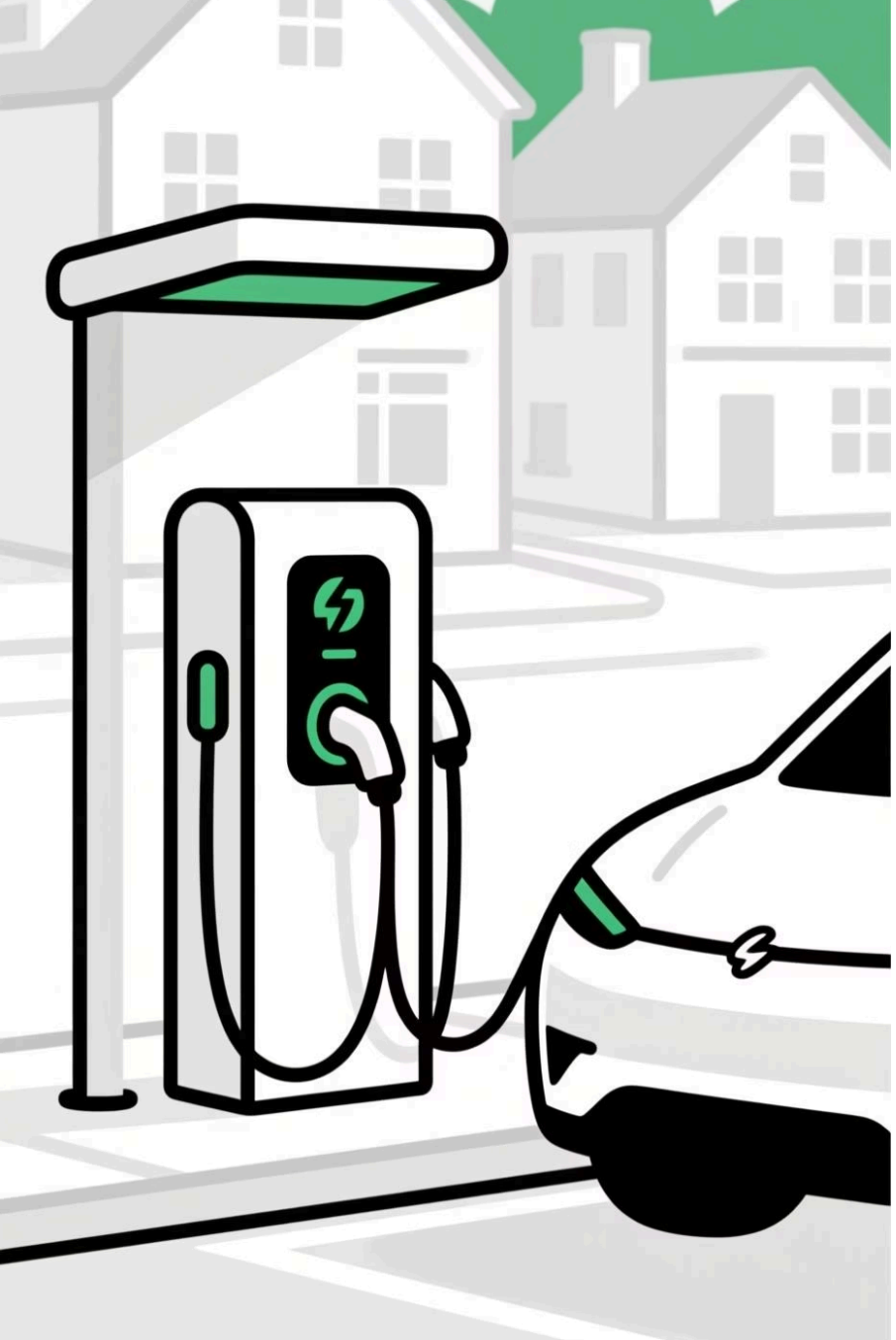


Connecticut EV Infrastructure & Energy Capacity Analysis

Key Project Aims

1

EV Adoption & Grid Capacity

Analyzes if Connecticut's rising EV adoption is supported by adequate charging infrastructure and local grid capacity.

2

Data-Driven Insights

Utilizes EV registrations, charging station availability, and city-level electricity-use profiles.

3

Identify Gaps

Examines gaps between EV demand and infrastructure supply across different cities and counties.

4

Highlight Underserved Areas

Pinpoint regions lacking sufficient EV charging infrastructure.

