Selling the District Short

Short-term rentals: a new challenge to housing affordability in the District of Columbia

March 2017
D.C. Working Families
Map of Airbnb Listings

Legend

Listing by Type
- Entire home/apt
- Private room
- Shared room

Ward
- Ward 1
- Ward 2
- Ward 3
- Ward 4
- Ward 5
- Ward 6
- Ward 7
- Ward 8

Map of Airbnb Listings
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Executive Summary

This report examines the proliferation of short-term rentals (STRs) in the District of Columbia, with a focus on their impact on the residential housing market. In light of its findings, the report recommends additional measures that should be taken to better protect D.C. neighborhoods against the rapid growth of online platforms that facilitate investment in commercial short-term rentals.

The growth of the commercial STR market has serious negative implications for housing affordability and quality of life for D.C. residents. While the District grapples with a serious housing affordability crisis, the widespread conversion of residential units into short-term rentals makes it even harder for families to find affordable places to live. Commercial short-term rental operations may be pushing steeper rent increases across the District. Moreover, regulators have not exercised enforcement of health, safety, zoning, and rental housing laws on short-term rentals.

D.C. law already prohibits the conversion of rental housing for hotel use. Unfortunately, STR platforms have solicited thousands of illegal listings in a matter of a few years. The District government currently lacks the necessary enforcement tools to adequately address this new widespread systematic violation of its laws. Furthermore, the incentive to convert housing into illegal hotel rooms is extremely strong because of the high listing prices commanded by entire-home/apartment rentals on the STR market. Based on these findings, this report urges officials to adopt thorough and effective enforcement measures to ensure compliance with D.C. law.

The recent expansion of short-term rentals in Washington, D.C. is largely a product of online listing platforms such as Airbnb. While there are a number of short-term rental platforms operating in D.C. facilitating short-term rental transactions, including HomeAway, FlipKey, and VRBO, this report focuses its analysis on the largest and fastest-growing platform, Airbnb. As of October 2016, Airbnb had 5,295 listings in the District of Columbia, and grew by 37.8 percent in the previous year.
Topline Findings

This report defines **commercial listings** as listings by hosts with multiple listings in the District of Columbia, since it is impossible to live in more than one unit at a time. Such units are likely to represent housing that is removed from the market.

**Airbnb has approximately 5,295 listings in the District; approximately 37 percent (1,980 listings) are commercial listings.** This suggests that Airbnb removes a significant number of units from the housing market.

**Commercial listings represent an estimated 52% of total Airbnb revenue in the District.** The fact that commercial listings appear to constitute a majority of Airbnb’s D.C. revenue demonstrates that commercial use is a major function of the platform and a core component of its business. Airbnb includes some exceptionally expansive operations in the District, **including one operator who has 65 listings in D.C. alone.**

**Of the total number of Airbnb listings in the District, 3,567 or 67 percent of them are entire-home/apartment listings.** These listings represent situations where the operator is not present to host or supervise guests, and are illegal.1 Such listings command higher prices and create a strong incentive to remove housing from the market in order to profit from commercial STR operations.

Eighty-two percent of total revenue from Airbnb in the District was derived from illegal entire-home listings.

**In nineteen different neighborhoods within the District, commercial listings are equivalent to at least 10 percent of vacant housing stock.** This suggests that if commercial STR units were restored to the market, housing would become significantly more available in those neighborhoods. **In eight of these neighborhoods, commercial Airbnb units are equivalent to 15 percent of vacant rental housing units.**

STR platforms create a strong financial incentive for investors to convert residential housing to STR use. In the District’s top 20 neighborhoods for Airbnb use, the average monthly rent was $2,752, but the average illegal listing had the capacity to generate up to $5,711, for an estimated potential profit margin of 152 percent. Because STR platforms allow owners to quickly turn a profit through rental arbitrage, STRs may play a significant role in expediting gentrification in such neighborhoods.

**Airbnb is growing rapidly in the District.** From October 2015 to October 2016, Airbnb grew by 37.8 percent, and commercial listings grew by 34 percent.
The District of Columbia faces an increasingly critical shortage of affordable housing that threatens residents’ ability to live, work, and raise families in the District. According to a March 2015 report by the D.C. Fiscal Policy Institute, rents have soared over the past decade, while incomes have remained the same. The District lost nearly half its supply of low-cost units between 2002 and 2013, with the number of low-cost apartments (those renting for less than $800 a month) dropping from almost 60 thousand in 2002 to 33 thousand in 2013. The supply of moderately-priced apartments ($800 to $1,000 per month) has also dwindled by nearly 30 percent since 2002.²

Very low-income households have been the most severely affected by this trend; 64 percent of them spend half or more of their incomes on housing. For households with incomes around $22,000 per year, monthly rents increased by $250 in the past ten years (adjusting for inflation), while incomes remained flat, forcing them to spend an average of 50 percent of their income on rent. Even moderate-income families have felt the pinch, with incomes up to $54,000 experiencing similarly severe cost burdens.³

As the cost of housing eats up an increasing proportion of household budgets, a growing number of residents are at risk of being unable to afford necessities like food, clothing, healthcare, and transportation without leaving the District.⁴ The housing crisis in the District of Columbia can be attributed to numerous causes: a booming population, rising construction costs, increasing income inequality, the proliferation of low-wage work, limited land availability, and a waning public commitment to subsidizing affordable housing, especially at the federal level.⁵

In response to these trends, elected officials and community allies have fought to secure considerable public investment in increasing the availability of affordable housing and providing relief for working families. In both fiscal years 2016 and 2017 Mayor Muriel Bowser and the D.C. Council took a major step forward by committing $100 million annually to the Housing Production Trust fund.⁶

At the same time, worker justice advocates and allied elected officials have won major victories in improving the pay of D.C.’s working class residents, which will bring some of the District’s housing choices closer, and within reach for thousands of families.⁷
While these hard-won victories represent important steps toward addressing the District’s affordable housing crisis, new multinational corporations have developed business models that undermine this progress. Airbnb and similar online short-term rental platforms are facilitating the widespread conversion of housing units into illegal hotel rooms, in a bid to profit from the District’s already-scarce housing stock.

