Vancouver & Victoria Short-Term Rental Market Analysis
CMPT 353 Project

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1 Introduction

Short-term rentals play a visible role in both the housing market and the tourism economy in British Columbia. For many residents and investors, they are a potential source of income; for policymakers, they are a sector to monitor and regulate. Deciding whether and how to operate an Airbnb in Vancouver or Victoria involves balancing opportunity with changing market conditions.

On May 1, 2025, new provincial rules came into effect under the B.C. Short-Term Rental Accommodations Act. These rules require most hosts to have both a municipal business licence and a provincial registration number, and in many cases limit rentals to the host's principal residence. The goal is to return more housing to long-term residents while still allowing some short-term rentals to operate. These changes have the potential to reduce the number of active listings, shift prices, and change the mix of licensed versus unlicensed properties.

This report examines three key questions for prospective and current hosts:

1. What listing features such as location, property type, size, and amenities are most strongly linked to higher annual revenue?

2. Which neighbourhoods offer the best return when projected Airbnb income is compared to the cost of buying a property?

3. How has the new B.C. short-term rental regulation affected the market in its early months?

We combine recent Airbnb listing data for both cities with neighbourhood house price estimates and mapped boundaries. The analysis blends statistical modelling with visual summaries to provide practical, evidence-based insights for those considering or already engaged in short-term rental operations.

2 Data and ETL

Our analysis draws on multiple recent datasets. The primary source is monthly snapshots of Airbnb listings in Vancouver and Victoria during early 2025, containing each property's location, nightly price, property type, number of bedrooms and bathrooms, amenities, review metrics, and licence status. To provide financial context, we also incorporate 2025 benchmark property prices for each neighbourhood and official neighbourhood boundary maps.

Because these inputs came from different files and formats, we first created a single, consistent dataset. This process included:

- **Standardising fields** – converting prices to numeric CAD values, ensuring dates used a consistent monthly format, and normalising text fields.
- **Neighbourhood matching** – linking each listing to its neighbourhood using cleaned names, with fuzzy matching where exact matches failed.
- **Feature engineering** – estimating annual revenue as nightly price $\times$ occupancy rate (from recent booking activity), counting amenities, and computing distances to the city centre.
- **Data integration** – merging with external benchmark price data for ROI analysis.
- **Final cleaning** – removing extreme outliers (e.g., nightly price $>$ \$1,0000 or occupancy $>$ 100%), dropping incomplete records, and ensuring correct data types.

The result is a unified table of 14,479 listing-month records across both cities, ready for analysis for all three research questions.

3 Data and ETL

Our analysis draws on several sources of recent market information. The primary dataset comes from monthly snapshots of Airbnb listings in Vancouver and Victoria during early 2025. These snapshots include each listing's location, nightly price, property type, number of bedrooms and bathrooms, reviews, amenities, and licence status. To provide financial context, we also use neighbourhood-level benchmark house prices for the same period, along with official maps of city neighbourhood boundaries.

Because the raw data came from different files, formats, and dates, we first prepared a unified, clean dataset before any analysis. This involved matching each listing to its neighbourhood, standardising numeric fields, and creating additional variables such as estimated annual revenue and an occupancy indicator based on recent activity. For ROI calculations, we grouped listings by neighbourhood and compared predicted annual income with average purchase prices.

4 Question 1: Predictors of Annual Airbnb Revenue

Objective: Determine which listing characteristics have the strongest association with annual Airbnb revenue in Vancouver and Victoria, providing actionable guidance to hosts and prospective investors.

Methods: Two complementary models were used: **k-Nearest Neighbours (KNN)** regression with $k = 5$ to capture local non-linear patterns, and **Random Forest** regression with 200 trees to rank feature importance and capture interactions. In this context, *feature importance* measures how much each variable (e.g., price, number of reviews) contributes to improving the model's predictions: larger values mean the variable is more influential in determining annual revenue. Model performance was evaluated with 5-fold cross-validation and compared to a baseline OLS regression.

