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US Housing Market Trends

Explore price shifts, economic drivers,
and 3-year forecasts.





US Housing Market Overview

This project explores trends in U.S. home values by analyzing Zillow housing data enriched with public indicators like income, unemployment, taxes, and disasters.

TRACK HOUSING PRICE CHANGES OVER TIME

Gain a deeper understanding of market shifts from 2018–2023.

IDENTIFY KEY FACTORS DRIVING HOME PRICES

Discover how income levels, tax rates, and unemployment correlate with housing trends.

FORECAST FUTURE HOME VALUES

Build predictive models to estimate housing prices through 2026.



Why This Project?

Understanding real estate trends is more important than ever in our reality, as rising home prices, economic uncertainty, and post-pandemic shifts reshape the U.S. housing landscape.

With my background in computer mathematics and passion for data analysis, I wanted to explore:

- How major factors like income, unemployment, and tax rates influence home values
- What regions are most vulnerable or resilient to economic changes
- Whether we can forecast housing prices with confidence and clarity

This project not only allowed me to apply my skills in analytics, but also to create a tool that could guide better decisions—for analysts, buyers, or policymakers.





Questions to Explore



1. HOW HAVE HOME PRICES CHANGED IN MAJOR U.S. METRO AREAS FROM 2018 TO 2023?

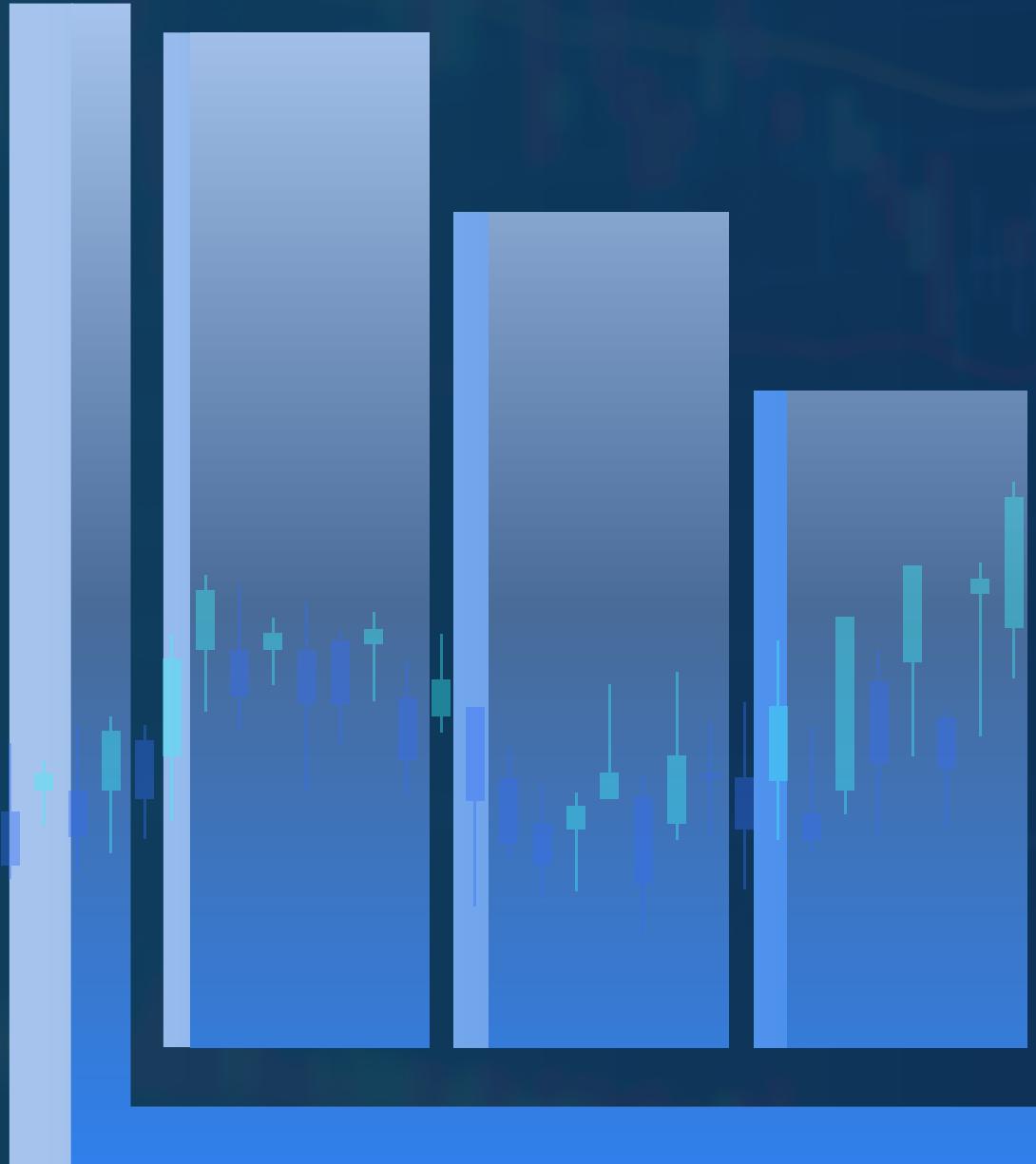
2. WHICH METRO AREAS EXPERIENCED THE FASTEST GROWTH IN HOME VALUES?

