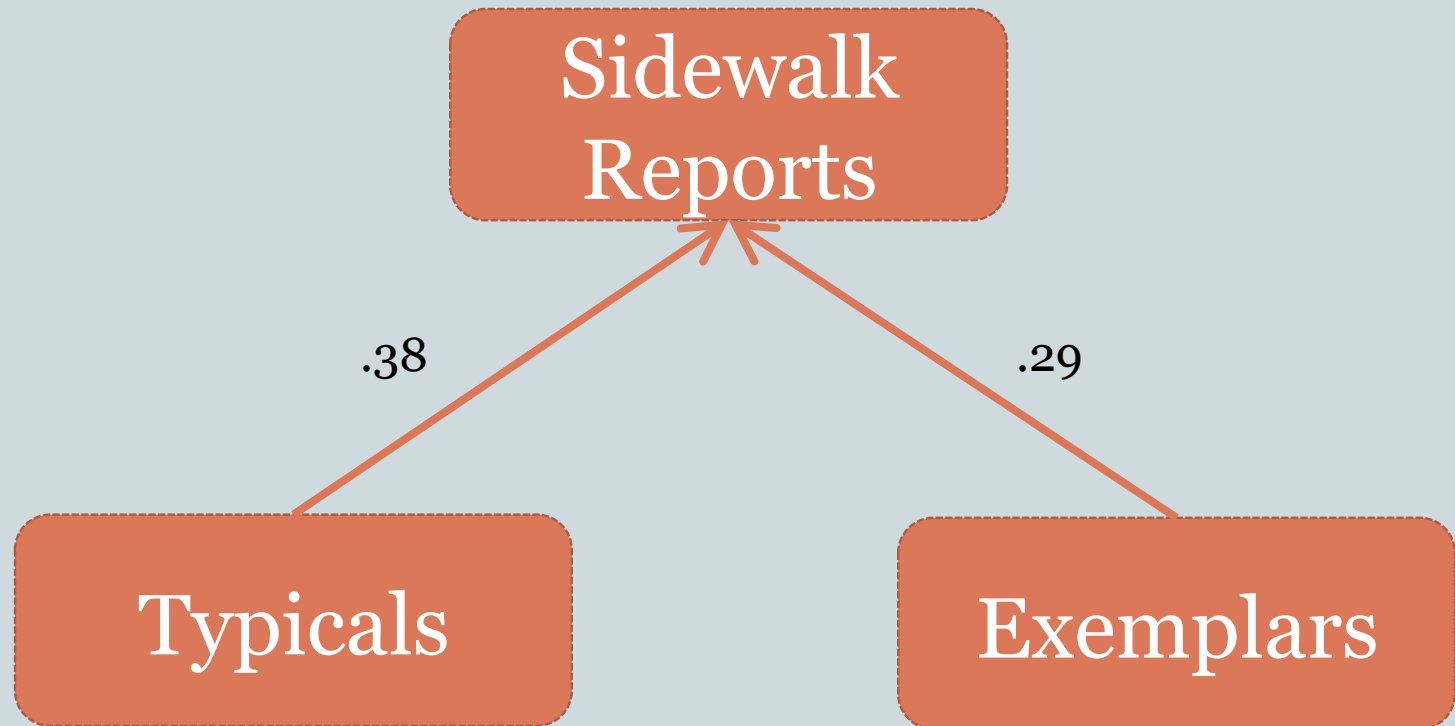
Study 1: Behavioral Composition and Neighborhood Maintenance

