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The Unequal Spatial Distribution of City Government Fines: The Case of Parking Tickets in Los Angeles

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Abstract

This study investigates the relationship between government fines and neighborhood composition using data on parking citations in Los Angeles. Parking ticket fines have received significant attention in public debates concerning bias in government and law enforcement practices. In these debates, community advocates claim that parking citations are spatially concentrated in neighborhoods of predominantly economically vulnerable populations. Using parking ticket data in 2016 from the City of Los Angeles, this study shows that the number of parking tickets is higher in neighborhoods with a larger presence of renters, young adults, and Black residents. The study also finds that the burden on Black neighborhoods is not alleviated by Black representation in city council. However, Hispanic neighborhoods with a Hispanic council representative experienced higher parking ticket rates for regulations that are more likely to be violated by visitors, specifically, violations occurring during the evening and overnight hours, and specific to time-limit and permit-related regulations.

Keywords

spatial inequality, neighborhood, descriptive representation

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Introduction

A recent U.S. Department of Justice (DOJ) report found that government officials in Ferguson, Missouri—a city with a majority Black population but a majority White government—encouraged the police force to ticket more residents in anticipation of decreasing sales taxes (U.S. Department of Justice, Civil Rights Division 2015). This predatory practice targeted the poor and people of color, populations typically lacking the financial means to pay fines on time. Missed payments led to further fines, license suspensions, and jail time, pushing socioeconomically vulnerable populations toward a state of perpetual debt. The report concluded that the "harms of Ferguson's police and court practices are borne disproportionately by African-Americans, and there is evidence that this is due in part to intentional discrimination on the basis of race" (U.S. Department of Justice, Civil Rights Division 2015, p. 4).

A major takeaway from the report is that unlawful bias in governance and enforcement is not relegated to police violence, which has received heightened public attention due to high-profile instances of police assault toward unarmed Black civilians, but also applies to minor offenses. Prior research has documented bias in government and enforcement practices, such as pedestrian and traffic stops by the police (Baumgartner et al. 2017; Gelman, Fagan, and Kiss 2007), vehicle towing (Esquivel 2010), and city zoning ordinances that deter minority and poor residents from moving into White upper-class neighborhoods (Rothwell and Massey 2009). The DOJ report revealed a form of bias—the targeting of socioeconomically vulnerable populations for fines—previously overlooked in public and scholarly discussions of government-related discrimination. Since the report's release, this form of selective bias has been observed in other cities across the United States (Fagan and Ash 2017; Sances and You 2017).

Despite heightened public discourse, little academic work exists that tests claims of bias in city government fines. To address this deficiency, this study examines the spatial distribution of an important source of fine revenues—parking tickets—in the City of Los Angeles in 2016. Specifically, this article examines whether highly ticketed streets are located in neighborhoods with a greater presence of young adults, renters, low-income residents, and Black, Hispanic, and Asian populations. The study then tests whether the relationship between minority presence and parking tickets is moderated by minority political representation. Prior research indicates that political and community leaders are important to neighborhood socioeconomic health and well-being (Sampson 2012) and are more likely to address issues of discrimination if their constituents share similar racial/ethnic backgrounds (Broockman 2014). I test this hypothesis by examining whether the associations between parking

tickets and percentage Black, Hispanic, and Asian are conditioned on neighborhood Black, Hispanic, and Asian political representation on the Los Angeles City Council.

I focus on parking tickets for several reasons. First, much of the public discussion surrounding the unfair distribution of government fees centers on parking fines (DeHaven 2015; Ewing 2017; Reyes 2015). This is not surprising considering that parking tickets are ubiquitous—for example, more than 2.5 million tickets were issued in Los Angeles in 2016—and, therefore, increased parking enforcement or fines often draw considerable public attention. In comparison, other government fines, such as court usage fees and civil forfeiture, are less common. Second, parking fines in parking-reliant cities encompass a significant proportion if not the majority of total fine revenues. For example, Los Angeles took in $152 million from parking tickets in 2015, which represents 64% of the total fees, fines, and penalties collected by the city (Los Angeles City Controller 2015). Third, the correspondence between periods of financial downturns and increased parking ticket rates and fines have been observed in major cities across the United States (Garrett and Wagner 2009; McGinty and Blumenthal 2008). For example, Los Angeles increased parking ticket fines six times between 2005 and 2012. Critics accused city officials of increasing fines solely to balance the city's budget (Zahniser 2012). Fourth, parking tickets represent the gateway to other fines such as nonpayment, suspended license, court order, and jail fees. In Los Angeles, 20% of ticket recipients incurred late fees for not paying their tickets on time.

The study's research objectives carry important research and policy implications. First, the study can speak to policies that raise parking ticket costs. If citations are concentrated in socioeconomically vulnerable neighborhoods, then the financial burden of higher fines falls on these neighborhoods assuming no change in enforcement. Given that socioeconomically disadvantaged populations often do not have the resources to pay their tickets on time, late fines and court fees only increase their burden. Furthermore, some have argued that city officials raise ticket costs not to improve traffic management or enhance public safety, but to cover budget shortfalls (DeHaven 2015; Grover and Glasser 2016). In this case, not only is the burden of increased costs placed on disadvantaged areas, but that burden is not directly tied to the primary role of parking tickets—to manage traffic, parking, and public safety. Second, the study can speak to issues of bias in city governance. Parking ticket rates should show no association with neighborhood race/ethnicity, rental status, age, and income after controlling for the built environment and structural characteristics that are associated with illegal parking. An association may indicate a potential bias in parking enforcement, which is explicit if

enforcement officers are intentionally targeting certain neighborhoods, as was found in Ferguson, and has been argued by critics of parking enforcement practices in certain cities (e.g., DeHaven 2015). Third, the study can speak to issues regarding the efficacy of descriptive representation in abating spatial inequality. The study contributes to the descriptive representation literature by examining the effects of descriptive representation at a local level and comparing effects across Black, Hispanic, and Asian representation.

The study can also speak to broader issues of spatial inequality. Unlike traffic and pedestrian stops, parking enforcement does not require direct contact between individuals and the police. As such, an unequal spatial distribution of parking tickets may be a reflection of neighborhood characteristics. A long line of research has documented the importance of neighborhoods in organizing social problems within cities (Sampson 2012). These problems include crime, social isolation, unemployment, poverty, segregation, lack of access to supermarkets, proximity to health hazards, and urban blight (Diez Roux and Mair 2010; Sampson 2012; Wilson 1987). This study contributes to this literature by examining whether parking tickets are also unevenly distributed across neighborhoods and whether this spatial inequality can be explained by neighborhood demographic composition. Moreover, parking enforcement in large cities, such as Los Angeles, does not fall under the domain of the police department but under a separate division specific to parking management. As such, civil employees and not police officers are typically writing parking tickets. Therefore, rather than issues related to police bias and discrimination, which has received significant attention in policy and academic work, the current study speaks to broader issues of city governance.

Background

The unequal distribution of parking tickets can occur for a number of reasons. First, parking regulations, which are typically based on the types of residential units in the area, may differ between neighborhoods. Second, areas where parking demand exceeds supply are likely more vulnerable to parking violations. Therefore, higher parking ticket rates reflect built environment and structural characteristics that increase the demand for or limit the supply of on-street parking. For example, a study analyzing commercial truck parking violations in Chicago found that areas with higher levels of food-service sales experienced higher rates of violations (Kawamura et al. 2014). Other characteristics include fewer parking garages, more commercial establishments, and limited public transportation options. Third, tickets may be concentrated in areas associated with greater general traffic enforcement. In this case,

because traffic officers and general policing have a high presence in the area, more violations are identified and ticketed. The built environment and structural features that are associated with illegal parking or greater traffic enforcement are also spatially associated with certain demographic features of the resident population, specifically, rental status, age, income, and race/ethnicity. Therefore, associations between neighborhood socioeconomic characteristics and parking ticket rates should disappear after accounting for the built and structural environment.

The unequal distribution of parking tickets, however, may be a reflection of selective bias in enforcement. This is the argument made by parking rights advocates in favor of overhauling parking regulation in cities such as Los Angeles (Bender et al. 2015; DeHaven 2015; Grover and Glasser 2016). Critics claim that parking officials target certain neighborhoods because the populations residing in these areas cannot afford to initially pay their tickets, and, thus, accumulate additional fines that add to city coffers (DeHaven 2015; Makowsky and Stratmann 2009). This claim represents the idea that law enforcement is a source of revenue rather than a broadly socialized public good. In turn, enforcement is allowed to single out who will shoulder the burden of this predatory practice.

