
The Price of Parking in Providence, RI

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INTRODUCTION

Parking, though seemingly mundane, is a multifaceted problem that lies at the center of many transportation challenges facing cities. One of the central problems of parking is its pricing, particularly for on-street residential and commercial parking. We analyze the implications of residential parking pricing in Providence, Rhode Island, and its broader parking permit program.

Our three research questions include:

1. How does Providence's permit program compare to other similar cities?
2. In what ways have comparable cities made significant changes to their permit program?
3. What is the value of an off-street parking space in Providence?

To answer our first two questions, we use an original dataset of 130 cities in the country and compare different metrics of these programs, as well as analyze in-depth interesting changes from Costa Mesa, CA and Revere, MA. To evaluate the value of an off-street space, we use an original dataset of housing units sold in Providence and employ a regression model. We find that while Providence's permit program is similar to comparable cities by many metrics, its price is well above that of other cities. Furthermore, we find off-street parking is abundant in the city and non-garage spaces are insignificant to housing prices. Garage spaces, however, do have a significant effect on price. After an analysis of these two sets of data, we recommend Providence offer discounted permits to lower-income residents and increase its allowance for guest pass uses. However, we acknowledge that the program's low enrollment and compliance rates are ultimately influenced by the fact that the majority of the housing stock in the city includes off-street parking.

PRIOR RESEARCH ON PARKING

Various transportation policies have incentivized car dependence, including residential parking minimums, employer-paid parking, and the under-pricing of parking; such policies were implemented because municipalities found parking was a significant contributor to local economies.

¹ To maintain parking profits, car dependency, and the public's perception that parking is mainly free or relatively cheap, municipalities hid parking costs within the price of various commodities such as retail and housing costs.² While some reform efforts aimed at decreasing automobile use and the amount of land taken up by parking spaces have been successful, others have been met with unintended consequences and limited efficacy. Starting in the 1980s, major cities worldwide began

¹ Daniel Albalade and Eren Inci, "Introduction to the Special Issue on the Economics of Parking," *Journal of Transport Economics and Policy* 52, no. 3 (2018): pp. 181-183, <https://www.jstor.org/stable/90020689>.

² Daniel Albalade and Eren Inci, "Introduction to the Special Issue on the Economics of Parking".

implementing paid parking permits programs in commercial and residential areas as vehicle ownership surged.³ With more and more parking permit programs implemented in cities, public administrators struggle to strike a balance between high parking fees, high vacancy, and low parking fees, not enough vacancy.

Residential parking minimums, in particular, have allowed for an increase in land use problems and car use. In Los Angeles, “minimum off-street parking requirements have been a success at encouraging greater automobility and probably a failure at lowering traffic congestion.”⁴ In response, policy efforts such as simply reforming existing parking minimums are underwhelming. In contrast, more comprehensive actions such as converting parking infrastructure have been more significant in decreasing car use.⁵ Residential parking pricing is further complicated, as residents’ willingness to pay for a parking permit exceeds the residents’ parking permit’s price but is far below the on-street price faced by non-residents.⁶ In addition to parking minimums, employer-paid parking has also incentivized car dependence, and its spillover effect aptly illustrates difficulties with policy reforms.⁷ Broadly, parking policy reforms, especially pricing tactics, aim to disincentivize car use and poor land-use decisions but may have unintended consequences or underwhelming outcomes. Additionally, pricing reform efforts in parking and the housing market must be comprehensive in their focus on equity, as lower-income households are disproportionately affected by generous off-street parking requirements.⁸

A COMPARISON OF PARKING POLICIES

We collected a variety of information about residential permit programs across 130 cities, including 32 with population density over 4,000 people per square mile, 31 cities with populations over 100,000, 33 cities in the northeast with populations over 50,000, and 33 cities in the northeast with populations over 20,000. Providence meets all of these metrics, it has a population of 179,000 and a

³ Jesper de Groot, Jos van Ommeren, and Hans R. Koster, “The Impact of Parking Policy on House Prices,” *Journal of Transport Economics and Policy* 52, no. 3 (2018): pp. 267-282, <https://www.ijstor.org/stable/90020694>.

⁴ Mikhail Chester et al., “Parking Infrastructure: A Constraint on or Opportunity for Urban Redevelopment? A Study of Los Angeles County Parking Supply and Growth,” *Journal of the American Planning Association* 81, no. 4 (2015): pp. 268-286, <https://doi.org/10.1080/01944363.2015.1092879>.

⁵ Mikhail Chester et al., “Parking Infrastructure: A Constraint on or Opportunity for Urban Redevelopment? A Study of Los Angeles County Parking Supply and Growth”.

⁶ Jos van Ommeren, Derk Wentink, and Jasper Dekkers, “The Real Price of Parking Policy,” *Journal of Urban Economics* 70 (2011): pp. 25-31, <https://doi.org/10.2139/ssrn.1480564>.

⁷ Donald C. Shoup, “An Opportunity to Reduce Minimum Parking Requirements,” *Journal of the American Planning Association* 61, no. 1 (1995): pp. 14-28, <https://doi.org/10.1080/01944369508975616>.

⁸ Todd Litman, “Parking Requirement Impacts on Housing Affordability,” Victoria Transport Policy Institute (1995).

population density of roughly 9,000 people per square mile.⁹ We compare aspects of Providence’s permit program to those in the entire dataset, and to cities with populations over 100,000.

INTRODUCTION TO PROVIDENCE’S PERMIT PROGRAM

Of the 130 cities studied, 105 offer residential parking permits. On average, a parking permit in Providence (\$100 for cars registered in the city, \$200 for cars registered outside) is more expensive than those in other cities. The average cost of a permit for a car registered within the city in all cities studied is \$41, and is \$32 in cities with populations over 100,000. Furthermore, the average permit cost for cars registered outside of the city (for cities that implement a price difference) is \$79 across all cities, and \$76 in cities over 100,000 people– both notably lower than the permit price in Providence. We also study the ease of finding information through a measure of 1-10, where we rank how easy it is to find information on the internet for each city. A 1 indicates the information on a given city’s permit program is difficult and time consuming to find, whereas a 10 indicates the information is easily accessible and searchable on the internet. In this measure, all studied cities average a rating of 6, and comparatively, Providence is ranked a 10, indicating high ease of finding information with regards to parking policy.

