Predicting Affordable Housing Shortages

FORECASTING METRO AREAS AT RISK OF AFFORDABLE HOUSING SHORTAGES WITHIN THE NEXT FIVE YEARS

Image Credit: Aïda Amer/Axios

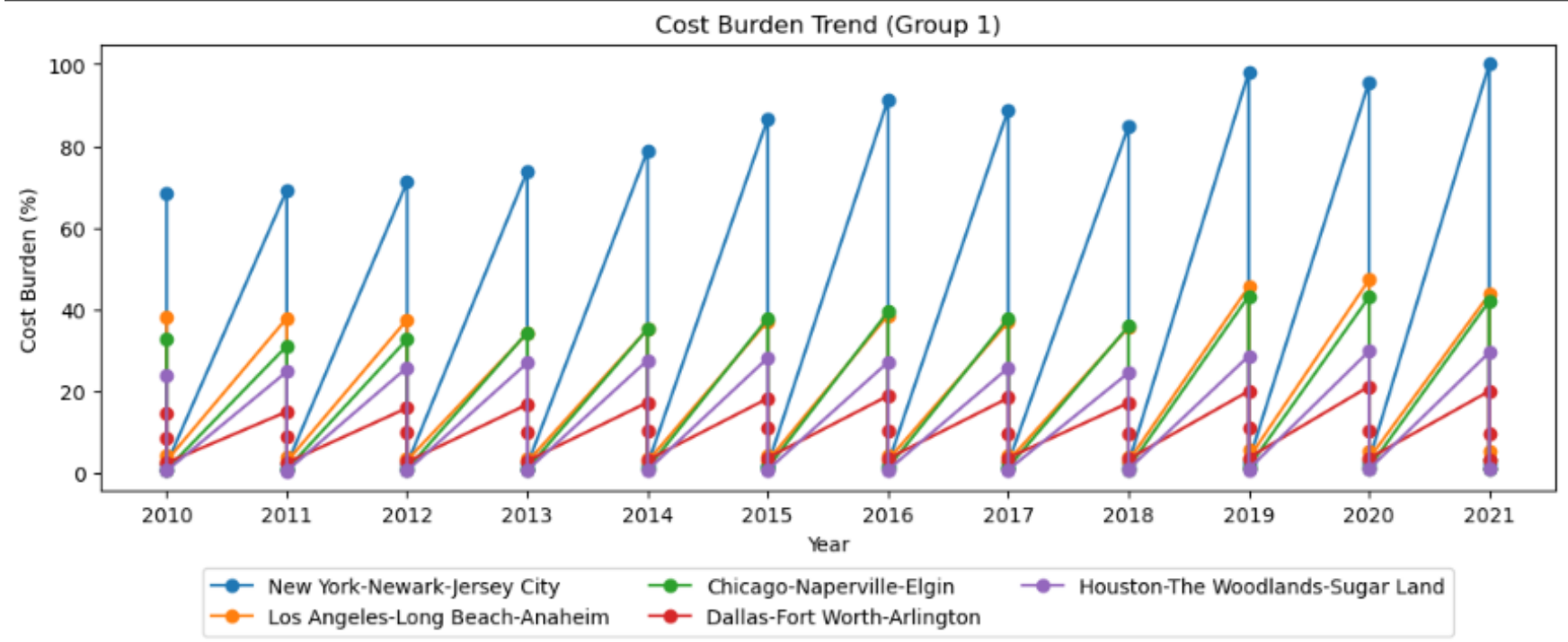
Objectives

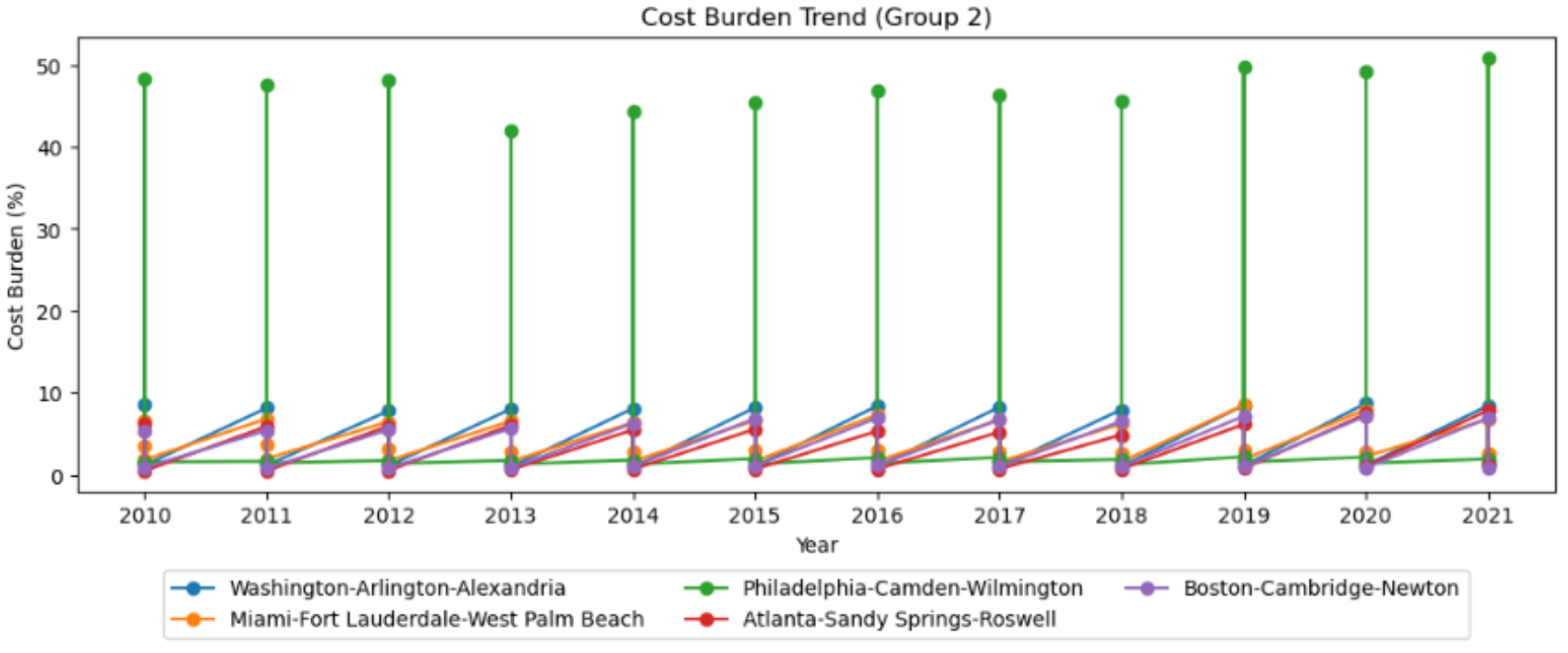
EDA aims to identify and visualize trends, disparities, and key factors influencing housing affordability across metro areas, providing insights into regions most affected by cost burdens.

Modeling aims to develop and validate predictive models that forecast future affordable housing shortages in the next 5 years, enabling stakeholders to proactively address challenges in high-risk regions.

