Who Gets a Streetlight? Unequal Responsiveness in City Services*

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Abstract

Recent work raises concerns about whether all citizens have equal political voice. We assess inequalities in public goods and service provision in U.S. cities, the primary provider of these resources. We introduce the largest dataset of citizen-initiated demands for services — almost 25 million requests from 15 cities over a 10-year period. We link these data to information about neighborhood characteristics, and show that cities respond faster to advantaged neighborhoods than less advantaged neighborhoods. However, we show that these substantive magnitude of these differences are small. For example, we find that service demands from white neighborhoods are responded to about 1.9 *hours* faster than the same demands from less white neighborhoods. These findings lead us to conclude that citizens of all economic and demographic backgrounds are much closer to "political equals" than not in access to public goods and services.

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An essential ingredient of democratic government is the "responsiveness of the government to the preferences of its citizens, *considered as political equals [emphasis added]*" (Dahl 1971, 1). Past work suggests that federal and state policy reflects public preferences (Erikson, Wright, and McIver 1993; Lax and Phillips 2012; Simonovits, Guess, and Nagler 2019), and that *changes* in mass preferences correspond to similar movement in policy outputs (Caughey and Warshaw 2018; Page and Shapiro 1983; Stimson, Mackuen, and Erikson 1995; Soroka and Wlezien 2010).

There is increasing concern, however, that government tends to prioritize the preferences of the advantaged: there is a tighter link between the preferences of legislators and the preferences of white and black citizens than with those of non-white and poor citizens (Bartels 2008; Ellis 2012; Griffin and Newman 2007, 2008; Rigby and Wright 2011), and affluent opinion is a stronger predictor of policy changes than non-affluent opinion (Gilens 2005, 2012). These effects may also be exacerbated because candidates and thus elected officials tend to be members of advantaged groups (e.g., Juenke 2014; Shah 2014), and politicians' personal backgrounds often shape their decision-making while in office (Burden 2007; Butler 2014; Carnes 2013). In sum, despite a clear link between aggregate preferences and policy, citizens appear far from "political equals" in national and state politics and policymaking.

Though there is much less work on (unequal) responsiveness in local politics, findings thus far comport with expectations from the state and national politics literature: local policies reflect citizen policy preferences (Tausanovitch and Warshaw 2014) and cities spend more on municipal services (e.g., parks and recreation, public transportation, etc.) as support for Democratic presidential candidates increases (Einstein and Kogan 2016), even as the left-right ideological positions of white and affluent citizens appear better represented among city elected officials than the positions of non-whites and affluent citizens (Schaffner, Rhodes, and La Raja 2016). Responsiveness in the local context is unique because localities are often constrained by state and national mandates in policymaking (e.g., Gerber and Hopkins 2011; Peterson 1981). Still, they have tremendous latitude in providing and maintaining access to

critical public goods and services — roads, bridges, streetlights, police, fire, water, sewers, waste collection, parks, recreation, libraries, public transportation, and much more. Indeed, these services are "at the heart of city government" (Yates 1977, 26). In this paper, we offer a test of whether cities are more responsiveness to the *service* demands and needs of the advantaged — white and affluent citizens — than those of the less advantaged.

Whether there are racial and economic inequalities in how governments allocate goods and services remains an open question. On one hand, diverse and segregated cities tend to invest less in collective goods and services (e.g., Alesina, Baqir, and Easterly 1999; Glaser 2002; Hopkins 2009; Trounstine 2016). Cities may even use public policy to ensure that goods primarily benefit predominantly white, wealthy, and politically powerful neighborhoods (Trounstine 2018). Further, non-white and poor respondents tend to evaluate city services much less favorably than do white and rich respondents, suggesting that cities may prioritize the advantaged in providing access to goods and services (e.g., DeHoog, Lowery, and Lyons 1990; Hajnal and Trounstine 2014). At the same time, other work argues that cities distribute services — and respond to citizen-initiated complaints and demands — on the basis of administrative procedures and professional bureaucratic values rather than on the basis of race or class (e.g., Jones et al. 1977, 1978; Lineberry 1977; Mladenka 1981; Nivola 1978). Understanding whether there are inequities in city services is a particularly important question given the strong link between constituent service and citizen evaluations of government and elected officials (e.g., Hajnal and Trounstine 2014; Harden 2016; Tucker 2019).

Our approach to this question mirrors contemporary work on (unequal) policy responsiveness: we measure group demands, government's response to those demands, and then assess whether government prioritizes the demands of white and wealthy citizens, relative to non-white and poor citizens. To do so, we introduce the largest and most comprehensive dataset of citizen-initiated demands for public goods and services — almost 25 million 311 requests from 15 of the largest 25 cities in the U.S. between 2008 and 2018. 311 is a

government-sponsored phone number available in many U.S. cities, and is the primary way citizens can report issues in their community. For researchers, 311 data represent the main source of information on the demands citizens place on city governments (Minkoff 2016; White and Trump 2018). The data tell us the nature of demand (e.g., a broken streetlight or a missed trash collection), where it was requested, when it was requested, and when the government closed the request. We use these data to assess whether government responds *faster* to service demands from advantaged neighborhoods than to demands from less advantaged neighborhoods. In other words, we assess whether cities prioritize whiter and richer neighborhoods using an empirical approach akin to contemporary work on policy responsiveness (e.g., Gilens 2012; Tausanovitch and Warshaw 2014).

We find *some* evidence of two kinds of inequality in responsiveness: request-based and need-based. First, consistent with audit experimental studies of constituent communication (e.g., Butler and Broockman 2011; Einstein and Glick 2017; White, Nathan, and Faller 2015), we find that cities respond to requests from whiter and and more affluent neighborhoods faster than those *same* requests from less white and affluent neighborhoods. We also find evidence of need-based inequality. We show that, to some extent, neighborhoods of different racial and economic compositions tend to request different goods and services. That is, some service demands tend to come much more often from non-white areas than white areas (and vice-versa). On average, government is slower to respond to needs of less advantaged communities than to the needs of more advantaged neighborhoods. Cities appear to prioritize both requests from and the needs of the advantaged.

