

# AirBnB in Paris: A Case Study

## The Show

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## **Introduction**

The Travel & Tourism group has prepared a presentation that explores the question, “Does AirBnB disrupt local communities?” The Travel and Tourism group was immediately attracted to the idea of AirBnB as a topic of further exploration because AirBnB is a popular, technology and data-driven platform that has disrupted the bedrock tourism and hospitality industries. Furthermore, company data is abundant and publicly available, providing a rich resource for additional exploration. The presentation that the Travel and Tourism group has utilized Paris as a case study city. The presentation first explores the context of AirBnB tourism within Paris and then hones in to determine potential impact on the local community using the data that is publicly available by AirBnB.

## **Literature Review and Research Methods**

Prior to developing the content outline and strategy for the development of visualizations, the team conducted an extensive literature review to identify one particular article that would inspire the content of the presentation. The team settled on a Harvard Business Review article titled, “AirBnB is Facing an Existential Expansion Crisis” by Tom Slee in which Slee argues that AirBnB disrupts local neighborhoods. Slee makes the case that neighborhoods are disrupted in two ways: first, the number of rentals in proportion to the total number of residential properties has increased drastically, turning regular neighborhoods comprised of family residences into tourist districts. Second, Slee makes the point that commercial actors have moved into local communities, purchasing up multiple properties and utilizing them solely as AirBnB rental listings. As a result, the team decided to conduct an independent analysis utilizing Paris as a case study in order to examine whether or not Slee’s arguments appear to be accurate.

The team identified a number of potential sources of data that could be utilized for the presentation. The Slee article itself contains data sets for the cities of Lisbon, Portugal; Reykjavik, Iceland; and Joshua Tree, California. However, the team decided to focus on larger, more populous cities. Data sets were pulled from the AirBnB company site for Barcelona, Paris, London, Los Angeles, and New York. For each city, 4 .csv's were pulled, including information on listings, neighborhoods, and reviews. After a further review, the team decided to focus specifically on Paris as a singular case study rather than attempting a comparative study.

## **Analytical Observations**

### *Summative Overview*

The team decided to first present a summative overview of the Paris AirBnB market to provide a context for more analysis. The team discovered a number of critical insights based on this research. First, a simple time series analysis for the past three years indicated that the number of AirBnB rental properties has approximately doubled each year, from 20,000 rental listings in 2015 to over 52,000 so far in 2017. This indicates an extraordinary growth in AirBnB activity in Paris.

Next, an analysis of pricing and a text analysis of reviews revealed that location is a key factor in marketability and pricing of rental listings in the Paris market. Certain neighborhoods are valued and priced higher than other neighborhoods in Paris. Additionally, short term rentals for five or fewer days are priced more aggressively than longer stays, particularly for rentals of entire homes or apartments. As would be expected, renting an entire home or apartment is more expensive than renting a private room, which is more expensive than renting a shared room with few exceptions. If property-owners are indeed renting out their primary or secondary

residence, these scales show how much money might be streaming into Paris without any lessening of community feel.

### *Hosts with Multiple Rental Property Listings*

One key area of investigation in order to answer the overarching question that driving the presentation, “Does AirBnB disrupt local communities?” is the number of hosts with multiple rental property listings. Slee argues that, in many cases, rather than staying true to AirBnB’s original intent that families and home owners would rent out their own homes, commercial actors come into communities, purchase up properties and rent them out on AirBnB, disrupting local neighborhoods. The team decided to investigate to determine whether or not this is actually the case in Paris.

Based on our own independent analysis, the team discovered that, in Paris, the pessimistic scenario Slee envisions does not seem to be the case. In fact, the vast majority of hosts in Paris list only one property, 41,547 to be exact. Approximately 3,019 hosts list 2-4 rental properties, 165 list 5-10 properties, and 126 hosts list more than 10 properties. Of the host who list 5 or more properties, that majority list fewer than 20. However there are a small number of hosts who list more than 50 rental properties. Additionally, there is one extreme outlier who lists over 150 properties on AirBnB in Paris. On the whole, however, it appears that the AirBnB community in Paris is as it was intended - individuals and families listing their own homes or properties online for rental.

### *Scale: The Prevalence of AirBnB Rentals in Local Communities*

Slee also argues that cities encounter problems of scale, “Even smaller communities are experiencing problems of scale when it comes to Airbnb. Joshua Tree is a tiny town of 7,000

people on the edge of the Joshua Tree National Park in California. It has over 200 available Airbnb rentals. Resident Christine Pfranger observes that “locals are having difficulty finding homes to rent, and are being pushed out of their homes to make way for more vacation rentals.” Another resident adds, “Airbnb and vacation rentals are changing our community....House prices are going up because people now buy houses to rent out as vacation rentals, making it close to impossible for people working in the area to buy a house.” As such, Slee believes that the total proportion of rental properties compared to homes occupied by individuals and families is rapidly expanding, pushing residents out.

The independent analysis conducted by the team also cast doubt on this assertion. Of all residential properties in Paris, only 4% of them are listed on AirBnB. Although the number of rentals has grown rapidly over the course of the past few years, in proportion to the total number of residences, the number of AirBnB rental properties remains relatively small. In addition, nearly 20% of all AirBnB reviews are written in French, so there is still a large portion of local AirBnB business that is French, if not Parisian.

## **Production Methods**

### *Software Systems*

A variety of software systems were employed to produce The Show. Javascript was utilized for the coding of The Show presentation itself. Meanwhile, Excel was utilized for data wrangling and manipulation, and R was utilized to produce the graphics. Specific R packages that were utilized for data manipulation and the visualizations themselves include: ggplot2, waffle, SnowballC, textcat and dplyr.

### *Data Visualization Techniques Employed*

The Show utilizes an extensive variety of data visualization techniques, including a time series line graph, a waffle chart, a box plot, bar graphs and a pie chart. Each graph was chosen for its capacity to capture the specific data at hand.

For example, a time series line graph was utilized as the best technique to convey the rapid growth of AirBnB rental property listings over the past three years. The line graph conveys in an easily intuited manner the sharp upward trend in property listings.

Color coded bar graphs were utilized to provide comparative summary information on the Paris market. The three colors made property types easy to distinguish and the single scale of the shared y-axis made comparisons quicker to intuit by viewers. The shading of the bars also gives an extra dimension - showing the values at quantile values for comparison.

The waffle chart provided a sense of proportionality in the number of hosts with a single rental property listing and the number of hosts with multiple listings. The colors made host categories easy to discern, while a scaled rendering of 1 square = 100 hosts made relative proportionality easy to distinguish.

The use of the boxplot was primarily intended for a quick view of the outliers. Where as bar charts quickly and easily captured the size of categories, the box plot provided a higher level view of the distribution of outliers, including the one host with over 150 rental property listings.

The pie chart was also utilized as a quick and easy way to display information about proportion. While pie charts are often not recommended for a comparison of multiple categories of information, with the large percentage of French language reviews, and that as our focus, it is easy to understand.

## **Production Retrospective**

Given the opportunity to complete the assignment over again knowing what we now know, it might have been interesting to conduct a comparative study of cities, particularly a comparison of both large and small cities. Perhaps the impact of AirBnB rental listings is not so great in large cities, but it may have more impact on smaller cities. Could European cities be impacted more than American or Asian cities? Are non-city destinations, such as those near environmental attractions or national parks, impacted in ways that are different from urban environments? Additionally, it would have been interesting to incorporate even more visualizations techniques, including interactive techniques such as mapping, via the D3.js platform.

## References

### Data Sources

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### Literature Review

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