Where the Sidewalk Ends: How Participation Contributes to Inequity in Basic Government Service Provision

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Abstract

Do biases in representation arise at the most basic levels of policy implementation, and can political participation contribute to these inequities? Leveraging a panel of geographic administrative data from a large city, I evaluate equity in the provision of a crucial government service: the repair of sidewalks. I combine detailed data on the physical conditions of the city's sidewalks with data on local residents' use of the city's 311 service request system to assess who is represented in local infrastructural policy. I show that the quality of basic city infrastructure is biased along existing racial and socioeconomic divisions. Sidewalks in more heavily minority and less wealthy neighborhoods improve at a rate below those sidewalks in whiter and wealthier neighborhoods. However, participation can compensate for inequities in the improvement and deterioration of infrastructure. To the extent that residents in minority and low-income areas use 311 services to request repairs, their sidewalks improve at rates on par with those in whiter and wealthier places. Yet because of inequities in who participates, sidewalks in low-income and more heavily minority areas do not improve as much on average. Basic local government service provision can be subject to biases, and citizen participation may only have limited ability to resolve these historical inequities.

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Introduction

Central in normative theories of democratic representation is the idea that citizens' wishes are translated into policy with equal voice. Yet research over the last century in political science has demonstrated biases in representation along race-, class-, and age-based divisions in society (e.g., Dahl, 1961). One prominent explanation for this is the fact that citizen participation rates also cleave along such socio-demographic divisions, and strategic politicians rationally respond to the people who participate in the political process — in particular, those who vote in elections. Under this theory, citizen participation may be both a *cause* and a potential *remedy* for biases in representation.

Research in political science and economics has focused primarily on two forms of representation in order to diagnose potential biases. Numerous studies have examined whether politicians' public positions and votes correspond with the ideological preferences of some racial or socioeconomic groups of the population more than others. This line of work has indicated that politicians are more responsive to the ideological preferences of older and wealthier citizens, among other groups. In a separate line of work, scholars have examined the responsiveness of government to direct constituent requests for information. This research has indicated biases on the part of government officials along lines of race, class, and religion.

This work leaves largely unanswered the question of whether biases in representation arise in later stages of policy. The process of policy implementation by street-level bureaucrats – officials ranging from police officers to city clerks – constitutes a great deal of the work that government does on behalf of constituents. Moreover, such implementation work is often done in ways that are hard to observe systematically, leaving room for discretion on the part of bureaucracies that do this work. Yet we know relatively little about whether biases in policy implementation exist despite the fact that it would indicate major faults in democratic representation. Nor do we have conclusive answers about the potential for political participation to ameliorate such biases.

In this paper, I assess biases in policy implementation using a direct and objective measure of the provision of services to constituents. Specifically, I harness geographically-located data on the objective quality of sidewalks — a crucial city service for residents across the socio-demographic spectrum. I use these data in combination with socio-demographic data to show that government systematically underserves residents who are non-white and poor. Combining these data on sidewalk quality with geographically-located individual citizen service requests for sidewalk repair, I examine the role of participation in procuring better service provision. Not only do inequities exist in basic service provision, but citizen participation can only marginally remedy these inequities. In places with high levels of citizen participation, inequities in representation are small, but in places with low participation, those same inequities persist. Thus underlying differential participation across racial and income divisions can still lead to inequities. These results indicate that, while participation via innovative so-called "smart city" tools may be a way to encourage engagement, it is not a panacea for producing equity in representation.

This paper proceeds as follows. First, I discuss previous research on representation and sources of bias in representation, as well as work showing ways to ameliorate these inequities. Next, I introduce my original data on localized service provision – the objective quality of sidewalks — along with my sources of participatory and demographic data and my research design. I then discuss my findings and demonstrate how politicians systematically underserve minority residents but how citizen participation can eliminate these gaps. Finally, I briefly conclude and discuss the implications for future research on representation, participation, and urban politics.

Background

A central question in political science is that of representation. Assessing whether citizens' policy interests influence the policy outputs of government, and *whose* interests are best

represented, is the subject of a great deal of research (e.g., Dahl, 1961). A large body of work in political science shows that national politicians are more responsive to interest groups and citizens who are older, wealthier, and more likely to vote (Bartels, 2008; Carnes, 2012, 2013; Gilens, 2012; Griffin and Newman, 2005; Hacker and Pierson, 2010; Hill and Leighley, 1992; Jacobs and Skocpol, 2005; Rigby and Wright, 2013). When they take public stances in their speeches or vote on policy, politicians generally seem to be biased in their representation towards certain socio-demographic groups rather than others.

This may be because of the different rates at which some groups participate in the political process relative to other groups (Anzia, 2019; Einstein, Palmer, and Glick, 2019; Griffin and Newman, 2005; Key, 1949; Rosenstone and Hansen, 1993; Verba, Schlozman, and Brady, 1995). By writing directly to their representatives, or simply voting at higher rates, some citizens may better communicate their wishes to politicians. Politicians and their staffers may therefore have a biased picture of their constituents' interests (Broockman and Skovron, 2018; Hertel-Fernandez, Mildenberger, and Stokes, 2019). As a result, policy may be biased towards the wishes of those groups. Indeed, a longstanding viewpoint in political science has been that this drives certain groups to receive better representation than others (APSA Task Force, 2004; Verba and Nie, 1972; Verba, Schlozman, and Brady, 1995).[1]

Work examining biases in representation has proceeded along one of two paths. In the first vein of work, researchers tend to show that group-level ideology or policy preferences differ from politicians' votes or the policies that are actually enacted by government. Research in this tradition has most often focused on ideological representation. For instance, a number of prominent studies assess whether the wishes of groups of citizens for more liberal or more conservative policies match the policies that government enacts (e.g. Bartels, 2008; Erikson, Wright, and McIver, 1993; Gilens, 2012; Hacker and Pierson, 2010; Rigby and Wright, 2013). By examining the correspondence between policies and the wishes of groups of voters, research in this tradition has demonstrated that representation may be biased

[1]Though, see Butler (2014).

towards the interests of one group relative to another.

However, much of this work examines the enactment of ideological policy but ignores another important part of public policy: implementation. During the implementation of public policy, "decisions of street level bureaucrats... effectively *become* the public policies they carry out" (Lipsky, 1980, xii). We know much less about representation of constituents' interests in a non-ideological sense during this implementation phase of policy. This may be because preferences are far more similar across groups. During policy implementation, most members of the public would prefer to have "more" of government's work — whether it is better hospitals, faster fire truck response times, or smoother roads. These types of services may be even more subject to strategic credit-claiming (de Benedictis-Kessner, 2022). This may inherently make it hard to measure potential biases in representation (Soroka and Wlezien, 2008).

Research on national and state politicians has often identified this type of government output as "service," and a separate dimension from policy (e.g., Butler, Karpowitz, and Pope, 2012). Though such services are often provided by government agencies rather than politicians themselves, those in office usually have a great deal of influence over the ways bureaucracies deliver those services. Inequities in the way that policies are implemented may therefore indicate flaws in democratic representation by both elected and unelected officials.

The existing research on government service has focused mainly on the services which are directly provided to constituents. Butler, Karpowitz, and Pope (2012) quote Fenno (1978) in describing such service work as "providing help to individuals, groups, and localities in coping with the [...] government" (475). This constituent service work is one important piece of policy implementation done by government. Political scientists and economists have commonly assessed biases in representation in this area of policy by experimentally assessing government responsiveness to specific constituent requests for service. Using audit experiments, researchers have varied putative characteristics of constituents contacting government and recorded politicians' responses. Work in this tradition has used the presence

of politicians' responses, their timeliness, or their informational content as a yardstick by which to assess representation (e.g. Butler and Broockman, 2011; Carnes and Holbein, 2019; Einstein and Glick, 2017; White, Nathan, and Faller, 2015).[2] The results of such studies have indicated biases in responsiveness along class, race, and other societal divisions.

Previous work on biased representation, by construction, has relied on either measures of ideological (mis)matches or informational responses to short communications. A focus on ideological policy preferences alone ignores an entire swath of the actions governments take after the passage of policy that may — or may not — represent the wishes of their constituents. Likewise, though replies to constituent emails are an important informational responsibility of government, much of the policy implementation work done by government is far more consequential for citizens's lives. The broader set of actions that governments engage in when implementing policy — how, when, and where governments deploy resources after funds are allocated — is often set aside in favor of more tractable measures of government informational responsiveness. Ignoring the broader set of actions government officials engage in, however, may ignore critical places where biases are introduced in democratic representation.

Local governments are one such place where biases in representation may appear in policy implementation. The majority of government services that people experience in their daily lives — even those funded by the federal government or state governments — are implemented at the local level. Government decisions at the local level have a bevy of immediate consequences in people's lives (Oliver, 2001). These consequences are a perfect example of how representation in policy delivery may not be ideological in the sense that many national policies are, but may still be biased.

