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Electric Vehicle Adoption Analysis

Objectives

Analyze BEV vs PHEV adoption patterns across major counties to understand which regions lead EV adoption and why.

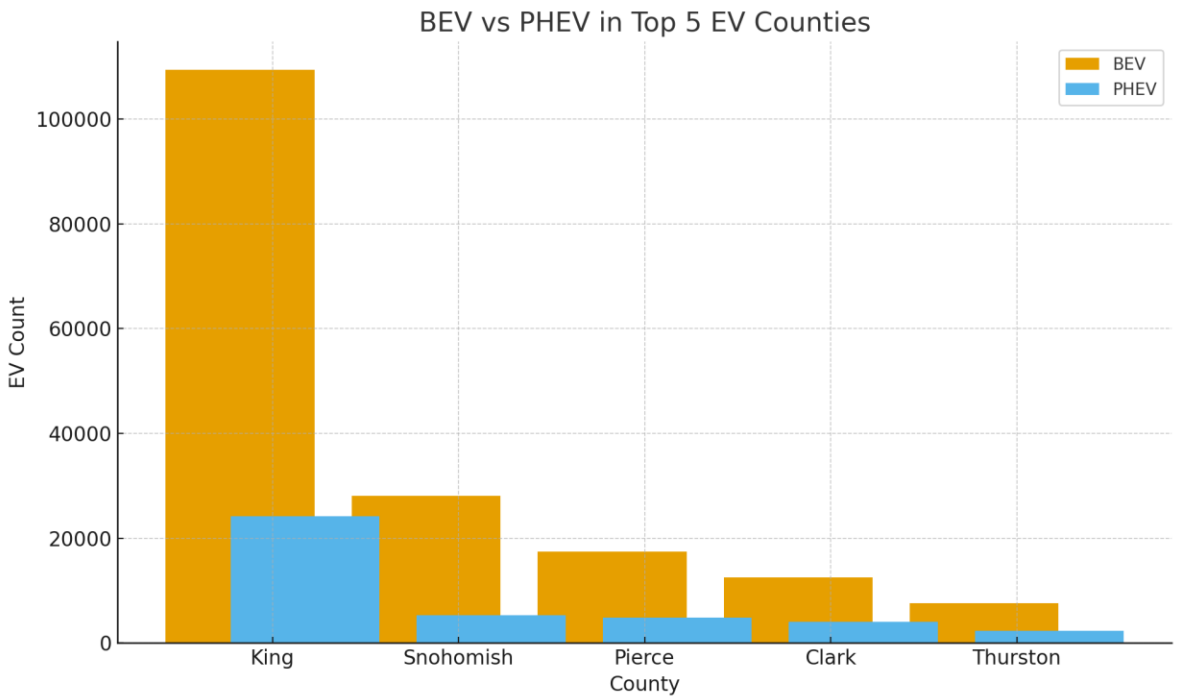
Examine EV adoption over time using model-year trends, showing how growth compares to broader global adoption patterns.

Identify regional differences in total EV distribution to understand how income, infrastructure, and population density shape EV adoption.

How the EV Data Was Analyzed

- Dataset: Washington State EV Vehicle Population Data (VIN, County, Type, Model Year, Make).
- Cleaning & Filtering: Filtered by top counties; categorized EV type into BEV vs PHEV.
- **Integrated Insights:** Combined county-level comparison, time-series growth, and regional distribution to understand “where,” “when,” and “why” EV adoption is strongest.

