

# Car Ownership: Evidence Review



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**Prepared for: The Department for Transport**

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# 1. Executive Summary

The Department for Transport (DfT) commissioned a Rapid Evidence Assessment (REA) to understand how car ownership is changing in the UK. The review was commissioned in the context of the Net Zero targets set by the UK government, the transition to electric vehicles, the COVID-19 pandemic and the increased cost-of-living which are all important factors impacting trends in car ownership. This REA aimed to understand the influence of these factors, and others, on how car ownership has changed over time. Trends considered included levels of ownership, types of cars (such as fuel type and size) and demographic profiles of car ownership among other factors.

Findings in this report drew on 31 academic articles, 18 data sets and 16 industry papers. Key data sets included: The National Travel Survey (NTS), the National Travel Attitudes Study (NTAS), DfT's Technology Tracker, Census 2021, Vehicle Licensing Statistics, The Society of Motor Manufacturers and Traders (SMMT) and an AA driver poll (see section 8.2.Data sets).

## 1.1 Key findings

### 1.1.1. Trends in car ownership [see **section 3.1** in full report]

The long-term trend for car ownership over the last 50 years is that the proportion of households in Great Britain and England with access to one or more cars has steadily increased, from 52% in 1971 to 67% in 2022. Over this period, the proportion of households with one car has remained at around 45% and the proportion with two or more vehicles has increased from 8% to 34%. The years 2020 to 2022 saw a slight reversal in this trend, with a small decrease observed in the proportion of households with two or more cars and a small increase in the proportion with one car only. Evidence demonstrates that this was coupled with lower levels of used and (in particular) new car sales in 2022 compared to 2019 and increases in the average age of vehicles. The evidence suggested that two main impacts of the COVID-19 pandemic drove this reduction in car sales between 2019 to 2022:

- The trade and manufacturing industry saw widespread market closures, experienced frozen production and the number of vehicles produced in the UK dropped significantly. Showrooms were also closed, which was connected to fewer registrations of new cars.
- People were put off making large purchases, travelled less, and had lower demands for vehicles.

However, in 2023 car sales appear to be on the rise again, with evidence showing that new car registrations in the UK increased by 17.9% in 2023 compared to 2022 and the used car market grew by 5.1% over this period – but remain below pre-pandemic levels.

### 1.1.2. Trends in car types [see **section 3.2**]

The review identified trends in the types of cars the UK public have owned in recent years, across different categories. These included:

- **Fuel type:** In 2023 most UK licensed cars were fuelled by petrol (58%) and diesel (34%) but these proportions have gradually fallen since 2015 (from 62% and 37% respectively). During this period the proportion of hybrid and electric vehicles have risen - between them, in 2023, they accounted for around 8% of vehicles compared to just over 1% in 2015. Recent sales data shows that the new car market is moving quickly to low emission vehicles – in 2023 hybrid and electric vehicles<sup>1</sup> accounted for 47% of new car registrations an increase from 8% in 2019. Over the same period, diesel cars fell to 6% from 27% of new car registrations and petrol fell to 46% from 66%. The second-hand market for hybrid and electric vehicles is at an earlier stage – hybrid and electric<sup>2</sup> accounted for 5.6% of used car sales in 2023 compared to 1.7% in 2019. Forecasts suggest that intentions to purchase low emission cars are set to continue to increase in future (see section 6)
- **Size:** A comparison of the top ten new and used purchased car models in 2017 and 2022 suggests limited changes in preferences of car size, with the majority of the top ten comprising medium cars in both years. However, in the new car market, the data appears to suggest a modest shift towards smaller engine sizes and there is also evidence of a steady and potentially growing demand for Sports Utility Vehicle (SUV) models, with 5 out of 10 of the top registered/purchased models being SUVs in 2022, compared with 3 out of 10 in 2017.
- **New and used cars:** In 2020, levels of new car registrations and used car sales both fell and have since remained lower than pre-pandemic levels. Used cars have always been a higher proportion of total vehicle purchases than new cars and this gap has increased since 2020 (following supply-side issues in the new car market during the pandemic), with sales of used cars making up 79% of all car purchases in 2023 compared to 77% in 2019.

### 1.1.3. Trends in car financing and ownership models [see **section 3.3**]

- In 2022, 84% of new cars and 22% of used cars were bought on finance and the amount people borrowed to acquire cars hit a new record (£41 billion, an increase of £4 billion compared to 2021). Beneath these headline figures there had been:
  - A downward trend since 2020 in the proportion of new cars bought on finance. This was linked to increasing Electric Vehicle (EV) sales, where consumers were more likely to reject dealer-sourced finance in favour of options such as salary sacrifices, which come with significant tax benefits.
  - An increase since 2021 in the proportion of used cars bought on finance and in the amount borrowed for used car purchases. This was linked in the literature to increased demand for near-new used cars after the shortage of new cars during the pandemic drove-up prices resulting in increased use of car financing, and an increased market for more expensive used EVs.