Figure 1. Permit Program Averages Across Cities

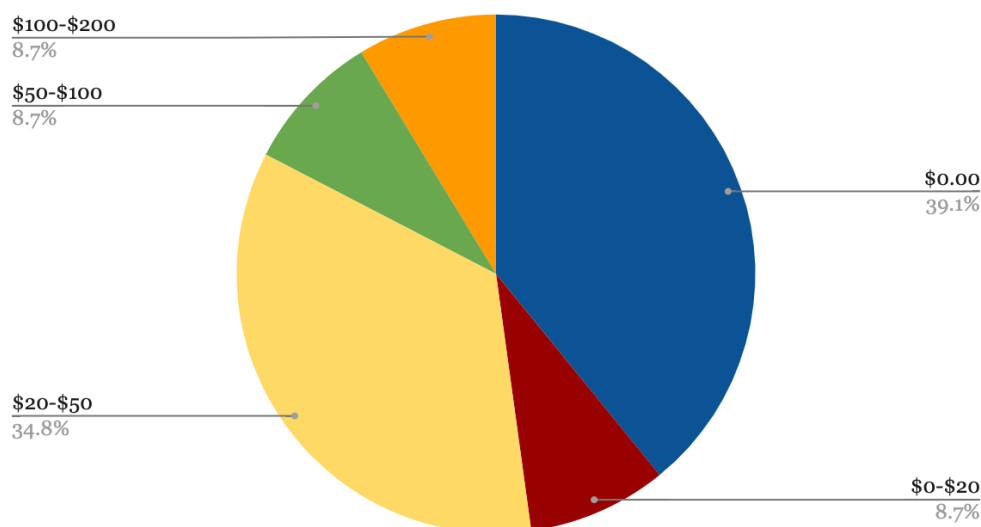
	All cities	Cities over 100k	Providence
Average cost for car registered in city	\$41	\$32	\$100
Max cost for car registered in city	\$715	\$180	\$100
Average cost for car registered outside of city	\$79	\$76	\$200
Max cost for car registered outside of city	\$540	\$500	\$200
Ease of information	6	6	10

⁹ “QuickFacts: Providence City, Rhode Island,” United States Census Bureau, n.d., <https://www.census.gov/quickfacts/providencecityrhodeisland>.

In general, a parking permit in Providence is much more expensive than in comparable cities. In all cities studied, roughly 8% have permits costs over \$100, and similarly, in cities with over 100,000, roughly 8% have permit costs over \$100 for cars registered within the city. Notably, for both all cities and our subset, a majority of permit programs are free. In all cities studied, a third (31%) offer permits free of cost, and nearly half (47%) have costs under \$50. For cities with populations over 100,000, 39% offer free parking permits, and 43% have costs under \$50.

Figure 2. Permit Price in Cities with Over 100k

Residential Parking Permit Cost (Cities over 100K)



Households in Providence are limited to two permits. While 51 of 130 cities offer an unlimited number of permits per household, of the 79 cities that limit the numbers of permits, most limit them to either two or three permits per household. Some cities offer additional passes after a certain number at an increased price from the base price. For example, Philadelphia offers an unlimited number of permits, but the price increases with each additional car.¹⁰ Interestingly, in Anaheim, the city limits the number of permits based on the number of bedrooms in the house- households with up to two bedrooms are allowed one permit, three to four bedrooms are allowed two permits, and any houses over 5 bedrooms are allowed three permits.¹¹

¹⁰ "Residential Parking Permit," Philadelphia Parking Authority, n.d., <https://philapark.org/residential-parking-permit/>.

¹¹ "Residential Permit Parking," City of Anaheim, n.d., <https://anaheim.net/4817/Permit-Parking>.

Figure 3. Program Aspects Across Cities

Aspect	All cities	Cities over 100k	Providence
Discounted Pass	8% (10)	3% (1)	×
Guest Pass	64% (83)	74% (23)	✓
Unlimited Guest Passes	36% (47)	45% (14)	×
Unlimited Permits	34% (44)	19% (6)	×
Parking Anywhere in City	34% (44)	19% (6)	×
All Year Parking (No Exceptions)	33% (43)	54% (17)	×

GUEST PASSES

Of the 130 cities in our dataset, 79 offer guest passes. While Providence offers a fixed number of guest passes for a single price for one night, many cities offer different rates depending on the length of a guest's stay, and usually do so by differentiating between guest passes and visitor passes. In Berkeley, CA, the city has options for either a short term visitor pass or a long term, multi-day visitor pass.¹² The short term "1-Day Hangtag permits" are effective for 24 hours after activation, and residents may purchase up to twenty of these passes per year. Conversely, the city also offers long term passes, which are valid for two consecutive weeks and are limited to three per year. Similarly, Everett, MA, has visitor passes that cost \$5 for a one night pass, \$10.00 for a 7-day pass, \$15 for a 14 day pass, \$20 for a 21 day pass and \$25 for a 30 day pass.¹³

In general, Providence seems to have a more restrictive guest pass system than most cities do. Not only does the city not provide multi-day pass options, but, compared to most other cities in the country that offer guest passes, Providence has a more restrictive number of passes allotted per

¹² "Residential Preferential Parking Permits," City of Berkeley, n.d., <https://berkeleyca.gov/city-services/parking/residential-preferential-parking-permits#visitor>.

¹³ "Residential Parking Stickers," City of Everett, n.d., <https://cityofeverett.com/city-hall/departments/parking/residential-parking-stickers/>.

year. Comparatively, Anaheim, CA, allows for 100 guest passes per year at only \$1 per day per guest.

¹⁴ On the other hand, 51 cities in our data do not offer any guest passes. One of the only cities with a more costly guest policy than Providence is Philadelphia, PA, in which it similarly allows only 5 guest passes per year, but for \$35.

DISCOUNTED PASSES

Providence does not currently offer discounted pricing for the overnight parking program, aligning with the structure of most U.S. residential permit systems. Of the 130 cities we researched, 10 offer discounted price points, with most of those discounts reserved for the elderly and disabled. Only three of these cities — Portland, OR; Columbus, OH; Hartford, CT — explicitly account for financial hardship or low-income residents.

In Portland, the cost of a residential permit is dependent on the zone in which one resides; the standard price is set at \$75 per permit, but some zones may demand up to \$370 per permit.¹⁵ If a resident lives in a zone that charges more than \$75 for a permit, they may appeal to the city with proof of financial hardship or reduced income and be exempt from any inflated prices.¹⁶ A Portland resident may only be considered for discounted permit pricing if they can provide one of the following documents: Home Forward subsidized rent form, Housing and Urban Development (HUD) subsidized form, Social Security Disability award letter, Supplemental Nutrition Assistance Program (SNAP) award letter, Oregon Health Plan notice, or proof that they are a dependent who qualifies for free or reduced lunch programs.¹⁷

Columbus, OH residents may qualify for a permit fee reduction if they can demonstrate that they meet certain income guidelines. Those who are granted a permit fee reduction are only required to pay \$10 per residential permit, as opposed to the typical cost of \$25.¹⁸ We were not able to get in contact with the city's parking authority, despite multiple attempts, so the details of said "certain income guidelines" are only available to residents of Columbus who have been assigned an account number to log into the city's online permit portal.