Airbnb commenced its D.C. operations in 2009. In the past year (October 2015 through October 2016) the number of total District listings on the platform has grown from 3,843 listings to 5,295—an increase of 37.8 percent. By comparison, over the latest one-year period for which data is available (2014-2015), housing inventory in the District grew at approximately 1.1 percent (±.02 percent), while the District’s population nearly twice as quickly at 2.0 percent.

This massive growth is occurring despite the fact that under current law, the conversion of rental housing into traveler accommodations is prohibited in the District of Columbia.

Furthermore, zoning regulations require that an individual can short-term rent only his or her permanent residence. Anyone seeking to start a business as a short-term rental host is required to obtain a Basic Business License, comply with the zoning code, and comply with the Rental Housing Act, which includes the District’s rent control policy. If these laws were adequately enforced, they would virtually eliminate illegal commercial listings on Airbnb and significantly curb the negative impacts of short-term rental activity in the District.

Lawmakers have long recognized the need to protect affordable housing and neighborhood quality through rental housing laws and the zoning code. These laws pre-date the rise of Airbnb and other platforms and were developed without internet hosting platforms in mind. For example, the zoning code prohibits bed and breakfasts as a home occupation in apartment buildings, likely because policymakers determined that residential apartment living is not compatible with high-traffic businesses with large numbers of guests entering the building with no security or safety precautions. The fact that such businesses are now facilitated by online hosting platforms does not change the real-world impacts that caused leaders to outlaw them in the first place.

What is new, however, is the mass solicitation and development of illegal listings by online hosting platforms. Platforms like Airbnb have made it easy and convenient for hosts to ignore and frustrate the purposes of the laws and regulations designed to preserve neighborhood quality of life and protect housing affordability.

This report sheds light on the proliferation of these illegal short-term rentals in the District and the extent to which their impact on the supply of long-term residential housing may drive up rents and exacerbate gentrification in many D.C. neighborhoods. These troubling findings make clear that while the District already has laws in place to prevent this form of rental arbitrage, significant improvements in enforcement must be made to stop illegal operators and ensure affordable housing units remain available for District residents.
Airbnb has worked hard to create an image of itself as primarily a platform to facilitate “home-sharing,” which means that hosts dwell in the same unit with guests. The idea is for travelers to build personal relationships with local residents for a more “authentic,” intimate experience visiting a city. However, that is not how most people use Airbnb; only about a third of Airbnb listings are actually used for home-sharing by local residents. Instead, studies have shown that Airbnb generates the majority of its revenue from real-estate investors and commercial operators who do not live on the property and instead rent out their units full time as a business venture.

Whenever a housing unit is used for a short-term rental instead of a home for a resident, it reduces the supply of housing. Reduced housing supply puts upward pressure on rental prices—potentially forcing some residents to leave their neighborhoods or even move out of the District entirely. STRs may contribute to higher rental prices across the District, because when housing becomes unavailable in one neighborhood, residents are pushed to seek housing in other neighborhoods, driving up rents across the board.

**Previous studies**

Several studies have demonstrated links between a high concentration of Airbnb listings—particularly the commercial entire-home/apartment variety—and a decline in the supply and increase in the price of residential rental housing.

A June 2016 report by Housing Conservation Coordinators Inc. and MFY Legal Services Inc. used 2015 AirDNA data to assess the interaction between the short-term and traditional rental market in New York City. The report found that having a high concentration of Airbnb “Impact Listings”—those most likely to result in the reduction in the supply of residential rental units—was strongly correlated with rapidly rising rental prices. According to their analysis, the average rent in the top twenty Airbnb neighborhoods in New York increased nearly twice as quickly as in the city as a whole. The report did not explore whether Airbnb was a cause of gentrification in those neighborhoods, but the strong correlation suggests that the problem of Impact Listings is particularly severe in gentrifying neighborhoods, and potentially exacerbates gentrification. Furthermore, the report determined that if the 8,058 units defined as Impact Listings were made available on the rental market, the number of available rental units citywide would increase by 10 percent.

Another study was conducted by The Real Deal, a monthly New York real estate news magazine, using Airbnb scrape data and empirical studies of the housing market in New York, which provided STRs may pose a substantial threat to the availability and affordability of housing in the District by displacing long-term owners and renters and depleting D.C.’s limited housing resources—in turn driving up rents.
estimates of how much rent would increase or decrease based on changes in the size of citywide housing inventory. Their analysis found that Airbnb is likely responsible for increasing rents as much as $69 per month in certain neighborhoods. This analysis may be partially flawed in that it did not account for the fact that the empirical models they used are citywide. If a family is pushed out of a neighborhood, or prevented from living in a neighborhood, they will very likely move to another neighborhood in the city. When that happens, the impact on their original neighborhood is reduced, but rents may increase in whichever neighborhood they live in next. In that way, the gentrifying effects of short-term rentals may spread across the city even to neighborhoods where STRs are not endemic.

Yet another report, published by Dayne Lee as a note in the Harvard Law and Policy Review using a roughly similar methodology to this report, found that STRs have contributed to gentrification and housing unaffordability in Los Angeles. Even a study commissioned by Airbnb itself found that their listings resulted in increased rental prices. Performed by Thomas Davidoff of the Sauder School of Business, University of British Columbia, the study found that Airbnb increased the price of all one-bedroom units in New York by an average of $6 a month, and increased rents in San Francisco by an average of $19 a month. However, the data provided by Airbnb on which Mr. Davidoff’s findings were based claimed that 80 percent to 90 percent of listings were by residents sharing the home in which they live. This appears to contradict observations of Airbnb behavior in Washington, D.C. and thus is likely to significantly underestimate the impact of Airbnb on average rent increases. Airbnb has not released the full research or the data, or explained the methodology of the report.