“Typical” Custodians / mi²

Exemplars

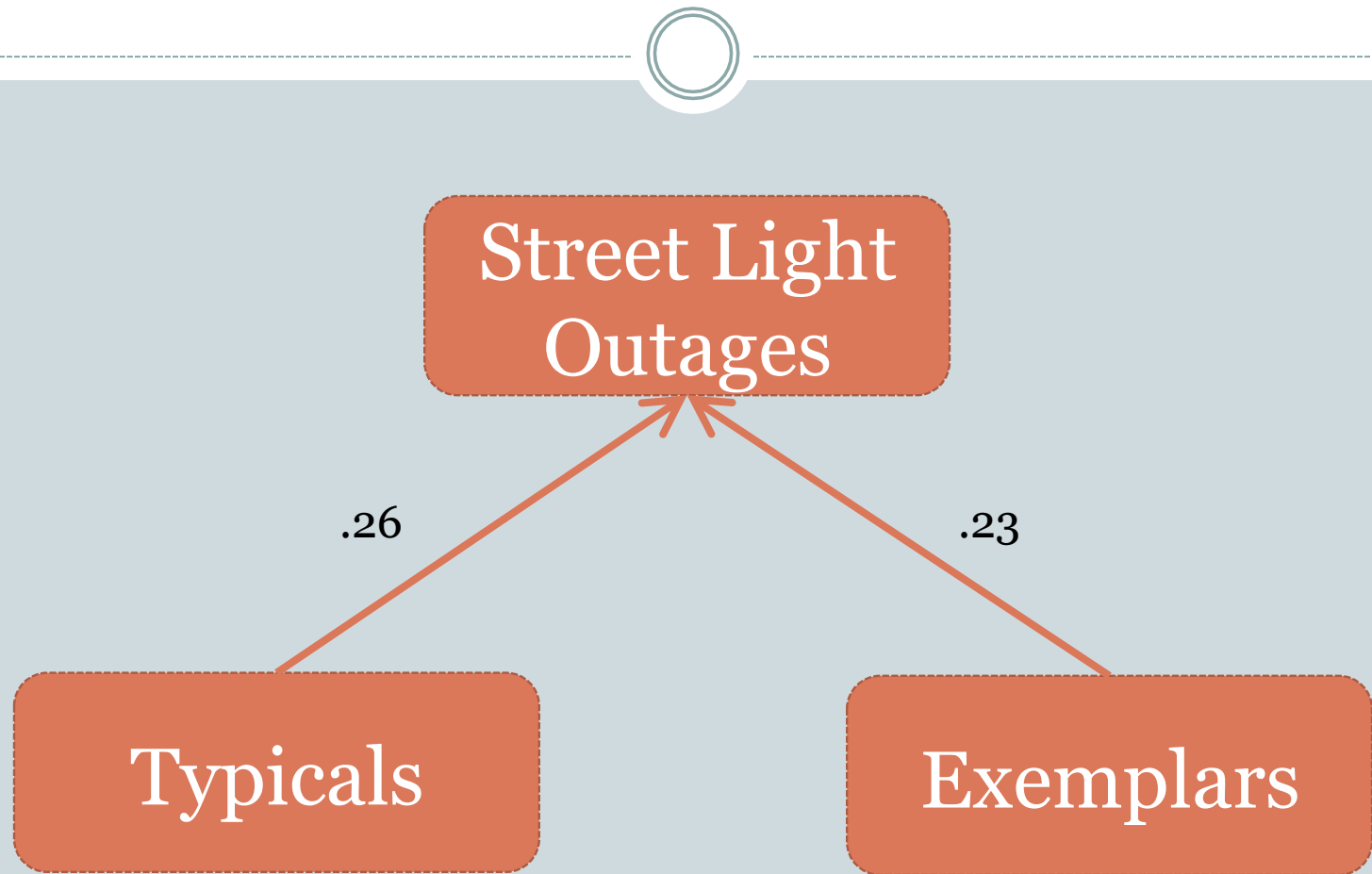


Study 1: Behavioral Composition and Neighborhood Maintenance



Interaction effect = .13

Study 1: Behavioral Composition and Neighborhood Maintenance

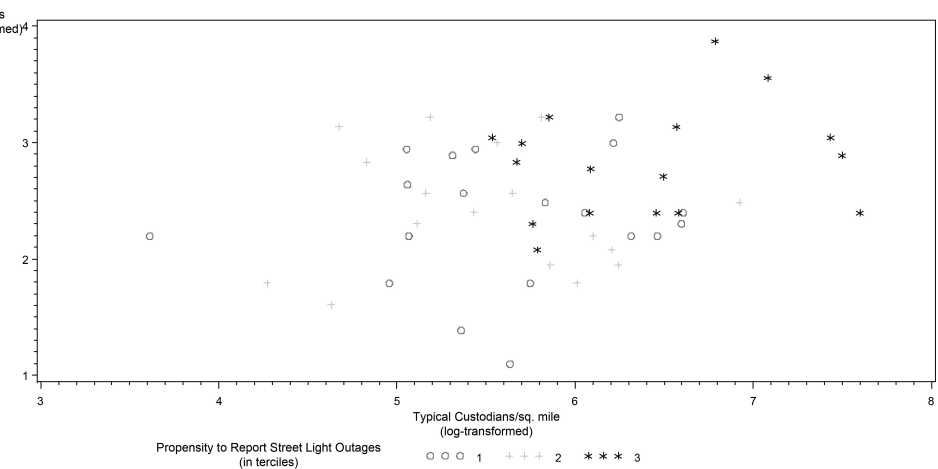
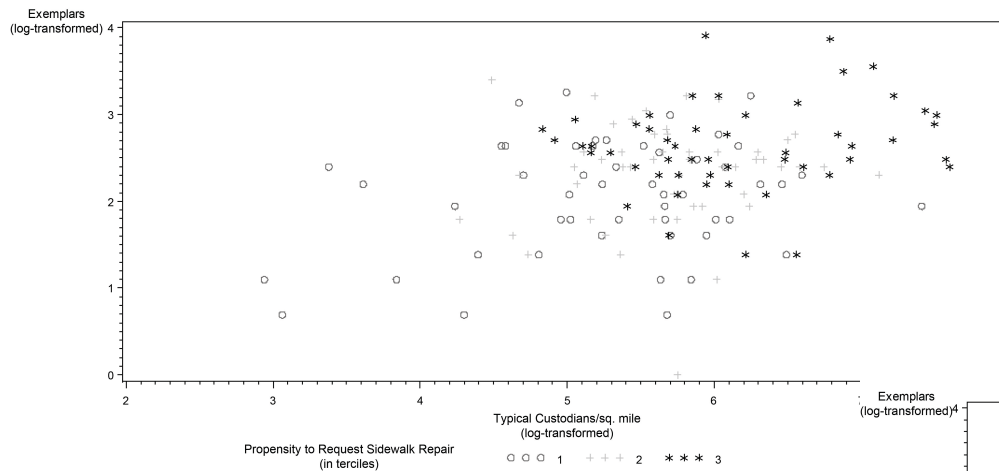