¹⁴ "Residential Permit Parking," City of Anaheim, n.d., <https://anaheim.net/4817/Permit-Parking>.

¹⁵ Portland Bureau of Transportation, PDF "Zone Parking Permits in the Online System - Permits Offered, Price, Key Dates," (City of Portland, April 22, 2021).

¹⁶ Portland Bureau of Transportation, PDF "Zone Parking Permits in the Online System - Permits Offered, Price, Key Dates," April 22, 2021.

¹⁷ "Parking in the Central Eastside," City of Portland, Oregon, n.d., <https://www.portland.gov/transportation/parking/parking-central-eastside>.

¹⁸ Jennifer Gallagher, PDF "University District Parking Plan Frequently Asked Questions" (Columbus: Department of Public Service, n.d.).

The city of Hartford offers to waive permit expenses for residents with qualifying disabilities or financial hardships. Included in the conditions listed are residents who are either enrolled in the CT Department of Social Services Temporary Family Assistance (TFA) or in the CT State Administered General Assistance (SAGA).¹⁹ Upon submission of proper documentation, residents may be granted a waiver for the \$25 annual parking permit fee.

Though we have demonstrated that it is not common for most U.S. cities to address lower-income residents in their parking policies, these three cities give us an idea of the conditions a population must endure for the city to take initiative. According to the U.S. Census, Portland and Columbus report poverty rates of 13.1%²⁰ and 19.1%²¹, respectively; these rates are much higher than the national average of 11.4%²². But while Portland and Columbus offer merely discounted permit pricing, Hartford offers to fully waive permit fees for qualifying residents. This is most likely a response to the fact 28%²³ Hartford lives in poverty, which is more than double the national average. According to the Census, Providence has a poverty rate of 23%²⁴ which, similar to Hartford, is more than double the national average. Yet, Providence has the most expensive residential permit fees of the four cities (\$100) and does not offer any discounted pricing.

REGISTRATION REQUIREMENTS

To be eligible for most residential permit programs, applicants must prove that their car is registered to an address within the city. Cars registered to addresses outside the city in which an applicant is trying to obtain a permit do not generally qualify for permits unless the city has explicitly made an exception for vehicles registered outside its jurisdiction or for special circumstances, such as company vehicles. It is generally true that if residents with vehicles registered outside the city are able to obtain a permit, they do so at an inflated price.

While some permit programs may welcome cars registered outside their jurisdiction, many cities will only make the exception if applicants meet certain criteria. In cities such as Philadelphia, PA and San Mateo, CA, applications consisting of outside vehicle registrations are considered on a case-by-case basis. In Philadelphia, vehicle registration exceptions are only made for applicants who can

¹⁹ "Residential Parking Permit (RPP)," Hartford Parking Authority, n.d., <https://hartfordparking.com/park-easy-in-hartford/on-street-parking/resident-parking-permit/#6>.

²⁰ "QuickFacts: Portland City, Oregon," United States Census Bureau, n.d., <https://www.census.gov/quickfacts/portlandcityoregon>.

²¹ "QuickFacts: Columbus City, Ohio," United States Census Bureau, n.d., <https://www.census.gov/quickfacts/columbuscityohio>.

²² "National Poverty in America Awareness Month: January 2022," United States Census Bureau, January 2022, <https://www.census.gov/newsroom/stories/poverty-awareness-month.html>.

²³ "QuickFacts: Hartford City, Connecticut," United States Census Bureau, n.d., <https://www.census.gov/quickfacts/hartfordcityconnecticut>.

²⁴ "QuickFacts: Providence City, Rhode Island," United States Census Bureau, n.d., <https://www.census.gov/quickfacts/providencecityrhodeisland>.

demonstrate that they are a resident and principal operator of a company car, “to the satisfaction of the Parking Authority.”²⁵ The San Mateo Public Works Department generally follows the same rules, but allows appeals to be submitted for company cars, leased cars, and caregivers or resident employees.²⁶

In rare cases, like Washington D.C., applicants with cars registered outside the city may qualify for residential permits through registration reciprocity. The D.C. Department of Motor Vehicles (DMV) offers registration reciprocity — the recognition of registrations from other jurisdictions — to full-time students, active military personnel, temporary or part-time residents, and members of Congress.²⁷ If an applicant meets all the criteria for registration reciprocity, and their address in the city is on a street that is zoned for parking, they become eligible for the residential permit program, at an inflated price. So while the term ‘registration reciprocity’ may give the impression that vehicles registered to an address outside the city will be considered the same as those registered to the city, D.C.’s system is not much different than those that simply demand higher permit fees from applicants with registrations from other jurisdictions; it just adds another step.

ZONE LIMITATIONS

The overnight parking program in Providence allows permit holders to park on any residential street located in the police district assigned to their address. Many permit programs across the country differ in where they allocate and limit permits, most either by specific street or by neighborhood blocks. In these cities, residents are limited to parking either on their street or in their own neighborhood. Of the 130 cities studied, 86 require permit holders to park within a specific zone in which their home is located. Among the 31 cities with populations over 100,000, 25 require permit holders to park within a specific zone or street.

In Baltimore, MD, the city operates their permit program by neighborhood, and even employs a unique degree of authority to each community association. In 1979, the City Council of Baltimore implemented Residential Permit Parking (RPP) Areas.²⁸ These restricted RPP areas were established to help secure parking for each respective residential community while encouraging alternative parking plans for non-residents. In general, the permit program is only in place in certain residential neighborhoods where parking is already limited, such as communities near major employers,

²⁵ “Residential Parking Permit,” Philadelphia Parking Authority, n.d., <https://philapark.org/residential-parking-permit/>.

²⁶ Public Works Department, PDF “Residential Parking Permit Program Policy and Procedures,” (City of San Mateo, September 2021).

²⁷ “Reciprocity Parking Permits for Temporary and Part-Time District Residents,” DC Department of Motor Vehicles, n.d., <https://dmv.dc.gov/service/reciprocity-parking-permits-temporary-and-part-time-district-residents>.

²⁸ “Types of Residential Parking Permits,” Baltimore Parking Authority, n.d., <https://parking.baltimorecity.gov/types-residential-parking-permits>.

colleges, universities, medical institutions, and sports complexes. Under this program, however, each Community Association controls multiple aspects of the program, including: the days and times that the RPP program will be in effect, which block faces and streets can participate, and the number of visitor passes allowed per household. Permit holders can only park on streets within their neighborhood boundary under their community association.

To this extent, Providence has a more lax parking program, in that it allows permit holders to park anywhere in their police district, which includes multiple neighborhoods.

