

House Prices in Nashville

Shea Conaway

Nashville As "It" City and Rising Cost of Living

The New York Times

Nashville's Latest Big Hit Could Be the City Itself

By Kim Severson

Jan. 8, 2013

NASHVILLE — Portland knows the feeling. Austin had it once, too. So did Dallas. Even Las Vegas enjoyed a brief moment as the nation's "it" city.

Now, it's Nashville's turn.



- Nashville has grown more popular
- Cost of living used to be low but is now increasing
- Investigate and find what influences house prices

Primary Topic: House Prices in Nashville

To better understand house prices, we analyzed:

- House size and features
- Location
- Time trends
- Text descriptions

Data source:

- Zillow

Our conclusions to discuss today:

- Size drives price, requires transformation
- More expensive closer to downtown
- Price increase over time and seasonal patterns

How did we draw our conclusions?



Example Zillow Listing

1115 Cahal Ave, Nashville, TN

Buy Rent Sell Home Loans

1115 Cahal Ave Nashville, TN 37206

Zillow Save Share More

3 bd | 3 ba | 2,087 sqft
1115 Cahal Ave, Nashville, TN 37206
Closed: **\$515,000** Sold on 05/19/20 | Zestimate®: **\$670,700**
Est. refi payment: \$2,300/mo [Refinance your loan](#)

[Home value](#) [Owner tools](#) [Home details](#) [Neighborhood details](#)

Overview

Stunning historic home in East Nashville! Walkability to East Nashville YMCA and favorite local restaurants. A 2 minute drive to the new Public opening early 2021! Features a fully updated kitchen, renovated bathrooms, 4 beautiful original fireplaces, a spacious backyard and basement. GPZ for Lockeland Design Center Elementary! Virtual walkthrough can be found on YouTube by searching 1115 Cahal Ave.!

Listing Provided by:
Jessi Sgarlata
Compass Tennessee, LLC

Source: RealTracs MLS as distributed by MLS GRID, MLS#: 2125093 [realtracs](#)

Zillow checked: November 02, 2021 at 12:25pm
Data updated: July 30, 2020 at 10:35am

Bought with: Martin Hickman, 340511
Compass Tennessee, LLC

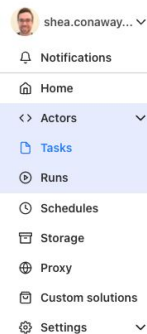
Facts and features

[Edit](#)

Type:	Single Family Residence	Heating:	Central
Year built:	1899	Cooling:	Central Air
		Parking:	Open Parking
		Lot:	0.29 Acres

- House size and rooms
- Price and date sold
- Text description
- Pictures
- Other details

Data Collection and Cleaning



Actors / Tasks / my-task / Runs

Run #B2KO7ZKQpMYCHd5C0

Actor Task my-task

Started at 2021-11-11 09:16:28.302 Finished at 2021-11-11 13:00:19.400 Duration about 4 hours



SUCCEEDED



37333 results

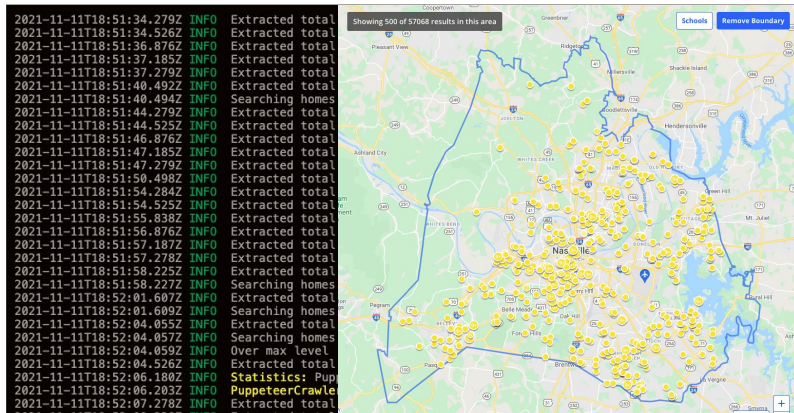


2.4k of 2.4k requests handled

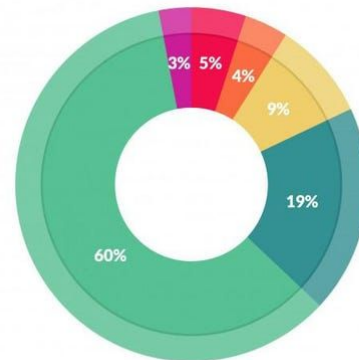
Log Info Input Key-value store Dataset Request queue Live view Webhooks API

