

CYNTHIA PEDRASA

12/18/2019

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MODULE 4 PROJECT

TIME SERIES ANALYSIS

TOP 5 ZIP CODES FOR INVESTMENT PROPERTY

- ▶ **Data:** Zillow Monthly Average House Price for given zip codes for given dates from 4/1996 thru 4/2018
- ▶ **Question:** What are the top 5 zip codes nationwide with the highest Return on Investment (ROI) in 5 years that are within accepted standard deviation threshold (variability in returns)?
- ▶ **Forecast** the future house pricing for the top 5 zip codes

ESTIMATING REAL ESTATE APPRECIATION

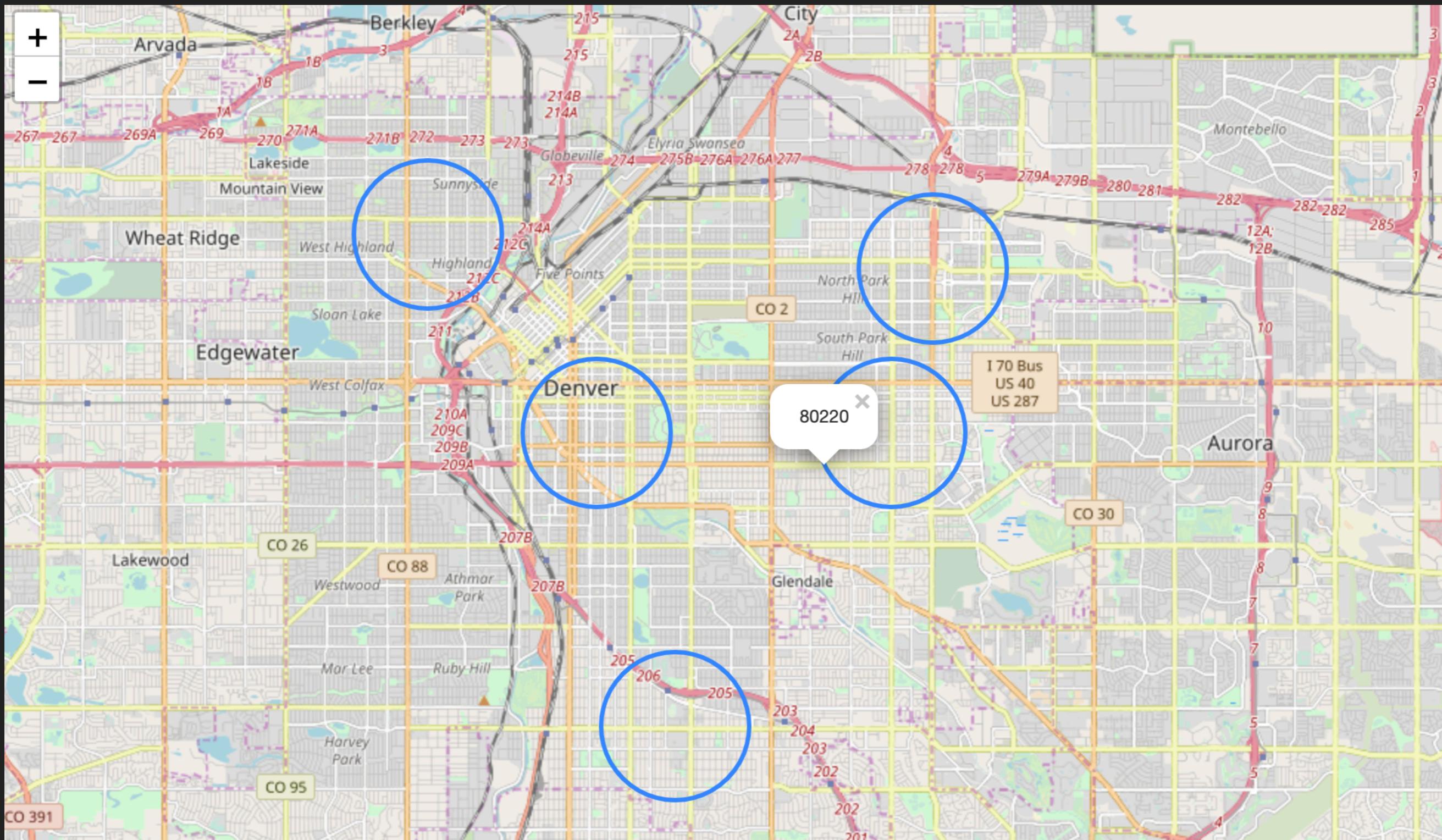
1. FUTURE GROWTH = $(1 + \text{ANNUAL RATE})^5 \text{ YEARS}$
2. FUTURE VALUE = (FUTURE GROWTH) X (CURRENT FAIR MARKET VALUE)
3. APPRECIATION = (FUTURE GROWTH X COST OF INVESTMENT) - COST OF INVESTMENT