Longstanding wisdom in urban politics research has asserted that local governments are a non-ideological setting, but the nature of local government services can still lead to inequalities with representational consequences. For instance, as Adrian (1952) stated it,

[2]For a comprehensive review, see Costa (2017).

there is "no Republican way to pave a street and no Democratic way to lay a sewer" (766). Yet local governments distribute services that can still disproportionally affect some groups of people and not others within a city (Peterson, 1981). The basic services delivered by local governments are inherently spatial — for instance, road repair occurs at a given place rather than uniformly across space. The implementation of these services may therefore have large spatial variation. Because people are also distributed spatially within governmental units, this means that people can receive vastly different levels of government services within the same locality. Biases in local policy implementation *within* cities may therefore mean that some groups of people are served well by local government and others served terribly. Thus the potential for inequities in local representation is enormous.

Given that the vast majority of elections and elected officials in the United States are at the local level, representation at the local level is also important in its own right. Recent evidence indicates that state and local governments are broadly responsive to the ideology of the public (Caughey and Warshaw, 2018; Einstein and Kogan, 2015; Palus, 2010; Tausanovitch and Warshaw, 2014), albeit with some institutional barriers to this responsiveness (Dynes, Hartney, and Hayes, 2021). State and local elections may serve as a conduit for citizens' ideological views to be translated into policy (Caughey, Warshaw, and Xu, 2017; de Benedictis-Kessner and Warshaw, 2016, 2020*b*).[3] And voters may hold state and local governments accountable for public services in much the same way that they do for national politicians (de Benedictis-Kessner and Warshaw, 2020*a*), albeit with some biases due to a more complex institutional and policy landscape (de Benedictis-Kessner, 2018*a*,*b*; Payson, 2017; Sances, 2017). Yet answers to questions of representation and accountability at the local level remain less conclusive than for the same questions at the national level (Trounstine, 2010; Warshaw, 2019).

Recent work in urban politics has addressed questions about representation using the available data on the distribution of public goods across cities. For instance, Hajnal and

[3]Though see Dynes and Holbein (2020) for evidence that this electoral connection may not translate into different outcomes from policy at the state level.

Trounstine (2010) show that while economic constraints limit public goods spending in cities, political and intergovernmental factors also influence spending patterns. In a similar vein, Rugh and Trounstine (2011) demonstrate the critical role of racial diversity in the public's willingness to spend funds on public goods. More recently, An, Levy, and Hero (2018) show that the degree to which income inequalities fall along racial lines determines the degree to which different cities provide public goods. This research suggests that there is heterogeneity in the way cities provide services that may or may not indicate failures of representation. At the same time, studies such as these often must rely on cross-city comparisons to make such inferences. The legacy of segregation and vast inequality of resources in cities may lead to unequal provision of public goods *within* cities as well as *across* cities (Trounstine, 2018). Inequalities in resources may also have hidden consequences that lead to further inequities in government service provision, such as lower homeownership rates in minority neighborhoods leading to poor service delivery by police following burglaries (Goldstein, 2022). Diagnosing the inequities introduced by these patterns and the government decisions that lead to them is therefore critical for our understanding of representation in cities (Sances and You, 2017).

In turn, an older literature in urban politics examined imbalances in the way that public services were provided *within* cities. Some studies demonstrated substantial inequities in these services. For instance, Levy, Meltsner, and Wildavsky (1974) documented the racial and class divisions in several policy arenas — library spending, school budgets, and street reconstruction projects — and showed that there were significant inequalities in these policies and their outcomes in Oakland, CA. In similar vein, Cingranelli (1981) demonstrated that police and fire protection expenditures varied in their equity across neighborhoods in Boston, MA, and Koehler and Wrightson (1987) showed that flexible recreation programs varied in their quality along racial lines in Chicago. Others came to contradictory findings — showing instead that services like parks and recreation programs, fire protection, and educational resources were distributed in ways that favored rather than disfavored minority and poor neighborhoods in cities such as Chicago (Mladenka, 1980) and Houston (Mladenka and Hill,

1978). Yet others showed that municipal bureaucrats in other cities were locked into formulas and technical criteria that make discrimination or inequity of any kind in service delivery relatively impossible (e.g. Lineberry, 1977; Jones et al., 1978). This body of work, on the whole, has mixed conclusions about the degree to which service delivery at the local level is equitable.

Moreover, only limited work has examined how participation interacts with inequalities in representation. Among the few studies that have assessed this, many of these relied upon small samples of citizen requests. In one such examination, Mladenka (1977) observed that the quality of bureaucratic responses to requests for specific services were relatively balanced across the city of Houston. He concluded from this pattern that there was little evidence of problems with democratic representation. Unanswered in this research, however, was whether or not the distribution of services city-wide was equitable — with or without direct citizen participation. This leaves a gap in our understanding of barriers to representation — and ways that individuals' actions may overcome those barriers.

Theoretical Expectations

Given the existing evidence on biases in representation in both the ideological and non-ideological senses, there are several distinct theoretical expectations that arise for any examination of representation at the local level of policy implementation.

Primarily, budgetary and time constraints facing local governments may force the politicians and agencies delivering services to do so in ways that are not equal across all constituents. In the case that I examine in this paper, this would suggest that basic city service provision would have disparities in its quality across neighborhoods.

In addition, there is reason to expect that any disparities in representation will align with racial and other socio-economic divisions. Given the presence of conscious or unconscious bias among policymakers, biases in responsiveness may lead to biases in service levels. This

leads to the expectation that the quality of government service provision will have biases that correspond with racial and socio-economic differences.

Finally, research on political participation suggests that it may be one reason why biased representation occurs and may also help ameliorate biases that arise. This line of work suggests that increased political participation in the form of direct citizen service requests may help to close gaps in representation. This leads to the expectations that when participation is greater the quality of government service provision will be greater.

Data and Research Design

To examine these questions, I combine three sources of data. First, I gathered data on the objective conditions of sidewalks in the City of Boston to capture the quality of provision of a basic city service. These data come from sidewalk conditions surveys ("audits") conducted in 2012 and 2015 by the City's Public Works Department. Sidewalk conditions were measured for each segment of sidewalk in the City in both time periods. The principal measure of conditions is a Sidewalk Conditions Index, or SCI, which is a standard score between 0 and 100 used by many public works professionals across the country. I match the geolocation of each sidewalk segment in 2015 with the closest sidewalk segment in 2012, yielding data for both time periods for 24,527 sidewalk segments. I then geolocate each sidewalk segment within a corresponding Census-designated street segment in order to match with other data sources. This aggregation to a street segment corresponds to, generally, sidewalks on one city block. These street segments are nested within corresponding Census blockgroups and Census tracts.

I combine these data with 311 service requests from the City of Boston specifically requesting sidewalk repair. 311, a system similar to 911, has been introduced over the last decade to a number of cities across the country as a way for constituents to request non-emergency services from their government. Previous work in the social sciences has used

records of these 311 service requests as a measure of citizen participation based on objective needs for services (O'Brien, 2018; White and Trump, 2018; cf. Burnett and Kogan, 2017). I use 311 reports from the time period between the two audits of objective conditions of each sidewalk segment to measure the extent of citizen participation.[4] I combine these service requests with the sidewalk conditions data by matching the geolocation of each 311 request with a specific Census-designated street segment, again nested within Census blockgroups and tracts.

Finally, I combine these data on sidewalk conditions and participation with demographic data from the 2012-2016 American Community Survey (ACS), provided by the US Census Bureau. These data give me estimates of population characteristics within a given Census blockgroup: specifically the median income, median age, educational attainment, and racial demographics of each geography. I combine these blockgroup-level demographic data with each street segment's data on sidewalk conditions and participation.

Because of the descriptive, rather than causal, nature of the questions regarding equity in service provision, I use a relatively simple research design to assess the correlates of the quality of service provision. However, due to the panel nature of these data (i.e. two time periods), I can eliminate the potential for my conclusions about descriptive differences in conditions to be confounded by time-invariant factors unrelated to the correlates of interest that I examine. For instance, the degree to which a street is populated by commercial rather than residential properties, or the pedestrian density on a street could both plausibly motivate government to concentrate repair efforts in such places. Such confounders could serve to increase or decrease sidewalk conditions in any of the geographic units for reasons unrelated to the predictors of interest. To avoid such problems, I operationalize the main dependent variable as a *change* in sidewalk conditions over time rather than levels. This has the advantage of eliminating time-invariant unit-level confounding that could occur.

[4]311 data were cleaned to remove (a) city worker reports of sidewalk conditions, as indicated by reports originating from the city worker smartphone app rather than the public-facing reporting systems, and (b) 311 reports with locations originating at the address of City Hall, which is the default location for the smartphone app's submission system.

However, I replicate the main analyses in the paper using levels rather than changes as the dependent variable in Appendix D and find similar results.

Results

A preliminary question is where the conditions got better — or got worse — between 2012 and 2015, when the two audits were conducted. The map in Figure 1 below shows this. In the top panel, I plot these conditions at the individual street segment, and in the bottom panel I plot these conditions at the blockgroup level.[5] In the top panel, streets in red indicate sidewalks where the SCI (which ranges from 0 to 100) decreased, and streets in green indicate sidewalks where the SCI increased. Likewise in the bottom panel, green areas are places in which sidewalk conditions improved, while red areas indicate places where conditions deteriorated.

These maps indicate spatial heterogeneity in the condition of basic city services in Boston. In other words, different areas of the city received different levels of service, leading to disparities in the implementation of infrastructural policy.