Whether the concentration of parking tickets in socioeconomically vulnerable neighborhoods is due to intentional bias or neighborhood built environment and structural characteristics, the impact on residents living in these neighborhoods is magnified by policies increasing parking ticket fines. Parking rights advocates have claimed that increases in ticket costs are largely driven by city budget shortfalls (DeHaven 2015; Grover and Glasser 2016). In this case, city officials are raising costs not for the specific purpose of lowering parking violations or increasing parking management and public safety but increasing revenue to balance the city's general operating budget. Although cities should be aware of the harmful differential effects of their policies, raising ticket costs is not necessarily unlawful. However, it is if it is accompanied by the purposeful targeting of certain demographic groups for tickets. The city of Ferguson, Missouri, offers an illustrative example. A DOJ report found that Ferguson officials encouraged the use of fines and court fees as a tool for generating revenue (U.S. Department of Justice, Civil Rights Division 2015). The amount of revenue from citations rose 56% between 2011 and 2014. The report also found that Blacks are disproportionately at risk for being cited. As such, the burden of increased fines fell on Black residents not simply because they live in areas that happen to be more vulnerable to illegal parking (e.g., limited on-street parking options, higher population density, more parking meters), but because they were explicitly targeted by law enforcement at the behest of city officials.

Spatial inequality is further exacerbated by late fines and fees. Prior research has shown that increased fines will not deter repeat offenders who account for the bulk of a city's tickets and often view parking violations as an acceptable gamble (Shoup 2010). If cities raise parking ticket costs high enough to deter these chronic violators, they unfairly penalize many more drivers for occasional violations. Higher income violators may complain, but they can pay the occasional ticket. Those who cannot pay will accumulate additional tickets and fines and have their licenses suspended. Suspensions harm credit ratings and make it harder for people to take out loans and get and keep their jobs. In Ferguson, residents who fell behind on fines and did not appear in court after a warrant were charged an additional $120 fine, arrested, assessed a $50 fee for the arrest warrant, and charged a fee for each mile that police drove to serve it.

The unfair distribution of parking enforcement has other negative consequences for burdened populations besides diminished financial outcomes. An important characteristic of parking enforcement in Los Angeles and other large cities is that it is under an agency separate from the police department. In most cases, parking tickets are written by traffic enforcement agents rather than police officers. As such, arguments of bias and inequitable parking enforcement are not necessarily directed toward the local police force, which has received the bulk of attention in the enforcement discrimination literature, but the broader city government. Residents may develop decreased trust in local government, which may induce lower rates of civic participation. In the case of Black and Hispanic residents, perceived discrimination in parking enforcement adds to their historical distrust toward political and public institutions. This distrust undermines the legitimacy of city governance and general enforcement, and without legitimacy, enforcement agencies lose their ability and authority to function effectively, which, in turn, impacts the overall public safety in the neighborhood (Marschall and Shah 2007; Sharp and Johnson 2009).

The demographic groups often cited by parking rights advocates as experiencing the greatest ticket burden are young adults, renters, low-income households, and racial/ethnic minorities (Bender et al. 2015; DeHaven 2015; *Los Angeles Times* 2014; Reyes 2014). Low-income households tend to reside in areas with overcrowded on-street parking, greater physical and social disorder, more apartment buildings, vacant lots, abandoned buildings and cars, higher crime rates, and other structural characteristics that may increase rates of violations and draw the attention of police and parking enforcement agents (O'Brien, Sampson, and Winship 2015; Sampson 2012; Shoup, Yuan, and Jiang 2017). Renters and young adults tend to be lower income, so the neighborhood attributes linking poor communities to high

parking ticket rates also apply to these groups. Renters, however, also live in dense neighborhoods with many apartment buildings and few parking options. Young adults are typically renters, but they also tend to live in mixed-used neighborhoods, which have a greater presence of commercial establishments, and, thus, are competing for limited parking spaces with visitors and commercial vehicles.

An association between ticket rates and the Black, Hispanic, or Asian composition of a neighborhood controlling for age distribution, renter-status, income, and the built environment may be evidence of unlawful racial bias in parking enforcement. Although not exclusively examining parking tickets, Sances and You (2017) analyzed data on city revenues from fines and court fees and found evidence of race playing a role in the degree to which cities rely on fines as a source for revenues. The mechanisms potentially explaining this association include cities targeting poor and minority populations because they are less likely to complain and the use of fines as a means of social control.

The study also found that Black representation on city councils partially moderates the relationship between percentage Black and fines revenue. They speculate that Black representatives in city government offer a channel to deliver complaints regarding discriminatory practices and monitor the degree to which budgets are balanced through exploitative sources. This hypothesis is known as descriptive representation and emphasizes the importance of local political settings for the well-being of communities with concentrations of marginalized residents (Pitkin 1967). Increases in minority representation in elective office may lead to the increased ability of minorities to influence policy processes and outcomes, which in turn should yield protection against unlawful bias, greater ability to mobilize on behalf of neighborhood concerns, and improvements in local services (Wilkins and Williams 2008). Lower parking ticket rates in minority neighborhoods with effective descriptive representation in city council may be a reflection of political protection from exploitative practices or greater political support for services that improve the local parking infrastructure.

Although a number of studies demonstrated that minority presence in government increases legislative responsiveness to minority interests, some studies found no effects and in some cases, a decrease in responsiveness (Preuhs 2006). Preuhs (2006) outlined several models for explaining these divergent findings. The first model, the political incorporation model, argues that minority representatives must be incorporated into the broader political regime to exert influence (Browning, Marshall, and Tabb 1984). Preuhs separated this model into three sub models based on type of incorporation: (1) membership in the governing coalition, (2) position of power over a specific policy area, (3) control of formal leadership regardless of policy area. The

second model, the racialized institutions model, argues that racial polarization may undermine the mechanisms that lead to influence over policy decisions by marginalizing minority representatives and offering fewer coalition members (Hawkesworth 2003). The third model, the party as substantive representative model, suggests that minority presence makes no difference in governments where liberal parties hold power (Swain 1995). The applicability of these models in a given city depends on the prevailing demographic trends in the resident population. For example, descriptive representation may have little to no impact in cities with declining minority populations. The impact of descriptive representation will also depend on the presence of multiple racial/ethnic groups. In a city such as Los Angeles, Blacks may be competing for political resources in an environment where Hispanics and Asians have been increasing in absolute size and socioeconomic and cultural influence. In general, the impact of descriptive representation will depend on the interaction of a city's broader political incorporation of minority representatives, history of race relations, prevailing demographic trends, and number of race/ethnic groups competing for political resources.

Data and Variables

The study area is Los Angeles, a city with a population of nearly four million residents in 2010. Los Angeles is a valuable case study of how parking tickets are distributed across neighborhoods because the city strikes a balance of having slow growth in parking infrastructure, rapid urban expansion, an uneven distribution of parking availability, a heavy reliance on automobile travel, and restrictive parking requirement policies (Chester et al. 2015). The city also has an extensive history of conflict between parking rights advocacy groups and city officials over parking policies and enforcement (Elkind and Smith 2017; Shoup 2005), which has only intensified given recent citywide increases in parking ticket costs. Moreover, although Los Angeles is more demographically diverse compared with similarly large cities in the Midwest and Northeast, the spatial distribution of its neighborhoods by age, renter status, income, and race/ethnic composition is uneven.

Parking ticket data come from the city's open data portal (City of Los Angeles, Open Data Portal 2016). The dataset contains a census of parking citations with information on the geographic location of the parking violation, violation code, and fine amount. Parking citations were geocoded using either geographic coordinates (latitude/longitude) or street addresses when coordinates were missing. California Vehicle and Los Angeles Municipal codes were used to select citations that were specific to on-street parking (eliminating, for example, bicycle citations and parking citations in shopping center parking

lots). Because data in prior years were not complete, the analysis was limited to citations issued in 2016. Parking fine revenues in 2016 totaled $148 million, which represents a 25% increase since 2002. Citations are largely issued by Los Angeles Department of Transportation (LADOT) parking enforcement officers. They are issued when violations are detected by a patrolling officer and through complaints from local businesses and residents to the LADOT dispatch center, which is open 24 hours a day. The city also installed smart parking technology on a sample of parking meters that allows drivers to check a mobile app, website, or call 511 for real-time availability and cost of parking spaces. The technology does not alert drivers of or dispatches enforcement officers to expired meters; however, occupancy data are collected by city parking officials to inform enforcement policies to ensure compliance.