RETURN ON INVESTMENT = (GAIN FROM INVESTMENT – COST OF INVESTMENT)/COST OF INVESTMENT

REDUCE STANDARD DEVIATIONS FROM THE EXPECTED RETURN

FACTORS IMPACTING ROI

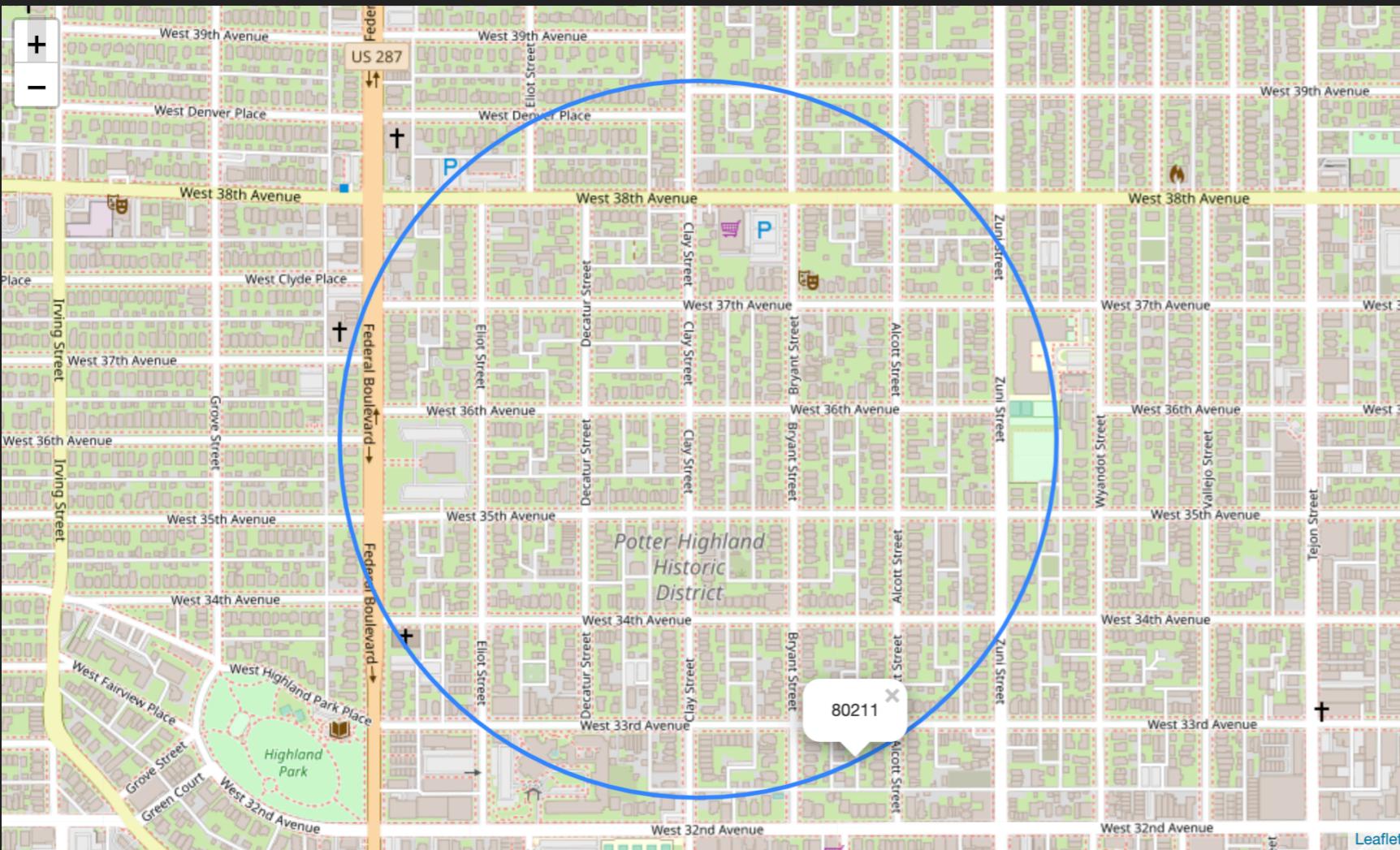
- ▶ REAL RETURN OVER NOMINAL RETURN
- ▶ TRANSACTION COST
- ▶ 20% CAPITAL GAIN TAX OR MORE
- ▶ 5 YEARS COMPOUNDED RATE
- ▶ INFLATION
- ▶ OTHER FEES/EXPENSE
- ▶ OPPORTUNITY COST