I next move to assessing racial and income-based equity in basic service provision within the City – that is, whether or not the improvement (and deterioration) of sidewalks occurred in places where different type of people reside. As a first cut at this, I compare the change in SCI between my two time periods with the racial and income characteristics of the blockgroup within which each sidewalk segment lies in Figure 2.[6]

These results indicate that the heterogeneity in sidewalk repair demonstrated in Figure 1 aligns with race and income patterns in the city. Sidewalks were more likely to improve in areas with higher proportions of white residents and wealthier areas. Of course, these demographic differences could be subject to a host of confounders: for instance, the sidewalks

[5]In each blockgroup, I plot the average change in sidewalk conditions among all street segments in the block group, weighted by the area of the street segment.

[6]These results in regression format, usign both binary measures of demographics and continuous measures, are shown in Table A2 in Appendix A.

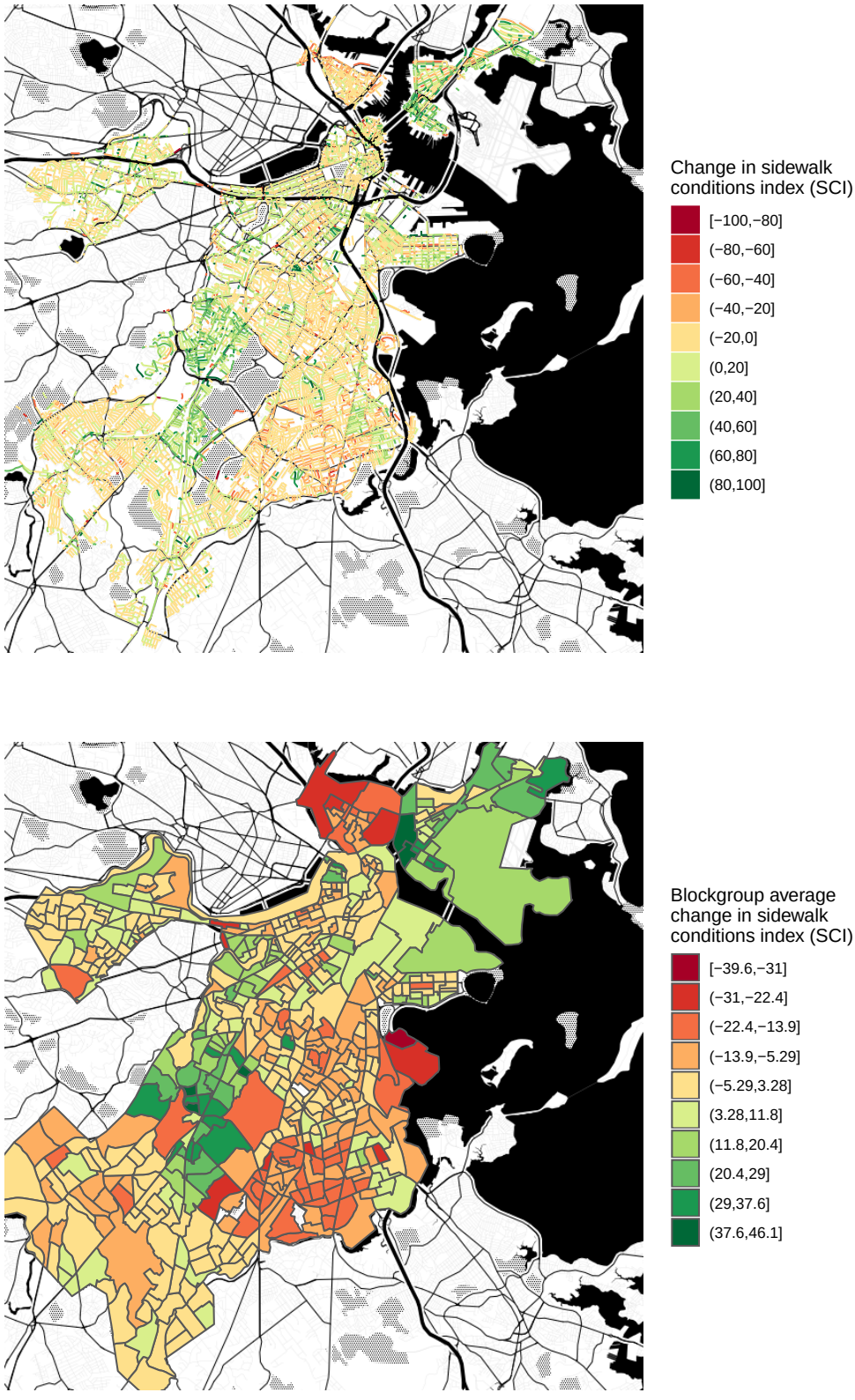

Figure 1: Change in sidewalk conditions within each street segment (top panel) and block-group (bottom panel), 2012-2015

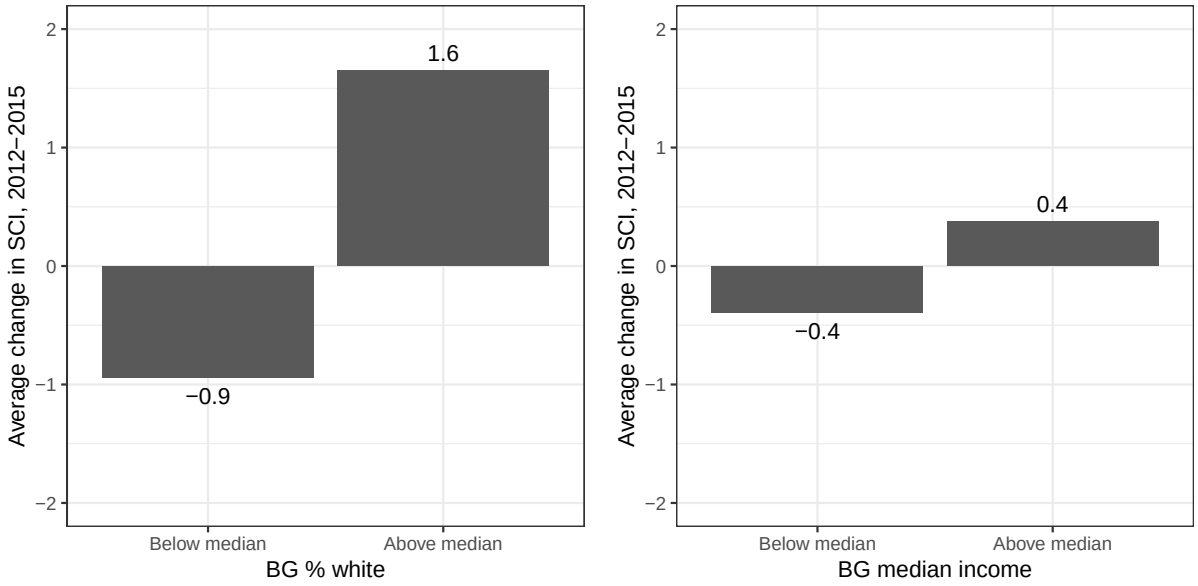

Figure 2: Correlates of change in sidewalk conditions, 2012-2015

in whiter and wealthier areas could be more likely to improve between 2012 and 2015 because they also began with worse conditions and simply needed more repair. To analyze the joint impact of these potentially overlapping factors I regress the change in sidewalk conditions on demographic predictors as well as their initial condition. Table A3 in Appendix A shows the effect of racial demographics and income controlling for the initial conditions of sidewalks on the street in 2012. Even holding the initial condition of sidewalks in 2012 constant, streets in whiter areas were more likely to improve than those in less white areas. The effect of an area's income is now statistically insignificant and small, indicating that the differences observed across income levels in the right panel of Figure 2 are likely explained by racial demographics or initial sidewalk conditions.

The Role of Political Participation

Next, I assess whether political participation, as measured via citizen requests for city services, drove these differences in the provision of sidewalk repair between 2012 and 2015. If, for instance, citizens in wealthier and whiter areas simply use 311 systems more to request sidewalk repairs, it may be that the city merely responds to the requests that it receives,