3. WHAT EXTERNAL FACTORS—SUCH AS UNEMPLOYMENT, INCOME LEVELS, AND TAX RATES—are most strongly associated with price shifts?

4. CAN WE BUILD RELIABLE 3-YEAR FORECASTS FOR HOME VALUES ACROSS KEY METRO AREAS?



Data Sources



HOUSING MARKET DATA (ZILLOW)

Downloaded datasets covering:

- ZHVI (Zillow Home Value Index)
- Inventory of homes
- Sales of single-family residences

ECONOMIC INDICATORS (FRED)

Pulled via API:

- Median household income
- Unemployment rate
- Population estimates

TAX DATA (OPENICPSR)

Downloaded panel dataset with:

- State/local sales tax
- Income tax rates
- Property tax estimates



Dataset Overview

Time Frame

The dataset spans from January 2018 to December 2026, including 5-years of historical data and machine-learning-based 3-year forecasts.

Geographic Coverage

- 49 major U.S. metro areas
- United States national average (for baseline comparison)

Granularity

- Data is aggregated at a monthly level
- Ensures consistency across different sources and indicators





1. Trends Overview

Understanding the trajectory of U.S. home values is crucial for homeowners, investors, and policymakers alike.

In this section, we uncover:

- The national growth in home prices from 2018 to 2023
- Which metro areas have experienced the most significant changes
- Regional differences and cyclical market patterns

Visual insights will guide us through how the housing market has evolved—and what signals it may hold for the future.





U.S. ZHVI Over Time

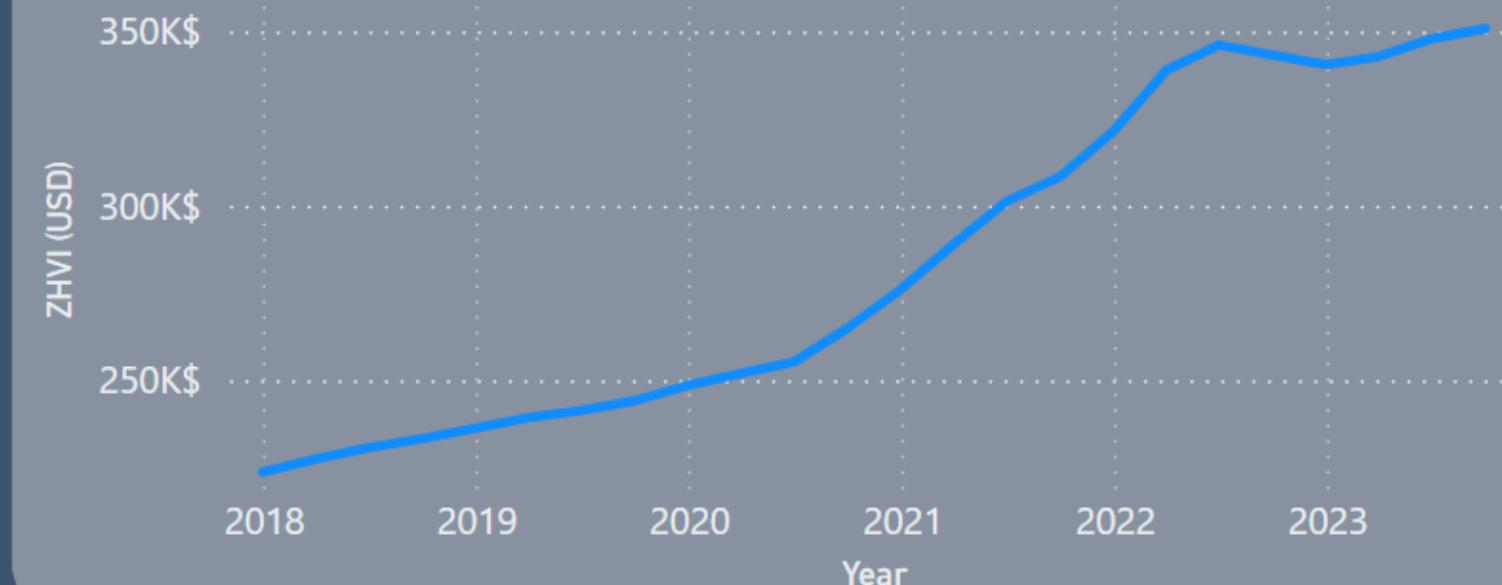
This chart highlights the growth in the Zillow Home Value Index (ZHVI) across the United States from January 2018 through December 2023.

Key observations include:

- A sharp COVID-era price spike in 2020–2021 driven by low interest rates, remote work migration, and supply constraints
- A moderation in 2022 due to rising interest rates and inflation
- A stabilization trend in 2023 as the market began to normalize

These national patterns set the foundation for deeper metro-level analysis in the following slides.

