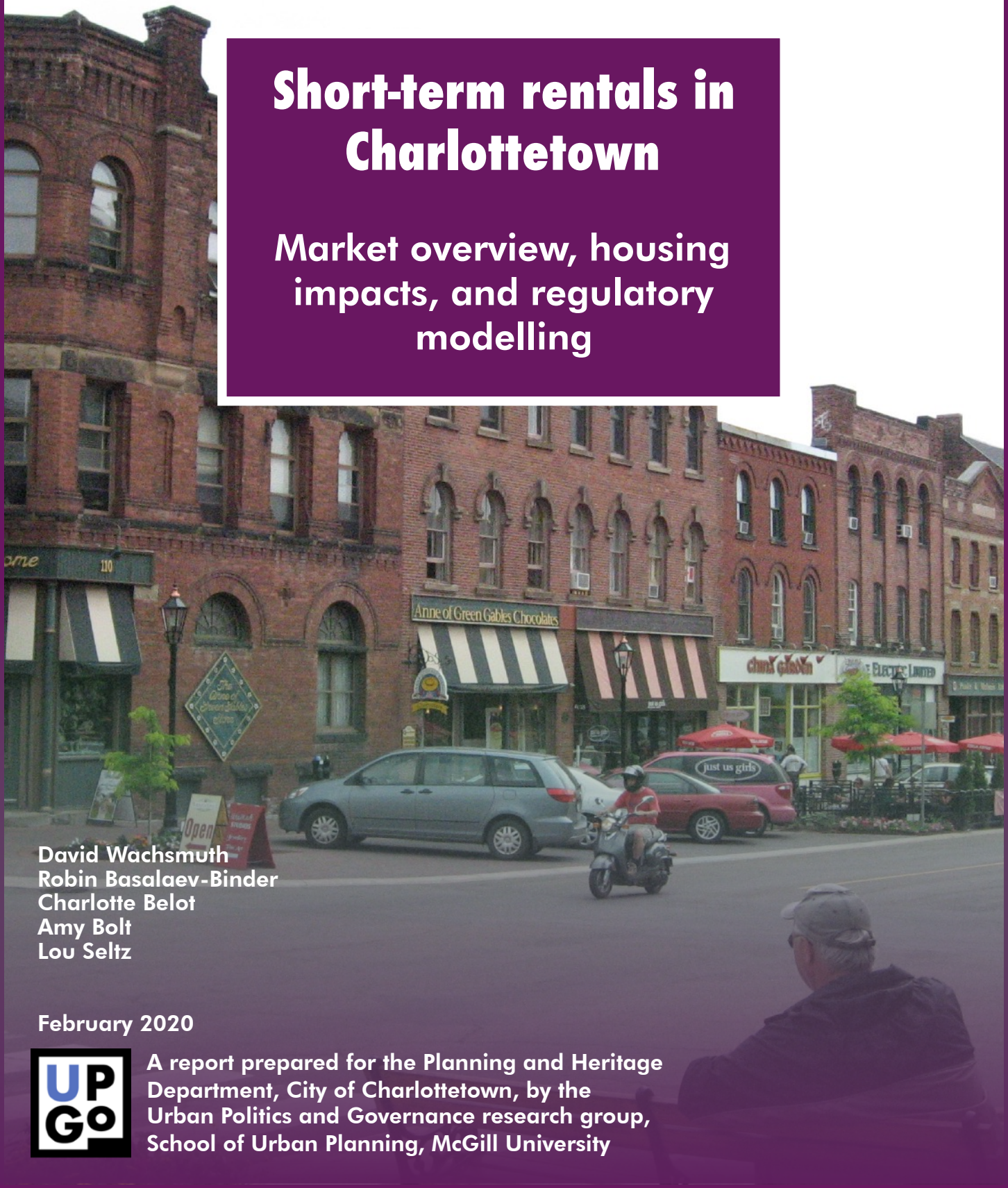
Short-term rentals in Charlottetown

Market overview, housing impacts, and regulatory modelling



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A report prepared for the Planning and Heritage Department, City of Charlottetown, by the Urban Politics and Governance research group, School of Urban Planning, McGill University

Executive summary

This report analyzes short-term rentals in the City of Charlottetown and models five regulatory scenarios. It provides a general market overview of STRs in Charlottetown, along with their spatial distribution and trends in their seasonal or long-term patterns. It measures the impacts of STRs on the Charlottetown housing market, particularly with respect to questions of housing availability and affordability. And it analyzes the sources of STR supply in Charlottetown, especially the division in the market between casual "home sharers" and dedicated "commercial operators".

SHORT-TERM RENTAL MARKET OVERVIEW

- On September 1, 2019 there were **635 short-term rentals active in housing units in Charlottetown**—an 18.5% year-over-year increase.
- The 409 hosts operating active listings in Charlottetown earned **$8.5 million in revenue** 2019. The top Charlottetown host earned more than $430,000 in 2019, while median host revenue was $19,300.
- **Current listings are concentrated in the centre of Charlottetown, but growth is faster in outlying areas.** Three in five listings are located in the Queen Square and St. Avards wards, while Beach Grove had the highest listing growth rate (200%).
- **Charlottetown's STR market is dominated by entire-home listings**, which make up 77% of active listings and earned 89% of all host revenue in 2019.
- Family-suitable **homes with two or more bedrooms make up 73% of entire-home listings** in Charlottetown.
- Charlottetown has the most seasonal variation of any Canadian STR market, with **70% of reserved nights occurring between May 1 and September 30**.
- Just five percent of hosts earned over a third (36%) of all revenue last year, and **the most successful ten percent of hosts earned nearly half (47%) of all STR revenue.**

HOUSING MARKET IMPACTS

- **STRs removed an average of 138 housing units from Charlottetown's long-term housing market** in 2019, and additional 55 units were active full-time during the summer high season.
- **STRs are responsible for 38% of all rent increases in Charlottetown since 2017.** The growth of STRs in Charlottetown has cost the average Charlottetonian renter $292 since 2017.

- **Charlottetown has the fifth lowest vacancy rate (1.2%) of any Canadian city**, and our projections suggest it will remain below 3% for the next three years. We estimate that, if there were no dedicated STRs, the city would currently have a 2.9% vacancy rate.

HOME SHARERS AND COMMERCIAL OPERATORS

- **Commercial multilistings**—listings controlled by hosts with multiple listings—**account for just over half of active listings (52%) and host revenue (55%)** in Charlottetown.
- We estimate that **54% of listings were operated in their hosts' principal residences**, but these listings were only responsible for 41% of reserved nights during the year.

REGULATORY SCENARIO MODELLING

- We evaluate five scenarios for regulating STRs in Charlottetown, which range from banning all non-principal-residence and apartment listings to limiting non-principal-residence listings to commercially and mixed-use zoned neighbourhoods.
- The scenarios would permit between 48 and 61% of current listings to continue to operate unimpeded, would return between 50% and 90% of lost housing units to the long-term market, and would all significantly improve the rental vacancy rate.
- To address a STR supply shortfall which might result from each of the scenarios, 219 to 306 new listings and 22.4 to 30.0 additional nights booked per listing, would be required if the City achieved 100% regulatory compliance. The ranges fall to 104-144 listings and 11.5-15.6 nights for 50% compliance rate.
- We conclude that there is little risk of an adverse tourism accommodation supply shock occurring in the wake of stronger regulations on STRs in Charlottetown, even under the more restrictive scenarios being contemplated.

Scenario	% of current listings still allowed	% of 2019 reserved nights allowed	Units returned to market (% of total)	2020 estimated rental vacancy rate (compared to 0.6% baseline)	Minimal additional listings required (75% compliance rate)	Minimal additional nights booked required (75% compliance rate)
Scenario 1: Principal residence only, no apartments	47.6%	34.8%	125 (90%)	2.2%	224	22.8
Scenario 2: Principal residence only, apartments allowed	53.9%	39.8%	122 (88%)	2.1%	196	21.0
Scenario 3: Principal residence only, no apartments, but commercial zones allowed	52.4%	40.3%	87 (63%)	1.7%	200	20.5
Scenario 4: Principal residence, apartments allowed, and commercial zones allowed	57.3%	44.1%	86 (62%)	1.7%	179	19.1
Scenario 5: Principal residence, apartments allowed, commercial and DMUN zones allowed	60.9%	49.2%	69 (50%)	1.4%	160	17.1

HOST COMPLIANCE DATA ANALYSIS

- The UPGo/AirDNA dataset used to perform the analysis in this report has comparable listing coverage to the Host Compliance dataset which the City has access to.
- The Host Compliance data has sufficient coverage to provide a reliable overview of the STR market, and to track changes over time.
- Because the HC dataset lacks detailed activity data, it cannot be used to conduct adequate housing-market impact analysis.
- It should be feasible to monitor questions relating to the supply of STRs and their regulatory compliance in Charlottetown using the HC data.

Introduction

In December 2019, researchers from the Urban Politics and Governance research group (UPGo) at McGill University were commissioned by the Planning and Heritage Department of the City of Charlottetown to provide an empirical overview of the short-term rental (STR) market in Charlottetown, with a particular emphasis on three topics:

1. A general market overview of the key facts about STRs in Charlottetown, along with their spatial distribution and trends in their seasonal or long-term patterns.
2. The impacts of STRs on the Charlottetown housing market, particularly with respect to questions of housing availability and affordability.
3. The sources of STR supply in Charlottetown, especially the division in the market between casual "home sharers" and dedicated "commercial operators".

UPGo was further asked to model the potential impacts of a series of different regulatory scenarios on the latter two topics; i.e., how would different STR regulations affect housing availability and affordability in Charlottetown, and how would they affect the supply of STRs in Charlottetown? Finally, we were asked to assess the reliability of data collected by the firm Host Compliance, and its potential utility in assessing STR market impacts and facilitating regulation monitoring and enforcement. What follows is the results of these tasks.

DATA AND METHODOLOGY

The analysis in this report is based on a combination of private and public data sources. The key sources are as follows:

- Listing and activity data about Airbnb, HomeAway and VRBO short-term rental listings gathered by the consulting firm AirDNA. This data includes canonical information about every STR listing on the Airbnb or HomeAway platforms which was active in the City of Charlottetown between 1 January 2016 and 31 December 2019. This includes information such as the listing type (entire home, private room, shared room or hotel room), the number of bedrooms, the advertised daily price, and the approximate location of the listing. All of this information is publicly available on the Airbnb or HomeAway websites, and was collected through frequent "web scrapes" by AirDNA. In addition to this canonical information, AirDNA provides estimates of daily listing activity: whether a given listing was reserved, available or blocked. AirDNA computes these estimates by monitoring the calendar availability of listings, and noting changes in status from available to unavailable, then using a machine-learning model to decide probabilistically whether a given status change represented a reservation or a host blocking dates off as unavailable. We use this data for our core analysis of the STR market, including our counts of active listings, our breakdown of different listing types, our estimates of STR-induced housing loss, and our estimates of listings which are commercial operations and which are located in hosts' principal residences.

- Additional data about Airbnb listings collected by McGill University researchers, including web scrapes of listings to verify activity and location.

- Data on STR operators collected by the consulting firm Host Compliance on behalf of the City of Charlottetown. This data was used to validate the results of the primary analysis, and additionally to explore the feasibility of reproducing the analysis with the Host Compliance data alone.

- Data about housing assessment, development and permits, provincial short-term rental registrations, and land-use zoning, from the City of Charlottetown. This data was used, first of all, to carry out regulatory scenario modelling, in particular for identifying the building type and applicable zoning for short-term rental listings. Some of the scenarios envisage regulating STR listings located in apartment buildings differently from listings located in houses. We used the City of Charlottetown's definition of an apartment as a housing unit located in a building with three or more units, and relied on a Bayesian statistical analysis method for probabilistically estimating the building type of listings in cases where the exact address is not known. We also use this data for housing market analysis, in particular for estimating the city's future rental housing stock in light of existing trends and new housing starts and completions.

- Statistics Canada data about the distribution of population and dwellings within Charlottetown from the Census, and Canada Mortgage and Housing Corporation (CMHC) data about the Charlottetown housing market, including unit numbers, rents, and the rental vacancy rate.