The much more encouraging news for democratic governance is that these differences in responsiveness are quite small in substantive magnitude. On average, we find that service demands from white neighborhoods are responded to about 1.9 *hours* faster than the same demands from less white neighborhoods. Likewise, we find that each 1 percentage point increase in relative white neighborhood need for a given good or service (relative to non-white neighborhood need for that good) corresponds to just a 36 *minute* decrease in average wait

time. In practice, these kinds of differences appear rare, as relative needs are ultimately quite similar across advantaged and less advantaged communities. The magnitude of these effects suggests to us that, on average, cities tend to respond to requests with the same relative urgency regardless of neighborhood characteristics. Unlike with national policymaking, we see that citizens of all economic and demographic backgrounds are much closer to "political equals" than not in access to municipal public goods and services. In the conclusion, we discuss the broader implications of these findings for American democracy.

Inequality and City Services

One well-established finding in political economy is the negative relationship between local racial diversity/segregation and public goods provision (Alesina, Baqir, and Easterly 1999; Glaser 2002; Hopkins 2009; Trounstine 2016). In new work, Trounstine (2018) shows that government exacerbates racial segregation through housing and land policy. In four cities, she shows these policy decisions had corresponding effects on public goods provision, as segregated black neighborhoods had fewer sewer systems and extensions. These findings replicate across other public goods, too (Trounstine 2016). Cities may be particularly reticent to offer collective goods as white residents (and white political elites) come to see these services as primarily benefitting racial minorities (e.g., Gilens 1996; Luttmer 2001). All told, race appears to shape whether — and how — municipalities distribute goods.

White and the affluent residents also tend to view the quality of city services much more favorably than do non-white and poor residents (e.g., Aberbach and Walker 1970; DeHoog, Lowery, and Lyons 1990; Hajnal and Trounstine 2014; Schuman and Gruenberg 1972). For instance, Hajnal and Trounstine (2014) find, across 26 cities, that non-white and economically disadvantaged citizens are less satisfied with city police, fire, libraries, and schools, and that these evaluations shape general impressions of local government. These differences are substantively large, too: relative to white respondents, black respondents

evaluate city services about 6 percentage points less favorably. Other work finds that black respondents' service evaluations depend on who holds political office. Marschall and Ruhil (2007) find that blacks report higher levels of satisfaction with their neighborhood conditions, police services, and public schools when black officials serve on the city council and on the school board.

Critically, subjective measures reflect objective measures of local conditions (e.g., Holbrook and Weinschenk 2019), and tend to capture citizens' interactions and experiences with city officials, bureaucrats, and services more generally (e.g., Kelly 2003; Kelly and Swindell 2002; Percy 1986). DeHoog, Lowery, and Lyons (1990) and Hajnal and Trounstine (2014) argue that differential satisfaction reflects differential experiences with city services and treatment by elites, as the effects of race and class on service satisfaction disappear as measures of neighborhood conditions, issues, and service quality are accounted for. Moreover, Marschall and Ruhil (2007) find feelings toward police are particularly high as black mayoral tenure increases, as police forces are more responsive to service requests, and as the police force sees increases in black representation, again suggesting a strong link between evaluations and actual government performance and action. These findings are also consistent with accounts of how minority descriptive representation in Congress positively affects the provision of services focused on minority constituents (Canon 1999; Grose 2011; Lowande, Ritchie, and Lauterbach 2019). In short, racial and economic differences in evaluations reflect differential responsiveness: cities — except those with black officials serving in elected office — prioritize the demands and needs of white and affluent residents.

On the other hand, a separate literature sees the distribution of city services and resources as driven by "bureaucratic decision-rules" and *not* by neighborhood economic or racial characteristics (e.g., Jones et al. 1977, 1978; Lineberry 1977; Mladenka 1980, 1981; Mladenka and Hill 1978; Nivola 1978). Mladenka (1980) studies fire protection, educational resources, and waste collection services in Chicago, and finds that service delivery is routinized and reflect technical-rational criteria. For instance, whether a neighborhood receives

waste collection services depends not on political support or demographic characteristics, but on the distribution of home ownership, the distance to be travelled between pickups, and the amount of waste generated per neighborhood. These technical-rational criteria benefitted the advantaged and the disadvantaged; that is, in some neighborhoods, these criteria meant more and better waste collection services for the advantaged, and in others, these processes benefited to less advantaged. Others found similar patterns in Oakland (Levy, Meltsner, and Wildavsky 1974), San Antonio (Lineberry 1977), Detroit (Jones et al. 1977, 1978), and Houston (Mladenka and Hill 1978).

Some work in this tradition even test responsiveness directly using data on citizen contacts. Jones et al. (1977) and Mladenka (1981) study a small-set of citizen-initiated complaints — akin to the kinds of data we use below — and find no evidence in Chicago, Dallas, Detroit, and Houston of substantive or statistical relationship between processing time — the time it took a city to respond to a complaint — and neighborhood race or class. Likewise, Vedlitz and Dyer (1984) find no relationship between the "clear rate" — the number of calls responded to versus the number received — and race, class, or a neighborhood's political composition in Dallas. In all three studies, government's response followed administrative procedures and resource constraints (i.e., time and effort to meet a particular kind of demand).