BEV vs PHEV Relationships



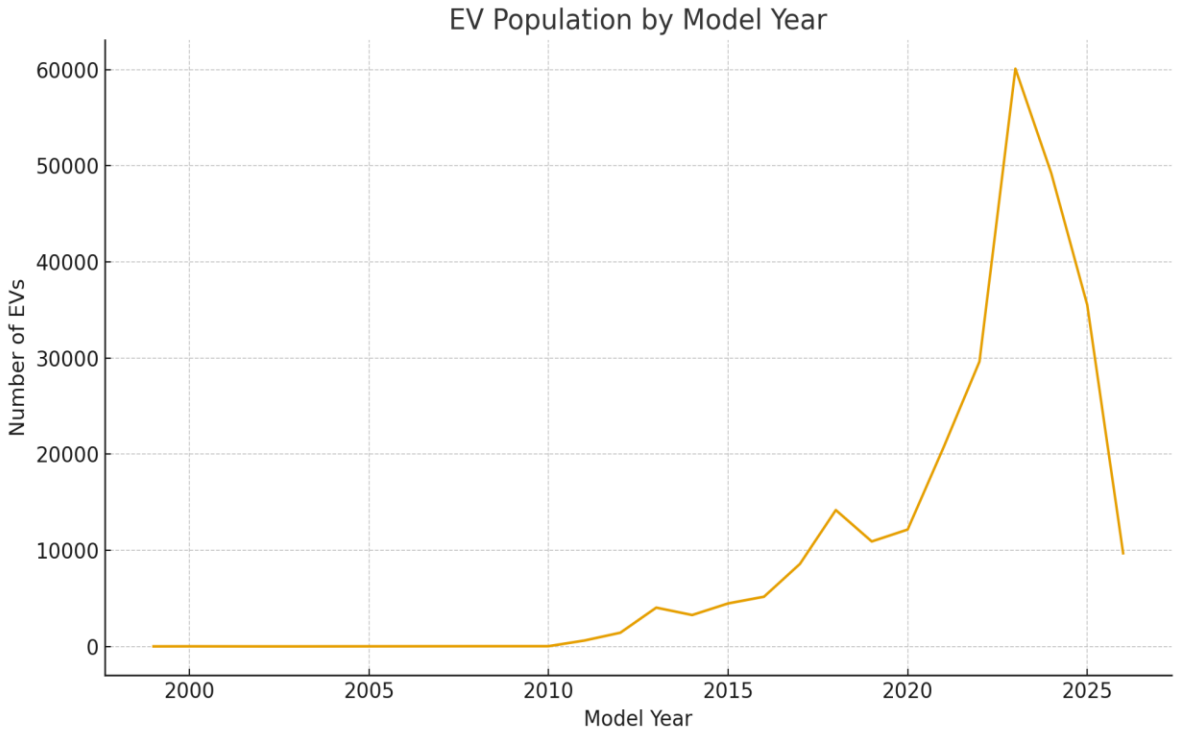
King County leads overwhelmingly in both BEV and PHEV adoption — the strongest EV region in the dataset.

Snohomish and Pierce counties follow with moderate adoption levels.

BEVs dominate PHEVs across all major counties, suggesting stronger consumer preference for fully electric vehicles.

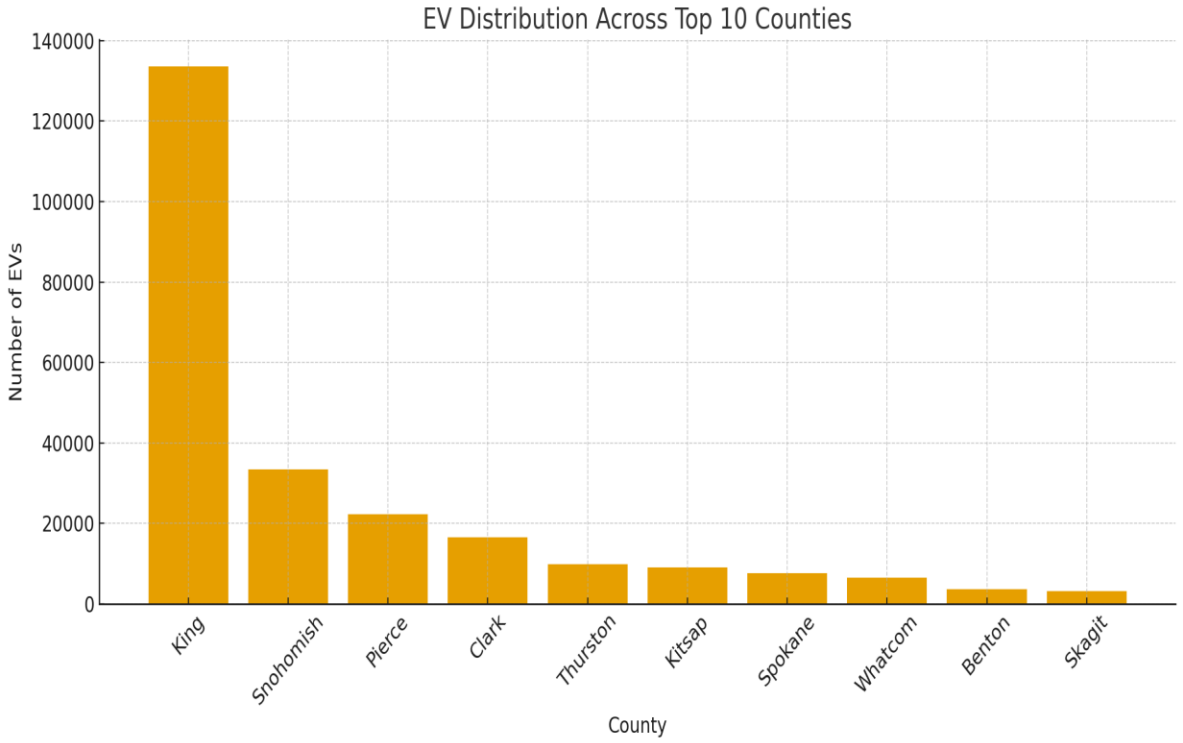
Urban and high-income counties show the strongest BEV concentration, aligning with charging availability and tech-focused populations.