Home Value Trends Over Time





Monthly Home Sales & Inventory Trends

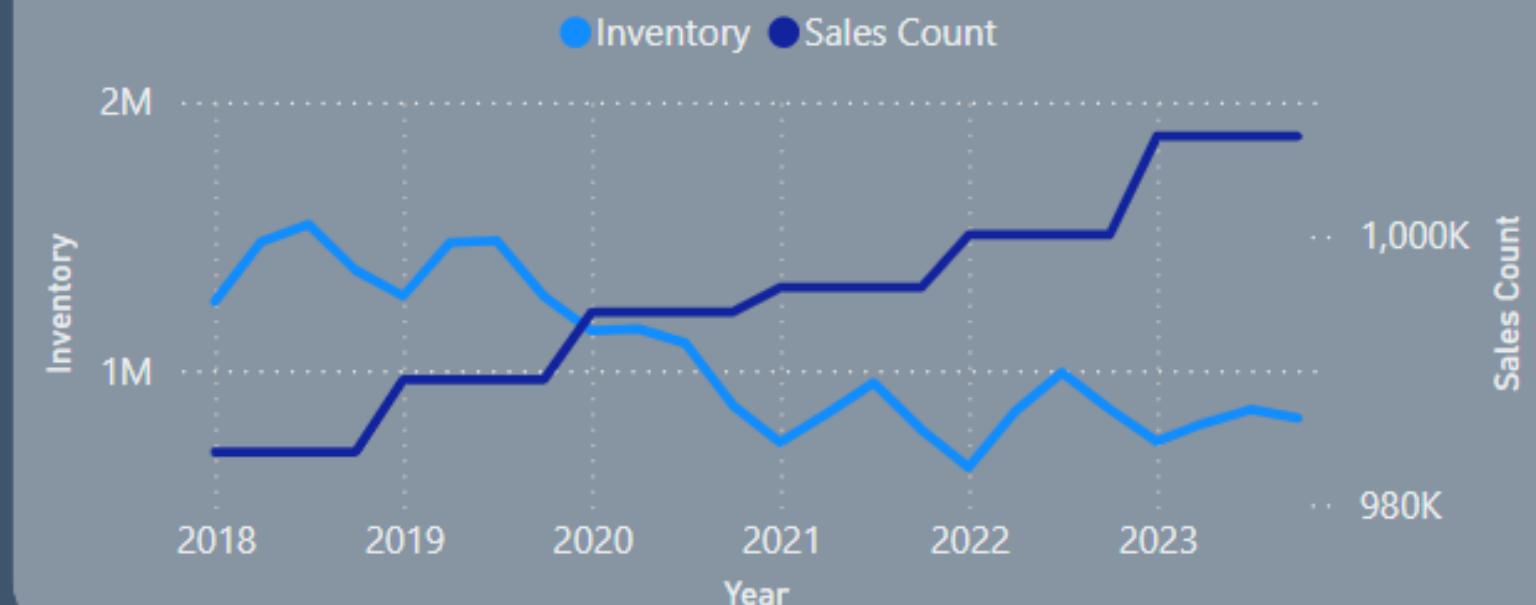
This dual-line chart shows national trends in single-family home sales and available inventory from 2018 through 2023.

Key takeaways:

- Inventory fell sharply during 2020–2021, as high demand outpaced supply — contributing to rapid price appreciation.
- Sales volumes peaked in 2021, coinciding with historically low interest rates.

Tracking the balance between supply and demand is essential to understanding local market pressures, and we explore these dynamics at the metro level next.

Monthly Home Sales vs Inventory (U.S. 2018–2023)





