GROUP 1

2025

ANALYSIS OF VICTORIA'S RENTAL MARKET

Jordan Chao   Stanley Zaranski   Bike Pham   Zhi Jian Damyan Ang   Du-Simon Nguyen

Problem Overview and Project Objectives

- Understanding rental market from a data driven perspective

- Determining drivers of rental demand

- Maximising revenue today while spotting tomorrow's high-growth properties

1. What are the most important internal and external features in predicting rental prices?

2. What are the top 10 suburbs with the highest predicted growth rate?

3. What are the most liveable and affordable suburbs?

Project Timeline

W6 — Sprint 1 - Data collection (5hrs)

W7 — Sprint 2 - Data preprocessing (20hrs)

W8 — Sprint 3 - EDA (20hrs)

W9 — Sprint 4 - Modelling Forecasting (15hrs)

Break — Sprint 5 - Results and Analysis (20hrs)

W10 — Sprint 6 - Report (15hrs)

Key Findings

Answering the big 3 questions

1. Most Important Features

Feature	Random Forest Importance (%)	XG Boost Importance (%)	Feature type
Bathrooms	21.96	26.63	Internal
Bedrooms	13.21	20.99	Internal
Percentage of Bachelor Holders	16.2	14.36	External
Percentage of Certificate Holders	-	3.06	External
Weekly median family income	2.91	8.52	External
Weekly median individual income	2.73	2.65	External
Number of tram stops	2.55	2.27	External
Number of bus stops	2.56	-	External
Population estimate	-	2.18	External
Car Spaces	-	1.93	Internal

