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OnStreet EV Charging - Analysis of household parking to determine public EV charge point requirements using AI and geospatial analysis.

Abstract

The electrification of car fleet is essential to reaching our ambitious climate action goals as a nation. Due to the limited storage capacity and range of EVs, the availability of chargers is a concern for prospective buyers, particularly for those who do not have access to home charging. This cohort likely falls into lower socio-economic groups. The aim of this study was to estimate how many homes this situation applies to, so that the potential demand for public charging stations, including their spatial distribution, can be understood. The study was guided by stakeholder consultation, including representatives from local authorities. Using high-resolution aerial images, an AI model was developed to predict which households have the capability to install a home charger (offstreet parking), thus identifying those who will require public charge points (onstreet parking). A dataset has been produced, comprising the number of onstreet and offstreet households per Central Statistics Office (CSO) small area maps. Additionally, Small Area Population Statistics (SAPS) data, which could correlate with EV uptake by households, has also been analysed to generate a demand index for public residential EV update in 30 towns.



Research Outcomes

- Development of an AI model based on aerial imagery to identify residential households would require public EV charging facilities.
- Use AI model to estimate the number of households requiring a public EV charger per CSO small area.
- Analysis of socio demographic data to assess likelihood of EV adoption.



Recommendations

- Local authorities now have a dataset support to plan their rollout of public residential chargers to have most impact for citizens.
- Data for apartments should be captured in planning permission application process.
- Bottleneck in delivery of high-volume imagery dataset by Tailte.