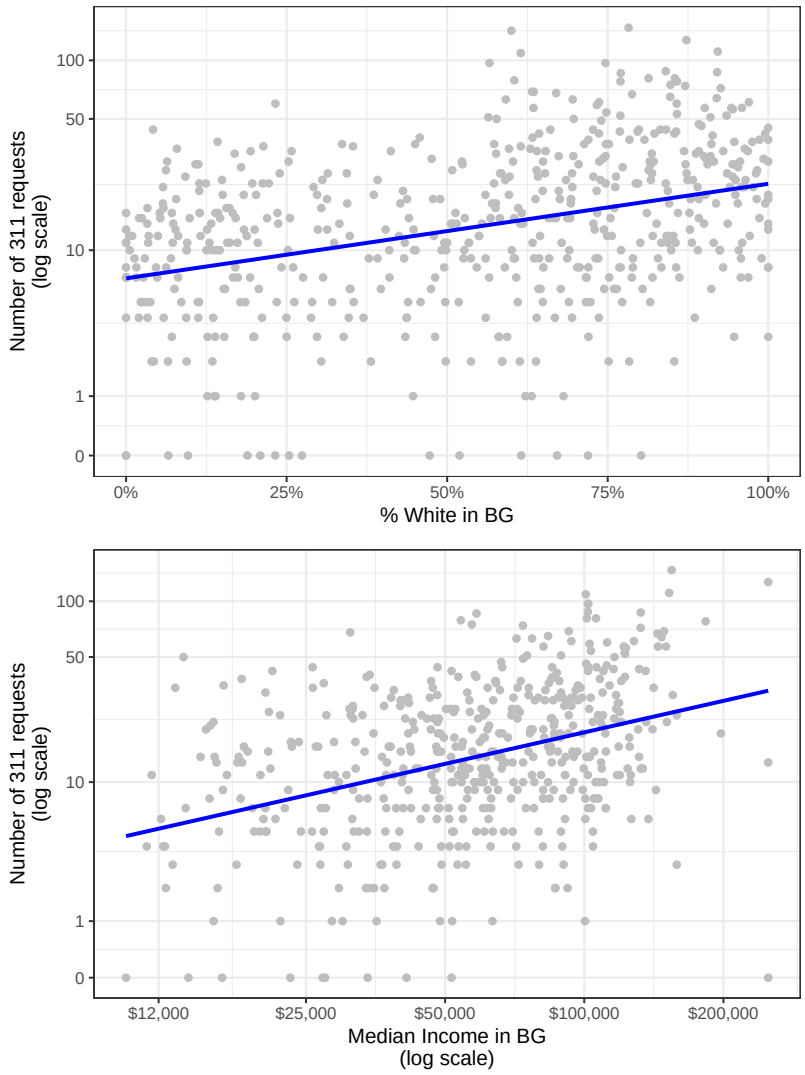

Figure 3: Number of 311 service requests for sidewalk repair by neighborhood racial demographics (top) and income (bottom)

and as a result the conditions improve in wealthier and whiter areas. Figure 3 shows the bivariate relationships between service requests and race and income. Both race and income are predictive of the neighborhood propensity to request services.[7] Streets in blockgroups that had a higher percentage of white residents and higher median incomes were more likely to receive more calls for sidewalk repair during this period.

It is true that more requests for sidewalk repairs do occur on streets that are in wealthier and whiter areas, but this does not encompass the entirety of the story. To assess whether

[7]See Appendix B for regression analyses.

differential political participation is driving inequities in the provision of sidewalk repairs, I regress the change in sidewalk conditions on each street on 311 participation that occurred on that street between the two audits of sidewalk conditions, along with demographic characteristics of the street's area. I interact the measure of participation with these demographic predictors to test whether citizen participation differentially influences service provision. These results are presented in Table 1.[8]

Table 1: The Differential Influence of Participation

	Dependent variable:	
	Street's average Δ in sidewalk conditions	
	(1)	(2)
Log(311 requests on street + 1)	2.235**	13.755
	(0.938)	(9.692)
% white in BG	8.649***	
	(1.811)	
Log(311 requests on street + 1) × % white in BG	−4.608***	
	(1.275)	
Log(BG median income)		0.565
		(1.186)
Log(311 requests on street + 1) × Log(BG median income)		−1.223
		(0.871)
Constant	−4.089***	−6.251
	(1.043)	(13.034)
Observations	24,286	22,348
R^2	0.009	0.0004
Adjusted R^2	0.009	0.0003
Note:	*p<0.1; **p<0.05; ***p<0.01	
	Standard errors clustered by blockgroup	

The results of these analyses confirm the previous analyses and again show that nonwhite and poor areas receive worse sidewalk repair services, but extend those analyses to also

[8]I show these results using alternative measures of income, race, and participation in Tables A5 and A6 in Appendix C. In both cases, the results are relatively consistent across alternative methods of measuring participation and demographics. I also replicate these analyses using levels of the dependent variable rather than the change over time in Appendix D and find similar results.

indicate that participation plays a differential role based on the demographics of an area. The large and statistically significant coefficient on the base term for the percentage of white residents in a blockgroup in the first column of Table 1 demonstrates that whiter areas experienced much greater improvement in sidewalk conditions between the audits in 2012 and in 2015. Participation, as measured by the the logged number of 311 requests on a street, may help to close this gap: the coefficient on the base term for the number of 311 requests is positive and statistically significant, indicating that in areas with lower numbers of white residents, sidewalk conditions are more likely to improve when more 311 requests for sidewalk repair are made. The negative coefficient on the interaction term between this measure of participation and the neighborhood's racial demographics indicates that participation has a *smaller* effect in whiter areas. However, the base effect of race dwarfs the negative interaction between participation and race. The net effect of participation and race therefore is that sidewalks in whiter neighborhoods improved regardless of levels of citizen participation. In other words, streets in whiter areas were more likely to improve during this time period even with no constituent 311 participation, while those in areas populated by more nonwhite people were only likely to improve with a large degree of citizen-initiated requests for repair.

Participation similarly has a different influence by the socioeconomic demographics of each street's neighborhood. The second column of Table 1 shows how streets in higher income neighborhoods improved to a greater degree than those in lower-income neighborhoods. As with the analyses of participation and race, the base effect of the number of 311 requests for sidewalk repair is associated with greater improvement in sidewalk conditions between 2012 and 2015. Though statistically insignificant, this positive coefficient suggests that for streets in lower income areas, more participation may be associated with improved conditions. At the same time, the interaction between participation and income is negative, indicating that the effect of participation is smaller in wealthier neighborhoods. As with the analyses of race, these results together suggests that streets in higher income neighborhoods were more likely to improve regardless of the amount of citizen 311 requests for sidewalk repairs, while

those in lower income neighborhoods improved only with larger degrees of participation.

I present the results for race and participation graphically in Figure 4, with each street's number of requests for sidewalk repair along the horizontal axis and the change in sidewalk conditions between 2012 and 2015 along the vertical axis. As participation increases in neighborhoods with fewer white residents, as represented by the blue circles and line, sidewalk conditions improve to a greater degree. In whiter neighborhoods, however – as represented by the red circles and line, participation had little influence on the degree of improvement in conditions. At the low end of the spectrum of participation, less white neighborhoods show less improvement in conditions than more white neighborhoods. Yet at high levels of participation, towards the right of the plot, the improvement in sidewalk conditions in less white neighborhoods is on par with that in more white neighborhoods. For sidewalks in blockgroups with a below-median proportion of white residents, improvement in conditions only reaches parity with those sidewalks in whiter neighborhoods when at least 3 requests for repair are made via the city's 311 system.

Figure 5 shows similar dynamics at play with income and participation, though divided by the income of each street's neighborhood, with lower-income neighborhoods represented by the blue circles and line and higher-income neighborhoods by the red circles and line. As participation increases (moving to the right along the horizontal axis), the improvement in sidewalk conditions is greater in lower-income neighborhoods, as represented by the positive slope of the blue line. At the higher end of the participation measure, sidewalk conditions in low-income neighborhoods improved on par with those sidewalks in higher-income areas. However, in lower-income neighborhoods with less constituent participation, sidewalk conditions did not improve at the same rate as in higher-income neighborhoods with low participation levels.

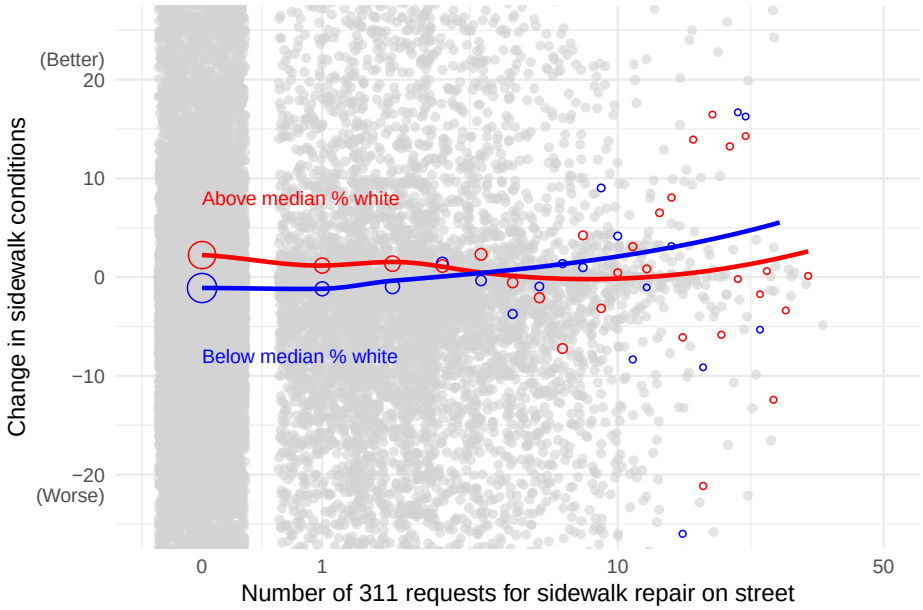

Figure 4: Change in sidewalk conditions by participation and race. Red open circles represent binned means for streets in blockgroups with above-median % white residents, and blue open circles represent binned means for streets in blockgroups with below-median % white residents, both scaled in size according to the number of street segments within the bin. Grey filled circles each represent a single street segment. Lines are local averages (loess).

