

Evaluating the Neighborhoods in Fairfax County of Virginia, USA

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1. INTRODUCTION

1.1 The Background

The Fairfax County is a county of the Virginia State of the United States located in the suburban of the capital city Washington, D.C. The county is one of the well-developed city clusters that has a promising future to continue to flourish, in terms of population, demographics, income level, location, and employment opportunities.

The Fairfax County is the 3rd highest-income county in US, accounts for 13% of Virginia's population and 20% of the DC-VA-MD Metropolitan Area population, and is home to seven Fortune 500 companies. Also, Amazon's second headquarter offices has been selected to locate right next to the Fairfax County.

1.2 The Problem

The county has a total area of 406 square miles (1,050 km²), and there are a number of allegedly good residential zones in this small area including 58 neighborhoods or 80 zip codes. With the rapid development and also as a resident living in the area myself, it is helpful to know which neighborhoods have the higher potential or in other words more attractive to live in.

This project is designed to evaluate all the 58 neighborhoods in Fairfax County and identify those with higher parameters indicating better places to live in. Coding will use data in areas of population, housing market, income level, crime, and school quality, Foursquare location data will also be used to explore and segment these neighborhoods.

1.3 Target Audience

The result of this project might be of interest to the current and future residents of the Fairfax County, as well as to property investors.

2. DATA COLLECTION

Neighborhood values are typically determined by the following factors: real estate market trends, demographic trends, income level and job access, crime and safety, school quality, and nearby features. The following datasets were collected accordingly (Table 1):

- 1. Fairfax County neighborhood list and zip code list.** This is the foundation of this project and other indicator data will be organized by this neighborhood and/or zip code list. Official lists gained from the Fairfax County Government was selected for this data needs.

2. **Real estate market.** Property values in each neighborhood is a good indicator of the value and potential of the neighborhood. The popular real estate website Zillow has its own house value index by zip code. Higher index indicates higher neighborhood value.
3. **Demographics.** Population is a good indicator for a neighborhood. The better a neighborhood is, the more residents it has. Official 2019 population data from the Fairfax County Government was selected, the higher population the more positive for a neighborhood assessment.
4. **Income level.** Good neighborhoods tend to have more high-income residents. The per capita income from 2014-2018 by zip code/neighborhood of Fairfax County from the popular income statistics source American Community Survey was selected for this assessment indicator. The higher per capita income, the more positive for a neighborhood.
5. **Crime and safety.** Crime rate is another common indicator for neighborhood evaluation. The Weekly Crime Data from the Fairfax County Police Department will be used, and it is a real time database that's always updated for the most recent 7 days. The more total crime number for a selected neighborhood, the lower value of this neighborhood.
6. **School quality.** School quality is another common and important indicator. School scores of the public elementary schools of Fairfax County for 2019 from the popular school rating website SchoolDigger was selected for this indicator. School scores will be aggregated by zip code/neighborhood, the higher score the better neighborhood.
7. **Nearby features.** Location is everything for a neighborhood. It makes a neighborhood more valuable and attractive if, for example, it's close to shopping centers, entertainment businesses, food and beverage amenities, city centers, recreational centers, sought-after tourist areas, and office buildings. Foursquare data will be used to explore and evaluate the nearby features for a given neighborhood, neighborhoods with similar characteristics may be segmented and grouped in this analysis.

Table 1: Data Collection Summary

#	Data	Source	Method
1	Fairfax County neighborhood and zip code list	Fairfax County Government, Open Geospatial Data https://opendata.arcgis.com/datasets/3111976184004077_b836f535f31eadf1_21.csv	Import from a downloadable csv file from the source
2	Property Value	Zillow, home value index (by zip code and by city), current https://www.zillow.com/fairfax-county-va/home-values/	Import from a downloadable csv file from the source
3	Population	Fairfax County Government, Economic, Demographic and Statistical Research (EDSR) unit, demographics data 2019 https://www.fairfaxcounty.gov/gisapps/iplsmapi/IPLSExport.ashx?Type=Z&Year=2019&Param=ALL	Import from a downloadable csv file from the source
4	Income	American Community Survey, per capita income, 2014-2018 http://www.livehealthyfairfax.org/indicators/index/view?indicatorId=15&localeTypeId=3&periodId=1581	Import from a downloadable csv file from the source
5	Crime	Fairfax County Police Department, Weekly Crime Data, current https://www.fairfaxcounty.gov/apps/pfsu/api/file/crimereportsfromsp	Import from a downloadable csv file from the source
6	School quality	SchoolDigger, Fairfax County elementary public school scores, 2019 https://www.schooldigger.com/go/VA/zip/22033/search.aspx	Make an excel spreadsheet
7	Nearby features	Foursquare	API