Interaction effect = .36

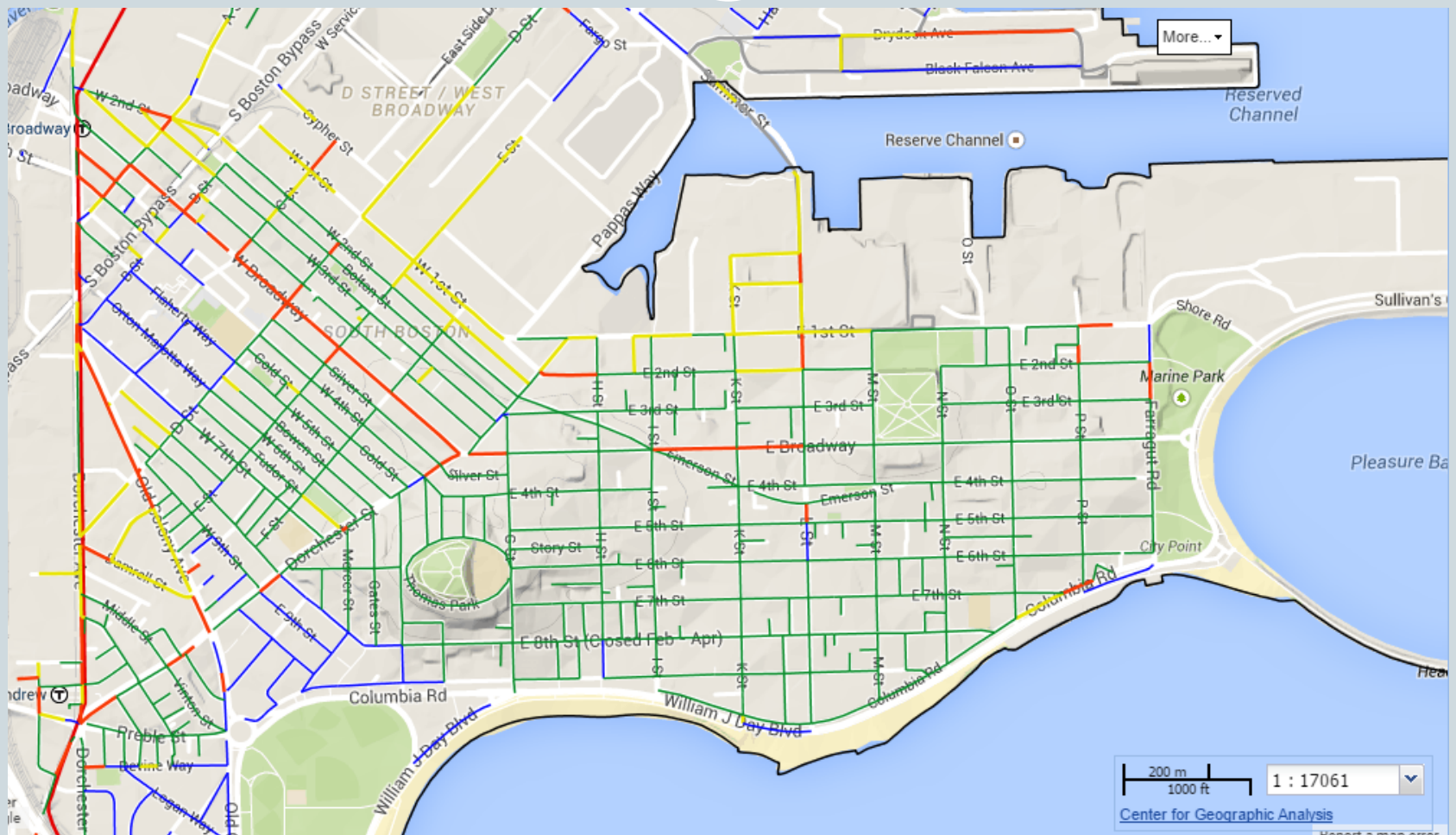
Study 1:

Behavioral Composition and Neighborhood Maintenance

- Behavioral heterogeneity in custodianship is critical to neighborhood maintenance.

