

A Tale of Two (Modern) Cities:

A Comparison of the Attempts to Regulate Airbnb in San Francisco and Boston

Andrea Ferreira

Georgia Institute of Technology
School of City and Regional Planning
Prof. Michael Dobbins, AICP, FAIA
3 May 2020

Table of Contents

| | |
|--|----|
| Author's Note..... | 3 |
| Executive Summary..... | 5 |
| Part I: General Background | |
| Introduction..... | 6 |
| History of Airbnb..... | 7 |
| Impacts on Cities..... | 8 |
| A History of the Regulations..... | 17 |
| Legality of the Regulations..... | 22 |
| Part II: Case Studies | |
| Comparison between San Francisco and Boston..... | 25 |
| Case Study: San Francisco..... | 26 |
| Case Study: Boston..... | 42 |
| Part III: Guide for other Cities | |
| Recommendations & Conclusion..... | 57 |
| Endnote..... | 64 |
| Bibliography..... | 66 |
| Appendices..... | 75 |

Author's Note

For someone interested in the intersection of the shared economy and real estate, the rise (and fall) of short-term rental company Airbnb presents a fascinating case study. Airbnb, along with platforms such as Uber, WeWork, and Lyft, are grouped together as part of a new wave of disruptive urban technology changing the way in which people interact with each other and the city.¹ The potential of these platforms to rapidly transform industries has been well-documented in the case of rideshare services, such as Uber's disruption of the taxicab industry in New York City.² However, unique to homesharing platforms like Airbnb, is their ability to simultaneously impact both the housing and hospitality markets. Given this potential for the rapid disruption of different sectors, it is logical for many cities to attempt to regulate short-term rental platforms. In recent years, many cities have attempted to regulate Airbnb; however, these regulations often come too late—only after Airbnb listings have exploded and enough long-term residents have raised vocal concerns.

The idea behind this project was born from my personal experience living in various Airbnb accommodations in Lisbon, Portugal, for a summer internship. While the platform provided an extremely convenient way to find temporary housing in a pinch, I ended up having to live in three different Airbnb listings over the three-month period. My experience exposed a darker side of the platform, the lack of regulations—of host conditions and of the platform itself—and its ability to silently take over housing markets

¹ Eric Biber, Sarah E. Light, J.B. Ruhl, and James Salzman, "Regulating Business Innovation as Policy Disruption: From the Model T to Airbnb," *70 Vanderbilt Law Review* 1561 (2019), accessed February 25, 2020, <https://scholarship.law.vanderbilt.edu/vlr/vol70/iss5/4>.

² Judd Cramer, and Alan B. Kruger, "Disruptive Change in the Taxi Business: The Case of Uber," *NBER Working Paper No.22083* (March 2016), <https://www.nber.org/papers/w22083.pdf>.

in a short period of time. Since my departure it has further expanded; in 2019, Lisbon had the highest density of listings on Airbnb of any European city (thirty rooms per thousand people).³

This study focuses on two coastal American cities—San Francisco and Boston—that also experienced an explosion of short-term rentals after the introduction of Airbnb. However, both San Francisco and Boston have attempted to monitor and limit the platform through policy.

Through this comparative study, I had two main goals. First, I wanted to better understand the behavior of Airbnb in the city, including how the platform responded to regulations. Based on these findings, my second goal was to provide recommendations based on the more effective strategies for regulating Airbnb.

³ Victoria Haviland, "Lisbon has highest ration of Airbnb locations in Europe," *Online Marketplaces*, June 4, 2019, <https://www.onlinemarketplaces.com/articles/26168-Lisbon-has-highest-ratio-of-Airbnb-locations-in-Europe>.

Executive Summary

This paper provides an overview of the history of Airbnb and its challenges within the city, including some of the studied impacts that Airbnb has had on both the residential and tourism sectors. Next, the paper evaluates the steps some cities have taken to regulate or ban the platform, through case studies in two comparable cities—San Francisco, California, and Boston, Massachusetts. Spatially, these two cities are comparable, and have faced similar challenges in maintaining housing affordability. Each city presents an interesting case: San Francisco, as the birthplace of Airbnb and the city with the longest history of regulating the platform, and Boston, as the first major city to regulate Airbnb concurrently with statewide regulations.⁴ Lastly, this paper suggests policy considerations and offers recommendations for other cities considering regulating the platform. The overall aim of this paper is to be a consolidated resource for city governments and citizens that explores the rationale behind regulating Airbnb, as well as evaluating the regulations to provide recommendations on what has proven most effective for certain goals.

⁴ Massachusetts is the first state to enforce a statewide registry.

Part I: General Background

Introduction

In this century, digital technology has rapidly shaped the built environment and reconfigured human activity in cities. Platforms such as Lyft, Uber, and Airbnb claim to increase human interactions in the city, and, for the better. These platforms are often grouped into the “shared economy,” and claim to foster local economic development (empowering locals to “be their own bosses”) while bolstering community development by connecting citizens with citizens.⁵ In the broadest sense, the shared economy is defined as any “economic activity that involves individuals buying or selling usually temporary access to goods or services, especially as arranged through an online company or organization.” This definition has been debated by scholars, with the harshest critics denying the existence of a “shared economy.” Some have argued that the “shared economy” is actually a “gig” economy since the goods and services are not being “shared,” but rather sold for the sole goal of profit maximization.⁶ Likewise, for others, Airbnb and Uber are not part of a “sharing economy,” but rather an “access economy,” where “consumers are more interested in lower costs and convenience than fostering social relationships with [others].”⁷ This distinction is important, as it leads “successful business models [to] not be based on community, as a sharing orientation does not

⁵ Matthew Spoke, “History Repeats Itself for Gig Economy Workers—And Not In A Good Way,” *Forbes*, January 21, 2020, <https://www.forbes.com/sites/mattpoke/2020/01/21/history-repeats-itself-for-gig-economy-workersand-not-in-a-good-way/#552a0088591f>.

⁶ Mike Bulajewski, “The Sharing Economy Was Dead on Arrival,” *JSTOR Daily*, December 12, 2018, <https://daily.jstor.org/the-sharing-economy-was-dead-on-arrival/>.

⁷ Giana M. Eckhardt and Fleura Bardhi, “The Sharing Economy Isn't About Sharing at All,” *Harvard Business Review*, January 28, 2015, <https://hbr.org/2015/01/the-sharing-economy-isnt-about-sharing-at-all>.

accurately depict the benefits consumers hope to receive.” Given Airbnb’s rapid success, spreading to over 100,000 cities since its founding, this implied prioritization of profit over community is particularly concerning.⁸ The Airbnb model operates and derives success from the substitution, and sometimes permanent conversion, of long-term rentals into short-term tourist and business accommodations.⁹ As these new short-term listings are unaffordable (and for other reasons, inaccessible) to long-term renters, Airbnb has constricted housing supply across the globe.

A combination of factors—as a streamlined competitor to traditional hospitality models, its capacity to affect the already tight urban housing markets, and its easily accessible platform—make Airbnb a regulatory issue for cities. However, given the digital nature of the platform, and the newness of the shared economy in general, regulating the platform has proven incredibly challenging. Many times, the regulations come too late—after Airbnb has already saturated the market in a city and established loyal host and client bases—leading to resistance from hosts and investors, as well as the persistence of Airbnb illegal listings.

History of Airbnb

Airbnb’s history itself goes back to the burgeoning housing crisis. In 2007, cofounders Brian Chesky and Joe Gebbia were struggling to pay the (already notoriously) high San Francisco rent.¹⁰ After realizing that conferences usually exceeded hotel room

⁸ "Fast Facts," *Airbnb*, accessed January 20, 2020, <https://news.airbnb.com/fast-facts/>.

⁹ Laura Crommelin, Laurence Troy, Chris Martin & Chris Pettit, "Is Airbnb a Sharing Economy Superstar? Evidence from Five Global Cities," *Urban Policy and Research* 36:4 (2018): 429-444, DOI: 10.1080/08111146.2018.1460722.

¹⁰ "Fast Facts," *Airbnb*, accessed January 20, 2020, <https://news.airbnb.com/fast-facts/>.

supply, they started to rent out air mattresses in their apartment, and quickly turned a profit. Thus, the company was birthed for the purpose of helping hosts make extra income to meet rental costs amidst the housing crisis. While bed and breakfasts existed at this time, as well as other listing sites such as Craigslist, Airbnb (formerly airbedandbreakfast) was the first platform to combine the two services to offer a digital platform catered to homesharing.

From there the company expanded—first within San Francisco and then, with the help of investors, to New York City and beyond, opening their first international office in London in 2011. From 2012 onwards the platform began experiencing rapid growth, reaching one million nights booked that June (doubling total bookings in just half a year). Today Airbnb has over 7 million listings and has hosted over 500 million guests since 2008.¹¹ In 2017, the latest publicly reported earnings by the company, Airbnb made a profit of \$93 million.¹²

Studied Impact on Cities

Despite Airbnb's beginnings and their continued marketing as a way for homeowners to earn supplemental income, evidence suggests that this platform has been leveraged by investors of real estate to turn a quick profit, while displacing the local long-term population. Indicators for investor units include entire home listings (classified as those where the owner is not present), that are "highly available (classified as those listed for over 60 days), as well as the properties listed by hosts with multiple listings.¹³ In 2017,

¹¹ Ibid.

¹² Krista Gmelich, "Airbnb Says It Made a Profit Again in 2018," *Bloomberg*, January 15, 2019, <https://www.bloomberg.com/news/articles/2019-01-15/airbnb-says-it-made-a-profit-again-in-2018-as-ipo-looms-large>.

¹³ "About," *Inside Airbnb*, accessed March 5, 2020, <http://insideairbnb.com/>.

CBRE published a study on these “hosts with multiple listings,” calling them a “key driver of Airbnb growth.”¹⁴ The study lists that multi-unit hosts are the “most controversial” because of the “resulting intersection of lodging and housing,” and found this group to be the fastest-growing, accounting for 40 percent of the company’s total revenue in 2016 (\$1.8 billion).¹⁵¹⁶

Researchers, reviewing the demographic distribution of these hosts with multiple listings, have concluded that Airbnb is furthering racial wealth disparities. A report conducted by the Economic Policy Institute examined the wealth distribution of Airbnb hosts, and found that, like most assets, the supplemental income benefits of Airbnb were “concentrated among white and high income households.”¹⁷ Additionally, the research concludes that the “unfettered option to choose Airbnb [means] conferring an enhanced option to predominantly wealthy and white owners,” often at the expense of the predominately-minority long-term renters.¹⁸ Similarly, Wachsmuth and Weisler argue that Airbnb and other online sharing platforms exacerbate gentrification using the rent gap theory, the theory that new investment is directed to areas where the potential return is increasing greater than the actual return achieved.¹⁹ Airbnb accelerates the closure of rent gaps as the platform allows investors to instantaneously realize potential returns simply by listing their property on the site, with “the only necessary step for converting a

¹⁴ “Hosts with Multiple Units--A Key Driver of Airbnb Growth: A Comprehensive National Review Including a Spotlight on 13 U.S. Markets,” *CBRE* (March 2017), https://www.ahla.com/sites/default/files/CBRE_AirbnbStudy_2017.pdf.

¹⁵ *Ibid*, 3.

¹⁶ See “Comparison of Boston and San Francisco for the studied impacts of multi-unit hosts on each city.

¹⁷ Josh Bivens, “The economic costs and benefits of Airbnb,” *Economic Policy Institute*, January 30, 2019, <https://www.epi.org/publication/the-economic-costs-and-benefits-of-airbnb-no-reason-for-local-policy-makers-to-let-airbnb-bypass-tax-or-regulatory-obligations/>.

¹⁸ *Ibid*.

¹⁹ David Wachsmuth and Alexander Weisler, “Airbnb and the Rent Gap: Gentrification Through the Sharing Economy,” *Environment and Planning A: Economy and Space* (2018), 10.1177/0308518X18778038

long-term rental to a short-term rental is to remove the existing tenant.”²⁰ With the tenant evicted, the unit can be listed on the site for higher rents than what the long-term market can pay, effectively substituting between the two markets. In this way, Airbnb has become a vehicle for gentrification, by allowing for the opening and simultaneous closing of a rent gap through short term rentals. Examining New York City rentals, Wachsmuth and Weisler further conclude that there is a spatial disparity between listings, with most of the effects being felt in predominantly white, “post gentrified” areas. These areas also coincided with the most amenities, such as being in closest proximity to central business districts. However, the researchers concluded that “households in areas at high risk of future impact are on average 71% non-white” and that Airbnb was accelerating “the impending arrival of a new intensification of racialized gentrification in New York.”²¹

The research suggests that the effects of Airbnb was felt in waves. The areas most susceptible to gentrification in New York City at first started as those “near the central business district which have historically featured high rates of [tourist] demand” or highly accessible residential areas, often spatially close to central business districts.²² Listings would spread from these centers over time. These trends are important to note, as New York City is one of the oldest and largest markets for Airbnb, and accurately models Airbnb’s growth. According to Wachsmuth, “cities that have much smaller markets ... grow in a way that already happened in New York before we started gaining the data. And we are seeing the exact same process repeat, kind of in real time.”²³

²⁰ Ibid., 10.

²¹ Ibid., 23.

²² Ibid., 12.

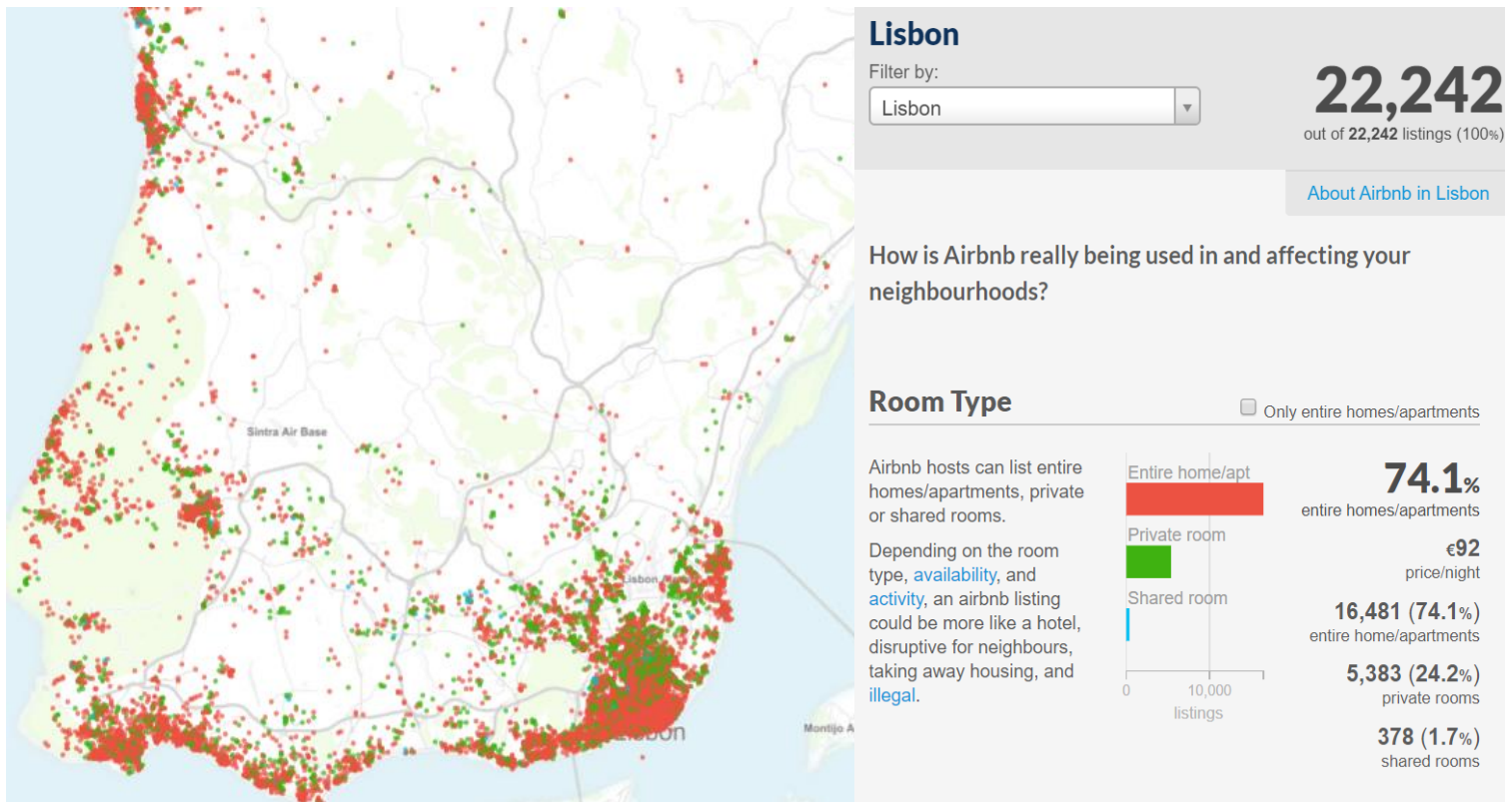
²³ Alastair Boone, “Airbnb is Coming for Your Neighborhood,” *Pacific Standard*, March 12, 2018, <https://psmag.com/economics/airbnb-is-coming-for-your-neighborhood>.

Moreover, especially in countries where tourism was a key driver in any economic recovery after the Great Recession (such as southern European nations), Airbnb is noticeably contributing to a rapid “touristification” of major cities. Like in New York City, Airbnb’s progression mainly starts in areas of high tourist demand near city centers and rapidly expands outwards. Cocola-Gant and Gago explore the effect of Airbnb at the neighborhood level in Lisbon, Portugal. Their research suggests that homesharing, as defined as primary residents renting out part of their homes, is correlated with lower level tourism places. However, areas of historically high tourism are seeing an uptick in “buy to let investment and the professionalization of short-term rentals.”²⁴ The authors argue that since 2008, excess capital has been invested in real estate, with Airbnb providing a platform for investors to list newly acquired units at higher prices, and effectively replace long-term, working class tenants with visitors. Examining the spatial data for many European cities with high volumes of tourism, this seems to be the case, with a large concentration of “investor units” concentrated in the center of the city and dispersing outwards (Figure 1).

²⁴ Augustin Cocola-Gant, and Ana Gago, “Airbnb, Buy-to-Let Investment and Tourism-Driven Displacement: A Case Study in Lisbon,” *Environment and Planning A: Economy and Space*, (August 2019):2, doi:10.1177/0308518X19869012.

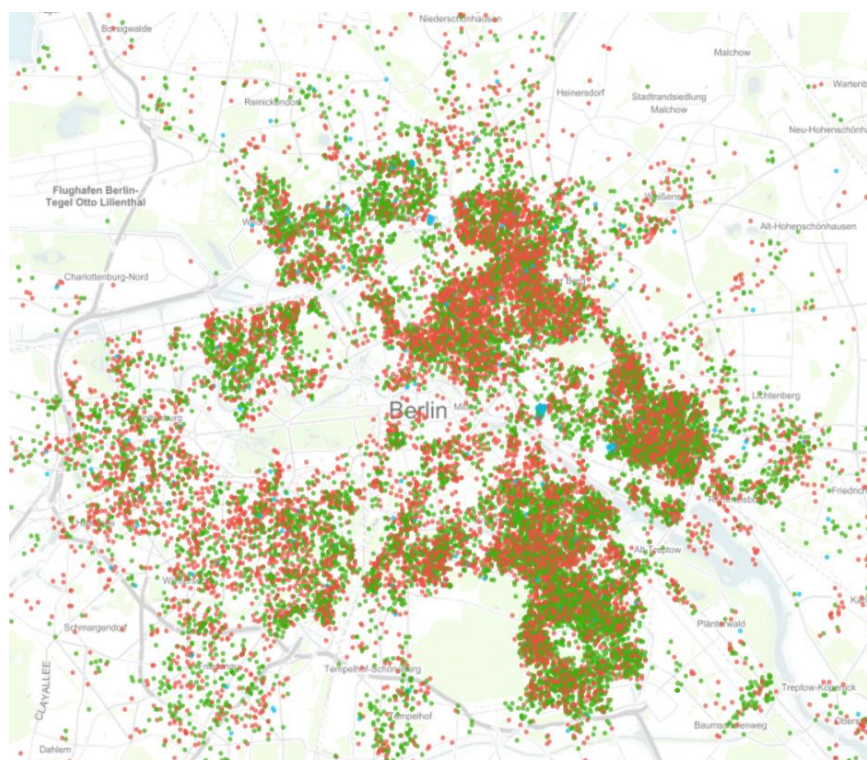
Figure 1. Airbnb In European Cities²⁵

Overview of the spatial distribution of listings in six top markets for Airbnb in Europe: Lisbon, Berlin, London, Rome, Paris and Madrid. With the exception of Berlin, all of the other cities are dominated by “entire home listings,” which indicate the presence of “investor units” (landlords renting on Airbnb instead of on the long-term).



For Lisbon (above), the rentals are predominantly “entire homes/apartments,” indicating investor activity, and are concentrated along the amenity-rich neighborhoods along the coast.

²⁵ "Get the Data," *Inside Airbnb*, accessed March 20, 2020, <http://insideairbnb.com/get-the-data.html>.



Berlin

Filter by:

Berlin

22,552

out of 22,552 listings (100%)

[About Airbnb in Berlin](#)

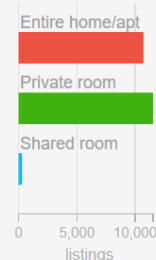
How is Airbnb really being used in and affecting your neighbourhoods?

Room Type

☐ Only entire homes/apartments

Airbnb hosts can list entire homes/apartments, private or shared rooms.

Depending on the room type, [availability](#), and [activity](#), an airbnb listing could be more like a hotel, disruptive for neighbours, taking away housing, and [illegal](#).



47.5%

entire homes/apartments

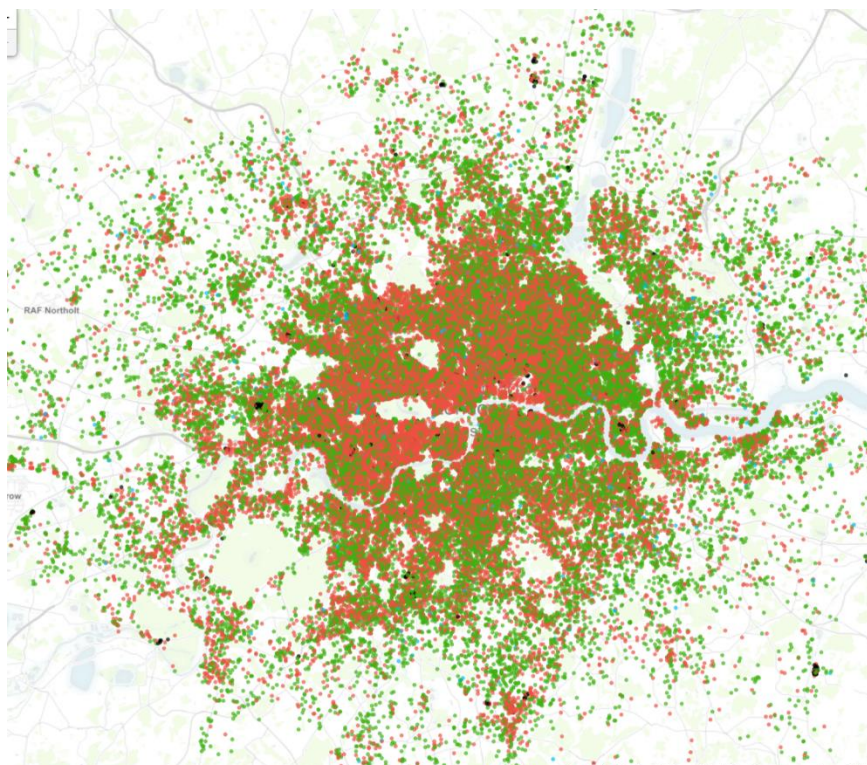
€67
price/night

10,722 (47.5%)
entire home/apartments

11,534 (51.1%)
private rooms

296 (1.3%)
shared rooms

In Berlin (above), while rentals are mostly “private rooms,” they are concentrated near the center of the city in amenity-rich areas. Berlin had steep fines for landlords who rented their entire homes on Airbnb from 2016-2018, which might be responsible for the persistence of “shared home” listings.