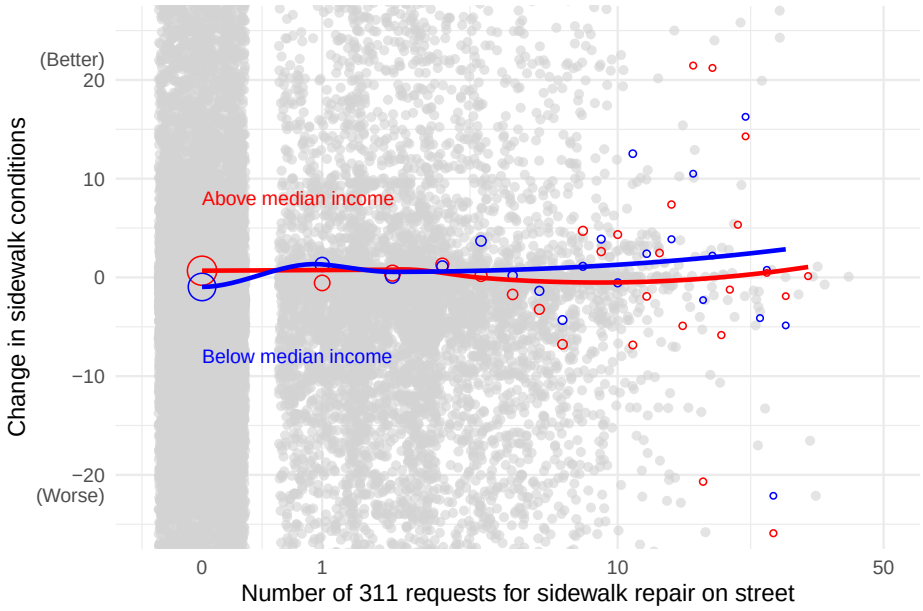

Figure 5: Change in sidewalk conditions by participation and income. Red open circles represent binned means for streets in blockgroups with above-median median incomes, and blue open circles represent binned means for streets in blockgroups with below-median median incomes, both scaled in size according to the number of street segments within the bin. Grey filled circles each represent a single street segment. Lines are local averages (loess).

Mechanisms

What drives these different patterns of service delivery between neighborhoods of different racial demographics and income levels? In this section, I explore several different possibilities for the mechanism behind these inequities in outcomes and differential responsiveness.

One possibility is that local decisionmakers are engaging in *positive* discrimination. As Goodsell (1981) notes, negative discrimination is often unfeasible within the constraints of bureaucratic rules. Instead, positive discrimination might occur towards favored neighborhoods — for instance, the "granting of personal favors in the form of extra-attentive behavior" (Goodsell, 1981, 771). Taking extra time with resident's service requests might occur for certain types of residents rather than others because of familiarity or comfort on the part of government employees. These employees' personal backgrounds and the information they bring from their own experiences may shape such levels of comfort (Butler, 2014). This could lead to similar patterns of inequities, in which even a low number of service requests for sidewalk repairs in white and wealthy neighborhoods get extra attention, while those requests coming from more heavily minority or poor neighborhoods might not receive extra attention.

To explore this mechanism, I use a subset of 311 service records included in the city's full dataset that hint at the priorities of city workers. Often when fulfilling constituents' service requests in the field, public works employees report fixing additional problems in the neighborhood that they notice and logging those requests via the 311 system and then immediately fulfilling them.[9] Analyzing the locations of these employee-initiated 311 records is one preliminary way to assess whether this mechanism may play a role in the systematic inequities observed in sidewalk infrastructure. Figure 6 shows the correspondence between neighborhood racial (top panel) and income (bottom panel) patterns and employee-generated 311 requests, which mirror the patterns from Figure 3.

As shown in both panels, the same neighborhoods that improved in their sidewalk condi-

[9]This observation was based on author interviews with public works department managers.

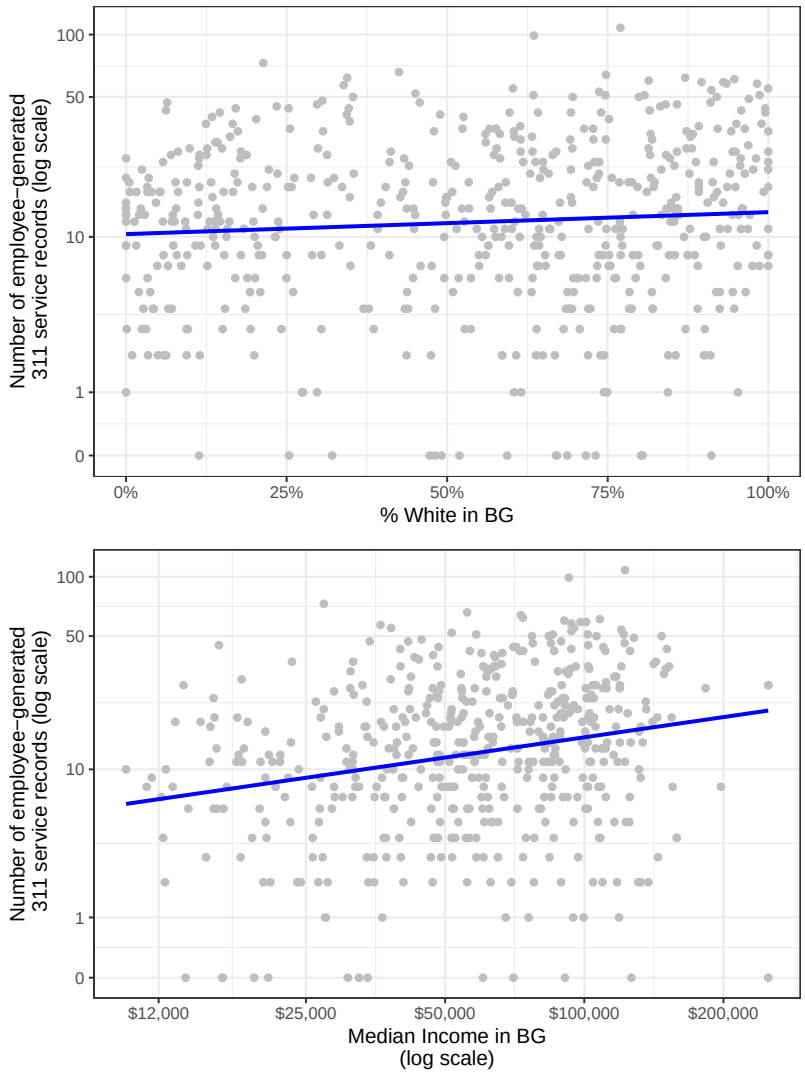

Figure 6: Number of city employee-generated 311 service records for sidewalk repair, by neighborhood racial demographics (top) and income (bottom)

tions during this period — whiter and wealthier areas — also accumulated more employee-initiated 311 service records. In whiter neighborhoods (i.e. those blockgroups with an above-median percentage of white residents), there were 19 employee-initiated 311 records for sidewalk repair on average. In contrast, in neighborhoods with below-median percentages of white residents there were only 16 employee-generated records on average. Similarly, in high-income neighborhoods there were an average of 21 employee-generated records, while in low-income neighborhoods there were an average of only 14 records. These differences suggest that positive discrimination may be occurring among public works employees.

Another potential mechanism behind these inequities is that street-level bureaucrats implementing the policies behind sidewalk repair engage in negative discrimination of some kind. They could penalize certain neighborhoods in their provision of sidewalk repairs because of their underlying beliefs or prejudices. This could be taste-based (i.e. racism, or classism), or it could be statistical discrimination (i.e. not based on overt prejudice but instead in a belief that neighborhoods with more non-white or poor residents do not need more sidewalk repairs). There is some evidence that the latter phenomenon may be happening. For instance, the Menino Survey of Mayors in 2018 found that 86% of big-city mayors reported a belief that street maintenance was equitably provided to white people and people of color in their city, while only 14% reported believing that such services were "better for white people" (McFarland et al., 2018). This belief among cities' top elected officials that street and sidewalk infrastructure provision is already equitable may be what causes bureaucrats in their cities to deliver services that perpetuate existing inequities rather than ameliorate them. Further examination of this type of discrimination is needed, and could include an assessment of the role of information in forming bureaucrats' perceptions of need for services. This question is also ripe for an experimental examination, especially in an arena in which we know so little about government decision-making and in which marginal increases in information are likely to have a large impact (Butler, 2019).

A third mechanism that may be generating these patterns of service delivery is the possibility that some residents work outside official channels of service delivery to request government attention. For instance, city residents might privately communicate to their elected leaders requesting repairs of sidewalks in their neighborhoods. Some residents might be more likely to use this path of communication: those who are more comfortable and trusting of their political leaders, those who have more time and resources, and, much as with other forms of political participation, those who belong to a majority racial group. Such imbalances in informal communication might lead to the patterns I observe: namely, that sidewalks in whiter and wealthier neighborhoods improve even without large numbers

of official citizen 311 requests submitted. Residents in whiter and wealthier neighborhoods might simply communicate with their government in other ways *as well as* via official 311 channels. Records of emails, letters, and phone calls to elected officials or their staff – and the demographics of the people making use of these channels of communication – might help to understand whether this mechanism is at play.[10] Understanding such patterns of participation may help to further uncover the causes of the inequities documented in this paper.