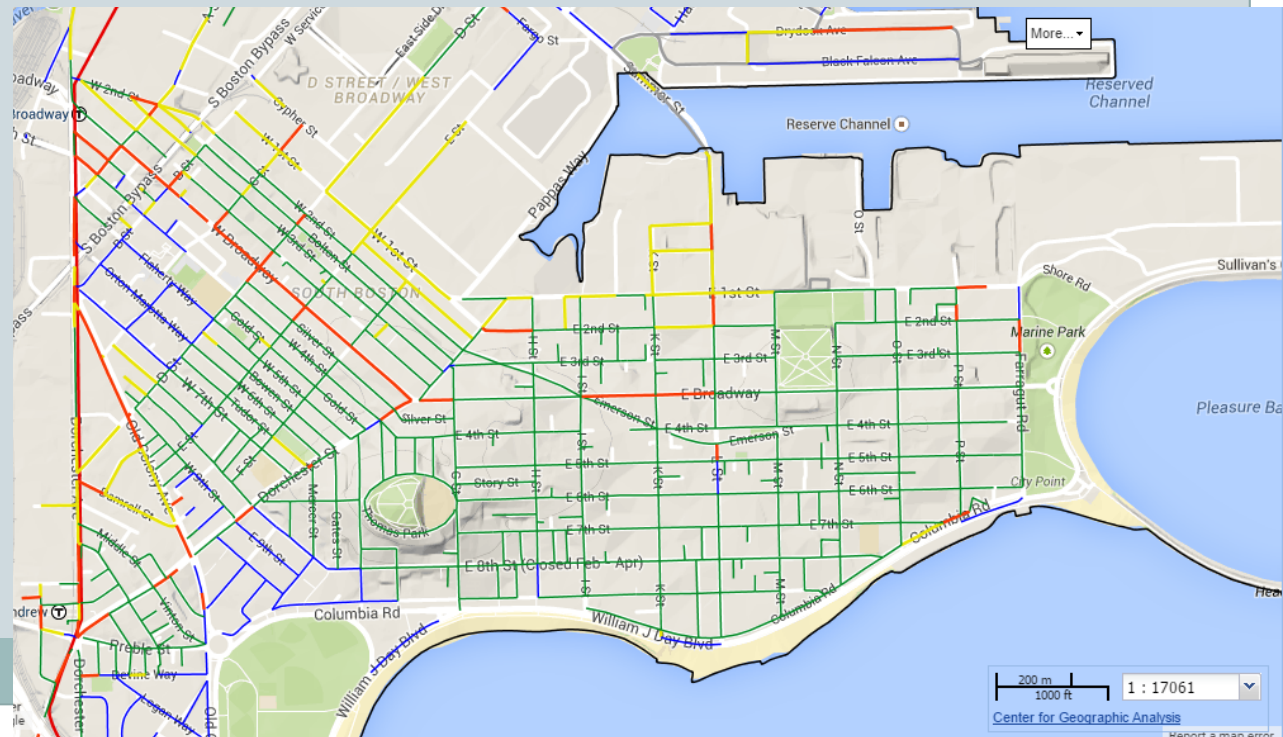


Study 2: Differentiation of Tasks in the Urban Commons



Study 2: Differentiation of Tasks in the Urban Commons

- How are behavioral differences manifest across contexts?



Study 2:

Differentiation of Tasks in the Urban Commons



- “Typical” custodians vs. Exemplar custodians
 - Greater territoriality in exemplars will extend further into “shared” spaces—main streets and commercial districts.
 - Exemplars will be more active in the enforcement of social control, reporting incivilities committed by others.
- Constituents vs. City employees
 - City employees will be most active in institutional spaces.
 - Constituents in general will be more likely to want to enforce social control

Study 2: Methods



- Database from March 2010-March 2015.
 - 439,748 reports with geographical information that referenced issues in the public domain.
 - $N_{const.} = 152,648$ reports made by 63,743 individuals.
 - $N_{city} = 64,409$ reports made by city employees
 - 21 of the 77 “public” case types referenced incivilities committed by others (e.g., graffiti removal).

Study 2: Methods



- Reports categorized by type of reporter
 - Typical: <4 reports
 - Exemplar: ≥ 4 reports
 - City Employee identified by mechanism of reporting.
- Reports Mapped to Road
 - $N = 24,730$ road segments in Boston
 - Categorized as Main/Non-Main by MassGIS standards
 - Zoning determined from tax assessments

Study 2: Behavioral Differences Across Contexts



	Typical	Exemplar	City
Total	75,644 (35%)	77,004 (35%)	64,409 (30%)

Study 2: Behavioral Differences Across Contexts



	Typical	Exemplar	City
Non-Main	55,544 (39%)	45,986 (32%)	42,286 (29%)
Main	20,100 (27%)	31,018 (42%)	21,123 (31%)
Total	75,644 (35%)	77,004 (35%)	64,409 (30%)

$\chi^2_{df=2} = 3,223; p < .001$

Study 2:

Behavioral Differences Across Contexts



	Typical	Exemplar	City
Residential	60,613 (38%)	51,829 (33%)	46,535 (29%)
Commercial	6,795 (26%)	11,273 (44%)	7,658 (30%)
Industrial	1,288 (23%)	2,014 (37%)	2,191 (40%)
Exempt/Gov.	2,976 (25%)	4,762 (40%)	4,100 (35%)
Not Zoned	3,972 (26%)	7,126 (47%)	3,925 (26%)
Total	75,644 (35%)	77,004 (35%)	64,409 (30%)

$\chi^2_{df=8} = 3,767; p < .001$

Study 2: Behavioral Differences Across Contexts



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Residential	60,613 (38%)	51,829 (33%)	46,535 (29%)
Commercial	6,795 (26%)	11,273 (44%)	7,658 (30%)
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$\chi^2_{df=8} = 3,767; p < .001$

Study 2:

Behavioral Differences Across Contexts



	Typical	Exemplar	City
Incivilities	11,780 (33%)	17,983 (50%)	5,888 (17%)
Natural Deterioration	63,864 (35%)	59,021 (33%)	58,521 (32%)
Total	75,644 (35%)	77,004 (35%)	64,409 (30%)

$\chi^2_{df=2} = 3,144; p < .001$

Study 2:

Behavioral Differences Across Contexts



	Typical	Exemplar	City
Incivilities	11,780 (33%)	17,983 (50%)	5,888 (17%)
Natural Deterioration	63,864 (35%)	59,021 (33%)	58,521 (32%)
Total	75,644 (35%)	77,004 (35%)	64,409 (30%)

$\chi^2_{df=2} = 3,144; p < .001$

Study 2:

Behavioral Differences Across Contexts



- Confirmed descriptive patterns with three-level multilevel model.
 - Two models
 - ✦ Exemplar v. typical custodian
 - ✦ Constituent v. city employee
 - Report-level characteristics
 - ✦ Manmade incivility
 - ✦ Weekend v. weekday
 - ✦ Season
 - ✦ Snow Removal
 - Street-level characteristics
 - ✦ Main v. non-main street
 - ✦ Zoning
 - ✦ Length
 - Neighborhood-level characteristics
 - ✦ Population density
 - ✦ Predominant use (downtown, industrial, residential, park)

Study 2:

Behavioral Differences Across Contexts



- All previous findings confirmed
 - Issues on main and non-residential streets were more often reported by exemplars.
 - Issues on non-residential streets, particularly industrial and exempt, were more often reported by city employees.
 - Incivilities were more often reported by constituents than city employees, and by exemplars in particular.
- Additional findings
 - Exemplars did more of the reporting in neighborhoods with institutional uses and higher population density.
 - City employees did less of the reporting in neighborhoods in the downtown and with higher population density.

Study 2: Articulating the Division of Labor



- Territoriality differentiates typical and exemplar custodians.
- Typical custodians focus on regions abutting homes, and exemplars cover “shared” spaces.
- How does this division of labor approach improve our understanding of the commons?

Study 2: Articulating the Division of Labor



- Tested this question with regressions.
 - Used survey sample (439 custodians).
 - Predicted making any reports...
 - ✦ On a main street
 - ✦ On a non-residential street
 - ✦ Referencing a manmade incivility
 - Predictors included
 - ✦ Demographics
 - ✦ Two aspects of territoriality
 - ✦ Exemplar? (0/1)

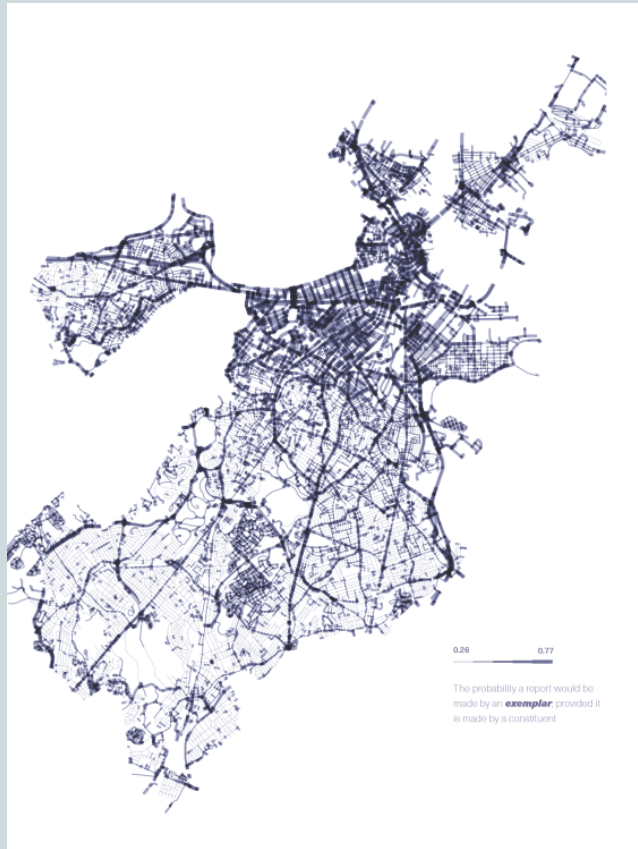
Study 2: Articulating the Division of Labor



- Being an exemplar exclusively explained making any reports on a main or non-residential street.
 - Suggests an indirect relationship, where territoriality leads to greater activity which spills into “shared spaces.”
- A desire to enforce social norms additionally explained reporting any manmade incivilities.
 - Describes a direct relationship, with territoriality motivating a particular type of reporting.

Study 2: Uneven Need for Typicals and Exemplars

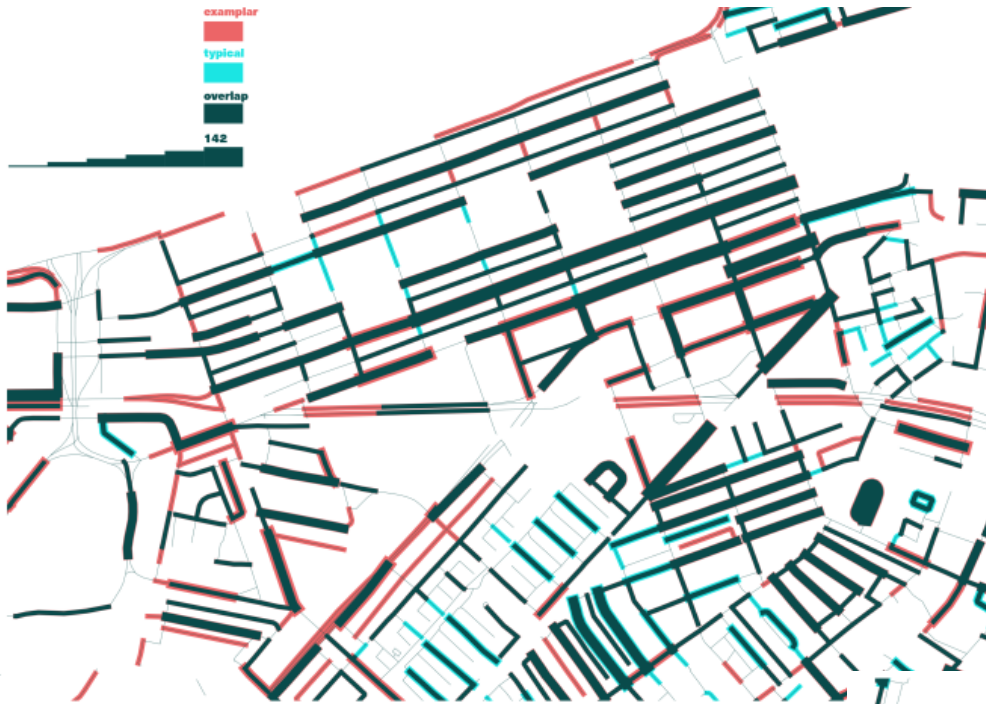
Need for Exemplar vs. Typical Custodians