All four of the above studies excluded the effect of other STR platforms including VRBO and Flipkey, which have a major presence in the District, and consequently are likely to underestimate the actual impact of STRs on the D.C. housing market. Even with this limitation, the studies outlined above suggest that STRs can exert significant upward pressure on rents which contributes to housing unaffordability and gentrification.
Airbnb Impact on Quality of Life

In addition to STR’s potential impact on rental prices and housing availability, STRs have drawn complaints that they detract from long-term residents’ quality of life and sense of security in their neighborhoods.

Residential tenants and homeowners traditionally expect their neighbors to be other long-term residents, approved by a landlord or seller, and accountable to a lease or otherwise invested in the neighborhood, with a stake in maintaining decent relations with their neighbors and landlords. Short-term renters, on the other hand, are not accountable to anyone but the STR host, who in many cases is not present in the building to be responsible for their guests. This can often mean there is no recourse for neighboring tenants when things go wrong.

There have been complaints in the District about housing being used as party venues in residential neighborhoods. In one prominent example, the Attorney General shut down an Airbnb party house operating in Dupont Circle, which was operating illegally. Police had been dispatched to the house more than one hundred times in the previous year because of complaints from neighbors.

Despite the lawsuit, the house was still operating through Airbnb without an appropriate license, as of the writing of this report.

D.C.’s Zoning Code is designed to provide places for tourist accommodations while also protecting residential neighborhoods. Unfortunately, online hosting platforms have enabled thousands of users to simultaneously and anonymously violate these laws.

Purpose and Scope of Work

The goal of this report is to ascertain the extent to which the negative impacts of STRs studied in cities like New York and San Francisco are affecting the D.C. housing market. By examining the number and type of Airbnb listings in the District, along with rental price and occupancy trends, this report seeks to identify the neighborhoods that are most impacted by STRs and highlight the consequences of these illegal listings.
FINDINGS: AIRBNB IN THE DISTRICT OF COLUMBIA

Airbnb prevents thousands of housing units from being used by D.C. residents

More than one-third (37 percent) of all Airbnb listings in the District are controlled by operators with multiple D.C. listings. Commercially-operated listings are likely to represent residential housing units that are no longer available to D.C. families because they have been converted into illegal hotel rooms. In total, there are an estimated 1,980 commercial listings in the District. This finding suggests that STR platforms significantly reduce the availability of housing in the District. Unfortunately, this number is only a snapshot from October 2016; as shown in Part III of this report, the number of commercial listings on Airbnb has been growing quickly and this growth shows no sign of abating any time soon. Without proper regulation, it is impossible to predict how many housing units could ultimately be removed from the rental market.

In October 2016, there were an estimated 1,980 commercial listings in the District of Columbia, or 37% of total listings

Figure 1: Listings by type and commercial estimate. Source: Share Better Scrape, October 2016
Illegal entire-home/apartment listings dominate Airbnb

While Airbnb portrays itself as mainly facilitating home-sharing, in which hosts share a spare couch or bedroom with a guest in the spirit of hospitality and meeting new people, home-sharing is a relatively minor function of the platform.

Sixty-seven percent of its listings (3,567) are entire apartment listings, and only 33 percent (1,728) are private or shared rooms. “Shared rooms” account for only 3 percent of listings in the District. This means the majority of Airbnb’s listings are illegal listings in which the operator is not present to host guests.

67% of all Airbnb listings in the District are entire-home/apartment rentals in which the operator is not present to host guests.

Figure 2: Number of listings per type. Source: Share Better Scrape, October 2016
Entire-home listings pose a variety of problems. Such listings by definition typically lack a responsible individual managing the listing in person, which gives rise to heightened concerns about quality of life impacts. There have been several reports of entire-home listings being used as party houses in the District. In apartment buildings, they can present serious quality of life and security concerns, as they allow unsupervised visitors access to apartment buildings, where they have no accountability to the unit’s neighbors.

More importantly, the prevalence of entire-home/apartment listings is a particular threat to the availability of housing in the District. Of course, commercial private room listings are also likely to deprive D.C. residents of an affordable room. But commercial entire-home/apartment listings completely remove lodgings designed for a household and convert them to short-term, commercial use.

As discussed below, the ability to post entire-room listings creates a strong temptation for investors to remove housing from the market in order to take advantage of the high prices short-term rentals can command.
Figure 3: Map of Commercial Airbnb Listings, October 2016. Sources: Airbnb Website- Share Better Scrape, October 2016; Ward boundaries - DC Office of the Chief Technology Officer; OSM TF Landscape – NextGIS December 2016.
By comparing average rent data produced by Zillow, an online real estate database, from October 2015 through October 2016, with average Airbnb listing prices for entire-home rentals, we can determine the likely profit margins for entire-home commercial hosts in Airbnb’s top neighborhoods. We consider entire-home rentals only here because they most directly relate to the incentive to remove entire units from the housing market, and because it is difficult to estimate the rental price for individual rooms.

Overhead for Airbnb units can be extremely low. Airbnb allows operators to charge an additional cleaning fee (not included in this analysis) for rentals which can cover more than just the cost of cleaning. The two cost factors we consider are the cost of renting the unit and the 3 percent host service fee Airbnb takes off the listing price.

As a baseline for revenue estimates, this analysis assumes 100 percent occupancy of Airbnb units for thirty nights a month. Although most units are unlikely to achieve this level of occupancy, we use this estimate in order to determine a point of reference for the potential profit for a unit.

Within the twenty neighborhoods with the highest ratios of commercial Airbnb listings to vacant housing units, the average neighborhood rent was $2,752, but the average Airbnb listing would yield $6,927 if rented full-time over thirty days—a $4,175 difference, or approximately a 152 percent return.

Even scaled down to match the occupancy rate at D.C. hotels, the profit potential is
considerable. At a 79.8 percent occupancy rate, operators could expect a 101 percent profit margin on average in the top 20 Airbnb neighborhoods. These estimates also make it clear that Airbnb units can be highly profitable even with much lower occupancy levels than hotel rooms. In sixteen neighborhoods, hosts could potentially earn more than double the average monthly rent and achieve more than a 100 percent profit margin. In Downtown D.C., operators could achieve a 207.7% profit margin.