Parking citations were aggregated up to the neighborhood level. I used neighborhoods as the units of analysis because they capture the high degree of spatial heterogeneity in demographic composition and parking tickets within large cities such as Los Angeles. Block groups were used to represent neighborhoods. Block groups contain around 1,000 households or 2,000 residents. Unlike Census tracts, they are smaller units of analysis that better capture local representations of residential settings. Unlike blocks, the smallest administrative Census geographic units available, block groups have large enough population sizes to provide accurate measures of certain neighborhood demographic features, specifically, income and age composition. Other geographic representations of neighborhoods specific to Los Angeles, such as neighborhood councils and community plan areas, were not considered due to their relatively large geographic scales and small sample sizes and to connect findings with the broader literature on neighborhood inequality, which has relied on Census-defined, small-scale geographies such as tracts and block groups to represent neighborhoods. The main dependent variable is the number of on-street parking citations in a block group.

The main independent variables are the log median household income, percentage of residents between the ages of 20 and 35, percentage of occupied housing units that are renter occupied, and percentage of residents that are Hispanic, non-Hispanic Black, and non-Hispanic Asian (hereafter called Black and Asian). The non-Hispanic distinction was used for Blacks and Asians because of the strong Hispanic cultural presence in the city and the reporting of race and ethnicity as separate and distinct concepts by the Census (Humes, Jones, and Ramirez 2011). To keep as many block groups in the final analytic sample, the citywide average was imputed for the 2% of block groups missing data on median household income. Data for these variables were taken from the 2012–2016 United States American Community Survey (ACS).

The analysis controlled for a number of built environment characteristics associated with neighborhood demographic characteristics and parking tickets. These characteristics include the number of bus stops per area, indicators of whether a hospital, park, college, or K-12 school is located within neighborhood boundaries, the number of retail businesses per area separated by function (grocery stores, restaurants and eateries, apparel, personal services, and recreational), the number of parking meters per area, and the number of parcels per area separated by commercial, single family residence, and other residential. The analysis also controlled for the following direct measures of parking supply and demand: the percentage of parking spaces that are on-street and nonresidential off-street, the number of vehicles per 100 total parking spaces (on- and off-street), the percentage of occupied housing units with one or two vehicles, the percentage of occupied housing units with five or more vehicles, the percentage of renter-occupied units with one or two vehicles, and the percentage of renter-occupied units with five or more vehicles. Parking space data are measured at the tract level and were taken from Chester et al. (2015). The number of vehicles at the tract level were obtained through the ACS. The percentages of housing units by number of vehicles are measured at the block-group level and were obtained through the ACS. The analysis also controlled for whether the neighborhood is primarily residential, which is defined as block groups with residential units making up at least 90% of total parcels. To control for potential spillover effects due to individuals parking their vehicles in residential neighborhoods to visit nearby nonresidential areas, I separated the residential neighborhood category into sharing and not sharing a border with a nonresidential neighborhood. All models also controlled for whether the neighborhood is located on the city boundary, the log number of employees as a proxy of daytime population, population size, log population density, and parking enforcement district. Neighborhoods located within airport boundaries ($N = 16$) were not used in the analysis because they have few or no residents and are relatively isolated from the rest of the city. The final sample contains 2,489 block groups. Descriptive statistics of all variables used in the analysis are shown in Table 1. All variables are measured at the block-group level unless otherwise noted. Full variable descriptions and data sources are shown in Online Appendix Table A1.

Method

The first set of analyses shows descriptive maps comparing the locations of neighborhoods with high and low counts of parking citations and the locations of neighborhoods with high and low presence of young adult, renting, low income, Black, Hispanic, and Asian residents. The analysis used the

Table 1. Descriptive Statistics of the Analytic Sample (N = 2,489).

Variable	*M*	*SD*
Total parking citations	625.16	1,432.55
Time-limit parking citations	155.79	684.48
Permit parking citations	51.30	296.44
Street-cleaning parking citations	235.71	304.88
Day parking citations	491.90	1,176.08
Evening parking citations	59.64	239.92
Overnight parking citations	73.53	219.88
Median household income ($)	61,315.37	36,906.51
% 20–35 years old	16.49%	8.31%
% renter-occupied housing units	59.08%	28.17%
% non-Hispanic Black	9.63%	15.49%
% Hispanic	46.56%	29.91%
% non-Hispanic Asian	10.72%	12.27%
Log population size	7.23	0.52
Log population density	9.41	0.90
Log number of employees	5.34	1.43
Tract-level vehicles per 100 parking spaces	5.78	3.42
% of owner-occupied units		
with 1 or 2 vehicles	64.10%	24.14%
with 5 or more vehicles	3.37%	6.64%
% of renter-occupied units		
with 1 or 2 vehicles	72.32%	19.00%
with 5 or more vehicles	1.03%	4.80%
Tract-level % of parking spaces		
Nonresidential off-street	42.80%	22.76%
On-street	33.74%	17.33%
Parcels per area		
Commercial	162.13	193.88
Single-family residential parcels	1,853.96	1,547.62
Other residential parcels	574.44	592.23
Business establishments per area		
Grocery stores	17.49	30.44
Apparel and accessory stores	17.66	79.83
Eating and drinking places	42.02	89.66
Other retail establishments	70.44	222.26
Personal services	36.01	60.62
Amusement and recreation services	12.30	26.10
Parking meters per area	147.77	402.33

(continued)

Table 1. (continued)

Variable	*M*	*SD*
Bus stops per area	38.40	61.49
School in neighborhood (1 = *Yes*, 0 = *No*)	32.66%	
College in neighborhood (1 = *Yes*, 0 = *No*)	0.84%	
Park in neighborhood (1 = *Yes*, 0 = *No*)	15.63%	
Hospital in neighborhood (1 = *Yes*, 0 = *No*)	1.97%	
Touching city boundary (1 = *Yes*, 0 = *No*)	14.18%	
Black council district (1 = *Yes*, 0 = *No*)	20.81%	
Hispanic council district (1 = *Yes*, 0 = *No*)	24.75%	
Asian council district (1 = *Yes*, 0 = *No*)	7.55%	
Residential/Nonresidential		
Residential not bordering nonresidential	37.16%	
Residential bordering nonresidential	45.44%	
Nonresidential	17.40%	
Parking enforcement district		
Central	12.66	
Hollywood	12.78	
Southern	25.55	
Valley	34.47	
Western	14.54	

Note. Area in per area variables is in square miles.

Getis-Ord Gi* statistic to identify hot and cold spots for each variable (Getis and Ord 1992). The Gi* statistic generates a z score and corresponding p value for each block group, where z scores greater than 1.96 indicate a significant hot spot, and z scores lower than −1.96 indicate a significant cold spot ($p < .05$). A hot or cold spot is based on a comparison of the local average (the block group and neighboring block groups, which is defined as block groups sharing a border) to the global average (the City of Los Angeles). The resulting maps show areas in the city where neighborhoods of high or low values significantly cluster.

The second set of analyses provides statistical estimates from multivariate regression models. The first set of models examines the association between the total number of on-street parking tickets and neighborhood demographic characteristics. All regressions are estimated as count data models in which the dependent variable is the number of parking tickets in a block group. Justification for this approach lies in the fact that parking ticket counts are cumulative, nonnegative, integers, and nonnormally distributed. Because the conditional variance is much larger than the conditional mean, models are

estimated as negative binomial regressions where the exposure is the block-group population size. Age, renter-status, median income, and race/ethnicity composition were modeled separately and then combined in a final complete model.

The second set of models tests the moderating effects of city council representation. The Los Angeles City Council is the governing body of the city. The council orders elections, levies taxes, authorizes public improvements, approves contracts, and adopts traffic regulations. There are 15 council districts in the city with one elected member assigned to each district. As representatives of their district neighborhoods, council members may protect against unfair ticketing practices. According to prior research (Broockman 2013; Sances and You 2017; Wilkins and Williams 2008), this more vigilant political representation may matter more in cases where representatives share similar descriptive traits, in particular, race/ethnicity. To test this hypothesis, the analysis estimated models interacting neighborhood percentage Black, percentage Hispanic, and percentage Asian with an indicator of whether the neighborhood is represented by a Black, Hispanic, or Asian council member in the beginning of 2016. Of the city's 15 council members, four are Hispanic, three are Black, and one is Asian.