Combined, it is unclear whether we should expect significant racial and economic inequalities in how cities respond to public goods requests. Regardless, we see past empirical tests — with the exception of some early studies noted above (e.g., Jones et al. 1977; Mladenka 1981) — as ill-equipped to detect unequal responsiveness. We argue that the strongest and most appropriate empirical approach mirrors contemporary work on unequal policy responsiveness (e.g., Gilens 2012; Griffin and Newman 2008): (1) measure the preferences — in this case, demands — of different racial and economic groups as well as how government responds to those demands; and (2) assess the statistical relationship between group demands and government responses. The results offer insight into the degree of inequality in

responsiveness.

Two Pathways to Unequal Responsiveness

Disadvantaged groups may experience inequality through a variety of mechanisms. In particular, cities may prioritize *requests* from the advantaged over those from the disadvantaged, and they may prioritize the *needs* of the advantaged over the needs of the disadvantaged — or both. More specifically, we propose two (mutually non-exclusive) pathways to unequal responsiveness. First, cities may respond to service requests — i.e., a 311 call to remove graffiti from public property — from whiter and richer neighborhoods faster than they do the *same* kind of request from less white and affluent neighborhoods. Second, the needs of neighborhoods — i.e., whether a neighborhood needs better infrastructure or better waste collection — may differ along economic and demographic lines, and in responding to all needs, government may prioritize responding to the needs of the advantaged over the disadvantaged. We further articulate both channels below.

Cities may prioritize requests from the advantaged. A growing body of audit experimental research shows that political elites — elected legislators and executives, as well as bureaucrats and other government actors — use discretion in responding to constituent communication. Butler and Broockman (2011) show legislators are 5 percentage points more likely to respond to e-mails about registering to vote from a white alias than the same email from a black alias. Critically, there appears to be limited evidence of legislators responding to strategic or partisan, electoral incentives, as legislators of both parties discriminate against black aliases at about the same rate. Rather, the biases appear to be "taste-based" in that politicians simply prefer prioritizing communications from white aliases relative to black aliases. Subsequent work reports similar biases against immigrants and Latino/as in communications with legislators, housing agency officials, and local election officials (e.g., Einstein and Kogan 2016; Gell-Redman et al. 2018; Mendez and Grose 2018; White, Nathan,

and Faller 2015).

These racial and ethnic biases tend to generalize. In a meta-analysis of audit studies in the U.S. and abroad, Costa (2017) finds that minority constituents are about 10 percentage points less likely to receive a response than a non-minority constituent. There is, however, more limited evidence of similar effects among other social and demographic groups. Though Lajevardi (2018) and Pfaff et al. (2019) find evidence of religious bias toward Muslims, others find no evidence discrimination against low-income constituents (Carnes and Holbein 2019) and same-sex couples seeking to obtain a marriage license (Lowande and Proctor 2019).

Like audit studies, we define request-based inequality as city's propensity to respond to requests from whiter and more affluent communities faster than the same request from less white and affluent neighborhoods. In short, holding demand-side considerations constant, cities prioritize the advantaged: when a predominantly white neighborhood and a predominantly non-white neighborhood both report an overflowing sewer, government tends to fix the sewer in the whiter neighborhood before the sewer in the less white neighborhood. In empirical terms, for a given service, we would observe a *faster* response time for requests from whiter and more affluent neighborhoods relative to requests from a less white and poorer neighborhoods.

In responding to all requests, cities may also discriminate against the *needs* of the less advantaged. Different neighborhoods are likely to need different kinds of services, and in turn place different demands on government. For instance, Thornton et al. (2016) find that predominently low-income and non-white neighborhoods tend to have more graffiti, broken windows, and litter than wealthier neighborhoods and areas with more white residents. Similarly, they show that more advantaged neighborhoods have poorer sidewalk conditions. Neckerman et al. (2009) report that poorer areas have fewer street trees and less clean streets. If demands follow needs, poorer and less white neighborhoods should ask government for different kinds of goods and service than wealthier and whiter neighborhoods. Minkoff (2016) examines 311 data — as we do below — in New York City, and finds broad support for

the link between need and revealed demand via contacting These findings are also consistent with early work suggesting that the primary predictor of citizen-initiated contacting is need (e.g., Thomas 1982; Vedlitz, Dyer, and Durand 1980), even above and beyond the influence of socioeconomic predictors of civic and political participation more generally (e.g., Verba and Nie 1972).

Unlike request-based inequality, demand-side considerations drive need-based inequality; if predominantly white neighborhoods tend to need sidewalk repairs and predominantly non-white neighborhoods tend to ask for graffiti removal, government will respond to requests for sidewalk repairs faster than to requests for graffiti removal. Need-based inequality would mean observing a *faster* response time for the kinds of services most often requested in whiter and more affluent neighborhoods relative to those most often needed in less white and affluent areas.

Two different mechanisms may drive need-based inequality. Differential responsiveness to needs may reflect the less advantaged tending to ask for goods and services that simply take more government resources to respond to. If so, need-based inequality may reflect government capacity; it is less a deliberate expression of a pro-white or pro-rich bias on the part of government, and more coincidental. On the other hand, government may recognize what neighborhoods of different economic and racial makeups need, and choose to devise a bureaucratic resource and response system that ensures the advantaged receive better representation than the less advantaged. In this case, need-based inequality reflects the same kind of "taste-based" discrimination outlined above. Teasing these mechanisms apart is difficult with the data we bring to bear below; it would likely require a case-by-case study of 311 response systems across cities and the many agencies and departments of each city government. We leave this important work to future researchers, but note that through either mechanism, the needs of the advantaged are prioritized and tended to first.