Table 1 The incentive to rent short-term. The below chart lists top Airbnb neighborhoods by the number of units as a percent of the vacant housing units in the neighborhood (red), and shows the percent difference between residential rents and short-term rental rates, for a full-time STR (blue). Sources: ShareBetter Scrape, October 2016; Zillow Rental Index, ZRI Time Series, City and Neighborhood, 2011-2016.

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Commercial listings / vacant units</th>
<th>Avg. Rent 2015-2016</th>
<th>Airbnb Average Potential Revenue</th>
<th>Potential profit margin at 100% occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>U Street Corridor</td>
<td>68.5% ± 27.9%</td>
<td>$2,937</td>
<td>$7,519</td>
<td>156.1%</td>
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<tr>
<td>Judiciary Square</td>
<td>30.8% ± 6.8%</td>
<td>$2,831</td>
<td>$7,426</td>
<td>162.3%</td>
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<tr>
<td>Shaw</td>
<td>23.2% ± 6.2%</td>
<td>$2,993</td>
<td>$6,661</td>
<td>122.6%</td>
</tr>
<tr>
<td>Logan Circle</td>
<td>18.6% ± 6.8%</td>
<td>$2,825</td>
<td>$6,666</td>
<td>135.9%</td>
</tr>
<tr>
<td>Eckington</td>
<td>18.3% ± 3.6%</td>
<td>$2,628</td>
<td>$4,625</td>
<td>76.0%</td>
</tr>
<tr>
<td>Capitol Hill</td>
<td>18.1% ± 2.2%</td>
<td>$2,928</td>
<td>$8,109</td>
<td>177.0%</td>
</tr>
<tr>
<td>Mount Vernon Square</td>
<td>17.8% ± 4.6%</td>
<td>$2,555</td>
<td>$6,658</td>
<td>160.6%</td>
</tr>
<tr>
<td>Brookland</td>
<td>15.1% ± 5.5%</td>
<td>$2,713</td>
<td>$6,153</td>
<td>126.8%</td>
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<tr>
<td>Michigan Park</td>
<td>14.8% ± 5.5%</td>
<td>$2,437</td>
<td>$8,107</td>
<td>232.7%</td>
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<tr>
<td>Columbia Heights</td>
<td>14.8% ± 1.9%</td>
<td>$2,748</td>
<td>$6,115</td>
<td>122.6%</td>
</tr>
<tr>
<td>NoMa</td>
<td>14.1% ± 3.8%</td>
<td>$2,250</td>
<td>$6,468</td>
<td>187.5%</td>
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<tr>
<td>Near Northeast</td>
<td>13.9% ± 3.4%</td>
<td>$2,842</td>
<td>$7,848</td>
<td>176.1%</td>
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<tr>
<td>Barney Circle</td>
<td>12.6% ± 3.5%</td>
<td>$2,699</td>
<td>$5,534</td>
<td>105.1%</td>
</tr>
<tr>
<td>Downtown</td>
<td>12.1% ± 1.8%</td>
<td>$2,661</td>
<td>$8,187</td>
<td>207.7%</td>
</tr>
<tr>
<td>Ledroit Park</td>
<td>11.7% ± 2.6%</td>
<td>$2,933</td>
<td>$5,247</td>
<td>78.9%</td>
</tr>
<tr>
<td>Truxton Circle</td>
<td>11.6% ± 3.6%</td>
<td>$2,738</td>
<td>$6,701</td>
<td>144.8%</td>
</tr>
<tr>
<td>Petworth</td>
<td>11.0% ± 2.3%</td>
<td>$2,597</td>
<td>$6,188</td>
<td>138.2%</td>
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<tr>
<td>Bloomingdale</td>
<td>10.9% ± 1.9%</td>
<td>$2,940</td>
<td>$4,140</td>
<td>40.8%</td>
</tr>
<tr>
<td>West End</td>
<td>10.6% ± 3.1%</td>
<td>$3,097</td>
<td>$5,925</td>
<td>91.3%</td>
</tr>
<tr>
<td>Dupont Circle</td>
<td>9.9% ± 2.4%</td>
<td>$2,417</td>
<td>$5,032</td>
<td>108.2%</td>
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<tr>
<td>Top 20 Airbnb Neighborhoods</td>
<td>15.5% ± 2.4%</td>
<td>$2,752</td>
<td>$6,927</td>
<td>151.7%</td>
</tr>
</tbody>
</table>

Above, the table demonstrates the powerful incentive to convert long-term residential units into highly profitable illegal hotel rooms in the top twenty District neighborhoods for Airbnb.
In order to get a clearer picture of the role commercial and entire-home listings play on Airbnb, we examine the importance of such listings in contributing to the total revenue generated by the platform in the District. This question is important to understanding whether commercial and investment use of STR hosting platforms are a major component of these platforms’ business. If heavy commercial and investment use of STR hosting platforms were the exception rather than the norm, it might suggest that enforcement policy should be more targeted to finding and stopping bad operators. In that case, platforms would have an incentive to work with cities to promote lawful use of their platform, in order to maintain a good public image. On the other hand, if commercial and entire-home use are a major component of STR platforms’ business, platforms may find it imperative to prevent general compliance with the law. In that case, it would be necessary to regulate the platforms themselves.

As outlined above, commercial units account for a major component of Airbnb usage—an estimated 37 percent of listings are controlled by commercial operators. When considering revenue, commercial listings are even more prominent.

The reason for this is that, as expected, commercial listings are much more heavily used than other listings. Airbnb’s dependence on illegal entire-home listings is especially striking. The data shows that entire-home listings account for more than three-quarters of total D.C. revenue for Airbnb.

Unfortunately, they also may explain why Airbnb has been reluctant to share data that would help officials enforce existing short-term rental laws or to remove illegal listings from their website. A major portion of Airbnb’s profits depend on illegal rentals.

These revenue figures demonstrate that commercial and entire-home listings—not home sharing—represent the core of Airbnb’s business.
Likely due to their high profitability, commercial STRs may remove a significant portion of housing inventory that should be available for District residents. In nineteen different neighborhoods, commercial Airbnb listings are equivalent to more than 10 percent of vacant housing stock.