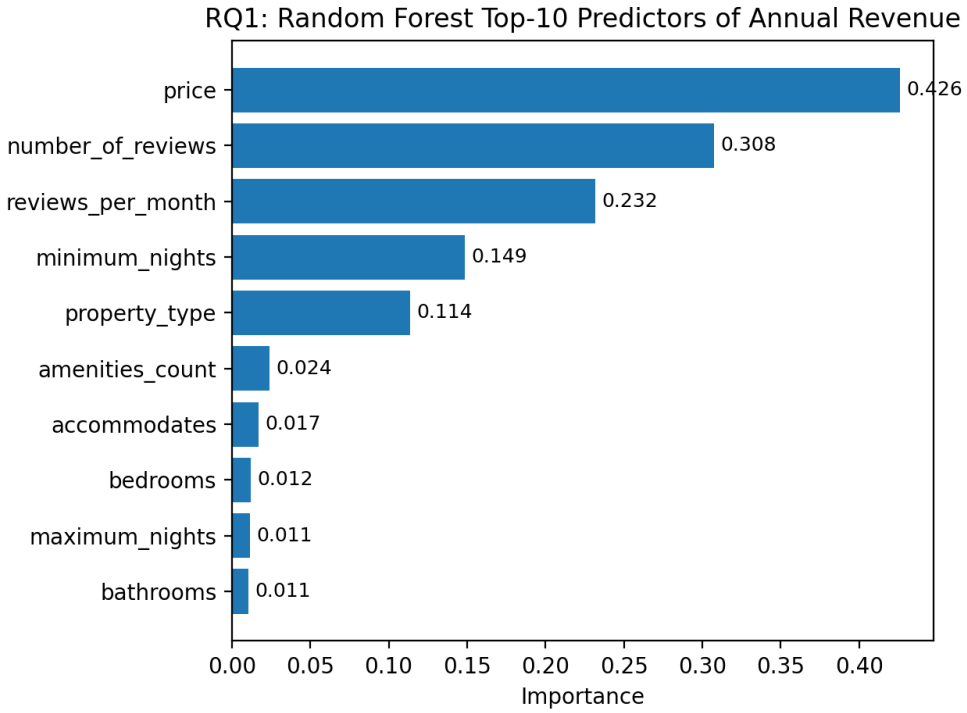


Figure 1: Top-10 Random Forest feature importances for annual revenue.

Results: Both models identified consistent top predictors: nightly price, number of reviews, reviews per month, minimum nights requirement, and property type. Price emerged as the dominant predictor, followed by review-based demand indicators. Minimum nights was negatively associated with revenue, and entire homes/apartments tended to earn more than private rooms.

Interpretation: These results suggest that competitive nightly pricing, maintaining a steady flow of positive reviews, and offering flexible booking terms are key levers for maximising annual revenue. Properties catering to larger groups or with full amenities generally outperform smaller or more restrictive options.

5 Question 2: Return on investment (ROI) by Neighbourhood within Each City

Goal: Evaluate the relative attractiveness of neighbourhoods in Vancouver and Victoria for short-term rental investment by comparing predicted annual Airbnb revenue to local property purchase prices.

Methods: Return on investment (ROI) was defined as:

$$\text{ROI} = \frac{\text{Predicted Annual Revenue}}{\text{Neighbourhood Benchmark Price}}$$

Predicted annual revenue values came from the Random Forest model in Question 1, which estimated revenue for each listing based on its characteristics. Annual revenue for each listing was

initially calculated as:

$$\text{Annual Revenue} = \text{Nightly Price} \times \text{Estimated Occupancy Rate} \times 365$$

These listing-level predictions were then averaged for each neighbourhood before dividing by the benchmark dwelling price.

(a) Vancouver

Neighbourhood	Revenue	Price	ROI
Downtown	25,337	660,017	0.038
Strathcona	29,079	917,658	0.032
Renfrew–Coll.	25,968	900,658	0.029

(b) Victoria

Neighbourhood	Revenue	Price	ROI
Sooke	21,407	869,400	0.025
Victoria West	20,653	1,020,900	0.020
Langford	20,647	1,048,000	0.020

Table 1: Top neighbourhoods by ROI in Vancouver and Victoria. Predict Revenue and Price in CAD.