Data

311 is a government-sponsored phone number that provides access to non-emergency municipal services. It offers citizens a way to communicate with their local government about issues in their community. In short, 311 makes citizens the "eyes and ears" of the city, allowing city officials to devote resources to fixing — rather than searching for — issues. In most cities, citizens can call 311 directly, and in some cities, can report issues online or via a smartphone application. Complaints can be filed 24 hours a day, seven days a week. In some cities (e.g., Boston and San Francisco), callers can include a photo of the problem along with their written description. After filing the complaint, an estimated time to completion is often given, and the request can be tracked from there. In most cities, calls are routed to a central command center before city employees direct the call to the appropriate agency or department. City workers then investigate the report and (if needed) fix the issue. Once fixed, city workers either mark the request as "closed" in the 311 log, or report back to the central command center.

311 data provide a wealth of information about citizen-initiated complaints, including: the kind of good or service requested/nature of demand (e.g., waste collection, streetlight repair, etc.), where it was requested (the latitude and longitude of the request location), when it was requested, and when the government closed the request. Though several scholars have used 311 data as measures of civic and political participation and neighborhood conflict (e.g., Cohen et al. 2019; Feigenbaum and Hall 2016; Legewie and Schaeffer 2016; Lerman and Weaver 2013; Levine and Gershenson 2014), the primary — and perhaps most appropriate (e.g., White and Trump 2018) — use of the data is as a measure of demand for public services. Given these features, 311 data meet our own needs: it provides information on citizen demands, and because it captures when government responded to each demand, information about responsiveness. Examples of 311 calls in our data include the following (edited by the authors for clarity and grammar):

> "Streetlight is hanging by one wire over the road. Looks like it will fall at any moment." — Detroit, 5/13/2018

> "HUGE pothole on the freeway entrance ramp. This hole is very dangerous to motorcycles entering the freeway. Someone is going to get hurt if they hit it." — San Diego, 1/2/2017

> "Trash collection was missed last Friday and yesterday. Trash cans are full, and trash is overflowing in the whole alley. Please pick up ASAP." — Washington, DC, 1/14/2015

We sought to collect 311 data for each of the 25 largest cities in the U.S. for a many years as possible (up to the end of 2018). To be included in our data, the city 311 log must include the four features described above: data on the kind of request, where it was requested, when it was opened, and when it was closed. Of the top 25 cities, 15 met these criteria (in order by population): New York, Los Angeles, Chicago, Houston, Philadelphia, San Diego, Dallas, Austin, Jacksonville, San Francisco, Denver, Washington, Boston, Detroit, and Nashville.[1]

Cities receive calls about hundreds of different kinds of issues, some much more common than others. For instance, Austin's 311 call log includes 147 unique services. San Francisco's includes 101, many of which only received a handful of calls. One challenge then is determining which of these calls to analyze in an assessment of unequal responsiveness. We considered two options. The first was to create a broad list of goods and services that we anticipated would be found in each city call log (e.g., street repairs), work through the data city-by-city, and categorize as many as possible into these broad categories. The downside of this approach is that we may lose a significant amount of within-city variation in the kinds of requests made and the frequency with which they are made. In looking at the data, we found the most common requests were often not the same across cities. In Dallas, complaints about tall grass and weeds are quite common, but we do not see a similar pattern in any other

[1]Indianapolis and Seattle do not currently have 311. Phoenix, San Antonio, Columbus, El Paso, and Memphis have 311, but their call logs do not include latitude and longitude. City officials in San Jose did not respond to our FOIA requests. Data from Fort Worth are not freely available to the public.

city. Likewise, only in New York are calls about heat and hot water issues and plumbing common.

We choose instead to maintain the variation across cities, and emphasize the most common needs within cities. To do so, for each city, we first collapsed similar but related services into one category. For example, we combine requests for trash collection and recycling collection into one. We then selected for analysis only the top 10 service areas — or as many service areas as are in the data up to 10 — within each city, aggregated across the entire time period. Our approach ensures our analyses do not "miss" important features of each city. Further, it ensures that our investigation is focused on the most pressing challenges that each city community faces. Table 1 summarizes the 311 data for each city. It gives the date range of our data, the total number of calls, as well as the number and share of calls included in the city's top 10 service categories (and in turn, our analyses). In total, our dataset includes 38.5 million service requests. Over 25 million of these — about 65% — fall in the top 10. City-by-city, we see that our sampling strategy picks up most of the calls. In 13 of 15 cities, our analysis includes more than 60% of all calls; in 8 of 15 cities, it includes more than 70% of all calls.

Table 1: **Summary of Requests by City**

City	First Request	Last Request	# of Requests	# of Requests (Top 10)	% Top 10
New York, NY	01/01/2010	12/31/2018	17,655,254	8,644,127	48.96
Los Angeles, CA	08/05/2015	12/31/2018	3,083,707	2,784,236	90.29
Chicago, IL	02/11/2008	12/31/2018	4,231,886	4,231,886	100.00
Houston, TX	11/07/2011	12/31/2018	2,161,509	1,313,892	60.79
Philadelphia, PA	12/08/2014	12/31/2018	791,334	558,533	70.58
San Diego, CA	05/20/2016	12/31/2018	370,888	274,598	74.04
Dallas, TX	10/01/2016	09/27/2018	733,833	284,691	38.80
Austin, TX	12/31/2013	12/31/2018	622,294	395,950	63.63
Jacksonville, FL	01/01/2012	12/30/2016	1,195,220	718,006	60.07
San Francisco, CA	07/01/2008	12/31/2018	2,969,713	2,407,340	81.06
Denver, CO	01/01/2008	12/31/2014	1,054,924	698,240	66.19
Washington, DC	01/01/2012	12/31/2018	2,037,846	1,483,042	72.77
Boston, MA	07/01/2011	12/31/2018	1,417,930	1,161,932	81.95
Detroit, MI	07/21/2014	12/31/2018	156,810	137,799	87.88
Nashville, TN	07/17/2017	12/31/2018	76,896	60,705	78.94
			38,560,044	**25,154,977**	**65.24**

We merged our 311 call log with economic and demographic data from the American

Community Survey (ACS). The ACS is sent to approximately 295,000 addresses monthly and 3.5 million per year, making it the largest household survey administered by the U.S. Census Bureau. Today, it is the primary source for economic and demographic information. We use the latitude and longitude given for each 311 call to place each call within a block-group, and we append to each call block-group estimates of per capita income and percent non-Hispanic white.[2] Before doing so, we split the 311 data into two groups: calls made between 2008 and 2012, and calls made after 2013. For 2008-2012 calls, we use estimates from the 2012 ACS, reflecting income and race estimates averaged across survey data collected between 2008 and 2012. Post-2013 calls are merged with the 2017 ACS (reflecting ACS data collected between 2013 and 2017).