Justifications and Assumptions

Model

Multicollinearity

Correlation or Causation

Features

Data Leakage

Non Informative Features

2. Liveability & Affordability Index
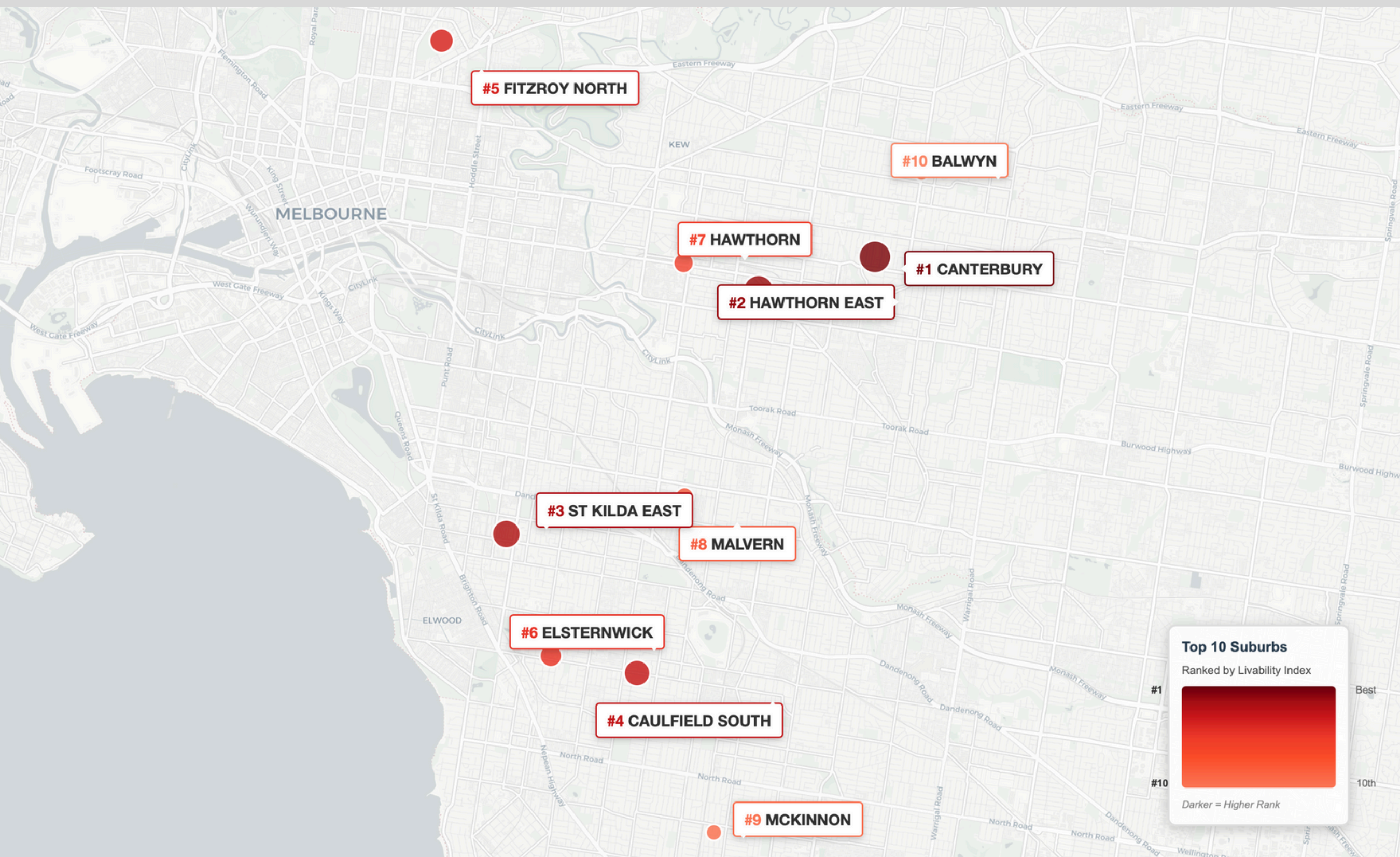