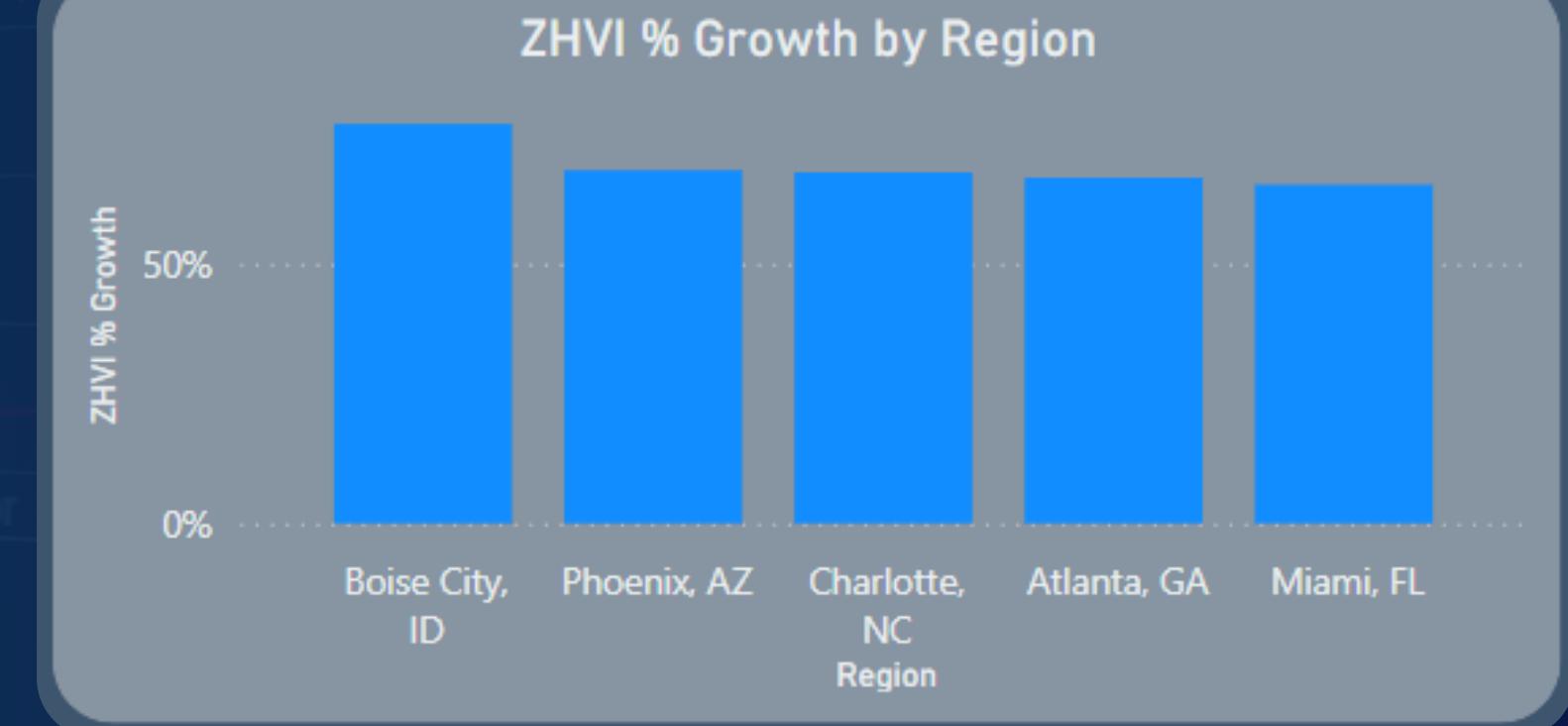
Top 5 Fastest-Growing Metros (2018–2023)

This bar chart highlights the five metro areas with the highest percentage increase in the Zillow Home Value Index (ZHVI) between January 2018 and December 2023.

Key observations:

- Each of these metros saw over 60% growth in home values, indicating robust local housing demand.
- Markets like Boise, Phoenix, and Charlotte benefited from population inflows, remote work migration, and comparative affordability during the post-2020 housing boom.

Tracking these growth leaders provides insight into both investment opportunities and future affordability pressures in high-growth metros.





2. Drivers of Home Value

This section explores the underlying factors that influence home price trends across different metro areas.

Key drivers include:

- Economic indicators like median income and unemployment rates
- Tax policies, including local income and sales taxes
- Environmental factors such as the frequency of natural disasters
- Population shifts, migration trends, and job market dynamics

Understanding these variables provides deeper insight into why home values rise faster in some regions and helps anticipate future housing market performance.



Correlation with ZHVI (All Homes)