5

Inform Investment Priorities

Guide strategic allocation of resources for infrastructure development.

6

Support Policy Goals

Contribute to Connecticut's sustainability and EV policy objectives.

Unified Analytical Framework

1

Transportation Data

EV registrations and usage patterns.

2

Energy Data

Grid capacity and electricity consumption.

3

Demographic Data

Population density and socio-economic factors.

This framework integrates diverse datasets to provide a holistic view of EV infrastructure needs, informing investment priorities and supporting statewide sustainability goals.

Why Connecticut Is the Ideal Case Study

Connecticut offers clean, consistent, and detailed city/county datasets, a rarity among states. This allows for accurate cross-dataset analysis.

EV data, charging station data, and energy profiles align neatly with municipal boundaries, minimizing inconsistencies and improving reliability of comparative insights.

- **Ambitious EV Targets:** Connecticut has aggressive EV adoption goals, making infrastructure planning urgent and relevant.
- **Stronger Methodology:** Focusing on one state enables a more robust and detailed analytical approach.
- **Deeper Insights:** The concentrated study yields more profound and actionable findings.
- **Actionable Recommendations:** Provides real-world policymakers with practical and implementable solutions.

Driving Sustainable Futures

Our project aims to provide critical insights for Connecticut to lead the way in sustainable transportation and energy management.

What the Data Reveal

EV Adoption Outpaces Infrastructure

Rising EV adoption is not matched by adequate charging infrastructure growth statewide, posing future challenges.

City-Level Gaps Revealed

While Fairfield, Hartford, and New Haven counties lead in charger availability, significant infrastructure gaps persist within individual cities.

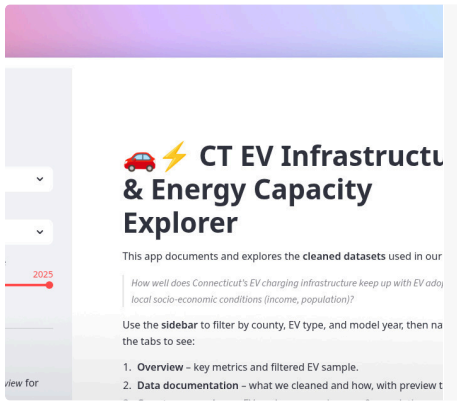
High-Income Charging Deserts

Affluent towns (e.g., New Canaan, Weston, Avon) with large EV fleets have almost no public ports, creating severe charging deserts.

Critical Charger Strain

A "Charger Pressure Index" shows some cities with 700-1100 EVs per public port, signaling high unmet demand and user frustration.

These findings build directly on the robust dataset foundations introduced earlier, providing critical insights for targeted interventions.



Streamlit

CT EV Infrastructure & Energy Capa...

This app was built in Streamlit! Check it out and visit https://streamlit.io for more...

Key Drivers of EV Adoption

1

Infrastructure Availability

Regression analysis shows each additional public port is associated with approximately 15 more EVs, underscoring the direct impact of charging access on adoption.

2

Income as a Predictor

A $1,000 rise in median income correlates with roughly 18 more EVs, reinforcing why affluent suburbs often lead in electric vehicle adoption.

3

Co-evolution of Supply & Demand

Strong positive relationships between EV counts, total ports, and charger mix (Level 2/DCFC) indicate a mutual dependency between infrastructure and adoption rates.

These insights emphasize that infrastructure and income jointly shape EV adoption critical for accurate demand forecasting and strategic planning.

Future Outlook: The Coming Surge

Exponential EV Growth

Connecticut is projected to exceed 60,000 EVs by 2026, marking over a 45% increase since 2023.