For each call, we created a measure of responsiveness: wait time. Wait time measures how long it took the government to respond to the demand; it is simply the difference (in days) between the given open date and the given close date. Larger values indicate a longer wait time. The measure makes a key assumption: the close dates given in the data are precise to the day. That is, we assume that city officials tend to close requests in "real-time," and not in batches at the end of the week or month. There is no obvious reason to suspect that the given close dates are inaccurate. First, governments tend to use 311 data as a performance metric and as one of many ways to determine how to best allocate resources. Closing requests in batches would give the government imprecise information and almost no insight into actual performance. Still, Figures A1 and A2 looks for clustering in the data within each city in two ways. First, Figure A1 simply counts the number of requests closed on each day of the week within each city. If the closing dates given in the data reflect the internal process that a city uses to "clear their deck," then we may expect to see that calls tend to be closed on only one or two days of the week.

Figure A2 takes the same approach for each day of the month — e.g., the 1st of the month, the 15th, etc. Here, we would be looking to make sure that cities do not tend to batch close

[2]We exclude observations where the latitude and longitude given in the data do not fit within the bounding box of the city. We suspect these few cases reflect record-keeping errors.

requests on the 1st of the month, the last of the month, etc. Either would add raise questions about our measure of responsiveness, but we find limited to no evidence of obvious clustering in the data. Instead, calls seem to closed throughout the work week, suggesting that cities at least do not tend to batch completed requests from each week on Friday (for example). There is some evidence of clustering around particular dates in particular cities — e.g., in Philadelphia, many more calls than average are closed on the 26th of the month. Likewise, there appears to be some clustering around the 22nd in Dallas, the 17th in Denver, and the 13th in San Francisco. In general, though, we see limited consistent patterns in the data to suggest that the closure dates in the data are wholly inauthentic. These diagnostics suggest to us that our measure of responsiveness comes with limited measurement error and record keeping-induced bias.

We bring to bear the largest and most comprehensive dataset of citizen-initiated service demands to date. The data offer both measures of citizen demands, as well as government responsiveness. Merged with neighborhood-level economic and demographic data, we are able to assess whether government is more responsive — in our setting, whether government responds faster — to requests from the advantaged and to the needs of the advantaged. We do so below, presenting our design and results in turn.

Pathway #1: Request-Based Inequality

We start with a test of request-based inequality. Recall that we define request-based inequality as the propensity to respond to requests from whiter and more affluent communities faster than the same request from less white and affluent neighborhoods. Using the dataset describe above, we first categorize each call as coming from a neighborhood either above or below the city median percent white and the city median logged per capita income. From here, we calculate the mean wait time within each city-service, month, and year combination separately for calls both above and below the city medians. Before doing so, we trim the

data in two ways. First, we exclude outlier values in wait time that may not reflect the true data-generating process. Specifically, we exclude all calls above the 90th percentile in wait times to exclude the (very rare) wait times that exceeded months or even years. We suspect these few cases likely reflect errors in record-keeping or required a much more substantial mobilization of municipal resources. Second, to ensure that the average wait times within each group do not reflect only a small number of calls, we exclude city-service-month-year observations where the total number of calls falls below the 5th percentile. Taken together, we create a dataset that gives our measure of responsiveness (within each city-service, month, and year) for the advantaged — defined here as for those neighborhoods above the city median in percent white and logged per capita income — and for the less advantaged. We assess request-based inequality with the following equation estimated using OLS:

$$\textit{Average Wait Time}_{ijk} = \beta_0 + \beta_1 \cdot \textit{Advantaged Request}_{ijk} + \gamma_i + \delta_j + \theta_k + \epsilon_{ijk} \qquad (1)$$

where $\textit{Average Wait Time}_{ijk}$ is the mean wait time for city-service i in month j and year k. $\textit{Advantaged Request}_{ijk}$ is an indicator variable equal to 1 for requests from neighborhoods above the city median percent, or city median logged per capita income for city-service i in month j and year k. γ_i, δ_j, and θ_k are fixed effects for each city-service, month, and year in the data. ϵ_{ijk} is the error term. The city-service fixed effects are essential to our test of request-based inequality. The inclusion of these fixed effects mean that β_1 gives the average estimated difference in average wait times between advantaged and less advantaged communities *for a given service*. With city-service fixed effects, our model is akin to audit experimental studies that estimate the effect of a treatment — i.e., a white alias relative to a black alias — on responsiveness. Month and year fixed effects account for seasonal variation and over-time trends in response times common to both advantaged and less advantaged neighborhoods. Standard errors are calculated using a block bootstrapping method that takes into account

the variation within our aggregate measure of wait times. For 1,000 iterations per model, we resample (with replacement) within the groups over which we aggregate — city-service, month, and year — replicate the same aggregation procedure and reestimate the model. We take the standard deviation of the distribution of regression coefficients as the standard error of the coefficient, taking into account the variation across individual request wait times masked via aggregation.