In eight different neighborhoods, this figure exceeds 15 percent. These neighborhoods are particularly impacted by the growth of Airbnb, and may suffer the greatest increases in rental prices because of reduced housing supply. (See Table 2, below.)

Airbnb units are most highly concentrated in Wards 1, 2, and 6—areas which are the most convenient to Downtown and the monuments, museums, and landmarks of the federal district. These wards contain a mix of high-priced and rapidly gentrifying neighborhoods. Wards 1 and 2 also have high concentrations of affordable units, and in particular have more rent-controlled units than any other wards.32

The proliferation of short-term rentals may threaten that housing. A flagrant example of short-term rentals removing rent-controlled housing from the market is discussed in the case study below, in which an entire rent-controlled building is converted to short-term rental use.

Although these wards are the mostly highly affected, the map below reveals that Airbnb is gaining a significant presence in all eight wards of the District.
Rent Increases in Top Airbnb Neighborhoods

• The median rent increase across Airbnb’s top 20 neighborhoods was 14.9%, compared to the District-wide average rent increase of 11.0%.

• In those neighborhoods, rent is rising 35 percent faster than in the District as a whole.

• Sixty-five percent of the 20 top-Airbnb neighborhoods saw larger average rent increases than the District-wide average.

• In neighborhoods like Eckington, Capitol Hill, and LeDroit Park, the average rent increase was nearly double the District-wide average increase.

Rental pricing data from Zillow shows that rents have risen more quickly in the top twenty Airbnb neighborhoods from 2011-2016, with a median increase of 14.9 percent compared to the citywide average of 11.0 percent.\textsuperscript{33}

While the table below demonstrates that many of the top neighborhoods for Airbnb were also some of the most rapidly gentrifying neighborhoods in the District, it does not prove Airbnb caused the increase. For example, it is possible that commercial STR operations are most viable in gentrifying neighborhoods, and that they locate in such neighborhoods for that reason.

Regardless of the cause, commercial STR operations are most prominent in gentrifying neighborhoods, and therefore take away housing where it is needed most.
<table>
<thead>
<tr>
<th>Neighborhood</th>
<th># Of Illegal Commercial Listings</th>
<th># Of Vacant Rentals</th>
<th>Illegal Commercial Listings as % of vacant rental housing</th>
<th>% Rent Increase 2011-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>U Street Corridor</td>
<td>102</td>
<td>149 ± 60.8</td>
<td>68.5% ± 27.9%</td>
<td>11.87%</td>
</tr>
<tr>
<td>Judiciary Square</td>
<td>76</td>
<td>247 ± 54.4</td>
<td>30.8% ± 6.8%</td>
<td>5.45%</td>
</tr>
<tr>
<td>Shaw</td>
<td>54</td>
<td>233 ± 62.4</td>
<td>23.2% ± 6.2%</td>
<td>15.72%</td>
</tr>
<tr>
<td>Logan Circle</td>
<td>48</td>
<td>258 ± 93.8</td>
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<tr>
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<td>119 ± 43.5</td>
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<td>14.88%</td>
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<tr>
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<td>17</td>
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<td>14.8% ± 5.5%</td>
<td>16.27%</td>
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<tr>
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<td>1123 ± 148.0</td>
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<td>10.35%</td>
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<tr>
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<td>Downtown</td>
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<td>454 ± 110.6</td>
<td>9.9% ± 2.4%</td>
<td>6.19%</td>
</tr>
</tbody>
</table>

Median of Top 20 Airbnb D.C. Neighborhoods 14.9%

D.C. City-Wide Average 11.0%

Table 2: Top Twenty D.C. Airbnb neighborhoods marked by higher median rent increases over the last five years, higher than the city-wide average. Sources: Airbnb website - Share Better Scrape, October 2016; Housing vacancy data, neighborhood – American Community Survey 5-year Estimates, 2015 – neighborhoods defined as sets of Census tracts assigned based on to DC Office of Planning, Google, and other data sources; Housing data, citywide – American Community Survey 5-year Estimates, 2015. Rent data: Zillow Rental Index, 2016. Five neighborhoods with unreliable housing estimates or low numbers of Airbnb listings were excluded from the list.
The Cascade Effect and Gentrification

Short-term rentals have the potential to hasten the gentrification process in several ways.

First, short-term rentals increase the potential for residential buildings to be used as vehicles for speculative investment without providing housing for residents. For example, in the case study below, an investor purchased a rent-controlled apartment building in Columbia Heights, kept the building free of tenants, and instead rented out rooms to tourists using STR platforms. This allowed the owner to earn income from the building without operating it as a residential apartment building.

The owner was able to operate this way for a long time in part because there were no long-term tenants to complain about rent control violations. If the laws restricting commercial STRs had been enforced, the most practical means of generating income through the building would have been to renovate the building and offer it for permanent residents to rent in compliance with housing laws. Instead, up to twenty families were deprived of housing in Columbia Heights.

Second, at the neighborhood level, any single unit taken off the market likely means that one less family will be able to reside in that neighborhood—thanks to extremely low vacancy rates. This family will then need to move to a different neighborhood, increasing demand-side pressure on that area’s housing market. In the aggregate, this may cause a cascade effect, in which rent rises not just in the top Airbnb neighborhoods where people are unable to find a place to live, but also in the overflow neighborhoods where families are moving.

Finally, short-term rentals may induce landlords to increase rents, by increasing the amount of rent a subset of tenants is willing and able to pay. At the same time, short-term rentals may create the opportunity for landlords to push steeper rent increases. Contrary to Airbnb’s message that STRs help “middle-class families” stay in their homes in the face of increasing rents, Airbnb may instead be contributing to increasing rents by reducing housing supply. In fact, some property management companies have been holding discussions with Airbnb on allowing STRs in their building in exchange for a cut of the revenue.
Table 3 Percent of potential units removed because of commercial Airbnb activity. Sources: Airbnb website - Share Better Scrape, October 2016; Housing data, neighborhood – American Community Survey 5-year Estimates, 2015 – neighborhoods defined as sets of Census tracts assigned based on to DC Office of Planning, Google, and other data sources; Housing data, citywide – American Community Survey 5-year Estimates, 2015. Five neighborhoods with unreliable housing estimates or low numbers of Airbnb listings were excluded from the list.

