

# ESDA 0093 Assignment 1

## Candidate Number: HLG6

### Rationale & Significance:

As public interest for Electric Vehicles (EV) ramp up in recent years, it is important to examine the accessibility for publicly available EV chargers within the country. This work aims to find the spatial distribution of EV chargers in the LSOA region, as well as its relation to public income. (50)

### Data source and processing:

Three datasets were used:

The *LSOA 2011 geometry* dataset downloaded from Moodle. The *Admin-based income statistics, England and Wales: tax year ending 2018 (Income)* from Office for National Statistics. The *National Chargepoint Registry (NCR)* from gov.uk.

The first two dataset were not processed. The third dataset was first cleaned by removing incomplete rows, then spatial joined with the LSOA dataset to remove any charging port outside the LSOA region. (69)

### The main spatial methods:

The maps were done in R using the “tmap” and “sf” library. The LSOA dataset was imported as sf object, then joined with the Income dataset. A `st_join` was performed to calculate the number density of EV charger within each LSOA region. (42)

### Code:

[https://github.com/jichuan-zhang/ESDA\\_Code/tree/main/0093\\_assignment\\_01](https://github.com/jichuan-zhang/ESDA_Code/tree/main/0093_assignment_01)

### Findings:

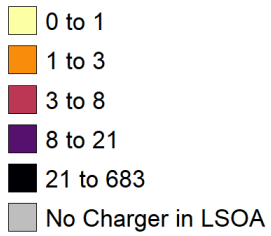
- There is an extremely uneven distribution of EV charging port within the London area compared to outside London area. This disparity is so extreme that when a kernel plot was attempted it was just a red dot around London.
- The EV charging port distribution generally follows the distribution of Income, with higher income area hosting more public EV charging port.
- The number of EV charging port in each LSOA region, surprisingly is not too high in most area. This is mostly due to LSOA is assigned to number of people rather than area. (Some outliers are at the northern side of the LSOA near Scottish border)
- The Income per EV charger is lower at higher income area, suggesting the correlation is positively accelerating (Charger increases faster than income).

To prompt the shift to EV, the government should support public EV chargers in rural area to make the access more equitable.

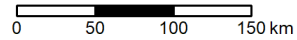
# EV Charging Port Area Density



## Area Density / m2



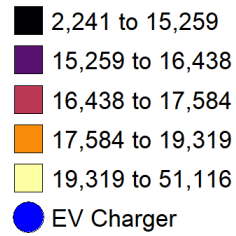
Source:  
Office for National Statistics  
National Chargepoint Registry



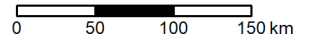
# Scattered Charging Port



## Individual Income



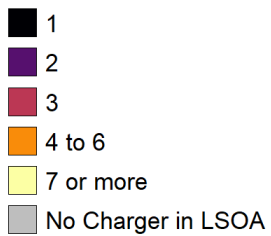
Source:  
Office for National Statistics  
National Chargepoint Registry



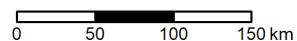
# Number of EV Charging Port



## Number of EV Charger



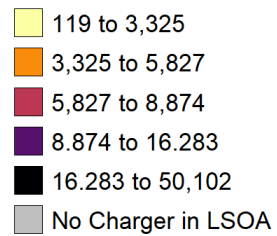
Source:  
Office for National Statistics  
National Chargepoint Registry



# Income per EV Charging Port



## Income per EV Charger



Source:  
Office for National Statistics  
National Chargepoint Registry