London

Filter by:

London

87,235

out of 87,235 listings (100%)

[About Airbnb in London](#)

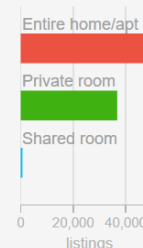
How is Airbnb really being used in and affecting your neighbourhoods?

Room Type

☐ Only entire homes/apartments

Airbnb hosts can list entire homes/apartments, private or shared rooms.

Depending on the room type, [availability](#), and [activity](#), an airbnb listing could be more like a hotel, disruptive for neighbours, taking away housing, and [illegal](#).



56%

entire homes/apartments

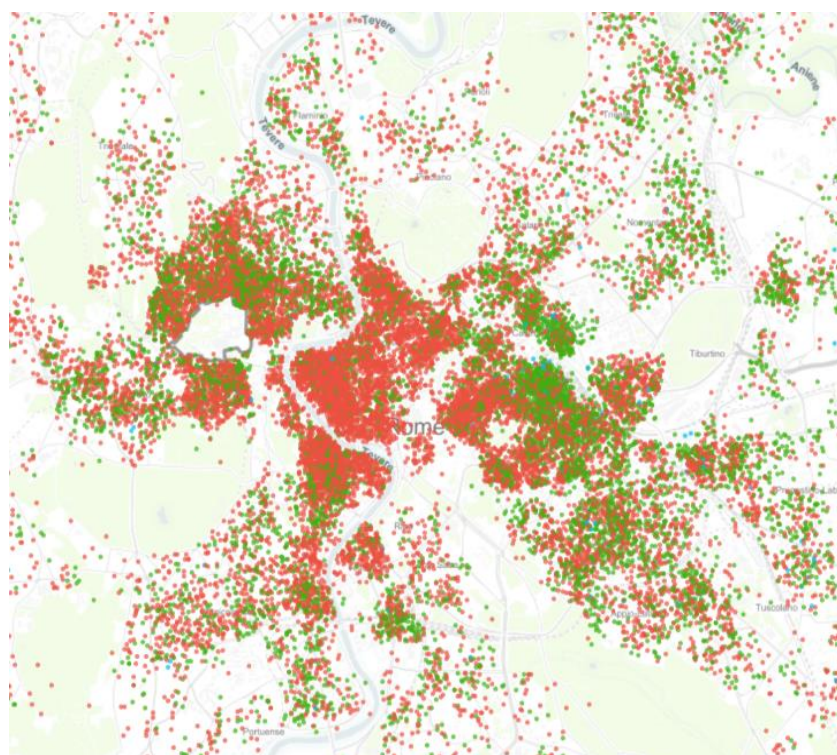
£126
price/night

48,872 (56%)
entire home/apartments

36,797 (42.2%)
private rooms

667 (0.8%)
shared rooms

In London (above), rentals are predominately “entire-home listings.” This type of listing is also concentrated in the core of the city, with “shared-home” listings being more common on the city periphery.



Roma

Filter by:

Roma

29,436

su un totale di 29,436 annunci (100%)

[Su Airbnb a Roma](#)

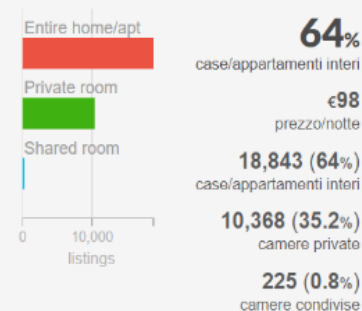
Come è realmente usato Airbnb e quali sono le conseguenze nel tuo quartiere?

Tipo di stanza

☐ Solo case/appartamenti intere

Gli "host" di Airbnb possono affittare case/appartamenti interi, stanze private o condivise.

Secondo la tipologia di alloggio offerto e il tasso di attività, un annuncio di Airbnb potrebbe funzionare in maniera più simile ad un hotel non regolamentato, essere di disturbo al vicinato, sottrarre disponibilità di alloggi al



As with London, in Rome (above) rentals are predominately “entire-home listings” with this type of listing concentrated in the core of the city. The percentage of entire home listings is greater in Rome than in London.



Paris

Filter by:

Paris

59,881

out of 59,881 listings (100%)

[About Airbnb in Paris](#)

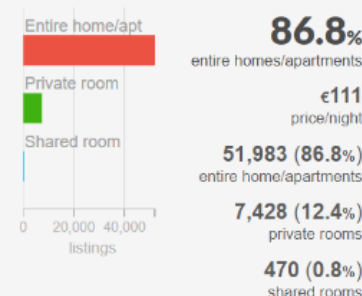
How is Airbnb really being used in and affecting your neighbourhoods?

Room Type

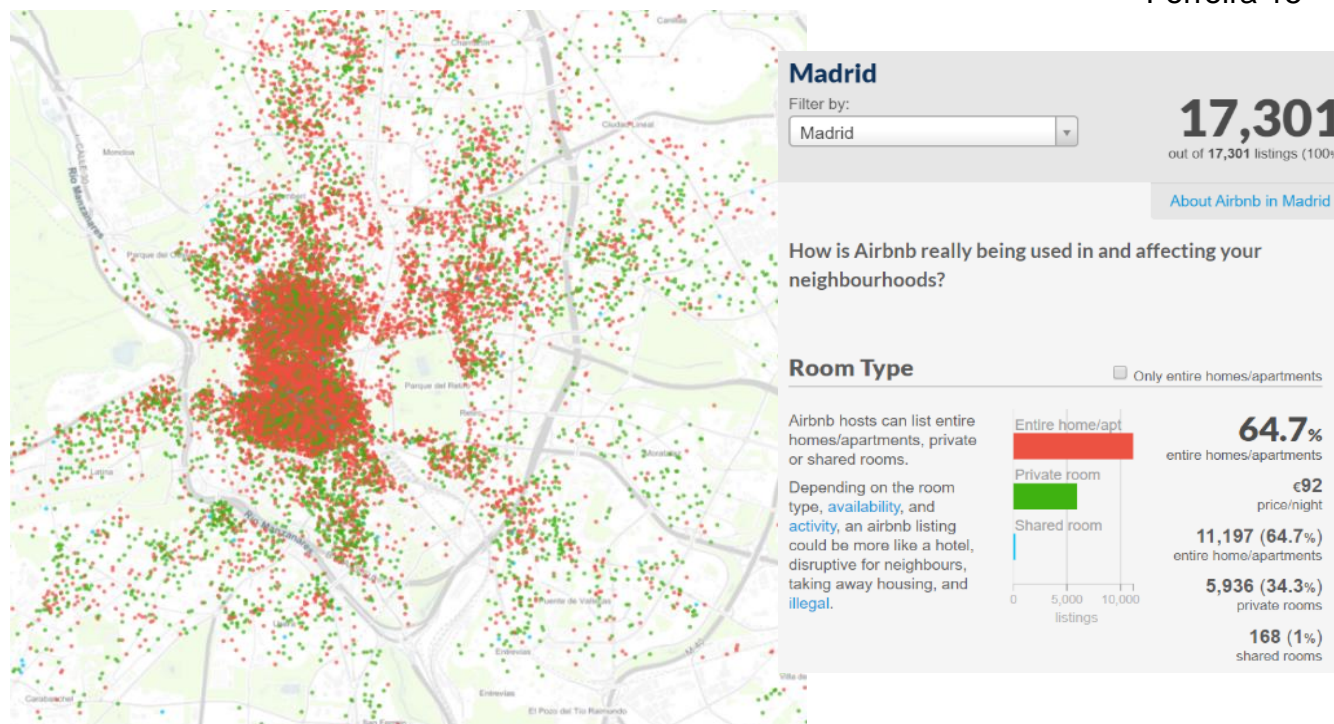
☐ Only entire homes/apartments

Airbnb hosts can list entire homes/apartments, private or shared rooms.

Depending on the room type, availability, and activity, an airbnb listing could be more like a hotel, disruptive for neighbours, taking away housing, and illegal.



In Paris (above), there is a proliferation of “entire home listings,” more so than any other city in this study. Listings are densely concentrated throughout the city, though they are most concentrated in the area right of the Seine River (where attractions like the Louvre and Notre Dame are).



In Madrid (above) rentals are predominately “entire-home listings,” with this type of listing concentrated in the core of the city. This distribution mirrors that in Rome and are even more concentrated at the city core.

European properties are architecturally different from American ones as they are much less likely to contain accessory units (such as basement or carriage houses).²⁶ Consequently, European cities exhibit a higher presence of non-primary dwellings listed on Airbnb than their American counterparts. Therefore, one might expect the substitution effect, the “touristification” described by Cocola and Gant, to be highest in European cities. However, studies on the impact of Airbnb listings on property value and rent prices in Barcelona found a similar correlation between rising prices and Airbnb presence as in Boston, suggesting that even when limited to primary residences, Airbnb still caused significant displacement through the acceleration of home values.²⁷

²⁶ Miquel-Àngel Garcia-López, Jordi Jofre-Monseny, Rodrigo Martínez Mazza, Mariona Segú, "Do short-term rent platforms affect housing markets? Evidence from Airbnb in Barcelona," *MPRA Paper No. 96131*, (2019), <https://mpra.ub.uni-muenchen.de/96131/>.

²⁷ Ibid.

Beyond the rising costs and displacement, other studies have suggested that the influx of short-term rentals, especially if unrestricted by legislature, negatively impacts the character of surrounding residential neighborhoods. While long-term renters have more of a formal legal agreement (through leases) and may have more social ties to their neighborhood, there is little incentive for Airbnb guests, as short-term renters, to behave according to ordinances regulating noise and other nuisances. This incentive among short-term renters will decrease as the number of listings increase, as even if a guest were to be evicted from one property, they could easily find a different accommodation on the platform to substitute.

Other studies have examined Airbnb's economic development capacities, and its intersection with the hotel industry. Bivens concludes that short-term rental platforms can create two additional externalities unrelated to the aforementioned housing market impact: "local government tax collections fall" and "job quality and quantity suffering."²⁸ To the first point, cities have reaped the benefits of established hotel lodging taxes, which all hotels are subject to pay, but Airbnb is not always subject to depending on a municipality's ordinance. Consequently, in cities where there is a large substitution of hotel stays for Airbnb, but no established lodging tax for short-term rentals, the city effectively will lose a lot of revenue. On the second point, Airbnb also directly competes with hotels and other traditional lodging accommodations, which employ many people (such as front desk staff and cleaning people) but consolidates all these jobs into one person—the host. The host decides how much to charge for a cleaning fee, with the option to clean the apartment themselves or outsource this work. While this consolidation allows

²⁸ Josh Bivens, "The economic costs and benefits of Airbnb."

for Airbnb prices to be cheaper than traditional hotels, it also may be destroying jobs if no protections are put in place.

A History of the Regulations

There is an increasing concern over the presence of Airbnb in cities for its potential to compete with the hospitality and residential markets. This has led a growing number of cities to place restrictions on the platform in the last few years. A 2017 comparative study by Nieuwland and van Melik examines 11 different cities across the United States and Europe to understand the policies that these cities passed to regulate Airbnb, and their motivations behind doing so. The authors concluded “overall, with the exception of Barcelona, European cities have a more receptive approach to Airbnb than American cities, which – except for Denver – are stricter and make it more difficult for [short-term rentals] to operate.”²⁹ This could be in part because these platforms are newer in European markets, thus having less of an impact on the housing and hospitality markets so far. Furthermore, the study also classifies the types of restrictions on a spectrum based on the stated goal of the city—from preserving affordable housing to tourism and land use concerns. The study found that cities like Barcelona, whose main goal was to “ease the pressure of tourism” instituted locational regulations, either banning Airbnb fully or partially in specific neighborhoods.³⁰ In cities such as San Francisco or New York, whose primary goal was to “protect affordable housing,” regulations banned the listing of entire houses, and listing availability, capping the maximum number of nights a property could

²⁹ Shirley Nieuwland & Rianne van Melik, “Regulating Airbnb: how cities deal with perceived negative externalities of short-term rentals,” *Current Issues in Tourism* (August 2018): 817, DOI: [10.1080/13683500.2018.1504899](https://doi.org/10.1080/13683500.2018.1504899).

³⁰ Ibid., 818.

be listed on the platform.³¹ The final goal, to “preserve residential living” led to similar regulations as the cities whose aim was to protect housing affordability, with cities like Denver and Paris limiting listing availability, and requiring hosts to only list primary residences.³² While this framework will be used to measure the effectiveness of these measures with regards to Boston and San Francisco in part II, it is also helpful to see an overview of the regulations taken by different national and global cities (Figure 2).

Figure 2. Overview of Regulations in Major Cities³³

This table summarizes different measures taken by some cities to restrict Airbnb. The regulations vary from city to city, with many cities updating their regulations upon hosts finding loopholes within the regulation.

| City | Year Passed | Regulation |
|---------------|-------------|---|
| New York City | 2011 | Listings are required to be the primary residence and cannot be rented out for less than 30 days. Hosts can have two paying guests for less than 30-day stays only if the host is present, and all guests have access to every room and exit of the unit. Airbnb is also required to share data with the city, and Airbnb must pay a fine for illegal listings advertised (no units on Class A apartments can be advertised for a period of less than 30 days). |

³¹ Ibid.

³² Ibid.

| | | |
|--------------|------|--|
| Santa Monica | 2015 | Only primary residence listings (hosts must be living in the property), hosts required to register with the city and Airbnb required to remove illegal listings, guests pay a 14% occupancy tax. |
| Chicago | 2017 | Hosts are subject to an annual registration fee (units must be registered with the city), with rentals subject to HOA prohibitions. Listings are also required to have insurance of \$1 million and pay a lodging tax of 10.5%. Additionally, Chicago is one of the first cities to require hosts to keep a record of housekeeping costs and services. |
| Paris | 2017 | Units are required to register with the city and display their registration number or risk a fine (the Elan Law). Airbnb can be fined up to €12.5 million for illegal listings. |
| Las Vegas | 2018 | A permit is required to operate a short-term rental. Rentals with more than three bedrooms pay extra fees. Listings cannot be within 660 feet of each (pre-existing registered listings in violation are grandfathered in) and hosts also must collect a lodging tax to pay to the city. |

| | | |
|-----------|------|---|
| Miami | 2018 | Listings are required to register, with illegal units facing fines or removal from the site. Hosts are required to list their registration number on the site. Short-term rentals are also illegal in many residential areas by default, as only in tourist areas are rentals able to meet the requirement to be listed for more than 6 months and 1 day. |
| Barcelona | 2018 | Units are required to register with the city, with Airbnb having an agreement with the city to provide listing data and remove illegal units on instruction; short-term rentals pay the largest property taxes. |

Although many cities have some form of short-term rental restrictions in their zoning ordinances, the challenging part has been the enforcement of these regulations. A study by UBS suggests that Airbnb growth is slowing due to the increasing number of cities imposing restrictions, though there is still many existing (illegal) short-term rentals in major cities.³⁴ In fact, a McGill University study estimates that over 65 percent of revenue in New York City came from illegal listings from 2014-2017.³⁵ Despite these

³⁴ Arjun Kharpal, "Airbnb's growth is slowing because it's being hit by regulation, UBS says," *CNBC*, April 23, 2017, <https://au.finance.yahoo.com/news/airbnb-apos-growth-slowing-because-105317952.html>.

³⁵ David Wachsmuth, Jennifer Combs, and Danielle Kerrigan, "The Impact of New Short-term Rental Regulations on New York City," *Urban Politics and Governance Research Group at McGill University* (January 2019), <http://www.sharebetter.org/wp-content/uploads/2019/01/Impact-of-New-STR-Regs-2019.pdf>.

challenges in the enforcement of the regulations, one positive is that legal courts have consistently sided with cities regarding the legality and enforcement of short-term rental bans. This has given municipalities some standing when reaching settlements with Airbnb, especially when getting the platform to comply with the removal of illegal listings.

Additionally, just as cities are finding creative ways to limit Airbnb in their zoning ordinances, investors are finding creative responses and loopholes in these regulations. For example, accessory dwelling units, complete housing units that are located separately from the primary residence on single family lots, have long been used to provide privacy between family members. Recently, some municipalities have started to permit these units in their zoning codes for their “potential to increase housing affordability” and the overall housing stock.³⁶ However, these same benefits that ADUs can provide for long-term renters also apply to Airbnb, so cities must be careful in regulating the new construction of ADUs in order to make sure these units contribute to long-term affordability. One notable example is in Los Angeles, where a state law that reduced restrictions on the new construction of ADUs in 2017 saw a proliferation of these units in the short-term rental market. This led the city to explicitly amend their existing ordinance to ensure that ADUs were only allowed to be listed on Airbnb if the ADU itself was the host’s primary residence.³⁷ Thus, just as technology is ever-evolving, city governments need to be fluid and adaptable in their policy responses to mitigate the negative externalities.

³⁶ "Accessory Dwelling Units," *American Planning Association*, accessed February 28, 2020, <https://www.planning.org/knowledgebase/accessorydwellings/>.

³⁷ Matthew Blake, "While you were sleeping: LA bans 'granny flats' as Airbnbs," *The Real Deal Los Angeles*, October 29, 2019, <https://therealdeal.com/la/2019/10/29/while-you-were-sleeping-la-bans-granny-flats-as-airbnbs/>.

The Legality of the Regulations

While homesharing is not a new concept, there is an increased need for specific legislation to provide guidance regarding the treatment of Airbnb. Jefferson-Jones makes the distinction between traditional homesharing, which historically bridged the gap between shortages in housing stock that drove up the rent in cities, and Airbnb and other short-term rental platforms that are “facilitated by technology...causing the innovation in sharing to outpace changes in housing regulations” (561).³⁸ The fast pace of these platforms, and their largely unforeseen negative impacts on the cities they operate within, is the rationale for many of the bans. Legally, justifications for the bans fall into three categories: “property values and character of the neighborhoods,” where it is conventionally argued that short-term rental guests do not adhere to the community values within a neighborhood; “revenue and competition with licensed lodging,” where hotels argue that while Airbnb is their direct competitor though the platform is not subject to the same lodging taxes; and, to promote “public safety,” which takes into account the difficulty in enforcing Airbnb regulations and argues that hosts are often operating on a “black market” of shared rentals in order to transfer some or all of the burden of housing costs.³⁹

Furthermore, given the aforementioned impacts on the already constrained housing markets of cities, limiting Airbnb in a city correlates to a legitimate government purpose for protecting the “public safety.” At the same time, owners are not deprived of

³⁸ Jamila Jefferson-Jones, “Airbnb and the Housing Segment of the Modern ‘Sharing Economy’: Are Short-Term Rental Restrictions an Unconstitutional Taking?” *Hastings Constitutional Law Quarterly* Vol. 42 (2015):561, <https://ssrn.com/abstract=2624700>.

³⁹ *Ibid.*, 573-575.

all property values, as “the potential benefits are only the *difference* between what the property owner earned” before the conversion into a short-term rental and after.⁴⁰ Therefore, regulating or limiting a single host or entity from listing multiple properties does not constitute a regulatory taking.

However, as Airbnb exists in the digital realm, the question becomes whether one can regulate the brick and mortar assets (the listings) through regulating the platform, or whether cyber laws should prevail. The main question here is whether companies like Airbnb are protected under cyber laws. In previous lawsuits, Airbnb has cited their protection under the Communications Decency Act Section 230, which states that “No provider or user of an interactive computer service shall be treated as the publisher or speaker of any information provided by another information content provider.”⁴¹ According to this, Airbnb contends that it is merely a listing platform, and cannot be responsible for what users post on it. They also assert that only under protection of the CDA Section 230 can they continue to “screen content, use editorial discretion, and block objectionable material to ensure smooth stays for both hosts and guests” and provide services like user reviews to keep the platform safe and nondiscriminatory for users.⁴² However, it is important for other cities looking to impose restrictions to know that in 2019, a federal judge sided with the city of Santa Monica in that their ordinance could hold the

⁴⁰ Josh Bivens, “The economic costs and benefits of Airbnb.”

⁴¹ Christopher Zara, “The Most Important Law in Tech Has a Problem,” *Wired*, January 3, 2017, <https://www.wired.com/2017/01/the-most-important-law-in-tech-has-a-problem/>.

⁴² “Airbnb & the Communications Decency Act Section 230,” *U.S. House of Representatives Document Repository*, accessed March 1, 2020, <https://docs.house.gov/meetings/IF/IF16/20191016/110075/HHRG-116-IF16-20191016-SD009.pdf>.

homesharing company accountable for bookings of listings not registered with the city.⁴³ Explicitly, the federal judge ruled that while the “content of Airbnb listings were protected by Section 230, illegal activities [were] not.” The judge then ruled in favor of the short-term rental law passed by the city requiring all listings be registered, deeming unregistered listings illegal.⁴⁴

⁴³ Bloomberg, "Airbnb loses major fight over Santa Monica's rental law," *Los Angeles Times*, March 13, 2019, <https://www.latimes.com/business/la-fi-airbnb-santa-monica-short-term-rental-20190313-story.html>.

⁴⁴ Tonya Riley, "The Technology 202: Airbnb now part of Congress's debate over Silicon Valley's legal shield," *The Washington Post*, October 14, 2019, <https://www.washingtonpost.com/news/powerpost/paloma/the-technology-202/2019/10/14/the-technology-202-airbnb-now-part-of-congress-s-debate-over-silicon-valley-s-legal-shield/5da3b24f88e0fa3155a710c2/>.