Several additional analyses were conducted to examine the robustness of the main findings. First, separate models were estimated for predominantly residential and nonresidential neighborhoods. The justification for running separate models is that any association between neighborhood demographic composition and higher ticket counts is more meaningful in areas where city residents actually live. Parking violators in highly ticketed nonresidential areas are likely visitors who may not reflect the resident population. Moreover, parking regulations may differ between nonresidential and residential areas. Residential neighborhoods were defined as block groups with residential units making up at least 90% of total parcels. An indicator of whether the neighborhood borders a nonresidential neighborhood is included in all residential neighborhood models.

The analysis then models citations disaggregated by type and time of day. For citation type, separate models were run for citations specific to time-limit, permit use, and street-cleaning parking violations. Time-limit citations are issued for overtime use of or failure to pay a parking meter, overtime use of a designated parking time-limit area indicated by street signs, and overtime use of a time-limit colored curb (green = short time-limit zone; white and yellow = passenger loading zone). Permit citations are issued to vehicles without a permit to park on a street. Permits are issued only to or through local residents and are specific to overnight parking and parking in a preferential parking district. Preferential parking districts address intrusive parking

by nonresidents and commuter vehicles, according to LADOT, while allowing residents with permits—and their guests, if the resident applied for a guest permit—to park. Street-cleaning citations are issued to vehicles parking on streets during designated street-cleaning hours.

The major justification for examining these citation types is that they can differentiate between citations of local residents and nonresidents. This is an important distinction because local political representation may be either indifferent to the citation of visitors or perhaps encourage it to protect neighborhood parking spaces for residents or generate revenue through nonresidents. Time-limit parking citations may capture nonresidents because parking in a time-limit zone conveys a short-term visit to the area, and time-limit areas are more common near commercial properties and businesses. Permit-related parking citations may also capture nonresidents because permits are provided only for or through a local resident. In the case of street-cleaning parking tickets, they may capture residents neglecting to move their vehicles the night before or before going to work as street-cleaning hours are typically concentrated in the morning hours. Street-cleaning tickets also represent the most common citation in Los Angeles (approximately 25% of tickets in 2016) and is a major source of parking ticket revenue for the city. As such, they have been a central focus in resident complaints regarding the fairness and equity of parking tickets (Poston 2014; Reyes 2014).

For citations by time of day, separate models were estimated for citations occurring during the day, evening, and overnight. Daytime citations are those issued between 7:00 a.m. to 5:59 p.m., evening citations are those issued between 6:00 p.m. to 8:59 p.m., and overnight citations are issued between 9:00 p.m. to 6:59 a.m. Similar to citation type, the time of violation captures potential differences in the types of individuals parking their vehicles in a neighborhood. Overnight citations may capture nonlocal individuals failing to obtain an overnight parking permit. Evening citations may capture individuals visiting an area for outside dining or social events. Most citations are issued during the daytime hours when parking enforcement officers are more active. These hours may capture citations issued to a mixture of residents and visitors. On one hand, citations during daytime hours reflect residents neglecting to move their vehicles from, for example, daytime restricted street parking or during street-cleaning hours as they travel to other parts of the city for work or leisure. On the other hand, the daytime may better reflect nonresident parking behavior given that residents may be commuting out of a neighborhood for work, and nonresidents may be commuting in for work.

All models included the control variables described in section “Data and Variables.” Variance inflation factors (VIF) were estimated to assess the presence of multicollinearity. No variables exceeded VIFs greater than 5. Model

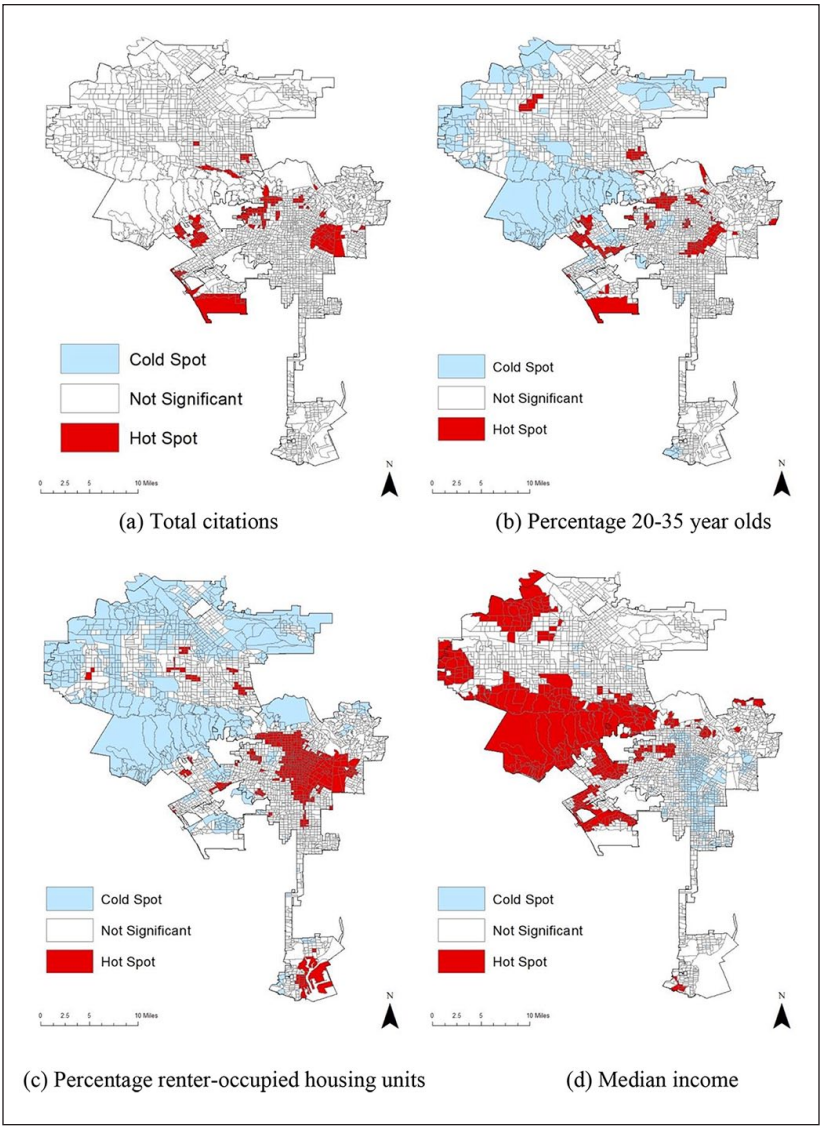
fit was assessed using Akaike information criterion (AIC) and Bayesian information criterion (BIC). Standard errors were clustered by city council district.

Results

Descriptive Maps

Figure 1 shows statistically significant hot and cold spots for parking tickets, percentage of residents between the ages of 20 and 35, percentage of housing units that are renter-occupied, median household income, percentage Black, percentage Hispanic, and percentage Asian in Los Angeles. These maps show areas in the city where neighborhoods with high and low values of each variable significantly cluster. For parking citations, I find high-count neighborhood clusters in heavily visited and trafficked areas such as downtown (the cluster of red neighborhoods east of the city's center), Hollywood (the cluster of red neighborhoods in the middle of the city and west of downtown), and along the coast (along the western portion of the city boundary). I find clusters of neighborhoods with high percentages of young adults in downtown, Hollywood, midcity, near the coast, and pockets in the northern portion of the San Fernando Valley. Cold spots are predominantly found along the northwestern edge of the city boundary. The percentage renter-occupied map shows cold and hot spots in similar locations as the percentage young adult map. I also find a large cluster of high-renter neighborhoods connecting the high young adult neighborhoods in downtown and Hollywood. The median household income map shows hot spots located in mid- and North Los Angeles and cold spots in downtown and the southern portion of the city. There are large clusters of Black neighborhoods in Southwest Los Angeles and a small cluster near downtown. Large clusters of high Hispanic neighborhoods exist in Southeast Los Angeles, the southernmost portion of the city, and parts of the San Fernando Valley. Percentage Asian hot spots exist in the northernmost portion of the city, parts of mid-Los Angeles, and toward the southern area of the city.