Liveability Index
Per Suburb

0.4 - Crime rate
0.3 - Number of schools
0.1 - Number of trams
0.1 - Number of buses
0.1 - Number of trains
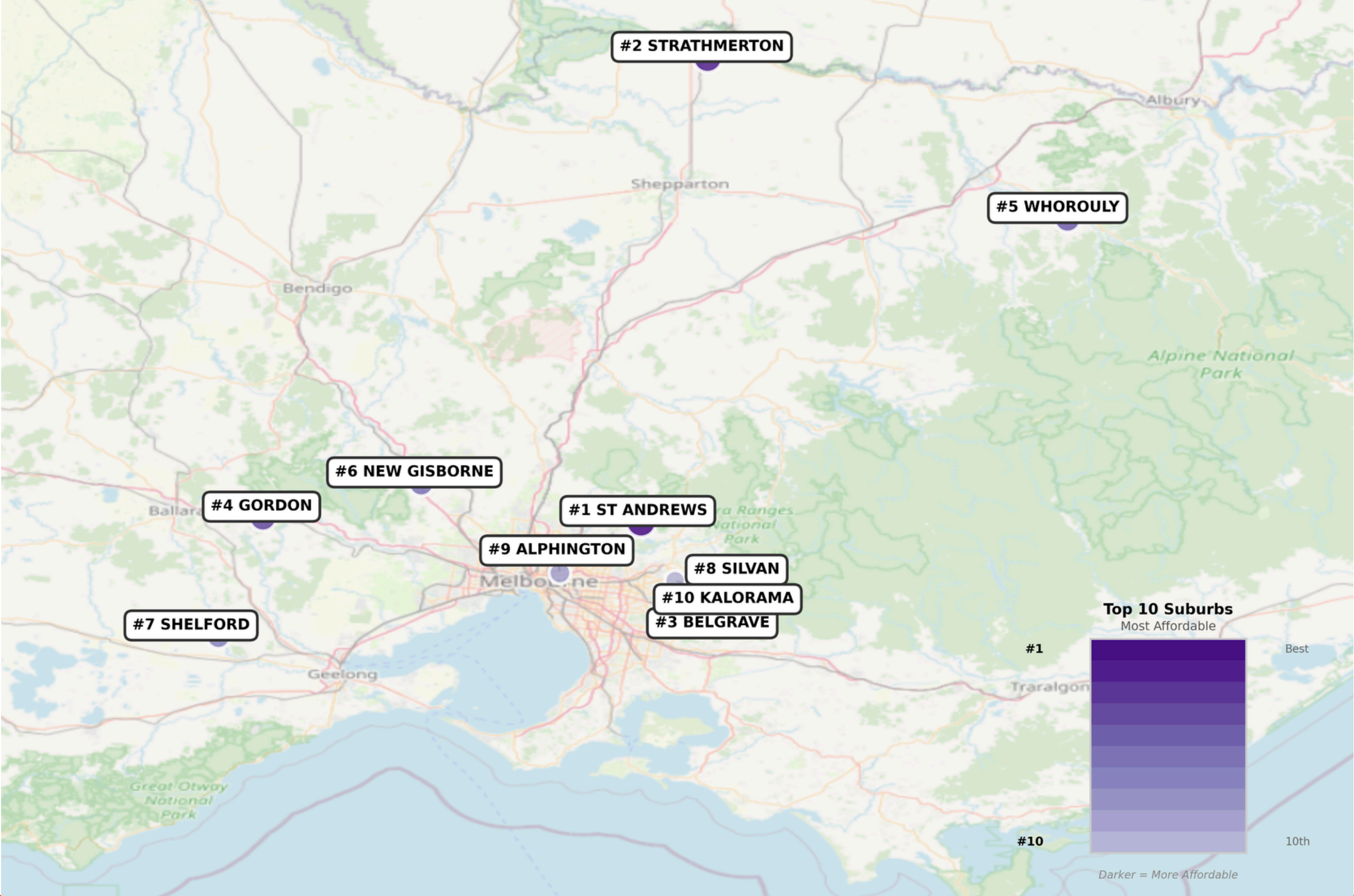
Affordability Index
Per Suburb