Table 2: **Estimates of Request-Based Inequality**

	(1)	(2)
White Request	−0.079	
	(0.009)	
Rich Request		−0.107
		(0.009)
City-Service FEs	✓	✓
Month FEs	✓	✓
Year FEs	✓	✓
Observations	17,438	17,449
Adjusted R^2	0.736	0.739

Table 2 presents our results. Column 1 assess the relationship between race and responsiveness; column 2 considers income and responsiveness. We find a negative and statistically significant relationship between requests from the advantaged and wait time, suggesting that cities tend to prioritize requests from advantaged neighborhoods. On average, cities tend to respond faster to requests from advantaged neighborhoods than to the same requests from less advantaged neighborhoods. At the same time, the substantive magnitudes of these differences suggest weak evidence of unequal responsiveness. For instance, we find that, on average, cities respond about 1.9 *hours* faster to requests from whiter communities than to the same request from less white communities. Our estimate of differential responsiveness by class is similar, though a bit larger in magnitude; on average, cities respond to about 2.57 *hours* faster to requests from more affluent neighborhoods than to requests from less

affluent neighborhoods. In short, our results suggest that — once the good or service itself is accounted for in them model — there are limited differences on the basis of neighborhood economic or demographic characteristics.

Consider these effects relative to the effects found in audit experimental work. As noted, Costa (2017)'s meta-analysis finds that non-minority constituents are about 10 percentage points more likely to receive a response than a minority constituent. While our estimates are not directly comparable to those in audit studies, it is clear that political elites exhibit much more "taste-based" bias in responding to constituent communications than to 311 complaints for goods and services. We conclude that while cities do appear to prioritize requests from the advantaged, the magnitude of these effects are small and for most community issues, trivial and unnoticeable to those making these requests.

Pathway #2: Need-Based Inequality

It remains possible that — even with limited request-based inequality — cities may prioritize the *needs* of the advantaged. Here, cities consider the different demands of the advantaged and the less advantaged, and respond to those needs particular to more advantaged communities faster than those particular to less advantaged communities. Need-based inequality requires first that there are differences in demand for particular goods and services. Needs must vary along economic and demographic lines. Consider 10 service categories within a given city. If, in the aggregate, neighborhoods above the city median percent white place 10% of their demands — their calls — in each category, and if neighborhoods below the city median do the same, prioritizing needs becomes much harder for cities because the needs and demands are the same across groups. If, however, advantaged and disadvantaged neighborhoods differ in *where* they place their demands, cities can observe these differences and much more easily prioritize the needs of some over others.

We aggregate our data across months and years, and for each city-service, calculate the

percentage of requests from neighborhoods above the city median and the percentage from below the city median placed in each service category. Each tells us about the *relative* need of a given good or service for advantaged neighborhoods and less advantaged neighborhoods: it tells us which goods — among the set of possible goods and services to demand from government — the advantaged (and less advantaged) need and demand the most. We take the difference between these two values, such that higher, positive values reflect greater need among the advantaged. We calculate the standard errors for these differences using a similar block bootstrapping technique as in our analysis of request-based inequality.