In order to facilitate public understanding and scrutiny of our work, complete methodological details, along with the code necessary to reproduce this analysis, are freely available under an MIT license on the UPGo GitHub page at github.com/UPGo-McGill/charlottetown-analysis.

1. Short-term rental market overview

There were 635 STR listings in Charlottetown housing units on September 1, 2019—a 7.9% increase since the previous year. Charlottetown's STR market is comparable to other cities in Atlantic Canada, relative to the city's size. Most listings are located in the Queen Square and St. Avards wards, but growth is highest in outlying wards. Three quarters of listings are entire homes—and these listings earn 90% of all host revenue. Charlottetown has the most seasonal variation of any Canadian STR market, with 70% of reserved nights occurring between May 1 and September 30. More than one third of all revenue is earned by one in twenty hosts.

ACTIVE DAILY LISTINGS AND ANNUAL REVENUE

"Active daily listings" are those which were displayed on the Airbnb.ca, HomeAway.ca, or VRBO.ca website on a given day, regardless of their availability status (reserved, available, or blocked). It is the clearest and least ambiguous means of determining the overall size of the short-term rental market in a location, particularly with respect to change over time. On September 1,

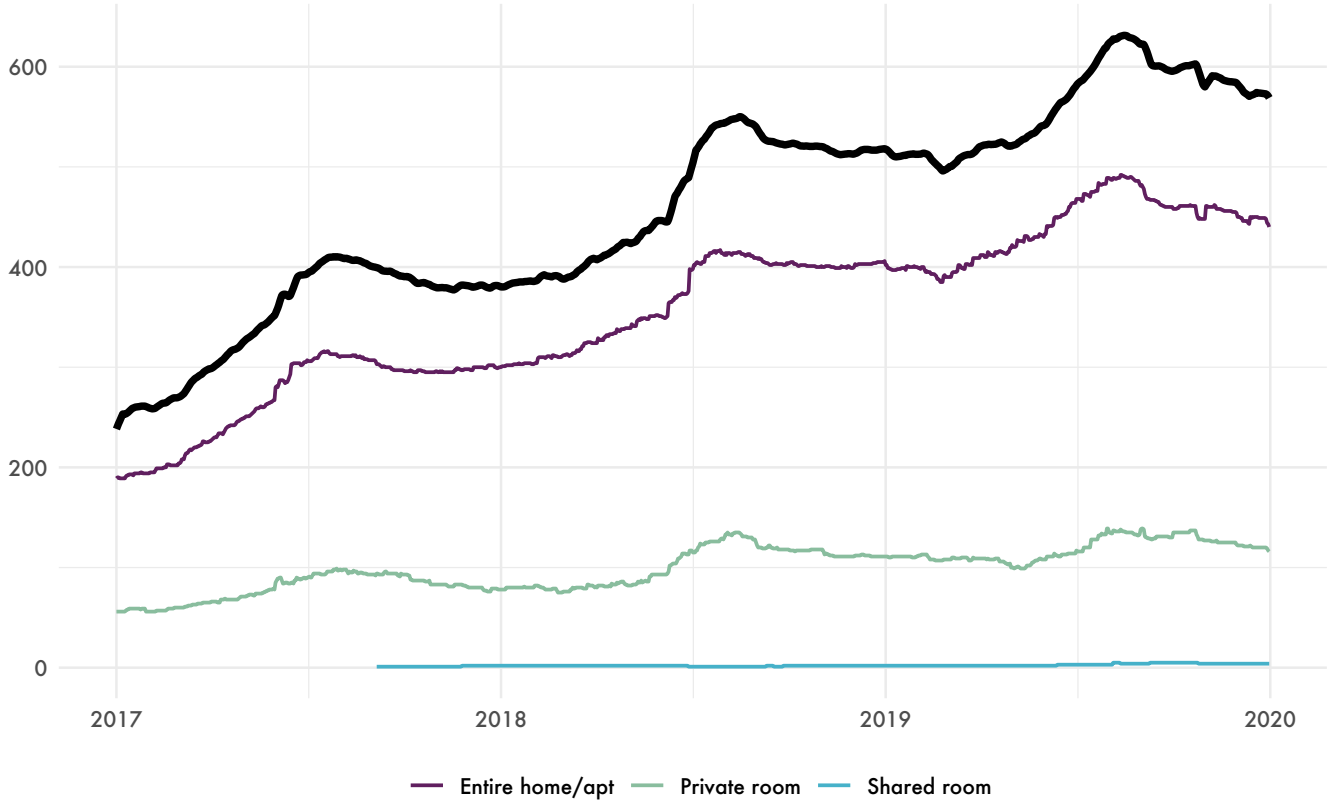

Figure 1. Active daily STR listings in the Halifax Regional Municipality

City	Active listings	Listings per 1000 households	Host revenue (2019)	Revenue per listing
Charlottetown	635	12.1	$8.5 million	$13,400
Halifax	2,483	13.2	$34.3 million	$13,800
St. John's	982	18.8	$10.3 million	$10,500
Lunenburg	394	28.1	$5.4 million	$13,700
Moncton	377	10.7	$3.7 million	$9,800

Table 1. STR activity in the top five Atlantic Canada cities

2019 (near the peak of the summer season), there were 711 active listings in Charlottetown. 76 of these were hotels or other traditional accommodation providers using the Airbnb or HomeAway platform for bookings. In all the analysis that follows, we have excluded those 76 listings and focused on the remaining 635 listings in housing units.

STR listings located in housing units in Charlottetown earned $8.5 million in 2019. The number of active listings in Charlottetown increased 7.9 % from the previous year, although the pattern of active listings shows considerable fluctuation throughout the year, with listing numbers at their lowest in February and rising steadily through August, after which point they decline again. (This seasonality pattern is discussed in more detail below). Figure 1 shows the growth rate of active daily listings in Charlottetown.

Compared with other cities in Atlantic Canada, Charlottetown's STR market is similar in scale relative to the area's size. On a per-dwelling basis, Charlottetown has about the same number of active STR listings as Halifax and Moncton, and fewer than St. John's or Lunenburg. Per-listing revenue in Charlottetown is approximately as high as the other most profitable markets in Atlantic Canada (Table 1).

WHICH STR PLATFORMS ARE USED IN CHARLOTTETOWN?

Of the 834 STR listings which were active in Charlottetown homes at any point in 2019, 678 (81.3%) of them were listed exclusively on Airbnb, 86 (10.3%) were listed exclusively on HomeAway or VRBO, and 70 (8.4%) were listed on both Airbnb and one of the other platforms. Those 834 listings were operated by 409 separate hosts.

HOW MANY STR LISTINGS ARE REGISTERED WITH THE PROVINCE?

Like other tourism proprietors, short-term rental operators on Prince Edward Island are obligated under the Tourism Industry Act to register their operations with the provincial government. Of the 834 STR listings in Charlottetown active at some point in 2019, we were only able to identify 265 which were registered. More than two thirds of listings (570) are not registered, and are therefore non-compliant with the Tourism Industry Act.

WHERE ARE STR LISTINGS LOCATED IN CHARLOTTETOWN?

There are active STR listings in all 10 of Charlottetown's wards, but the largest concentration by far is in the 500-lot area. Figure 2 shows the distribution of active STRs expressed as a percentage of all housing units; the left panel aggregates this measurement by dissemination area—the smallest unit at which Statistics Canada disseminates Census results—and the right panel aggregates by ward. A majority (61.1%) of all active listings are located in the Queen Square and St. Avards wards, which together accounted for an even higher percentage (70.0%) of 2019 host revenue (Table 2). Conversely, listing growth is highest in outlying wards which currently have low numbers of STR listings—in particular Beach Grove, Falconwood and Mount Edward. Beach Grove had the highest year-over-year growth rate in listings, at 200.0%, while St. Avards was the only ward which saw listings decline year-over-year, with a loss of 0.8%.

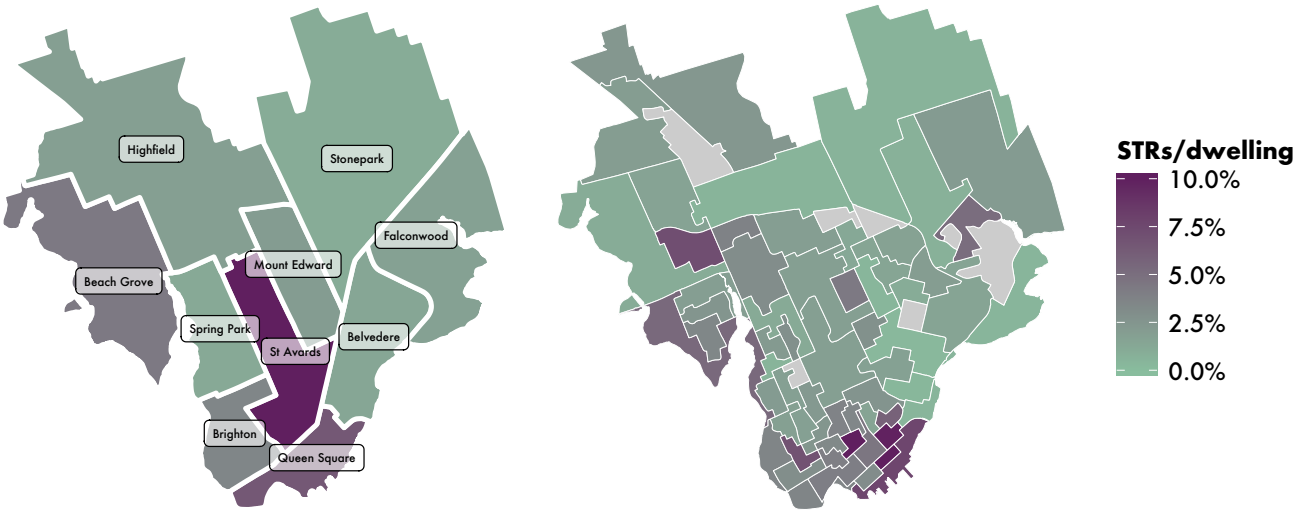

Figure 2: Active STRs as a share of all dwelling units in Charlottetown, by ward (L) and dissemination area (R)

LISTING TYPE PREVALENCE

STR listings can be entire homes, private rooms, shared rooms or hotel rooms. Most policy attention has focused on entire-home listings, under the theory that these listings are most likely to generate harmful negative externalities, including housing loss and neighbourhood nuisance. Table 3 provides the breakdown of listing types in Charlottetown on September 1, 2019. (No hotel rooms are listed, because these are located in non-housing listings excluded from our analysis.) It demonstrates that Charlottetown's STR market is dominated by entire-home listings, which make up more than three quarters (76.7%) of active listings and earned 89% (or $7.6 million) of all host revenue in 2019. These numbers are similar to those for other Canadian cities.

Neighbourhood	Active listings	Annual listing growth	Annual revenue	% reservations from May-Sep.
City of Charlottetown	635	7.9%	$8.5 million	70.8%
Beach Grove	51	200.0%	$354,000	73.8%
Belvedere	25	78.6%	$323,000	63.9%
Brighton	56	75.0%	$713,000	76.9%
Falconwood	19	171.4%	$160,000	89.9%
Highfield	29	20.8%	$319,000	67.9%
Mount Edward	23	91.7%	$271,000	79.5%
Queen Square	149	34.2%	$286,000	64.1%
Spring Park	24	60.0%	$141,000	82.7%
St Avards	239	-0.8%	$312,000	73.4%
Stonepark	19	72.7%	$261,000	81.4%

Table 2. STR activity by ward in the City of Charlottetown

Listing type	Active listings	Annual revenue	% of all listings	% of annual revenue	Revenue per listing
Entire home/apt.	487	$7.6 million	76.7%	89.0%	$15,000
Private room	144	$0.9 million	22.7%	10.9%	$5,800
Shared room	4	$0.0 million	0.6%	0.1	$2,500

Table 3. Listing type prevalence in the City of Charlottetown

LISTING SIZE

Since a significant portion of STRs in Charlottetown are operated out of housing units which could otherwise be housing a long-term resident, the size of these units is an important factor in determining the impact of STRs on housing supply in the city. If most housing units listed as STRs are studios and one-bedroom apartments, the opportunity cost of not housing long-term residents in those units will be somewhat lower than if most of the units are family-sized.