Showing only the latest lines of the log.

Show full log Download log Copy log to clipboard



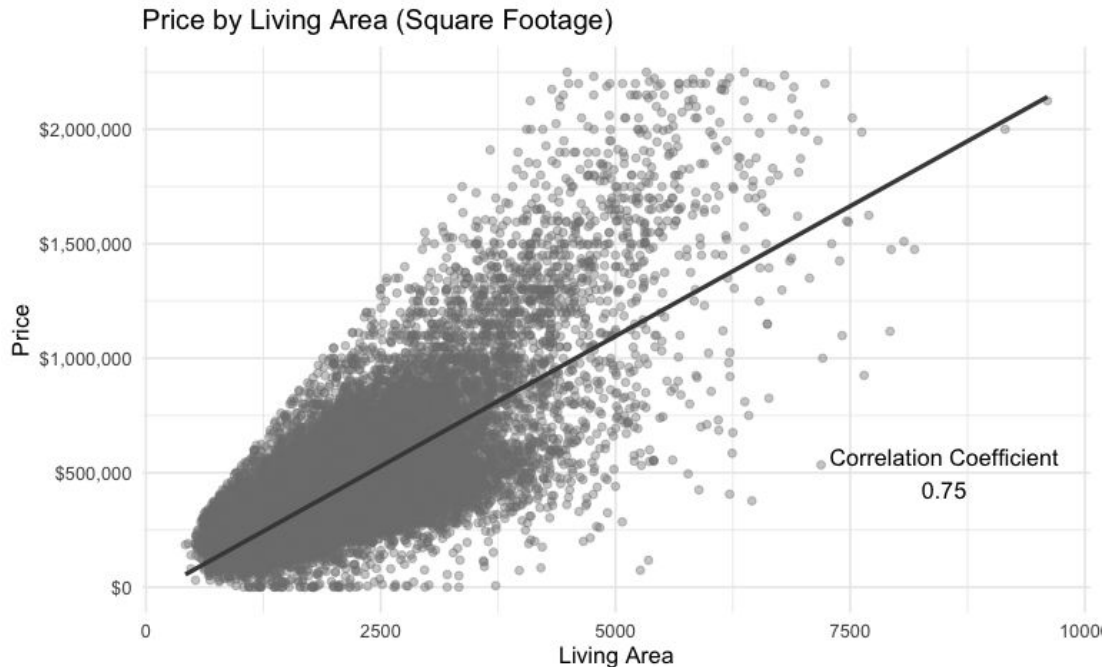
- Custom script to scrape data from Zillow
- Three years of house sales ~50,000
- Cleaned and verified data