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Total housing inventory</th>
<th>Vacant units</th>
<th>Commercial listings</th>
<th>Commercial listings / vacant units (%)</th>
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<tr>
<td>U Street Corridor</td>
<td>6977</td>
<td>149 ± 60.8</td>
<td>102</td>
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<td>Shaw</td>
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<td>23.2% ± 6.2%</td>
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<td>18.6% ± 6.8%</td>
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<tr>
<td>Eckington</td>
<td>1932</td>
<td>263 ± 52.6</td>
<td>48</td>
<td>18.3% ± 3.6%</td>
</tr>
<tr>
<td>Capitol Hill</td>
<td>14119</td>
<td>1143 ± 136.5</td>
<td>207</td>
<td>18.1% ± 2.2%</td>
</tr>
<tr>
<td>Mount Vernon Square</td>
<td>5822</td>
<td>349 ± 90.0</td>
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<td>17.8% ± 4.6%</td>
</tr>
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<td>Brookland</td>
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<td>15.1% ± 5.5%</td>
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<td>14.8% ± 5.5%</td>
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<td>Columbia Heights</td>
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<td>1123 ± 148.0</td>
<td>166</td>
<td>14.8% ± 1.9%</td>
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<td>262 ± 70.5</td>
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<td>14.1% ± 3.8%</td>
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<tr>
<td>Near Northeast</td>
<td>2906</td>
<td>266 ± 64.5</td>
<td>37</td>
<td>13.9% ± 3.4%</td>
</tr>
<tr>
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</tr>
<tr>
<td>Downtown</td>
<td>10065</td>
<td>1201 ± 179.4</td>
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<td>12.1% ± 1.8%</td>
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<td>Ledroit Park</td>
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<td>11.7% ± 2.6%</td>
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<td>Truxton Circle</td>
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<td>190 ± 58.4</td>
<td>22</td>
<td>11.6% ± 3.6%</td>
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<td>Petworth</td>
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<td>507 ± 103.7</td>
<td>56</td>
<td>11.0% ± 2.3%</td>
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<tr>
<td>Bloomingdale</td>
<td>3927</td>
<td>475 ± 82.0</td>
<td>52</td>
<td>10.9% ± 1.9%</td>
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<td>West End</td>
<td>4885</td>
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<td>Dupont Circle</td>
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<tr>
<td><strong>DISTRICT OF COLUMBIA</strong></td>
<td><strong>303,312</strong></td>
<td><strong>29,922 ± 905</strong></td>
<td><strong>1,980</strong></td>
<td><strong>6.6% ± 0.2%</strong></td>
</tr>
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</table>
Case study: Rent-Controlled Building in Columbia Heights

Columbia Heights is one of the most rapidly gentrifying neighborhoods in the District of Columbia. In November 2015, the Latino Economic Development Center (LEDC) discovered a 21 unit rent-controlled apartment building in Columbia Heights that they believed was being used for illegal short-term rental use instead of permanent housing.

The LEDC became aware of the property when they were alerted that an ownership stake in the building was being sold. The owners were required to notify the Department of Housing and Community Development (DHCD) of the sale because under the Tenant Opportunity to Purchase Act (TOPA), the building’s tenants had the right to purchase the building themselves.

An LEDC community organizer who went to visit the property to alert the tenants of their TOPA rights was barred from entering by a woman who identified herself as a friend of the owner.

Closer inspection of the offer of sale revealed that the owners testified to the District government that the building had exactly one tenant—the “friend” the organizer had previously encountered—and all twenty other units were vacant.

Additional research showed that several units in the apartment were listed on Flipkey, Homeaway, and seemingly on Airbnb. The building owner and sole tenant were mentioned frequently as managers or owners of the building in the listings and reviews.

It appeared that the building had been partially or entirely converted into a hotel instead of being used to provide affordable housing for District residents.

Further inspection of several short-term rental hosting platforms revealed that the owner also owned at least three other residential buildings which were being used as short-term rentals instead of permanent housing.

LEDC sent correspondence to both DCRA, which regulates business licensing and enforces zoning, and DHCD, which administers the rent control law, all of which were apparently being violated. DCRA insisted they could not inspect the property unless the LEDC organizer was able to get an invitation from the owner. DHCD did not follow up at all. An LEDC organizer then testified at a Budget Oversight Hearing under the D.C. Council Committee on Business Consumer and Regulatory Affairs on February 29, 2016.

In December 2016, Ward 1 Councilmember Brianne Nadeau and the D.C. Working Families Party conducted an exposé on the property in order to highlight the risk commercial short-term rental operations pose to housing affordability in the District.
The negative impacts of STRs on the District are likely to get worse as Airbnb continues to grow. In the past year alone, the number of total listings in the District has grown by 38 percent—from 3,843 listings to 5,297. Commercial listings have grown from 1,480 to 1,980, a 34 percent increase. By comparison, from 2014 to 2015, housing inventory grew at approximately 1.1 percent (±.02 percent), while the District's population increased by 2.0 percent. In the past year, commercial listings have grown by 34%.

These statistics reveal what is one of the fundamental problems underlying the District’s housing crisis: population growth is outstripping housing supply.

Unfortunately, while District leaders scramble to provide more affordable housing to narrow this gap, commercial STR investors are converting the District's existing housing stock into illegal hotel rooms.

Figure 5 Growth in number of listings, October 2015 to October 2016. Airbnb Website- Share Better Monthly Scrapes, October 2015 to October 2016
Methodology

Data

The data used in this report was provided by ShareBetter, a national coalition of neighbors, community activists and elected officials who advocate for effective regulation of short-term rentals to protect neighborhoods and affordable housing. Because Airbnb has a history of declining to provide reliable data on its service, the most effective way to obtain this information is through automated observation of activity visible on the Airbnb website. This process is known as “scraping.” ShareBetter has obtained data from web scrapes performed on a monthly basis dating back to September 2015. A majority of the figures in this report are based on an October 2016 web scrape.

