

# AirBnBs in Columbus

Zach Meluch

Autumn Moorefield

Kelley Richards

Michael Schnur



# Section Title

# Topic

Understand if and how AirBnb properties are impacting the housing market in Columbus.

# Reasons for Selecting the Topic

We have all stayed at AirBnBs.

This is a hot topic in the news:

- <https://travelnoire.com/the-airbnb-effect-on-an-already-high-cost-shrinking-housing-market>
- <https://www.cmu.edu/tepper/news/stories/2021/september/airbnb-market-expansion.html>

Specifically:

- Michael's sister owned some AirBnb properties but her neighbors became alienated so she is looking to sell the properties
- Autumn's neighbors were upset about a local property being used as an AirBnB
- Kelley's co-worker had stayed at a property for a few months and they had discussed whether properties such as this are limiting housing supply

# Data Sources

## Inside AirBnB

The listing of AirBnB properties in the City of Columbus was retrieved from the Inside AirBnB website: <http://insideairbnb.com/>. The goal of the group hosting this site is to provide data to the public to understand the potential impact of AirBnB properties on communities.

## Census Housing and Income Data

The United States Census Bureau conducts periodic surveys to collect information on social, economic, demographic, and housing characteristics of the the American population; these are called the American Community Surveys. The ACS contains various data related to housing characteristics, including housing occupancy, number of units in each structure, structure age, number of rooms, value, and costs, along with median income for households and families.

# Questions to Answer

- Did housing values change from 2015 to 2020 where there large concentrations of AirBnB properties?
- Are AirBnB properties clustered in certain areas, especially where housing values have gone up or where area incomes are relatively low or high?
- Were there any other variables to account for AirBnB clusters?
- What type of properties are being used as AirBnBs? (for example, whole houses or rooms)

# Data Exploration

- Options were explored on how to obtain the AirBnB data. In addition to the Inside AirBnB website, there are ways to scrape the data through APIs. ( example: <https://apify.com/dtrungtin/airbnb-scraper#what-does-airbnb-scraper-do>). The Inside AirBnB data were selected because the data is easy to obtain and are clearly labeled. The main drawback is that website only publishes data for certain cities although requests can be made to obtain data for other places. Columbus was selected because it is home to The Ohio State University and the group is familiar with area.
- To better understand the impact of AirBnBs on the housing market, finding datasets with demographic information were then explored. Census Data was settled on because of the ready availability and the robustness of the data. Further, data are collected regularly so trend analysis is facilitated. Further, one of the group members uses this information and is familiar with the data.

# Data Analysis

- The geographic feature in the Airbnb listing and Census files were different: the former uses latitude and longitude coordinates while the latter uses different geography levels, including zip code tabulation areas (which are used to approximate zip code boundaries). A Python package called GeoPy was used to find the zip code based on the coordinates. The results were transferred to PostgreSQL and a SQL query was employed to match the zip codes from the listings file to the four Census data tables (2015 and 2020 housing and income tables).
- The results were placed in a Pandas DataFrame. The data were trimmed and converted to floating objects as needed. A basic scatter plot was created to show the median household value in Columbus in 2015 and 2020 in three classes. A three dimensional model was then created to display the median household value along with the number of occupied Airbnb units.