$$1 - \frac{weeklyRent}{medianWeeklyHouseholdIncome}$$

Top 10 Most Liveable Suburbs

Rank	Suburb Name	Liveability Score
1	Canterbury	0.734
2	Hawthorn East	0.731
3	St Kilda East	0.717
4	Caulfield South	0.712
5	Fitzroy North	0.689
6	Elsternwick	0.673
7	Hawthorn	0.667
8	Malvern	0.656
9	McKinnon	0.655
10	Balwyn	0.654

Top 10 Suburbs

Ranked by Livability Index

#1 ... Best

#10 ... 10th

Darker = Higher Rank

Top 10 Most Affordable Surburbs

| Rank	Suburb Name	Affordability Score
1	St Andrews	1.00
2	Strathmerton	0.978
3	Belgrave	0.978
4	Gordon	0.965
5	Whorouly	0.962
6	New Gisborne	0.948
7	Shelford	0.945
8	Silvan	0.942
9	Alphington	0.933
10	Kalorama	0.932

3. Rental Price Forecast

Clayton Forecast for Next 5 Years
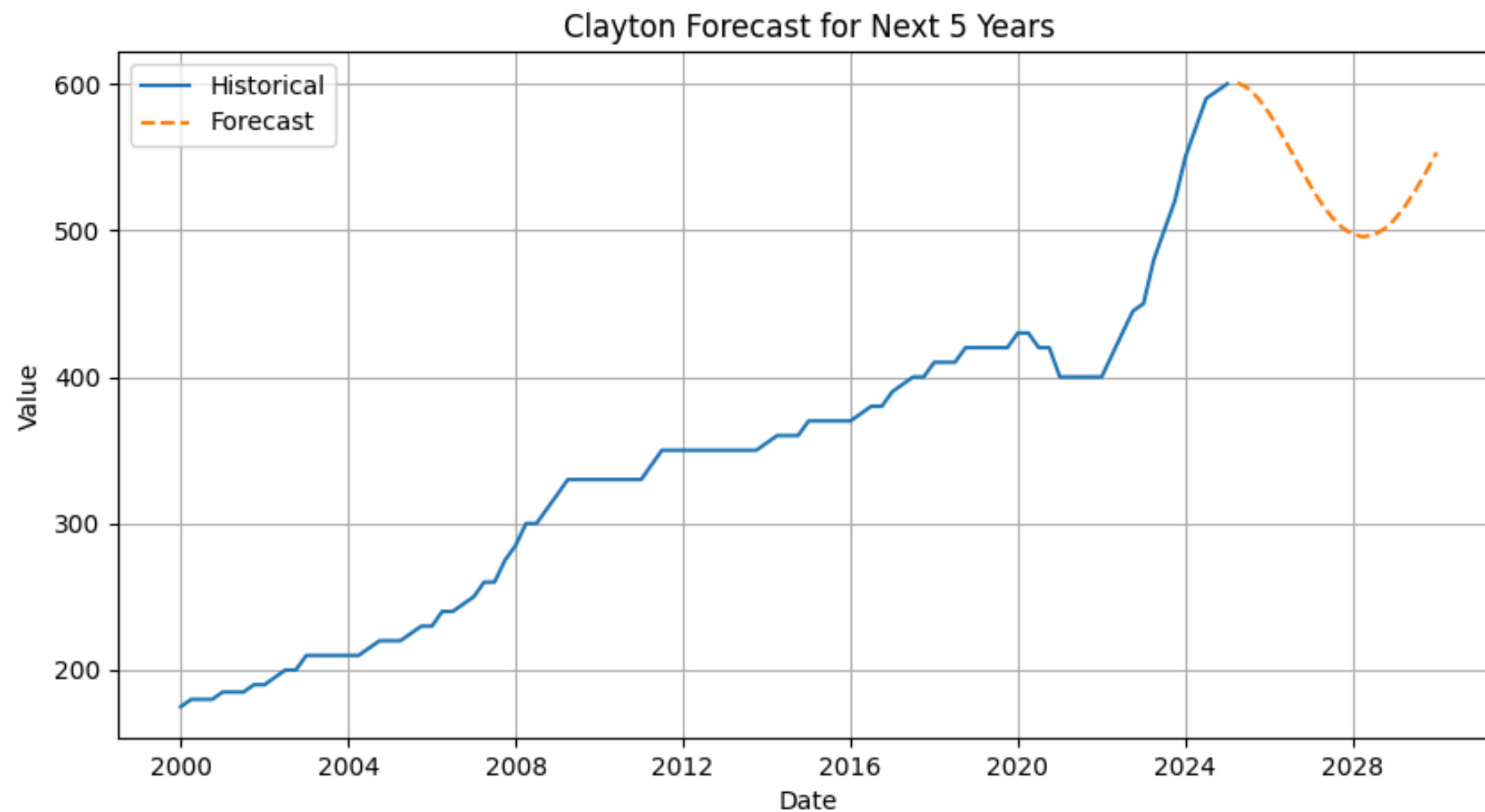
- **ARIMA Model**

- **Forecast accuracy**: 94–97%. Train 2020-2023, Test 2024

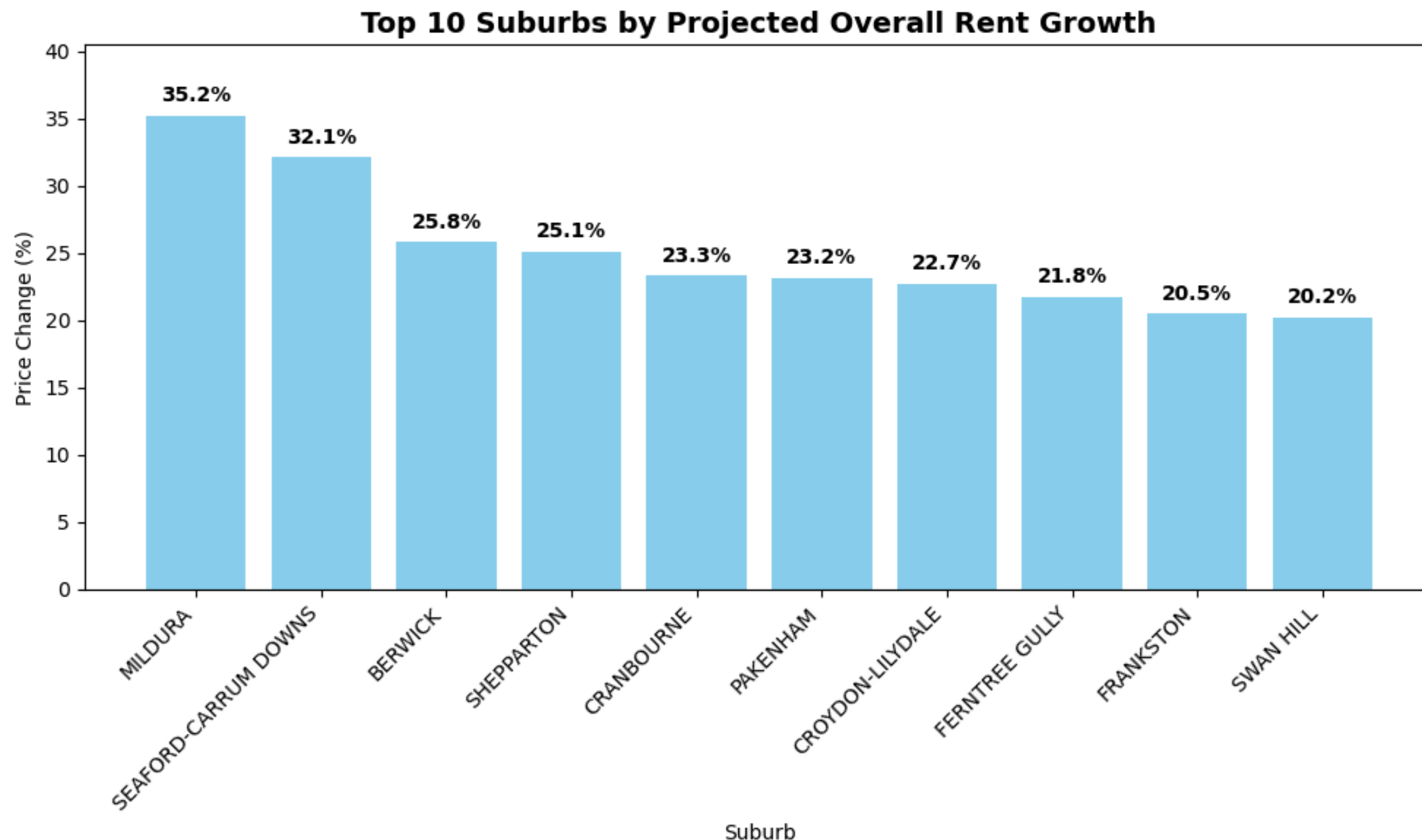- **Typical error**: Predictions are within $17–$37 per week of actual rents