Figure 2 overlays the parking ticket cluster map with the maps of each demographic variable to show where hot and cold spots overlap. Because no parking ticket cold spots exist, the maps identify the overlap between citation hot spots and hot and cold spots for each demographic variable. The maps zoom into the central area of the city because no parking ticket hot spots exist in the north and south regions of the city. I find clusters of low-income, high-rent, high-minority, and young adult neighborhoods overlapping with clusters of high parking citation neighborhoods in downtown Los Angeles. I also find


Cold Spot
Not Significant
Hot Spot
0 2.5 5 10 Miles
N
(a) Total citations
Cold Spot
Not Significant
Hot Spot
0 2.5 5 10 Miles
N
(b) Percentage 20-35 year olds
Cold Spot
Not Significant
Hot Spot
0 2.5 5 10 Miles
N
(c) Percentage renter-occupied housing units
Cold Spot
Not Significant
Hot Spot
0 2.5 5 10 Miles
N
(d) Median income

(continued)

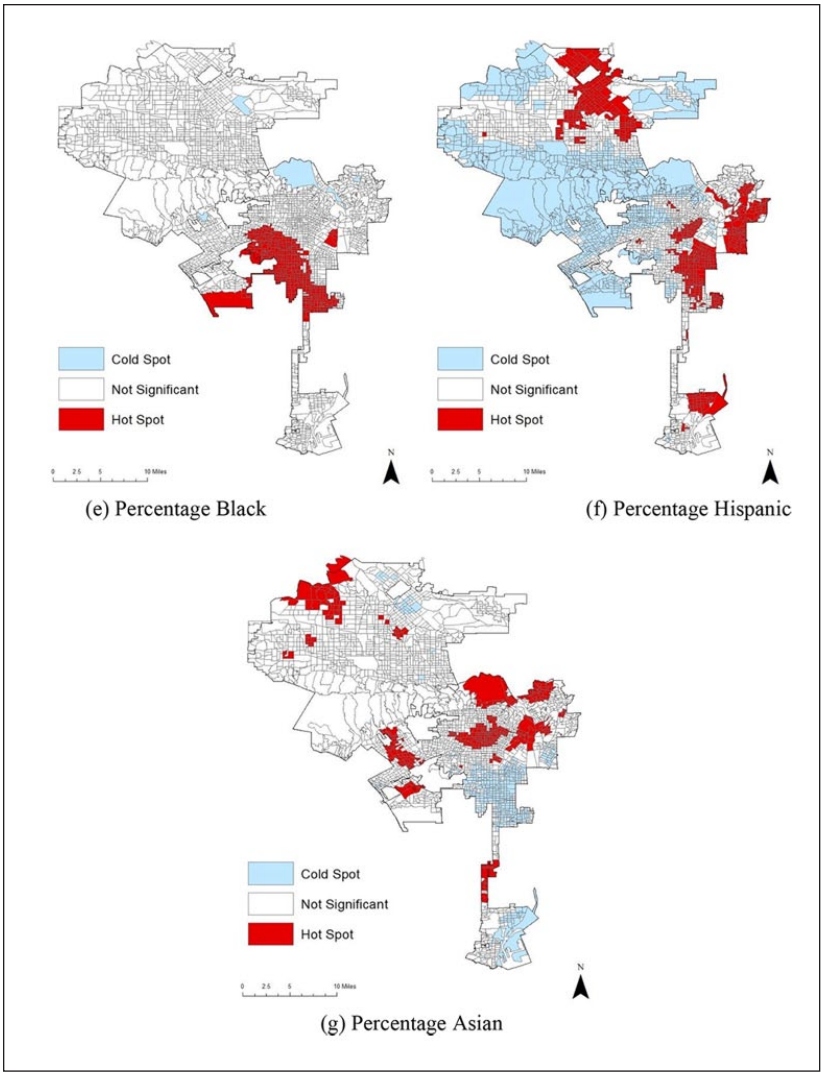


Figure 1. Hot and cold spots of Los Angeles neighborhood parking tickets and neighborhood demographic characteristics.

clusters of low-income, high-rent, and young adult neighborhoods overlapping with high parking citation clusters in the Hollywood area. Unlike downtown, these overlapping areas largely do not coincide with Black clusters and

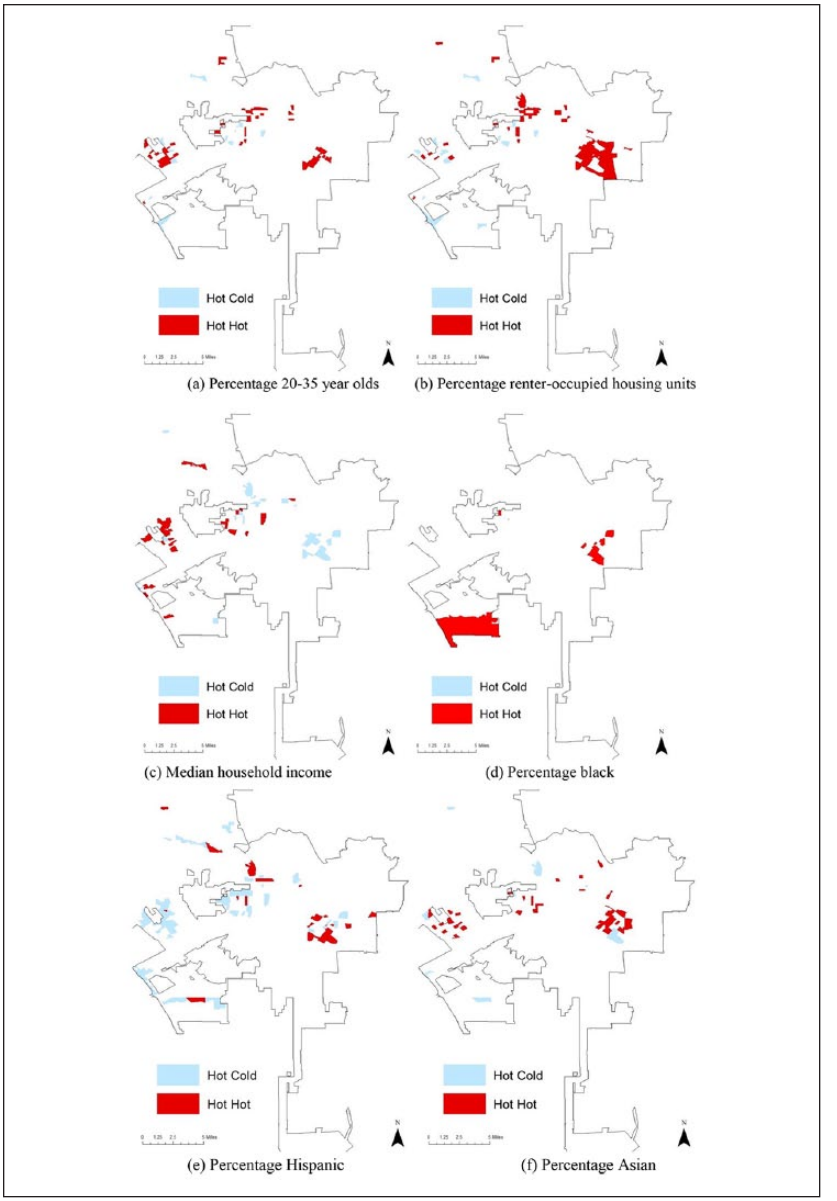


Figure 2. Overlap between Los Angeles neighborhood parking ticket and demographic characteristics hot and cold spots.

have a mixture of high and low Asian and Hispanic neighborhoods. The area south of Hollywood contains overlapping areas of high parking citations, high Asian, high median household income, and low Hispanic. However, these areas do not coincide with any Black clusters, and there is a mixture of hot and cold clusters of renter and young adult neighborhoods. I find a similar phenomenon in West Los Angeles.

In summary, these maps show that parking tickets are not randomly distributed across the city but are spatially clustered. These clusters tend to be found in dense, highly visited areas such as downtown and Hollywood. The maps do not provide conclusive evidence that ticket hot spots are only found in low-income, high-rent, high-minority, and young adult neighborhood clusters. Some clusters are found in these areas, such as downtown, whereas others overlap with neighborhood clusters of mixed types such as the high-income but high-rent and young adult clusters in West Los Angeles.