It bears noting that although Airbnb is the most well-known STR hosting platform, it is only one of several that operate in the District. This report does not include data from these, although HomeAway, Flipkey, and VRBO also have a significant presence in D.C. The principal reason for this omission is that it is impossible to know which listings are cross-listed on multiple platforms. To include data from all STR hosting platforms would likely cause the analysis to over-estimate the number of STRs in the District. Instead, by excluding listings from other sites, it is likely that this report understates the prevalence and growth of STRs in the District.

Calculating Commercial Listings

In order to identify and calculate the number of commercial listings, this report estimates commercial listings as all entire-home/apartment and private room listings by hosts with multiple listings. Shared rooms are excluded from this calculation. Given the available data, this metric is the best way to estimate the likelihood that an STR will be used as a commercial enterprise, and deprive a D.C. resident of potential housing. For the rest of this report, this metric is called “Commercial Listings.” The appendix provides a more detailed discussion on how the metric of commercial listings was selected.
Calculating Revenue Estimates

This report analyzes estimates of the revenue generated by each category of listing, defined by type (“entire-home” vs. "private room" vs. "shared room") and commercial use (“commercial” vs. "other"). Revenue estimates by type and commercial use were derived using the following methodology using scrape data:

First, we estimate revenues by summing the prices of all listings for each category. Then, finding that commercial listings are much more heavily used than other listings, we multiply the un-weighted revenue estimate by the average number of reviews for each category to obtain the estimated proportions of revenue from each category.

Based on a November 2015 report by Airbnb, entire-home listings appear to have a substantially similar distribution of activity level as other listings. Therefore, if we were to assume that commercial and other listings did not have significantly different levels of transient usage, it would be reasonable to estimate the proportion of revenue obtained from each category by summing the prices for all listings in each category, as shown in Figure 1. Under this estimate, commercial listings would represent 43 percent of total revenue.

However, it would be incorrect to assume that commercial listings have the same level of activity as other listings. As expected, commercial listings are much more heavily used than other listings. The best proxy we have for activity level is the total number of guest reviews for each listing. We assume in the below discussion that number of guest reviews is, on average, linearly related to the number of total nights the listing has been booked. Therefore it is possible to obtain an estimate of the proportion of revenue from each category by multiplying the revenue estimates in Figure 1 by the average reviews for each category booked.
The average number of guest reviews for commercial entire-home listings is 24 percent higher than for other entire-home listings, and the average number of reviews for commercial private room listings is 92 percent higher than for other private room listings.  

Therefore, it is possible to obtain an estimate of the proportion of revenue from each category by multiplying the revenue estimates in Figure 1 by the average reviews for each category.  

![Figure 7: Average reviews by category. Source: Share Better Scrape, October 2016](image)

Figure 8 Estimated revenue by commercial/other listings and type. Source: Share Better Scrape, October 2016.
Appendix - Definitions

This report makes several distinctions between rentals in order to differentiate which listings are depleting the housing inventory and better estimate the size of their impact.

**Shared Rooms**

“Shared Rooms” are rentals in which the guest sleeps in a room that will simultaneously be used by the host (i.e. on a couch in the living room). These listings are unlikely to represent situations where a permanent tenant would be displaced, except in a few cases where they appear to be a part of Airbnb hostels.

**Private Rooms**

“Private Rooms” are those in which guests have the privacy of their own room but the host is expected to be present during the guest’s stay. These listings may or may not displace long-term tenants because they have the potential to be used to fill vacant rooms in multi-bedroom apartments, which could otherwise be filled by long-term roommates. They can also deprive families of larger units by incentivizing hosts to rent or purchase larger units than they need.

**Entire-Home/Apartment**

“Entire-home/apartment” rentals grant guests private access to the entire dwelling unit. These listings are the most likely to displace permanent residents and are also the most viable as commercial units, commanding roughly double the average price of a “Private Room” listing.

**Operator**

Sixty-six percent of listings in the District are “entire home/apartment” listings. That means that, in a majority of cases, the person who listed the property is not actually hosting the guest. For that reason, we use the term “operator” as a generic term for a person who controls an STR listing. We will use the term “host” specifically to refer to situations in which a permanent resident of a dwelling unit actually hosts guests in their home.

**Commercial Listings**

“Commercial Listings” are those that are most likely to be principally used as a revenue source rather than as a permanent dwelling, thus displacing local residents. Commercial listings are primarily responsible for STRs’ negative impact on the D.C. housing market.

Because Airbnb has refused to publish accurate, anonymized data that would enable researchers and policymakers to understand and address the impact of STRs, this report estimates the number of commercial listings based on the number of entire-home and private room listings by hosts who have posted multiple listings.

This metric is not perfect but is likely a fair approximation of the number of units being used for commercial purposes. Hosts who post multiple listings cannot live in all of their listings, and may not live in any of their listings. The metric may over-count commercial listings because in some cases hosts may live in one of their listings permanently and rent out another unit as an investment (which would represent one commercial unit, not two), or post multiple listings for the place where they live, which Airbnb may allow in some cases.
On the other hand, the metric may under-count commercial listings because some hosts post under several host names. Moreover, many hosts may operate exactly one commercial listing (not where they live), and not post any other units on Airbnb. Such commercial units would not be included under this metric. Finally, commercial operators may operate multiple units, but only one inside the District. This would not be included in our count of commercial listings either.

In any case, the number almost certainly understates the total number of commercial STRs in the District because of Airbnb being the only platform that is included. On balance, the “multiple listing” metric is probably the best approximation possible for commercial listings, given the available data, so it is the one used in this report.

**Neighborhoods**

This report examines neighborhood-level effects from short-term rentals. Such an effort necessarily leads to the difficulty of comparing hyper-local data drawn using different boundary lines.