3. Rental Price Forecast

Mildura Forecast for Next 5 Years

Justifications and Assumptions
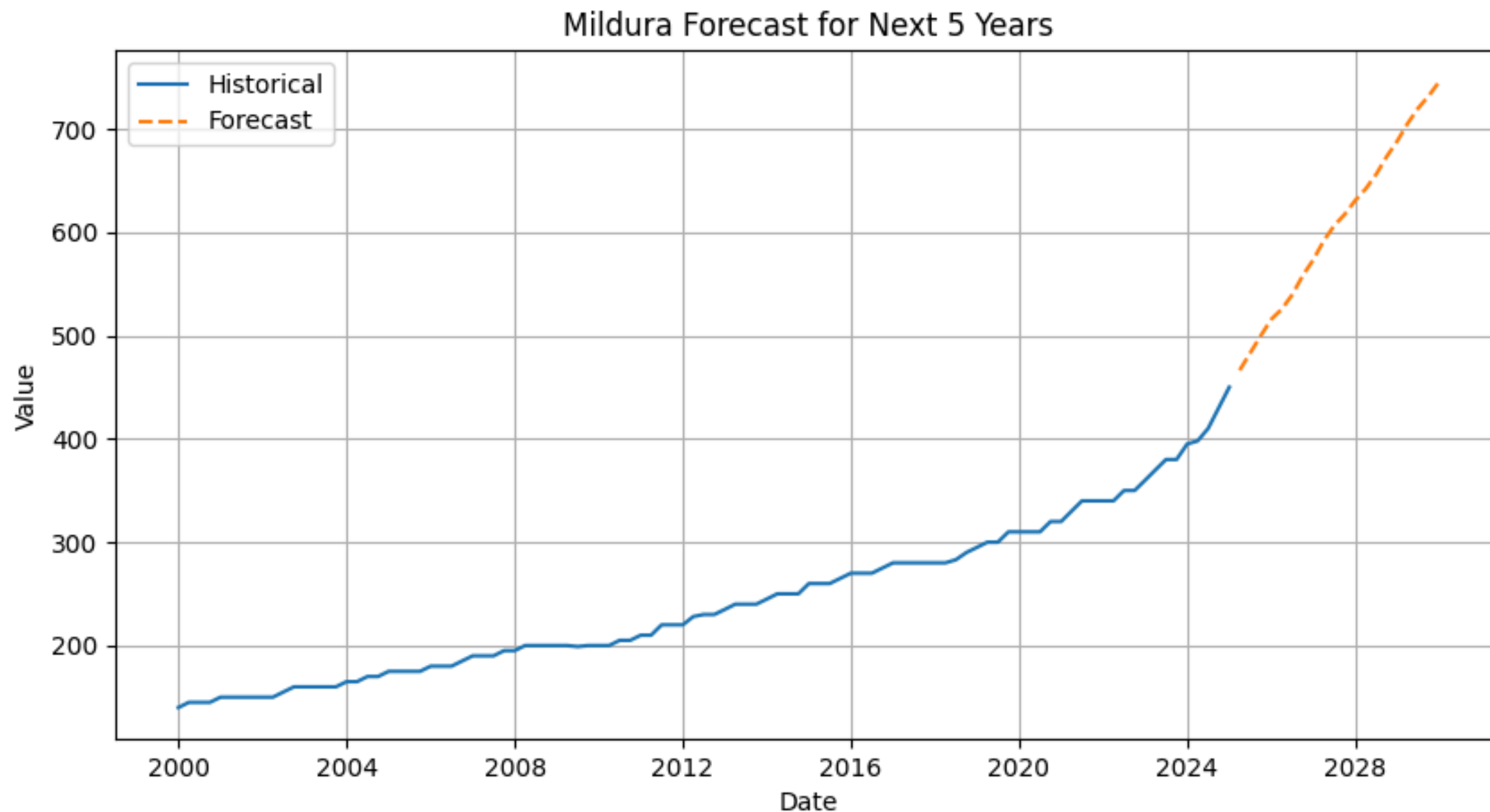
- **Rental markets follow historical patterns without major shocks**