Part II: Case Studies

San Francisco and Boston both present interesting cases to study the regulatory impacts on Airbnb listings. San Francisco is the birthplace of Airbnb, but also one of the first to impose restrictions. Boston is the first city to impose restrictions concurrently with a state effort to restrict the platform. Moreover, San Francisco and Boston are comparable geographically, as both are coastal cities with limited space markets. Both have similarly struggled with planning concerns such as shortages in affordable housing stock (which Airbnb is found to exacerbate). Both cities are the main spots for economic activity within their metropolitan areas (MSAs), which are two of the wealthiest areas in the United States (San Francisco-Oakland-Hayward, California MSA being the fourth richest in per capita income, and Boston-Worcester-Lawrence, Massachusetts-New Hampshire-Maine-Connecticut CMSA being the fifth richest). Both cities boast an incredibly skilled labor market, with Silicon Valley and a tech cluster in the San Francisco Bay Area and a cluster of universities in and around Boston. They are also two of the densest cities in the United States (San Francisco is the second densest, with 18,569 people per square mile and Boston is the seventh densest, with 13,938 people per square mile). Given these factors—a highly skilled labor market, high concentrations of wealth, and a high density in a coastal area—both San Francisco and Boston are two of the United States' most expensive cities, at number two and number four, respectively.⁴⁵ Factored into this is the cost of housing, which is notoriously high in both cities. San Francisco has one of the most expensive median rents in the nation, at \$3,490 a month for a one-bedroom in

⁴⁵ Lisa Goetz, "The 10 Most Expensive Cities in the U.S.," *Investopedia*, July 5, 2019, <https://www.investopedia.com/articles/personal-finance/080916/top-10-most-expensive-cities-us.asp>.

December of 2019, according to Zumper.⁴⁶ Similarly, in Boston the median rent for a one-bedroom was \$2,590 per month in January 2020, up 5.7 percent from 2019.⁴⁷ Given Airbnb's potential to impact the rental housing market, legislators in both cities were motivated to find a way to limit the platform, though San Francisco provides a longer term look at the staying power of regulations (from 2014 to 2020), while Boston provides a case where a larger regional government mobilized around regulating the platform.

Case Study: San Francisco

Airbnb's Specific Impact on San Francisco

San Francisco is the birthplace of Airbnb, and the city where the platform has operated the longest, with its presence in the city dating back to 2008. Thus, Airbnb for San Francisco has weathered both the early concerns over the platform's impact on the hotel industry, as well as the later concerns of the impact on the residential market. In 2012, San Francisco was the focus of an economic impact study done by Airbnb. Key findings concluded by the platform were that "Airbnb generated around \$56 million in local spending and [supported] 430 jobs" with "\$12.7 million [going] directly to local hosts."⁴⁸ However even at this time, "72 percent of Airbnb properties in San Francisco [were] located outside the central hotel district," suggesting that Airbnb already saturated the

⁴⁶ Adam Brinklow, "San Francisco market rents soar up to 105 percent above average," *Curbed San Francisco*, October 2, 2019, <https://sf.curbed.com/2019/10/2/20895578/san-francisco-median-rents-market-census-september-2019>.

⁴⁷ Tom Acitelli, "The Boston rental market heading into 2020 looks nothing like the sales market," *Curbed Boston*, January 7, 2020, <https://boston.curbed.com/2020/1/7/21054609/boston-rental-market-2020-forecast>.

⁴⁸ "Airbnb Economic Impact," *Airbnb*, accessed March 7, 2020, https://blog.atairbnb.com/economic-impact-airbnb/?_ga=2.251665164.445259306.1584535926-1802718855.1570011473#san-francisco.

residential markets, as a substitute for long-term rentals.⁴⁹ Moreover, Airbnb was not found to have a significant effect on the hospitality market. In 2016, Airbnb was found to not outpace or pose a significant threat to hotel industry growth according to research by CBRE. Pricing was the main influencer of this conclusion, as the average daily rate (ADR) of a hotel was double that of Airbnb's (\$270 to \$130, respectively) in 2015.⁵⁰ Moreover, the report concluded that by 2015, Airbnb had reached a mature stage in San Francisco, with the city being one of the bottom markets for Airbnb new unit growth.⁵¹ Even though this growth had seemingly tapered, San Francisco still had over 6,000 listings, ranking third in the United States for cities with the most Airbnb listings.⁵²

Within the housing market, the research suggests similar effects to those reviewed in the previous section. A study by Kakar et. al found that, all other factors controlled, white hosts charged 8 to 10 percent more than Asian or Hispanic hosts with comparable listings, though occupancy levels between the listings were not significantly different. This corroborates to some degree the research by the Economic Policy Institute that suggests that Airbnb can heighten racial income disparities.⁵³ Moreover, a study done by *The San Francisco Chronicle* completed just before the first wave of regulations in 2014 revealed that the short-term rental market was infringing on housing affordability in the already constrained market. At this point in time, there were over 5,000 listings, with 65 percent being entire unit listings, at least 160 of these being rented out full-time, and 513 multi-

⁴⁹ Ibid.

⁵⁰ Jamie Lane, "The Sharing Economy Checks In: An Analysis of Airbnb in the United States," *CBRE* (January 2016), <http://rss.hsyndicate.com/file/152006083.pdf>.

⁵¹ Ibid., 5.

⁵² Ibid.

⁵³ Venoo Kakar, Joel Voelz, Julia Wu, and Julisa Franco, "The Visible Host: Does Race guide Airbnb Rates in San Francisco?" *Journal of Housing Economics* volume 40 (2018): 25-40, <https://doi.org/10.1016/j.jhe.2017.08.001>.

unit hosts, all studied indicators of investor units.⁵⁴ Thus, this data suggests that Airbnb units were largely operating while violating local rental laws, and that they were contributing to the rising housing affordability challenges. Related, San Francisco is also one of the first cities where property owners faced lawsuits over converting entire, multi-unit, apartment buildings into “de facto hotels.”⁵⁵

San Francisco’s Airbnb Regulations

In many ways, San Francisco was a pioneer for dictating the treatment of short-term rentals. It was one of the first cities to officially legalize short-term rentals in areas zoned residential (before Airbnb was limited to areas that allowed commercial usage). However, in 2014, the municipal government’s attitude toward rentals changed, and the city became one of the first to place restrictions on the platform through the passage of Ordinance 218-14. Key terms of this ordinance are as follows: it limited entire home rentals to 90 days, required hosts to pay occupancy taxes, and required hosts to have liability insurance. Additionally, San Francisco was the pioneer for establishing an “Airbnb registry” that hosts were required to sign up after the ordinance took effect in February 2015.⁵⁶ The registry was an important component of the law, as it provided a way for San Francisco to keep track of the listings. It also required Airbnb and other short-term rentals to comply in helping to get listings onto the registry, with hosts still unregistered after 240 days subject to daily fines.⁵⁷ The goal of these regulations, was to “protect the city’s

⁵⁴ Carolyn Said, “Window into Airbnb’s hidden impact on S.F.,” *San Francisco Chronicle*, June 2014, <https://www.sfchronicle.com/business/item/Window-into-Airbnb-s-hidden-impact-on-S-F-30110.php>.

⁵⁵ Steven Hill, “Evictions and Conversions: The Dark Side of Airbnb,” *The American Prospect*, October 19, 2015, <https://prospect.org/economy/evictions-conversions-dark-side-airbnb/>.

⁵⁶ Prior to this, San Francisco had a housing law which prevented rentals requiring a minimum stay of less than thirty days with the goal of preserving affordable housing.

⁵⁷ Dara Kerr, “Airbnb purges thousands of San Francisco listings overnight,” *CNET*, January 18, 2018, <https://www.cnet.com/news/airbnb-purges-thousands-of-its-san-francisco-listings-overnight/>.

precious housing supply by obligating [Airbnb] to ensure that all their listings are legal and properly registered.”⁵⁸ Additionally, it was one of the first cities to hold Airbnb accountable in enforcing the new policy by requiring Airbnb to remove any listing that was not registered. Given the possibility that this San Francisco regulation would set a precedent for other global cities, the platform filed a lawsuit against the limitations. The parties reached a settlement in 2017 that stated that Airbnb could not allow illegal (unregistered listings) to be booked. The immediate impact of the settlement was a loss of nearly half of the city’s listings; however, a year later, Airbnb listings began to increase again.⁵⁹ It is also important to note that creating a registry without Airbnb’s help enforcing, as San Francisco did before the settlement in 2017, was deemed unsuccessful, as the registry only had 282 units of the thousands of listings on the site after six months.⁶⁰

Policy Impact

As of January 2020, there were 7,072 listings in San Francisco, 4,023 of which were classified as “recently and frequently booked.”⁶¹ Spatially, the listings are most concentrated in Downtown San Francisco, with listings more dispersed on the peripherals of the city, suggesting some level of touristification (Figure 3). Additionally, most of the listings as of 2020 are entire home listings and “highly available,” both indicators of illegal investor listings. These units are also concentrated in the downtown areas (Figure 4).

⁵⁸ Julie Littman, "Airbnb Settles Lawsuit in San Francisco," *Bisnow*, May 2, 2017, <https://www.bisnow.com/san-francisco/news/hotel/airbnb-settles-lawsuit-in-san-francisco-73935>.

⁵⁹ Olivia Carville, Andre Tartar, and Jeremy C.F. Lin, "Airbnb to America's Big Cities: See You in Court," *Bloomberg*, February 14, 2020, <https://www.bloomberg.com/graphics/2020-airbnb-ipo-challenges/>.

⁶⁰ Biz Carson, "The fight between Airbnb and San Francisco," *Business Insider*, May 15, 2015, <https://www.businessinsider.com/san-francisco-report-blames-airbnb-for-housing-shortage-airbnb-strikes-back-2015-5>.

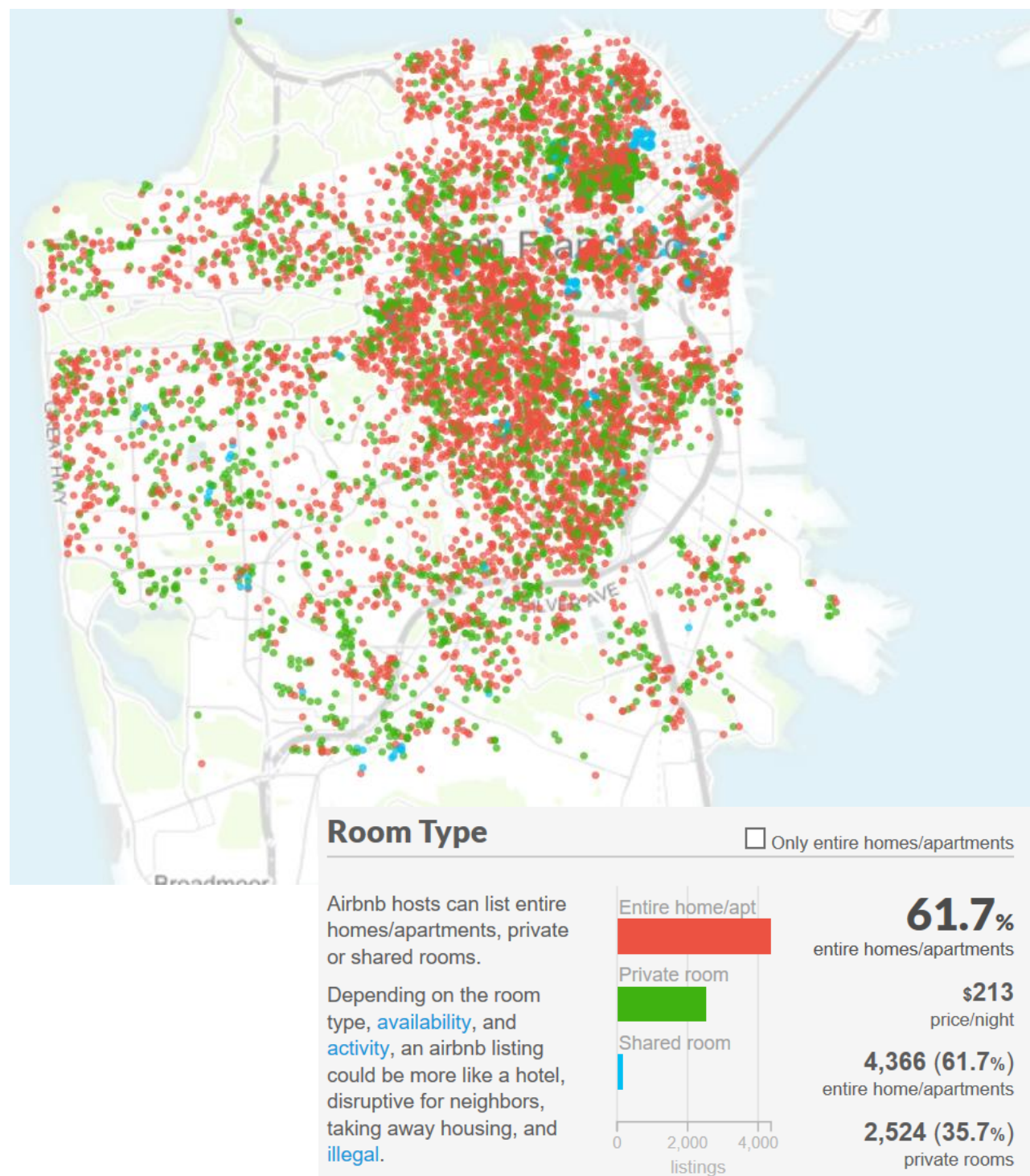
⁶¹ "San Francisco," *Inside Airbnb*, accessed March 1, 2020, <http://insideairbnb.com/san-francisco/?neighbourhood=&filterEntireHomes=false&filterHighlyAvailable=false&filterRecentReviews=false&filterMultiListings=false>.

Beyond this, in comparing the availability of these units, entire listings had a lower occupancy than the total listings, which could suggest that shared-unit homes were in higher demand. However, even if this is true, most of the entire home listings were still highly occupied, and thus unable to accommodate long-term renters. These units should still be considered “off the market” for long-term rentals even if they were less occupied than in previous years, suggesting that solely limiting the availability of entire home listings will do little to bolster the rental stock and increase housing affordability.

Given that the San Francisco regulations are some of the longest implemented of any municipality, it is important to analyze the current year over the course of a longer five-year period after the first restrictions were in place. In this context, it is harder to judge whether the policy has had the intended effect of increasing housing affordability through restricting Airbnb, as there is no clear downward trend in listings, and perhaps not enough years after the enforcement of the registry by Airbnb in late 2017 (Figure 4).

Figure 3. Map of total listings in San Francisco 2020⁶²

The map shows the spatial distribution of all Airbnb listings in San Francisco. Most of the listings are entire home listings, with the densest concentration of Airbnb in the downtown core



⁶² "San Francisco," *Inside Airbnb*.

Figure 4. Total San Francisco Listings Over Time⁶³

| Year | # of Listings |
|------|---------------|
| 2020 | 7,072 |
| 2019 | 7409 |
| 2018 | 4775 |
| 2017 | 8776 |
| 2016 | 8097 |
| 2015 | 5425 |

However, according to the data, after the first regulations were introduced in 2015, the city was able to reduce the number of listings from 11,000 to 5,425 (Figure 4). In the years following, the number of listings began to rise again until 2018, when there was a second dramatic drop in listings.

Given that Airbnb and San Francisco reached a settlement in which Airbnb agreed to assist in the removal of illegal listings from the site in 2017, this is the likely explanation for the second dramatic immediate drop in listings. Like in 2015, in 2018 there was a drop in total listings at first, when unregistered units were removed en masse. However, over the year as applications for the registry were processed, this number grew again. Given that these dramatic decreases coincided with legislative enforcements only to reemerge in the following years, suggests that Airbnb is like a weed in the city, with listings re-emerging with persistence a year or two after regulations are enacted. This suggests that

⁶³ "San Francisco," *Inside Airbnb*.

where the platform exists, legislators will constantly have to be innovating new policies to deter potential hosts from listing their properties, and that a registry alone is not enough.

The San Francisco government should continue to monitor the website reports and registry closely. From 2019 to 2020 there was a modest decrease of 4.8 percent in listings, from 7,409 to 7,072 (with entire home listings falling from 4,540 to 4,366), despite no change to the existing regulations. While this could suggest that the supply of Airbnb is plateauing in San Francisco, knowing the history of the persistence of the short-term rentals in the city, officials still need to monitor the registry closely in the coming years to ensure that listings do not exponentially increase.

Furthermore, there are two broader issues with the reasoning that by simply reducing the sheer volume of Airbnb listings, housing affordability will increase. The first issue is a decrease in the number of short-term rentals does not guarantee their conversion into long-term rentals. In San Francisco, after Airbnb began to cooperate by removing illegal listings, over 4,700 listings were purged overnight (from 11,000 rentals).⁶⁴ According to Airbnb, most of these listings were inactive, with “35 percent [having] no activity over the last six months.” If these listings that were not successful on Airbnb after half a year were not converted back to long-term rentals, there may be other factors besides monetary incentive for hosts. If true in this case, without a monetary necessity, hosts may just remove their listing from the markets all together, rather than converting the unit into a long-term rental, doing little to alleviate the housing shortages.⁶⁵

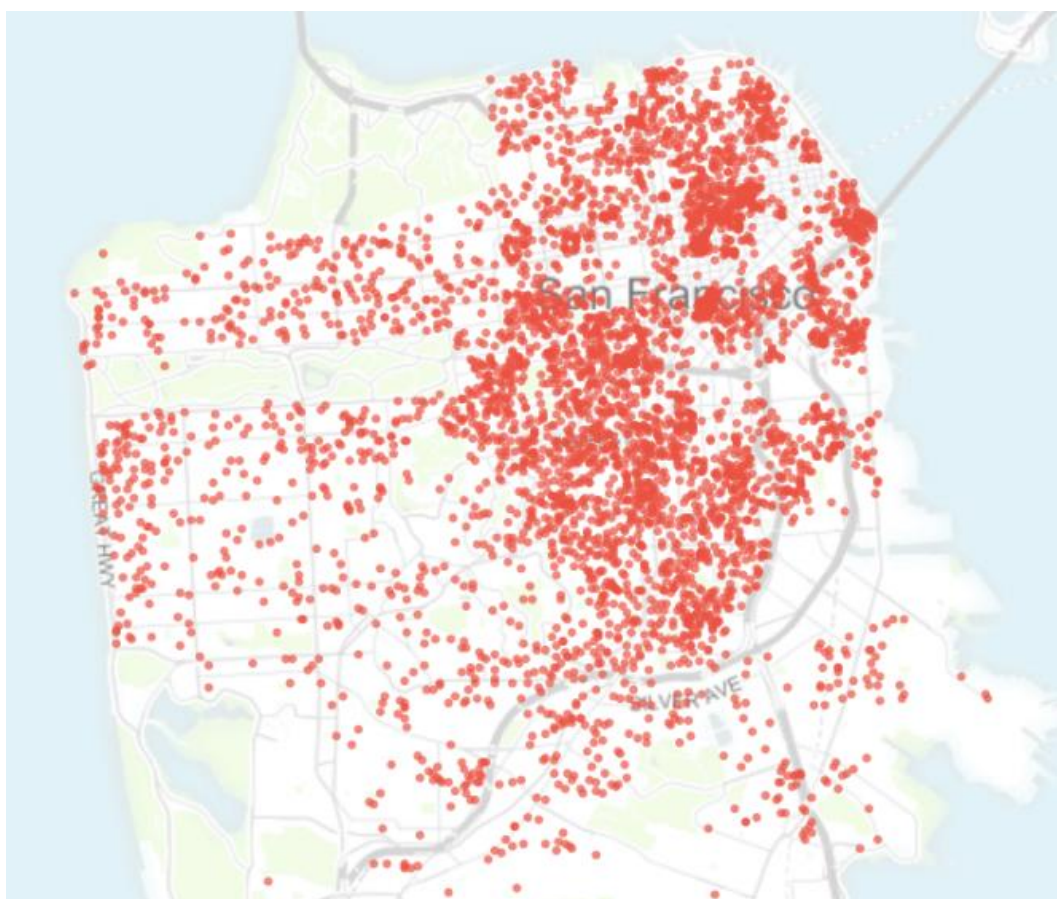
⁶⁴ Dara Kerr, “Airbnb purges thousands of San Francisco listings overnight.”

⁶⁵ Ibid.

The second issue is a matter of policy enforcement. In San Francisco, even with Airbnb's help in removing illegal listings, the re-registering process was slow-going, with the office having to process 200 applications per week.⁶⁶ For cities with even less of a government capacity than San Francisco, this high volume of listings could lead to legal trouble if the city's inability to process applications within the time limit given to register (240 days) led to the listings' unfair removal.

Figure 5. Map of Entire Home Listings in San Francisco 2020⁶⁷

This map shows the spatial distribution of "entire home" Airbnb listings. The distribution closely follows the distribution of all listings, the listings concentrated most heavily in the downtown.



⁶⁶ Ibid.

⁶⁷ "San Francisco," *Inside Airbnb*, accessed March 1, 2020, <http://insideairbnb.com/san-francisco/?neighbourhood=&filterEntireHomes=false&filterHighlyAvailable=false&filterRecentReviews=false&filterMultiListings=false>.

Neighborhood Impacts of the Policy⁶⁸

It is also worth evaluating the long-term effects of the policy enforcement on specific neighborhoods over time. Given the observed impact of Airbnb on the central core of cities, and the spatial concentrations for total listings (Figure 3) and entire home listings (Figure 5) in San Francisco, it is important to note whether the policies enforced led to any significant decreases in central neighborhoods. It is also important to note the behavior of Airbnb post-regulations in San Francisco's fastest gentrifying neighborhoods, as these are the areas likely to be the most vulnerable to the loss of affordable housing. According to a study done by University of California Berkeley, the fastest gentrifying neighborhoods of San Francisco were Tenderloin, Chinatown, and Bayview, with SoMA, Russian Hill, Nob Hill, Pac Heights, and the Mission neighborhoods displaying the most documented displacement in 2015.⁶⁹

According to listing data, many of the fastest gentrifying, centrally located, neighborhoods also were those most susceptible to Airbnb. Chinatown, Downtown/Civic Center, Financial District, and South of the Market were the neighborhoods that experienced the most volatility in listings (and entire home listings) over time.⁷⁰ These were the areas where listings decreased the most immediately after a new policy was passed (seen in 2015 and 2018), only to increase and surpass original levels in the following year (Figure 6).

⁶⁸ See Appendix A and Appendix B for data on listings by neighborhood over time.

⁶⁹ Adam Brinklow, "Map shows which SF neighborhoods gentrifying fastest," *Curbed San Francisco*, November 17, 2017, <https://sf.curbed.com/2017/11/17/16670116/uc-berkeley-urban-displacement-map-gentrification-oakland>.

⁷⁰ See Appendix B and Appendix D

Beyond this, it is also interesting to note the price trends for these neighborhoods, as an increase of prices in the Airbnb listings also simulates the effects of increased demand to an area, ultimately leading to decreased affordability and increased displacement.⁷¹ When analyzing the listing data over time, it is difficult to identify a clear pattern for the price related to regulations in these downtown neighborhoods. While the overall distribution of prices seems to be raising in the area overtime, much like the trends for listings, the pricing seems to be a moving target, with a new central hotspot popping up every year. (Figure 7).