Consequences

What are the consequences of the inequitable provision of services along racial and class lines? To assess this, I move to analyzing an additional source of data: survey data conducted by the City of Boston to assess constituents' satisfaction with their 311 request. This short survey features several questions, one of which asks for respondents' overall satisfaction with the response and service from the city in responding to their request. One consequence of disparities in city service provision may be downstream divisions in residents' satisfaction with their government along similar lines of race and class.

To examine whether this phenomenon occurs, I compare survey reports of satisfaction with the city's response to residents' sidewalk repair requests. Figure 7 displays residents' survey responses divided between service requests in higher income vs. lower income blockgroups (upper set of points) and in whiter vs. less white blockgroups (lower points). Both panels show that the disparities in city service provision described earlier in this paper correspond with sharp divides in satisfaction with the city's 311 service as well. On average, 66% of survey respondents who made 311 requests in more affluent areas of the city reported being "satisfied" or "very satisfied" after the closure of their service request. In contrast, only 47% of survey respondents who made requests in less affluent areas reported being

[10]Unfortunately, the City of Boston has made a policy of not disclosing email and phone communications records despite public records requests.

"satisfied" or "very satisfied." Similar divisions appear along racial lines: 67% of survey respondents in more white areas reported being "satisfied" or "very satisfied" while only 40% of respondents in less white areas were satisfied following their requests.[11] These differences are not necessarily *caused* by the city's handling of their repair request – there may be a host of other reasons for survey respondents in these areas to be less prone to satisfaction or approval of the city government's job. Yet the correspondence between racial demographics and income and satisfaction with a basic city service indicates that there may be downstream consequences to the systematic inequities described earlier in this paper.

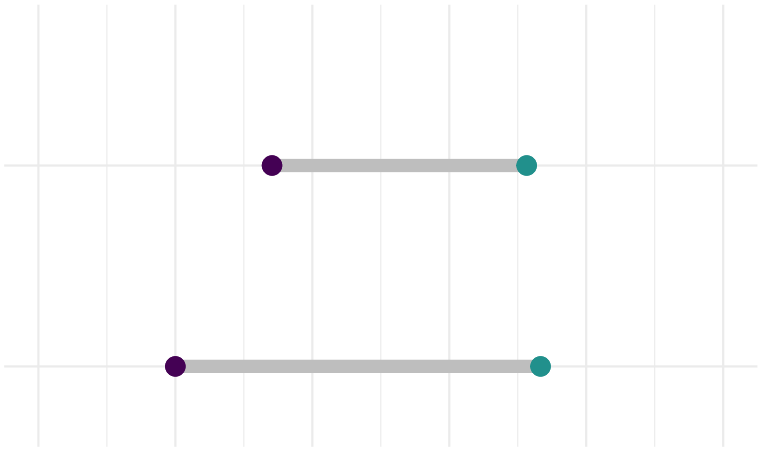

Figure 7: Satisfaction with city's 311 service by race and income

Conclusion

Representation in policy — both ideological and non-ideological — is an important hallmark of the health of democracy. The implementation stage of policy, which is rife with opportunity for bureaucratic discretion, is one place where this fault in democratic representation may arise. Diagnosing biases that occur in the administration of public services, as well as the degree to which citizen participation may close gaps in service quality, is important for

[11] In Appendix F I present regressions analyzing whether these differences correspond more systematically with race and income. These examinations corroborate the basic differences presented here.

any assessment of the functioning of democracy.

In this paper, I utilize fine-grained data on policy implementation at the local level to show that biases exist in basic service delivery along racial and socio-economic lines. These data allow me to examine this question in a place where representational biases have immediate consequences for the daily lives of constituents. These biases may also have downstream consequences on mobility, property values, and public safety.

Utilizing these data in combination with data on localized constituent service requests, I also show that political participation may close gaps in service delivery that result from existing representational biases. However, the underlying patterns in participation rates differ along lines of race and income, as documented by some previous research (Kontokosta and Hong, 2021; Minkoff, 2016) but in contrast to other previous research (Clark, Brudney, and Jang, 2013). Because of these different base rates in participation, the rewards to political participation are skewed. In places where citizens engage in targeted political participation, government services are more likely to improve — leading to limited biases in representation. Yet in areas with less participation, inequities persist. Thus participation may be a limited tool for ensuring equity.

The consequences of these inequities are real, though the ability to fully uncover them is limited. The initial evidence presented here suggests that the city's worse provision of sidewalk repair to minority and poor neighborhoods may result in lower levels of satisfaction among residents in these areas. Such dissatisfaction may lead to apathy and subsequent lack of engagement with official routes of participation, such as 311 (Clark and Brudney, 2019). Thus the eventual result of the inequitable provision of services may compound participatory differences and therefore further future inequities in service provision. However, such inequities in service provision may also have downstream consequences that are less obvious, such as worse health outcomes (Sallis et al., 2009). The inequitable distribution of repair to sidewalk infrastructure may therefore exacerbate environmental injustices.

The findings from this paper suggest several open avenues of research. While the analy-

ses presented here showing inequities are largely descriptive — indicating patterns of service delivery across space that align with socio-demographic residential patterns — more research is needed to better understand where in the policy implementation process these biases arise. For instance, future research should further examine the behavioral processes of policymakers and other government workers whose decisions lead to inequities. In addition, the results presented here leave open the question of how to fix modes of participation that currently favor those with existing political capital and resources. Future work could test strategies for encouraging participation among those who receive lower levels of government service. If participation is to be relied upon as a panacea for solving representational biases, answering such questions about increasing engagement with and trust of government are key to eventually ensuring more equitable service delivery.

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Appendix for
"Where the Sidewalk Ends: How Participation Contributes to Inequity in Basic Government Service Provision"

A Bivariate comparisons of sidewalk conditions

In this section, I replicate the bivariate analyses of the change in sidewalk conditions shown in Figure 2 of the main manuscript. In addition, Table A3 includes the initial condition of sidewalks as a control in the regression of the change in sidewalk conditions on demographics.

Table A2: Correlates of change in sidewalk conditions, 2012-2015

	Dependent variable:					
	Street's average change in sidewalk conditions, 2012-2015					
	(1)	(2)	(3)	(4)	(5)	(6)
Above-median sidewalk conditions, T1	−13.530***					
	(0.307)					
Sidewalk conditions index, 2012		−0.333***				
		(0.005)				
Above-median % white in BG			2.595*			
			(1.392)			
% white in BG				6.728***		
				(1.661)		
Above-median BG median income					0.769	
					(1.252)	
Log(BG median income)						0.051
						(0.994)
Constant	7.002***	22.007***	−0.945	−3.311***	−0.393	−0.525
	(0.217)	(0.360)	(1.079)	(0.995)	(0.908)	(10.922)
Observations	24,527	24,527	24,286	24,286	22,348	22,348
R^2	0.073	0.152	0.003	0.007	0.0002	0.00000
Adjusted R^2	0.073	0.152	0.003	0.007	0.0002	−0.00004
Note:						*p<0.1; **p<0.05; ***p<0.01
						Standard errors clustered by blockgroup in models 3-6

Table A3: Differential change in sidewalk conditions

	Dependent variable:			
	Street's average change in sidewalk conditions, 2012-2015			
	(1)	(2)	(3)	(4)
Above-median BG median income	−0.151		−1.142	
	(1.659)		(1.566)	
Log(BG median income)		−0.798		−1.714
		(1.335)		(1.232)
Above-median % white in BG	2.697	3.196*		
	(1.652)	(1.672)		
% white in BG			6.286***	7.309***
			(2.212)	(2.178)
Sidewalk conditions index, 2012	−0.333***	−0.332***	−0.331***	−0.330***
	(0.018)	(0.018)	(0.018)	(0.018)
Constant	20.401***	28.804**	18.812***	36.423***
	(1.666)	(14.053)	(1.701)	(12.869)
Observations	22,348	22,348	22,348	22,348
R^2	0.162	0.162	0.164	0.164
Adjusted R^2	0.162	0.162	0.164	0.164

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered by blockgroup

B Predictors of 311 Service Requests

To assess how levels of participation correspond to racial and socioeconomic characteristics of neighborhoods, I compare the propensity of neighborhoods to request repairs for their sidewalks across levels of race and income. Table A4 shows the results from the regression of the log of the number of requests for sidewalk repair +1 on income and racial demographics. Both race and income are predictive of the neighborhood propensity to request services. As the regression results indicate, streets in blockgroups that had a higher percentage of white residents, even holding income constant, were more likely to receive more calls for sidewalk repair during this period.