CHANGES IN TWO CITIES

Considering the residential permit program in Providence is relatively new, we turn to examples of other U.S. cities that have undergone significant changes to their permit systems. In order to gauge the severity of residential reprisal or flawed construction that would prompt such changes, we pull two case studies from our original dataset of 130 cities. We found Costa Mesa, CA and Revere, MA both offer examples of permit programs that have either become more lenient or more strict in response to permit-holder feedback and compliance rates.

COSTA MESA, CA

Costa Mesa's residential parking permit system has undergone significant changes in recent years. As of May 2022, the city is conducting a Citywide Residential Permit Parking Study that started in March 2021. Until its completion, Costa Mesa will not be issuing or renewing residential parking permits or guest passes.²⁹ While the outcome of this study is still pending, this is not the first time Costa Mesa has sought to revamp its residential parking permit system.

Prior to January 2016, Costa Mesa followed a resident-only street parking program, where residents had to petition to designate their neighborhoods as restricted residential parking zones. Only residents who successfully petitioned for this designation could park on the street overnight. For these residents, each household was allowed up to two long-term parking permits and unlimited guest passes. The permit also did not require annual renewals.³⁰ Overall, residents needed to take initiative in applying for restricted parking zones, but once this process was completed, residents did not need to renew it, and their guests could park rather freely.

²⁹ "City Services Directory: Parking Permits," City of Costa Mesa, n.d., <https://www.costamesaca.gov/Home/Components/ServiceDirectory/ServiceDirectory/254/45>.

³⁰ Bradley Zint, "Costa Mesa Increases Number of Resident-Only Parking Permits and Keeps Them Free," Daily Pilot (Los Angeles Times, January 6, 2016), <https://www.latimes.com/socal/daily-pilot/tn-dpt-me-0107-costa-mesa-parking-20160106-story.html>.

In January 2016, the city council decided to move away from this policy, as many residents were dissatisfied with inadequate parking enforcement and there was a dramatic increase in permit zone applications.³¹ The current permit system allows up to three resident permits from one household and one hundred guest permits per year. Permits are valid for three years, with applications and renewals remaining free of charge. More importantly, the new permit designed in 2016 is a placard that hangs on rear-view mirrors instead of a sticker on the bumper. With a valid residential parking permit, a resident can then park their car in the residential zone where their residence is located.³² In November 2017, in response to residents' growing inquiry regarding the newly designed residential permit parking program, the city's Public Services Transportation department launched a Permit Parking Hotline.³³

In 2021, to further improve the existing residential parking program, the Public Services department initiated a citywide parking study with the help of an external consulting firm. From March 2021 to November 2021, the city held four public outreach meetings, in which residents provided feedback on the progress of the parking study. This process was guided by a clear timeline that starts with an operational needs assessment and ends with establishing a final plan in the winter of 2021. The last part of the plan, however, has been delayed. The public outreach meetings are a part of the initial data collection and recommendation drafting process.³⁴

Since the first public outreach meeting in March, the city has emphasized the importance of a data-driven approach to residential parking reforms while ensuring the new policies will be enforceable.³⁵ Through extensive data collection and analysis of parking durations, times when parking is busiest, and locations with high occupancy rate, they discovered that, in two of the busiest City Council Districts, vehicles are parked for more extended periods at the weekends than on weekdays, and the average weekday occupancy is 10% higher than that of the weekend.³⁶ Specifically, most blocks with an existing residential parking permit system as of March 2021 had a parking occupancy of around 15% throughout the day.³⁷ The study also reveals that most respondents do not live on a residential permit parking street, but those who do on a permit parking street are primarily satisfied with the permit program at the time. In addition, the vast majority of

³¹ Bradley Zint, "Costa Mesa Increases Number of Resident-Only Parking Permits and Keeps Them Free".

³² Ibid.

³³ "Public Services Launches Permit Parking Hotline," City of Costa Mesa News (City of Costa Mesa, November 8, 2017), <https://www.cityofcostamesanews.com/public-services-launches-permit-parking-hotline/>.

³⁴ "Parking," City of Costa Mesa, n.d., <https://www.costamesaca.gov/city-hall/city-departments/public-services/transportation-services/parking>.

³⁵ Jennifer Rosales and Kellie Dugdale, PDF "Citywide Residential Parking Study," (City of Costa Mesa, n.d).

³⁶ Ibid.

³⁷ Ibid.

respondents who live on parking permit streets are opposed to abolishing the residential parking permit program.³⁸

In their community outreach meeting in June 2021, the Public Services Office made equitable access, sustainable solutions, and efficient program management the guiding principles of the residential permit parking reform initiative. Under these principles, the study proposes creating new residential permit zones near commercial areas. 51% of the residents living in the proposed zone have to sign the petition to qualify for a new residential parking zone designation. The permit zone also has to meet the 70% occupancy threshold.³⁹ The most significant change to the existing permit policy is limiting the maximum permit to 1 permit per qualified resident.⁴⁰ Changing the maximum from three per household to one per individual can benefit large generational families and limit the number of cars owned by one person. To ensure equitable access to parking permits, they also introduce a low-cost permit for qualifying low-income residents while charging a \$25 annual fee for the new program to be sustainable. In response to residents' growing needs for managing their permits promptly, the city plans to launch an Automated Permit Management System, where residents can self-manage their accounts.⁴¹

Outside of direct amendments to the residential permit parking program, the Office of Public Services also proposes shared parking agreements between private property owners and the city. In these agreements, private premises are to share unoccupied parking spaces with the city as additional residential parking slots.⁴² From an environmental sustainability point of view, the city is working to promote and expand its public transportation networks to discourage excessive car use, suppressing residential parking needs from the root.⁴³

The residential parking reforms in Costa Mesa are marked by several characteristics that can be applicable to Providence. First, the process of researching current policies and identifying reforms is highly participatory. Residents are not only informed on the final policy recommendations. They responded to research surveys while providing periodic feedback in community outreach meetings. Second, the policy recommendations consist of both short- and long-term, direct and indirect solutions. Like many cities, in the long run, Costa Mesa aims to reduce car usage and promote public transportation. Lastly, the city takes into account the parking needs in large multigenerational

³⁸ Jennifer Rosales and Kellie Dugdale, PDF "Citywide Residential Parking Study".

³⁹ Jennifer Rosales and Julie Dixon, PDF "Community Parking Meeting," (City of Costa Mesa, September 2021).

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Raja Sethuraman, "Citywide Parking Study Of The Residential Permit Parking Program," 21-389 Citywide Parking Study Of The Residential Permit Parking Program § (2021), 4.

⁴³ Raja Sethuraman, "Citywide Parking Study Of The Residential Permit Parking Program".

households. Overall, Costa Mesa's proposed residential parking permit system is highly interactive and data-driven.