Figure 1: **Relative Need of Goods and Services**

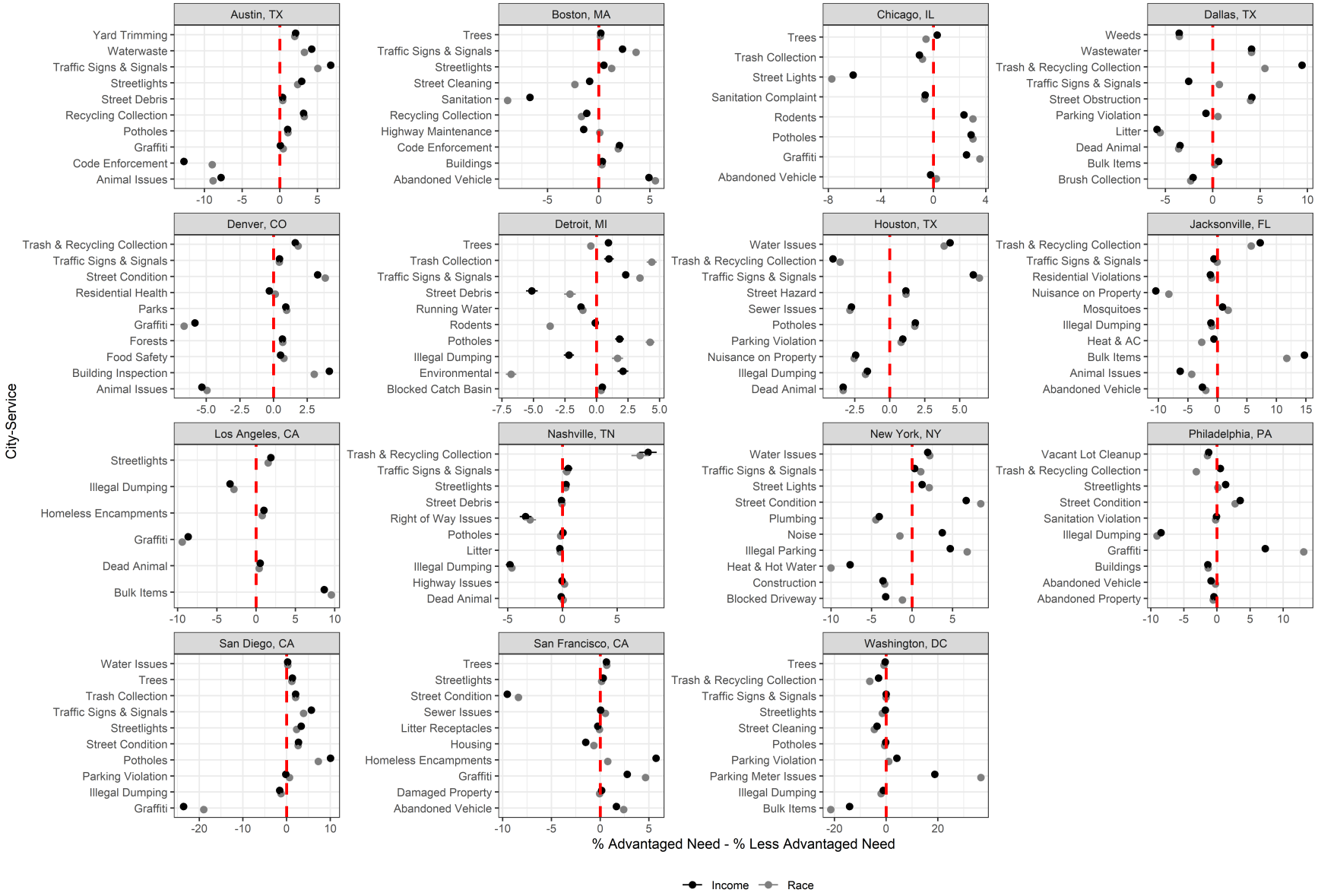

Figure 1 plots these results. Aggregating across time, we find some areas of significant differences in need between more white and less white neighborhoods, and richer and poorer neighborhoods. For instance, in New York, advantaged neighborhoods tend to call about street conditions, street lights, and illegal parking violations. In contrast, less advantaged areas in New York tend to call about heat, hot water, and plumbing issues. In Houston, white communities and wealthy communities call about water issues, traffic sign and signal repairs, and potholes, whereas less white and less affluent areas call about much different concerns: dead animals, illegal dumping and waste collection. Many of the instances where we find substantial differences in need comport with conventional wisdom and expectations. In Washington, DC, needs are quite similar across neighborhoods, except in one case: parking meter issues. We should expect parking meters to be found in areas of higher density and in business districts, where residents to be more white and have higher incomes. While these differences are notable, we also note significant similarity in needs. In some cities, our measure hovers around 0% for all services. In many others, the magnitude of the differences — to the extent they exist — are quite small. In short, while we find some evidence that needs often do vary across neighborhoods within cities — suggesting that need-based inequalities may manifest if cities prioritize the needs of the advantaged at the expense of the needs of the less advantaged — our expectations for significant differences may be tempered by the relative uniformity in needs.

As before, we categorize each call as coming from a neighborhood either above or below the city median percent white and the city median logged per capita income. We trim the data — excluding outliers in wait times, and observations with wait times generated with few calls — in the same way as in our test of request-based inequality. We calculate the mean wait time for each city-service, month, and year combination. As in our descriptive analysis of need, we calculate the percentage of requests from neighborhoods above the city median placed in each service category. We do this for each city-service, month, and year combination in the data, and we do the same for neighborhoods below the city median.

We again take the difference between these two values, giving us a measure of whether the advantaged or the less advantaged demanded more of the given good or service in each month and year in the data. We test for need-based inequality using the following question estimated using OLS:

$$\textit{Average Wait Time}_{ijk} = \beta_0 + \beta_1 \cdot \textit{Advantaged Need}_{ijk} + \gamma_i + \delta_j + \theta_k + \epsilon_{ijk} \tag{2}$$

where the $\textit{Average Wait Time}_{ijk}$ is the mean wait time for city-service i in month j and year k. $\textit{Advantaged Need}_{ijk}$ is one of two variables. The first is the difference in relative need as described above, measured for each city-service i, month j, and year k. As noted, positive values indicate greater need among the advantaged. The second dichotomizes this variable, taking the value 1 if city-service i is a greater relative need among the advantaged (i.e., if the difference measure discussed above is positive) than the less advantaged in month j and year k. As before, γ_i, δ_j, and θ_k are fixed effects for each city-service, month, and year in the data. ϵ_{ijk} is the error term. The city-service fixed effects are important again, as it allows us to test how *changes* in relative need over-time corresponds to *changes* in wait times. That is, it allows us to assess whether wait times change as a service moves from a "need of the disadvantaged" to a "need of the advantaged" from month-to-month. As before, standard errors are calculated using the same block bootstrapping method.

Table 3 shows our results. We find consistent evidence of need-based inequality: cities respond faster to goods and services that white and wealthy neighborhoods tend to ask for, relative to the goods and services that non-white and poor areas to ask for. In particular, our estimates suggest that as advantaged demand for a given service increases over-time, wait time decreases. But, once again, we find that these changes in wait time are small. For example, averaging across city-services, we find that each 1 percentage point increase in white neighborhood demand relative to non-white neighborhood demand decreases average

time about 36 *minutes*. Further, white neighborhood needs tend to be responded to about 3.8 hours faster than less white neighborhood needs. The point estimates are remarkably similar across models of race and income, with slighter larger effects for affluent needs. As mentioned, we are unable to tease apart the mechanisms for these differences. Indeed, these effects may reflect government discretion and discrimination, or government capacity and the time and resources needed to meet a demand. Nevertheless, we can conclude that the extent of need-based inequality is minimal — perhaps even more minimal than our findings of request-based inequality. At worst, government is 4 hours faster to respond to the services most needed and demanded by affluent neighborhoods. At best, because of the relative similarity in needs, the potential for disparities as large as 4 hours are quite unlikely.