This difficulty is addressed by using a variety of data sources, mainly Google and Office of Planning designations, to map Census tracts to neighborhood names. Each Airbnb listing was mapped into a Census tract using the listing’s approximate coordinates scraped from the Airbnb website and the official tract boundaries (provided by the D.C. Office of the Chief Technology Officer).

Zillow's Rental Index provides neighborhood-level data based on their own neighborhood designations; these designations are highly comparable with this report’s set of neighborhoods. ZRI’s neighborhood designations were then mapped to the same set of neighborhood designations.

Thus, the Airbnb listings, the Census figures, and the Zillow rental estimates have been mapped to the same set of neighborhoods with the same boundaries. This method is not exact but should result in reasonable comparisons for the purposes of the methodology used by this report.
Sources

3. Ibid.
4. Ibid.
9. U.S. Census Bureau, “Housing units,” 2014 and 2015 American Community Survey 1-Year Estimates, Table B25001, accessed January 26, 2016; U.S. Census Bureau, “Total Population,” 2014 and 2015 American Community Survey 1-Year Estimates, Table B01003, accessed January 26, 2016. The Census also estimates the number of households, though less reliably. From 2014 to 2015 the ACS shows a 1.59 percent increase (±0.98 percent) in the number of households which is not reliable enough an estimate for meaningful comparison with the growth in housing units. See ACS 1-Year Estimates “Households and Families” Table S1101.
13. 11 DCMR Subtitle U 251.1 (jj)(2)
16. For those who are predominantly interested in home-sharing to meet new people, the web service Couchsurfing, which predates Airbnb, facilitates home-sharing but does not allow hosts to charge their guests.
17. Airdna.com, 2016. AirDNA is a third-party firm that uses advanced artificial intelligence and machine learning technology to model Airbnb occupancy based on listings and historical Airbnb occupancy data, and markets its research to STR investors.
18. The variables had a correlation of 0.93. The correlation coefficient is a statistical measure which falls between -1 and 1. It indicates the interdependence of variables in a data set. A correlation of 1 indicates that two variables vary together perfectly linearly in the same direction. Strong correlation suggests two variables are likely related, but does not prove one causes the other.
23. A visual inspection of the websites for Flipkey and VRBO on August 1, 2016 found 1,991 listings for Washington, D.C.
rooms to displace one resident, as might be the case for a hostel posting rooms on Airbnb. It is reasonable to assume that, in most cases, shared rooms do not displace a resident; or, if they do, it takes several shared rooms to displace one resident, as the case for a hostel posting rooms on Airbnb.

26. "Doug," https://www.airbnb.com/rooms/789295, accessed January 26, 2016. According to the D.C. Property Information Verification System, the house has a license for single family rentals. The address of the house is 2220 Q Street NW. See https://pivsservices.dcra.dc.gov/PIVS/Search.aspx, accessed January 26, 2016. Single family housing rental licenses are prohibited to be used for transient occupancy (14 DCMR 201.3) and are intended for families to rent as housing on a long-term basis.


28. Zillow Rental Index, ZRI Time Series, City and Neighborhood. Average weighted by number of residential units per neighborhood; neighborhood averages are the mean of monthly estimates from October 2015 through October 2016.


30. Monthly figure obtained by deducting 3 percent host service fee from neighborhood average for commercial entire-unit listings, then multiplying by thirty

31. See Figure 3 Estimated revenue by commercial/other listings and type.


34. Sufficient neighborhood-level data do not exist to provide reliable averages across the top 20 neighborhoods; the median provides a useful measure of central tendency across these neighborhoods.


36. Airbnb makes it difficult to pinpoint addresses, but the owner of the building had a profile with apartments listed in extremely close proximity to the site.


40. U.S. Census Bureau, “Total Population,” 2014 and 2015 American Community Survey 1-Year Estimates, Table B01003, accessed January 26, 2016. The Census also estimates the number of households, though less reliably. From 2014 to 2015 the ACS shows a 1.59 percent increase (±0.98 percent) in the number of households which is not reliable enough an estimate for meaningful comparison with the growth in housing units. See ACS 1-Year Estimates “Households and Families” Table S1101.


42. At the time of writing, data from November 2016 were available; however, November saw a steep spike in listings likely resulting from anticipated bookings from the inauguration and related events. October 2016 was chosen instead because it is more likely to be characteristic of the District’s STR market long-term.

43. See the Appendix for definitions of listing types.

44. "Shared rooms" are not broken up by commercial use, since we do not count any shared rooms as commercial—even though some of them are. It is reasonable to assume that, in most cases, shared rooms do not displace a resident; or, if they do, it takes several shared rooms to displace one resident, as might be the case for a hostel posting rooms on Airbnb.
The dollar figures shown do not have any real life meaning; however, figures are shown in dollars rather than percent because the summed prices are used to calculate the actual estimated proportions of revenue by category shown in Figure 3. Lighter colors are used in this chart because these figures represent an intermediate step in the calculation of estimated revenue.


47. It should be noted that these are averages of total number of reviews, not average reviews for each listing, because the scraped data does not indicate the age of a listing. Therefore, a new listing with a smaller number of reviews may in fact be more active than an older listing with more reviews. Thanks to the large number of listings, however, assuming listing age is independent from use intensity and whether a listing is commercial or not—and there is no obvious reason to doubt it—the above percent differences should accurately estimate the actual differences in use intensity between the two types of listings.

48. That is, a category c’s share of revenue \( R_c = \frac{\text{sum of prices for listings in category} \times \text{avg. reviews for listings in category}}{\text{total sum of (sum of prices \times avg. reviews) for all categories}} \) or

\[
R_c = \frac{\sum_{i=1}^{\text{num}} p_{ci} \bar{r}_c}{\sum_{c=1}^{\text{num categories}} \sum_{i=1}^{\text{num}} p_{ci} \bar{r}_c}
\]

where \( R_c \) is the estimated proportion of revenue from category \( c \), \( p_{ci} \) is the price of a given listing in a category \( c \), and \( \bar{r}_c \) is the mean number of reviews in the category.