26.6% of entire-home STR listings in Charlottetown are studio (4.3%) and one-bedroom (22.3%) units, while units with two bedrooms or three or more comprise 35.1% and 38.3% of the listings respectively (73.4% total).

The Canada Mortgage and Housing Corporation considers units with two or more bedrooms to be family-suitable units. These

larger units are proportionately under-represented on STR platforms—they are 73.4% of entire-home listings, but 82.4% of total dwelling units in Charlottetown. However, they nevertheless represent a majority of the short-term rental market in Charlottetown, and thus a potential threat to the supply of family-appropriate housing in the municipality.

SEASONALITY

Short-term rentals exhibit some degree of seasonality in all Canadian markets, with a disproportionately large share of STR reservations occurring in the summer months. But Atlantic Canada in general, and Charlottetown in particular, exhibit very high levels of seasonality. Controlling for underlying growth trends, 70.8% of reserved nights and 75.3% of host revenue in Charlottetown occur between May 1 and September 30. This is the highest proportion of any of the top 40 urban markets in Canada (Figure 3). As summarized in the final column of Table 2, above, seasonality varies to some extent by ward, with Belvedere displaying the least seasonal variation (63.9% of reservations in May through September) and Falconwood the highest (89.9% of reservations in May through September), although the underlying volumes of activity are low enough that these differences are not highly significant.

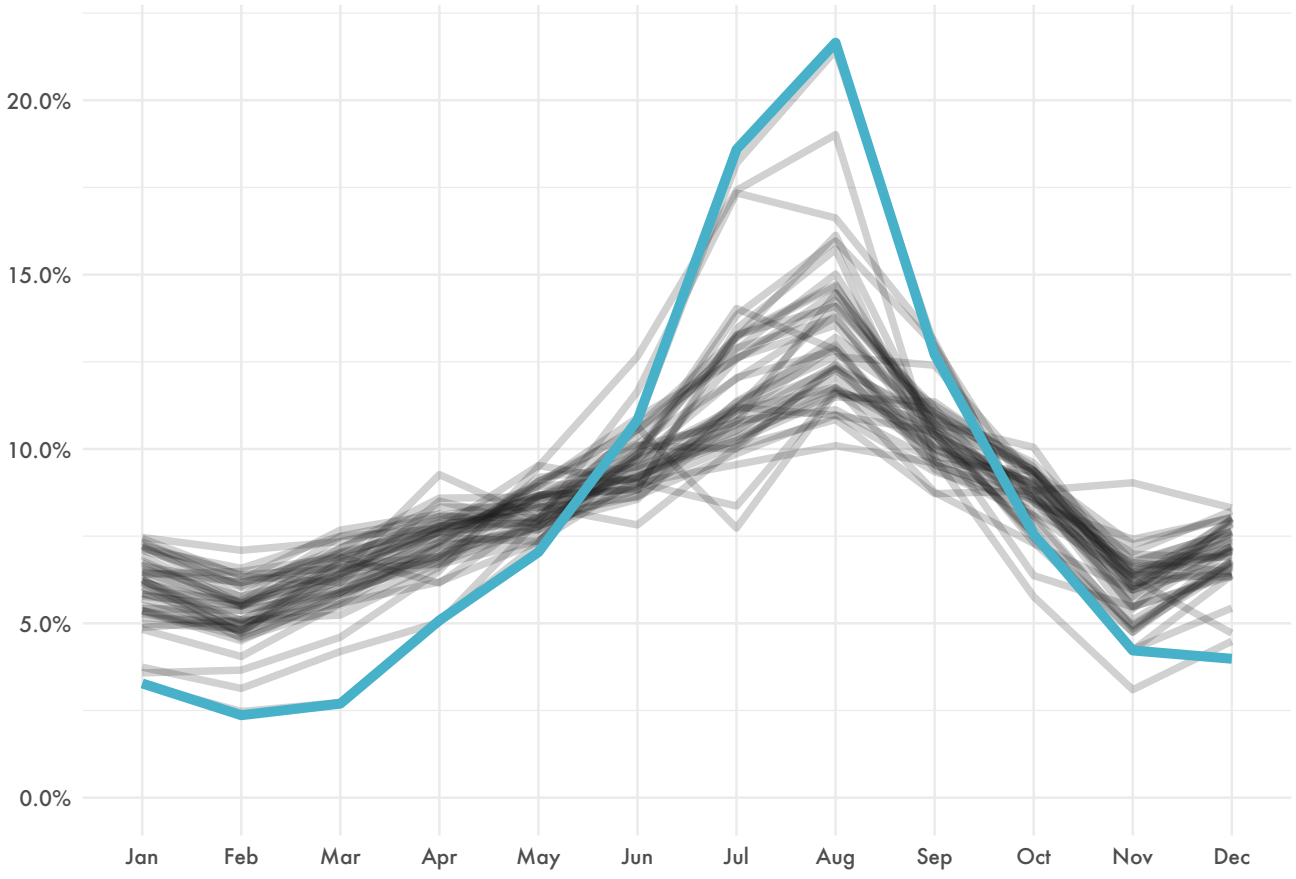

Figure 3: Percentage of growth-adjusted STR reservations occurring each month in Charlottetown (highlighted) and other major Canadian markets

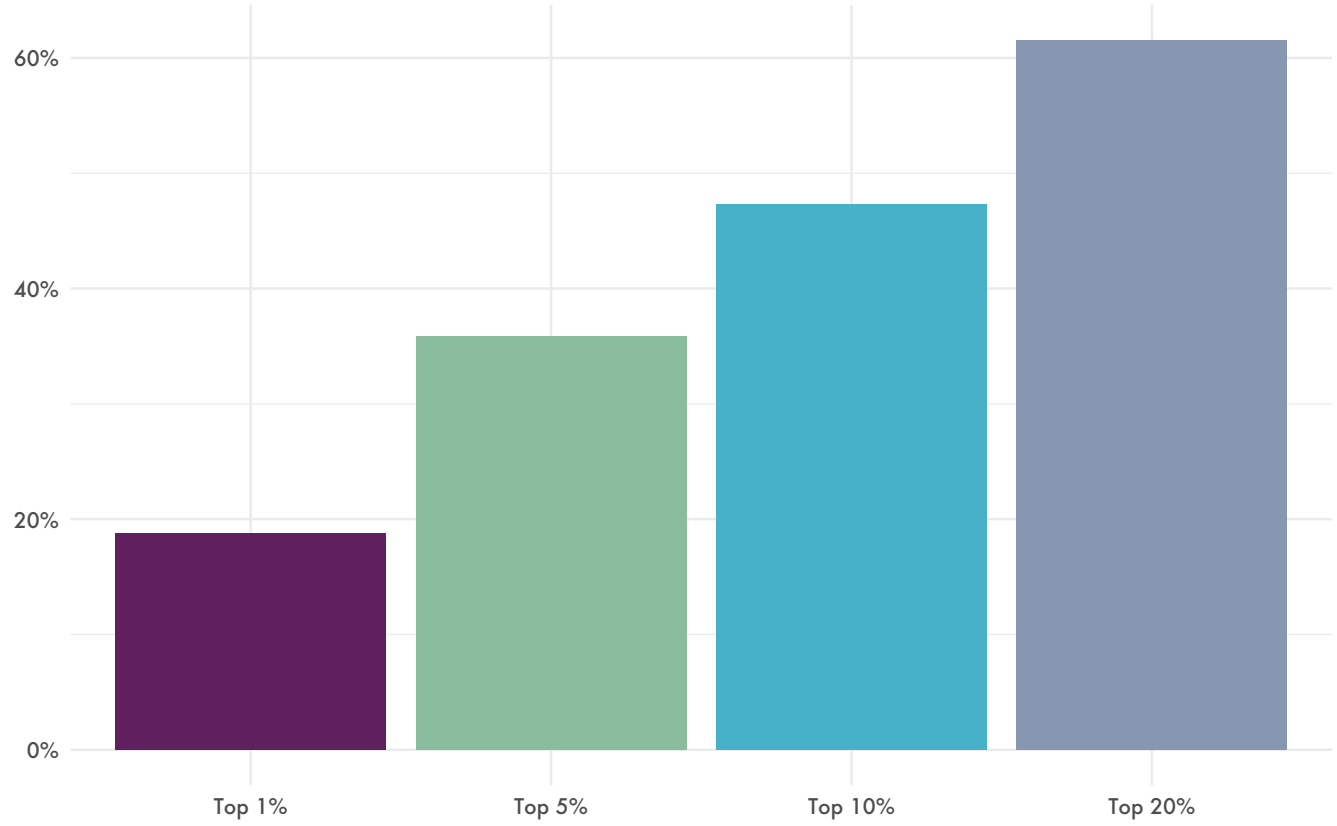

Figure 4. STR host revenue distribution in the City of Charlottetown

REVENUE DISTRIBUTION

A crucial distinction for understanding the structure of an STR market is the distinction between casual STRs ("home-sharing") and dedicated STRs ("commercial operations"). There are multiple ways to capture this distinction, and we examine it in more detail in subsequent pages, but one way is to examine the distribution of revenue among STR hosts. Is revenue widely distributed between many part-time hosts of single listings, or concentrated among a small number of commercial operators who control many full-time listings?

Figure 4 shows the percentage of the total $8.5 million in STR revenue last year which accrued to the top twenty percent, ten percent, five percent and one percent of Charlottetown hosts. More than one third (35.9%) of all revenue last year was earned by just one in twenty hosts, and the most successful ten percent of hosts earned nearly half (47.3%) of all STR revenue. As Table 5 shows, the median host revenue in Charlottetown last year was $19,300, while the top earning host earned almost $440,000.

Host percentile	Annual revenue
25th percentile	$9,000
50th percentile (median)	$19,300
75th percentile	$34,000
100th percentile	$439,700

Table 4. Charlottetown STR host earnings

2. Housing market impacts

Charlottetown's rental market is one of the tightest in the country, with a 1.2% rental vacancy rate. STRs took an average of 138 housing units off the rental market in 2019—a number which rose to 193 during the summertime. This is a 99% increase over the past two years, and approximately three times the vacant and available for rent units available during 2019. We estimate that STRs are responsible for more than a third of all rent increases in the city in the last three years—an average of $292 per renter. Taking into account a large amount of new housing construction, we expect the rental vacancy rate to rise to 2.0% by 2022, although we estimate the vacancy rate would be 4.1% in the absence of dedicated STRs.

CHARLOTTETOWN HOUSING CONTEXT

The Charlottetown housing market has been under considerable stress in the last several years. In 2018, the city had the lowest rental vacancy rate in the entire country (0.2%), and while the vacancy rate has increased somewhat in 2019, it remains in the bottom five nation-wide (1.2%), while rent increases have threatened Charlottetown's status as one of the country's most affordable cities.

As of the 2016 census, Charlottetown had just under 17,200 dwellings. Extrapolating from housing completion data from CMHC, which shows that around 550 new units were completed between 2017 and 2019, the number of dwellings has increased since then by 3.2%, to approximately 17,750. Additionally, City permitting data shows that the City of Charlottetown saw 1,165 new housing unit starts between 2017 and 2019, with most of these starts occurring in 2018 and 2019 (see Table 5). This implies a relatively rapid increase in units over the next several years, as these approved projects are completed.

Year	Total units (starts)	Rental units (starts)
2015	410	259
2016	282	190
2017	182	75
2018	150	75
2019	135	67
Total	*1,159*	*666*

Table 5. Charlottetown housing starts

A significant and growing share of housing in Charlottetown is rental housing. As of October 2019, there were 4,918 "primary" rental housing units—apartments and townhouses—in the city of Charlottetown, which is nearly 30% of all units. Many Charlottetown families also live in "secondary" rental units, which include rented condominiums and secondary suites, but which are not tracked in CMHC's annual data. The primary rental stock has been growing substantially faster than the rest of the city's housing—it increased by 3.0% from 2018 and by

6.2% since 2014. Furthermore, three in five housing completions (61.6%) and housing starts (59.9%) between 2017 and 2019 were intended for the primary rental market, which implies a further shift in the Charlottetown housing market toward rental units.