- **Quarterly seasonality considered, though contractual rents may be less seasonal**

- **Model does not include external drivers (e.g., inflation, migration, policy)**

Top 10 Highest Predicted Growth Suburbs

Top 10 Suburbs by Projected Overall Rent Growth

Suburb	Price Change (%)
MILDURA	35.2%
SEAFORD-CARRUM DOWNS	32.1%
BERWICK	25.8%
SHEPPARTON	25.1%
CRANBOURNE	23.3%
PAKENHAM	23.2%
CROYDON-LILYDALE	22.7%
FERNTREE GULLY	21.8%
FRANKSTON	20.5%
SWAN HILL	20.2%

Key Findings

- **Outliers**: Some suburbs (e.g. Blackburn, Armadale) had higher error due to sudden market shifts

- **Highest growth projected in Mildura, Seaford-Carrum, Berwick, etc.**

Forecasting: Understanding Market Caveats

Distribution of Annual Rent Price Change Across Suburbs
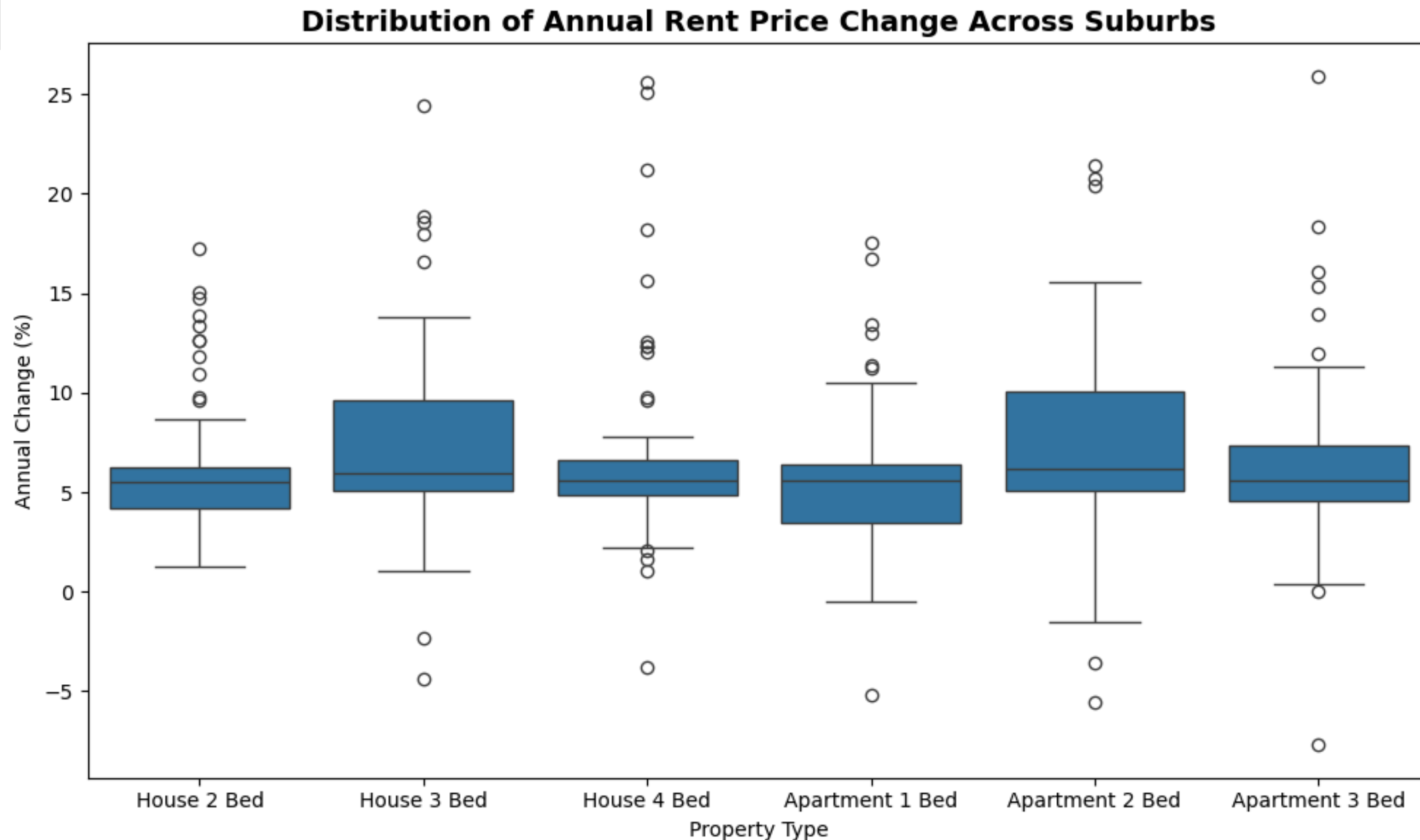
Project Integrity

Ensuring our approach is methodologically sound and ethically responsible

Evaluating Project Methodology

Project Limitations and Underlying Assumptions

| Limitations/Challenges	Assumption/Justification
Temporal mismatches between datasets	Stable demographic and socio-economic conditions
Spatial granularity mismatch	Neighbouring/overlapping regions of different granularities share similar properties
Potential sampling bias	Listings reflect market conditions

Privacy Acknowledgments

- **Centralised Codebase**

- **Data Confidentiality**

- **Secure API Key Storage**

Recommendations

Translating Empirical Findings into Stakeholder Actions

Turning Insights into Solutions
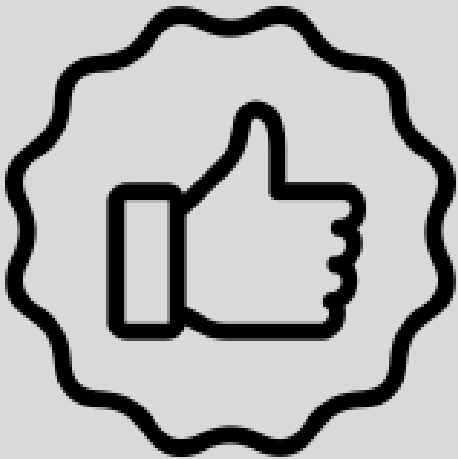
1. Dynamic dashboards for real-time rental insights

2. Time series for suburb-level insights

3. Feature importance for property-level insights

Suburb	Liveability Rank	Affordability Rank	Unit Avg Rent Today ($)	Projected Annual Growth (%)
CAULFIELD	4	136	632.41	6.2
HAWTHORN	7	114	615.59	3.2
BENTLEIGH	9	289	586.58	5
NORTHCOTE	16	128	613.73	6.7
THORNBURY	17	151	542.32	6.1

The Intelligent Investor

up to

65%

higher return on investment by utilizing our analysis

Return on Investment (ROI) =

$$\frac{\text{Avg Rental Income Over Next 5 Years}}{\text{Median Property Price Today}}$$