Table A4: Predictors of Service Requests for Sidewalk Repair, 2012-2015

	Dependent variable:	
	Log(# 311 requests on street + 1)	
	(1)	(2)
Log(BG median income)	0.016	0.0004
	(0.027)	(0.028)
Above-median % white in BG	0.206***	
	(0.029)	
% white in BG		0.344***
		(0.044)
Constant	0.147	0.235
	(0.293)	(0.290)
Observations	22,348	22,348
R^2	0.026	0.026
Adjusted R^2	0.026	0.026
Note:		*p<0.1; **p<0.05; ***p<0.01
		Standard errors clustered by blockgroup

C Analyses with Alternative Measures of Participation and Demographics

In this section, I present additional analyses of sidewalk conditions with alternative specifications of the measures of both participation and demographics. I show these results by race in Table A5 and income in Table A6. In both tables, I include multiple methods of operationalizing participation, and multiple methods of operationalizing the demographic characteristic of interest.

As shown with the analyses in the main body of the paper, participation is associated with a greater improvement in conditions in less white neighborhoods, as represented by the base effect of each measure of participation (rows 1, 2, 5, 6, 7, and 8 in Table A5). Meanwhile, the interaction terms are negative, indicating a smaller effect of participation in whiter neighborhoods. This differential effect is negative across all model specifications, though its size fluctuates due to the different range of the measures used. Across model specifications, the base effect of being in a whiter neighborhood is large, positive, and statistically significant. As with the analyses presented in the main body of the paper, this base effect dwarfs the negative interaction between participation and racial demographics.

Table A6 presents similar alternatives for income and participation. The results are again relatively consistent across model specifications. Universally, the measures of participation are associated with improvements in sidewalk conditions, as indicated by the positive coefficients (rows 1, 2, 5, 6, and 7 in Table A6). Though not all of these coefficients are statistically significant, each measure of participation is associated with greater improvement in the conditions of sidewalks. The interactions between the measures of participation and the measures of higher income, however, indicate differential effects of participation (rows 4, 10, 11, 12, 13, 14). Specifically, the negative values of all these coefficients indicate that participation has a smaller effect on sidewalk conditions when it occurs in higher income areas. In most cases, this smaller effect of participation is entirely swamped by the base effect of

Table A5: The Role of Participation by Race

	Dependent variable:							
	Street's average Δ in sidewalk conditions, 2012-2015							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(311 requests on street + 1)	2.235**	0.685						
	(0.938)	(0.955)						
Log(311 requests in BG + 1)					3.614***	0.741		
					(1.094)	(1.762)		
% white in BG	8.649***				36.420***			
	(1.811)				(6.299)			
Log(311 requests on street + 1) × % white in BG	−4.608***							
	(1.275)							
> 0 311 requests on street			0.581					
			(1.280)					
# 311 requests on street				0.263				
				(0.291)				
> 0 311 requests in BG							9.258***	
							(2.377)	
# 311 requests in BG								0.089
								(0.071)
Above-median % white in BG		3.399**	3.336**	3.137**		14.783**	30.801***	6.125***
		(1.593)	(1.633)	(1.508)		(6.063)	(4.000)	(2.268)
Log(311 requests on street + 1)×above-median % white in BG		−1.799*						
		(1.086)						
> 0 311 requests on street×above-median % white in BG			−2.027					
			(1.461)					
311 requests on street×above-median % white in BG				−0.520				
				(0.332)				
Log(311 requests in BG + 1)×% white in BG					−9.739***			
					(2.026)			
Log(311 requests in BG + 1)×above-median % white in BG						−3.890*		
						(2.032)		
> 0 311 requests in BG×above-median % white in BG							−28.446***	
							(4.240)	
# 311 requests in BG×above-median % white in BG								−0.149*
								(0.077)
Constant	−4.089***	−1.159	−1.099	−1.135	−13.389***	−2.826	−10.001***	−2.403
	(1.043)	(1.259)	(1.303)	(1.178)	(2.626)	(5.094)	(2.109)	(1.854)
Observations	24,286	24,286	24,286	24,286	24,286	24,286	24,286	24,286
R^2	0.009	0.003	0.003	0.003	0.021	0.009	0.005	0.006
Adjusted R^2	0.009	0.003	0.003	0.003	0.021	0.008	0.005	0.006

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered by blockgroup

income (again, measured in multiple ways). As in the analyses presented in the main body of the paper, the measures of higher income are all positive, indicating that streets in higher income areas were more likely to improve during this time period even with no constituent 311 participation.

Table A6: The Role of Participation by Income

	Dependent variable:						
	Street's average Δ in sidewalk conditions, 2012-2015						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log(311 requests on street + 1)	13.755	1.242*					
	(9.692)	(0.739)					
Log(311 requests in BG + 1)					14.421	2.103**	
					(11.070)	(1.050)	
Log(BG median income)	0.565				3.054		
	(1.186)				(3.265)		
Log(311 requests on street + 1)×Log(BG median income)	−1.223						
	(0.871)						
> 0 311 requests on street			1.889**				
			(0.915)				
# 311 requests on street				0.307			
				(0.241)			
# 311 requests in BG							0.105
							(0.077)
Above-median BG median income		1.498	1.645	1.194		8.244**	2.696
		(1.343)	(1.361)	(1.306)		(4.168)	(1.876)
Log(311 requests on street + 1)×above-median BG median income		−1.814**					
		(0.894)					
> 0 311 requests on street×above-median BG median income			−2.705**				
			(1.144)				
311 requests on street×above-median BG median income				−0.435			
				(0.292)			
Log(311 requests in BG)×Log(BG median income)					−1.231		
					(1.001)		
Log(311 requests in BG)×above-median BG median income						−2.731*	
						(1.443)	
311 requests in BG×above-median BG median income							−0.109
							(0.082)
Constant	−6.251	−0.848	−0.963	−0.663	−35.839	−5.843**	−2.173
	(13.034)	(0.975)	(0.991)	(0.944)	(35.672)	(2.748)	(1.477)
Observations	22,348	22,348	22,348	22,348	22,348	22,348	22,348
R^2	0.0004	0.001	0.001	0.001	0.002	0.003	0.002
Adjusted R^2	0.0003	0.001	0.001	0.0005	0.002	0.003	0.002

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered by blockgroup

D Provision of Services Using Levels

In this section, I replicate all the main analyses of the provision of sidewalk repair but instead of change in sidewalk conditions I use the level of sidewalk conditions in 2015 as my main dependent variable. To control for potential confounding between sidewalks in different types of places, I include the measure of conditions in 2012 (in other words, a lag of the dependent variable) in all models along with other predictors.

Table A7: Correlates of sidewalk conditions in 2015

	Dependent variable:			
	Street's sidewalk conditions, 2015			
	(1)	(2)	(3)	(4)
Above-median BG median income	1.408			
	(1.146)			
Log(BG median income)		0.793		
		(0.917)		
Above-median % white in BG			1.989	
			(1.339)	
% white in BG				5.574***
				(1.537)
Sidewalk conditions, 2012	0.665***	0.665***	0.666***	0.667***
	(0.018)	(0.018)	(0.017)	(0.017)
Constant	21.078***	13.128	21.206***	19.088***
	(1.688)	(10.131)	(1.711)	(1.622)
Observations	22,348	22,348	24,286	24,286
R^2	0.430	0.429	0.424	0.426
Adjusted R^2	0.429	0.429	0.424	0.426
Note:				*p<0.1; **p<0.05; ***p<0.01
				Standard errors clustered by blockgroup

Across all models in Tables A7 and A8, I find that previous conditions (measured in 2012)

Table A8: Correlates of sidewalk conditions in 2015

	Dependent variable:			
	Street's sidewalk conditions, 2015			
	(1)	(2)	(3)	(4)
Above-median BG median income	−0.151		−1.142	
	(1.659)		(1.566)	
Log(BG median income)		−0.798		−1.714
		(1.335)		(1.232)
Above-median % white in BG	2.697	3.196*		
	(1.652)	(1.672)		
% white in BG			6.286***	7.309***
			(2.212)	(2.178)
Sidewalk conditions, 2012	0.667***	0.668***	0.669***	0.670***
	(0.018)	(0.018)	(0.018)	(0.018)
Constant	20.401***	28.804**	18.812***	36.423***
	(1.666)	(14.053)	(1.701)	(12.869)
Observations	22,348	22,348	22,348	22,348
R^2	0.431	0.431	0.432	0.433
Adjusted R^2	0.431	0.431	0.432	0.433

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered by blockgroup

are a statistically significant and positive predictor of conditions in 2015. In other words, sidewalks that were in better condition previously were more likely to be in better condition in 2015. This is perhaps unsurprising: the amount of change — either improvement or deterioration — is likely to be small on average across the city. However, the demographic predictors in Tables A7 and A8 illustrate a broader trend by racial demographics as well. When controlling for previous conditions and income, sidewalks in areas with higher white population were more likely to have better conditions in 2015.

I next assess how participation affects sidewalk conditions in 2015, while controlling for previous conditions. These results are shown below in Tables A9 and A10. These results corroborate the evidence presented in the main text of the paper. Table A9 shows that previous sidewalk conditions continue to have a large and statistically significant positive effect on later conditions, but that the income of the area surrounding the sidewalk shows an inconsistent effect that is in all cases statistically indistinguishable from zero.

Table A10, on the other hand, shows that participation and race predict sidewalk conditions. Holding previous conditions constant, those sidewalks in whiter areas had better conditions in 2015. This effect is statistically significant when using the measure for raw % white (columns 2 and 4), though it is smaller and insignificant when using a binary measure (columns 1 and 3). Participation also appears to have a small positive effect on later conditions for sidewalks in less white areas, as measured by the base effect of participation in columns 2 and 4. The interaction between participation and the racial demographic measure is negative and statistically significant in columns 2 and 4, and more than negates the base effect of 311 calls.