80% of project

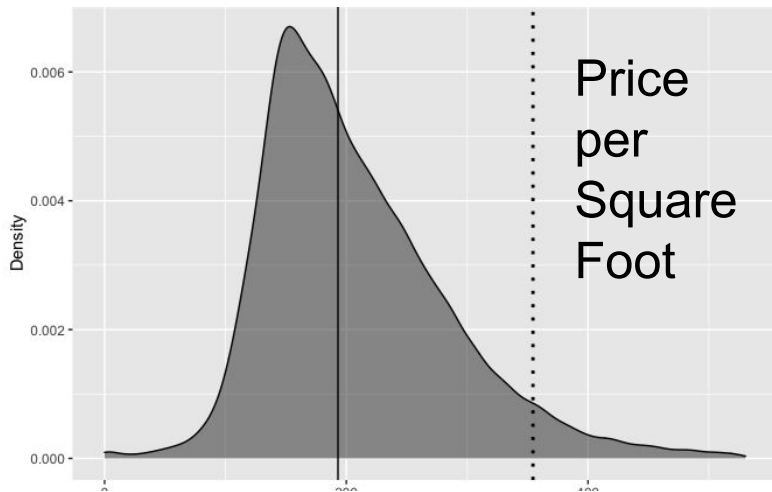
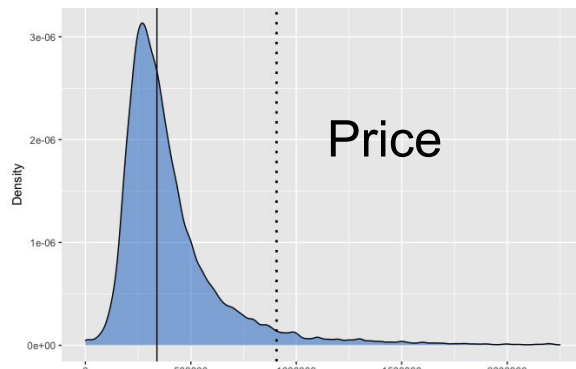
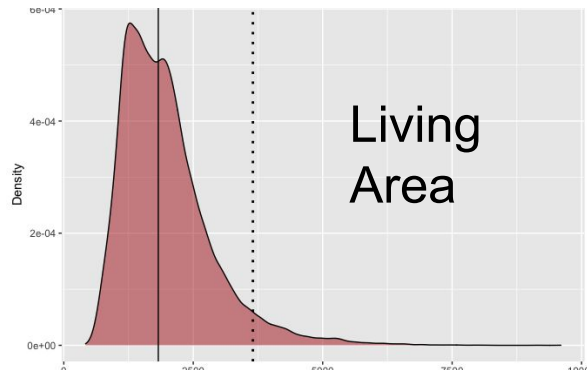
Source: Forbes.com, "Cleaning Big Data: Most Time-Consuming, Least Enjoyable Data Science Task, Survey Says" by Gil Press (2016)

Transformation: Price per Square Foot



- Intuitively, size is a major driver of price
- Visual and correlation confirmation
- Why price/sqft transformation
 - Compare houses of different sizes
 - Analyze other home price factors without size effect
 - Price measure with less spread, fewer extreme values

Transformation: Price per Square Foot

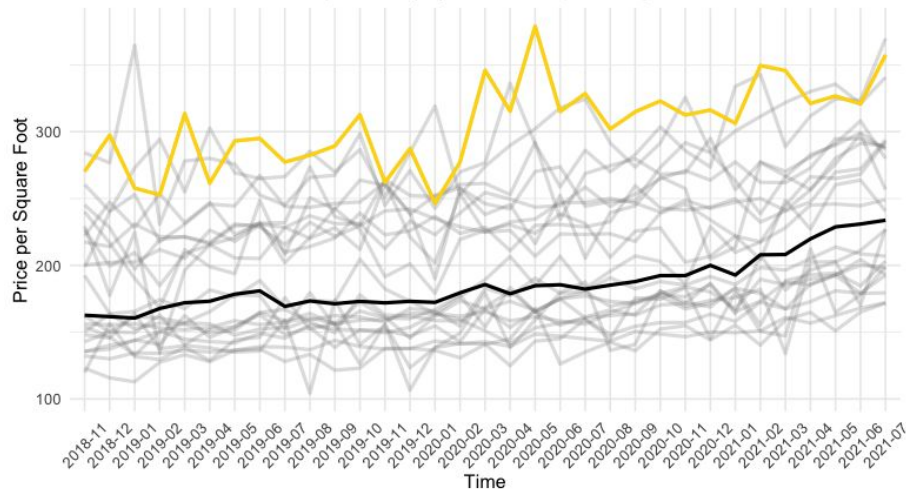


- Price per Square Foot has less spread, fewer extreme values
- Enables other analyses without size effect

