



Beyond Utilisation: Consumer Behaviour and Charging Infrastructure

To meet the UK Government's target by 2035, we must have an efficient and reliable rollout of charging infrastructure across the country.

In previous papers we have called for the importance of a data led deployment to ensure the right chargepoints are in the right place, at the right time to fit in with our patterns of life. As of May 2024, there are now 62,536 chargepoints across 32,992 locations.¹

Key success metrics for charging infrastructure including utilisation, are becoming increasingly standardised, but to continue deployment at pace and scale, we must incorporate additional metrics into analysis. This paper will explore consumer behaviour and how it can inform the strategy and policy of deploying charging infrastructure.

Consumer behaviour and drivers' patterns have a significant influence on when and how much charging infrastructure is utilised.

Factoring behaviours and journey data into forecasts of chargepoint utilisation will not only give industry a better picture of the overall landscape, but also allow stakeholders to make better informed decisions about infrastructure deployment. This paper provides examples of data sets that can be considered and the benefit of factoring them into analysis.

Using MOT data in modelling

The data shown below is MOT test data from 2018 – 2021 from Field Dynamics, where they analysed 140 million MOT records.² Each MOT result is given a unique identifier, anonymised, and then published to data.gov.uk. With this anonymised vehicle ID, Field Dynamics have been able to identify consecutive MOT tests for each vehicle and calculate the mileage difference between them.³

The overall observation is that the **miles driven per week are less than the full charge of most modern EVs**. A Ford Fiesta averages 90 miles per week, whereas an Audi A6 averages 147 miles per week.⁴

¹ EV charging statistics 2024 – Zapmap (zap-map.com)

² GB MOT Mileage Report – Field Dynamics (field-dynamics.co.uk)

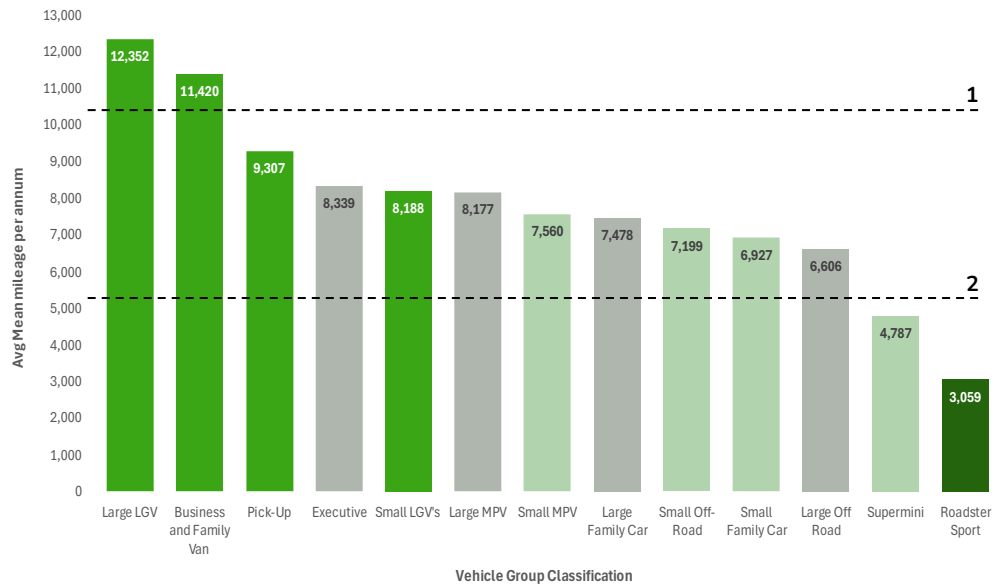
³ Care should be taken when extrapolating data due to the time period and COVID 19

⁴ GB MOT Mileage Report – Field Dynamics (field-dynamics.co.uk)

Findings



Average annual mileage and weekly mileage by vehicle type



- - - 1: 10,400 annual miles ; eqv. 200 miles per week
- - - 2: 5,200 annual miles ; eqv. 100 miles per week

In 2021, over half of vehicles on the road averaged between 100 and 200 miles a week. In 2023 the average range on a full battery for all EVs was 236 miles with new models coming onto the market averaging up to 300.⁵ Cars already on the market such as the Vauxhall Corsa Electric and the Fiat 500 are within these weekly ranges which suggests that those vehicles could manage a weekly or fortnightly charge.

Smaller vehicles such as a supermini and small family cars which include models like the Ford Fiesta drive less miles yearly compared to vans and larger executive cars such as an Audi A6. Each make and model have different mileage usage as a result of journey patterns, which is important for predicting future projections and understanding their charging requirements.

For example, it may be more appropriate for a small family car to use a slow chargepoint that is nearer to home whereas a large LGV will typically be travelling to a particular destination and will need to charge on route, using a rapid chargepoint. Weekly mileage is one insight into consumer behaviour - journey routes and where drivers are starting from and travelling to, are also important for understanding behaviour.