REVERE, MA

At the end of 2016, the City of Revere announced that it would employ stricter regulations for its residential parking permit program in the new year. In response to several cases of fraud and abuse of permits, with overwhelming reports of non-Revere residents with guest passes occupying the majority of residential parking spaces, the city decided to regulate the number of visitor passes allotted to permit-holders. In 2017, the city's mayoral office released a statement explaining that the reduction of visitor passes to two-per-permit-holder was intended "to curtail visitor parking permit abuse and fraud, and ensure that residential spots are reserved for Revere residents who are paying excise tax and registering their cars in the city."⁴⁴

Visitor parking passes were only issued to permit-holders, allowing the city to track and hold those who abuse visitor passes accountable, as well as those residents who allowed the abuse to take place. Upon the implementation of the changes to Revere's permit system, the city gave residents a month's grace period before the policy would be heavily enforced for vehicle owners, allowing ample time for businesses, residents, landlords, and health care workers to get their affairs in order. Ultimately, the goal was to bar non-residents from parking on streets specifically reserved for Revere residents and permit-holders, which the city struggled to regulate beforehand.

However, in 2019, Revere adopted even stricter permit program reforms due to continued abuse of the visitor pass system. Instead of allotting two visitor passes per permit-holder, the city now only allows one visitor pass per permit holder. Following the modifications made to the program in 2017, the city caught a number of people making copies of visitor passes to display in their cars, allowing them to avoid ticketing. Revere quickly responded to these reports of fraud with even stricter parking policies.

According to the City of Revere's Parking Office, "the permit cost is \$10.00 and is only for guests and visitors of these households or buildings."⁴⁵ In other words, visitor passes may only be given to guests or visitors coming to your household. This wording was explicitly added to prevent permit-holders from obtaining visitor passes for people who simply wish to park in areas reserved

⁴⁴ "2017 Revere Resident and Visitor Parking Permits Available Online; City Announces Changes to Visitor Parking Permit Policy to Protect Resident Parking and Crack down on Abuse and Fraud," City of Revere, December 20, 2016, <https://www.revere.org/news/post/2017-revere-resident-and-visitor-parking-permits-available-online-city-announces-changes-to-visit-or-parking-permit-policy-to-protect-resident-parking-and-crack-down-on-abuse-and-fraud>.

⁴⁵ "2021 Residential Parking Program," City of Revere, n.d., <https://www.revere.org/departments/parking-clerk/residential-parking-program>.

for Revere residents. Additionally, the pass is now only valid for a year and can be used for ten days per month, and to provide further incentive for residents to comply with the new regulations, the residential parking pass is now free for those whose cars are registered to an address within the city.

AN ANALYSIS OF THE VALUE OF OFF-STREET PARKING

We aim to estimate the value of an off-street parking spot in Providence both quantitatively and qualitatively through an original regression analysis and through interviews with real estate agents in Providence. To understand the impact of off-street parking, both garage and non-garage, we essentially try to find the difference between housing units with parking and those without. Additionally, we gather insight from market experts on how Providence residents perceive parking when looking for housing.

PRIOR RESEARCH ON THE PRICE OF PARKING

Existing analyses on the effect of parking on housing prices suggest parking generally increases the price of housing. Previous studies estimate that off-street parking, included in a housing unit, is found to increase housing costs anywhere from 10 to 25 percent, and garage parking is specifically correlated to increase rents by 17 percent.⁴⁶ In an analysis of MSAs across the country, Gabbe and Pierce find garage parking is associated with higher rents of about \$142 per month.⁴⁷ Moreover, the United States has a proliferation of units with off-street spaces, in which 38% of rental units have garage parking and 45% of the units have surface or other non-garage parking space.⁴⁸ In order to accommodate car dependence, more housing units include parking spaces, which further drives up housing costs.⁴⁹

Furthermore, in San Francisco, Jia and Wachs find a statistically significant price differential between units with parking and units without with regards to housing price.⁵⁰ Asserting that parking availability and housing affordability are “intimately linked,” they find municipalities’ parking norms significantly increase housing development costs, raising sales prices and rents. Both parking minimums, as well as the growth of parking in general, have contributed to price differences in housing. Consideration of other factors, however, is critical to understanding price differentials in the housing market, such as land use decisions (not just parking minimums). While these

⁴⁶ Wenyu Jia and Martin Wachs, “Parking Requirements and Housing Affordability: Case Study of San Francisco,” *Transportation Research Record: Journal of the Transportation Research Board* 1685, no. 1 (1999): pp. 156-160, <https://doi.org/10.3141/1685-20>.

⁴⁷ C.J. Gabbe and Gregory Pierce, “Hidden Costs and Deadweight Losses: Bundled Parking and Residential Rents in the Metropolitan United States,” *Housing Policy Debate* 27, no. 2 (2016): pp. 217-229, <https://doi.org/10.1080/10511482.2016.1205647>.

⁴⁸ C.J. Gabbe and Gregory Pierce, “Hidden Costs and Deadweight Losses: Bundled Parking and Residential Rents in the Metropolitan United States”.

⁴⁹ Donald C. Shoup, “An Opportunity to Reduce Minimum Parking Requirements”.

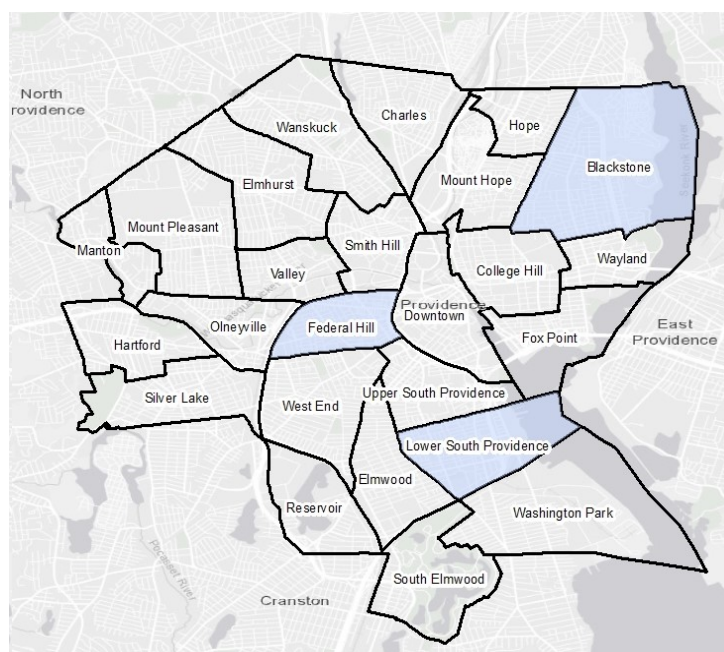
⁵⁰ Wenyu Jia and Martin Wachs, “Parking Requirements and Housing Affordability: Case Study of San Francisco”.

aforementioned studies specifically analyze the price difference of units with parking and those without, they broadly illustrate the cost of parking and how residents value off-street parking. We plan to similarly find the price differential between units with and without parking in Providence.