This expansion in rental housing comes in the face of extremely challenging circumstances for Charlottetown renters. In the last decade, Charlottetown's rental vacancy rate peaked at 7.9% in 2013, but then dropped steadily until 2018. In October 2018, the city had the lowest rental vacancy rate in all of Canada, at 0.2%. Given the size of the city's rental market, this means that there were close to zero apartments available for anyone in the city trying to find one. This is a clear sign that there was not enough rental housing available to meet the demand coming from existing residents and newcomers to the Island. The vacancy rate has since increased to 1.2% in October 2019—a sharp increase in a single year, but still far below the 3% vacancy rate which is considered an absolute minimum for a healthy rental market. Charlottetown currently has the fifth lowest vacancy rate of any Canadian city, after Victoria (1.0%), Halifax (1.0%), Vancouver (1.1%), and Abbotsford (1.1%). There are 11 total cities with vacancy rates under 2%, out of the 37 cities (those with populations over 10,000) surveyed.

Thanks to these tight rental market conditions, rents in Charlottetown have increased substantially in the last several years. The average monthly rent across all apartment types increased 1.8% from October 2018 to October 2019, from $885 to $901. Furthermore, rents have increased 13.6% since 2014, when the average rent was $793. The average rent for a two-bedroom apartment is now $937, an increase of 2.9% from 2018. However, in comparative terms Charlottetown remains relatively

affordable; in 2019, Charlottetown had the 9th lowest average rent (for a two-bedroom apartment) of all 37 Canadian cities with populations over 10,000. All cities with lower rents were in Quebec and New Brunswick. Trois-Rivières had the lowest average rent, at $625, while Vancouver had the highest, at $1,748. Additionally, the average two-bedroom rent rose slower than the national average rate, which was 3.9% between 2018 and 2019. Of the 37 cities included in CMHC's dataset, 11 had smaller rates of rent increases, while 25 had higher rates of increase; Windsor, Sudbury, and the Ontario side of Ottawa-Gatineau all saw rents rise about 8% in 2019.

STR-INDUCED HOUSING LOSS

One of the most important considerations when gauging the impacts of STRs on a city is the extent to which STRs are removing long-term housing from the market. This process can occur either directly, where tenants are evicted or not replaced at the end of a lease, or indirectly by absorbing new construction or existing investment properties which otherwise would have gone onto the long-term market. To obtain a precise number of such cases of housing loss, STR hosts would need to be individually surveyed, which is infeasible because hosts are anonymous on the Airbnb and HomeAway platforms. The Host Compliance data, while providing identifiable host information for almost half of its listings, does not identify the hosts of every property.

One reasonable proxy for STR listings which represent long-term housing loss is commercial operations which are not operated out of a host's principal residence. These are discussed in more detail in the next section. Another method, arguably simpler, is to identify listings which are highly available throughout the year and which receive many bookings. Along these lines, we define frequently rented entire-home (FREH) listings as entire-home listings which were available on Airbnb or HomeAway a majority of the year (at least 183 nights) and were booked a minimum of 90 nights. Except in rare cases of residents who travel most of the year, it would be very difficult for someone to rent their home as an STR for the majority of the year and still actually live there. On September 1st, 2019 there were 111 FREH listings in Charlottetown. These listings are what the advocacy group Fairbnb has called "ghost hotels"—entire homes converted to dedicated STR operations. Each of these dwelling units could be housing Charlottetown residents, but instead, are serving as de facto hotels.

These 111 FREH listings are a good starting point for estimating housing loss caused by conversions to STR. However, it is also possible that private-room listings are contributing to housing loss, as a full-time private-room STR might have otherwise been offered to a roommate on a long-term lease. Additionally, it is also possible that entire housing units have been subdivided into multiple private-room listings. We call these "ghost hostels", in analogy to the ghost hotels discussed above. We detect ghost hostels by finding clusters of three or more private-room listings operated by a single host, whose reported locations are close enough to each other that they could have originated in the same actual housing unit. (Airbnb and HomeAway obfuscate listing locations by shifting them randomly up to 200 m.) In addition to the 111 FREH listings, we identified a further 24 housing units which had been converted into ghost hostels on September 1st, 2019.

On September 1st, 2019, we believe there were 135 housing units in Charlottetown which were being used as dedicated short-term rentals and therefore not being offered on the long-term rental market. 111 of these were frequently rented entire-home listings, and 24 were clusters of private-room

listings operating out of the same housing unit. The equivalent figure one year ago (September 1, 2018) was 124, which means that there has been an 8.9% increase in STR-induced housing loss in Charlottetown between those dates— more than the growth in total active listings in Charlottetown from 2018 to 2019 (7.8%). Taking into account seasonal fluctuations and underlying growth, the average number of housing units which we believe were converted to full-time STRs in Charlottetown was 55 in 2017, 125 in 2018, and 138 in 2019. At most point in the last three years, STR listings contributing to housing loss have grown faster than the STR market as a whole.

Because Charlottetown's STR market is highly seasonal, it may also be the case that there are STR listings which are operated full time during the summer months but not throughout the rest of the year. Some of these units might be 8- or 9-month student housing and then become converted to full-time STR in May or June, some of these units might be dedicated STRs which are simply taken off the market during the slow non-summer season, and some of these units might be the principal residence of a person or family who spend summers outside of Charlottetown. In most cases, however, units operating full time throughout the summer imply a reduction in available housing for long-term residents during that time. We therefore identify listings which are highly available and reserved in the summer months (defined here as May through September, which is when the bulk of Charlottetown's STR activity occurs), but are not otherwise counted as FREH listings. These units were available or

reserved for 120 nights or more in the May-September period, and were reserved at least 60 nights during this time. An additional 55 units were identified in 2019 as being seasonally active full time, and in 2018 and 2017 there were 50 and 42 respectively. This brings the total average summertime housing loss numbers to 97 in 2017, 175 in 208, and 193 units in 2019 (Figure 5).

To contextualize these figures, we note that in 2019 there were approximately 60 vacant rental units available for rent in Charlottetown at any given time. During the non-summer months of 2019, there were on average twice this number of full-time STRs which otherwise could be on the long-term rental market, while in the summertime this figure increased to three times the number of vacant rental units serving as dedicated STRs.

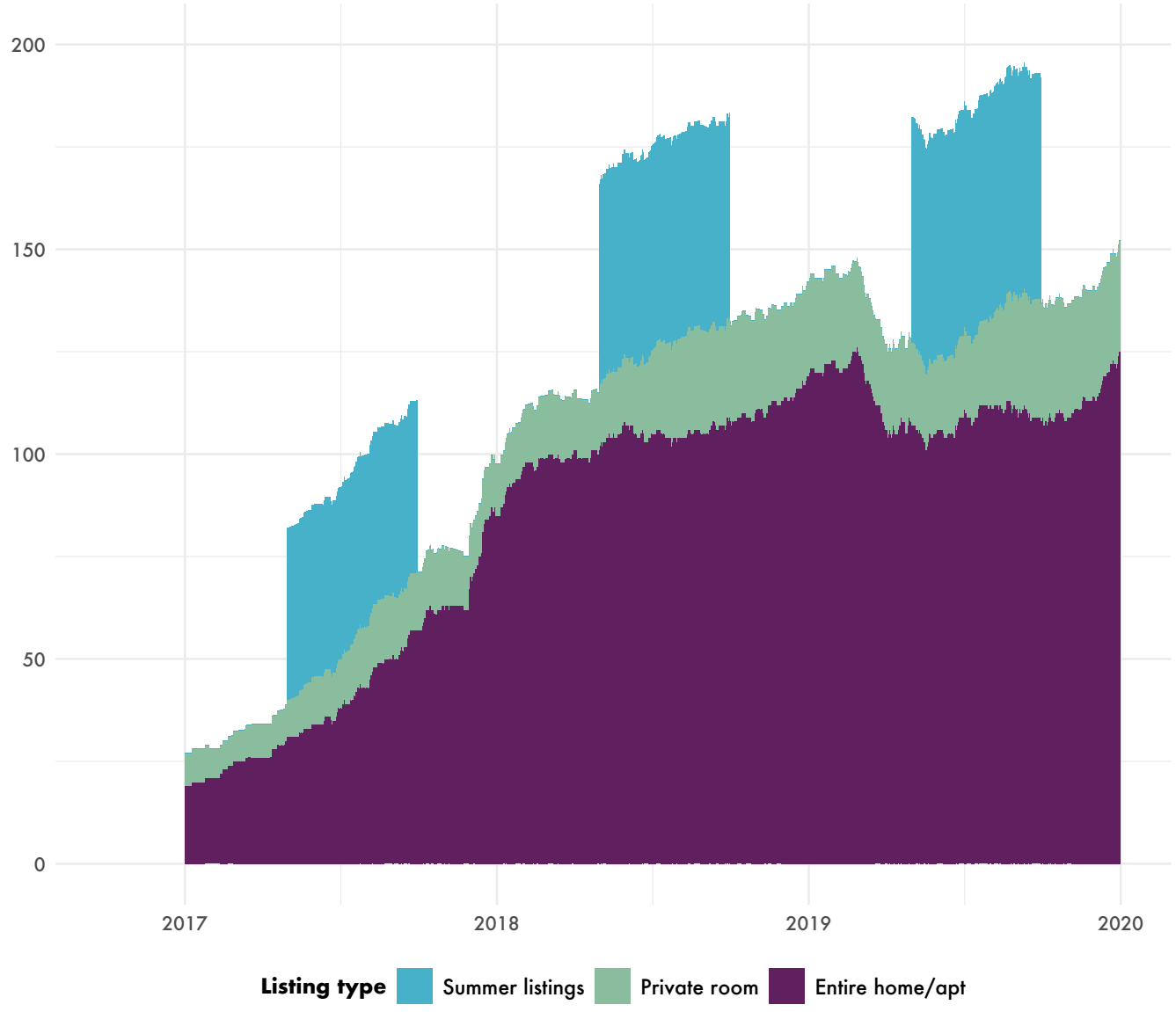

Figure 5: Housing units converted to dedicated STRs in the City of Charlottetown

RENT INCREASES

The growth of STRs in Charlottetown has effectively shrunk the size of the local rental market, by converting housing units which otherwise could house residents into tourist accommodations. And by offering a new revenue stream to homeowners and potentially some tenants who are willing to become part-time home sharers, STRs have increased the economic value of residential properties. Both phenomena would be expected to increase housing costs, since there is less available housing stock, and since the economic potential of the existing stock is increased.

No empirical research exists in a Canadian context to evaluate the impact of STR growth on housing prices or rents, but a US study[1] answered these questions through an examination of every US Airbnb listing between 2012 and 2016. This study found that a 1% growth in STR listings in a location predicts a 0.018% increase in monthly rents and a 0.026% increase in house prices. While these numbers appear small, they are being multiplied by STR listing growth rates which have been quite high, so the authors find that the growth of Airbnb is responsible for one fifth of all rent growth and one seventh of housing price growth in the United States during the study period.

Relying on the fact that this model was developed taking into account an extremely wide range of locations, we can apply the average values of their model to the Charlottetown housing market to obtain a rough estimate of the impact which STR growth in Charlottetown has had on residential rents. Doing so suggests that, over the 2017-2019 period, STRs have been responsible for a 2.8% increase in average monthly rents in the city. Since rents have risen 7.5% in Charlottetown in this time period, this implies that more than a third (37.7%) of all rent increases over the last three years have been caused by the growth of STRs. Put differently, the growth of STRs has cost the average Charlottetonian renter $292 since 2017. To be clear, this estimate comes with a high level of uncertainty, since it applies average parameters from a model developed in the United States.