Highest 5-Year ROI Across Suburbs and Property Types
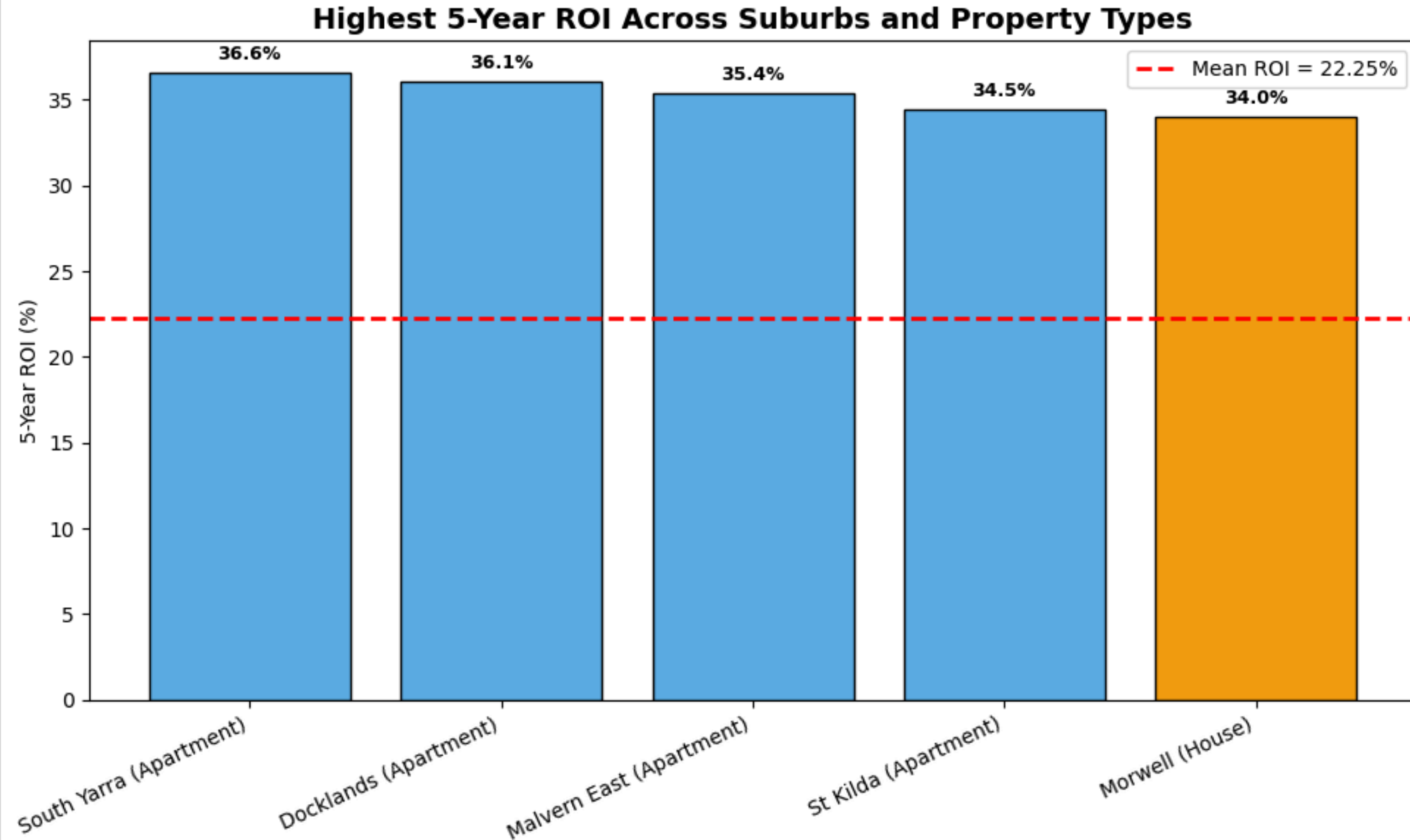
Project Feasibility, Value, and Next Steps

- **Foundation for Future Research and Analysis**

- **Investment Perspective: Present Market vs. Future Prospects**

- **Correcting Prices for Rental Property Listings**

RENTAL DESIRABILITY

AFFORDABILITY

LIVEABILITY

FUTURE GROWTH

Thank you