Table A9: The Role of Participation by Income

	Dependent variable:			
	Sidewalk conditions, 2015			
	(1)	(2)	(3)	(4)
Log(311 requests on street + 1)	1.015	7.467		
	(0.684)	(8.461)		
Log(311 requests in BG + 1)			1.368	−1.659
			(0.946)	(9.842)
Above-median BG median income	1.921		4.102	
	(1.231)		(3.862)	
Log(BG median income)		1.051		−0.450
		(1.078)		(2.876)
Sidewalk conditions, 2012	0.665***	0.665***	0.666***	0.665***
	(0.018)	(0.018)	(0.018)	(0.018)
Log(311 requests on street + 1)×Above-median BG median income	−1.311			
	(0.825)			
Log(311 requests on street + 1)×Log(BG median income)		−0.653		
		(0.758)		
Log(311 requests in BG + 1)×Above-median BG median income			−1.105	
			(1.327)	
Log(311 requests in BG + 1)×Log(BG median income)				0.231
				(0.890)
Constant	20.692***	10.177	17.481***	24.190
	(1.737)	(11.904)	(2.901)	(31.471)
Observations	22,348	22,348	22,348	22,348
R^2	0.430	0.429	0.430	0.430
Adjusted R^2	0.430	0.429	0.430	0.430

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered by blockgroup

Table A10: The Role of Participation by Race

	Dependent variable:			
	Sidewalk conditions, 2015			
	(1)	(2)	(3)	(4)
Log(311 requests on street + 1)	0.146	1.410		
	(0.997)	(0.983)		
Log(311 requests in BG + 1)			0.105	2.255**
			(1.813)	(1.114)
Above-median % white in BG	2.321		7.774	
	(1.552)		(6.111)	
% white in BG		6.849***		25.424***
		(1.671)		(6.741)
Sidewalk conditions, 2012	0.667***	0.668***	0.669***	0.674***
	(0.017)	(0.017)	(0.017)	(0.017)
Log(311 requests on street + 1)× Above-median % white in BG	−0.685			
	(1.089)			
Log(311 requests on street + 1)× % white in BG		−3.011**		
		(1.310)		
Log(311 requests in BG + 1)× Above-median % white in BG			−1.789	
			(2.045)	
Log(311 requests in BG + 1)× % white in BG				−6.448***
				(2.111)
Constant	21.138***	18.542***	20.740***	12.291***
	(1.851)	(1.659)	(5.417)	(2.920)
Observations	24,286	24,286	24,286	24,286
R^2	0.424	0.427	0.425	0.430
Adjusted R^2	0.424	0.427	0.425	0.430

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered by blockgroup

E Provision of Services, Alternative Aggregations

In this section, I replicate all the main analyses of the provision of sidewalk repair but instead of aggregating to the street segment level I aggregate to the Census blockgroup level.

Table A11: Correlates of change in blockgroup sidewalk conditions, 2012-2015

	Dependent variable:					
	BG's average change in sidewalk conditions, 2012-2015					
	(1)	(2)	(3)	(4)	(5)	(6)
Above-median sidewalk conditions, T1	−10.122***					
	(1.024)					
Sidewalk conditions, T1		−0.314***				
		(0.028)				
Above-median % white in BG			4.695***			
			(1.091)			
% white in BG				8.861***		
				(1.533)		
Above-median BG median income					1.487	
					(1.150)	
Log(BG median income)						0.457
						(0.916)
Constant	5.270***	20.664***	−2.129***	−4.523***	−0.650	−4.902
	(0.864)	(2.090)	(0.764)	(0.890)	(0.810)	(10.052)
Observations	552	552	546	546	502	502
R^2	0.151	0.184	0.033	0.045	0.003	0.0005
Adjusted R^2	0.149	0.182	0.031	0.043	0.001	−0.002

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered by blockgroup

Table A12: Differential change in sidewalk conditions in blockgroups

	Dependent variable:			
	BG's average change in sidewalk conditions, 2012-2015			
	(1)	(2)	(3)	(4)
Above-median BG median income	−0.262		−1.535	
	(1.313)		(1.328)	
Log(BG median income)		−1.176		−2.222**
		(1.051)		(0.998)
Above-median % white in BG	3.754***	4.425***		
	(1.307)	(1.357)		
% white in BG			8.786***	9.984***
			(1.927)	(1.860)
Sidewalk conditions, T1	−0.313***	−0.311***	−0.310***	−0.307***
	(0.029)	(0.029)	(0.029)	(0.029)
Constant	18.685***	30.926***	16.297***	38.993***
	(2.170)	(10.926)	(2.143)	(10.308)
Observations	502	502	502	502
R^2	0.213	0.215	0.226	0.231
Adjusted R^2	0.208	0.210	0.222	0.227

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered by blockgroup

Table A13: Predictors of Service Requests for Sidewalk Repair, 2012-2015

	Dependent variable:	
	Log(# 311 requests in BG + 1)	
	(1)	(2)
Log(BG median income)	0.368^{***}	0.315^{***}
	(0.089)	(0.089)
Above-median % white in BG	0.424^{***}	
	(0.096)	
% white in BG		0.803^{***}
		(0.142)
Constant	-1.553^{*}	-1.186
	(0.942)	(0.927)
Observations	505	505
R^2	0.178	0.189
Adjusted R^2	0.175	0.186
Note:		*p<0.1; **p<0.05; ***p<0.01
		Standard errors clustered by blockgroup

Table A14: The Role of Participation by Income

	Dependent variable:			
	BG's average change in sidewalk conditions, 2012-2015			
	(1)	(2)	(3)	(4)
Log(311 requests in BG + 1)	27.534***		2.411**	
	(9.939)		(0.953)	
# 311 requests in BG		0.985*		0.117*
		(0.540)		(0.068)
Log(BG median income)	6.583**	1.912		
	(2.715)	(1.343)		
Log(311 requests in BG + 1) ×Log(BG median income)	−2.475***			
	(0.903)			
#311 requests in BG ×Log(BG median income)		−0.087*		
		(0.047)		
Above-median BG median income			13.699***	4.606**
			(4.009)	(1.811)
Log(311 requests in BG + 1)×above-median BG median income			−4.566***	
			(1.364)	
# 311 requests in BG×above-median BG median income				−0.171**
				(0.075)
Constant	−72.629**	−21.172	−6.406**	−2.346*
	(29.429)	(14.748)	(2.490)	(1.292)
Observations	502	502	502	502
R^2	0.017	0.007	0.027	0.015
Adjusted R^2	0.011	0.001	0.021	0.009
Note:				*p<0.1; **p<0.05; ***p<0.01
				Standard errors clustered by blockgroup

Table A15: The Role of Participation by Race

	Dependent variable:			
	BG's average change in sidewalk conditions, 2012-2015			
	(1)	(2)	(3)	(4)
Log(311 requests in BG + 1)	3.960***	2.242***		
	(1.092)	(0.829)		
% white in BG	35.090***			
	(5.091)			
Log(311 requests in BG + 1) × % white in BG	−9.537***			
	(1.785)			
> 0 311 requests in BG			9.471**	
			(3.801)	
# 311 requests in BG				0.111**
				(0.046)
Above-median % white in BG		20.705***	29.499***	8.956***
		(3.396)	(5.934)	(1.591)
Log(311 requests in BG + 1)×above-median % white in BG		−5.851***		
		(1.175)		
> 0 311 requests in BG×above-median % white in BG			−25.385***	
			(6.035)	
# 311 requests in BG×above-median % white in BG				−0.213***
				(0.056)
Constant	−14.485***	−7.429***	−11.249***	−3.672***
	(2.670)	(2.118)	(3.722)	(1.036)
Observations	546	546	546	546
R^2	0.090	0.076	0.053	0.057
Adjusted R^2	0.084	0.071	0.048	0.052
Note:				*p<0.1; **p<0.05; ***p<0.01
				Standard errors clustered by blockgroup

F Consequences of Unequal Service Provision

In this section, I display the analyses of survey responses along racial and class lines. These analyses corroborate the basic cross-sectional differences presented in the main body of the paper, and show that race and income are both substantively and statistically significantly associated with residents' satisfaction with the city's handling of sidewalk repair requests.

Table A16: Determinants of sidewalk repair survey responses

	Dependent variable:			
	Overall satisfaction with handling of 311 request			
	(1)	(2)	(3)	(4)
Above-median % white in BG	0.972***			
	(0.263)			
% white in BG		1.427***		
		(0.402)		
Above-median BG median income			0.767***	
			(0.260)	
Log(BG median income)				0.542**
				(0.229)
Constant	2.783***	2.553***	2.971***	−2.548
	(0.229)	(0.296)	(0.221)	(2.579)
Observations	305	305	297	297
R^2	0.051	0.041	0.036	0.022
Adjusted R^2	0.048	0.038	0.032	0.019
Note:				*p<0.1; **p<0.05; ***p<0.01
				Standard errors clustered by blockgroup