METHODOLOGY

We collected real estate data on all units sold within the past year for three neighborhoods in Providence. Our study population includes the Federal Hill, Blackstone, and Lower South Providence neighborhoods. Federal Hill is a gentrifying neighborhood adjacent to downtown Providence, allowing for both a diverse housing stock and diverse demographics. We also study the Blackstone neighborhood, the wealthiest neighborhood in the city, and Lower- South Providence, a dense, lower-income neighborhood.

Figure 4. Neighborhoods Studied



We downloaded data on all units sold between March 2021 and March 2022 from Redfin, which include the number of bedrooms, number of bathrooms, lot size, selling price, square footage, and year built. The downloadable Redfin data, however, do not include number of parking spaces, but sometimes do include number of garage and non-garage spaces on the listing website. We determine the number of parking spaces (garage or non-garage) by either looking at the number of spaces listed on the website, or by looking at pictures of the listing. Due to the already generous estimates of parking spots by realtors or homeowners on the site, we calculated parking spots (in the absence of explicit parking information on the site) similarly: by estimating the number of cars

that could simply fit in the parking space. Additionally, the quality of units may affect the selling price, thus we control for the quality of units sold with a measure of 1-5. A "1" indicates lower quality of housing interior and exterior, and a "5" indicates higher quality, recently renovated units. The quality measure was a subjective assessment based on looking at pictures of the houses on Redfin. Places that were ranked a 5 tended to have newly renovated kitchens and bathrooms, clean floors, and well-kept exteriors. Places that were ranked a 1, conversely, were units with stained floors, older kitchens and bathrooms, and degrading exteriors.

There is great variation between the three neighborhoods studied, both in parking spaces and price. In general, the wealthiest neighborhood in the city, Blackstone, is an outlier. The median housing price of units sold in Blackstone is nearly double that of the housing price in the Federal Hill and Lower South Providence neighborhoods. Additionally, Blackstone has a notably higher number of parking spaces, particularly garage spaces, than the other two neighborhoods. To gauge just how much parking is in the city, we also calculate the number of parking spaces divided by the number of bedrooms in each neighborhood. Table 1 shows the differences in average parking spaces in each of these neighborhoods, as well as variation in median housing price and parking spaces per bedroom.

Figure 5. Variation Between Neighborhoods

	All	Blackstone	Federal Hill	Lower South Providence
Average Total Parking	3	4	2	4
Average Garage Spaces	1	1	0	0
Average Driveway Spaces	3	3	2	4
Median Housing Price (of units sold)	\$506,000	\$720,000	\$347,000	\$310,000
Parking Spaces per Bedroom	.84	1	.65	.79
Sample Size (n)	412	202	153	57

We employ a linear regression model to find the price differential of units with and without parking, and apply this model to all three individual neighborhoods, as well as a combined dataset of all units studied. Our model controls for number of bedrooms, number of bathrooms, quality, square footage, property type, and neighborhoods. To account for the inherent difference in value between covered, garage spaces and non-garage, driveway spaces, we also apply a similar model to find the price differential for both garage and non-garage parking spaces.

RESULTS

Due to the variation between neighborhoods, and particularly the contrast of Blackstone to Federal Hill and Lower South Providence, we decide to only use data from Federal Hill and Lower South Providence in our model, and try to capture different types of decisions typical buyers make in the housing market. Rather than modeling the relationship between price and parking linearly as we initially expected, we run different scenarios of how typical buyers usually look for units parking. Our dichotomous model estimates the value of both: the value of one space (either garage, non-garage, or total parking) and the value of an additional space on top of the value of one space.

We find there is not a strong relationship between general parking and price in Providence.

The data show parking does not have a significant effect on price. It is clear the typical unit has an abundance of parking, as there is nearly one parking space for each bedroom in a given unit in Providence, which may be the reason why parking does not have an impact on housing price. Furthermore, there are only 23 units in the entire dataset that have 0 total parking. We find non-garage, off-street parking has little added value, and is insignificant to housing price, presumably because there is so much parking already included with a typical unit. The only factors included in the model that do not have a significant effect are non-garage spaces and total parking; all other factors seem to have a significant effect on price. For example, the effect of a bedroom in a unit is nearly \$12,000, and the effect of a bathroom is nearly \$55,000— both of which are significant in our model. On the other hand, the effect of a unit located in Lower South Providence detracts value by roughly \$130,00, which aligns with the median housing price of the neighborhoods relative to other neighborhoods studied. Essentially, the neighborhoods have a significant effect on price that is consistent with the differences we find in median housing price between the neighborhoods, with Lower South Providence having the lowest median price and detracting value from units. The insignificant impact of parking spaces may be attributed to the already high number of parking spaces, especially non-garage spaces, in Providence. Table A1 shows the effect on price for these

different scenarios, where we estimate the price impact of one parking space and the impact of any additional spaces for garage spaces, non-garage spaces, and total parking.

We do, however, find a significant premium for garage spaces, and that garage spaces are more valuable than driveway spaces. On average, having a garage affects housing price by \$43,381, and any additional garages affect price by \$14,126. Table 2 shows the effect of one garage space in a unit, as well as the price effect of an additional garage space when buyers are looking for two or more garage spaces. While the range of estimates is large, it is clear a garage space has a significant effect on price that is well above the cost of an on-street parking permit.

Figure 6. Garage Effect

	Price Effect	Price per Month	Price per Year
One Garage***	\$43,382	\$188	\$2,256
Range	\$10,915- \$75,848	\$47- \$329	\$564- \$3,948
Two or More Garages	\$14,126	\$61	\$732
Range	-\$20,808- \$29,060	-\$90- \$213	-\$1,080- \$2,556

When we apply the model on each neighborhood, we receive results somewhat similar to that of the combined dataset. In Federal Hill, there is a significant price effect of \$41,056 for one garage. In Lower South Providence and Blackstone, however, garage spaces do not have a significant impact on price. Tables A2, A3, and A4 show how, in general, parking spaces are insignificant in our model— with the exception of garage spaces in Federal Hill. Additionally, these models are less robust than our combined dataset of Federal Hill and Lower South Providence— in these neighborhood models, most inputs, such as bedrooms, square feet, and quality, are significant. In some iterations of the neighborhood models, however, have insignificant coefficients for inputs that are otherwise significant in the combined model.