<sup>1</sup> 'Hybrid and electric' includes battery electric, plug-in hybrid electric, and hybrid electric vehicles

<sup>2</sup> 'Hybrid and electric' includes battery electric, plug-in hybrid electric, hybrid electric and mild hybrid electric vehicles

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- There had also been reported growth of personal contract hire leasing, which is a form of long-term rental with fixed monthly fees. This has been linked to leasing companies offering lower monthly payments than dealers on personal contract purchase.

#### 1.1.4. Consumer profiles and purchase considerations [see **chapter 4**]

The review found that factors such as household demographics, income, and life stage played a role in car ownership. In the UK the evidence suggests that:

- Those least likely to own a car were elderly low-income groups, urban professionals, and young low-income groups.
- Those most likely to own multiple cars were heavy car users, who were employed, lived with family in suburban or rural areas and only used public transport and active travel modes occasionally.
- Those most likely to purchase a lower emission car tend to be older and higher earners.

In terms of the factors people consider when purchasing a car, the review found that utilitarian concerns, including affordability, durability and reliability were considered most important. While image and status factors and environmental factors could also come into play for some consumers.

When it came to environmental considerations, evidence suggests that in the UK, those who already have climate change concerns or awareness were more inclined to purchase EVs. In terms of public appetite to purchasing EVs, the review found some positivity about the potential environmental benefits, while concerns about affordability, the availability of charging points and concerns about vehicle range and battery life were the key barriers to uptake.

#### 1.1.5. Factors that influence changes in household car ownership [see **chapter 5**]

The evidence demonstrated that dependency on a car is high among car owners. Car ownership is viewed to be central to owners' lifestyles, particularly to visit family and friends and maintain relationships, but also to get to work.

Factors identified in the literature associated with increased car ownership included an increase in income, becoming a house owner and an increase in household size. On the other hand, UK and European evidence found that decreasing car ownership was associated with a decrease in household size, divorce, a fall in household income and moving to a central location, with the latter linked to the greater availability of public transport, and closer proximity to shops and recreational amenities. The evidence related to relinquishing cars or delaying car purchases identified broadly the same set of factors, alongside a desire to avoid the 'hassle' associated with ownership.

Wider contextual factors associated with a reduction in ownership and usage found in the evidence included:



- 
- Increased cost of living: The costs associated with cars and fuel mean the cost-of-living has influenced car ownership in the form of consumers putting off the decision to buy or replace a vehicle; and consumers reducing non-essential journeys.
  - Trends accelerated by the COVID-19 pandemic: This includes an increase in working from home and changes in shopping habits that have led to reductions in driving. These changes have persisted post-pandemic to some degree, providing the potential for reduced car use to impact on car ownership.
  - Car sharing services: which allows people to access a vehicle without being tied to ownership, through renting or accessing vehicles for short periods of time. Evidence from the UK and Europe suggests that members of car sharing schemes are less likely to own their own cars than non-members, and that there is an association between car sharing membership and a reduction in vehicle mileage.

### 1.1.6. Incentivising electric vehicle uptake [see **section 5.4**]

The literature identified a range of policy interventions associated with uptake of lower emission vehicles. A study analysing 15 European metropolitan areas found a relationship between markets with higher shares of electric vehicles and policies responding to barriers to electric vehicle adoption. Policy interventions included, fiscal measures such as one-time subsidies or tax breaks on electric vehicle purchase, a wider roll out of charging infrastructure and an information awareness campaign about electric vehicles. Additionally, policies that deterred the use of combustion vehicles and older vehicles, scrappage schemes, plug-in grants and policies aimed at improving air quality could also lead to reductions in the use of the most polluting vehicles and prompt wider electric vehicle adoption.

### 1.1.7. Car ownership forecasts [see **chapter 6**]

Growth in the ownership of EVs is forecasted, alongside a decline in petrol and diesel cars in the UK. Specifically, the Society of Motor Manufacturers and Traders forecasts the following changes in new car registrations between 2023 (as at January 2024) and 2025 (note that these forecasts have not been assessed as part of this review):

- Battery electric vehicles (BEV) to increase by 68%, from 315,000 to 530,000 units (from 13% of new registrations to 26%)
- Plug-in hybrid vehicles (PHEV) to increase by 33%, from 141,000 to 187,000 units (from 7% of new registrations to 9%)
- Hybrid electric vehicles (HEV) to increase by 26%, from 239,000 to 302,000 units (from 17% of new registrations to 15%)
- Diesel to fall by 30%, from 142,000 to 99,000 units (from 8% of new registrations to 5%)
- Petrol to fall by 14%, from 1.07 million to 919,000 units (from 56% of new registrations to 45%)

The Zero Emission Vehicle (ZEV) mandate sets out the percentage of new zero emission cars and vans manufacturers will be required to produce each year up to 2030. At the time this evidence review was conducted, 80% of new cars and 70% of new vans sold in Great Britain were required to be zero emission by 2030, increasing to 100% by 2035.