Multivariate Results

The maps shown in the previous section provide a geographic portrait of the relationships between parking tickets and neighborhood characteristics. The results in this section are from statistical models examining these relationships within a multivariate framework. Table 2 shows results from negative binomial regression models using neighborhood parking ticket counts as the dependent variable and population size as the exposure. Coefficients are presented as incident rate ratios (IRR) whereby a value greater than 1 indicates a positive relationship with the number of parking tickets in a neighborhood. In other words, the coefficients indicate the percent change in the number of parking tickets associated with a one-unit change in the independent variable adjusted for population size and the set of control characteristics listed in Table 1. Because of the large set of covariates included in the analyses, only the main results are shown. Full modeling results are provided in the online appendix. The first four columns of results are for regressions separately modeling each demographic characteristic. I find that the percentage 20–35 year olds, percentage renter-occupied housing units, and percentage Black are positively associated with the number of parking tickets in a neighborhood. In contrast, log median household income is negatively correlated with parking tickets. The coefficients for percentage Asian and Hispanic are not significant at conventional levels of statistical significance. Model (5) combines all variables into a single regression. The IRRs for percentage renter-occupied units, percentage 20–35 year olds, and percentage Black remain statistically significant and above 1. These coefficients indicate that a percentage point increase in the percentage renter-occupied units, percentage

Table 2. Negative Binomial Regression Models of Neighborhood Parking Ticket Counts.

Variable	(1)	(2)	(3)	(4)	(5)
Log median household income	0.722** (0.076)				0.948 (0.101)
% 20–35 year olds		1.015*** (0.003)			1.011*** (0.003)
% renter-occupied housing			1.013*** (0.002)		1.011*** (0.002)
% non-Hispanic Black				1.009* (0.004)	1.005* (0.002)
% Hispanic				0.998 (0.003)	0.996 (0.002)
% non-Hispanic Asian				0.996 (0.004)	0.992 (0.006)
AIC	13.907	13.904	13.864	13.898	13.833
BIC	34,696.176	34,689.674	34,588.866	34,673.885	34,511.310
N	2,489	2,489	2,489	2,489	2,489

Note. Coefficients are presented as relative risk ratios. Standard errors are clustered by city council district. AIC = Akaike information criterion; BIC = Bayesian information criterion.
*$p < .05$. **$p < .01$. ***$p < .001$.

20–35 year olds, and percentage Black are associated with a 1.1%, 1.1%, and 0.5% increase in parking tickets, all else being equal. A neighborhood moving from the 25th percentile (36.5%) to the 75th percentile (83.5%) in percentage renter-occupied units leads to a 51.7% increase in parking tickets. For percentage 20–35 year olds and percentage Black, a jump from the 25th to 75th percentile (11.4% to 19.9% for percentage 20–35 year olds and 0.8% to 10.2% for percentage Black) leads to a 9.4% and 4.7% increase in parking tickets, respectively. Log median household income, percentage Hispanic, and percentage Asian remain not significant.

Table 3 shows results from models testing whether the association between neighborhood racial composition is moderated by neighborhood own race representation in the city government council. Results are separately shown for each race/ethnicity interaction and combined in a final complete model. The coefficients for the other demographic characteristics are also shown, with modeling results for the control variables provided in the online appendix. For each separate race/ethnicity model, I find no interactive effect of percentage race/ethnicity and council representation. For the final model, I find that the main effects of percentage renter-occupied units, percentage

Table 3. Negative Binomial Regression Models Testing Racial/Ethnic Descriptive Representation.

Variable	(1)	(2)	(3)	(4)
Log median household income	0.935	0.914	0.942	0.924
	(0.095)	(0.086)	(0.096)	(0.088)
% 20–35 year olds	1.011***	1.010***	1.010***	1.010***
	(0.003)	(0.003)	(0.003)	(0.003)
% renter-occupied housing	1.010***	1.010***	1.010***	1.010***
	(0.002)	(0.002)	(0.002)	(0.002)
% non-Hispanic Black	1.005	1.006*	1.006*	1.005*
	(0.003)	(0.002)	(0.003)	(0.002)
% Hispanic	0.998	0.995	0.997	0.995
	(0.003)	(0.003)	(0.003)	(0.003)
% non-Hispanic Asian	0.992*	0.994	0.989**	0.991
	(0.004)	(0.004)	(0.004)	(0.005)
Black council member	0.894	0.952	0.950	0.961
	(0.152)	(0.112)	(0.121)	(0.147)
Hispanic council member	0.898	0.580	0.919	0.613
	(0.149)	(0.256)	(0.149)	(0.279)
Asian council member	1.376*	1.324	1.051	1.047
	(0.200)	(0.194)	(0.175)	(0.172)
% Black × Black council member	1.003			1.000
	(0.005)			(0.005)
% Hispanic × Hispanic council member		1.007		1.006
		(0.005)		(0.005)
% Asian × Asian council member			1.017	1.015
			(0.011)	(0.012)
AIC	13.824	13.817	13.819	13.813
BIC	34,488.768	34,473.215	34,476.059	34,462.594
N	2,489	2,489	2,489	2,489

Note. Coefficients are presented as relative risk ratios. Standard errors are clustered by city council district. AIC = Akaike information criterion; BIC = Bayesian information criterion.
*$p < .05$. **$p < .01$. ***$p < .001$.

20–35 year olds, and percentage Black remain statistically significant, but no interactive effect of percentage race/ethnicity and council representation for all race/ethnic groups.

The results from Tables 2 and 3 are for the entire city of Los Angeles. The relationships between parking tickets and neighborhood characteristics, however, may vary by whether the neighborhood is primarily residential or not. Table 4 shows results for complete models separated by residential and

Table 4. Negative Binomial Regression Models of Neighborhood Parking Ticket Counts for Residential and Nonresidential Neighborhoods.

	Residential		Nonresidential	
Variable	(1)	(2)	(3)	(4)
Log median household income	1.066	1.008	1.031	1.011
	(0.135)	(0.110)	(0.109)	(0.098)
% 20–35 year olds	1.008**	1.007**	1.004	1.002
	(0.003)	(0.003)	(0.004)	(0.004)
% renter-occupied housing	1.007*	1.007*	1.009**	1.008**
	(0.003)	(0.003)	(0.003)	(0.003)
% non-Hispanic Black	1.005*	0.999	0.998	1.004
	(0.002)	(0.006)	(0.003)	(0.004)
% Hispanic	0.995	0.994	0.991	0.989
	(0.003)	(0.004)	(0.004)	(0.005)
% non-Hispanic Asian	0.985	0.987*	0.991**	0.990*
	(0.008)	(0.005)	(0.003)	(0.004)
Black council member		0.806		1.080
		(0.164)		(0.173)
Hispanic council member		0.519		0.710
		(0.258)		(0.255)
Asian council member		1.116		1.173
		(0.189)		(0.153)
% Black × Black council member		1.010		0.991
		(0.007)		(0.005)
% Hispanic × Hispanic council member		1.008		1.006
		(0.006)		(0.003)
% Asian × Asian council member		1.001		1.014
		(0.006)		(0.012)
AIC	14.633	14.598	13.173	13.156
BIC	20,677.758	20,651.556	13,602.777	13,570.384
N	1,564	1,564	925	925

Note. Coefficients are presented as relative risk ratios. Standard errors are clustered by city council district. AIC = Akaike information criterion; BIC = Bayesian information criterion. *$p < .05$. **$p < .01$. ***$p < .001$.

nonresidential. The columns for each neighborhood type show results for models with and without the city council interactions. The AIC and BIC values indicate that the built environment, structural, and demographic characteristics included in the analysis do a better job of explaining parking tickets in predominantly nonresidential settings. The results for total citations in residential neighborhoods mimic those for the total sample: Percentage

renter-occupied housing units, percentage 20–35 year olds, and percentage Black are positively associated with parking ticket rates. Moreover, the effect sizes are similar. For nonresidential neighborhoods, percentage renter-occupied housing units and percentage Asian have significant relationships with parking ticket rates. The coefficients for the other demographic variables are not significant. The results for models testing the effects of descriptive representation mimic the findings for the total sample: The nonsignificant coefficients on the interactions between percentage race/ethnicity and council representation offer no support for the influence of race/ethnic descriptive representation on neighborhood parking tickets in both residential and nonresidential neighborhoods.