CHARLOTTETOWN HOUSING MARKET TRAJECTORY

After five years of tightening, Charlottetown's rental housing market experienced a reversal in 2019, as the vacancy rate increased from 0.2% to 1.2%. This increase is attributable in large part to the city's rapid rate of rental housing completions since 2018. This raises the question of whether Charlottetown's recently positive rental market trajectory should be expected to continue, and to what extent the short-term rental market will interact with the overall housing market trajectory.

Relying on governmental data alongside our own STR data, we project three years of the Charlottetown rental market, using housing supply and demand to estimate the rental vacancy rate both in the presence and absence of regulations of STRs. We make the following assumptions:

- Rental housing demand growth remains constant. The last several years has seen occupied rental units grow by approximately 2% per year, and we assume this trend continues.
- Supply growth follows existing trends, taking into account housing market starts and CMHC's supply growth projections.

[1] Barron, Kyle and Kung, Edward and Proserpio, Davide, The Effect of Home-Sharing on House Prices and Rents: Evidence from Airbnb (January 22, 2020). Available at SSRN: https://ssrn.com/abstract=3006832 or http://dx.doi.org/10.2139/ssrn.3006832

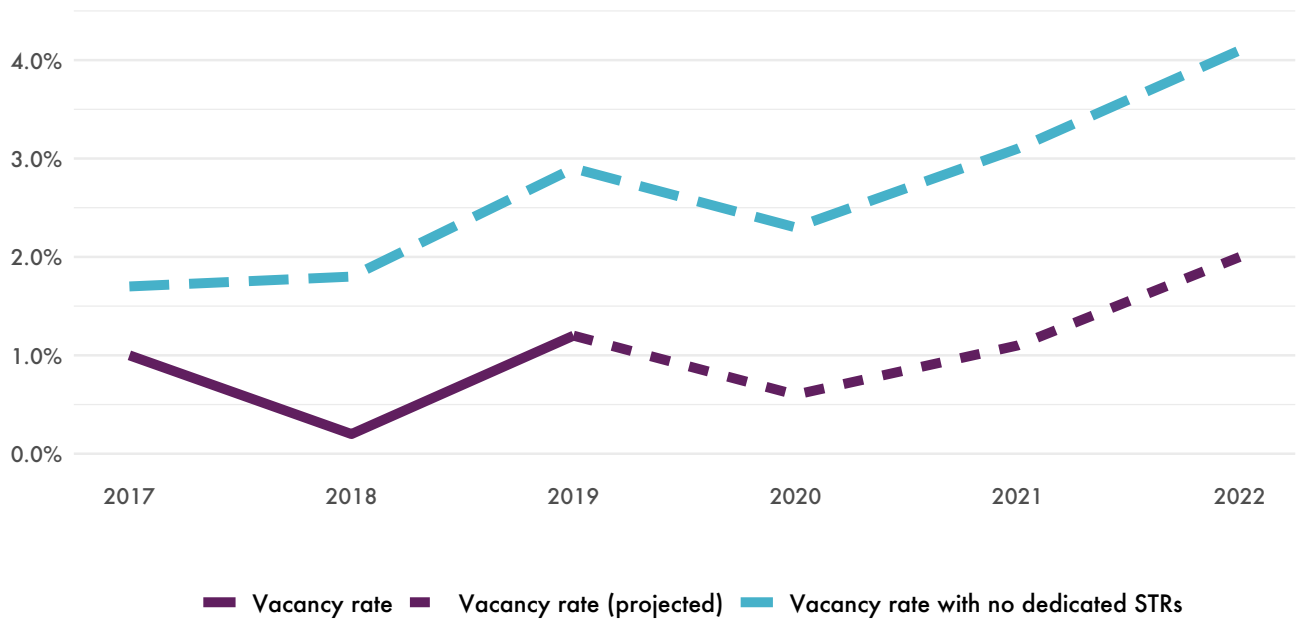

Figure 6: Actual and projected rental vacancy rates in the City of Charlottetown

- STR market growth continues along its current trajectory. The number of units converted to dedicated STRs grew approximately 10% between 2018 and 2019, and we assume that, in the absence of any regulatory intervention, this growth will continue.

- Dedicated STR units which were to be returned to the long-term housing market would enter the rental market at the same rate as new construction. Three in five new housing unit completions in Charlottetown is a rental unit, and we assume likewise that three in five dedicated STRs converted back to long-term housing would become long-term rentals.

Our projections can be found in Figure 6 and Table 6. We expect that the 2019 loosening of the rental market in Charlottetown will be partially reversed in 2020. A major cause of the loosening was the arrival of approximately 150 new rental units on the market in 2019, and we expect to see a smaller supply expansion next year (100 units), alongside a further expansion of dedicated STRs (15 units). After 2020 we expect to see a resumption of the loosening of the rental market, as the 2017-2019 boom in rental housing starts comes on to the market. We estimate that, if there were no dedicated STRs operating in Charlottetown, the city would currently be on the threshold of the 3% rental vacancy rate generally considered the minimum for a healthy rental market. Our projections suggest that, in the context of current rates of supply and demand growth, and continued expansion of dedicated STRs, the rental vacancy rate will instead remain well below 3% for the foreseeable future.

Year	Rental vacancy rate	Rental vacancy rate with no dedicated STRs
2017	1.0%	1.7%
2018	0.2%	1.8%
2019	1.2%	2.9%
2020	0.6% (projected)	2.3%
2021	1.1% (projected)	3.1%
2022	2.0% (projected)	4.1%

Table 6: Actual and projected rental vacancy rates

3. Home sharers and commercial operators

Approximately half of Charlottetown STR listings are "multilistings", which means they are operated by hosts who operate two or more entire-home listings or three or more private-room listings. We estimate that 46% of listings are not being operated out of their hosts' principal residences, and that these commercial operations were responsible for 60% of STR nights reserved in 2019.

MULTILISTINGS AND PRINCIPAL RESIDENCES

An important distinction for understanding the structure of an STR market is the distinction between casual STRs ("home sharing") and dedicated STRs ("commercial operations"). We previously examined revenue distribution among STR hosts as one way to identify commercial operators, but a more direct method is to find hosts who operate multiple listings. To take the simplest case, by definition a host with two or more entire-home listings cannot be operating both listings out of their principal residence.

We therefore define a "multilisting" as any listing operated by a host who is simultaneously operating other listings in such a manner that the listings cannot all be located at the host's principal residence. If a host has two or more entire-home listings active on the same day, those are multilistings. We likewise identify private-room multilistings in cases where a host has three or more private-room listings operating on the same day. Since 87% of entire-home listings have three or fewer bedrooms, there will be extremely few cases where a host operating three private-room STR listings in a dwelling unit has not converted that unit into a dedicated STR operation.

On September 1, 2019, 51.6% of active listings in Charlottetown were multilistings, and these listings earned 54.6% of total host revenue. Figure 7 demonstrates that half of both active listings and host revenue in Charlottetown belonged to multilistings in 2019, and that both of these proportions have increased since 2017. These figures should be taken as absolute minimums, since many commercial operators split their listings across several Airbnb or HomeAway accounts, and their listings would therefore be erroneously counted as non-commercial. Moreover, many STR commercial operators only operate a single listing, but operate it on a full-time basis. A house owner with a secondary suite, or the owner of an investment condo who operates an STR in it, are clearly commercial operators running listings which are not their principal residences, but they would not be counted by this method.

HOW MANY STR LISTINGS ARE OPERATED OUT OF A PRINCIPAL RESIDENCE?

We additionally calculated a principal residence field in order to identify those listings which are or are not operated in their hosts' principal residence, and therefore, may not be caught with the multilisting distinction described above. Principal residence status is estimated based on listing type, as well as how frequently the listing is rented and if it also a multilisting or not. Entire-

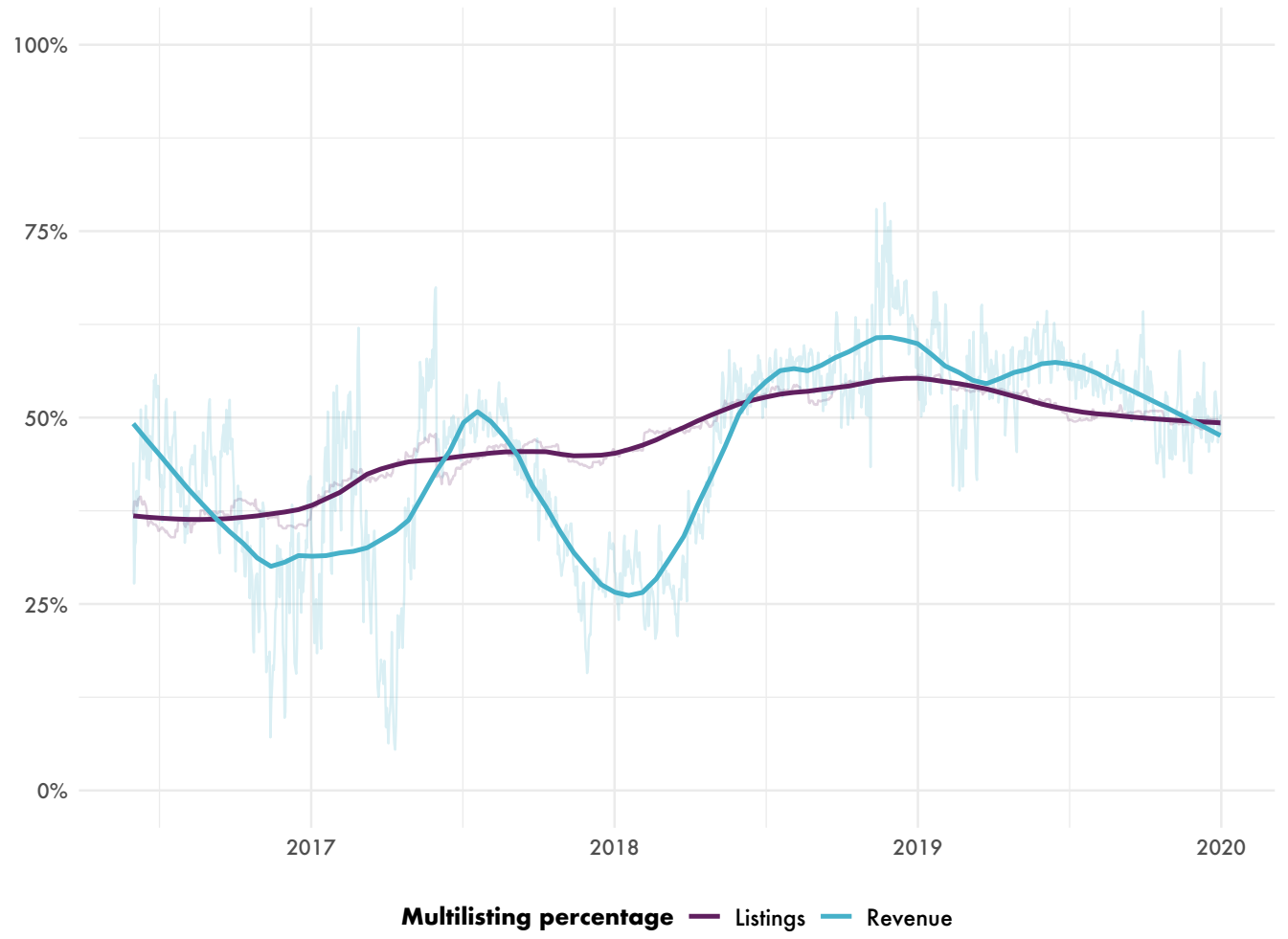

Figure 7. The percentage of total listings and revenue accounted for by multilistings in Charlottetown

home multilistings will, with one important exception, by definition violate the principal residence requirement, since a person cannot claim multiple homes as their principal residence. Of the 635 STR listings active on September 1, 2019, there were 261 entire-home multilistings. However, it is possible that a host rents out their own principal residence occasionally while also operating additional entire-home listings, so we conservatively assume that the least frequently rented entire-home multilisting is in fact the host's principal residence. We then add the FREH listings which were not already included in the list of multilistings and the private-room listings located in ghost hostels. In total, of the 635 active STR listings on September 1, 2019, 342 (53.9%) listings were likely operated in their hosts' principal residences. This means that just under half (46.1%) of listings active on that date were operated out of non-principal residences. The revenue earned from those listings in 2019 totalled $5.1 million—60% of total host revenue. Figure 8 shows the location of STR listings in Charlottetown by principal residence status. It demonstrates that principal residence STRs tend to be located throughout the city, while non-principal-residence listings are more heavily concentrated in and around the 500 Lot Area.