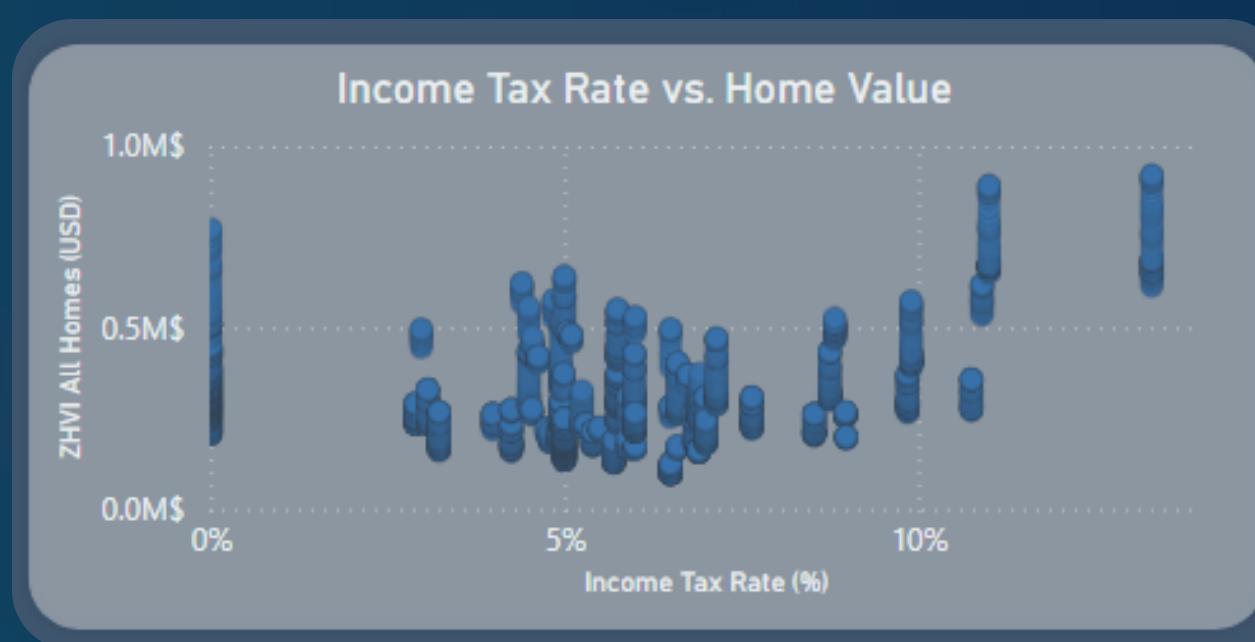
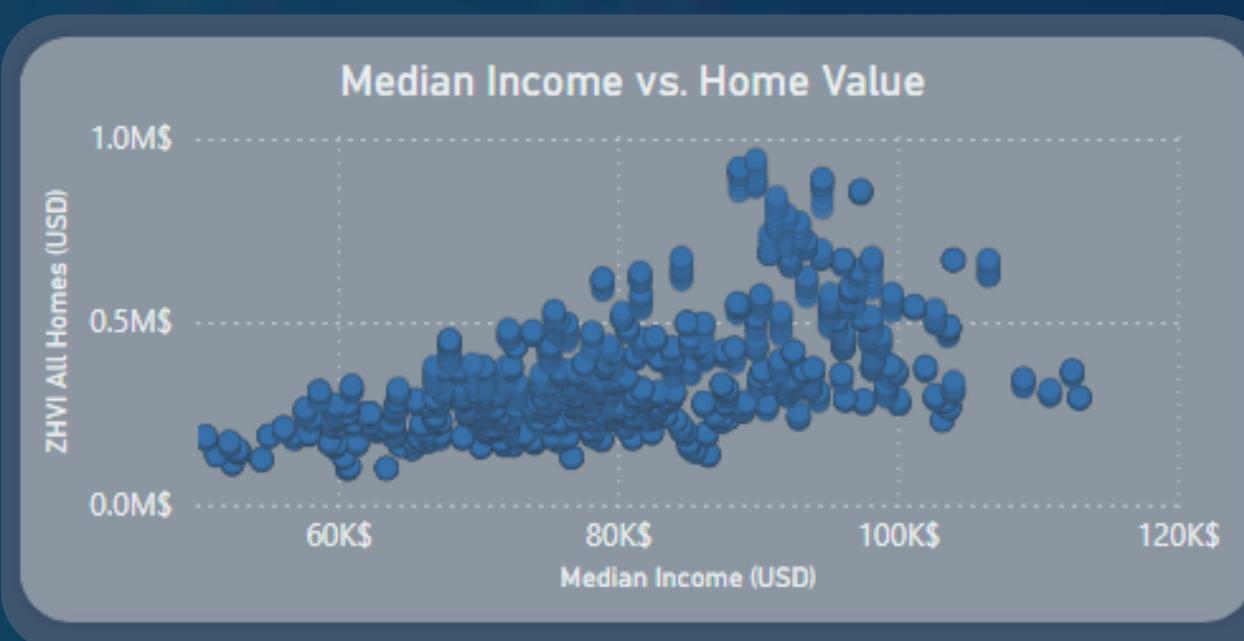
ZHVI Correlation with Economic and Policy Factors

This heatmap visualizes the Pearson correlation coefficients between Zillow Home Value Index (ZHVI) and various metro-level drivers from 2018 to 2023.

Key insights:

- Median Income shows a strong positive correlation with ZHVI, suggesting that higher earning regions tend to have higher home values.
- Unemployment Rate and Natural Disasters display a negative relationship with ZHVI, indicating potential downward pressure on housing values in affected areas.
- Tax Variables (e.g., Income Tax, Sales Tax) show mixed correlations, reflecting regional policy impacts that may either incentivize or deter housing demand.

These correlations provide a foundational understanding of which factors most influence home value changes across U.S. metros.



ZHVI vs. Median Income and Income Tax (U.S. Metros)

This visual compares how median household income and income tax rates relate to Zillow Home Value Index (ZHVI) across U.S. metro areas from 2018 to 2023.

Key insights:

- Higher median incomes are strongly associated with higher home values, reflecting greater purchasing power and demand in more affluent regions.
- Higher income tax rates also tend to align with elevated ZHVI, possibly due to urbanized states where both taxes and housing costs are above average.
- Notably, some low-tax metros still exhibit high home values, driven by factors like inbound migration, housing supply constraints, or regional desirability.
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This dual-variable view highlights how economic strength and policy environments jointly shape regional housing outcomes—providing a lens into affordability tradeoffs, market pressures, and investment opportunities across the U.S.



