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# Electric Mobility in Sweden: The geography of BEVs in Sweden

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## Executive Summary

Using geographic methods this study examines the geographic distribution of BEVs. Ownership by household and type of residential area as well as comparing the change of geographic distribution of BEVs during the last 5 years. Furthermore, the study examines the possibility to charge BEVs, either near home or during long distance travel. Thus, exposing potential lack of charging infrastructure as well as revealing a spatial correlation between BEV ownership and charging points.

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## 1 Introduction

In 2024, Transport Analysis (Trafikanalys) received a government mandate to develop a comprehensive knowledge base on the large-scale electrification of the transport sector. This initiative includes an updated analysis of the ownership and regional distribution of electric vehicles (EVs), with insights suggesting significant regional differences in household decisions to lease or purchase electric vehicles. What sets this study apart is its use of new data to examine electric vehicle usage in connection with households' housing types, geographic locations, and access to charging infrastructure.

Furthermore, the study aims to describe the regional difference in BEVs ownership during a period from 2018 to 2023. As well as development in new BEVs sales for the municipality types during the same period as shown in Figure 1.

By combining spatial data of BEV ownership with spatial data on public charging stations the study examines correlation between charging infrastructure and BEV.

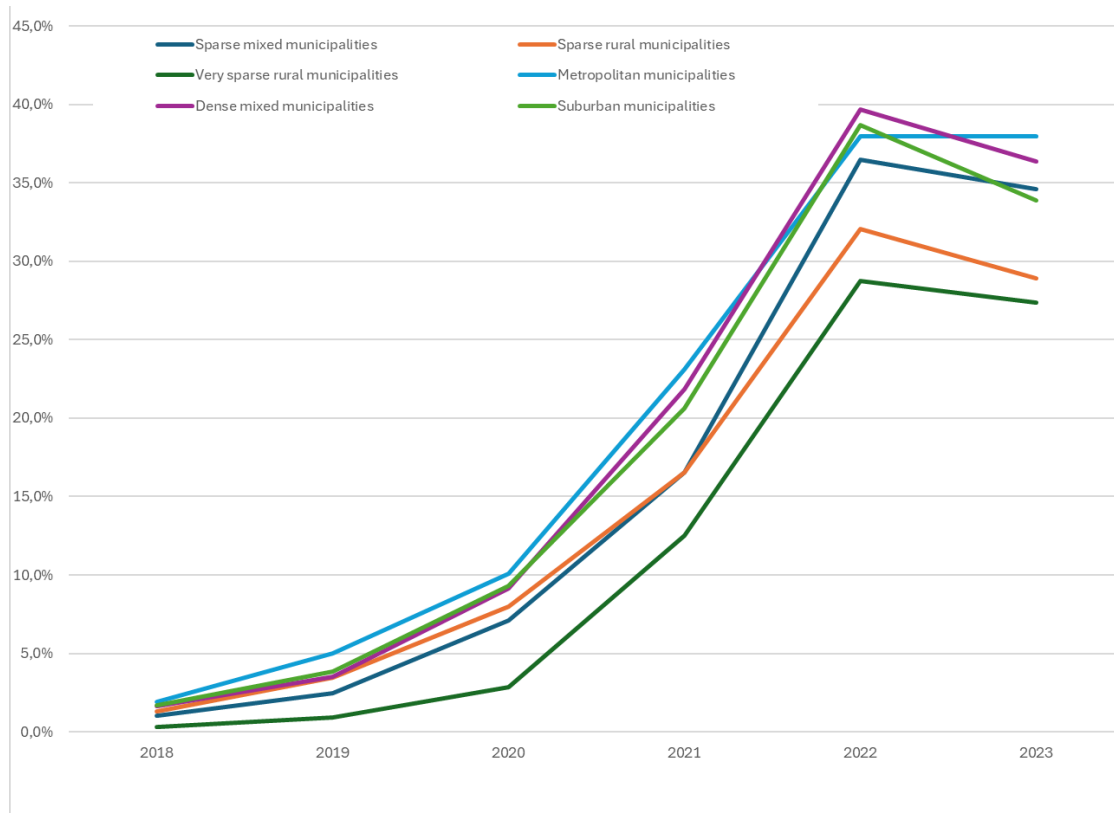


Figure 1: BEV sales in percentage of all car sales by municipality type

## 2 Data and method

The study employs geographical methods (GIS - Geographic Information Systems) to map, analyze, and contextualize electric vehicle (EV) ownership within a spatial framework. By layering various data elements, including BEV ownership, household type, built-up area classification, and charging station accessibility, the study examines spatial relationships among these factors.