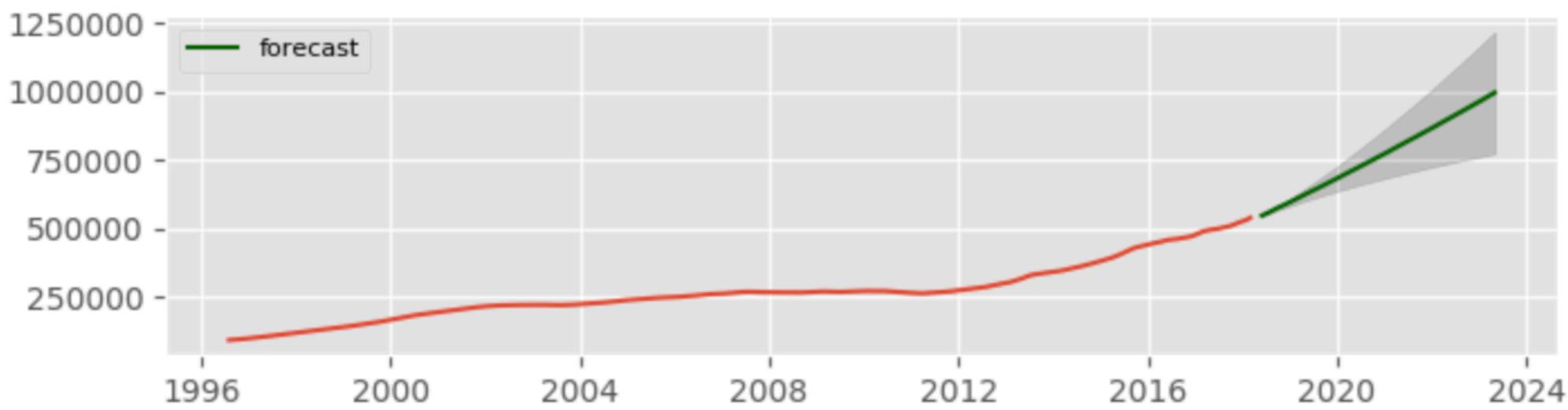
TOP 5 ZIP CODES WITH GREATEST APPRECIATION: 80010, 80220, 802038, 80203, 80211