INTERVIEWS WITH MARKET EXPERTS

While existing literature suggests that the inclusion of off-street parking increases housing costs by 10-25%, our research found off-street parking does not significantly influence the housing market in Providence. To verify these conclusions, we interviewed housing market experts: Providence-area real estate agents. Other research models demonstrate real estate agents possess the expertise needed to provide our study with a “bird’s eye view” of how the market reacts to various cost influences, such as parking.⁵¹ Considering Providence only introduced its residential parking permit system in 2012, we pointedly sought brokers who have worked in Providence real estate for more than 10 years, so we could determine whether the value of off-street parking shifted after the introduction of overnight street parking. Overall, the market experts came to a consensus that off-street parking does not significantly affect the price of housing in Providence because there is an abundance of it. Though we are confident in our respondents’ expertise, this area of our research is limited by sample size.

The list of questions presented to each interviewee is as follows:

1. Is off-street parking a major feature people inquire about when looking for homes?
 - a. Can you quantify the percentage of your clients that account for off-street parking spaces when choosing a property?
 - b. Does behavior differ among renters and buyers, or among people looking for single-family vs. multi-housing units?
2. Do residents in some neighborhoods put a greater emphasis on off-street parking than others? If so, which neighborhoods?
 - a. Are there certain neighborhoods that lack off-street parking, more than others?
3. In your experience, have you seen a shift in the demand for off-street parking, following the introduction of the permit program in 2012?
4. How does off-street parking affect the price of housing?

⁵¹ Matts Andersson et al., “The Effect of Minimum Parking Requirements on the Housing Stock,” *Transport Policy* 49 (2016): pp. 206-215, <https://doi.org/10.1016/j.tranpol.2016.05.005>.

Question 1: The importance of off-street parking in Providence

The interviewees assert the majority of their clients expect off-street parking to be included as a property feature, with the exception of those looking for housing in the downtown area, where parking is known to be offered at an additional cost. They have quantified the amount of conversations with clients, where lack of off-street parking is considered a dealbreaker, as upwards of 75%. To their knowledge, this behavior does not differ among renters and buyers; however, it does differ between clients looking at single-family and multi-family housing. They report that most clients who inquire about single-family housing are not willing to compromise on the inclusion of at least 2 off-street parking spaces; clients who inquire about multi-family housing units also stress the importance of off-street parking, but understand that spaces are often limited.

“Over 85% of people definitely want parking, on-site parking.”

Question 2: Neighborhoods lacking off-street parking

In what appears to be a surrender to client demand, interviewees indicate that neighborhoods zoned for mostly single-family housing are abundant in their supply of off-street parking and neighborhoods in the south and west ends of the city, which hold most of the multifamily housing stock, are less abundant. We did not particularly research the south-most or west-most neighborhoods in Providence, but our data on Lower South Providence (which is in the southern region of the city) is inconsistent with these claims. Interviewees also mentioned that in areas predominantly occupied by students, who are not allowed to apply for the Overnight Parking Program, off-street parking is in high demand, but most properties in those areas (west end) either lack an abundance of off-street parking or explicitly offer parking as a premium feature.

Question 3: The Overnight Parking Program

The Overnight Parking Program introduced a long-awaited exception to Providence’s 82-year overnight parking ban, but our seasoned realtors note that the program did not prompt a decrease in demand for off-street parking. Regardless of a permit system, the interviewees contend that off-street parking, both garage and non-garage spaces, are valued much more than on-street parking. They note that among fears of theft and hit-and-run accidents, clients have expressed that on-street parking is ultimately inconvenient and unreliable. Currently, the Overnight Parking Program requires all permit-holders to remove their vehicles from the street whenever the city institutes a parking ban for street cleaning or snow emergencies. If permit-holders do not have alternative parking options to utilize during such bans — interviewees flagged the most common

one as leaving your car at a friend's house—they are forced to pay fees for overnight garages. Therefore, the expert consensus was that off-street parking will always be more valuable than on-street parking.

Question 4: Off-street parking vs. the housing market

In general, the interviewees conclude that the presence of off-street parking does not significantly influence the price of housing in Providence. One interviewee, in particular, suggests that the reason off-street parking does not increase the price of housing at the rates found in our preliminary research (10-25%), is that prior to the establishment of the residential parking permit program, the city did its best to pave over every available inch of land to maximize spaces for off-street parking. As a result, the majority of the housing stock in Providence already includes off-street parking. The only

“It's generally true [that] if a house does not have parking, it's more difficult to sell ... the fact, however, is that most of the housing stock in the city does have off-street parking, most of it does.”

opinions held by our interviewees that are inconsistent with our data, concern the difference between the value of garage and non-garage spaces. They claim covered garage spaces are coveted for their functionality, but Providence residents are mostly concerned with securing off-street parking, and therefore do not care whether the spaces are covered or not. Our research found that covered garage spaces are valued at a significantly higher rate than non-garage spaces.

RECOMMENDATIONS

1. Discounted Permits for Lower Income Residents

In our analysis of other permit programs, we found that Providence charges more than double the average cost of residential parking permits, for vehicles registered both in and outside the city. This finding is most shocking when paired with the fact that the Providence poverty rate is also twice the national average. As noted in Part 1, only 10 of the 130 U.S. cities we researched offer discounted permits, with only 3 of those 10 extending such discounts to lower-income residents. Because Providence ranks among those cities with higher poverty rates, we believe it is the city's responsibility to, firstly, lower the Overnight Parking Program's enrollment fee, and secondly, offer discounted permits to lower-income residents.

2. Guest Passes vs. Visitor Passes

We found that the majority of cities in our original dataset, 79 of 130, offer guest passes to permit-holders at an additional cost. But across the charts, Providence is much more strict in its guest pass regulations when compared to other cities. For example, some cities employ the use of both guest and visitor passes. In cities such as Berkeley, CA and Everett, MA, the implementation of guest and visitor pass options — ‘guest’ indicating a short-term pass, and ‘visitor’ indicating a long-term pass — led to higher compliance rates with permit program guidelines. While compliance appears to be an overall issue for the Providence parking authority, we believe that expanding the guest pass system may provide more incentive for residents to enroll in the program and purchase guest passes.

CONCLUSION

While we had expected to find a relationship between the price of off-street parking and the price of housing in Providence — to help the city better understand how parking norms and permit pricing play into that equation — we instead found that the city’s housing stock is overwhelmed with off-street parking. Our research finds there is no shortage of off-street parking spaces in Providence, recording an average of nearly one space per bedroom. We assume the main reason off-street parking does not significantly affect the housing market is that the majority of the off-street parking inventory is made up of uncovered driveway spaces, as opposed to covered garage spaces. According to our data, garage spaces hold much more real estate value than non-garage spaces, with garage spaces estimated to be valued between \$10,915 and \$75,848 and non-garage spaces being so insignificant that they do not impact housing prices at all.