Network analysis enables precise calculations of proximity to the nearest charging stations, both within urban areas and along major highways, providing insights into the relationship between BEV ownership and the accessibility of the nearest charging point. These findings can be further enriched by incorporating data on household income and dwelling type, such as single-family or multi-family residences. Additionally, by integrating road networks with traffic flow and the locations of fast-charging stations, the study assesses the accessibility of fast-charging options for long-distance travel.

## 3 Results

The electric vehicle is no longer just an urban phenomenon; in recent years, the share of electric cars among newly registered vehicles has increased even faster in some municipalities outside metropolitan areas. However, the analysis reveals significant geographical differences in both newly registered electric cars and electric cars in active use. The proportion of electric vehicles is highest in major cities and densely populated municipalities (see Figure 1). The progress is slower in sparsely populated municipalities, where the distance between towns and fast-charging stations is greater.

The analysis also identifies deficiencies in charging infrastructure accessibility, particularly concerning the proximity of the nearest charging point for residents of multi-family housing. Many BEV owners in multi-family homes are dependent on public charging stations. Public charging stations are still scarce in some densely populated areas which could influence the decision on purchasing a BEV. However, since all parking spaces are scarce in densely populated areas, available public charging could also have a positive impact for the decision to purchase a BEV providing there are available charging stations nearby. In terms of housing type, the proportion of households owning an electric car and living in multi-family housing is highest in cities and lowest in rural municipalities. Additionally, it highlights the availability of fast-charging stations for longer journeys along major highways and other heavily trafficked roads (see Figure 2).

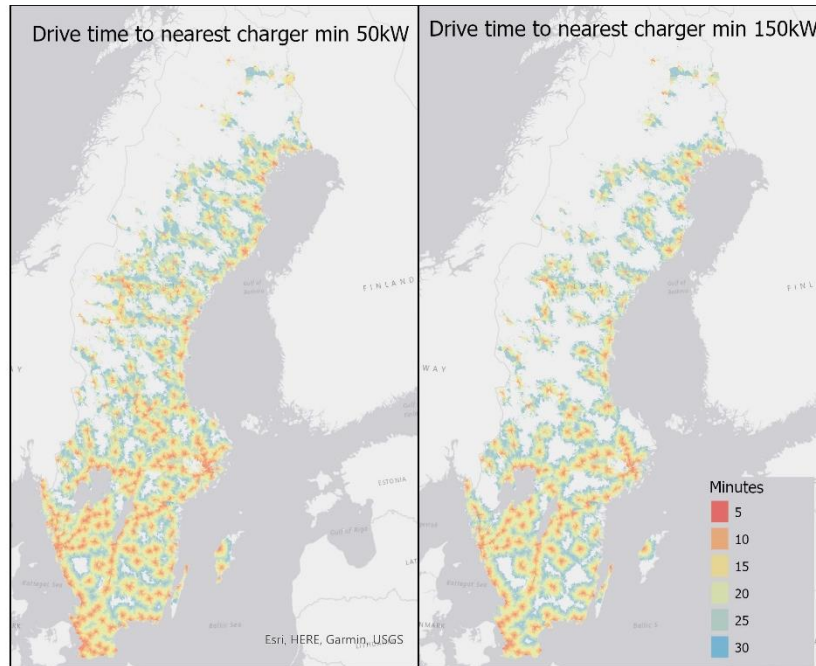


Figure 2: Drive time to nearest charger station with a minimum capacity of 50 kWh (left map) or 15 kWh (right map)

The number of charging stations nationwide has grown significantly, rising from approximately 2,350 public stations in 2020 to around 5,690 by mid-2024. However, reports of long queues at certain stations persist during high-traffic periods, such as public and skiing holidays. The colder climate, particularly in northern Sweden, affects the range of most BEVs, and combined with the limited number of charging stations in these areas, it presents additional challenges for long-distance travel.

## References

Trafikanalys Vem väljer en elbil? De svenska hushållens val av elbilar och laddhybrider; 2023;

## Presenter Biography



Florian Stamm works as an Adviser at the governmental agency Transport Analysis in Sweden. Stamm is the agencies expert on geographical data analysis. Stamm has a bachelor's degree in Geographic Information Systems.



Anette Myhr works as a Statistician at Transport Analysis. She works with data on vehicles in official statistics, analyses, and forecasts. Studied mathematical statistics at Umeå University.