Short-Term vs Long-Term EV Growth

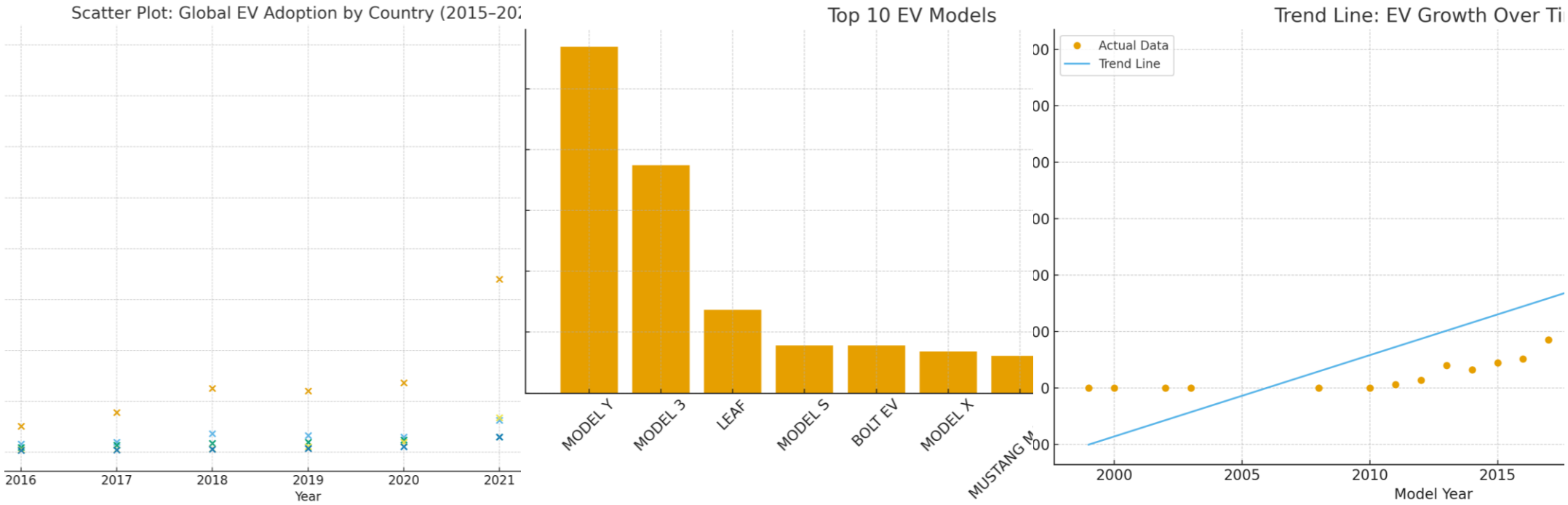


- Rapid growth begins around 2016, with sharp increases from 2020–2023.
- Model-year trends reflect major real-world EV milestones, like increased Tesla production and more affordable EV options.
- Newer EVs dominate the dataset, showing strong momentum matching national/global EV growth.
- Older model years drop sharply, showing EV adoption is a recent phenomenon.

Regional Distribution & Infrastructure



- Top 3 counties (King, Snohomish, Pierce) contain a large percentage of total EVs.
- Smaller and rural counties have very low EV adoption.
- Distribution patterns reveal inequalities in infrastructure, charging access, and affordability.
- High-EV counties correlate with stronger utility networks and higher median income, supporting faster adoption.


Scatter Plot: Global EV Adoption by Country (2015–20
2016
2017
2018
2019
2020
2021
Year
Top 10 EV Models
MODEL Y
MODEL 3
LEAF
MODEL S
BOLT EV
MODEL X
MUSTANG M
Trend Line: EV Growth Over Ti
Actual Data
Trend Line
2000
2005
2010
2015
Model Year

Charts

Key Findings

BEV dominance: BEVs massively outnumber PHEVs in all major counties.

Rapid adoption momentum: EV registrations surge after 2016, peaking 2021–2023.

Regional inequality: EV adoption is highly concentrated in a few urban counties with strong infrastructure.

Policy implications: High-EV regions align with state incentives and strong charging networks.

Conclusion

•**Integrated approach:** Combining county-level comparisons, model-year trends, and regional distribution provides a complete picture of EV adoption.

•**Clear insights:**

•BEVs dominate Washington's EV landscape

•Strong upward trend since 2016

•EV adoption concentrated in high-income, urban counties

•**Practical implications:**

•Identifies where EV markets are strongest

•Highlights infrastructure gaps

•Provides insight for policymakers, utility companies, and EV businesses