⁵ [Britain's new car market boosted by battery electric vehicle choice - SMMT](#)



Battery Efficiency

It is also important to consider the relationship between technology and consumer behaviour and how this can inform analysis on future patterns.

Battery efficiency is already starting to improve. For example, the Mercedes EQXX prototype has averaged 7.5m/kWh over 1,000 miles. The table below highlights how improved battery efficiency, going from 3m/kWh to 7m/kWh, can impact the energy demand to fully charge a car. As battery efficiency improves, less kWh is needed to charge the car, therefore a driver will need to charge their car less. However, there could be an opposite effect whereby if batteries get smaller to the equilibrium of needing to charge once or twice a week will remain to fit in with the availability and provision of infrastructure.

Battery efficiency (m/kWh)	Energy required (kWh) for 250 mile range	Energy required (kWh) for 500 mile range
3	83	167
4	63	125
5	50	100
6	42	83
7	36	71

* Future battery car efficiency is derived by dividing the range by the relevant m/kWh

What does this mean for industry?

There are a number of variables that affect the amount a driver needs to charge. From the data above, we can see that drivers today are averaging between 100 – 200 miles per week.

These are important insights as we can begin to understand what type of chargepoints are best suited for particular drivers, based off of their daily behaviour and mileage. For example, if a driver uses their car to go to work most days, it makes sense to install a slow chargepoint at the premises as they will be there all day. Alternatively, if a driver uses their car, mainly for activities such as shopping, then a fast chargepoint is more appropriate at a supermarket or shopping centre as dwell times are typically shorter.

What does this mean for Industry and Conclusion

To paint an accurate picture and really understand what type of chargepoints should be installed, other variables should be considered in broader analysis such as:

- Vehicle On-Board Charger limitations
- Pre-Installed local infrastructure
- Dwell Times
- On-Street Households within the locality
- Fleet Vehicles
- Bay Occupancy at peak times

As the market matures further, consumer behaviours will become even more important, with factors such as, brand loyalty, ancillary services and amenities, price and visibility of availability featuring more whereas as issues like reliability will reduce in significance.

In addition, regulations such as the Public Charge Point Regulations 2023⁶ will play an influential role on consumer behaviour. These regulations require chargepoints to be operational a minimum of 99% of the time, and to provide contactless payment terminals at all new chargepoints. By ensuring a high level of operation, and providing contactless payments, the regulations will increase consumer confidence which will impact the way consumers use chargepoints in the future. It is these type of variables that should be considered and factored into investor models

for sensitivity analysis which will allow investors to better understand the risk of their investment and potentially increase returns.

Using consumer behaviour data, combined with knowledge of the chargepoint utilisation ensures that the right chargepoints are in the right place, which increases chargepoint's utilisation rates which is a better investment.

Conclusion

As the UK continues to transition and EV adoption increases, consumers will be required to adopt new refuelling habits. Consumer behaviour – which is harder to predict – will become increasingly more valuable and will underpin the deployment of charging infrastructure in the coming years.

The data this paper highlights is a great insight into how consumer behaviour can influence the deployment of charging infrastructure, however there is still more data that needs to be collected and shared for investors to have a more informed decision.

By collecting and sharing more data, we will then begin to build a better picture of the state of market which can then be used to forecast future demand and lead to a smarter deployment of charging infrastructure – right chargers, right place, right time.

⁶ [The consumer experience at public chargepoints - GOV.UK \(www.gov.uk\)](https://www.gov.uk)



About the Green Finance Institute

The Green Finance Institute (GFI) was launched in 2019 to support the mainstreaming of green finance both in the UK and overseas. Uniquely positioned as an independent, commercially-focused organisation led by bankers and seed-funded by government, the GFI adopted a pioneering strategy of identifying the barriers to investment in real economy decarbonisation by sector, and committing to develop the solutions to demonstrate they could be overcome – a “think and do tank” of financial professionals, unencumbered by the short-term profit-making pressures of mainstream finance.

The GFI’s programmes and partnerships are all thoughtfully constructed to expand our influence with the decision-makers who are key to transforming systems and our efforts are supported by an effective communications strategy.

The GFI’s transport coalition was set up to unlock the financial barriers to the decarbonisation of road transport and enabling infrastructure, initially in the UK, to support the transition to a zero-carbon and climate resilient economy.

For more information, please visit www.greenfinanceinstitute.co.uk/programmes/cdrt/

About Field Dynamics

Field Dynamics is a leading net zero data analytics consultancy. We help organisations make the most efficient move to net zero. Our mission is to lead the charge towards a net zero future by pioneering data-driven solutions that empower industries to navigate complex challenges with clarity and confidence

Our projects span both the public and private sector with a focus on electric vehicles, heat, energy generation and land use. Our clients include leading management, strategy and transport consultancies, Distribution Network Operators, Charge Point Operators, government departments and local authorities.

Discover more about Field Dynamics at www.field-dynamics.co.uk