Figure 6. Total Listings for Downtown Neighborhoods in San Francisco⁷²

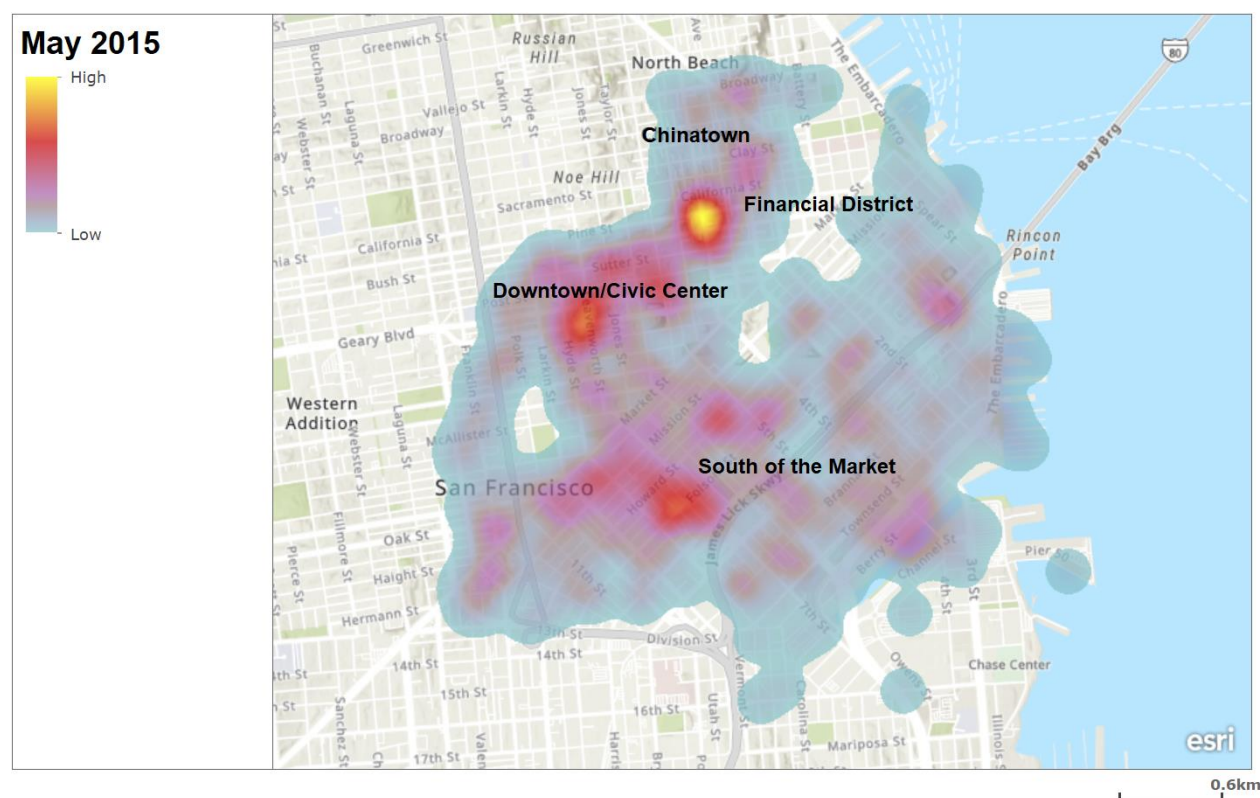
| Neighborhood | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 |
|-----------------------|------|------|------|------|------|------|
| Chinatown | 156 | 115 | 57 | 161 | 94 | 57 |
| Downtown/Civic Center | 785 | 616 | 311 | 564 | 313 | 197 |
| Financial District | 224 | 154 | 56 | 144 | 142 | 63 |
| South of the Market | 744 | 591 | 199 | 646 | 684 | 400 |

⁷¹ See page 7-8 for more on rental gap theory.

⁷² "Get the Data," *Inside Airbnb*, accessed March 20, 2020, <http://insideairbnb.com/get-the-data.html>.

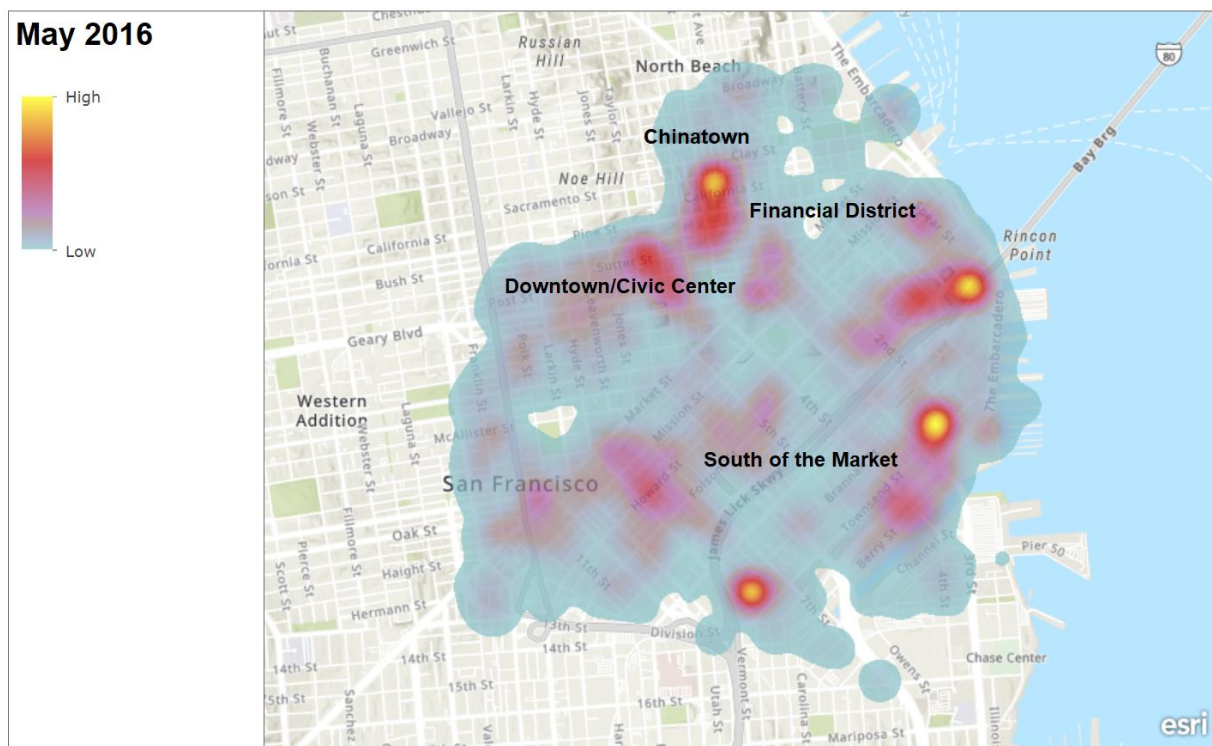
Figure 7. Pricing Heatmaps for listings in Central San Francisco⁷³

Heat maps for the prices were calculated using the data for ADR (average daily rate) of the listings in the centrally located neighborhoods of Chinatown, Downtown/Civic Center, Financial District, and South of the Market. The years examined were 2015 (first wave of regulations), 2016, 2017, 2018, 2019, and 2020.

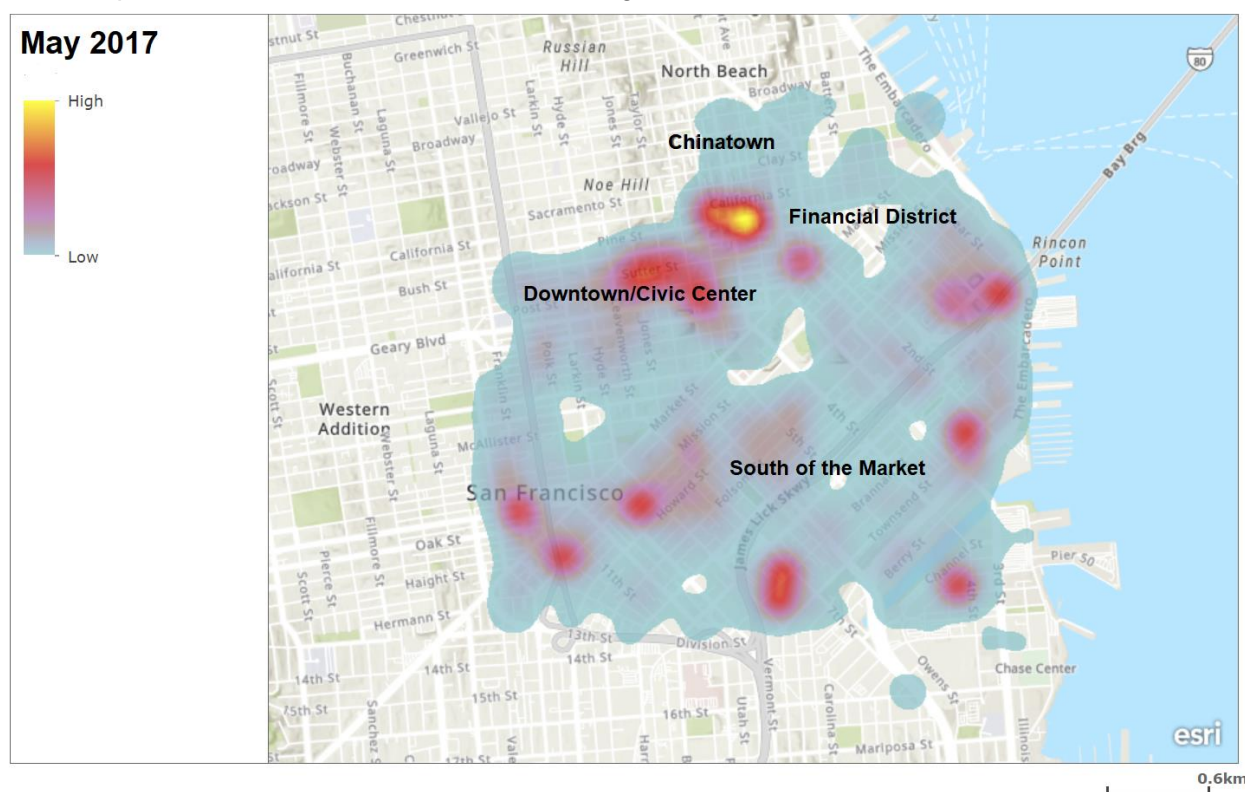


In 2015, the highest prices were concentrated at the intersection of Chinatown, Financial District, and the Downtown and Civic Center neighborhoods. However, all of the central core had pockets of higher priced rentals.

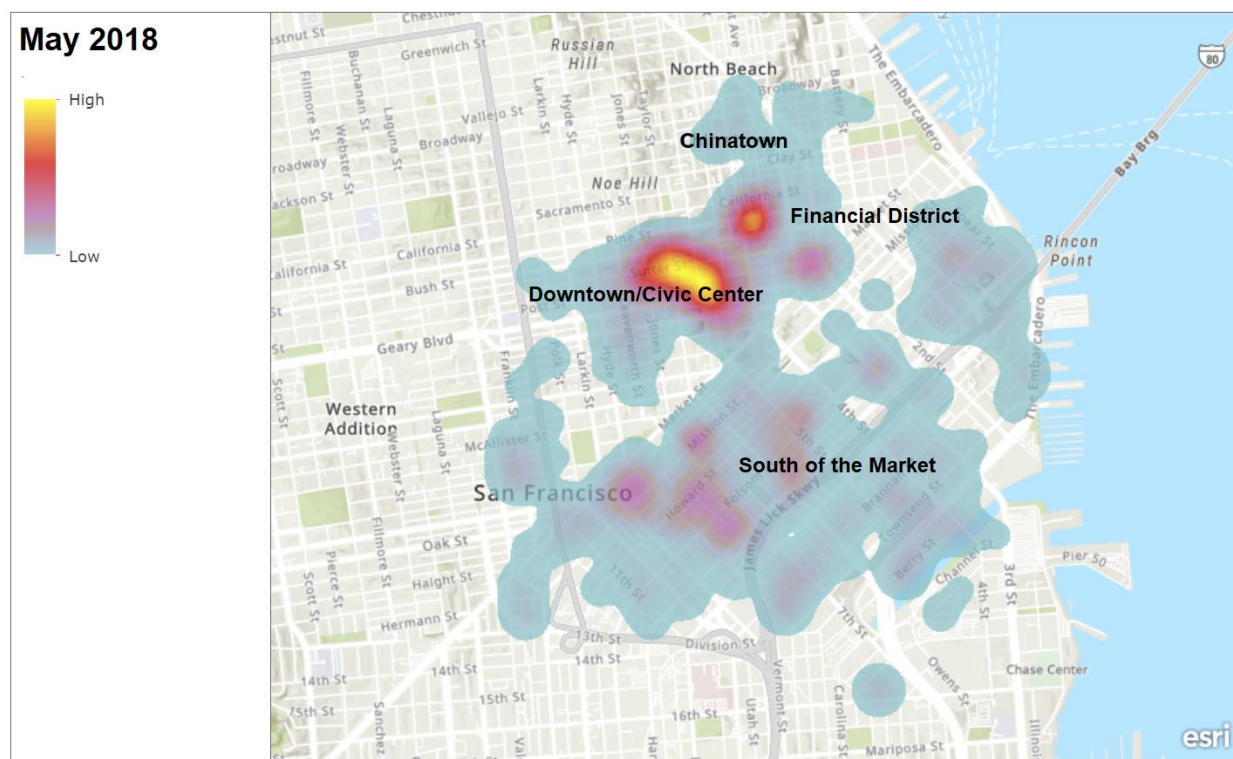
⁷³ "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.



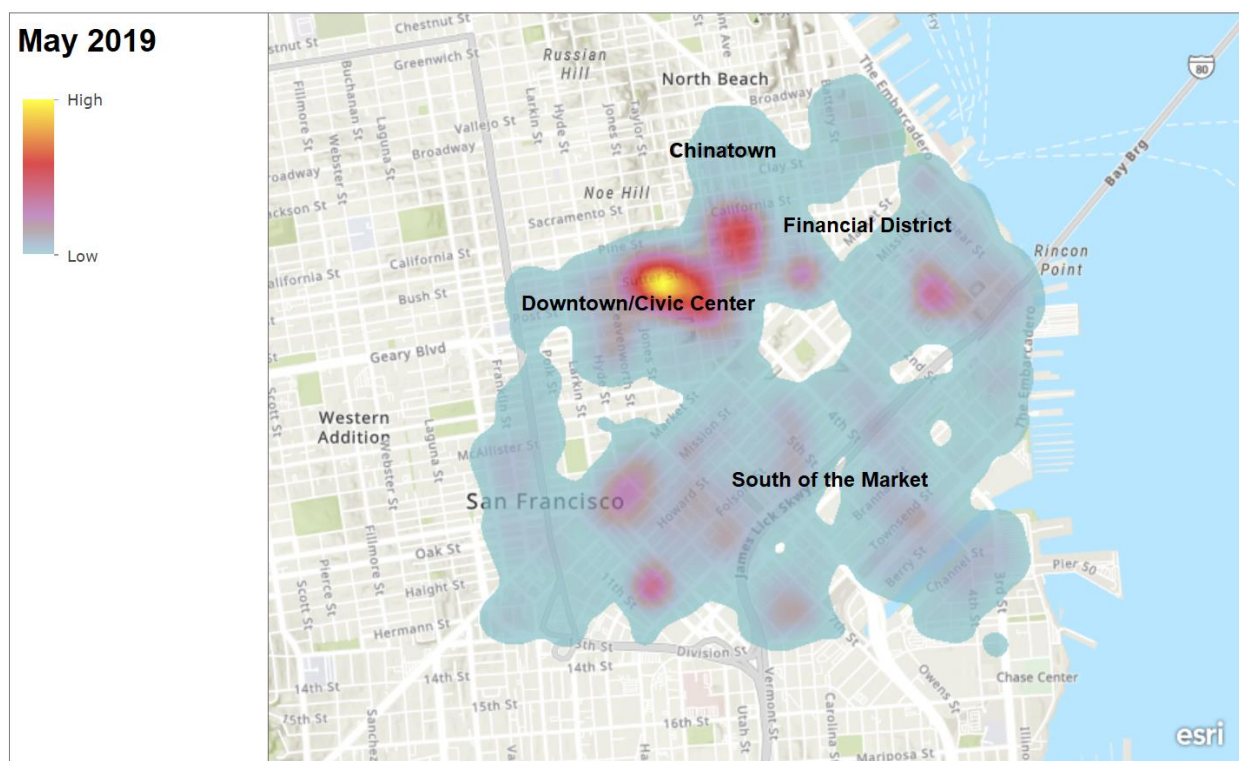
In 2016, the highest prices were no longer concentrated to the same intersection as before. Instead, smallest pockets of expensive listings cropped up throughout the central core, but overall prices seemed to decrease after the regulation.



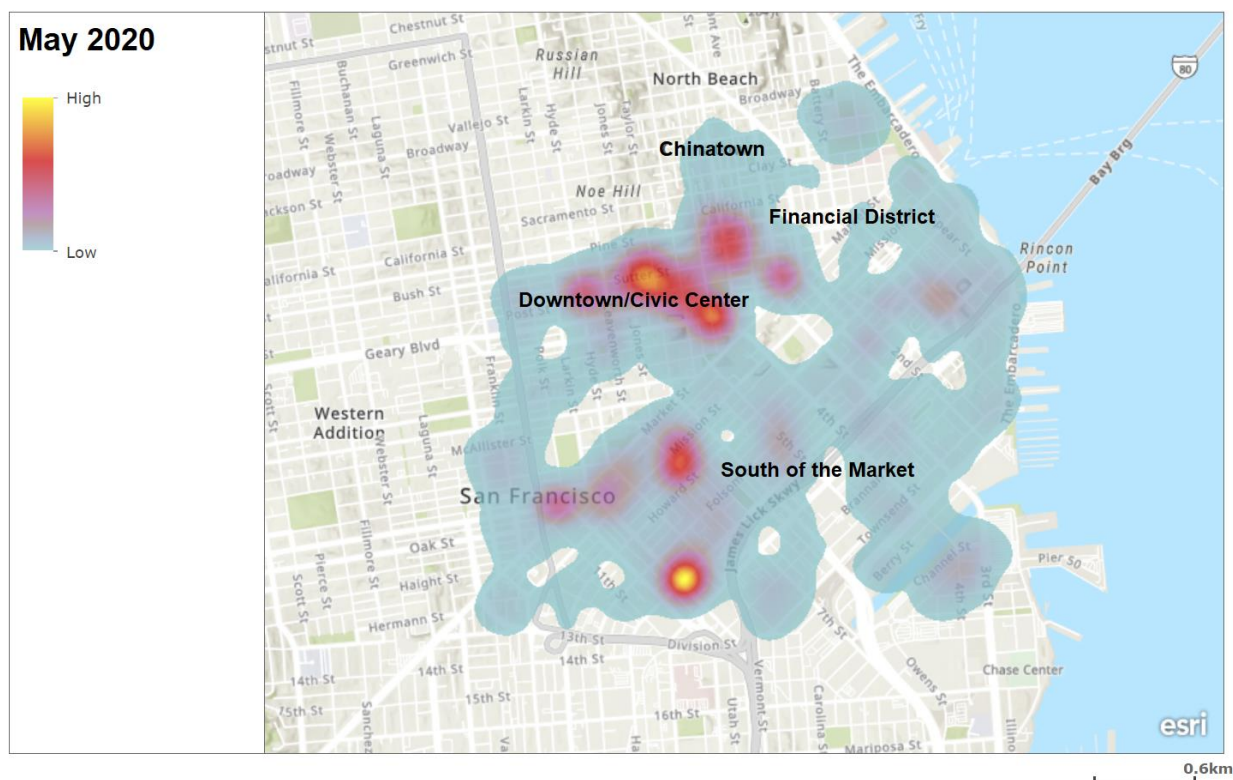
In 2017, the high pricing pocket between Chinatown, Financial District, and the Downtown and Civic Center neighborhoods re-emerged, with other places getting slightly less expensive in comparison.



In 2018, the high pricing pocket between Chinatown, Financial District, and the Downtown and Civic Center neighborhoods increased again to encompass a larger area of the Downtown and Civic Center. This is the year where Airbnb began to help remove illegal listings.



In 2019, the overall trends from the previous year persisted, though prices in general seemed to decrease. As listings began to increase again (see Figure 6), this could have stabilized prices throughout the area from 2018/



In 2020, a new high price pocket emerged in the South of the Market neighborhood. This is especially concerning for City Officials if it persists—as SoMa (South of the Market) is one of the San Francisco neighborhoods experiencing the highest rates of displacement.

Another goal of the policy was to reduce the volume of “entire home listings,” as these were indications of investor listings. All the neighborhoods with a higher proportion of “partial home” listings are located outside of the downtown core, on the peripheral of San Francisco, which suggests that the owners outside of the city core are the ones that Airbnb advertises—the home owner renting out an extra room in their house for additional income to finance their mortgages or additional expenses (Figure 8).⁷⁴ However, there is not a clear trend of an increase in partial home listings over time for these neighborhoods, so it is difficult to state whether the reduction was the direct result of policy. Most notably (since none of these neighborhoods are in the central core), the data suggests that if the

⁷⁴ See Appendix E for a map of San Francisco’s neighborhoods.

city wanted to further limit the number of Airbnb listings, they could consider limiting listings to only partial home.

Figure 8. San Francisco Neighborhoods with the Majority of Listings as Partial Home⁷⁵

| Neighborhood | % of Partial Home Listings | | | | | |
|----------------|----------------------------|------|------|------|------|------|
| | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 |
| Bayview | 56 | 59 | 61 | 67 | 63 | 70 |
| Crocker Amazon | 61 | 65 | 75 | 57 | 55 | 68 |
| Lakeshore | 78 | 76 | 64 | 57 | 76 | 68 |
| North Beach | 56 | 38 | 43 | 39 | 39 | 26 |
| Ocean View | 55 | 54 | 47 | 55 | 67 | 57 |
| Parkside | 100 | 46 | 45 | 49 | 67 | 49 |

Conclusion

San Francisco has one of the longest histories of regulating Airbnb. The city has evaluated their regulations to meet their main goal of protecting affordable housing. However, their overall stance has been exclusively to try and limit the overall number of listings (limiting the presence of Airbnb in the city). This has proven extraordinarily difficult, as investor units seemingly persist, even with Airbnb's cooperation in removing illegal listings. Without any restrictions on the pricing of listings in certain areas, the user-friendly platform provides a better alternative to long-term tenants for landlords. In the central neighborhoods examined (Figure 7), the nightly rate ranged from \$176 to \$230. Even charging the lower rate, by just renting for 17 days a month a host would earn over the average monthly rent in San Francisco, \$3,048.