Results: Vancouver's leaders—Downtown (0.038), Strathcona (0.032), and Renfrew–Collingwood (0.029)—combine high occupancy with strong demand from tourists and business travellers. Victoria's top areas—Sooke (0.025), Victoria West (0.020), and Langford (0.020)—have lower purchase prices but steady booking activity. Across all neighbourhoods, ROI ranged from 0.011 to 0.038, with medians of 0.021 in Vancouver and 0.018 in Victoria.

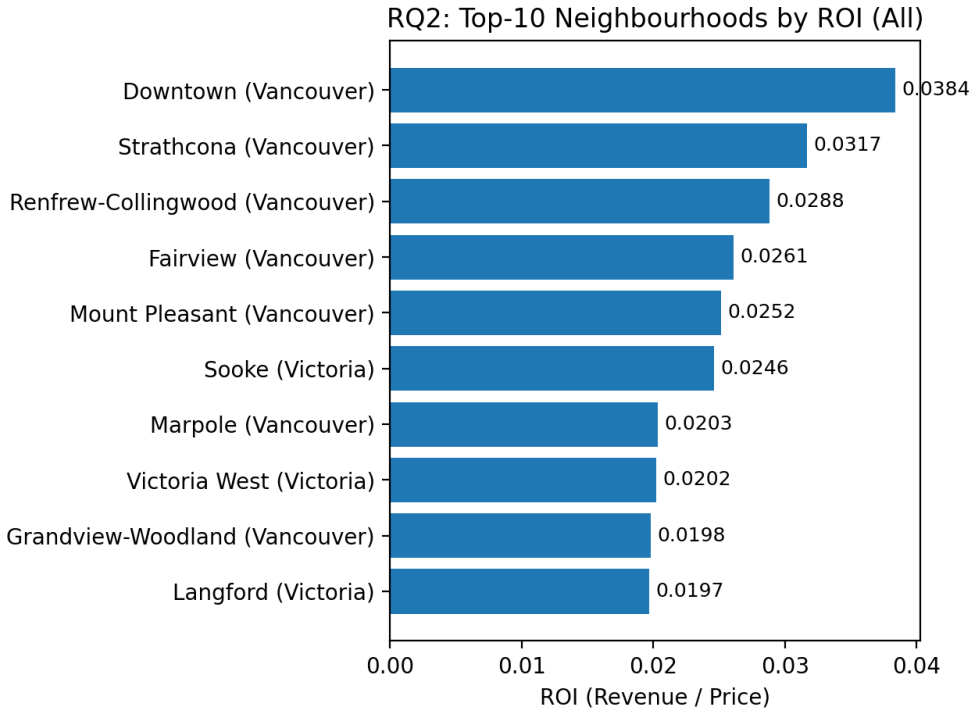


Figure 2: Top-10 neighbourhoods by ROI across both cities.

Interpretation: For investors, high-ROI neighbourhoods offer better income potential relative to capital cost, but ROI differences are shaped by both demand and property prices. In Vancouver,