Table 5 shows results for models separated by citation type. Similar to Table 4, I show results for models with and without the percentage race/ethnicity and city council interactions. Focusing first on the noninteraction models, the results for street-cleaning citations, which represent the largest share of total citations in the city, mimic those for total citations: positive associations for percentage 20–30 year olds, percentage renter-occupied units, and percentage Black. I find, however, important differences across time-limit and permit citations. For time-limit citations, which are more likely to be issued to visiting drivers, I find a positive association with log median household income and percentage renter-occupied units, but negative associations with percentage Black, Hispanic, and Asian. I find similar results for permit citations. Specifically, log median household income, percentage 20–35 year olds, and percentage renter-occupied units are positively associated with permit citations whereas percentage Hispanic is negatively associated. On one hand, these results may indicate a greater propensity for visitors to violate parking rules in White, wealthier, young adult, and renter neighborhoods. On the other hand, the results may suggest greater vigilance in the parking enforcement of visitors in these areas. However, it could also be a mixture of these explanations. In the case of young adult and renter neighborhoods, positive associations may indicate a greater number of visitors coming to these areas, thus, increasing counts of visitor-related parking violations and tickets. Moreover, parking ticket officers may increase patrolling in these areas given the greater presence of visitors. In the case of White and wealthier areas, the results may suggest a protective effect against nonresident violations through greater vigilance in the parking enforcement of visitors. This protective effect may be particularly true for time-limit and permit-related violations, which are often reported by local businesses seeking greater customer turnover and residents suspicious of unknown vehicles (*Los Angeles Times* 2015). These explanations are speculative and require further empirical investigation.

For the interaction models, I continue to find no significant interactions between council representation and percentage race/ethnicity for Black and

Table 5. Negative Binomial Regression Models of Neighborhood Parking Ticket Counts by Citation Type.

	Street cleaning		Time limit		Permit	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Log median household income	0.870	0.839*	2.127**	1.784*	2.653**	2.263*
	(0.081)	(0.071)	(0.591)	(0.449)	(0.737)	(0.845)
% 20–35 year olds	1.012***	1.011**	1.014	1.010	1.022*	1.021
	(0.003)	(0.003)	(0.009)	(0.010)	(0.010)	(0.011)
% renter-occupied housing	1.009***	1.008**	1.018**	1.015*	1.036**	1.039**
	(0.002)	(0.002)	(0.006)	(0.006)	(0.014)	(0.014)
% non-Hispanic Black	1.008**	1.008**	0.979***	0.990	0.987	0.975
	(0.002)	(0.003)	(0.005)	(0.008)	(0.015)	(0.018)
% Hispanic	0.996	0.994	0.976***	0.973***	0.967***	0.961**
	(0.003)	(0.003)	(0.002)	(0.003)	(0.006)	(0.012)
% non-Hispanic Asian	0.991	0.990*	0.975**	0.982	0.987	0.990
	(0.004)	(0.004)	(0.009)	(0.012)	(0.012)	(0.013)
Black council member		0.934		0.999		3.776
		(0.169)		(0.248)		(2.978)
Hispanic council member		0.531		0.233*		0.012***
		(0.245)		(0.146)		(0.011)
Asian council member		1.025		0.958		2.540*
		(0.138)		(0.304)		(1.203)
% Black × Black council member		1.000		0.983		1.006
		(0.006)		(0.009)		(0.012)
% Hispanic × Hispanic council member		1.007		1.019***		1.058***
		(0.006)		(0.006)		(0.011)
% Asian × Asian council member		1.015*		0.999		1.003
		(0.006)		(0.011)		(0.041)
AIC	12.387	12.373	7.186	7.178	3.155	3.138
BIC	30,911.848	30,878.462	17,968.278	17,947.415	7,933.083	7,892.662
N	2,489	2,489	2,489	2,489	2,489	2,489

Note. Coefficients are presented as relative risk ratios. Standard errors are clustered by city council district. AIC = Akaike information criterion; BIC = Bayesian information criterion.
*$p < .05$. **$p < .01$. ***$p < .001$.

Asian. However, I find that although the main effect of percentage Hispanic indicates a negative relationship with time-limit and permit-related parking tickets, this effect is counteracted by Hispanic council representation. In this case, the 2.7% and 3.3% increase in time-limit and permit-related parking tickets associated with a one percentage point increase in percentage Hispanic is offset by Hispanic council representation, which increases time-limit and permit-related parking tickets by 1.9% and 5.8%, respectively. A neighborhood moving from the 25th to the 75th percentile in percentage Hispanic (17.9% to 72.9%) leads to a 132.2% decrease in time-limit parking tickets. This decrease, however, is counteracted by a 104.7% increase in time-limit

Table 6. Negative Binomial Regression Models of Neighborhood Parking Ticket Counts by Time of Day.

	Day		Evening		Overnight	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Log median household income	0.919	0.901	2.432**	1.302	0.818	0.783
	(0.084)	(0.071)	(0.773)	(0.299)	(0.118)	(0.114)
% 20–35 year olds	1.012***	1.011***	1.011*	1.007	1.003	1.002
	(0.003)	(0.002)	(0.005)	(0.006)	(0.004)	(0.005)
% renter-occupied housing	1.009***	1.008**	1.013**	1.012*	1.020***	1.019***
	(0.002)	(0.002)	(0.005)	(0.005)	(0.003)	(0.003)
% non-Hispanic Black	1.005*	1.006	0.995	1.003	1.007	1.010*
	(0.002)	(0.003)	(0.005)	(0.007)	(0.004)	(0.004)
% Hispanic	0.995*	0.994	0.996	0.991**	1.004	1.002
	(0.002)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)
% non-Hispanic Asian	0.991	0.990*	0.986***	0.989	0.996	0.996
	(0.005)	(0.005)	(0.004)	(0.006)	(0.003)	(0.004)
Black council member		0.962		0.823		0.953
		(0.153)		(0.188)		(0.188)
Hispanic council member		0.678		0.278**		0.616
		(0.311)		(0.123)		(0.273)
Asian council member		1.013		1.235		1.168
		(0.149)		(0.321)		(0.181)
% Black × Black council member		0.999		0.989		0.996
		(0.004)		(0.008)		(0.007)
% Hispanic × Hispanic council member		1.005		1.019**		1.009*
		(0.005)		(0.006)		(0.004)
% Asian × Asian council member		1.015		1.016		1.006
		(0.009)		(0.029)		(0.015)
AIC	13.378	13.363	8.150	8.117	9.668	9.658
BIC	33,378.468	33,341.049	20,366.597	20,284.057	24,145.596	24,119.448
N	2,489	2,489	2,489	2,489	2,489	2,489

Note. Coefficients are presented as relative risk ratios. Standard errors are clustered by city council district. AIC = Akaike information criterion; BIC = Bayesian information criterion.
*$p < .05$. **$p < .01$. ***$p < .001$.

parking tickets if this neighborhood is represented by a Hispanic council member. These results indicate a possible protective effect of Hispanic council representation on parking spaces in Hispanic neighborhoods through the greater enforcement of time-limit and permit-related parking.

Table 6 shows results for models separated by time of day. I find that daytime citations largely mimic the results from the total citation models with the exception of percentage Hispanic, which is statistically significant and negatively associated with daytime parking citations. For evening citations, I find positive associations for log median household income, percentage 20–35 year olds, and percentage renter-occupied units and a negative association for

percentage Asian. All demographic characteristics have no association with overnight citations except percentage renter-occupied units, which is positively associated. In fact, percentage renter-occupied units is positively associated across all models in Tables 2 to 6, indicating that neighborhoods with larger percentages of renters are prone to more parking tickets across neighborhood and citation type above and beyond the built environment and measures of parking supply and demand. Similar to the citation-type models, I find that Black and Asian council representation have no influence on parking ticket rates in Black and Asian neighborhoods, respectively, but Hispanic council representation has important protective effects. Specifically, for every percentage point increase in percentage Hispanic, Hispanic council representation increases evening and overnight parking tickets by 1.9% and 0.9%, respectively.

Discussion and Conclusion

The primary research objective of this study is to examine the spatial relationship between parking citations—a common fine that makes up a significant proportion of total fines in large cities—and the demographic composition of residents at the neighborhood level in Los Angeles. Statistical analyses controlling for a large set of built environment and structural characteristics revealed that neighborhoods with greater percentages of renter-occupied housing units, 20 to 35 year olds, and Black residents experience greater parking ticket rates. These results have implications for policies that increase parking ticket costs. First, increased ticket costs will have a greater impact on Black, young adult, and high-rental neighborhoods assuming no changes in enforcement. Second, although raising ticket costs are not unlawful if they are not accompanied by explicit bias in enforcement, it is a misaligned policy if its primary purpose is to generate revenue for the city to bridge periods of budget shortfalls rather than to directly deter parking violations and strengthen parking management, traffic regulation, and public safety. Because tickets are concentrated in Black, young adult, and rental neighborhoods, they carry the burden of helping the city balance its general operating budget.