Time Trend Analysis: Price per Square Foot

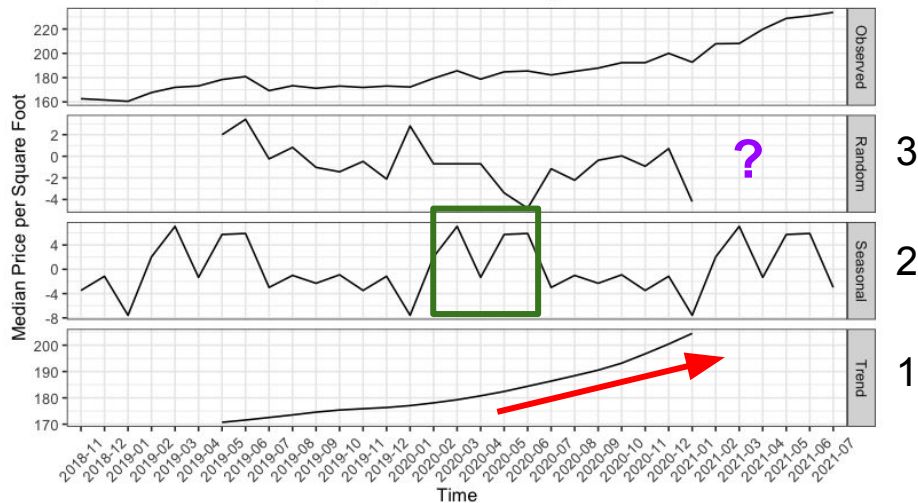
Median Price per Square Foot by Month

Nashville in black, individual zipcodes in gray, Vanderbilt zipcode in gold



- Prices increasing over time
 - **Nashville**
 - **Vanderbilt**
 - **All zipcodes**

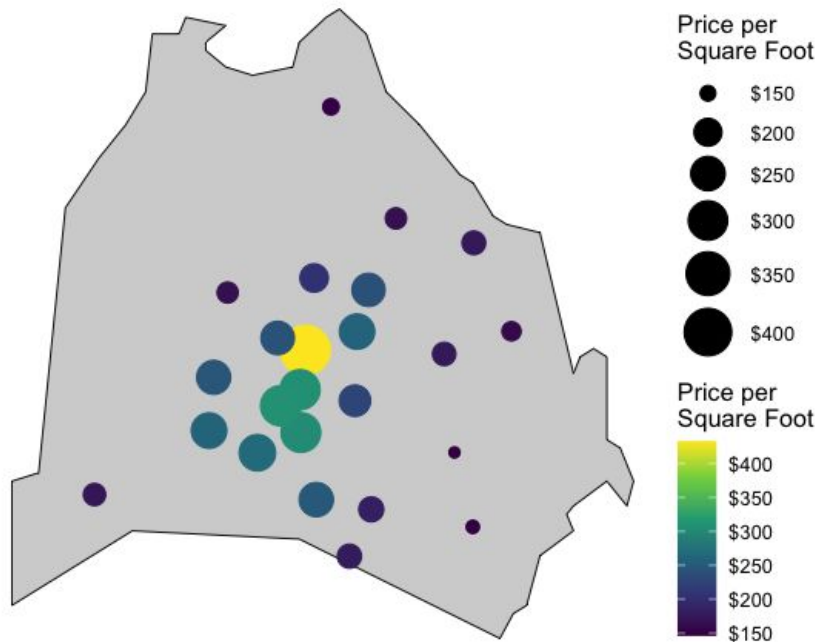
Median Price per Square Foot Decomposed Time Series



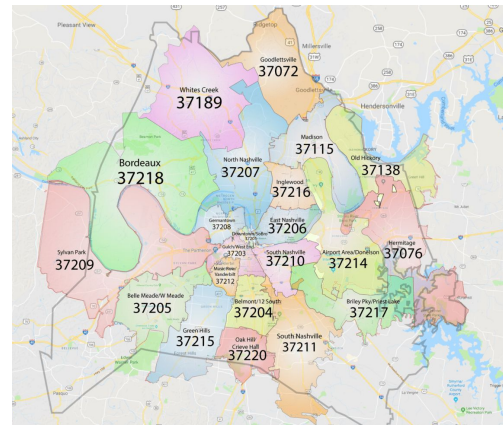
- Starting at the bottom plot
- 1. General trend: **increasing price**
- 2. Seasonal trend: **spring higher**
- 3. Random effects: **investigate**