Based on these findings, we assert that an abundance of off-street parking is the primary reason for low enrollment and compliance rates in the Overnight Parking Program. We do not deny that information accessibility and permit costs also contribute to these rates; however, we predict that even if the permit system was better advertised to residents and permit costs were reduced, the majority of residents would still abstain from enrolling in the program because they already have parking available on-site.

Appendix

Table A1. Combined (Lower South Providence and Federal Hill) Regression Table

	Results			
	Dependent variable:			
	Price			
	(1)	(2)	(3)	(4)
One Garage	43,382*** (16,463)			43,154** (16,679)
Two or More Garage	14,126 (17,714)			10,435 (19,061)
One Non-Garage		-26,581 (18,664)		-21,999 (19,248)
Two or More Non-Garage		-11,835 (15,269)		-4,683 (16,257)
One Parking Space			-15,788 (23,600)	
Two or More Parking Spaces			13,725 (20,353)	
Quality	37,891*** (7,006)	39,563*** (7,249)	37,161*** (7,179)	38,263*** (7,199)
Bedrooms	11,832*** (4,053)	12,438*** (4,150)	11,503*** (4,223)	12,086*** (4,183)
Bathrooms	56,033*** (8,667)	56,399*** (8,789)	54,242*** (8,910)	55,174*** (8,702)
Square Feet	32*** (6)	31*** (6)	32*** (6)	32*** (6)
Multifamily Unit	24,632 (20,890)	12,339 (21,365)	14,087 (21,739)	18,865 (21,458)
Single Family Unit	83,180*** (18,688)	73,835*** (19,823)	74,083*** (19,662)	75,663*** (19,619)
Lower South Providence	-130,346*** (14,365)	-127,514*** (14,738)	-133,009*** (14,959)	-130,259*** (14,742)
Federal Hill				
Constant	-15,718 (25,137)	5,975 (27,421)	196 (30,022)	-3,016 (27,397)
Observations	206	206	206	206
R ²	1	1	1	1
Adjusted R ²	1	1	1	1

Note:

* p < 0.1
** p < 0.05
*** p < 0.01

Table A2. Federal Hill Regression Table

	Results			
	<i>Dependent variable:</i>			
	Price			
	(1)	(2)	(3)	(4)
One Garage	41,056** (20,232)			40,130* (20,666)
Two or More Garage	11,337 (25,373)			8,179 (26,279)
One Non-Garage		-23,257 (21,017)		-17,779 (21,498)
Two or More Non-Garage		-9,911 (18,534)		-3,075 (19,151)
One Parking Space			-9,413 (26,156)	
Two or More Parking Spaces			7,206 (23,139)	
Quality	42,699*** (9,117)	44,065*** (9,372)	42,248*** (9,419)	42,824*** (9,394)
Bedrooms	8,736* (5,059)	8,539 (5,267)	7,622 (5,396)	8,794 (5,341)
Bathrooms	73,513*** (12,324)	77,662*** (12,193)	76,099*** (12,491)	73,188*** (12,378)
Square Feet	38*** (7)	36*** (7)	37*** (7)	37*** (7)
Multifamily Unit	-3,157 (26,414)	-15,586 (26,626)	-11,795 (27,350)	-7,839 (27,036)
Single Family Unit	81,504*** (26,155)	69,899** (26,874)	72,112*** (26,500)	75,469*** (27,009)
Constant	-55,118* (31,917)	-38,405 (34,356)	-44,299 (36,561)	-44,368 (34,306)
Observations	149	149	149	149
R ²	1	1	1	1
Adjusted R ²	1	1	1	1

Note:

* p < 0.05
 ** p < 0.01
 *** p < 0.001

□

Table A3. Blackstone Regression Table

	Results			
	<i>Dependent variable:</i>			
	Price			
	(1)	(2)	(3)	(4)
One Garage	36,690 (40,393)			36,433 (40,987)
Two or More Garage	124,630*** (37,961)			124,760*** (38,235)
One Non-Garage		3,887 (83,122)		429 (81,733)
Two or More Non-Garage		7,449 (79,557)		-4,473 (77,825)
One Parking Space			-81,841 (112,077)	
Two or More Parking Spaces			-30,588 (103,594)	
Quality	63,687*** (15,482)	65,319*** (16,148)	66,104*** (16,005)	63,966*** (15,775)
Bedrooms	4,719 (15,573)	9,086 (15,921)	7,321 (16,020)	4,739 (15,711)
Bathrooms	21,513 (23,183)	26,095 (23,803)	26,062 (23,725)	21,589 (23,326)
Square Feet	177*** (18)	180*** (19)	180*** (19)	177*** (18)
Multifamily Unit	-367,699*** (72,239)	-355,511*** (78,583)	-360,282*** (74,842)	-365,009*** (76,725)
Single Family Unit	107,915** (41,949)	147,483*** (47,226)	140,548*** (43,962)	110,318** (47,651)
Constant	-147,986** (65,328)	-157,950 (96,421)	-107,061 (110,592)	-147,784 (94,316)
Observations	202	202	202	202
R ²	1	1	1	1
Adjusted R ²	1	1	1	1

Note:

* p < 0.1
** p < 0.05
*** p < 0.01

□

Table A4. Lower South Providence Regression Table

	Results			
	<i>Dependent variable:</i>			
	Price			
	(1)	(2)	(3)	(4)
One Garage	11,888 (26,916)			18,006 (28,097)
Two or More Garage	3,144 (20,956)			952 (28,877)
One Non-Garage		-34,737 (47,957)		-43,506 (57,044)
Two or More Non-Garage		370 (24,748)		-1,598 (34,680)
One Parking Space			-57,109 (80,214)	
Two or More Parking Spaces			62,439 (58,410)	
Quality	29,385*** (10,888)	28,384** (11,163)	25,983** (10,367)	28,574** (11,358)
Bedrooms	18,611*** (6,386)	20,242*** (6,413)	22,954*** (6,208)	19,749*** (6,583)
Bathrooms	21,003 (13,739)	17,543 (13,565)	14,798 (12,932)	19,226 (14,066)
Square Feet	21** (9)	22** (9)	24*** (8)	22** (9)
Multifamily Unit	-48,684 (75,735)	-55,722 (74,848)	-59,880 (71,382)	-51,202 (76,730)
Single Family Unit	-29,318 (87,799)	-34,621 (86,645)	-27,988 (82,387)	-32,543 (89,008)
Constant	53,788 (93,088)	64,492 (93,612)	-1,780 (101,986)	58,040 (96,019)
Observations	57	57	57	57
R ²	1	1	1	1
Adjusted R ²	1	1	1	1
<i>Note:</i>			*** p < 0.01	