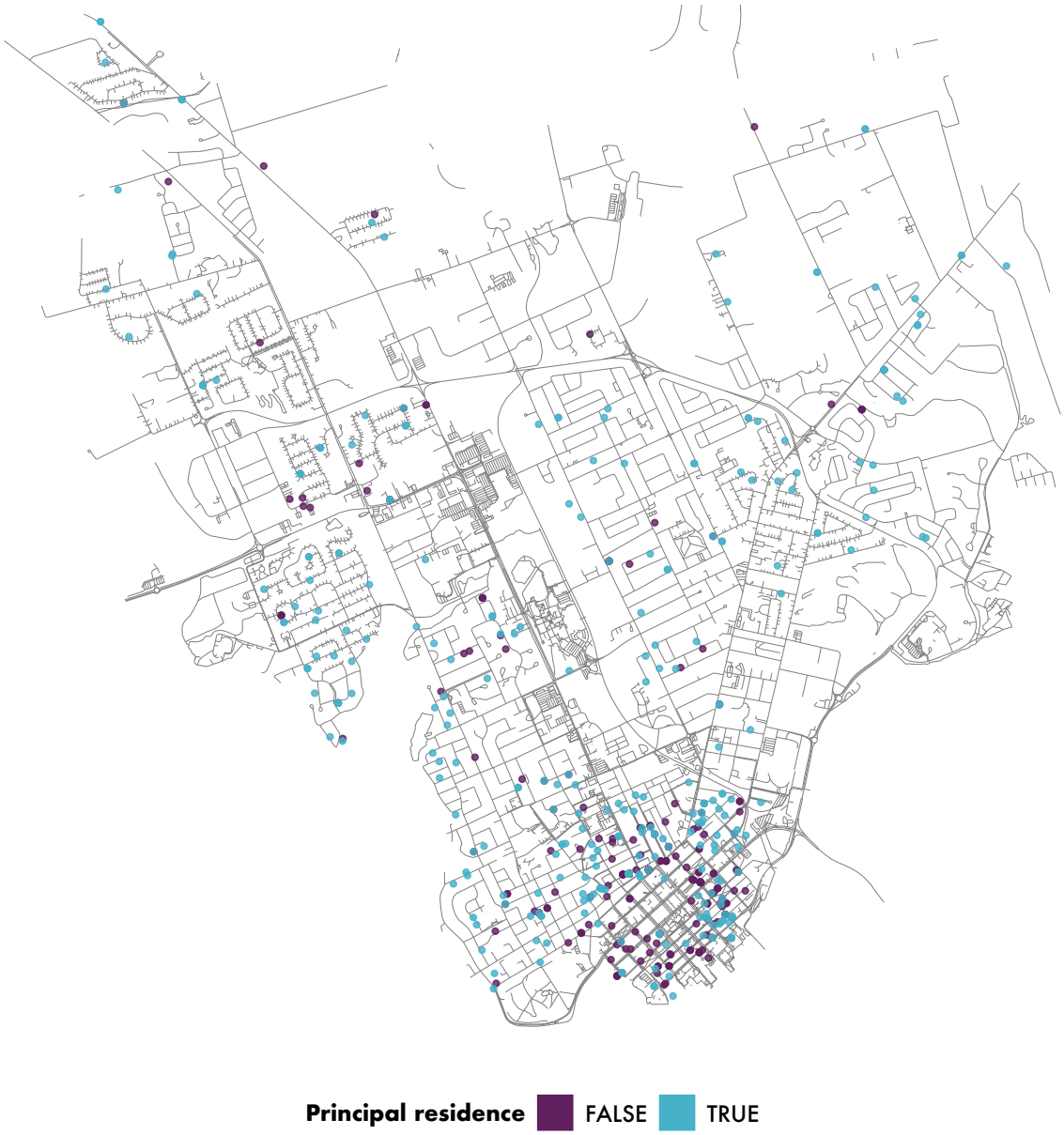

Figure 8. The location of Charlottetown STRs by principal residence status

HOW MANY NIGHTS ARE BOOKED IN PRINCIPAL RESIDENCE LISTINGS?

While we believe that most active STR listings in Charlottetown are being run in the host's principal residence, commercial operations are, by their nature, likely to be booked more frequently. In fact, while principal residence listings were 59.6% of all the listings active at any point during 2019, they only were responsible for 40.9% of reserved nights during the year. These numbers have declined considerably since 2017, when principal-residence listings were 66.4% of all active listings and were responsible for 49.6% of bookings.

This trend indicates that not only has Charlottetown's STR market become increasingly dominated by commercial operators over time, but also that there is recent historical precedent for the market hosting proportionately more home sharers than is currently the case.

4. Regulatory scenario modelling

We evaluate five scenarios for regulating STRs in Charlottetown, which range from banning all non-principal-residence and apartment listings to limiting non-principal-residence listings to commercially and mixed-use zoned neighbourhoods. The scenarios would permit between 48 and 61% of current listings to continue to operate unimpeded, would return between 50% and 90% of lost housing units to the long-term market, and would all significantly improve the rental vacancy rate. To address the possible STR supply shortfall which would result from each of the scenarios, 219 to 306 new listings and 22.4 to 30.0 additional nights booked per listing, would be required if the City achieved 100% regulatory compliance. Those ranges fall to 104-144 listings and 11.5-15.6 nights for a compliance rate of 50%.

OVERVIEW OF SCENARIOS

To aid in the development of empirically informed policy development, we now model the impacts of five different scenarios for regulating STRs in Charlottetown. These scenarios combine different approaches to allowing or restricting STRs based on whether they are operated in a host's principal residence, based on the building type (house or apartment), and based on the land-use zone where the listing is located. The five scenarios are:

1. Permitting STRs in any principal residence except apartments, with no allowance for commercial STRs.
2. Permitting STRs in any principal residence including apartments, with no allowance for commercial STRs.
3. Permitting STRs in any principal residence except apartments, and only allowing commercial STRs in zones that permit a hotel or hostel.
4. Permitting STRs in any principal residence including apartments, and only allowing commercial STR in zones that permit a hotel or hostel.
5. Permitting STRs in any principal residence including apartments, and only allowing commercial STR in zones that permit a hotel or hostel, as well as the Downtown Mixed Use Neighbourhood (DMUN) Zone.

These scenarios generally range from more restrictive (Scenario 1) to less restrictive (Scenario 5), and each imply different impacts on STR supply and the Charlottetown housing market. The spatial impact of the scenarios, with the location of active STR listings shown for reference, is indicated in Figure 9.

Before evaluating the possible future impacts of the five scenarios, we begin by specifying how they would affect currently active STR listings. Table 7 shows the percentage of active listings on September 1, 2019 which would continue to be permitted in each scenario, as well as the percentage of all nights reserved in 2019 which occurred in listings permitted in the scenario.

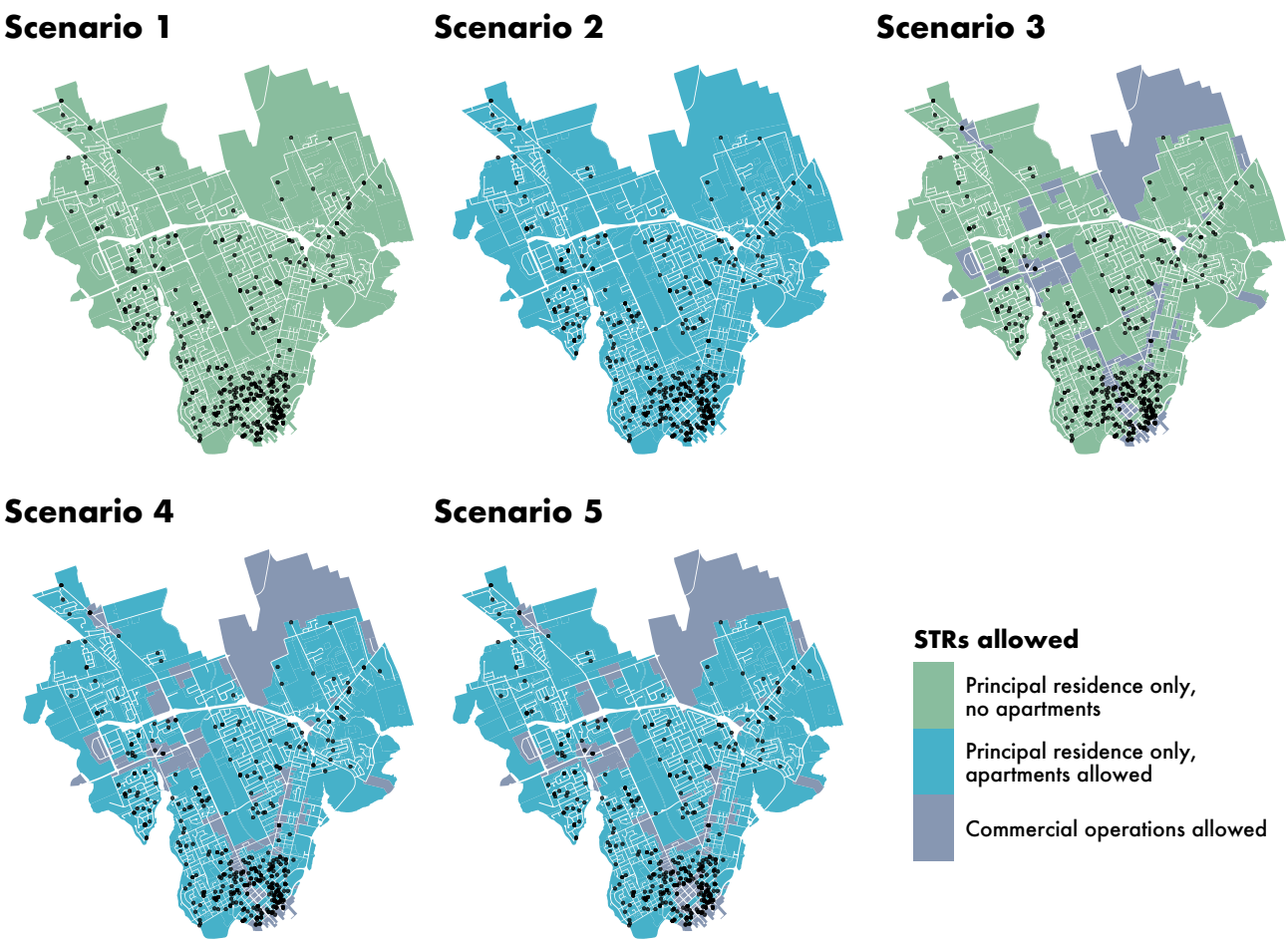

Figure 9. STRs allowed in Charlottetown under five regulatory scenarios

Scenario	% of current active listings which would still be allowed	% of 2019 reserved nights which would have been allowed
Scenario 1: Principal residence only, no apartments	47.6%	34.8%
Scenario 2: Principal residence only, apartments allowed	53.9%	39.8%
Scenario 3: Principal residence only, no apartments, but commercial zones allowed	52.4%	40.3%
Scenario 4: Principal residence, apartments allowed, and commercial zones allowed	57.3%	44.1%
Scenario 5: Principal residence, apartments allowed, commercial and DMUN zones allowed	60.9%	49.2%

Table 7. Percentage of existing listings and booking which would be permitted under five regulatory scenarios

The regulatory scenarios produce a range of outcomes with respect to how much of the current STR market would be allowed to continue to operate. However, all scenarios imply fairly large portions of current STRs being disallowed—between 39.1% and 52.4% of listings, which accounted for between 50.8% and 63.2% of nights booked in 2019. Scenario 5, which permits commercial operations in the widest area of the city and allows STRs in apartment buildings, would allow for the highest percentage of listings to continue to be permitted (60.9%, or 387 of the active listings on September 1), while Scenario 1, which prohibits all commercial operations and additionally prohibits listings in apartment buildings, would permit the fewest (47.6%, or 302 of the active listings on September 1).