80211

APPRECIATION 202,242
ROI=37%
FUTURE VALUE=748842
INCREASE RATE: 498

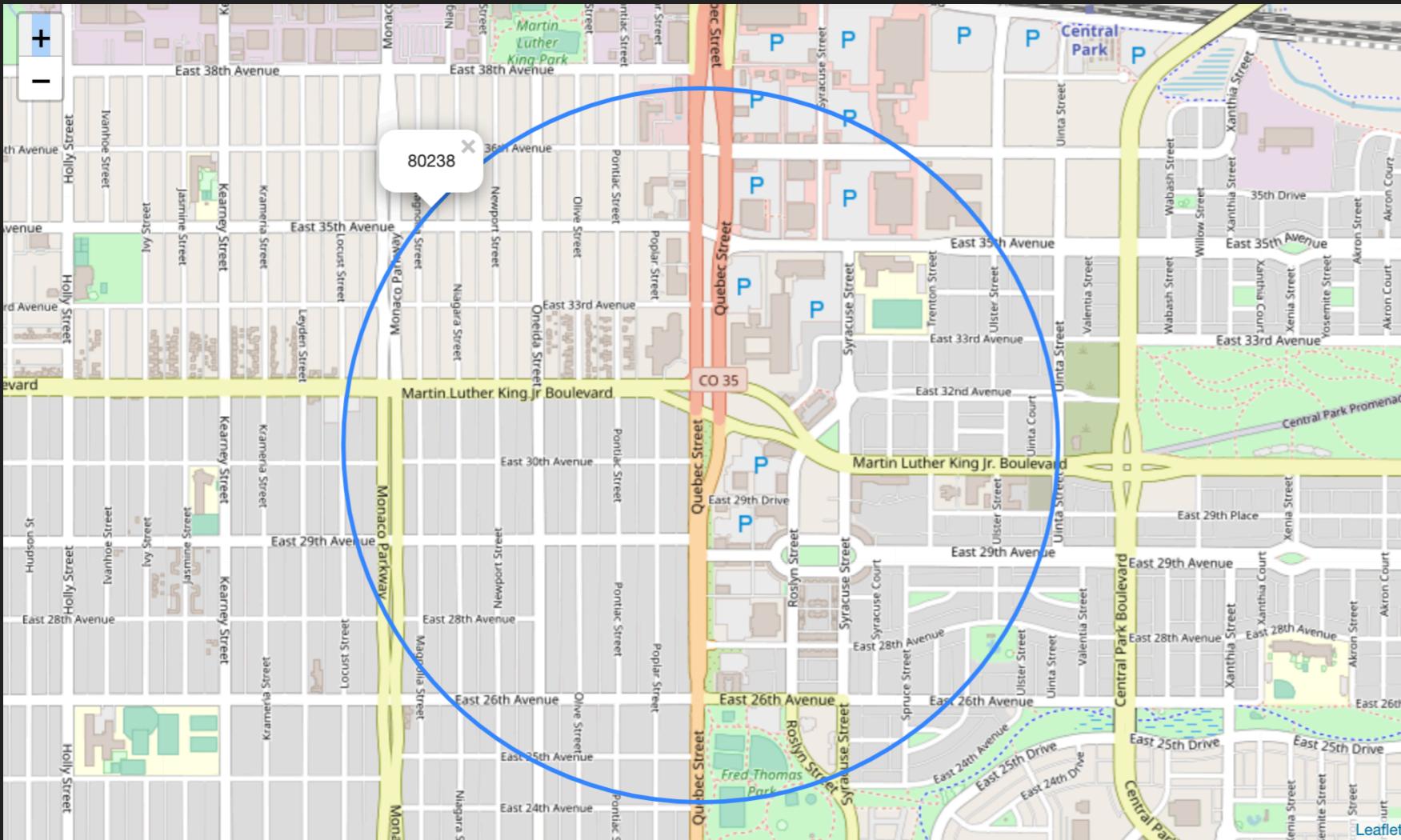


Final Forecast 80211

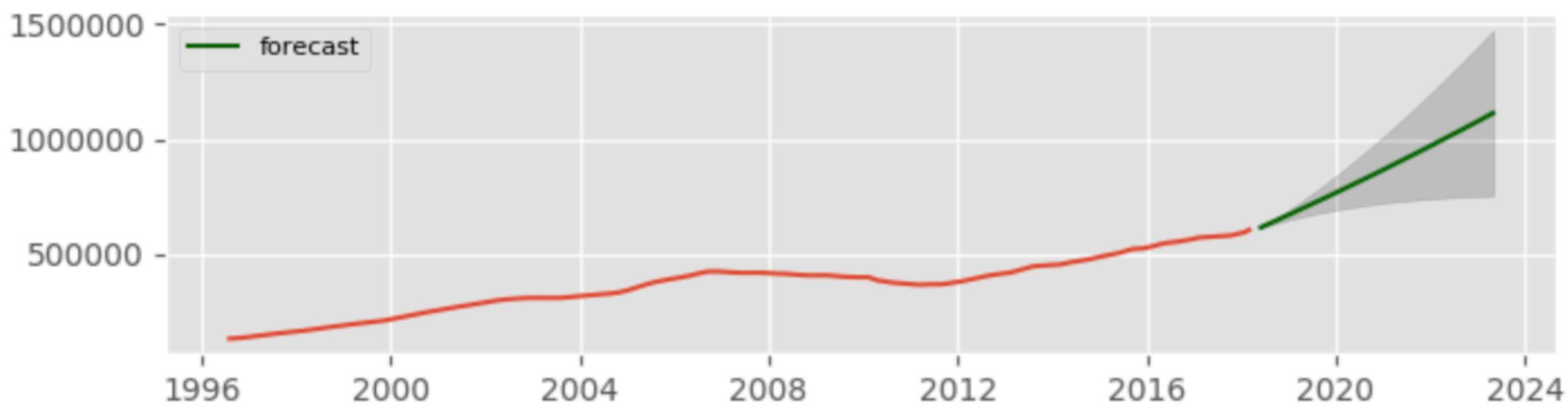


80238

APPRECIATION 226,625
ROI=37%
FUTURE VALUE=839125
INCREASE RATE: 366

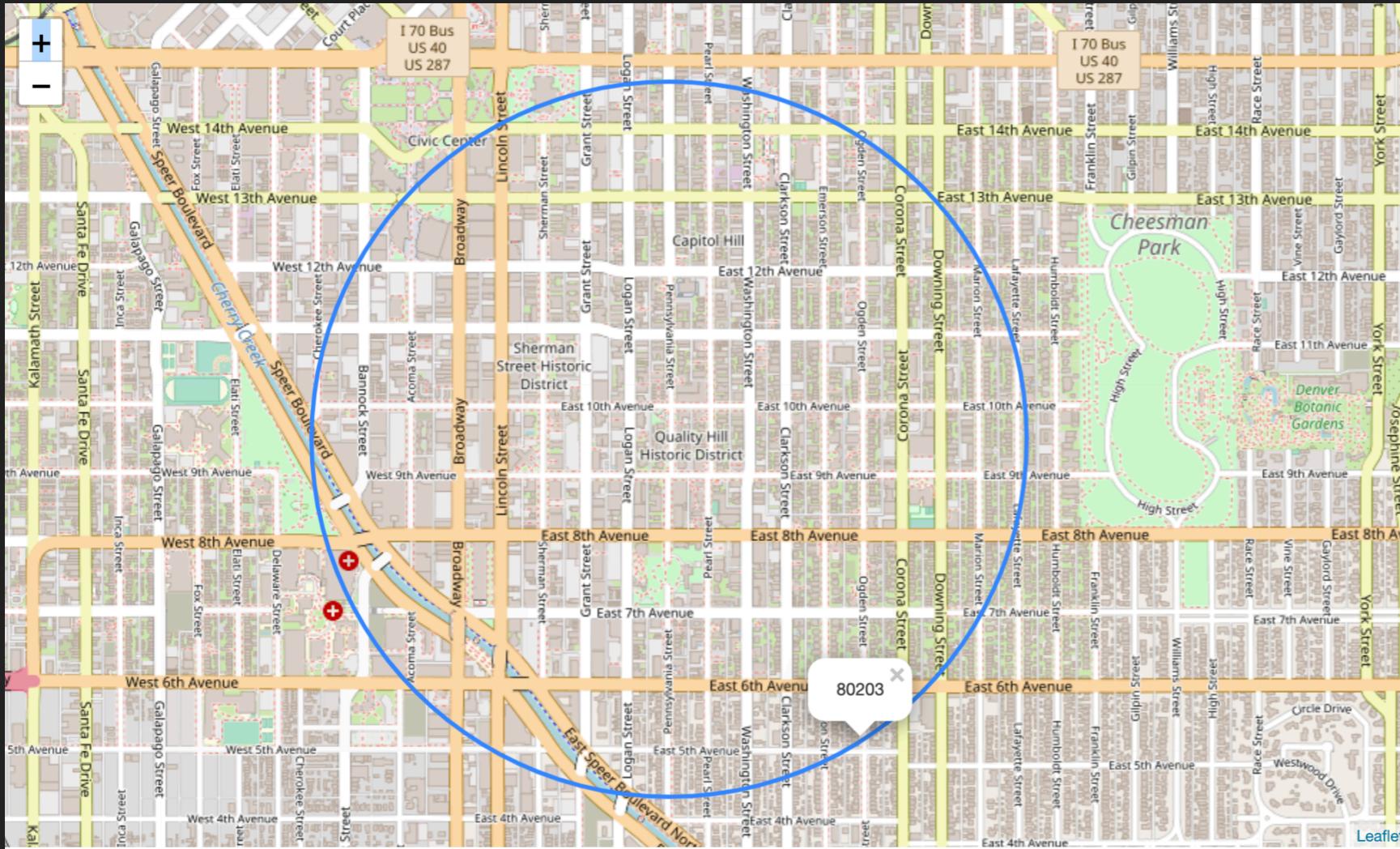


Final Forecast 80238

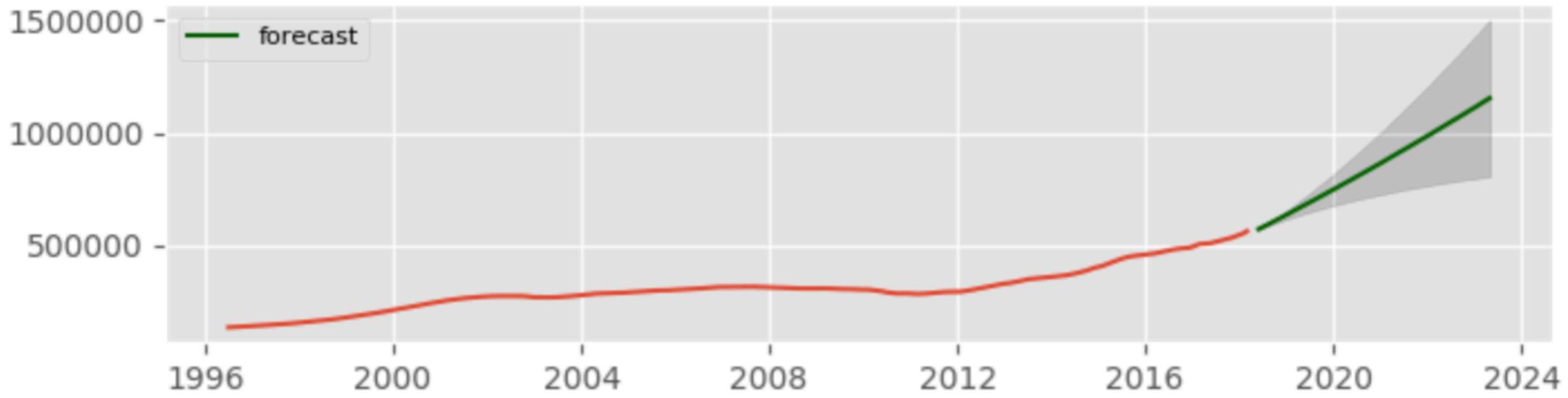