Location: Price per Square Foot Map

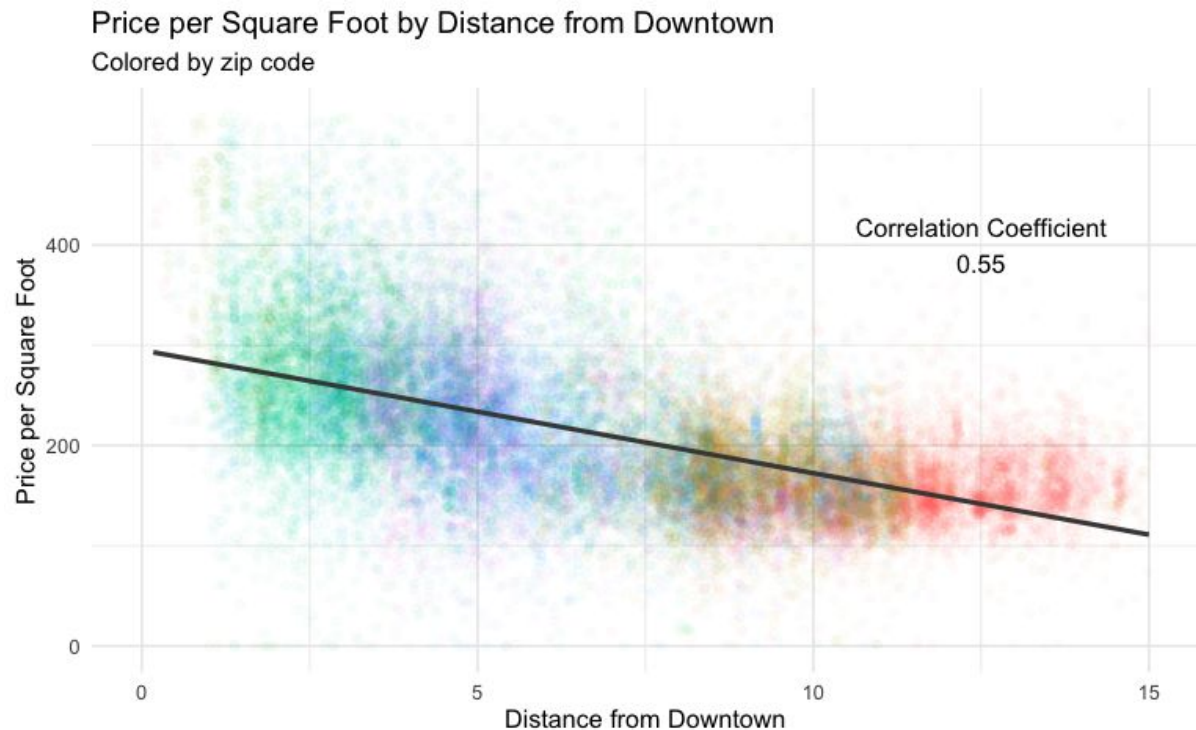
Median Price per Square Foot by Location



- Prices increase towards downtown
- Limitation: grouped by zipcode
- Merits further investigation by each house's exact distance from downtown



Location: Distance from Downtown



- Price decreases farther from downtown
- Zipcode stratification and mixing
- Note significant correlation despite many other factors

Analysis Conclusions

Covered today:

- Size drives price, requires transformation
- Price increase over time and seasonal patterns
- More expensive closer to downtown

Not covered from report:

- Additional features: Age, home types
- Text analysis

Limitations and Potential Improvements

- More thorough data cleaning
 - Investigate issues and outliers further
- Investigate "random" component of time series
- Three years of data

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