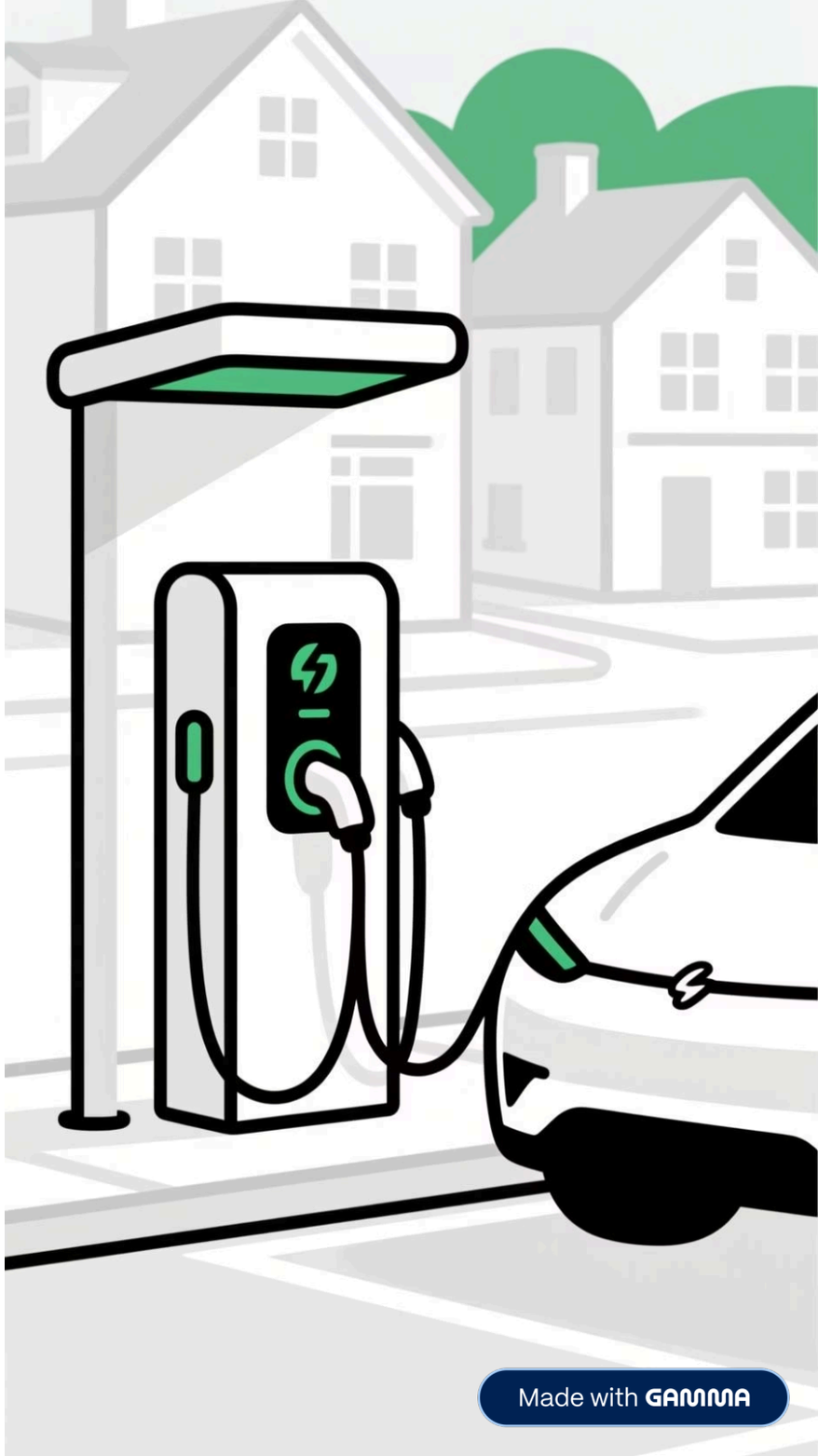
Infrastructure Lag

DC Fast deployment is limited to a few major cities, with Level 2 chargers dominating, creating potential bottlenecks.

Intensifying Grid Stress

Stamford, Westport, Greenwich, and Fairfield will face the highest projected peak loads (>3–4 MW), demanding early utility coordination.

These projections underscore the urgent need for strategic infrastructure planning and proactive energy management to support Connecticut's transition to electric mobility.



Recommendations

01

Prioritize Charging Deserts

Expand Level 2 and DC Fast infrastructure in identified high-need areas like New Canaan, Weston, Avon, Riverside, and Old Greenwich, where EV fleets are growing rapidly without adequate public charging.

02

Data-Driven Deployment Planning

Implement planning models that integrate income and existing infrastructure data to forecast and target areas where EV growth is most predictable, ensuring efficient resource allocation.

03

Accelerate DC Fast Expansion

Increase deployment of DC Fast chargers in critical high-traffic, high-load hubs such as Stamford and Westport to meet immediate demand and prevent future bottlenecks.

04

Proactive Grid Modernization

Collaborate closely with utility providers to plan and implement necessary grid upgrades in regions projected to exceed peak load thresholds due to EV adoption, safeguarding energy reliability.

Thank You!

GitHub Repository link:
https://github.com/Tooba-E131/CT-EV-Infrastructure-Energy-Capacity-Explorer

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