⁷⁵ "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

Case Study: Boston

Airbnb's Specific Impact on Boston

Several studies have examined the impact of Airbnb on both Boston's tourism and housing markets. A 2017 study by the Boston University Hospitality Review found that the hotel room supply in Boston has experienced growth despite the rise in Airbnb over the same period, with points of lower hotel occupancy levels corresponding to "supply shocks" from new hotel openings.⁷⁶ The study also found that ADR (Average Daily Rates) and RevPAR (Revenue per Available Room) for hotels exhibited an upward trend since 2010, suggesting that at least in Boston, Airbnb did not have a significant negative impact on the hotel industry. Furthermore, the authors find a positive correlation between these "key performance metrics" for Airbnb and hotels, which they attribute to "Airbnb demand [being] potentially different from hotel demand."⁷⁷ Given these considerations, the authors conclude that "Airbnb's negative economic impacts on the hotel industry are, at best, marginal," and that Airbnb may be even beneficial for its potential to expand the market for tourism in a city.⁷⁸

Another study done by the Boston University Hospitality Review of Airbnb's features in Boston found that guests prioritized the features of "entire homes and private rooms," reflected in prices for entire homes being 114 percent higher than a shared

⁷⁶ Tarik Dogru, Makarand Mody, and Courtney Suess, "Comparing apples and oranges? Examining the impact of Airbnb on hotel performance in Boston," *Boston Hospitality Review* 5 (2017): 4, https://www.researchgate.net/publication/317598078_Comparing_apples_and_oranges_Examining_the_impact_of_Airbnb_on_hotel_performance_in_Boston.

⁷⁷ Ibid., 13.

⁷⁸ Ibid.

room.⁷⁹ Additionally, the study found that Airbnb guests prioritized location to the city center, and are willing to pay less for listings that “seem to have commercial purposes”.⁸⁰ While the study used pricing as a measure of consumer willingness to pay, these indicators suggest the most desired units for Airbnb are those that exhibit mostly residential characteristics, while also being in a convenient location close to downtown. Given these preferences, and the findings in the other study, Airbnb legislation should be geared towards the protection of housing and rental units, rather than the protection of hotels.⁸¹

Other studies support the idea, Airbnb mainly negatively impacts the residential market in Boston. A 2017 study by Horn and Merante found that a one standard deviation increase in Airbnb listings corresponded to an increase of 0.4 percent in rental price in the next leasing period, all other factors held constant.⁸² Moreover, their research showed that while over 80 percent of hosts had only one listing, the 18 percent of hosts with multiple listings accounted for 46 percent of all total listings on the platform. This suggests that within the city, there is a sizable substitution effect, where commercial properties that would have been listed for more permanent leases are now being marketed as short-term rentals.⁸³

⁷⁹ Tarik Dogru and Osman Pekin, "What do guests value most in Airbnb accommodations? An application of the hedonic pricing approach," *Boston Hospitality Review* 5 (2017): 8, https://vtechworks.lib.vt.edu/bitstream/handle/10919/79602/What-do-guests-value-most-in-Airbnb-accommodations_An-application-of-the-hedonic-pricing-approach_Dogru-Pekin.pdf?sequence=1

⁸⁰ Ibid., 10.

⁸¹ Ibid.

⁸² Keren Horn and Mark Merante, "Is home sharing driving up rents? Evidence from Airbnb in Boston," *Journal of Housing Economics* Volume 38 (December 2017):14-24, <https://www.sciencedirect.com/science/article/pii/S1051137717300876>.

⁸³ Ibid.

These studies contradict a 2014 report released by Airbnb detailing “Airbnb’s positive impact on Boston.”⁸⁴ The study had a financial and social component, claiming that “62 percent of hosts said hosting positively changed the way they look at life,”⁸⁵ and that Airbnb contributed to \$51 million generated in the economy since 2009 (supporting 490 jobs).⁸⁶ However, implicit even in this report is the growing effect of Airbnb on the residential market, with 80 percent of guests who stayed in Airbnb properties doing so because “the location was more convenient than a comparable hotel.”⁸⁷ This suggests some level of conversion of amenity-rich units from long-term rentals to short term rentals, and some level of the touristification like that observed in European cities and San Francisco, where Airbnb was densest in residential areas nearest to the central business district.

Boston’s Airbnb Regulations

In June of 2018, Boston’s City Council voted in favor of a new Airbnb ordinance. The main concern was Airbnb’s effect on the housing market, with Mayor Walsh stating, “My goal in regulating short-term rentals has always been to responsibly incorporate the growth of the home-share industry into our work to create affordable housing for all.”⁸⁸ The ordinance conformed to the pattern found by Nieuwland and van Melik for cities that regulated to protect affordable housing, with its key terms as follows:

⁸⁴ “Airbnb’s Positive Impact in Boston,” *Airbnb*, accessed March 2, 2020, https://blog.atairbnb.com/airbnbs-positive-impact-boston/?_ga=2.251665164.445259306.1584535926-1802718855.1570011473.

⁸⁵ “Social Impacts in Boston,” *Airbnb*, accessed March 1, 2020, <https://blog.atairbnb.com/social-impacts-boston/>.

⁸⁶ “Economic Impacts in Boston,” *Airbnb*, accessed March 4, 2020, <https://blog.atairbnb.com/economic-impacts-boston/>.

⁸⁷ *Ibid.*

⁸⁸ Spencer Buell, “Boston’s City Council Just Passed an Overhaul of Airbnb,” *Boston*, June 13, 2018, <https://www.bostonmagazine.com/news/2018/06/13/airbnb-boston-city-council/>.

listings were limited to owner-occupied residences, listings must register yearly with the city, Airbnb must remove illegal listings (with these hosts subject to a \$300 nightly fine), Airbnb must produce monthly reports with listings and their corresponding city registration number, and hosts must alert their neighbors that they were registered on Airbnb.

Predictably, while most of city council supported the ordinance (all except two voted to pass the ordinance), Airbnb was outraged by these tougher restrictions and filed a lawsuit against the city in federal court. *Airbnb v. City of Boston* (Case 1:18-cv-12358) alleged that the ordinance violated the Communications Decency Act Section 230, which states internet companies cannot be held responsible for what users post on it.⁸⁹ A defining issue for this lawsuit was whether Airbnb was just a listing platform, or whether they function more as a leasing agent, playing an active role in the bookings. Airbnb and the city eventually reached a settlement, which upheld the ordinance conditions. Additionally, city officials were given the power to notify Airbnb of illegal, unregistered listings and have them removed from the website. In order to reach this settlement with Airbnb that was favorable for Boston, it was helpful to have prior court cases in other cities where judges sided with the city over the platform, and to have the state regulatory support (with Massachusetts passing a statewide registration requirement for units through the Massachusetts Department of Revenue).⁹⁰

Even though the settlement was favorable for the city, the lawsuit significantly stalled the citywide registration process. Four months into the new policy, just 150 of the

⁸⁹ Quincy Walters, "Airbnb Sues Boston Over Short-Term Rental Rules," *WBUR*, November 13, 2018, <https://www.wbur.org/bostonomix/2018/11/13/airbnb-boston-lawsuit>.

⁹⁰ "Occupancy tax collection and remittance by Airbnb in Massachusetts," *Airbnb*, accessed March 15, 2020, <https://www.airbnb.com/help/article/2587/occupancy-tax-collection-and-remittance-by-airbnb-in-massachusetts>.

over 6,000 listings on the platform had applied for a registration number.⁹¹ Policy enforcement is a persisting issue; at a recent Boston City Council meeting in November (a full year after the passage of the ordinance), Councilor Ed Flynn noted that he received reports that “unregistered ineligible units [were] still operating.”⁹²

Policy Impact

Given the recentness of Boston’s ordinance, only the immediate impacts can be evaluated. In evaluating the new policy, it is important to consider whether it furthered its goals, described by Mayor Walsh as “to responsibly incorporate the growth of the home-share industry into our work to create affordable housing for all.” The policies in Boston aimed to accomplish this mainly through reducing the number of investor units in the city.⁹³ As these would otherwise be listed on the long-term rental market, it is first important to analyze the ordinance’s effect, if any, on the reduction of these units that have the indicators of investor listings, such as hosts with multiple listings or entire units that are highly available.

As of 2020, there are 3,507 total listings in Boston, though the “entire home” and “highly available” units appear to be densely concentrated around the city center (Figure 9).⁹⁴ This total number of listings declined a meager .03 percent from 2019, which could suggest that Airbnb listings in the City of Boston are plateauing after the initial dramatic

⁹¹ Zeninor Enwemeka, “90 Days in, Only a Portion of Boston’s Short-Term Rentals Have Been Registered as Required,” *WBUR*, April 10, 2019, <https://www.wbur.org/bostonomix/2019/04/10/boston-airbnb-registry-ordinance>.

⁹² Crystal Haynes, “City council cracking down on short-term rental compliance in Boston,” *Boston 25 News*, November 14, 2019, <https://www.boston25news.com/news/city-council-cracking-down-on-short-term-rental-compliance-in-boston/1008696178>.

⁹³ Spencer Buell, “Boston’s City Council Just Passed an Overhaul of Airbnb.”

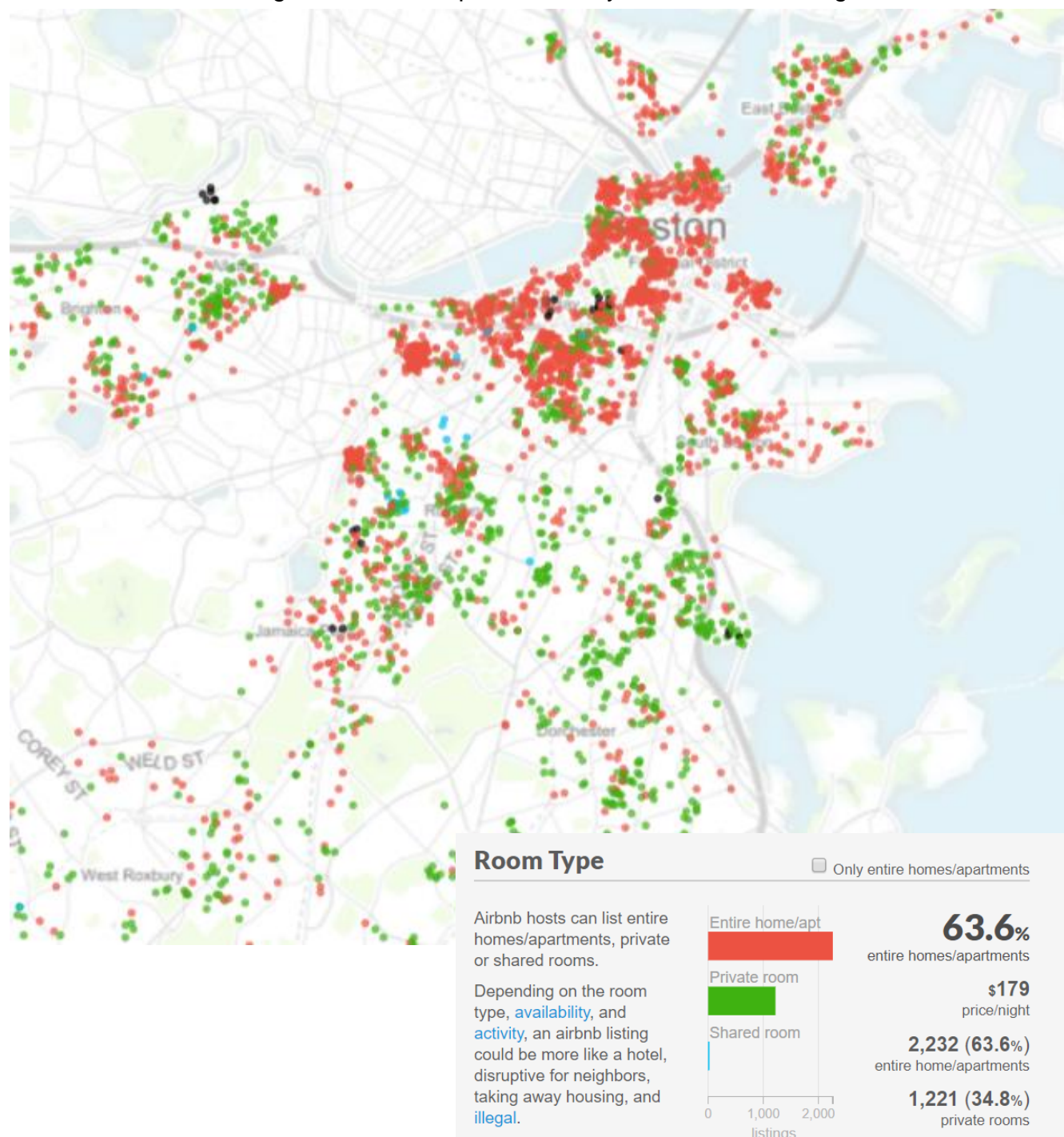
⁹⁴ “Boston,” *Inside Airbnb*, accessed March 24, 2020, <http://insideairbnb.com/boston/?neighbourhood=&filterEntireHomes=false&filterHighlyAvailable=false&filterRecentReviews=false&filterMultiListings=false>.

decrease in units in 2019 when Airbnb was forced to comply and remove illegal listings from the site (Figure 10). Furthermore, this also suggests that while compliance from Airbnb to remove illegal listings causes an immediate decline in units, the regulations taken by cities will never completely remove Airbnb from the city. Given this, perhaps the most effective way to limit Airbnb in the future would be to find ways barring new entry.

Given San Francisco's experience of regulation, reduction, and then reentry, it is imperative for Boston's government to continue to monitor the platform. If the number of listings continues to stagnate, these Boston regulations (and forcing Airbnb comply with removing illegal listings) might be the most viable long-term option for other cities looking to curtail the growth of Airbnb.

Figure 9. Map of total listings in Boston 2020⁹⁵

This is a map of the spatial concentration of listings in Boston. The listings are concentrated in downtown, with most listings being the entire home. Further from the downtown core, the neighborhoods are predominately shared home listings.



⁹⁵ "Boston," *Inside Airbnb*, accessed March 24, 2020, <http://insideairbnb.com/boston/?neighbourhood=&filterEntireHomes=false&filterHighlyAvailable=false&filterRecentReviews=false&filterMultiListings=false>.

Figure 10. Total Boston Listings Over Time⁹⁶

| Year | # of Listings |
|------|---------------|
| 2020 | 3507 |
| 2019 | 3508 |
| 2018 | 6218 |
| 2017 | 4871 |
| 2016 | 3585 |
| 2015 | 2563 |

Moreover, as entire home listings are an indicator of the presence of illegal investor units, it is important to evaluate the decline of these units (Figure 11). While the number of entire listings has declined since the regulation was enforced in 2019, it did so at a slower rate than the total listings. This suggests that the policies are disproportionately affecting the number of shared unit listings, preventing these hosts that need the supplemental income from Airbnb from accessing it.

Figure 10. Entire Home Boston Listings Over Time⁹⁷

| Year | # of Listings |
|------|---------------|
| 2020 | 2232 |
| 2019 | 2297 |
| 2018 | 3942 |
| 2017 | 3032 |
| 2016 | 2127 |
| 2015 | 1427 |

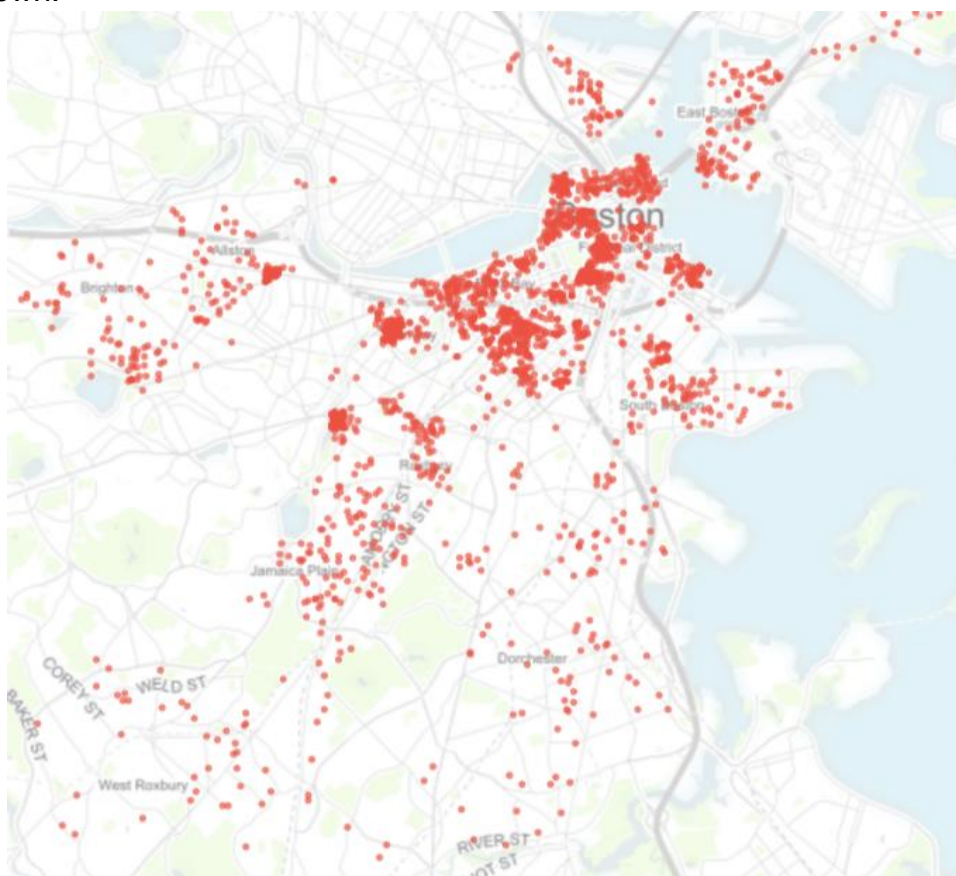
⁹⁶ "Boston," *Inside Airbnb*, accessed March 24, 2020, <http://insideairbnb.com/boston/?neighbourhood=&filterEntireHomes=false&filterHighlyAvailable=false&filterRecentReviews=false&filterMultiListings=false>.

⁹⁷ Ibid.

This is corroborated in the spatial pattern of listings. When comparing only the entire home listings (Figure 12, below) from the total listings (Figure 9), it seems as though all the existing listings are concentrated near the core of the city. Moreover, the total listing availability and the entire home listing availability were not significantly different, which suggests that the city is doing a poor job of enforcing the booking limit for entire home listings (for reference, most entire home listings were booked 149 nights a year). Given this, perhaps cities should additionally require Airbnb to place limits on listing calendars of entire homes (rather than just removing unregistered listings).⁹⁸

Figure 12. Map of entire home listings in Boston 2020⁹⁹

This map shows the spatial distribution of “entire home” Airbnb listings. The distribution closely follows the distribution of all listings (Figure 9), as listings concentrated in the downtown.



⁹⁸ See Appendices E-H for a historical breakdown of listings and percentage changes in listings.

⁹⁹ "Boston," *Inside Airbnb*.

Neighborhood Impacts of the Policy¹⁰⁰

Overall, a similar pattern in listings observed in New York City by Wachsmuth and Weisler, and in San Francisco, is present in Boston.¹⁰¹ Spatially, Boston's listings appear to be even more concentrated in the downtown region than San Francisco though this could be a result of the historic residential zoning of the cities (Figure 3, Figure 9). With regards to the rental gap, downtown Boston comprises the neighborhoods that are “post-gentrified,” with the neighborhoods most susceptible to future gentrification located outside the city core—Allston, East Boston, Roxbury, and the South End.¹⁰²

There appears to be less volatility in listing changes post-policy than in San Francisco, though Boston began to enforce the registry only after enlisting Airbnb's help (which could explain why listings only experience one drop).¹⁰³ However, Boston's regulations are relatively new, so the data is unclear on whether the policy produced significant (long-term) reductions in listings. For example, in 2020 (one year after the registry was enforced), some historically popular neighborhoods for Airbnb continued to decrease in listings volume (like Back Bay). Other hotspots increased from the previous year, but did not surpass the pre-regulation levels of listings in 2018 (Downtown, Allston and Beacon Hill).¹⁰⁴ There was no clear trend in the areas that were able to continuously reduce listings, unlike in San Francisco where the volume of listings in the central core seemed to always return in the years following a regulation. However, given that the

¹⁰⁰ See Appendix F-I for a chart of listings by neighborhood over time.

¹⁰¹ See Wachsmuth and Weisler, page 8.

¹⁰² Tom Acitelli, "7 Boston-area neighborhood everyone should be watching," *Curbed Boston*, January 7, 2020, <https://boston.curbed.com/boston-development/2020/1/7/21051943/boston-neighborhoods-to-watch>.

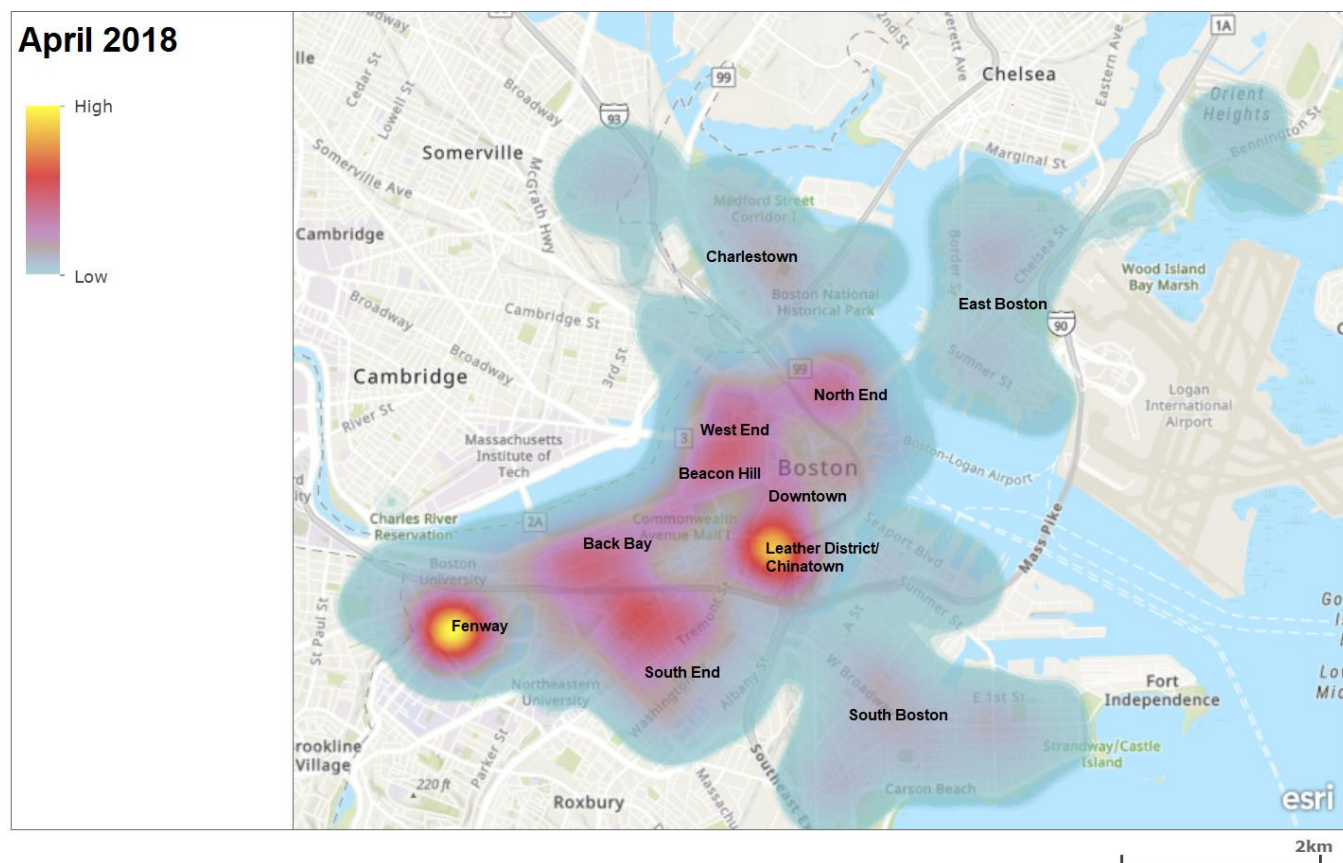
¹⁰³ See Appendix F.