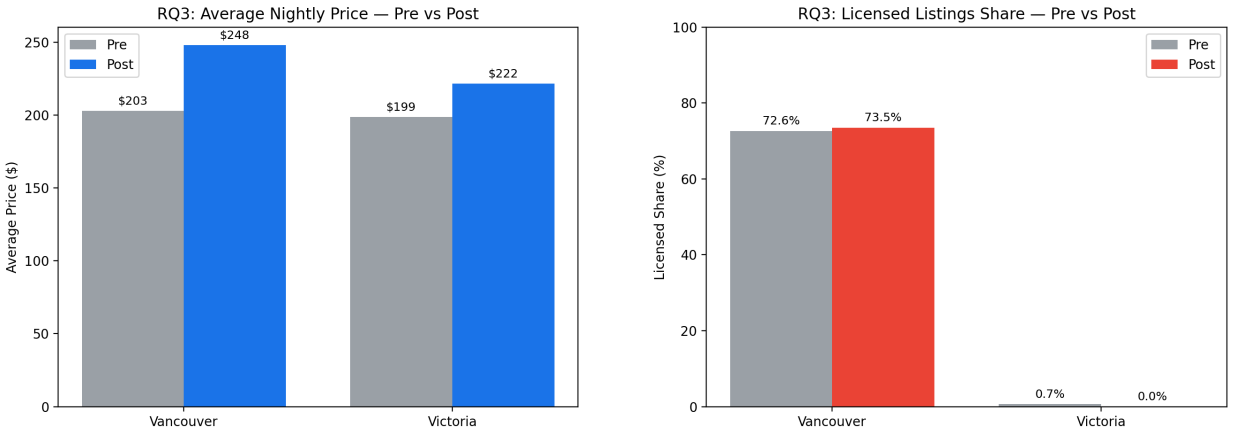
central areas with consistent bookings outperform expensive, low-occupancy zones. In Victoria, lower-priced suburbs can match or exceed returns from central locations despite lower nightly rates.

6 Question 3: Policy Impact – Pre/Post Comparison between Cities

Goal: Assess whether market conditions shifted in the months immediately before (March–April 2025) versus after (May–June 2025) the new provincial short-term rental regulations, and whether these shifts differed between Vancouver and Victoria.

Methods: We examined two metrics: (1) average nightly price, to see whether prices shifted after the regulation; and (2) licensed listings share, to gauge changes in compliance rates. For prices, we used a **two-way ANOVA** (Analysis of Variance) to test whether mean prices differed across cities, periods, and their interaction. Where ANOVA found significant differences, we applied **Tukey's Honest Significant Difference (HSD)** test to identify which specific city–period pairs differed. For licence share, we used a **Chi-square test of independence** to check whether the proportion of licensed listings was related to period. We then ran proportion z-tests within each city to check for pre/post changes.

Results: Average nightly prices rose in both cities after May 1, with Vancouver showing the larger jump (from \$203 to \$248, +\$45) compared to Victoria (from \$199 to \$222, +\$23). Vancouver's post-policy prices also ended higher than Victoria's. Licence share in Vancouver stayed stable at about 73%, while Victoria saw a small drop from 0.7% to 0%.



(a) Average nightly price

(b) Licensed listings share

Figure 3: Policy impact: Pre/Post comparison in Vancouver and Victoria.

Interpretation: These early results suggest that the regulation may have tightened supply or changed listing composition in a way that allowed prices to rise, especially in Vancouver. The lack of increase in licensed share in Vancouver could mean compliance was already high before the policy took effect, while Victoria's small decline may reflect short-term adjustments or data reporting quirks. Because the post-policy window is short, these should be treated as early signals rather than definitive trends.

7 Limitations

This analysis has several limitations. First, predicted revenue is based on modelled occupancy and price rather than actual booking data, and neighbourhood benchmark prices may not match the value of individual properties. Second, the post-policy observation period covers only two months, making it difficult to separate policy effects from seasonal changes or other market shifts. Finally, our ROI calculations focus only on gross revenue relative to purchase price and do not account for taxes, maintenance, financing, or management costs, all of which could substantially affect realised returns.

8 Conclusion

This report analysed short-term rental performance in Vancouver and Victoria through three key questions: identifying revenue drivers, comparing neighbourhood ROI, and assessing early effects of new provincial regulation. We found that pricing, recent reviews, and booking flexibility are among the strongest predictors of annual revenue. ROI analysis highlighted that in both cities, a few neighbourhoods outperform the median, often due to a combination of strong demand and relatively moderate property prices. The policy analysis showed early signs of price increases in both cities after May 1, 2025, with no immediate jump in licensed share in Vancouver and a slight decrease in Victoria. For prospective hosts and investors, these results underscore the importance of strategic location choice, competitive pricing, and maintaining guest satisfaction. For policymakers, the findings suggest that regulatory changes can influence market prices even in the short term, though longer-term monitoring is needed to assess impacts on supply and compliance. Overall, the framework developed here—combining listing-level modelling, ROI ranking, and pre/post market analysis—provides a reproducible approach for ongoing evaluation of the short-term rental sector.