Need for City Employees vs. Constituents

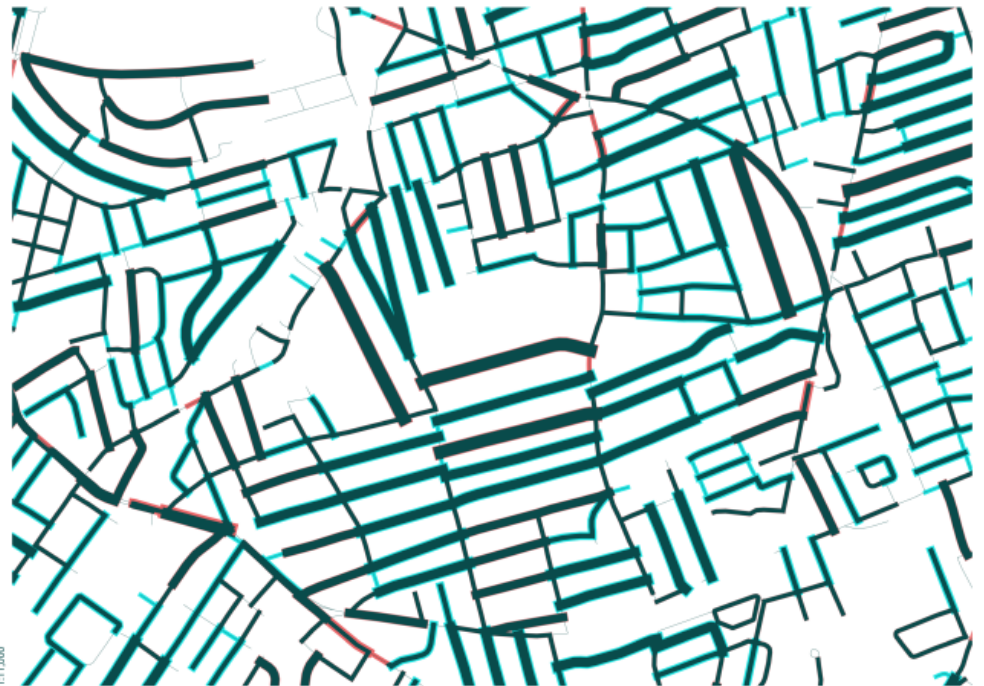


exemplar
typical
overlap
142



Back Bay

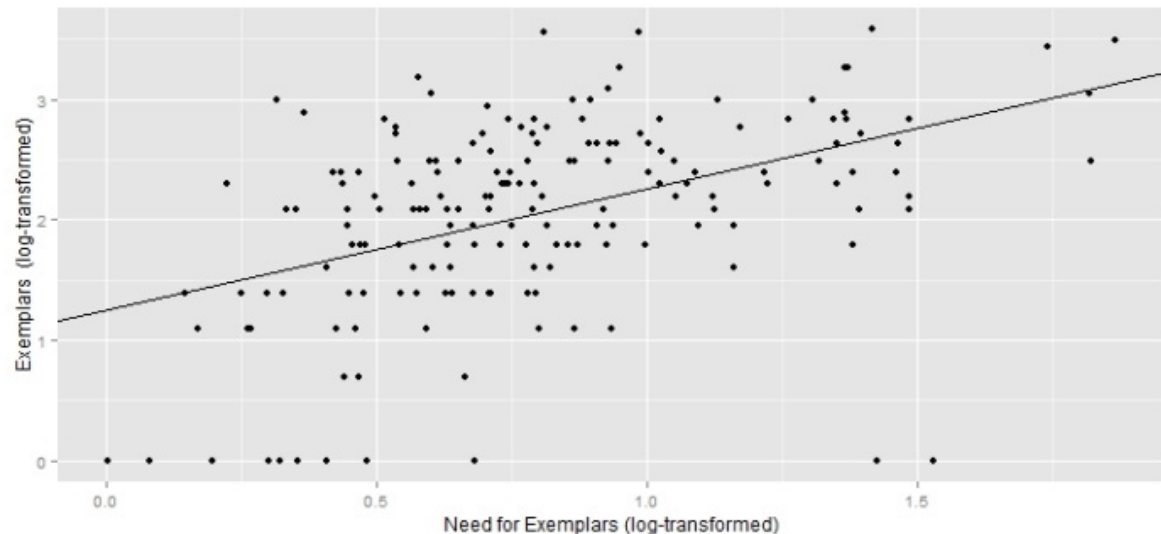
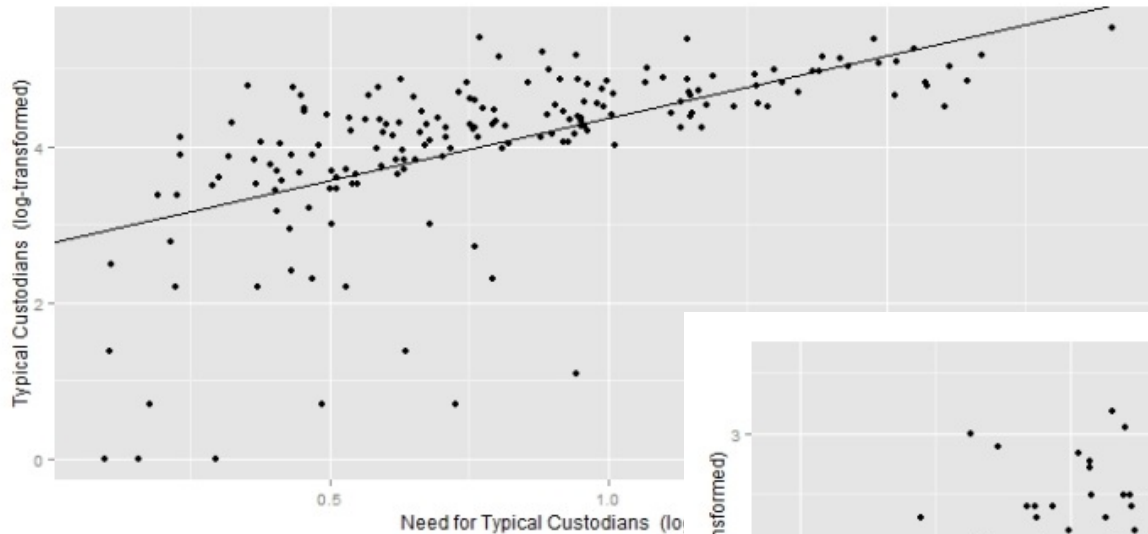
West Roxbury