One reason the scenarios all produce fairly similar results in terms of their impacts on the current STR market is that relatively few listings currently operate in zones which would allow commercial operations in some of the scenarios (see Figure 9, above). Even though the density of non-principal-residence listings is higher in commercially zoned areas than in other areas of the same wards (see Figure 10 below, for more analysis), these zones are relatively circumscribed, and so a majority of existing listing operate in zones which would allow STRs only in principal residences (apartments or no apartments). Therefore, allowing commercial STR operations in commercial zones would have a noticeable but not major impact on existing STRs. As we explore below, however, allowing commercial operations in parts of the city with currently low numbers of STRs would have more significant impacts on how the STR market would evolve in the future under different regulatory scenarios.

HOUSING MARKET IMPACTS

We estimated above that in 2019 an average of 138 housing units were serving as dedicated STRs and thus had been removed from the long-term housing market. Each of the five regulatory scenarios would have an impact on those units, since each is a commercial operation which would only be permitted in specific locations under specific scenarios.

Under scenarios 1 and 2, no commercial operators would be permitted in Charlottetown, so the entire remaining STR market would be served by home sharers offering listings in their principal residence. Below we model how the supply of short-term rentals could be expected to change under such circumstances. However, under scenarios 3 through 5, commercial operations

Figure 10. The percentage of units in residential and commercial zones converted to dedicated STRs

Ward	Dedicated STRs as % of housing in residential zones	Dedicated STRs as % of housing in commercial and DMUN zones
Beach Grove	0.1%	1.0%
Belvedere	0.1%	0.7%
Brighton	0.1%	3.7%
Falconwood	0.1%	3.0%
Highfield	0.1%	0.6%
Mount Edward	0.1%	2.4%
Queen Square	0.1%	0.2%
Spring Park	0.1%	0.2%
St Avards	0.1%	0.3%
Stonepark	0.1%	0.1%

Table 8. The percentage of units in residential and commercial zones converted to dedicated STRs

would be permitted in specific parts of the city which are zoned to allow hotels and hostels (all three scenarios) or which are part of the Downtown Mixed Use Neighbourhood zone (scenario 5). Under these scenarios, we expect a proportion of commercial STR operations previously operating in areas where they would now be prohibited to relocate to the allowed areas. (In some cases existing proprietors might purchase or rent new units to replace their old ones, and in other cases new proprietors would enter the market to meet the new demand.) Figure 10 shows the percentage of housing which has been converted to dedicated STRs in the commercially zoned and non-commercially zoned areas of each ward. In each case, commercially zoned areas have higher rates of conversion to dedicated STRs. (Totals for each ward are summarized in Table 8.) This figure includes the DMUN zone, corresponding to scenario 5, but the results are the same under the slightly more restrictive conditions of scenario 3.

For the purposes of assessing housing market impact, we here make the assumption that commercial operations would relocate from the prohibited to the allowed portions of each ward, until the commercially zoned areas of each ward eventually host 50% more commercial operations than they currently do, in per-dwelling terms. In effect, we assume that there exists additional capacity for dedicated STRs in commercially zoned areas, and that prohibiting dedicated STRs elsewhere in the city would incentivize the activation of this capacity. (We apply the same calculations to the intensive summer listings which are operated through the summer high season but not otherwise year round.)

Incorporating this assumption, our analysis finds that the different regulatory scenarios could be expected to return between 50 and 90 percent of dedicated STRs to the long-term housing market. Scenario 1 would return the highest percentage of rental units converted to STRs in 2019 back to the housing market (90.3% or 125 units), followed by Scenarios 2 (88.4% or 122 units), 3 (63.0% or 87 units), and 4 (62.3% or 86 units). Scenario 5 would return the lowest percentage (50.0% or 69 units) dedicated to STR in 2019 back to the market. Because private-room ghost hostels are by definition commercial operations, they would only be allowed to operate in the appropriate zones under scenarios 3, 4 ,and 5 (12, 12, and 13 respectively). An additional 55 units were identified as operating as seasonal full-time STRs between May 1 and September 30. Under the five scenarios, the number of those seasonal full-time units that would return to the long-term market ranges from 17 units (30.9%) under Scenario 5 to 39 units (70.9%) under Scenario 1 (Table 9).

Although scenarios 1 and 2 prohibit all commercial operations, our analysis shows small percentages of dedicated STRs continuing to operate under these scenarios. This reflects the fact that our estimates are based on the long-term trajectory of listings on the market, which in some cases are being rented casually for a stretch of months and then switch to full time for another stretch of months. The 9.7% of dedicated STRs that we estimate would remain on the market even under scenario 1, where all commercial operations are prohibited, thus recognizes the fact that individual listings will in some cases exhibit activity patterns that strongly resemble dedicated STRs (and thus remove housing from the long-

Scenario	**Housing units returned to the long-term market (% of total)**	**Summer units returned to the long-term market (% of total)**
Scenario 1: Principal residence only, no apartments	125 (90.3%)	39 (70.9%)
Scenario 2: Principal residence only, apartments allowed	122 (88.4%)	36 (65.5%)
Scenario 3: Principal residence only, no apartments, but commercial zones allowed	87 (63.0%)	30 (54.5%)
Scenario 4: Principal residence, apartments allowed, and commercial zones allowed	86 (62.3%)	28 (50.9%)
Scenario 5: Principal residence, apartments allowed, commercial and DMUN ones allowed	69 (50.0%)	17 (30.9%)

Table 9. Housing units returned to the long-term market under five regulatory scenarios

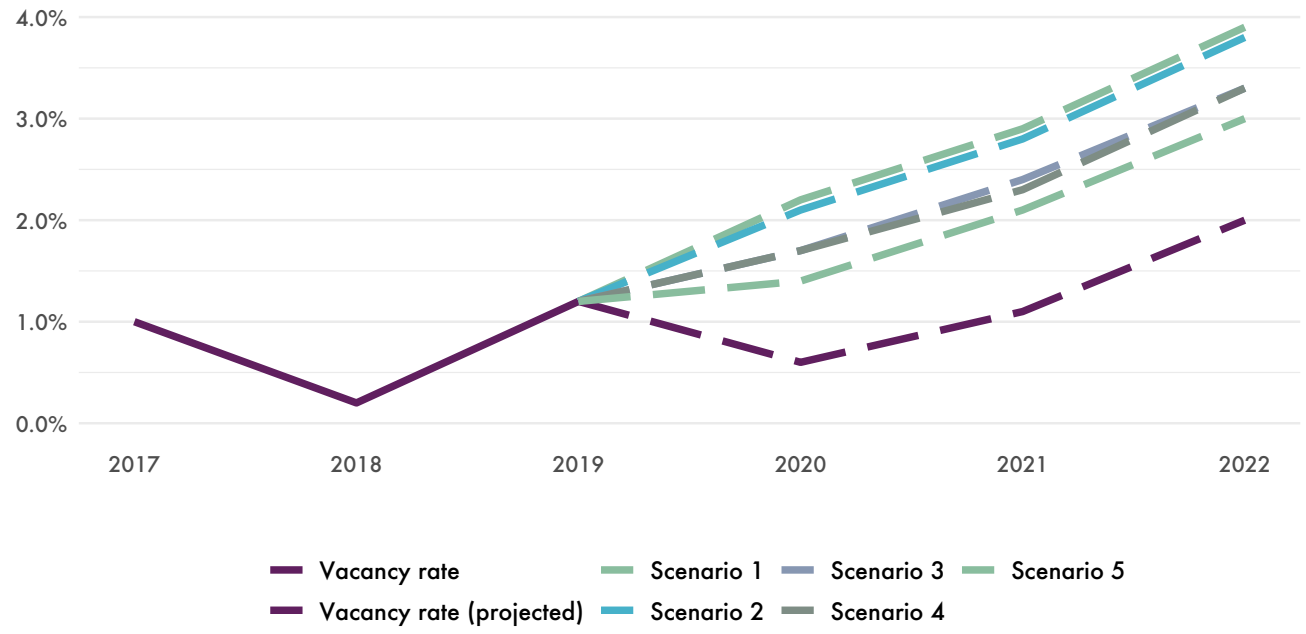

Figure 11: Actual and projected rental vacancy rates under five regulatory scenarios

Year	Rental vacancy rate (baseline)	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
2017	1.0%	-	-	-	-	-
2018	0.2%	-	-	-	-	-
2019	1.2%	-	-	-	-	-
2020	0.6% (projected)	2.2%	2.1%	1.7%	1.7%	1.4%
2021	1.1% (projected)	2.9%	2.8%	2.4%	2.3%	2.1%
2022	2.0% (projected)	3.9%	3.8%	3.3%	3.3%	3.0%

Table 10: Actual and projected rental vacancy rates under five regulatory scenarios

term market) even when they are being operated by the legal principal resident.

In Section 2, we presented two projections for the rental vacancy rate in Charlottetown—one under business as usual, and one where all dedicated STRs were removed from the market. We now supplement that table by estimating the trajectory of the rental vacancy rate under the five regulatory scenarios (Figure 11 and Table 10). As with the vacancy rate estimations above, these numbers reflect a high level of uncertainty about the underlying trends (e.g. the local economy could go into recession, or international immigration could experience a renewed boom), and thus should be treated as points of comparison to evaluate the relative impacts of the different scenarios, as opposed to definitive statements of how Charlottetown's housing market will evolve over the next several years.

STR SUPPLY IMPACTS

Each of the five regulatory scenarios we are exploring implies the removal of a substantial number of existing STR listings, because they are non-principal-residence operations, because they are located in an apartment building, or because they are not in a commercially zoned area of the city. It is important to explore, therefore, the extent to which the remaining portions of the market would be able to meet tourism demand if non-conforming listings were taken offline.

To begin with, we can estimate the potential shortfall in supply which would result from a large number of listings being removed from the market. In 2019 there were 56,700 nights reserved on STR platforms in Charlottetown housing units, split between the 834 listings which were active at some point in the year. If each of the five regulatory scenarios had been active through 2019, a portion of those listings would not have been permitted to operate, and therefore a portion of reserved nights would not have been able to occur. The precise numbers are 36,400 (scenario 1), 33,500 (scenario 2), 33,500 (scenario 3), 31,200 (scenario 4), and 28,400 (scenario 5). These figures are expected shortfalls in STR reservation nights, assuming that no changes in the activity of remaining listings occur, and that new STR listings are established to take advantage of the decrease in supply. Both of these assumptions are of course highly unrealistic, but point to two possible ways that the STR supply shortfall would be addressed.

For remaining hosts to make up the shortfall with no new hosts being added, the remaining listings would each need to increase their annual nights booked. The number of average nights booked in 2019 among listings which remain legal under the five scenarios varies between 46.2 (scenario 1) and 52.1 (scenario 5). Taking into account the total 2019 shortfall, existing hosts would each need to add between 52.4 (scenario 5) and 83.2 (scenario 1) additional booking nights on average.