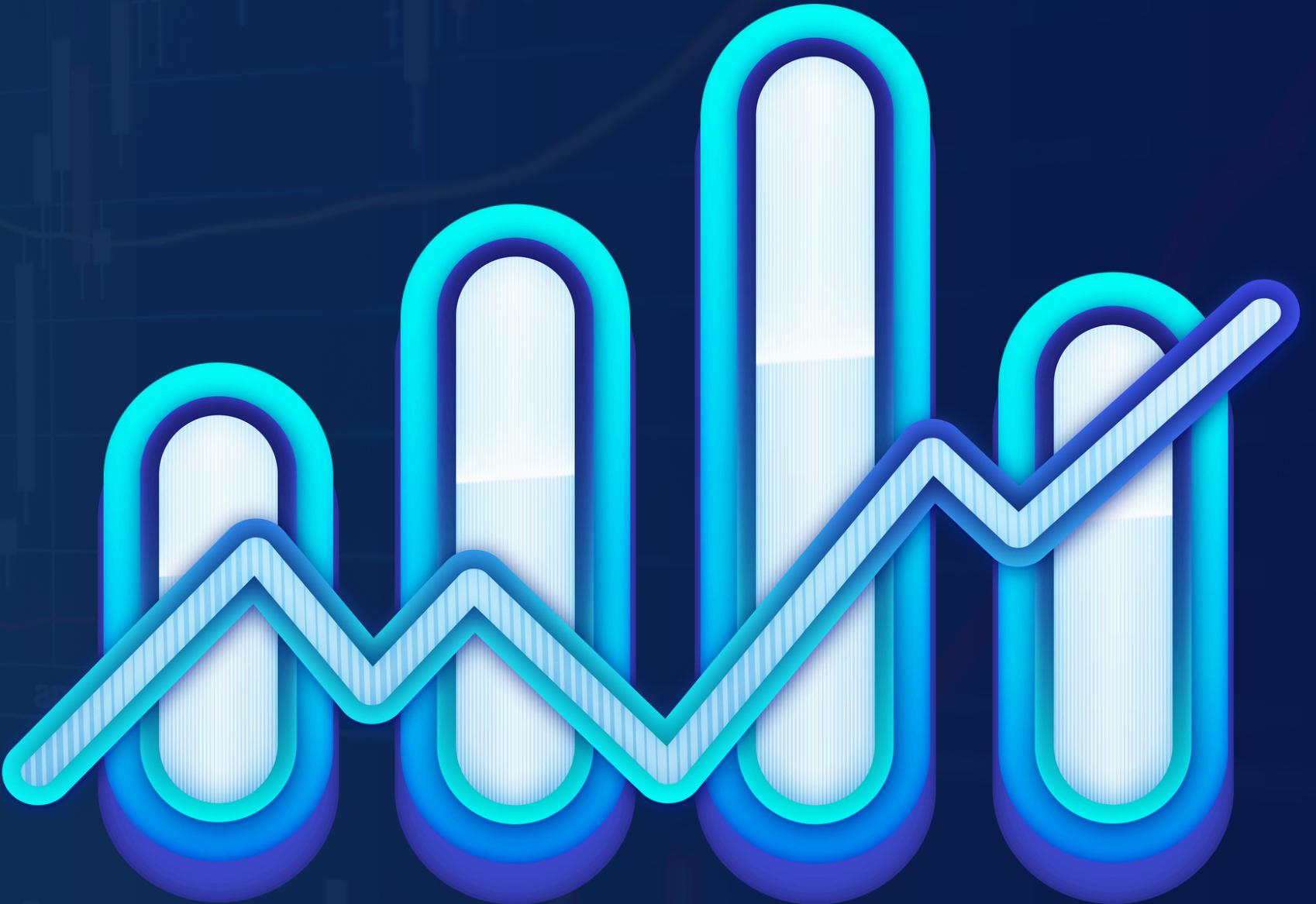
3. Regional Comparison

As home values shift in response to local conditions, regional comparisons become essential to understanding the broader housing landscape.

In this section, we explore how metro areas across the U.S. differ in:

- Market performance and volatility
- Local economic conditions and policy impacts
- Affordability, growth, and housing demand

These insights help reveal where housing markets are thriving, stagnating, or shifting—providing essential context for stakeholders, policymakers, and potential investors.





Regional Housing Market Summary

This matrix provides a side-by-side comparison of key housing and economic metrics across U.S. metro areas (2018–2023):

Included metrics:

- Average ZHVI – Average home value
- Median Income – Economic capacity of residents
- Unemployment Rate – Local labor market health
- Population – Market size and potential demand
- Sales Count – Transaction volume and activity
- Inventory – Supply availability

These indicators help assess which metros are thriving, which are under pressure, and how different forces—from income to supply—shape housing trends across regions.