Study 2: Division of Labor vs. a Simpler Model



- Created two measures of fulfillment of need.
 - Residual of custodian representation regressed against need.



Study 2: Division of Labor vs. a Simpler Model



- Do they tell a different story when compared to demographic predictors?
 - The traditional “cooperator” model emphasizes factors that motivate per capita participation, like homeownership
 - The division of labor model captures the diversity of urban form, highlighting factors like population density.

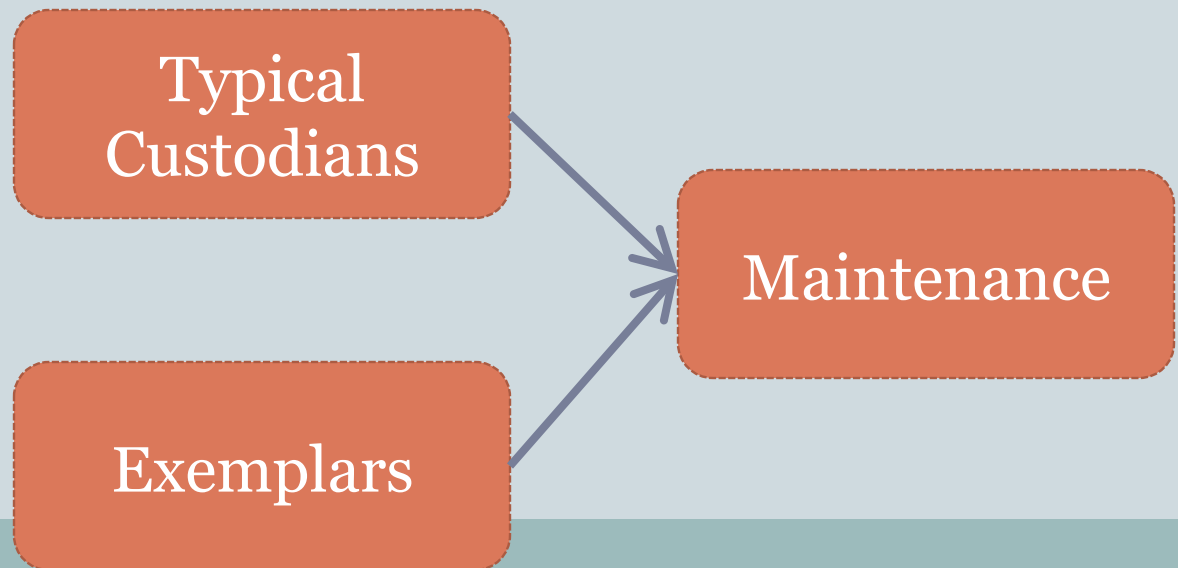
Custodianship and the Maintenance of the Urban Commons