80203

APPRECIATION 211,455
ROI=37%
FUTURE VALUE=789255
INCREASE RATE: 326

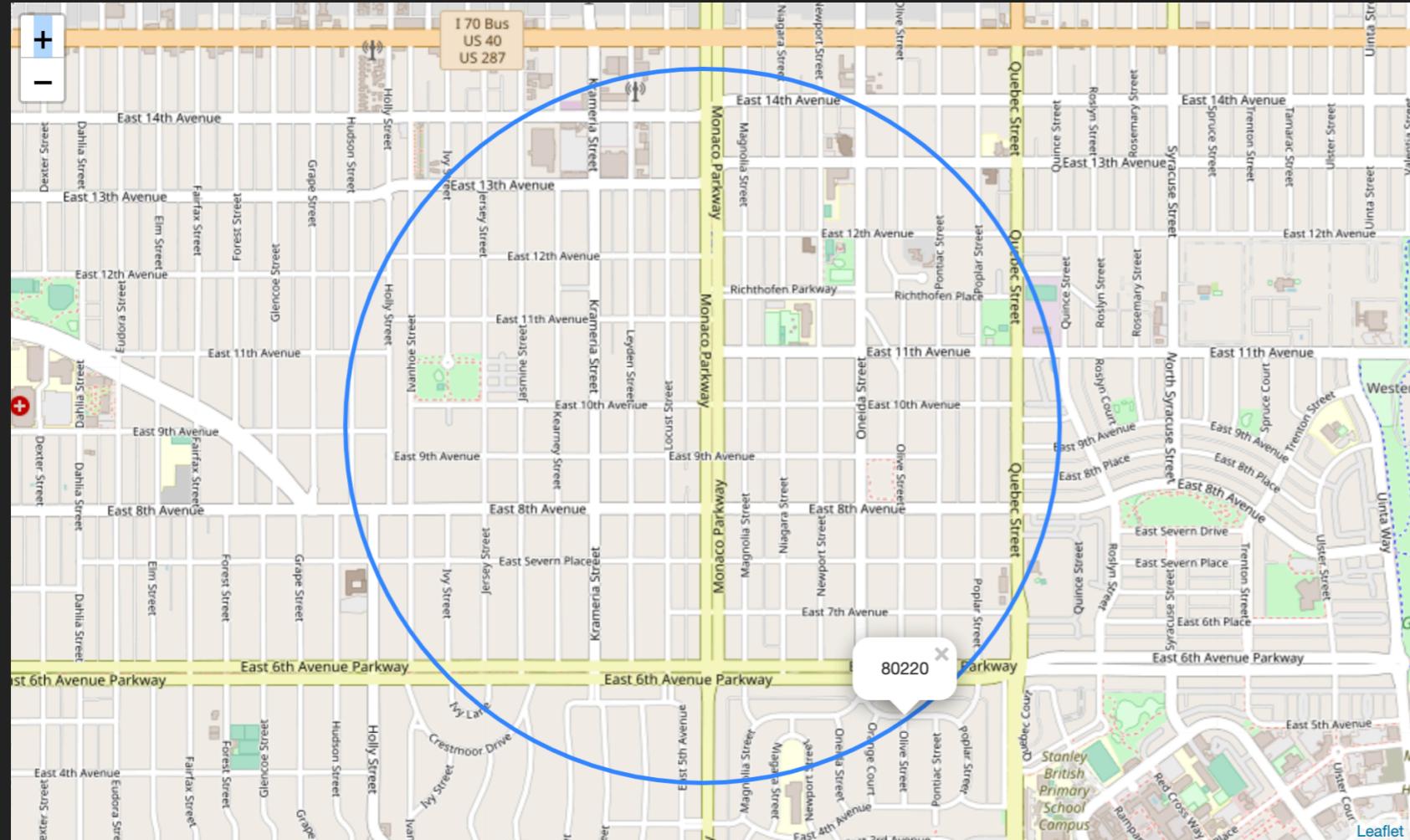


Final Forecast 80203

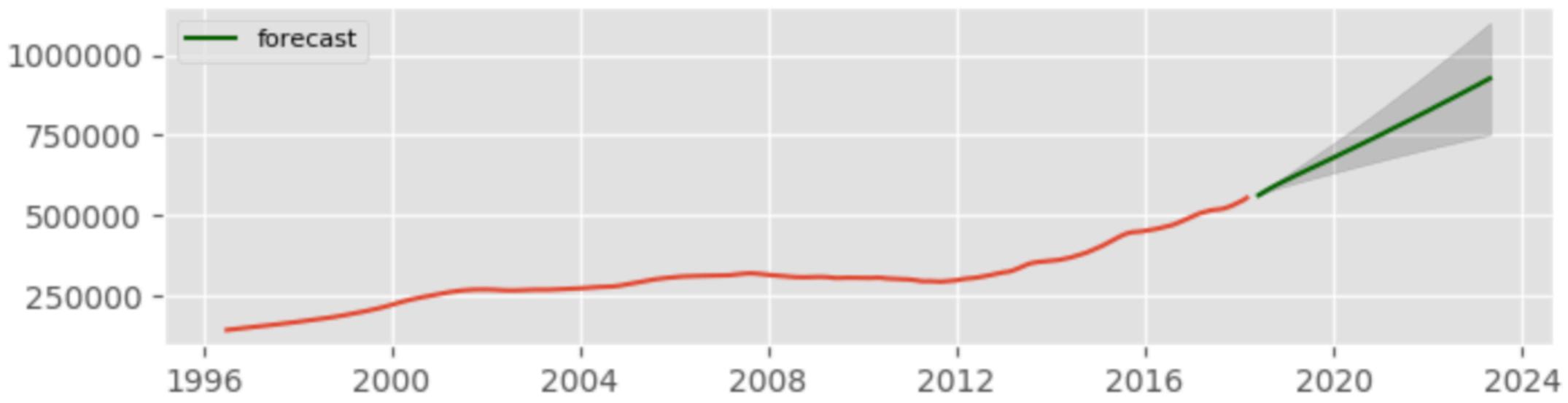


80220

APPRECIATION 207,607
ROI=37%
FUTURE VALUE=768707
INCREASE RATE: 305

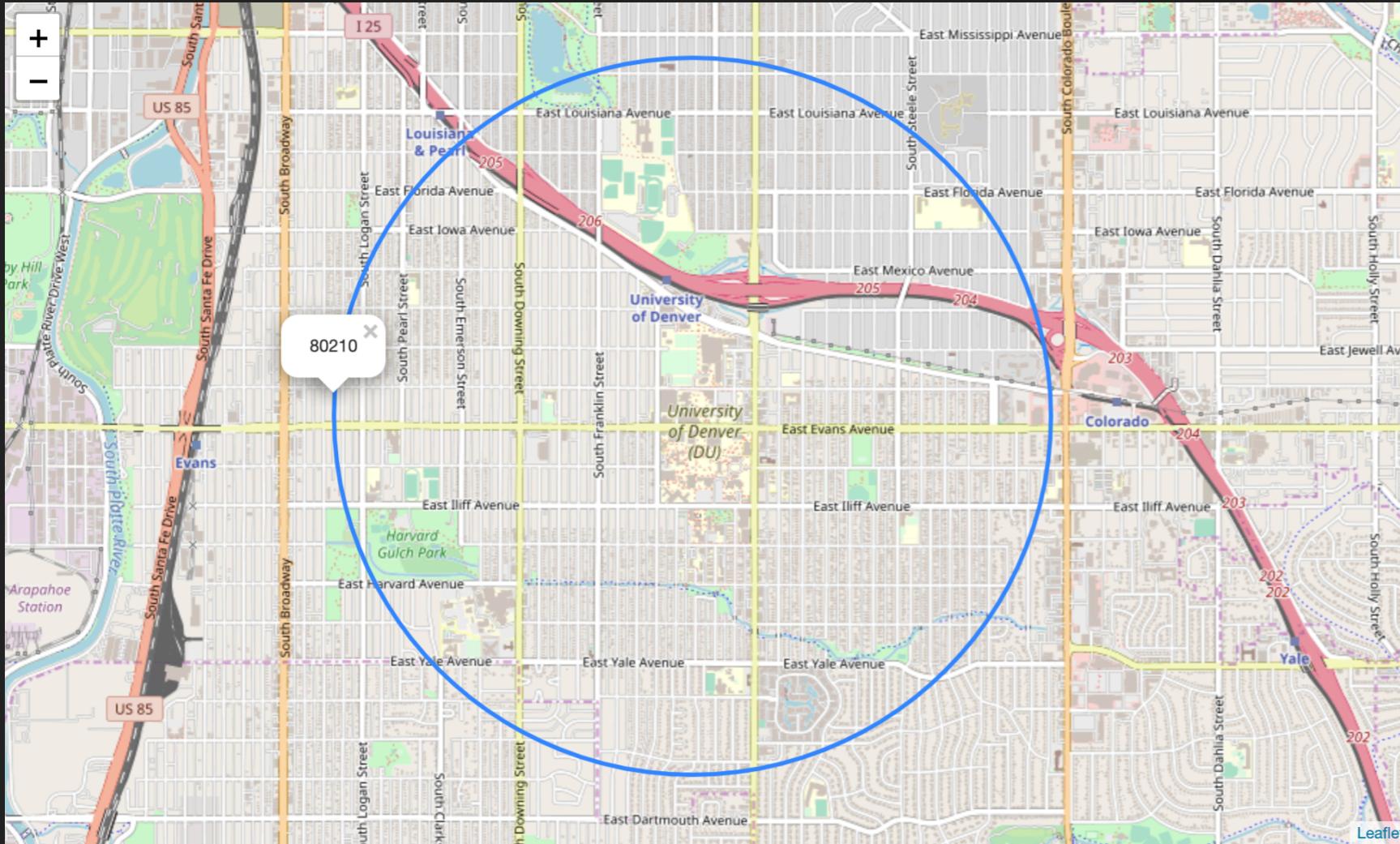


Final Forecast 80220

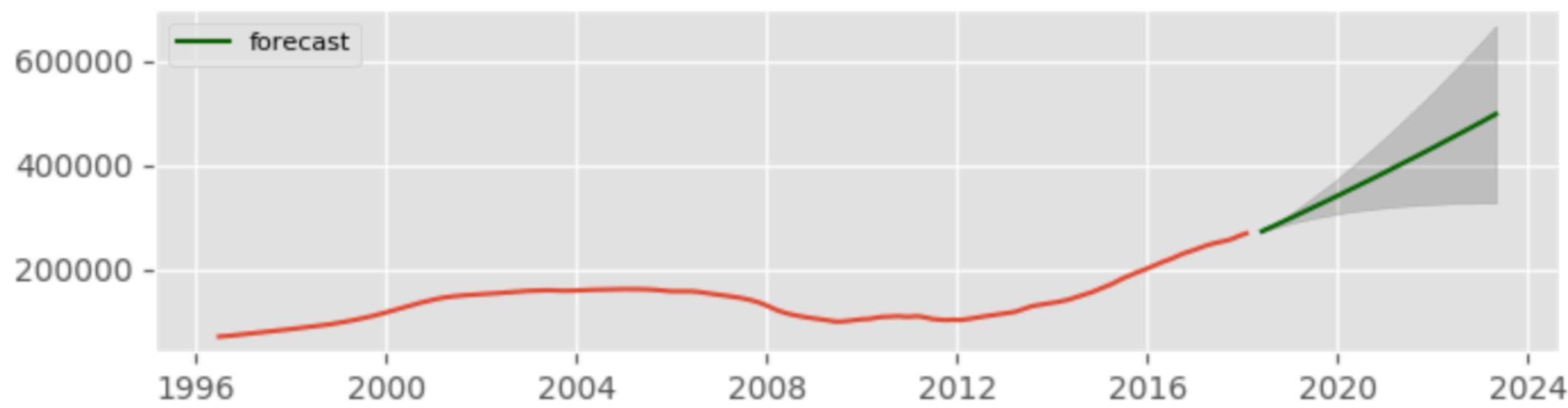