¹⁰⁴ See Appendix F.

listings were spatially concentrated in the central core after the regulations were enforced (Figure 9 and 12), it is helpful to observe pricing patterns for these neighborhoods for pricing “hotspots.” “Hotspot” areas, where the prices remained highest in San Francisco and the Wachsmuth and Weisler study, were the areas where Airbnb was the most resilient against regulations. These could signify areas that the City of Boston should watch closely in the coming years (Figure 13).

Figure 13. Pricing Heatmaps for listings in Boston¹⁰⁵

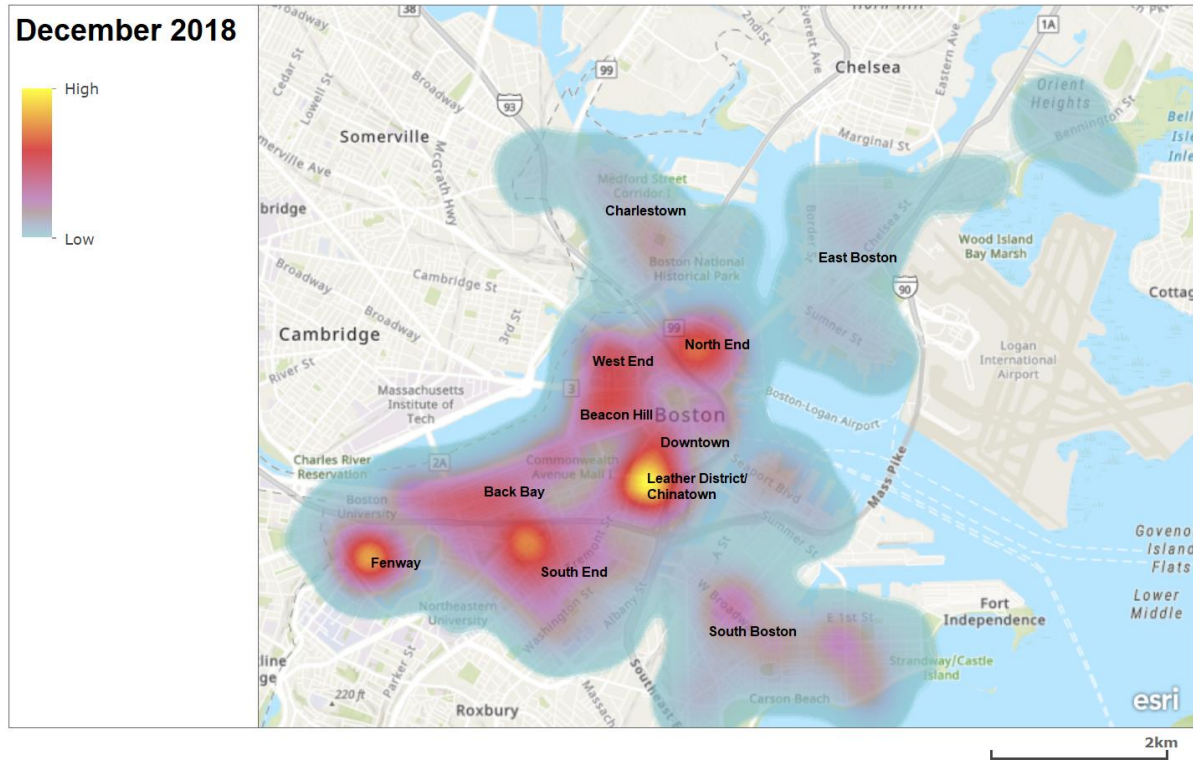
Heat maps for the prices were calculated using the data for ADR (average daily rate) of the listings in the centrally located neighborhoods of Boston.¹⁰⁶



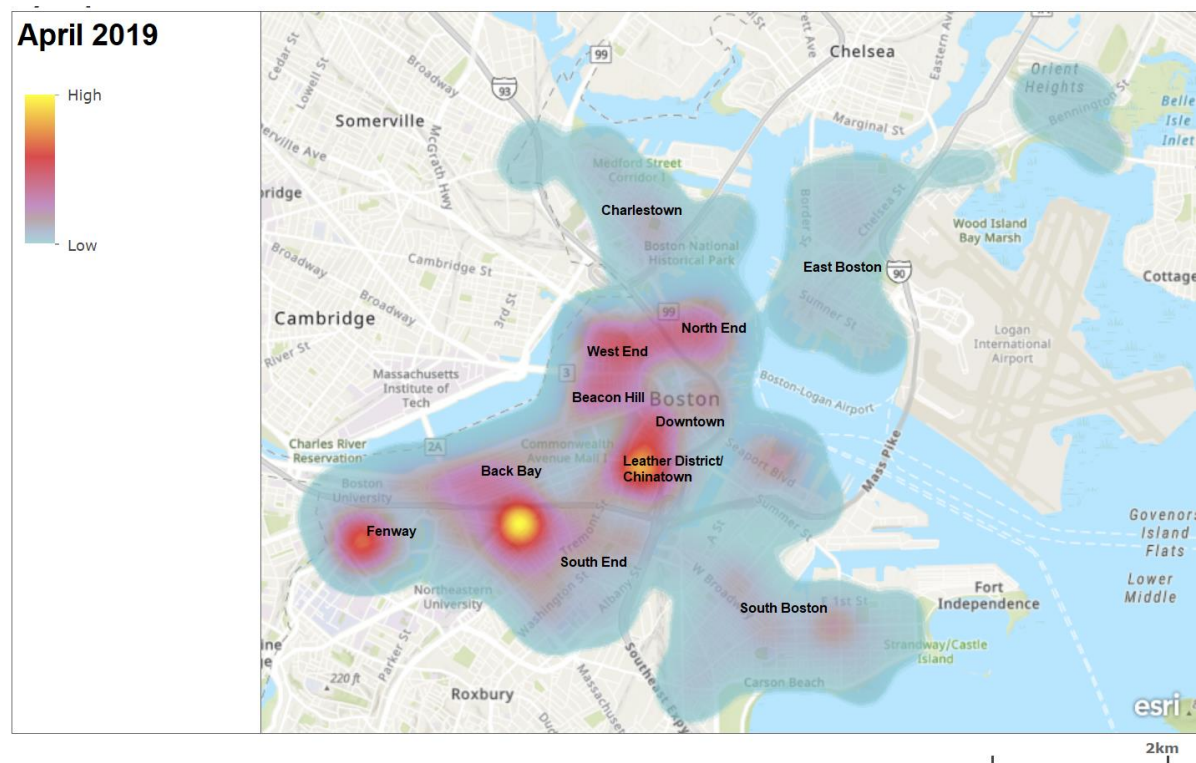
In April of 2018, the central neighborhoods held the highest prices overall; with Chinatown/ Leather District and Fenway (where there are many university students) having the highest prices.

¹⁰⁵ "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

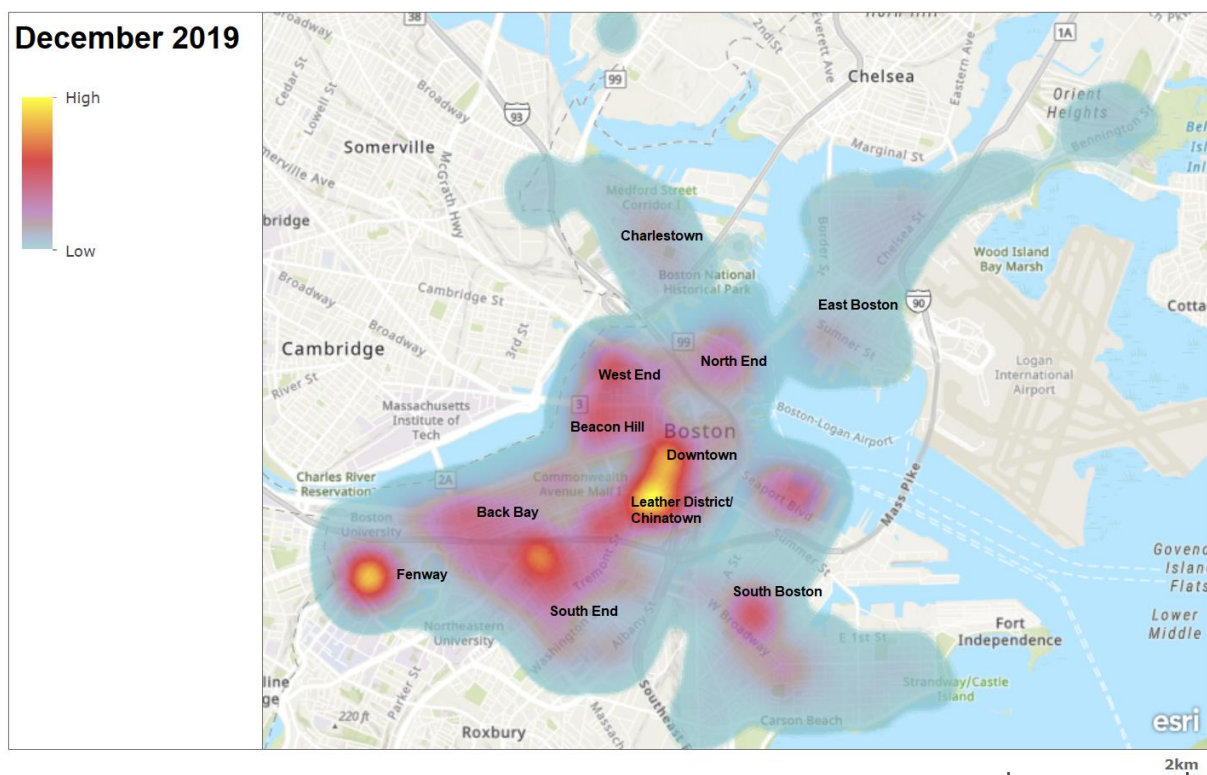
¹⁰⁶ Neighborhoods used were Back Bay, Beacon Hill, Charlestown, Chinatown, Downtown, East Boston, Fenway, Leather District, North End, South Boston, South End, West End



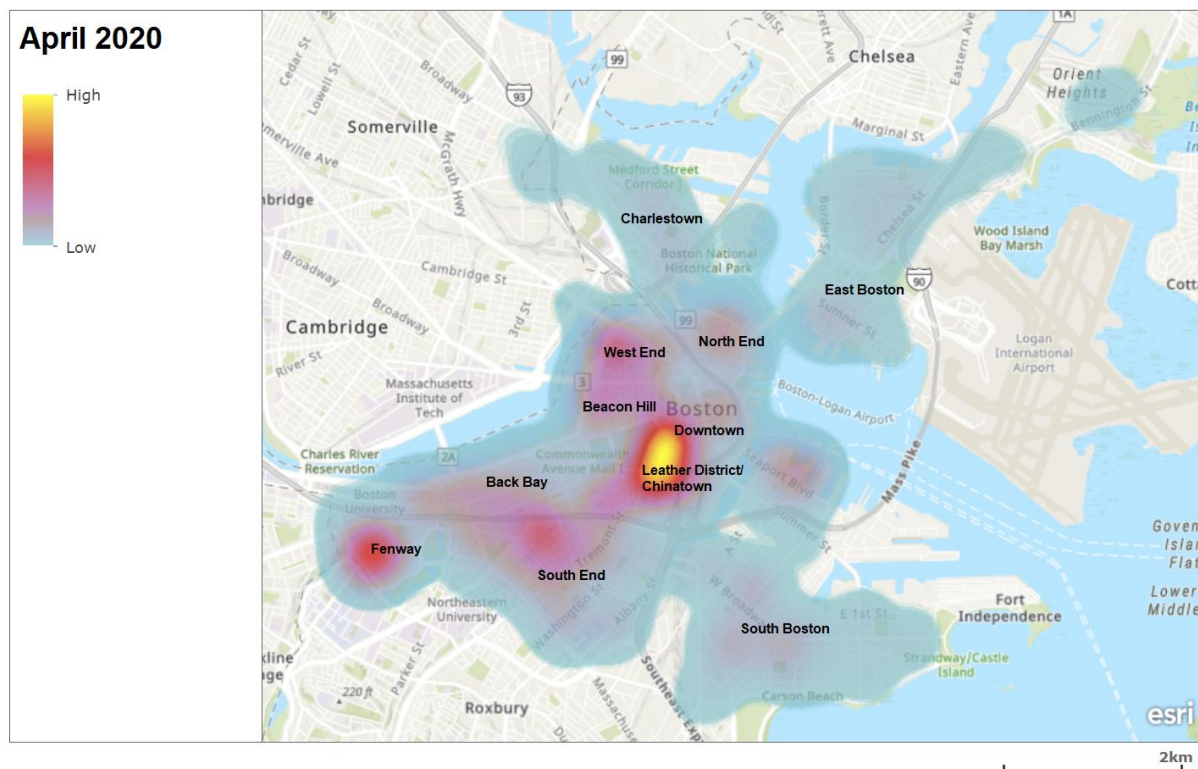
In December of 2018 (when the ordinance is passed), the central neighborhoods appear to be increasing in prices, with emerging hotspots in the South End, Back Bay, Beacon Hill, and the West and North Ends.



In April 2019 (immediately after the regulations are enforced), the central neighborhood hotspot seems to fade, though a new area in Back Bay develops a hotspot.



In December 2019 (after the regulations have had time to be enforced), the central neighborhood hotspot in Chinatown/Leather District is back, extending to the Downtown area. Also, the original Fenway hotspot (from April) seems to be re-emerging.



In April 2020 it seems as though the overall prices have fallen, though the Chinatown/Leather District is the one area that persists. Given this, legislators should consider special regulations in this area.

It is also important to study the impacts of the policy outside of the downtown core. As previously mentioned, “entire home listings” can be a sign of investor units or illegal listings. As with San Francisco, the neighborhoods with mostly “partial home” listings are on the edges of the city (Figure 14).¹⁰⁷ This is likely not the cause of policy (given these areas historically the majority of the shared listings), but it does suggest that in the outermost neighborhoods of cities, Airbnb is used as it was originally intended (as a way for hosts to list an unused room for much-needed additional income). Therefore, another policy Boston could pursue is to limit investor listings is to limit the downtown core to only partial home listings. However, these outermost neighborhoods also correlated with the lowest rents in the city, suggesting that they hold much of the affordable rental housing stock in Boston. Thus, more research is needed among partial listing hosts to find a balance between providing these hosts with the necessary supplemental income, while not removing rooms that would contribute to the long-term market if not for Airbnb.

Figure 14. Boston Neighborhoods with the Majority of Listings Partial Home¹⁰⁸

| Neighborhood | % of Partial Home Listings | | | | | |
|---------------|----------------------------|------|------|------|------|------|
| | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 |
| Allston | 53 | 55 | 11 | 72 | 67 | 71 |
| Dorchester | 78 | 81 | 61 | 81 | 84 | 86 |
| Hyde Park | 51 | 59 | 37 | 81 | 86 | 81 |
| Jamaica Plain | 54 | 57 | -8 | 59 | 62 | 67 |
| Mattapan | 75 | 80 | 60 | 88 | 91 | 92 |
| Roslindale | 64 | 64 | 45 | 69 | 80 | 75 |
| Roxbury | 64 | 70 | 44 | 70 | 76 | 67 |
| West Roxbury | 60 | 49 | 38 | 58 | 78 | 78 |

¹⁰⁷ See Appendix J for map of Boston's neighborhoods.

¹⁰⁸ "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

Conclusion

Boston, following San Francisco's example, enforced a registry with the help of Airbnb in 2019. Their goal was to promote affordable housing by reducing the number of illegal listings in the city, with enforcing a registry the key aspect of their policy. While the city is only a year into the registry, based on San Francisco's struggles, it is difficult to say whether the ordinance has permanently limited the platform. The listing data suggests that the decrease in listings was not permanent, as already some areas around the city core are seeing an increase in listings again. This suggests that the initial decrease was largely due to the lengthy licensing process, rather than hosts pulling their listing off the platform permanently.

Furthermore, like in San Francisco, in the absence of any price restrictions, Airbnb remained a more profitable option than long-term renting in many neighborhoods. Even in Back Bay, the most expensive central neighborhood examined, the average nightly rate was over \$200. A host would have to list their property for just 15 days to earn over the average monthly rent of \$2,900.¹⁰⁹ The highest prices in Boston seemed to be concentrated in the downtown core of the city, particularly in Chinatown and the Leather District. In the future, Boston could consider trying to enforce a price cap within these highly desirable areas to disincentivize owners from listing units on the short-term rental market.

¹⁰⁹ Eileen McEleney Woods, "A running list of the median cost to rent a one-bedroom apartment in every Boston neighborhood," *Real Estate Boston*, February 19, 2019, <http://realestate.boston.com/renting/2019/02/19/median-one-bedroom-rent-price/>.

Part III: Guide for Other Cities

Summary

This report set forth examples of what other cities have done to regulate short-term rentals, according to the city's main objectives. The report focuses on two major American markets—San Francisco and Boston—that imposed regulations on Airbnb to protect and preserve affordable housing. Given the scarcity of affordable housing stock in these cities, the possibility that landlords were converting their long-term apartments into Airbnbs and constricting the housing supply further was cause for regulations.

The main issue identified by these city governments was the presence of investor listings. Investor listings are problematic as they are likely directly converted from the long-term rental market, and directly contributing to housing shortages and raising rents in cities. This conversion was largely responsible for the “touristification” seen across cities with a large, established, short-term rental market.¹¹⁰ Investor units are largely indicated by a combination of the following three characteristics: listings that are the entire unit, hosts with multiple listings, and highly available listings (listings available for longer than three months). As many cities restrict the type of residence or the length of time that a property can be rented as a short-term rental, many investor units are inherently illegal. This presents another issue; that Airbnb's rapid expansion (and its digital nature) has historically made it difficult for cities to reign in investor listings.

¹¹⁰ See page 9.

Recommendations

- ***Create a city-wide registry***

Considering these issues, the first regulatory action a municipal government should take is to establish a registry to track Airbnb listings. A city-wide registry forces Airbnb hosts to apply for a registration ID connected to the property address they hope to list. City governments are then able to deny applications that violate their short-term rental ordinance. Without Airbnb's help removing illegal listings and providing the city with monthly lists of rentals, enforcing the registry is difficult and illegal listings persist (as seen by the first spike in listings in San Francisco). Even with the platform's help (which both San Francisco and Boston achieved after legally settling with Airbnb), processing registration applications can be a time-consuming. Both Boston and San Francisco saw listings rapidly increase a year into their registries, as the city governments worked their way through high volumes of applications. Thus, registries are more of a way to keep track of the listings and hold hosts in violation accountable, than a tool for discouraging short-term rentals.

- ***Create policies aimed at limiting investor units***

Beyond enforcing a general registry, the terms of a city's short-term rental ordinance should be tailored to a city's needs and goals. However, cities should make a conscious effort to limit investor units in a city. Within an ordinance, strategies for limiting investor units include the following: prohibiting listing non-primary residences, prohibiting hosts from listing multiple units, and limiting the

total number of days residences can be listed. City officials should use the registry to make sure no host is in violation of these terms. Furthermore, a city should also examine its spatial distribution of listings. As seen in San Francisco, Boston, and European cities (Figure 1), the city core tends to be populated with the highest shares of entire home listings and the most expensive listings. This suggests that Airbnb listings that correspond to investor units cluster around amenity-rich, favorable locations. Given this, cities with the goal of preserving affordable housing might consider different locational bans, such as restricting the downtown core of cities to only allow partial home listings.

- ***Disincentivize Short-term rentals by limiting potential profits***

As demonstrated with San Francisco and Boston, the restrictions enforced did little to disincentivize short-term rentals. For example, even with halving the number of days a host could list their property, Airbnb rentals still proved to be more profitable in less time than a long-term rental. Cities can include a lodging tax on host returns to try and close this rent gap between long-term and short-term earning potential. On this vein, another policy recommendation is to make the fines for breaking the ordinance high enough to dissuade illegal activity. The best (and maybe only) example of this is Berlin, who instituted fines of \$123,000 for those caught illegally listing short-term rentals.¹¹¹ However, this strategy only works in places with the capacity to enforce legislature or those who limit Airbnb early on. In cities with a mounting number of illegal Airbnb listings, the local government will likely not have the capacity to handle each individual case. Additionally, to close the rental gap

¹¹¹ Feergus O'Sullivan, "Berlin Just Canceled Its Airbnb Ban," *Citylab*, March 23, 2018, <https://www.citylab.com/life/2018/03/berlin-airbnb-vacation-rental-regulation-law/556397/>.

between the short term and long-term rental incomes, cities could try to enforce a price ceiling on rental units by area, though no city has attempted this yet.

- ***Be creative in regulations!***

Cities looking to limit the platform as much as possible, such as Las Vegas, can also find creative ways to regulate through zoning ordinances, such as creating a minimum distance between Airbnb units to limit the volume of new listings.

- ***Re-evaluate the platform according to the city's goals***

While both San Francisco's and Boston's regulations were created in order to protect affordable housing, there is little evidence to suggest that limiting listings promoted affordability. Regulations and registration fees might curtail the growth of new listings, but the data does not suggest that listings removed from the site are later converted into long-term rentals. Given this, cities may consider working with Airbnb to use the platform as a vehicle to provide affordable housing in the city (perhaps with a tenant voucher system). City officials might also see more success in incentivizing short-term hosts to convert their listings into long-term rentals, perhaps through tax incentives or other policies used to encourage affordable housing development.

Implications

Regulating Airbnb has implications for both the city government, the city's permanent residents, and Airbnb hosts. Enforcing regulations can be expensive for the city, requiring a lot of time and workers. Both San Francisco and Boston faced lawsuits from Airbnb that ultimately settled outside of court, but delayed regulations for months.

However, in cities with tight rental markets, there are documented stories of tenants evicted to convert a long-term unit into an Airbnb. Thus, regulating Airbnb is an issue of housing justice.

However, if a major city completely bans Airbnb, they are likely to face backlash from the platform and citizens. Berlin, which thoroughly restricted the platform from 2016-2018, eventually eased regulations and has seen an uptick in listings. Additionally, as demonstrated by San Francisco and Boston, there are partial room hosts (largely on the outskirts of the city) who benefit from the supplemental income. However, neighborhoods outside of the city center have lower median rents and usually hold most of the naturally affordable housing in the city. Thus, these hosts who may have rented to a long-term lower income tenant, may also be depleting the affordable housing supply by renting on Airbnb. Thus, the challenge remains for a city to find the balance between stimulating local economic development (by allowing hosts to benefit from an additional income stream) without infringing on housing affordability for the city's permanent residents.