Another objective of this study is to test claims that city government and enforcement are targeting certain neighborhoods for minor offenses. Parking tickets are relevant not only because they are among the most common minor offenses, but unlawful bias claims specific to parking enforcement are often raised in debates concerning the overhaul of parking regulations. If bias is not present, we should not expect racial and socioeconomic differences once we account for parking supply and demand factors and the neighborhood built environment and structural characteristics that are associated with illegal

parking. However, multivariate regression results show that parking ticket rates are higher in neighborhoods with a larger presence of renters, young adults, and Black residents above and beyond the effects of the built environment and structural characteristics. Additional models revealed that the burden of higher parking ticket rates in renter, young adult, and Black neighborhoods are specific to residential areas, establishing a stronger link between parking tickets and the actual neighborhoods where these populations live. The burden is also specific to street-cleaning parking citations, the violation representing the largest share of total citations in the city, and citations issued during daytime hours, the time period during which most parking tickets are issued, and enforcement is most active. These results show that claims of unlawful bias are not unfounded.

It must be noted that the results do not offer conclusive evidence that Los Angeles City officials are intentionally targeting socioeconomically vulnerable neighborhoods for fines as the DOJ found in Ferguson. Instead, the study indicates that fines are unequally distributed across neighborhoods, and this could be due to policies that explicitly target certain areas or implicit bias in the enforcement practices of parking officers. This unfair distribution whether implicit or directly imposed by city government suggests that policy makers should focus attention on reforming parking policies in specific locations, and these policies should take into consideration other variables beyond measures of demand and supply. Many of the recommended parking reforms released by the mayor's parking reform group (Los Angeles City Parking Reform Group 2015) are sensitive to where parking tickets are occurring, but greater emphasis should be placed on how these proposed recommendations can account for and potentially alter the relationship between parking ticket rates and the socioeconomic makeup of these locations.

The final research objective is to examine the importance of racial/ethnic descriptive representation in moderating the association between neighborhood racial/ethnic composition and parking ticket counts. The results show that the burden of higher ticket counts in Black neighborhoods is not alleviated by descriptive representation at the city council level. The results also reveal that Hispanic and Asian representation in city council do not influence total parking ticket counts in Hispanic and Asian neighborhoods, respectively. The citation type and time of day models, however, indicate that Hispanic council representation has a protective effect for Hispanic neighborhoods. Hispanic council representation is associated with greater parking tickets in Hispanic neighborhoods for parking regulations that are more likely to be violated by visitors, specifically time-limit, permit-related, evening, and overnight parking regulations.

The combination of prevailing demographic trends and Preuhs's models of political incorporation and racialized institutions offer insight on these results. From 1990 to 2010, percentage Hispanic in Los Angeles increased from 39.3% to 48.5%. In contrast, percentage Black decreased from 13.2% in 1990 to 9.2% in 2010. Although percentage Asian increased during this period, the rise is not as significant as the Hispanic population and is much larger in nearby cities. For example, percentage Asian in West Covina, a growing Asian enclave in Los Angeles county, increased from 16.3% in 1990 to 25.3% in 2010 whereas it increased from 9.2% to 11.1% during the same time period in Los Angeles City. Moreover, Asian political representation in Los Angeles is still limited, with only two Asian members elected to city council in the city's history. Also occurring during this period were high levels of racial conflict between Blacks and non-Blacks stemming from key events that increased polarization between the two groups, in particular, the riots in 1992 (Hunt and Ramon 2010; Sonenshein 1993). The result of these demographic shifts is a decline in Black political incorporation, limited Asian political representation in Los Angeles City, and greater Hispanic political influence.

Another potential explanation is the study's unit of analysis. The results are specific to the neighborhood level, which may yield significant effects of Hispanic representation given the prevalence of Hispanic neighborhood enclaves in the city (Logan, Zhang, and Alba 2002). It is not just the case that the overall Hispanic population is increasing, but it is clustering at the neighborhood level, which helps strengthen local coalitions for lobbying efforts at higher levels of government policy. These explanations are speculative and require further analyses. Future research should also examine associations between the foreign-born population and city government fines and fees. On one hand, immigrants may be particularly susceptible because they are less proficient with the English language and unfamiliar with the local governance system. On the other hand, immigrants may have greater protective support systems in cities with a large presence of immigrant neighborhood enclaves and a long history of immigration. Overall, the findings suggest that the impact of descriptive representation varies by race/ethnicity depending on the political history and demographic trends of the city.

Limitations of the study and other avenues for future research should be noted. First, the results are case specific and may not generalize to other cities. As described earlier, Los Angeles represents in many ways an ideal case study for examining issues related to parking regulation and enforcement; however, future studies should examine other cities to determine the robustness of this study's results to other urban settings. This is especially the case for the protective effects of Hispanic descriptive representation, which may

be true only in cities with a large, increasing Hispanic presence. Likewise, Black and Asian descriptive representation may be important in cities with larger Black and Asian populations. Still, the singular case study of Los Angeles offers a baseline comparison for future analyses of government fees and fines in Los Angeles, a city that has received considerable attention in public debates surrounding government service equity (Reyes 2015; Romero 2017), and other demographically similar cities. Second, the study examines a single year of parking citation data. Panel data allow for statistical procedures that can help control for time invariant unobservable neighborhood confounders. This data limitation prevents the study from making any strong causal claims. Moreover, because of its reliance on cross-sectional data, the study does not directly test the association between the anticipation of budget shortfalls, increased fines, and the targeting of disadvantaged areas. Future research utilizing longitudinal data should examine the direct impact of increases in parking ticket fines and changes in the geographic distribution of parking tickets. Third, because these data do not provide information on the characteristics of the individuals who receive parking tickets, the study does not examine the association between parking tickets and individual demographic and socioeconomic background. As such, the study's ecological results may not generalize to the individual level. The results cannot directly speak to the type of bias examined in studies of pedestrian and motor vehicle stops whereby officers may be pulling over individuals because of their race/ethnicity and other physical characteristics.

Despite these limitations, the study is one of the few to test the association between fines and resident demographic composition and the first to do so at the neighborhood level. Because data on government fines and fees have largely been available only at spatially aggregated levels, such as the city, prior studies have not been able to examine issues of fine inequity at lower spatial scales, such as the neighborhood, hiding important demographic, economic, institutional, and political variation within cities. This study utilized a unique publicly available dataset—parking fines geocoded at the location of the violation—to fill this gap in the literature. Data on resident usage of and engagement with public services are becoming increasingly available through city open data portals (O'Brien, Sampson, and Winship 2015), offering important opportunities for researchers to examine the relationship between city government actions and resident characteristics at finer levels of detail.

The study also contributes to the broader urban sociological literature by illustrating that minor problems, such as parking violations, are concentrated in disadvantaged neighborhoods. This literature has largely focused on aspects of the built environment, such as vacant lots and liquor stores, the socioeconomic environment, such as poverty and underachieving schools,

and major criminal offenses, such as homicides, when discussing the concentration of social problems in disadvantaged residential settings. Moreover, the attention paid to discriminatory and inequitable enforcement has focused on police officers and instances of physical harassment and violence. This study suggests that relatively ubiquitous social phenomena, such as parking enforcement, contribute to the spatial inequality of a city. In the case of Ferguson, inequality in the distribution of fines and fees was linked to explicit bias in the policies and practices of city officials and enforcement agents. However, the patterns of spatial inequality revealed in this study may, instead, be due to inadvertent bias shaped by broader patterns of residential segregation. Regardless of the reason, residents living in heavily ticketed neighborhoods may develop cynicism and distrust toward local government, particularly if local parking regulations are not clear and considered unfair, or increased ticket costs are perceived by local residents as an attempt to fill city coffers, leading to feelings of powerlessness and community disengagement. Although an examination of underlying causes and effects is beyond the scope of this study, the results lay groundwork for further research in equity issues in the enforcement of minor offenses and the potential use of policing to generate revenue, topics of great interest in urban policy debates but largely missing in academic work.

Declaration of Conflicting Interests

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