By examining the full picture, we gain insights into where markets may offer value, face affordability risks, or require policy intervention.

| Metropolitan | ZHVI AllHomes | Median Income | Unemployment Rate | Sales Tax | Income Tax | Population | Inventory | Sales Count |
|----------------|---------------|---------------|-------------------|-----------|------------|------------|-----------|-------------|
| Atlanta, GA | 293,643\$ | 69,155\$ | 4.09% | 4.00% | 5.80% | 10,778,099 | 22,600 | 8,961 |
| Boise City, ID | 390,620\$ | 77,002\$ | 3.49% | 6.00% | 6.65% | 1,868,470 | 2,992 | 1,027 |
| Charlotte, NC | 288,332\$ | 68,952\$ | 4.54% | 4.75% | 5.25% | 10,583,116 | 8,053 | 4,004 |
| Miami, FL | 354,481\$ | 68,195\$ | 4.27% | 6.00% | 0.00% | 21,909,191 | 21,081 | 5,824 |
| Phoenix, AZ | 364,632\$ | 79,178\$ | 4.98% | 5.60% | 4.20% | 7,294,646 | 19,678 | 7,666 |



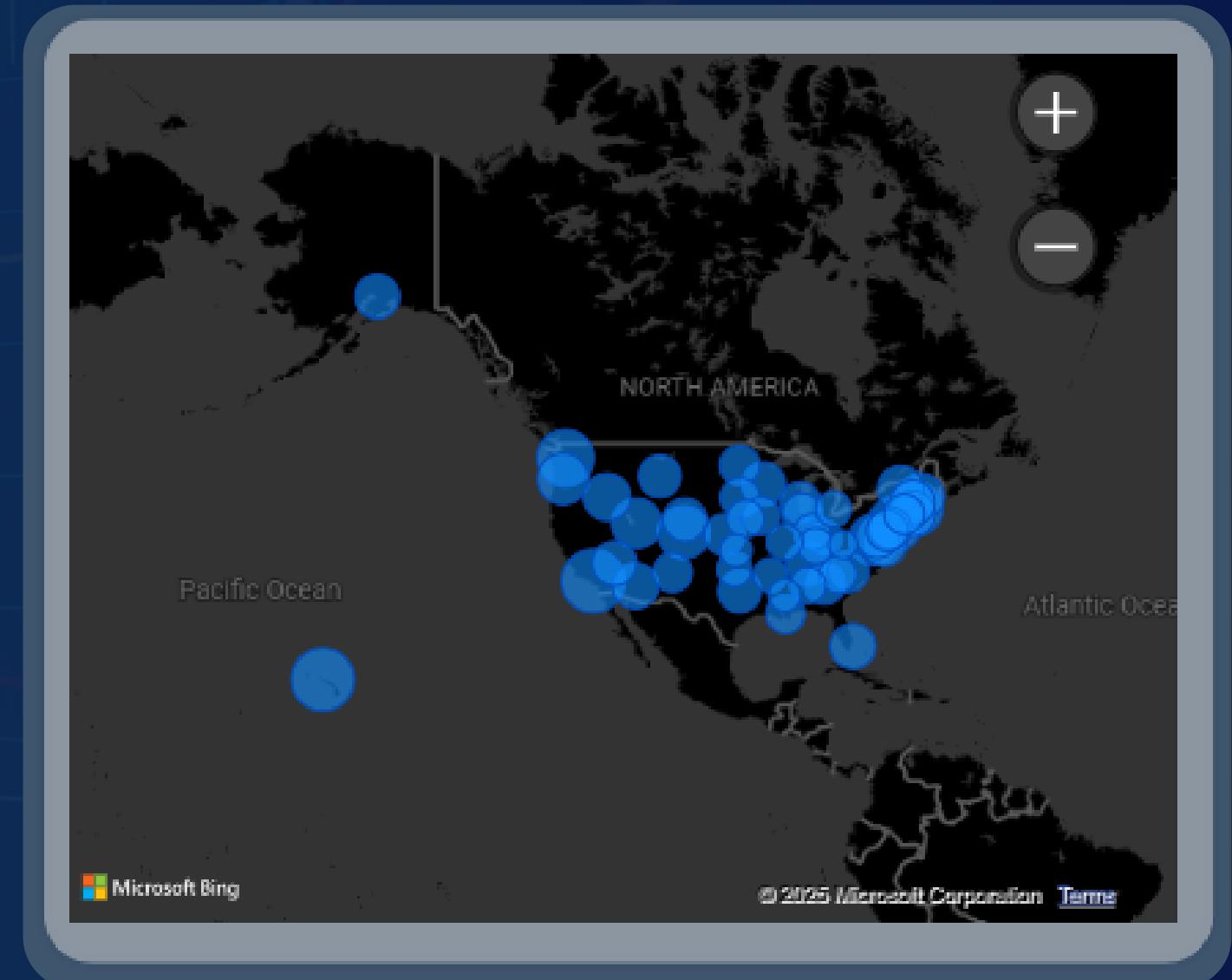
ZHVI by Region

This map visualizes regional differences in the Zillow Home Value Index (ZHVI) across U.S. metro areas as of December 2023.