Beyond the effect on housing affordability, the idea of touristification also has implications for the culture of a city. Given the spatial distribution of Airbnb, concentrated in popular and amenity-rich areas of the city, many people fear that the platform is gutting the city, stripping away the character of a city by solely catering towards visitors.

Finally, the need for adaptive policies is ever-present. The profitability of Airbnb has led others in the private sector to pursue short-term rentals. One example of this is the "pop-up" hotel industry, with actors such as WhyHotel, which "works with developers during the lease-up period, when often a significant portion of units lay fallow,"

“transforming these units into “furnished, amenitized hotel units.”¹¹² As more actors get involved in this market, short-term rentals might take many different forms. Cities must be aware of these new developments to avoid the similar struggles that the explosion of Airbnb caused in cities.

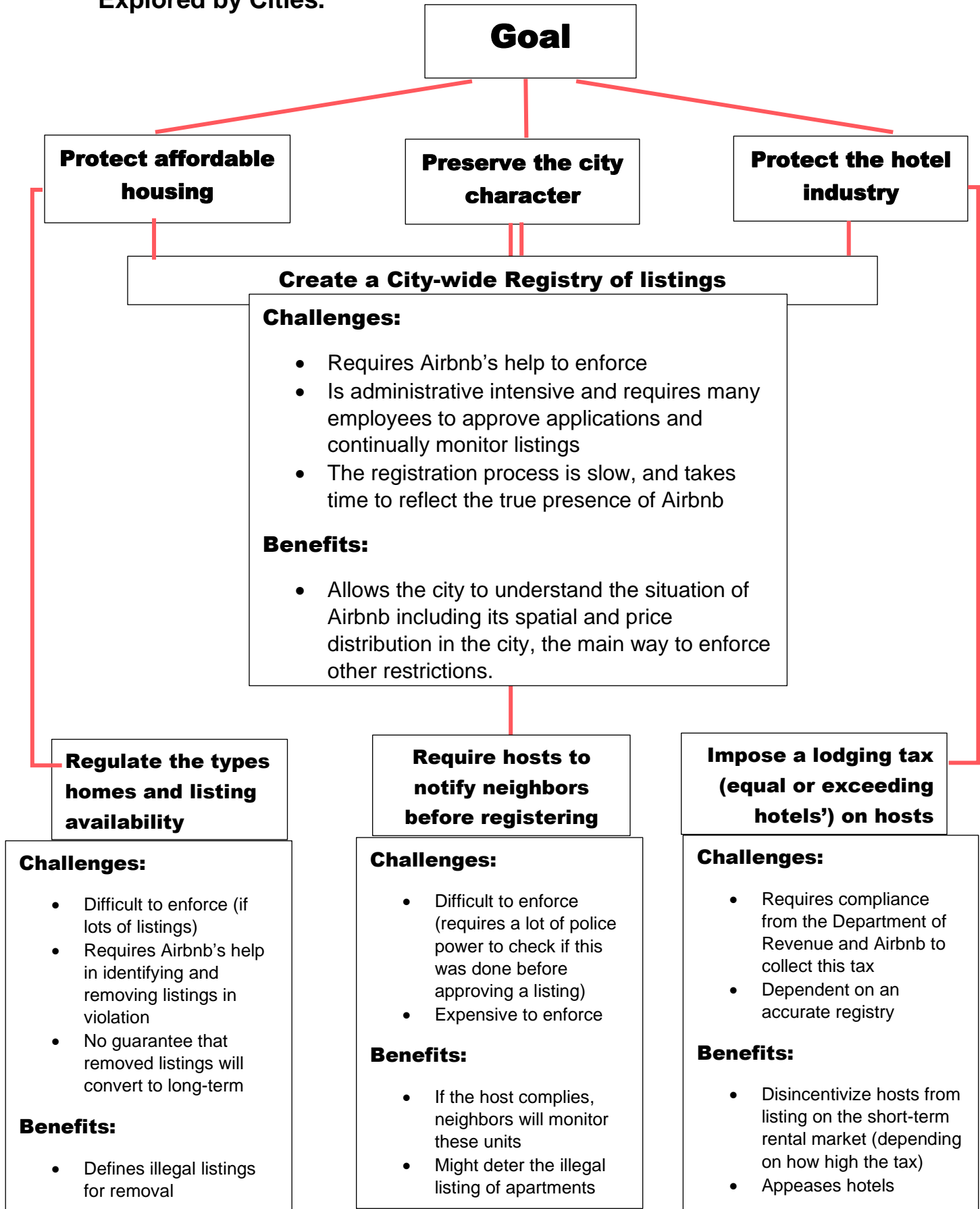
Conclusion

There is an increasing need for city governments to acknowledge Airbnb’s persistence in the city, and to be observant and open to constantly evaluating short-term rental policies.¹¹³ For example, if the goal is preserving long-term housing, governments need to consistently examine their short-term rental registries and remove illegal and inactive listings. These records would ideally be tracked to see whether listings removed from Airbnb are re-leased to long-term renters in the future, or if these landlords chose to stay vacant. Lastly, while there are increasingly strict regulations limiting short-term rentals in cities, these are not the sole panacea for the global housing affordability crisis. While cities should take care in regulating Airbnb, regulating Airbnb is just one piece in the puzzle of creating an affordable city. These regulations should only supplement the other affordable housing measures (such as income restricted apartments), to truly close the widening rental gaps.

¹¹² Aly J. Yale, “10 Years After Airbnb, Real Estate Developers See the Money in Home-sharing,” *Forbes*, October 17, 2018, <https://www.forbes.com/sites/alyjyale/2018/10/17/multi-family-developers-are-leveraging-the-short-term-rental-fad-heres-how/#1fd8e5ef38e0>.

¹¹³ See Figure 15 for a flowchart of the policy options discussed

Figure 15. A Brief Summary and Evaluation of Different Policy Options Explored by Cities.



Endnote

This paper explores just one branch of a larger urban issue—how technology functions in a city. While the focus of this paper is Airbnb, the broader issue of whether to regulate technology, and moreover, how to regulate these innovations are essential questions that cities must grapple with.

This paper was completed during the COVID-19 pandemic, which disrupted the way of life for citizens across the globe. The tourism sector was hit the hardest of all economic sectors, according to the United Nation's World Tourism Organization.¹¹⁴ Airbnb was not immune, with the platform seeing an unprecedented volume of cancellations. Airbnb's most prominent markets have been the most affected, with the company predicting a 54 percent decrease in revenue for the year from 2019.¹¹⁵

Despite the plummeting demand, Airbnb has reported just a 3.5 percent drop in supply. This might reflect a combination of the following factors: converting short-term rentals into long-term leases is costly and time consuming, many of Airbnb's markets do not demand from long-term tenants, many Airbnb hosts are not reliant on extra income from Airbnb, and many places retaining later bookings (for fall of 2020 to 2021).¹¹⁶ Outside of COVID-19, these considerations are important for cities to consider, as they suggest that just regulating the platform will not lead to an increase in the long-term rental supply.

¹¹⁴ "COVID-19: Putting People first," *United Nations World Tourism Organization*, April 14, 2020, <https://www.unwto.org/tourism-covid-19>.

¹¹⁵ Dillon Dubois, "How Mid-Term Stays May Rescue Short-Term Rentals," *AirDNA*, April 16, 2020, https://www.airdna.co/blog/how-mid-term-stays-may-rescue-short-term-rentals?utm_source=drip&utm_medium=email&utm_campaign=How+Mid-Term+Stays+are+Saving+Short-Term+Rentals&utm_content=0.

¹¹⁶ *Ibid.*

Even during the pandemic Airbnb rentals are continuing to be booked, but the demand has shifted from short-term renters to “mid-term” renters.¹¹⁷ According to AirDNA analysts, a majority of guests have booking longer stays since mid-February, with the average trip stay increasing from three nights to seven. Additionally, the demand for longer stays “tripled in recent weeks,” with over half of the trips booked in April being for longer than 14 days.¹¹⁸ Airbnb’s seeming resiliency is troublesome for the cities that had hoped to restrict it. The platform can seamlessly adapt to changing conditions, and it provides convenience and flexibility that guests and hosts both are loyal to.

It is hard to predict how cities will be molded by this pandemic, and exactly what the new normal will look like after the threat of COVID-19 passes. However, the resiliency of Airbnb suggests that governments might find more success working with the platform to achieve their affordable housing goals, instead of strictly banning it. Now, more than ever, is there a need for collaboration across the governments, nonprofits, and private sector institutions.

¹¹⁷ Ibid.

¹¹⁸ Ibid.

Bibliography

- "About." *Inside Airbnb*. Accessed March 5, 2020. <http://insideairbnb.com/>.
- "Accessory Dwelling Units." *American Planning Association*. Accessed February 28, 2020. <https://www.planning.org/knowledgebase/accessorydwellings/>.
- Acitelli, Tom. "The Boston rental market heading into 2020 looks nothing like the sales market." *Curbed Boston*, January 7, 2020.
<https://boston.curbed.com/2020/1/7/21054609/boston-rental-market-2020-forecast>.
- Acitelli, Tom. "7 Boston-area neighborhood everyone should be watching." *Curbed Boston*, January 7, 2020. <https://boston.curbed.com/boston-development/2020/1/7/21051943/boston-neighborhoods-to-watch>.
- "Airbnb & the Communications Decency Act Section 230." *U.S. House of Representatives Document Repository*. Accessed March 1, 2020.
<https://docs.house.gov/meetings/IF/IF16/20191016/110075/HHRG-116-IF16-20191016-SD009.pdf>.
- "Airbnb Economic Impact." *Airbnb*. Accessed March 7, 2020.
https://blog.atairbnb.com/economic-impact-airbnb/?_ga=2.251665164.445259306.1584535926-1802718855.1570011473#san-francisco.
- "Airbnb's Positive Impact in Boston." *Airbnb*. Accessed March 2, 2020.
https://blog.atairbnb.com/airbnbs-positive-impact-boston/?_ga=2.251665164.445259306.1584535926-1802718855.1570011473.

Biber, Eric, Sarah E. Light, J.B. Ruhl, and James Salzman. "Regulating Business Innovation as Policy Disruption: From the Model T to Airbnb." *70 Vanderbilt Law Review* 1561 (2019). <https://scholarship.law.vanderbilt.edu/vlr/vol70/iss5/4>.

Bivens, Josh. "The economic costs and benefits of Airbnb." *Economic Policy Institute*, January 30, 2019. <https://www.epi.org/publication/the-economic-costs-and-benefits-of-airbnb-no-reason-for-local-policymakers-to-let-airbnb-bypass-tax-or-regulatory-obligations/>.

Blake, Matthew. "While you were sleeping: LA bans 'granny flats' as Airbnbs." *The Real Deal Los Angeles*, October 29, 2019. <https://therealdeal.com/la/2019/10/29/while-you-were-sleeping-la-bans-granny-flats-as-airbnbs/>.

Bloomberg. "Airbnb loses major fight over Santa Monica's rental law." *Los Angeles Times*, March 13, 2019. <https://www.latimes.com/business/la-fi-airbnb-santa-monica-short-term-rental-20190313-story.html>.

Boone, Alastair. "Airbnb is Coming for Your Neighborhood." *Pacific Standard*, March 12, 2018. <https://psmag.com/economics/airbnb-is-coming-for-your-neighborhood>.

"Boston." *Inside Airbnb*. Accessed March 24, 2020. <http://insideairbnb.com/boston/?neighbourhood=&filterEntireHomes=false&filterHighlyAvailable=false&filterRecentReviews=false&filterMultiListings=false>.

Brinklow, Adam. "Map shows which SF neighborhoods gentrifying fastest." *Curbed San Francisco*, November 17, 2017. <https://sf.curbed.com/2017/11/17/16670116/uc-berkeley-urban-displacement-map-gentrification-oakland>.

Brinklow, Adam. "San Francisco market rents soar up to 105 percent above average."

Curbed San Francisco, October 2, 2019.

<https://sf.curbed.com/2019/10/2/20895578/san-francisco-median-rents-market-census-september-2019>.

"Boston." *BRA Office of Digital Cartography & GIS*, May 1, 2011.

<http://www.bostonplans.org/getattachment/62de9f36-5617-482c-bfe5-b2c6f827447d/>.

Buell, Spencer. "Boston's City Council Just Passed an Overhaul of Airbnb." *Boston*,

June 13, 2018. <https://www.bostonmagazine.com/news/2018/06/13/airbnb-boston-city-council/>.

Bulajewski, Mike. "The Sharing Economy Was Dead on Arrival." *JSTOR Daily*,

December 12, 2018. <https://daily.jstor.org/the-sharing-economy-was-dead-on-arrival/>.

Carson, Biz. "The fight between Airbnb and San Francisco." *Business Insider*, May 15,

2015. <https://www.businessinsider.com/san-francisco-report-blames-airbnb-for-housing-shortage-airbnb-strikes-back-2015-5>.

Carville, Olivia, Andre Tartar, and Jeremy C.F. Lin. "Airbnb to America's Big Cities: See You in Court." *Bloomberg*, February 14, 2020.

<https://www.bloomberg.com/graphics/2020-airbnb-ipo-challenges/>. Cocola-Gant, Augustin and Ana Gago. "Airbnb, Buy-to-Let Investment and Tourism-Driven Displacement: A Case Study in Lisbon." *Environment and Planning A: Economy and Space* (August 2019):2. doi:10.1177/0308518X19869012.

Cramer, Judd, and Alan B. Kruger. "Disruptive Change in the Taxi Business: The Case of Uber." *NBER Working Paper No.22083* (March 2016).

<https://www.nber.org/papers/w22083.pdf>.

"COVID-19: Putting People first," *United Nations World Tourism Organization*, April 14, 2020, <https://www.unwto.org/tourism-covid-19>.

Crommelin, Laura, Laurence Troy, Chris Martin, and Chris Pettit. "Is Airbnb a Sharing Economy Superstar? Evidence from Five Global Cities." *Urban Policy and Research* 36:4 (2018): 429-444. DOI: 10.1080/08111146.2018.1460722.

Dogru, Tarik, Makarand Mody, and Courtney Sues. "Comparing apples and oranges? Examining the impact of Airbnb on hotel performance in Boston." *Boston Hospitality Review* 5 (2017)

https://www.researchgate.net/publication/317598078_Comparing_apples_and_oranges_Examining_the_impact_of_Airbnb_on_hotel_performance_in_Boston.

Dogru, Tarik, and Osman Pekin. "What do guests value most in Airbnb accommodations? An application of the hedonic pricing approach." *Boston Hospitality Review* 5 (2017).

https://vtechworks.lib.vt.edu/bitstream/handle/10919/79602/What-do-guests-value-most-in-Airbnb-accommodations_An-application-of-the-hedonic-pricing-approach_Dogru-Pekin.pdf?sequence=1

Dubois, Dillon. "How Mid-Term Stays May Rescue Short-Term Rentals." *AirDNA*, April 16, 2020. <https://www.airdna.co/blog/how-mid-term-stays-may-rescue-short-term-rentals>

term-rentals?utm_source=drip&utm_medium=email&utm_campaign=How+Mid-Term+Stays+are+Saving+Short-Term+Rentals&utm_content=0.

Eckhardt, Giana M., and Fleura Bardhi. "The Sharing Economy Isn't About Sharing at All." *Harvard Business Review*, January 28, 2015. <https://hbr.org/2015/01/the-sharing-economy-isnt-about-sharing-at-all>.

"Economic Impacts in Boston." *Airbnb*. Accessed March 4, 2020. <https://blog.atairbnb.com/economic-impacts-boston/>.

Enwemeka, Zeninor. "90 Days in, Only a Portion of Boston's Short-Term Rentals Have Been Registered as Required." *WBUR*, April 10, 2019. <https://www.wbur.org/bostonmix/2019/04/10/boston-airbnb-registry-ordinance>

"Fast Facts." *Airbnb*. Accessed January 20, 2020. <https://news.airbnb.com/fast-facts/>.

Garcia-López, Miquel-Àngel and Jofre-Monseny, Jordi and Martínez Mazza, Rodrigo and Segú, Mariona. "Do short-term rent platforms affect housing markets? Evidence from Airbnb in Barcelona." MPRA Paper No. 96131, (2019). <https://mpra.ub.uni-muenchen.de/96131/>.

"Get the Data." *Inside Airbnb*. Accessed January 20, 2020. <http://insideairbnb.com/get-the-data.html/>

Gmelich, Krista. "Airbnb Says It Made a Profit Again in 2018." *Bloomberg*, January 15, 2019. <https://www.bloomberg.com/news/articles/2019-01-15/airbnb-says-it-made-a-profit-again-in-2018-as-ipo-looms-large>.

Goetz, Lisa. "The 10 Most Expensive Cities in the U.S." *Investopedia*, July 5, 2019.

<https://www.investopedia.com/articles/personal-finance/080916/top-10-most-expensive-cities-us.asp>.

Haviland, Victoria. "Lisbon has highest ration of Airbnb locations in Europe." *Online*

Marketplaces, June 4, 2019. <https://www.onlinemarketplaces.com/articles/26168-Lisbon-has-highest-ratio-of-Airbnb-locations-in-Europe>.

Haynes, Crystal. "City council cracking down on short-term rental compliance in Boston." *Boston 25 News*, November 14, 2019.

<https://www.boston25news.com/news/city-council-cracking-down-on-short-term-rental-compliance-in-boston/1008696178>.

Hill, Steven. "Evictions and Conversions: The Dark Side of Airbnb." *The American*

Prospect, October 19, 2015. <https://prospect.org/economy/evictions-conversions-dark-side-airbnb/>.

Horn, Keren, and Mark Merante. "Is home sharing driving up rents? Evidence from

Airbnb in Boston." *Journal of Housing Economics* Volume 38 (December 2017).
<https://www.sciencedirect.com/science/article/pii/S1051137717300876>.

"Hosts with Multiple Units—A Key Driver of Airbnb Growth: A Comprehensive National

Review Including a Spotlight on 13 U.S. Markets." *CBRE* (March 2017).
https://www.ahla.com/sites/default/files/CBRE_AirbnbStudy_2017.pdf.

Jefferson-Jones, Jamila. "Airbnb and the Housing Segment of the Modern 'Sharing Economy': Are Short-Term Rental Restrictions an Unconstitutional Taking?"

Hastings Constitutional Law Quarterly, Vol. 42 (2015):561.
<https://ssrn.com/abstract=2624700>.

Kakar, Venoo, Joel Voelz, Julia Wu, and Julisa Franco. "The Visible Host: Does Race guide Airbnb Rates in San Francisco?" *Journal of Housing Economics* volume 40 (2018): 25-40. <https://doi.org/10.1016/j.jhe.2017.08.001>.

Kerr, Dara. "Airbnb purges thousands of San Francisco listings overnight." *CNET*, January 18, 2018. <https://www.cnet.com/news/airbnb-purges-thousands-of-its-san-francisco-listings-overnight/>.

Kharpal, Arjun. "Airbnb's growth is slowing because it's being hit by regulation, UBS says." *CNBC*, April 23, 2017. <https://au.finance.yahoo.com/news/airbnb-apos-growth-slowing-because-105317952.html>.

Lane, Jamie. "The Sharing Economy Checks In: An Analysis of Airbnb in the United States." *CBRE* (January 2016). <http://rss.hsyndicate.com/file/152006083.pdf>.

Littman, Julie. "Airbnb Settles Lawsuit in San Francisco." *Bisnow*, May 2, 2017. <https://www.bisnow.com/san-francisco/news/hotel/airbnb-settles-lawsuit-in-san-francisco-73935>.

Nieuwland, Shirley, and Rianne van Melik. "Regulating Airbnb: how cities deal with perceived negative externalities of short-term rentals." *Current Issues in Tourism* (August 2018): 817. DOI: [10.1080/13683500.2018.1504899](https://doi.org/10.1080/13683500.2018.1504899).

"Occupancy tax collection and remittance by Airbnb in Massachusetts." *Airbnb*. Accessed March 15, 2020. <https://www.airbnb.com/help/article/2587/occupancy-tax-collection-and-remittance-by-airbnb-in-massachusetts>.

O'Sullivan, Feargus. "Berlin Just Canceled Its Airbnb Ban." *Citylab*, March 23, 2018. <https://www.citylab.com/life/2018/03/berlin-airbnb-vacation-rental-regulation-law/556397/>.

Riley, Tonya. "The Technology 202: Airbnb now part of Congress's debate over Silicon Valley's legal shield." *The Washington Post*, October 14, 2019.

<https://www.washingtonpost.com/news/powerpost/paloma/the-technology-202/2019/10/14/the-technology-202-airbnb-now-part-of-congress-s-debate-over-silicon-valley-s-legal-shield/5da3b24f88e0fa3155a710c2/>.

Said, Carolyn. "Window into Airbnb's hidden impact on S.F." *San Francisco Chronicle*, June 2014. <https://www.sfchronicle.com/business/item/Window-into-Airbnb-s-hidden-impact-on-S-F-30110.php>.

"San Francisco." *Inside Airbnb*. Accessed March 1, 2020. <http://insideairbnb.com/san-francisco/?neighbourhood=&filterEntireHomes=false&filterHighlyAvailable=false&filterRecentReviews=false&filterMultiListings=false>.

Sheppard, Stephen and Andrew Udell. "Do Airbnb properties affect house prices?"

Williams College Department of Economics, October 30, 2016.

<https://web.williams.edu/Economics/wp/SheppardUdellAirbnbAffectHousePrices.pdf>.

"Social Impacts in Boston." *Airbnb*. Accessed March 1, 2020.

<https://blog.atairbnb.com/social-impacts-boston/>.

Spoke, Matthew. "History Repeats Itself for Gig Economy Workers—And Not In A Good Way." *Forbes*, January 21, 2020.

<https://www.forbes.com/sites/mattspoke/2020/01/21/history-repeats-itself-for-gig-economy-workersand-not-in-a-good-way/#552a0088591f>.

Visser, M. "San Francisco Neighborhood Map." *Paragon Real Estate Group*, February 27, 2017. <http://hometeamsf.com/market-resources/>.

Wachsmuth, David and Alexander Weisler. "Airbnb and the Rent Gap: Gentrification Through the Sharing Economy." *Environment and Planning A: Economy and Space* (2018). 10.1177/0308518X18778038.

Wachsmuth, David, Jennifer Combs, and Danielle Kerrigan. "The Impact of New Short-term Rental Regulations on New York City." *Urban Politics and Governance Research Group McGill University* (January 2019).
<http://www.sharebetter.org/wp-content/uploads/2019/01/Impact-of-New-STR-Regs-2019.pdf>.

Walters, Quincy. "Airbnb Sues Boston Over Short-Term Rental Rules." *WBUR*, November 13, 2018. <https://www.wbur.org/bostonomix/2018/11/13/airbnb-boston-lawsuit>.

Woods, Eileen McEleney. "A running list of the median cost to rent a one-bedroom apartment in every Boston neighborhood." *Real Estate Boston*, February 19, 2019. <http://realestate.boston.com/renting/2019/02/19/median-one-bedroom-rent-price/>.