The fact that remaining listings would need to at least double their annual nights booked to make up the potential shortfall in STR supply indicates that, on its own, this is not a plausible route to the shortfall being addressed. Most obviously, if existing listings increase their average annual nights booked to over 120 nights, they would reach a status of full-time activity that would be inconsistent with their being operated by a principal resident. Another possibility is that new listings will be created to make up the shortfall. If new listings were added at the same average number of nights booked per listings as the

Scenario	Annual shortfall of reserved nights	Remaining listings	Avg. nights booked per listing	Avg. increase in nights booked required to fill shortfall (% increase)	New listings required to fill shortfall (% increase)
Scenario 1	36,400	438	46.2	83.2 (180.1%)	788 (180.1%)
Scenario 2	33,500	497	46.6	67.4 (144.6%)	719 (144.6%)
Scenario 3	33,500	469	49.4	71.4 (144.5%)	678 (144.5%)
Scenario 4	31,200	519	49.1	60.1 (122.4%)	635 (122.4%)
Scenario 5	28,400	542	52.1	52.4 (100.6%)	545 (100.6%)

Table 11: Actual and projected rental vacancy rates under five regulatory scenarios

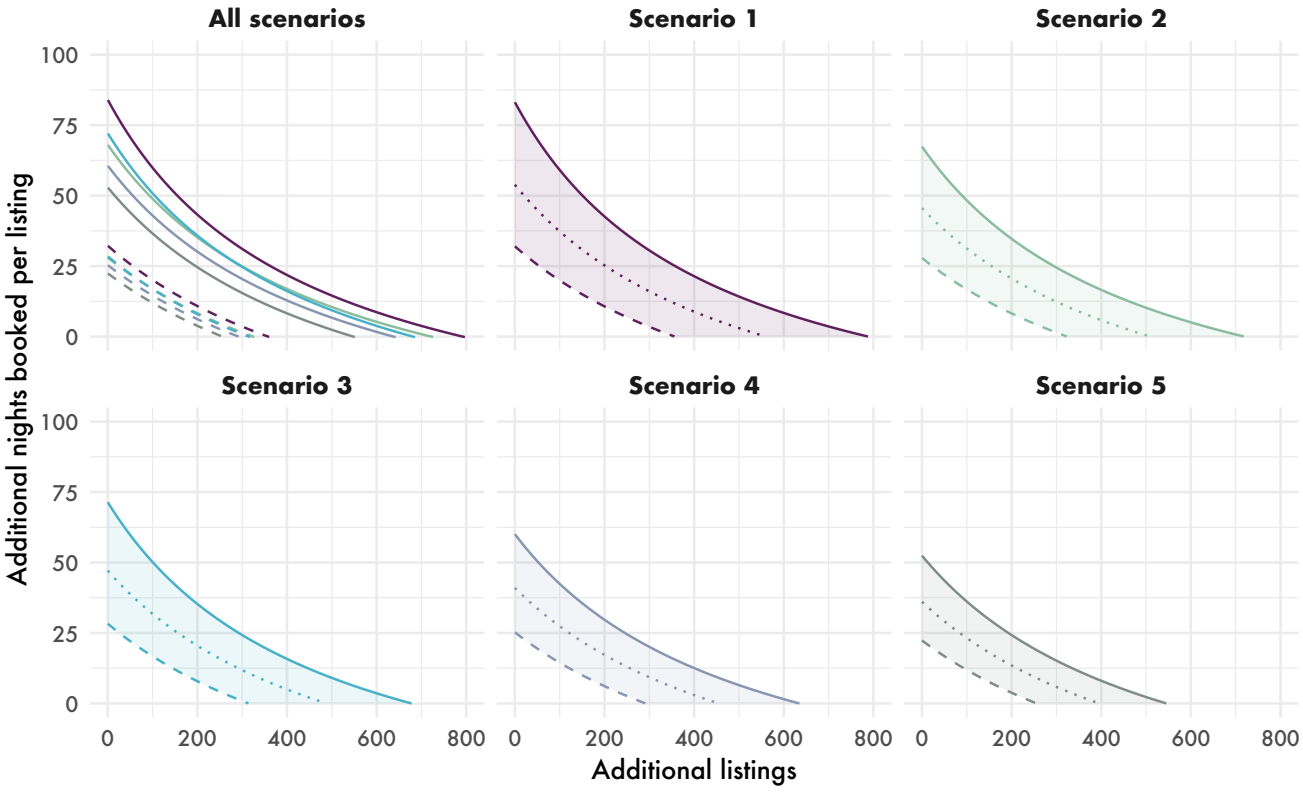

Figure 12: Additional listings or nights booked needed to make up STR supply shortfall under five scenarios. Solid line = 100% compliance; dotted line = 75% compliance; dashed line = 50% compliance

remaining listings under each scenario, between 545 (scenario 5) and 788 (scenario 1) new listings would be required to address the supply shortfall. These possibilities are summarized in Table 11.

In practice, the numbers of either additional booked nights or additional new listings are relatively implausible on their own in most scenarios; a more likely outcome is that the supply shortfall is addressed through a combination of the two mechanisms. Additionally, the modelling we have done assumes a 100% regulatory compliance rate, which is highly unlikely. The City of Vancouver's STR registration system, which is highly resourced and has been a local political priority, has a compliance rate of approximately 75%. Registration schemes with minimal attempts at strict enforcement, such as the system put in place by the Province of Québec in 2015, have seen compliance rates in the single digits. If Charlottetown achieves a similar rate, the number of new listings or additional nights booked to address a supply shortfall would shrink substantially. Figure 12 shows the different combinations of additional listings, changes to average nights booked, and regulatory compliance which would address the supply shortfall under all scenarios. For each scenario, the shaded region represents combinations of additional listings and additional nights booked which would address a potential STR supply shortfall at regulatory compliance rates between 50% and 100%. The figure demonstrates that in each scenario there are modest combinations of additional listings and additional nights booked which would address the supply shortfall, particularly if the regulatory compliance rate is assumed to be less than 100%. For example, at a

	100 % compliance rate		75% compliance rate		50% compliance rate	
Scenario	**Minimal additional listings**	**Minimal additional nights booked**	**Minimal additional listings**	**Minimal additional nights booked**	**Minimal additional listings**	**Minimal additional nights booked**
Scenario 1	306	30.0	224	22.8	144	15.6
Scenario 2	267	27.6	196	21.0	128	14.1
Scenario 3	275	26.8	200	20.5	129	13.9
Scenario 4	244	25.2	179	19.1	117	12.9
Scenario 5	219	22.4	160	17.1	104	11.5

Table 12: The most efficient combinations of additional nights booked and additional listings required to make up STR supply shortfall under five regulatory scenarios at 100%, 75% and 50% compliance rates

75% compliance rate, under all scenarios the supply shortfall could be met with roughly 200 new listings and between 10 and 25 additional average nights booked.

Table 12 provides the combination which minimizes both additional nights and additional listings at 50%, 75% and 100% compliance rates for each scenario. In other words, assuming 100% compliance with scenario 1 (where all commercial operations are successfully banned—the strictest conditions we modelled), 306 additional listings and 30 additional average nights booked would together make up the supply shortfall which would otherwise result from that scenario being enacted. Likewise, assuming 50% compliance with scenario 5 (where commercial operations are permitted in many parts of the city and many non-permitted operations manage to stay in operation—the laxest conditions we modelled), 104 additional listings and 11.5 additional average nights booked would together make up the supply shortfall.

Such increases are not dramatically out of line with underlying STR growth trends in Charlottetown, particularly in the 2017-2018 high-growth period. The results of this scenario modelling thus demonstrate that there is relatively little risk of an adverse tourism accommodation supply shock occurring in the wake of stronger regulations on STRs in Charlottetown, even under the more restrictive scenarios being contemplated.

5. Host Compliance data analysis

The bulk of the analysis in this report has been conducted using a proprietary dataset combining high-frequency web scrapes of Airbnb and HomeAway performed by the consulting firm AirDNA with additional extensively customized code produced by UPGo at McGill. This fact raises the question of to what extent the City of Charlottetown will be in a position to replicate the analysis in the future, which will become particularly important in the context of enforcing future regulations. While the City does not have access to the AirDNA data used in this analysis, it does have access to an STR dataset compiled by the consulting firm Host Compliance. Accordingly, we now briefly discuss the overlap between the Host Compliance data and the UPGo/AirDNA data, and then describe which aspects of the analysis in this report could be feasibly replicated using the Host Compliance data.

LISTING COVERAGE COMPARISON

The listing coverage of the Host Compliance (HC) data and UPGo/AirDNA is very close, although the two datasets provide slightly different (and complementary) types of information about the listings they cover. The HC data provides actual street addresses for many listings and aggregates listings to individual hosts across many STR platforms, which should make it possible to identify commercial operators with a strong degree of confidence. The AirDNA data, by contrast, does not identify street addresses and is limited to Airbnb, HomeAway and VRBO, although it contains precise estimates of daily activity which make it possible to assemble a detailed analysis of, e.g., listings which are operated on a full-time basis, and to track changes over time.

The UPGo/AirDNA dataset includes 1360 properties, 927 of which had some sort of activity in 2019. (Unlike the numbers presented earlier in the report, here we include non-housing listings for the sake of comparability with the HC data.) Of

these 927 properties, 739 were uniquely listed on Airbnb, 118 were uniquely listed on HomeAway/ VRBO, and 80 were listed on both. This means that the dataset tracks 1007 online listings, which are aggregated into 927 properties.

The Host Compliance dataset contains 855 properties, 421 of which are identified as having had activity in 2019. These properties are not comparable to the UPGo/AirDNA numbers, since they aggregate all the listings which are present at a given address, while the UPGo/AirDNA dataset separates, for example, three private-room listings in a single house into three distinct entries. Disaggregated into individual listings, the Host Compliance dataset contains 1265 listings, 740 of which were active in the last year.

Of the 927 properties active in 2019 according to the UPGo/AirDNA dataset, 62 are not in the HC dataset. This means that the HC dataset has information about 93.3% of the properties tracked by AirDNA, and is missing information about the other 6.7%. Conversely, of the 421 properties active in 2019 according to the HC data, 38 are not in the AirDNA dataset. Six of these are HomeAway properties which are no longer active, and four are Airbnb properties, two of which are active and two of which are not. The remaining 28 properties are listed on non-Airbnb and non-HomeAway platforms such as Booking.com, Tripping.com, and Expedia. However, only six of these properties have identified addresses, which means that the remaining 22 may be duplicates of Airbnb or HomeAway listings in the AirDNA dataset.

In sum, the UPGo/AirDNA dataset appears to include effectively every active Airbnb or HomeAway listing in Charlottetown (99.8%), but is missing between six and 28 listings operated exclusively on other platforms. The HC dataset, on the other hand, is missing 6.7% of Airbnb and HomeAway listings, but includes a number of listings operating exclusively on other platforms. The area of overlap between the two datasets is very high, and suggests that both datasets are independently reliable.

FEASIBILITY OF REPLICATING THIS ANALYSIS WITH HOST COMPLIANCE DATA

We have conducted three types of analysis in this report: a market overview of STR listings, an analysis of the housing-market impacts of STRs, and an examination of commercial operators and home sharers, which informed the regulatory scenario modelling. Our opinion is that the HC dataset should enable the first and third of these analyses to be accurately performed.

While the HC dataset lacks the detailed activity data which we rely on for some of our more analytically intensive market overview findings, the dataset has sufficient coverage to provide a reliable overview of the extent of the STR market, and enough temporal resolution to track changes over time. The HC dataset also provides an overview of commercial operators and home sharers which is comparable to that which we obtained with AirDNA data. (For example, the HC data identifies one third of listings as commercial multilistings. Our analysis only identifies an additional 15 percent of listings which are multilistings, which means that the HC data correctly identifies the majority of multilistings.)

However, because the HC dataset lacks detailed activity data, it cannot be used to conduct adequate housing-market impact analysis. Because the proportion of active STRs which are full-time operations taking housing off the long-term market has changed over time—and might be expected to change dramatically if new STR regulations are enacted—housing impacts can only be reliably assessed through measuring the actual activity patterns of individual listings.

Finally, and perhaps most importantly, it should be feasible to monitor questions relating to the supply of STRs and their regulatory compliance in Charlottetown using the HC data. Because HC aggregates listings to hosts and gives exact addresses in some cases, it will be possible to identify a relatively high proportion of the commercial operators operating multiple non-principal-residence listings. If the City enacts a regulatory scheme which limits these listings to certain geographical areas or building types, the HC data will prove valuable for monitoring compliance.

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ABOUT UPGO

UPGo, the Urban Politics and Governance research group at McGill University, conducts rigorous, public-interest research into pressing urban governance problems—particularly those that exceed or challenge city boundaries. UPGo has published numerous peer-reviewed journal articles and policy reports on short-term rentals in cities in Canada and around the world, including "Short-term rentals in Canada: Uneven growth, uneven impacts" and "The high cost of short-term rentals in New York City". UPGo is led by Prof. David Wachsmuth, the Canada Research Chair in Urban Governance at McGill University's School of Urban Planning, and is online at upgo.lab.mcgill.ca.


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