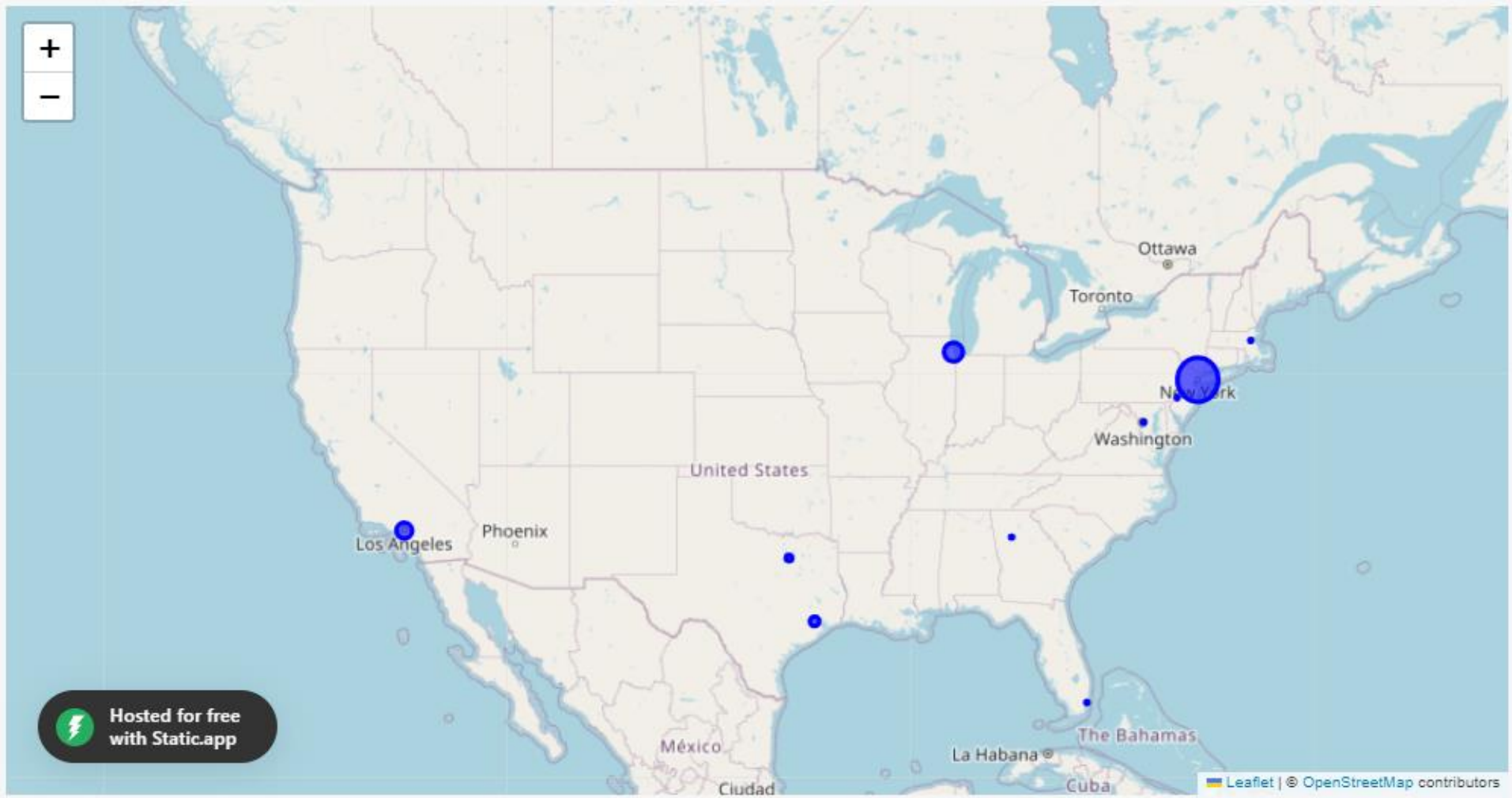
Exploratory Data Analysis

Trend of Housing Cost Burden Over Time by Metro Area





Distribution of Housing Cost Burden by Metro Area