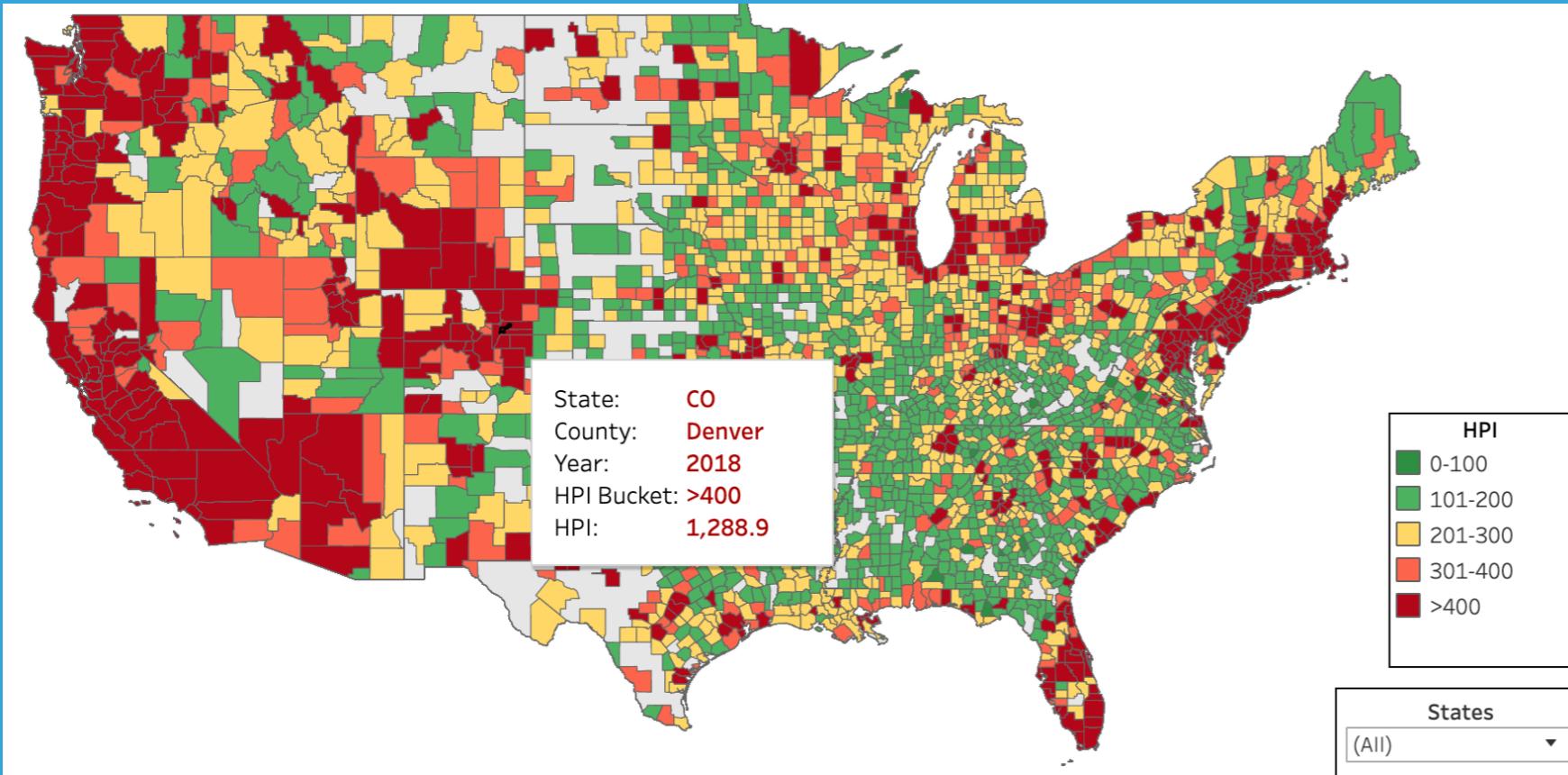
80010

APPRECIATION = 102712
ROI = 37%
FUTURE VALUE = 380312
INCREASE RATE: 294



Final Forecast 80010





FUTURE WORK

Get current Zillow data on monthly home price.
Create models using traditional statistical models
e.g. Regression-based models, *multi-variate
models, random forest regression, decision trees

*Actual value of any house will depend on the local real estate market, house condition and age, home improvements made and needed, and many other factors.

Review the Federal Housing Finance Agency House Price Index to project what a real estate investment would be worth today if appreciated at the average appreciation rate of all homes in Denver Colorado

A black and white aerial photograph of a massive concrete dam. The dam is a thick, curved wall that slopes down to a river or lake. A narrow walkway runs along the top of the dam, with railings on both sides. Two small figures of people are standing on the walkway, appearing very small against the enormous structure. The water of the reservoir behind the dam is dark and calm.

THANK YOU!