Appendix: Additional Figures

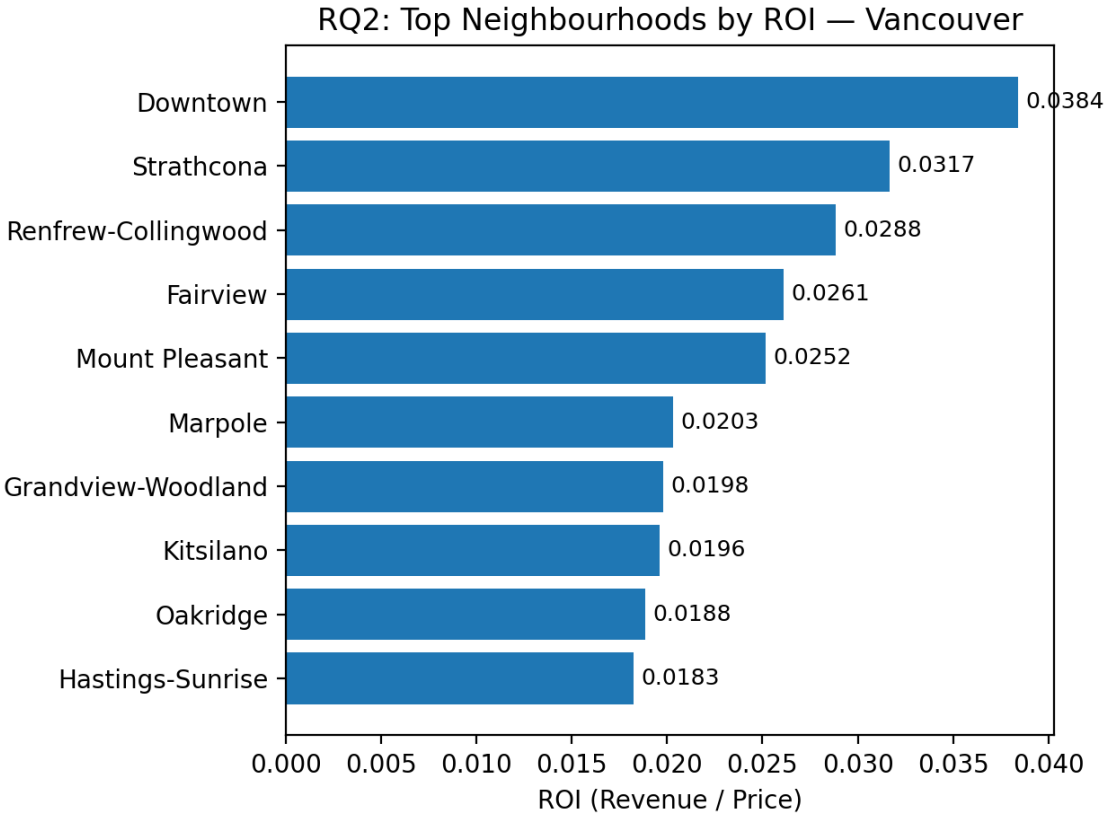


Figure 4: Top ROI neighbourhoods in Vancouver.