Key Insights:

- West Coast and Northeast metros generally report the highest home values, driven by economic hubs, limited housing supply, and sustained demand.
- Southeastern regions show moderate but growing values, reflecting migration patterns and affordability-driven relocation.
- Midwestern metros tend to maintain more affordable housing, though some areas experienced notable appreciation during the pandemic era.

This spatial view highlights how geography influences housing markets—helping uncover where price pressure and affordability vary most sharply across the country.





4. Taxes & Impact

In this section, we explore how state and local tax policies shape housing markets across U.S. metro areas.

From income taxes that affect household budgets to sales taxes that influence cost of living, taxes play a crucial role in regional affordability and home value trends.

We'll examine:

- How tax rates correlate with home prices
- The geographic distribution of tax burdens
- Which metros balance economic prosperity and tax pressure

Understanding the tax landscape helps reveal hidden costs and pressures that impact long-term housing market dynamics.





Income Tax and Sales Tax vs. Home Prices



This dual-axis visual compares average metro-level income tax and sales tax rates with average ZHVI (Zillow Home Value Index) from 2018 to 2023.

Key insights:

- Income Tax appears to have a stronger relationship with home values compared to Sales Tax. Metros with higher income taxes often show elevated home prices, potentially due to urbanization, high demand, and premium housing markets.
- Sales Tax demonstrates a weaker or inconsistent pattern, suggesting its impact on home values is less direct or mediated by other regional factors.
- Some low-tax metros still exhibit high ZHVI, indicating that housing demand, migration, and supply constraints may outweigh tax effects in certain regions.

These charts suggest that income tax policy may play a more substantial role in shaping long-term housing affordability and regional value differentials.



5. Forecasting

As we look to the future, housing market forecasts offer valuable insights for planning, investment, and policymaking.

In this section, we highlight:

- Predicted trends in home values through 2026
- Key factors influencing future growth (e.g., income, employment, tax rates)
- Emerging opportunities and potential market risks

By combining historical patterns with forward-looking models, these forecasts help stakeholders make informed decisions in a dynamic housing landscape.



Forecasting Methodology

TIME SERIES FORECASTING (PROPHET)

We used the Prophet model to forecast key economic and policy drivers through 2026:

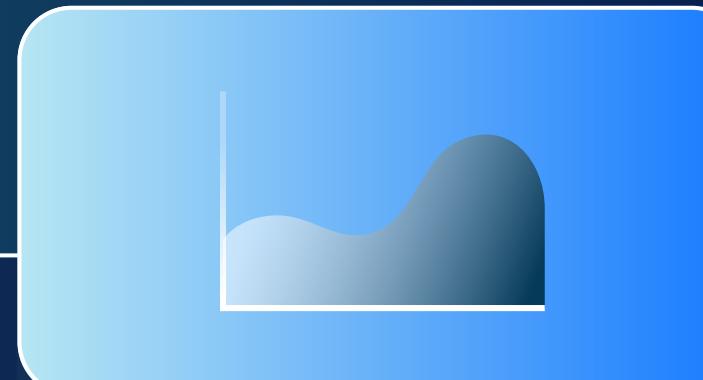
- Median Household Income
- Unemployment Rate
- Income and Sales Tax Rates

This step captures seasonal patterns, long-term trends, and external events (e.g., policy shifts, economic cycles).



PREDICTIVE MODELING (LINEAR REGRESSION)

Using the forecasted variables from Step 1, we built a regression model to predict future Zillow Home Value Index (ZHVI) for each metro area.





Forecasted Outcomes for 2026

As we project forward, several key metrics help us assess the health and direction of the housing market in metro areas by the end of 2026. These indicators provide insights into economic conditions, housing affordability, and potential market risks.

These values reflect machine learning forecasts based on macroeconomic factors, tax policy, and regional growth patterns. They can inform policy, investment strategies, and affordability assessments for stakeholders across the housing ecosystem.

Forecasted Home
Value (Dec 2026)

451.3K\$

% Change in Home
Value (2018–2026)

85.68%

Forecasted Median
Income (2026)

72.6K\$

Forecasted
Unemployment Rate
(2026)

7.77%



6. Key Takeaways & Insights

Understanding the future of the U.S. housing market requires more than just looking at location.
Our data-driven analysis reveals deeper forces shaping home values across regions.

FUNDAMENTALS FIRST

Drivers like income, unemployment, and tax rates outweigh geographic location in shaping future home values.

POLICY & RISK MATTER

High income taxes and economic volatility can suppress growth, even in desirable areas.

UNEVEN RECOVERY

Forecasts show a steady overall increase in home values, but recovery rates vary widely across metros.

STRATEGIC IMPLICATIONS

Investors and policymakers should assess economic indicators, not just past performance, to make informed decisions.



Thank You!

Thank you for exploring the US housing market forecast with me.
I hope these insights into home value trends, economic factors, and regional
drivers help inform your real estate decisions and investment strategies.