Table 3: **Estimates of Need-Based Inequality**

	(1)	(2)	(3)	(4)
% White Need - % Non-White Need	−0.025			
	(0.001)			
White Need		−0.157		
		(0.018)		
% Rich Need - % Poor Need			−0.026	
			(0.001)	
Rich Need				−0.203
				(0.018)
City-Service FEs	✓	✓	✓	✓
Month FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓
Observations	8,763	8,763	8,763	8,763
Adjusted R^2	0.754	0.754	0.754	0.754

Conclusion

Services are an important component of government work (Cain, Ferejohn, and Fiorina 1987; Fenno 1978) and are central to the way in which citizens evaluate government and their representatives in office. For example, Harden (2016) and Tucker (2019) both show that constituent service affects vote choice in elections, perhaps even more so than policy considerations. In the aggregate and at the local level, goods and services affects outcomes, too. Burnett and Kogan (2017) show that pothole complaints correspond to decreases in incumbent vote share in local elections. Political elites tend to respond to these incentives, too, as cities respond faster to 311 calls in city council districts with incumbent politicians seeking reelection (Christensen and Ejdemyr 2018). More generally, elected officials may even prioritize service work over policymaking (Butler, Karpowitz, and Pope 2012; Parker and Goodman 2009).

Despite the centrality of service to citizens and elites, most work on representation focuses on policy. Research has documented strong relationships between public opinion and policy (e.g., Caughey and Warshaw 2018; Erikson, Wright, and McIver 1993). Nevertheless, the opinions of the advantaged — white and affluent citizens — appear to be better represented in government than those of the less advantaged (e.g., Gilens 2012; Griffin and Newman 2008; Schaffner, Rhodes, and La Raja 2016). In this paper, we build off of this work and provide one of the first contemporary tests of unequal responsiveness in city goods and services. To do so, we leverage a new dataset of 25 million 311 service requests, and an empirical approach that approximates new work on policy and representation.

Our results are consistent in direction with work on unequal policy responsiveness: cities prioritize requests from the advantaged (request-based inequality) and the needs of the advantaged (need-based inequality). Yet, at the same time, we caution against interpreting our results as a ringing indictment against city governments. The magnitude of the differential responsiveness we show is small. Though an extra hour of a downed streetlight in a business district would be quite inconvenient, in most cases, and for most goods and services, the

average difference in response time would go unnoticed. In relation to past work, we find a middle-ground between research suggesting significant racial biases, and work suggesting that city service distribution follows technocratic administrative procedures. As noted, the magnitude of these findings stand in stark contrast to work on unequal policy responsiveness. For instance, Gilens (2005) shows when the rich and the poor disagree on policy, the probability of a proposed policy change being implemented increases about 30 percentage points as support among the rich increases. In comparison, low and median-income support has no effect on the probability of policy change. While these substantive findings do not map neatly onto our own empirics, the differences are nevertheless notable. We hesitate to speculate on why there lacks a substantive effect of race and class on goods provision, but note that bureaucrats and elected officials may be responding to different incentives. Elected officials may be responding to perceived electoral incentives to respond to particular groups. In contrast, as past qualitative and empirical work indicates (e.g., Mladenka 1980), city services follow bureaucratic decision-rules, and bureaucrats may prioritize upholding professional values and standards of performance. As a result, though elected officials clearly monitor service provision and see to it that demands are met (Christensen and Ejdemyr 2018), government action on services may still be divorced from much of the politics that drives policymaking.

We see our work as underscoring the importance of political participation — here via a government-run "complaint" line. A substantial body of work shows that political elites tend to respond to the preferences of those who vote (Griffin and Newman 2005; Martin 2003), and that patterns of unequal policy representation are attenuated as participation among the less privileged increases (e.g., Griffin and Newman 2007; Hajnal 2009; Hill and Leighley 1992; Hill, Leighley, and Hinton-Andersson 1995). Our findings corroborate this view, and suggest that non-voting participation — e.g., direct communication with government officials about needs and demands — may be particularly effective at achieving equal voice and representation.

Nevertheless, neighborhoods may not be fully equal in access to city goods and services.

Our data only allow us to address unequal *responsiveness*. We cannot address government action unrelated to 311-delivered demands, unequal conditions, or inequities in 311 participation that may exacerbate unequal conditions. First, cities surely fix streetlights, repair roads and bridges, and clean graffiti without the prompt of a citizen call. City workers may be "out-and-about" improving advantaged neighborhoods without being asked to do so, but may not do the same in less advantaged neighborhoods. Related, less advantaged neighborhoods may also simply be in worse condition — relative to more advantaged areas — at baseline. de Benedictis-Kessner (2019) finds evidence for "inequality in conditions." He draws on a unique dataset of Boston sidewalk conditions, and finds that sidewalks in minority and poor neighborhoods are in worse condition. And while greater 311 use in these communities attenuates these differences in conditions, inequities in participation — the advantaged tend to use 311 more than the advantaged (see also Feigenbaum and Hall 2016) — mean that sidewalks in non-white and poor areas are still in worse shape on average. As such, though we find participation fosters relative equality in responsiveness, inequities may persist because of differing baseline conditions and because the costs to political participation remain too high for many less advantaged communities to overcome. Given the latter, less advantaged communities may not benefit as much from a system that emphasizes equality in response. In short, though our study offers a direct test of responsiveness to citizen demands, we do not rule out other ways in which access to collective goods and services may be unequal. Future work should focus on the possibilities identified above.

Finally, our work suggests a pathway for less bias in government. Our intent in this paper is not to make a global claim about discrimination in government. More simply, we do not argue that there is no discrimination in government. For one, audit experimental work suggests that important biases exist (e.g., Costa 2017). However, our work does suggest that bureaucratized service provision may be essential to limiting the discretion of individual political actors and in turn, achieving equal responsiveness. In our setting, citizen-contacts are routed from a central command center to particular agencies of government. Processes

and procedures are in place to respond to these demands, and cities tend to follow these protocols. These processes stand in stark contrast to the audit experimental setting, where individual elites are given the choice over whether to respond or not. Normatively, our work suggests that government entities — cities and others — should adopt similar practices in handling all kinds of constituent service work, such as constituent communication.

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