Yale, Aly J. "10 Years After Airbnb, Real Estate Developers See the Money in Home-sharing." *Forbes*, October 17, 2018.
<https://www.forbes.com/sites/alyyale/2018/10/17/multi-family-developers-are-leveraging-the-short-term-rental-fad-heres-how/#1fd8e5ef38e0>.

Zara, Christopher. "The Most Important Law in Tech Has a Problem." *Wired*. January 3, 2017. <https://www.wired.com/2017/01/the-most-important-law-in-tech-has-a-problem/>.

Appendix A: Total Listings per Neighborhood in San Francisco¹¹⁹

| Neighborhood | Total Listings | | | | |
|-----------------------|----------------|------|------|------|------|
| | 2019 | 2018 | 2017 | 2016 | 2015 |
| All Neighborhoods | 7409 | 4775 | 8776 | 8097 | 5425 |
| Bayview | 169 | 114 | 126 | 128 | 67 |
| Bernal Heights | 388 | 320 | 459 | 410 | 286 |
| Castro/Upper Market | 422 | 293 | 477 | 513 | 355 |
| Chinatown | 115 | 57 | 161 | 94 | 57 |
| Crocker Amazon | 43 | 40 | 30 | 20 | 28 |
| Diamond Heights | 19 | 16 | 23 | 17 | 10 |
| Downtown/Civic Center | 616 | 311 | 564 | 313 | 197 |
| Excelsior | 163 | 111 | 152 | 98 | 64 |
| Financial District | 154 | 56 | 144 | 142 | 63 |
| Glen Park | 71 | 54 | 78 | 80 | 49 |
| Golden Gate Park | 4 | 5 | 15 | 25 | 24 |
| Haight Ashbury | 348 | 223 | 404 | 401 | 308 |
| Inner Richmond | 184 | 174 | 299 | 263 | 146 |
| Inner Sunset | 155 | 105 | 172 | 149 | 104 |
| Lakeshore | 55 | 36 | 51 | 70 | 44 |
| Marina | 182 | 115 | 306 | 314 | 242 |
| Mission | 692 | 523 | 1043 | 978 | 752 |
| Nob Hill | 225 | 103 | 298 | 310 | 232 |
| Noe Valley | 378 | 251 | 373 | 349 | 217 |
| North Beach | 158 | 99 | 175 | 181 | 120 |
| Ocean View | 95 | 86 | 121 | 89 | 56 |
| Outer Mission | 154 | 128 | 168 | 164 | 83 |
| Outer Richmond | 154 | 110 | 190 | 185 | 98 |
| Outer Sunset | 272 | 201 | 263 | 220 | 136 |
| Pacific Heights | 160 | 109 | 244 | 224 | 194 |
| Potrero Hill | 222 | 163 | 286 | 274 | 165 |
| Parkside | 128 | 88 | 125 | 174 | 57 |
| Presidio | 1 | 1 | 7 | 11 | 7 |
| Presidio Heights | 30 | 23 | 38 | 43 | 35 |
| Russian Hill | 180 | 103 | 226 | 236 | 164 |
| Seacliff | 24 | 18 | 26 | 18 | 11 |
| South of Market | 591 | 199 | 646 | 684 | 400 |
| Treasure Island/YBI | 0 | 0 | 26 | 12 | 8 |
| Twin Peaks | 64 | 48 | 98 | 82 | 58 |
| Visitacion Valley | 69 | 43 | 38 | 31 | 24 |
| West of Twin Peaks | 123 | 99 | 132 | 106 | 68 |
| Western Addition | 601 | 350 | 792 | 689 | 496 |

¹¹⁹ "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

Appendix B: Percentage Change in Total Listings per Neighborhood in San Francisco¹²⁰

| Percent Change in All Listings | | | | |
|--------------------------------|------|-------|------|------|
| | 2019 | 2018 | 2017 | 2016 |
| All Neighborhoods | 55% | -46% | 8% | 49% |
| Bayview | 48% | -10% | -2% | 91% |
| Bernal Heights | 21% | -30% | 12% | 43% |
| Castro/Upper Market | 44% | -39% | -7% | 45% |
| Chinatown | 102% | -65% | 71% | 65% |
| Crocker Amazon | 8% | 33% | 50% | -29% |
| Diamond Heights | 19% | -30% | 35% | 70% |
| Downtown/Civic Center | 98% | -45% | 80% | 59% |
| Excelsior | 47% | -27% | 55% | 53% |
| Financial District | 175% | -61% | 1% | 125% |
| Glen Park | 31% | -31% | -3% | 63% |
| Golden Gate Park | -20% | -67% | -40% | 4% |
| Haight Ashbury | 56% | -45% | 1% | 30% |
| Inner Richmond | 6% | -42% | 14% | 80% |
| Inner Sunset | 48% | -39% | 15% | 43% |
| Lakeshore | 53% | -29% | -27% | 59% |
| Marina | 58% | -62% | -3% | 30% |
| Mission | 32% | -50% | 7% | 30% |
| Nob Hill | 118% | -65% | -4% | 34% |
| Noe Valley | 51% | -33% | 7% | 61% |
| North Beach | 60% | -43% | -3% | 51% |
| Ocean View | 10% | -29% | 36% | 59% |
| Outer Mission | 20% | -24% | 2% | 98% |
| Outer Richmond | 40% | -42% | 3% | 89% |
| Outer Sunset | 35% | -24% | 20% | 62% |
| Pacific Heights | 47% | -55% | 9% | 15% |
| Potrero Hill | 36% | -43% | 4% | 66% |
| Parkside | 45% | -30% | -28% | 205% |
| Presidio | 0% | -86% | -36% | 57% |
| Presidio Heights | 30% | -39% | -12% | 23% |
| Russian Hill | 75% | -54% | -4% | 44% |
| Seacliff | 33% | -31% | 44% | 64% |
| South of Market | 197% | -69% | -6% | 71% |
| Treasure Island/YBI | 0% | -100% | 117% | 50% |
| Twin Peaks | 33% | -51% | 20% | 41% |
| Visitacion Valley | 60% | 13% | 23% | 29% |
| West of Twin Peaks | 24% | -25% | 25% | 56% |
| Western Addition | 72% | -56% | 15% | 39% |

¹²⁰ "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

Appendix C: “Entire Home” Listings per Neighborhood in San Francisco¹²¹

| Neighborhood | Entire Home Listings | | | | |
|-----------------------|----------------------|------|------|------|------|
| | 2019 | 2018 | 2017 | 2016 | 2015 |
| Bayview | 70 | 44 | 42 | 48 | 20 |
| Bernal Heights | 255 | 197 | 298 | 264 | 183 |
| Castro/Upper Market | 282 | 189 | 307 | 318 | 225 |
| Chinatown | 66 | 22 | 120 | 57 | 40 |
| Crocker Amazon | 15 | 10 | 13 | 9 | 9 |
| Diamond Heights | 11 | 7 | 10 | 8 | 6 |
| Downtown/Civic Center | 266 | 74 | 325 | 199 | 136 |
| Excelsior | 75 | 49 | 66 | 46 | 22 |
| Financial District | 97 | 16 | 72 | 85 | 35 |
| Glen Park | 50 | 39 | 59 | 56 | 35 |
| Golden Gate Park | 3 | 4 | 6 | 15 | 15 |
| Haight Ashbury | 218 | 117 | 223 | 234 | 176 |
| Inner Richmond | 125 | 102 | 180 | 152 | 80 |
| Inner Sunset | 100 | 64 | 108 | 93 | 70 |
| Lakeshore | 13 | 13 | 22 | 17 | 14 |
| Marina | 132 | 87 | 239 | 250 | 190 |
| Mission | 438 | 297 | 528 | 505 | 409 |
| Nob Hill | 144 | 62 | 185 | 193 | 152 |
| Noe Valley | 272 | 166 | 246 | 225 | 136 |
| North Beach | 98 | 56 | 107 | 111 | 89 |
| Ocean View | 44 | 46 | 54 | 29 | 24 |
| Outer Mission | 66 | 58 | 76 | 72 | 39 |
| Outer Richmond | 101 | 68 | 110 | 90 | 62 |
| Outer Sunset | 138 | 116 | 132 | 98 | 66 |
| Pacific Heights | 113 | 79 | 167 | 161 | 166 |
| Potrero Hill | 144 | 105 | 194 | 194 | 103 |
| Parkside | 69 | 48 | 64 | 57 | 29 |
| Presidio | 0 | 0 | 7 | 8 | 6 |
| Presidio Heights | 24 | 19 | 23 | 28 | 23 |
| Russian Hill | 138 | 79 | 146 | 165 | 114 |
| Seacliff | 14 | 9 | 17 | 13 | 8 |
| South of Market | 437 | 107 | 335 | 352 | 209 |
| Treasure Island/YBI | 0 | 0 | 9 | 2 | 2 |
| Twin Peaks | 41 | 27 | 63 | 55 | 38 |
| Visitacion Valley | 37 | 23 | 16 | 13 | 8 |
| West of Twin Peaks | 64 | 54 | 64 | 51 | 30 |
| Western Addition | 380 | 210 | 453 | 390 | 284 |

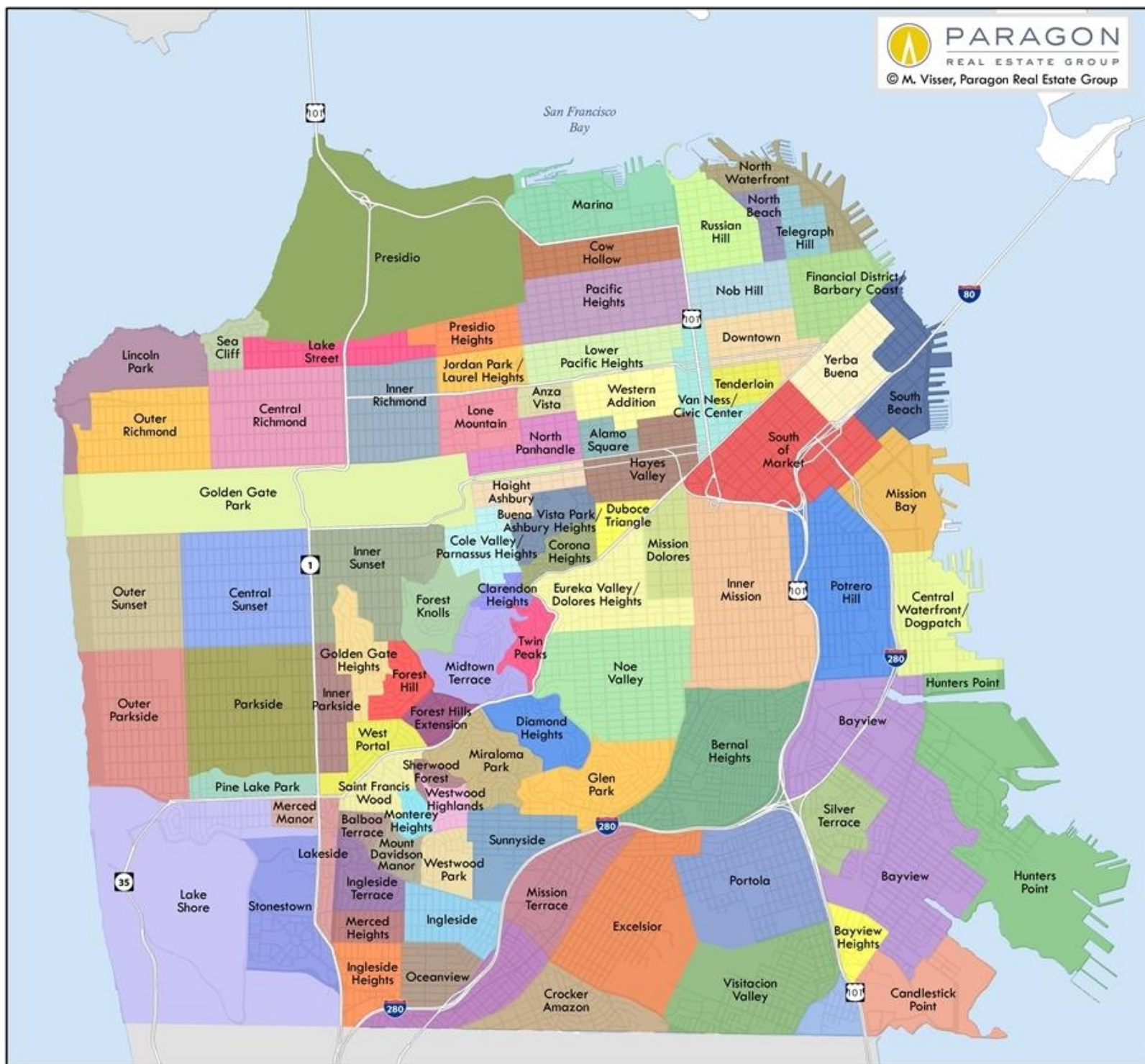
¹²¹"Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

Appendix D: Percentage Change in “Entire Home” Listings per Neighborhood in San Francisco¹²²

| Percent Change in Entire Home Listings | | | | |
|--|------|-------|------|------|
| | 2019 | 2018 | 2017 | 2016 |
| Bayview | 59% | 5% | -13% | 140% |
| Bernal Heights | 29% | -34% | 13% | 44% |
| Castro/Upper Market | 49% | -38% | -3% | 41% |
| Chinatown | 200% | -82% | 111% | 43% |
| Crocker Amazon | 50% | -23% | 44% | 0% |
| Diamond Heights | 57% | -30% | 25% | 33% |
| Downtown/Civic Center | 259% | -77% | 63% | 46% |
| Excelsior | 53% | -26% | 43% | 109% |
| Financial District | 506% | -78% | -15% | 143% |
| Glen Park | 28% | -34% | 5% | 60% |
| Golden Gate Park | -25% | -33% | -60% | 0% |
| Haight Ashbury | 86% | -48% | -5% | 33% |
| Inner Richmond | 23% | -43% | 18% | 90% |
| Inner Sunset | 56% | -41% | 16% | 33% |
| Lakeshore | 0% | -41% | 29% | 21% |
| Marina | 52% | -64% | -4% | 32% |
| Mission | 47% | -44% | 5% | 23% |
| Nob Hill | 132% | -66% | -4% | 27% |
| Noe Valley | 64% | -33% | 9% | 65% |
| North Beach | 75% | -48% | -4% | 25% |
| Ocean View | -4% | -15% | 86% | 21% |
| Outer Mission | 14% | -24% | 6% | 85% |
| Outer Richmond | 49% | -38% | 22% | 45% |
| Outer Sunset | 19% | -12% | 35% | 48% |
| Pacific Heights | 43% | -53% | 4% | -3% |
| Potrero Hill | 37% | -46% | 0% | 88% |
| Parkside | 44% | -25% | 12% | 97% |
| Presidio | 0% | -100% | -13% | 33% |
| Presidio Heights | 26% | -17% | -18% | 22% |
| Russian Hill | 75% | -46% | -12% | 45% |
| Seacliff | 56% | -47% | 31% | 63% |
| South of Market | 308% | -68% | -5% | 68% |
| Treasure Island/YBI | 0% | -100% | 350% | 0% |
| Twin Peaks | 52% | -57% | 15% | 45% |
| Visitacion Valley | 61% | 44% | 23% | 63% |
| West of Twin Peaks | 19% | -16% | 25% | 70% |
| Western Addition | 81% | -54% | 16% | 37% |

¹²² "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

Appendix E: Map of Neighborhood in San Francisco¹²³



¹²³ M. Visser, "San Francisco Neighborhood Map," *Paragon Real Estate Group*, February 27, 2017, <http://hometeamssf.com/market-resources/>.

Appendix F. Total Listings per Neighborhood in Boston¹²⁴

| Neighborhood | Total Listings | | | | | |
|------------------|----------------|------|------|------|------|------|
| | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 |
| Allston | 208 | 198 | 374 | 297 | 260 | 233 |
| Back Bay | 227 | 248 | 483 | 411 | 302 | 206 |
| Bay Village | 65 | 60 | 38 | 29 | 24 | 12 |
| Beacon Hill | 133 | 127 | 247 | 267 | 194 | 147 |
| Brighton | 194 | 170 | 382 | 288 | 185 | 152 |
| Charlestown | 86 | 73 | 164 | 150 | 111 | 130 |
| Chinatown | 87 | 49 | 132 | 122 | 71 | 22 |
| Dorchester | 440 | 371 | 549 | 400 | 269 | 166 |
| Downtown | 382 | 318 | 440 | 295 | 172 | 103 |
| East Boston | 182 | 175 | 301 | 259 | 150 | 104 |
| Fenway | 211 | 210 | 432 | 357 | 290 | 185 |
| Hyde Park | 41 | 35 | 62 | 44 | 31 | 21 |
| Jamaica Plain | 272 | 260 | 526 | 416 | 343 | 240 |
| Leather District | 3 | 3 | 8 | 10 | 5 | 6 |
| Longwood | 6 | 8 | 19 | 7 | 9 | 16 |
| Mattapan | 50 | 40 | 68 | 35 | 24 | 18 |
| Mission Hill | 150 | 135 | 217 | 134 | 124 | 71 |
| North End | 93 | 94 | 250 | 201 | 143 | 107 |
| Roslindale | 70 | 69 | 112 | 96 | 56 | 50 |
| Roxbury | 259 | 217 | 340 | 241 | 144 | 110 |
| South Boston | 254 | 251 | 426 | 329 | 257 | 151 |
| South End | 265 | 271 | 436 | 354 | 326 | 250 |
| West End | 84 | 79 | 146 | 62 | 49 | 43 |
| West Roxbury | 37 | 48 | 67 | 68 | 46 | 20 |

¹²⁴ "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

Appendix G. Percentage Change in Total Listings per Neighborhood in Boston¹²⁵

| Neighborhood | Total Listings % Change | | | |
|------------------|-------------------------|------|------|------|
| | 2019 | 2018 | 2017 | 2016 |
| Allston | -47% | 26% | 14% | 12% |
| Back Bay | -49% | 18% | 36% | 47% |
| Bay Village | 58% | 31% | 21% | 100% |
| Beacon Hill | -49% | -7% | 38% | 32% |
| Brighton | -55% | 33% | 56% | 22% |
| Charlestown | -55% | 9% | 35% | -15% |
| Chinatown | -63% | 8% | 72% | 223% |
| Dorchester | -32% | 37% | 49% | 62% |
| Downtown | -28% | 49% | 72% | 67% |
| East Boston | -42% | 16% | 73% | 44% |
| Fenway | -51% | 21% | 23% | 57% |
| Hyde Park | -44% | 41% | 42% | 48% |
| Jamaica Plain | -51% | 26% | 21% | 43% |
| Leather District | -63% | -20% | 100% | -17% |
| Longwood | -58% | 171% | -22% | -44% |
| Mattapan | -41% | 94% | 46% | 33% |
| Mission Hill | -38% | 62% | 8% | 75% |
| North End | -62% | 24% | 41% | 34% |
| Roslindale | -38% | 17% | 71% | 12% |
| Roxbury | -36% | 41% | 67% | 31% |
| South Boston | -41% | 29% | 28% | 70% |
| South End | -38% | 23% | 9% | 30% |
| West End | -46% | 135% | 27% | 14% |
| West Roxbury | -28% | -1% | 48% | 130% |

¹²⁵ "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

Appendix H. “Entire Home” Listings per Neighborhood in Boston¹²⁶

| Neighborhood | Entire Home Listings | | | | |
|------------------|----------------------|------|------|------|------|
| | 2019 | 2018 | 2017 | 2016 | 2015 |
| Allston | 94 | 176 | 103 | 98 | 76 |
| Back Bay | 214 | 427 | 367 | 263 | 170 |
| Bay Village | 31 | 32 | 23 | 20 | 7 |
| Beacon Hill | 116 | 216 | 227 | 155 | 112 |
| Brighton | 88 | 159 | 108 | 75 | 60 |
| Charlestown | 52 | 113 | 105 | 68 | 64 |
| Chinatown | 45 | 118 | 114 | 62 | 4 |
| Dorchester | 82 | 145 | 104 | 66 | 38 |
| Downtown | 281 | 400 | 260 | 144 | 84 |
| East Boston | 107 | 162 | 114 | 70 | 45 |
| Fenway | 193 | 354 | 274 | 208 | 140 |
| Hyde Park | 17 | 22 | 12 | 6 | 6 |
| Jamaica Plain | 118 | 281 | 215 | 157 | 113 |
| Leather District | 3 | 6 | 6 | 3 | 4 |
| Longwood | 6 | 9 | 5 | 4 | 9 |
| Mattapan | 10 | 16 | 8 | 3 | 2 |
| Mission Hill | 103 | 156 | 64 | 48 | 28 |
| North End | 83 | 231 | 183 | 119 | 79 |
| Roslindale | 25 | 38 | 35 | 19 | 14 |
| Roxbury | 78 | 121 | 102 | 58 | 48 |
| South Boston | 249 | 240 | 239 | 173 | 95 |
| South End | 213 | 362 | 279 | 250 | 190 |
| West End | 70 | 128 | 57 | 43 | 29 |
| West Roxbury | 19 | 30 | 28 | 15 | 10 |

¹²⁶ "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

Appendix I. Percentage Change in “Entire Home” Listings per Neighborhood in Boston¹²⁷

| Neighborhood | Entire Home Listings % Change | | | |
|------------------|-------------------------------|------|------|-------|
| | 2019 | 2018 | 2017 | 2016 |
| Allston | -47% | 71% | 5% | 29% |
| Back Bay | -50% | 16% | 40% | 55% |
| Bay Village | -3% | 39% | 15% | 186% |
| Beacon Hill | -46% | -5% | 46% | 38% |
| Brighton | -45% | 47% | 44% | 25% |
| Charlestown | -54% | 8% | 54% | 6% |
| Chinatown | -62% | 4% | 84% | 1450% |
| Dorchester | -43% | 39% | 58% | 74% |
| Downtown | -30% | 54% | 81% | 71% |
| East Boston | -34% | 42% | 63% | 56% |
| Fenway | -45% | 29% | 32% | 49% |
| Hyde Park | -23% | 83% | 100% | 0% |
| Jamaica Plain | -58% | 31% | 37% | 39% |
| Leather District | -50% | 0% | 100% | -25% |
| Longwood | -33% | 80% | 25% | -56% |
| Mattapan | -38% | 100% | 167% | 50% |
| Mission Hill | -34% | 144% | 33% | 71% |
| North End | -64% | 26% | 54% | 51% |
| Roslindale | -34% | 9% | 84% | 36% |
| Roxbury | -36% | 19% | 76% | 21% |
| South Boston | 4% | 0% | 38% | 82% |
| South End | -41% | 30% | 12% | 32% |
| West End | -45% | 125% | 33% | 48% |
| West Roxbury | -37% | 7% | 87% | 50% |

¹²⁷ "Get the Data," *Inside Airbnb*, accessed January 20, 2020, <http://insideairbnb.com/get-the-data.html>.

Appendix J. Map of Neighborhoods in Boston¹²⁸



¹²⁸ "Boston," *BRA Office of Digital Cartography & GIS*, May 1, 2011, <http://www.bostonplans.org/getattachment/62de9f36-5617-482c-bfe5-b2c6f827447d/>.