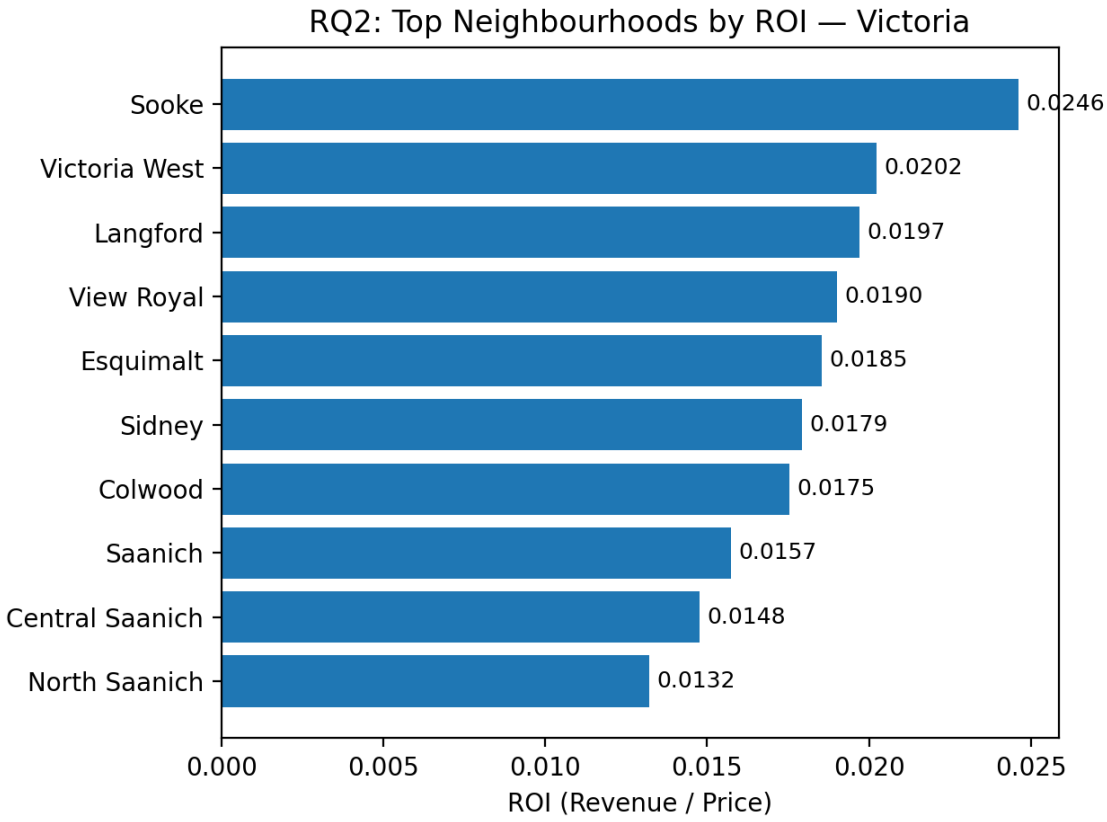


Figure 5: Top ROI neighbourhoods in Victoria.

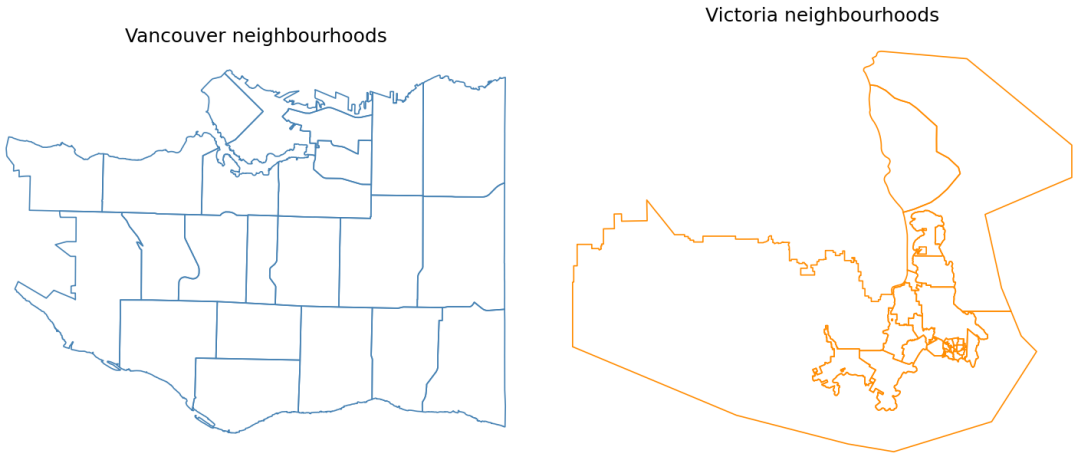


Figure 6: Neighbourhoods in Victoria and Vancouver.