Conclusions



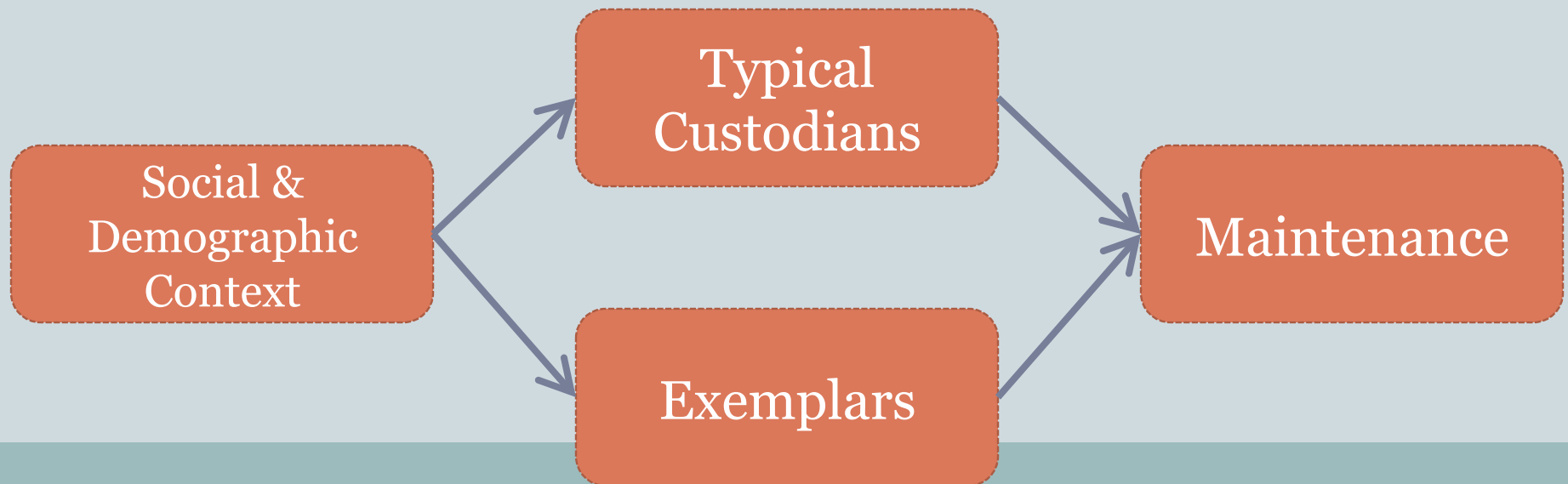
- A more nuanced understanding of the problem of the commons.
 - Acknowledges need and types of action.



Conclusions



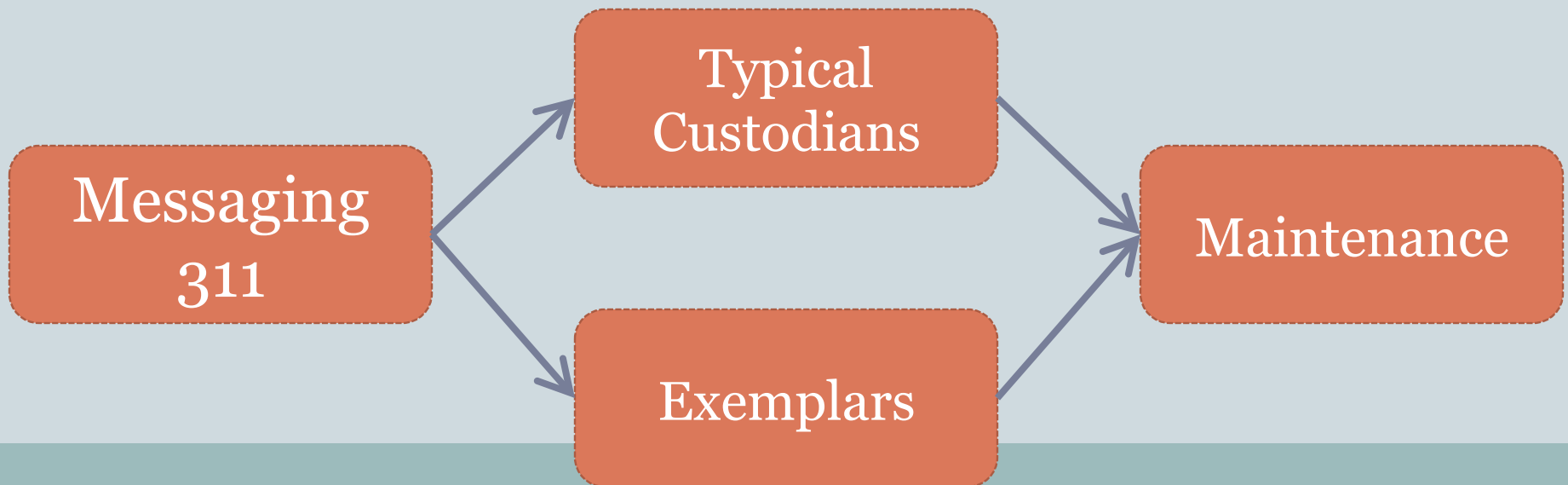
- A more nuanced understanding of the problem of the commons.
- A new perspective on urban maintenance
 - Models of group functioning now have two types of actors.



Conclusions



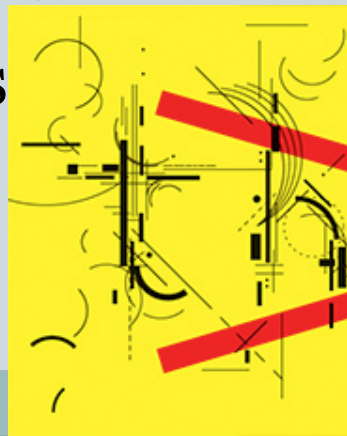
- A more nuanced understanding of the problem of the commons.
- A new perspective on urban maintenance
 - Models of group functioning now have two types of actors.
 - New pathways for public outreach



Conclusions



- A more nuanced understanding of the problem of the commons.
- A new perspective on urban maintenance
- Set the stage for other behavioral studies of sustainability?
- We need conceptual questions to make sense of administrative data.
- The synergies pos research-policy collaboration.



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Thank You