Source: https://magnetic-jellyfish.static.domains/housing-cost-burden-map

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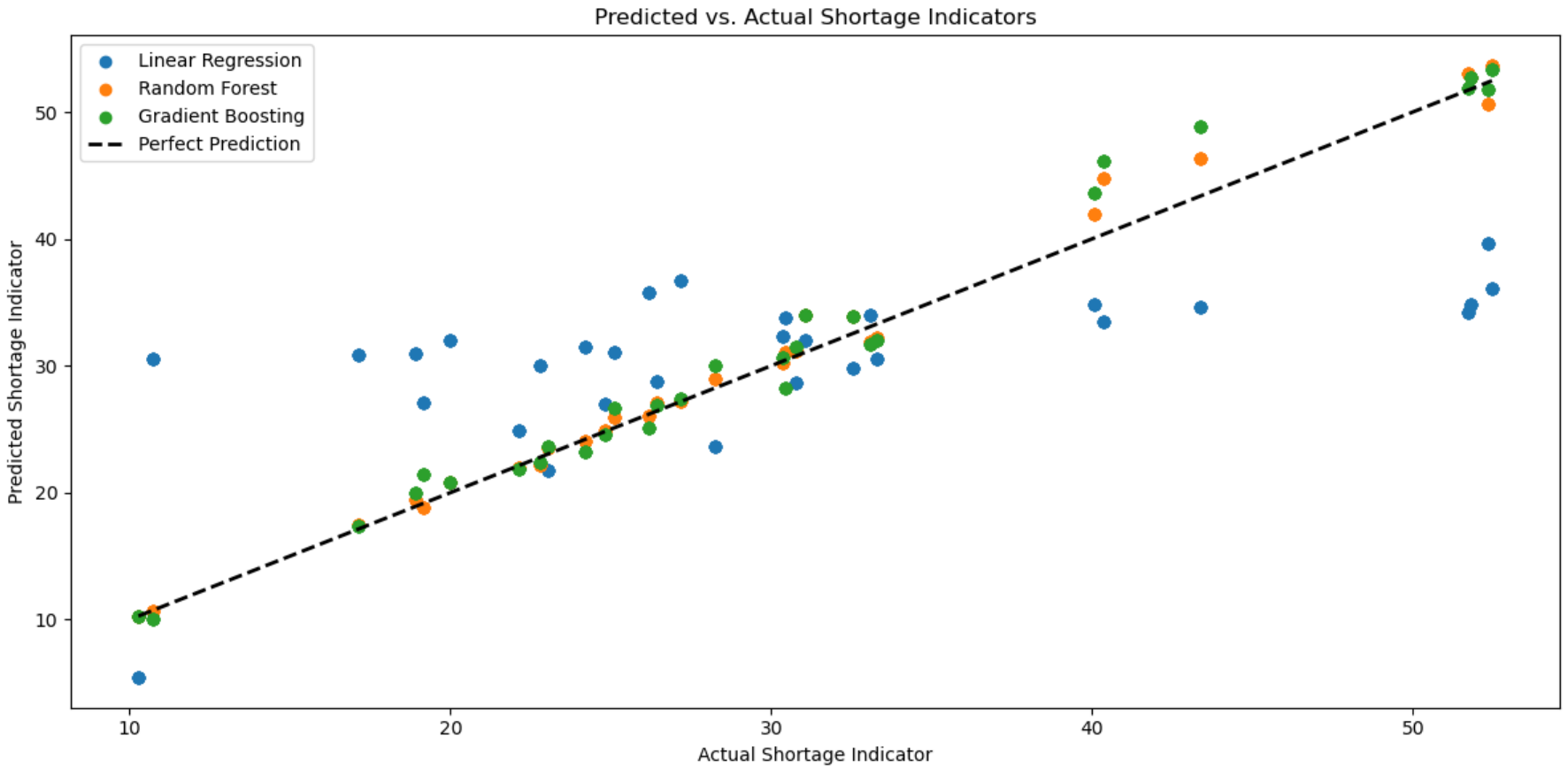
Predictive Modeling

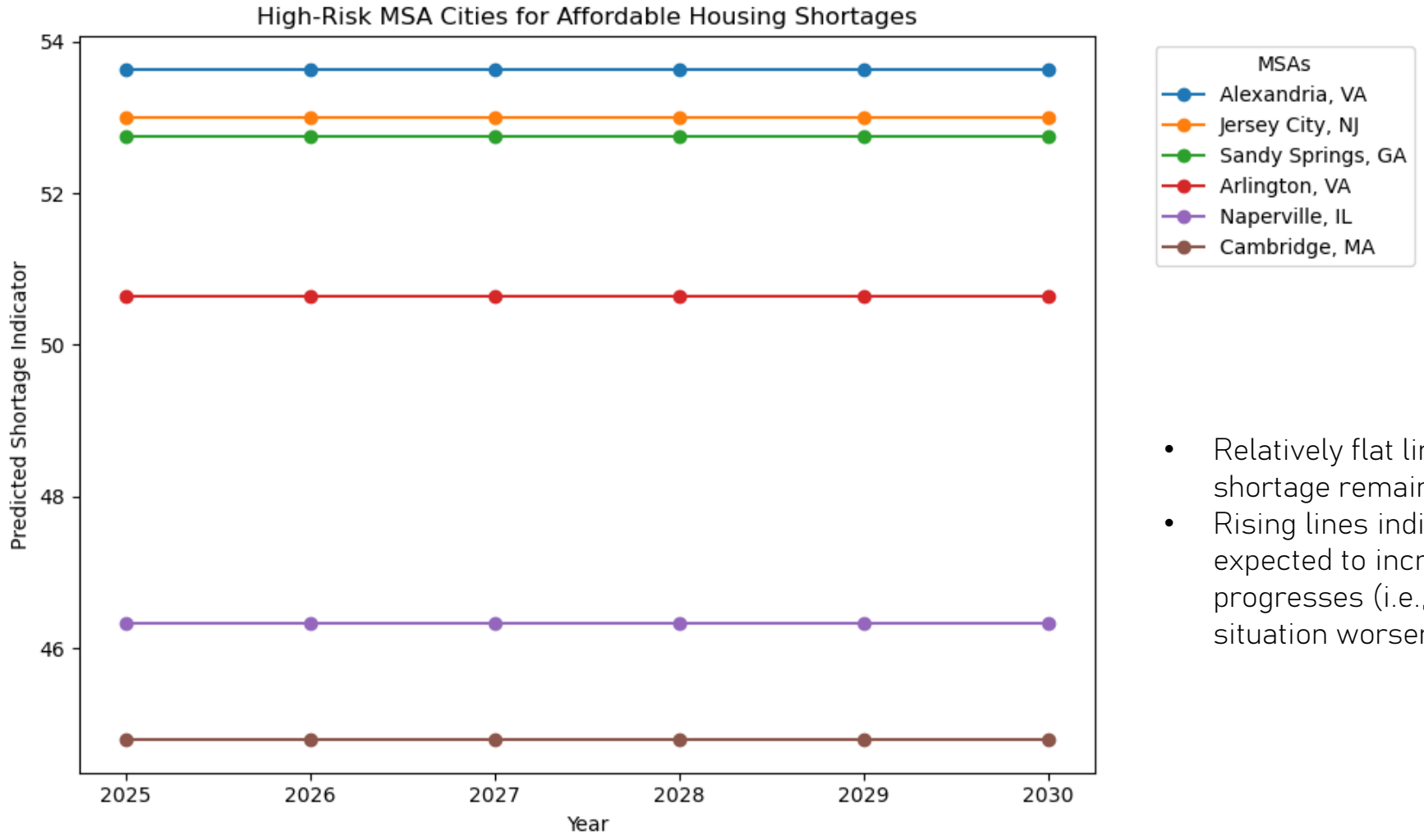
Modeling Shortage



Shortage Indicator Calculation

```
extended_df['shortage_indicator'] =
extended_df['a18'] / (extended_df['a1'] + 1e-6)
```

High Risk Cities



- Relatively flat line(s), suggest predicted shortage remains constant over time.
- Rising lines indicated shortage is expected to increase as times progresses (i.e., the affordable housing situation worsens

Conclusion

Persistent Housing Affordability Issues: Metro areas like New York-Newark-Jersey City and Los Angeles-Long Beach-Anaheim show consistently high housing cost burdens, highlighting urgent affordability challenges.

Predicted Worsening of Housing Shortages: Forecasts for 2025–2030 suggest a significant increase in affordable housing shortages in regions already under stress, such as New York and Chicago.

Effective Predictive Modeling: Random Forest models provided robust predictions, enabling data-driven insights to prioritize at-risk regions for intervention.

Next Steps

Policy Recommendations: Develop targeted policy suggestions based on high-risk regions, focusing on affordable housing development and cost-burden mitigation strategies.

Refinement of Predictive Models: Incorporate additional variables such as local housing policies or economic incentives to improve the accuracy of shortage predictions