Modelling by a UK insurance company estimates that of all annual used car sales, the proportion of BEVs will rise from 2% in 2021 to almost a third (31%) by 2030 in the UK.

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Reasons for the growth of EVs are linked in the evidence to regulatory CO2 targets, financial incentives for consumers, improved infrastructure, and vehicle availability. For example, in the UK there have been grant schemes for EV charging infrastructure, congestion charges, clean air zones and the ZEV mandate that (at the time of this evidence review) required all new cars and vans sold in Great Britain to be zero emission by 2035. Evidence from the Netherlands suggests the current barriers to purchase, such as high costs and lower driving range are also predicted to become less important after 2030. Instead, barriers are predicted to become more attitudinal, such as consumers preferring to tend towards familiarity.

Forecasted trends in UK markets related to car ownership models predict growth in hire purchase and personal contract purchase which involve taking out loans, alongside leasing/subscription, car sharing and a decline in outright purchase and car rentals. Key reasons for these forecasted trends are greater flexibility, cost efficiencies to consumers and consumers' ability to access a greater variety of cars than if they were purchasing outright.

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## 2. Introduction

The Net Zero targets set by the UK government and transition to electric vehicles, the COVID-19 pandemic and the increased cost-of-living are all important factors impacting on trends in car ownership. Within this context the Department for Transport (DfT) commissioned the National Centre for Social Research (NatCen) to conduct a Rapid Evidence Assessment (REA) to understand how car ownership is changing.

The primary aim of the REA is to understand how car ownership has changed over time, particularly focussing on 'recent' trends since the pandemic. This report explores:

- Any changes in household car ownership, the number of cars and the types of cars owned (for example, electric cars, hybrid cars etc).
- The demographic profile of car and van ownership and any changes in profile.
- The reasons for any changes and how ownership is forecasted to change in the foreseeable future.

The report highlights what evidence is currently available and where there are any gaps in the evidence.

### Research questions

The REA sought to answer three main research questions:

1. What are the 'recent' (i.e., since 2019 – pre-pandemic) trends in household car ownership and car purchase behaviours and how have these changed where applicable?
  - a) Access to cars and number of cars owned
  - b) Vehicle type, size, fuel used, ownership models and finance methods and terms (e.g., what % of people take out loans, buy outright, lease or use hire purchase) (and relationship to type of vehicle being purchased)
  - c) Where and how cars are being purchased, new versus second-hand purchases, age of vehicles, length of ownership before sale
  - d) Types of cars being sold and leased
  - e) What are the demographics and life stage of car purchasers, who is relinquishing ownership, which groups are delaying purchases and what types of vehicles are they purchasing/relinquishing?
2. How is car ownership forecasted to change in the future?
  - a) How is car ownership forecasted to change in the foreseeable future (looking forward to the next 5 years and beyond if data is available)?
3. What is driving change in people's purchase/ownership decisions, the number, and types of cars they own/the length they keep vehicles for?
  - a) What are people's attitudes to car ownership?
  - b) How are decisions impacted by environmental aspects like climate change, policies like Ultra Low/congestion charging, government commitments like the

- 
- 2035 target for phasing out the sale of new petrol and diesel cars and for all new cars and vans to be fully zero emitting?
- c) How do aspects like life stage, life changing events (e.g., parenthood) and career impact decisions including car ownership for different needs (e.g., family car vs work car)?
  - d) How do the alternative modes/new modes (e.g., shared mobility), car ownership models impact decisions?
  - e) How have trends in hybrid working, homeworking and internet shopping amongst other factors driven change?
  - f) How do aspects like cost-of-living costs, costs associated with purchasing/running a vehicle (including parking costs) impact decisions?
  - g) Are purchasing decisions being influenced by the affordability (upfront and ongoing) and availability (volume of diesel/petrol/EV/hybrid etc. cars in the market) of different types of vehicles?
  - h) What role have (changes in the) company cars market played in driving change including the role company tax relief has on purchasing decisions?
  - i) How do different geographies / driving contexts impact decisions, e.g., are some vehicle types felt to be advantageous for contexts (e.g., congested city driving vs rural driving)? What role do park pressures play in car ownership decisions?

## **The structure of this report**

The report consists of an overarching Executive Summary which brings together the findings from the evidence followed by four more detailed chapters (Chapters 3-6). The methodology and data sets used in the evidence review are covered in Chapter 8.

1. Executive Summary
2. Introduction
3. Trends in car ownership
4. Consumer profiles and purchase considerations
5. Changes in car ownership
6. Forecasted trends in car ownership
7. Evidence gaps
8. Methodology

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## Glossary

- SUV: sports utility vehicle
- EV: electric vehicle
- PHEV: plug-in hybrid vehicle
- HEV: hybrid electric vehicle
- BEV: battery electric vehicle
- REEV: range-extended electric vehicle
- ICE: internal combustion engine
- PCP: personal contract purchase
- PCH: personal contract hire
- HP: hire purchase

# 3. Trends in car ownership

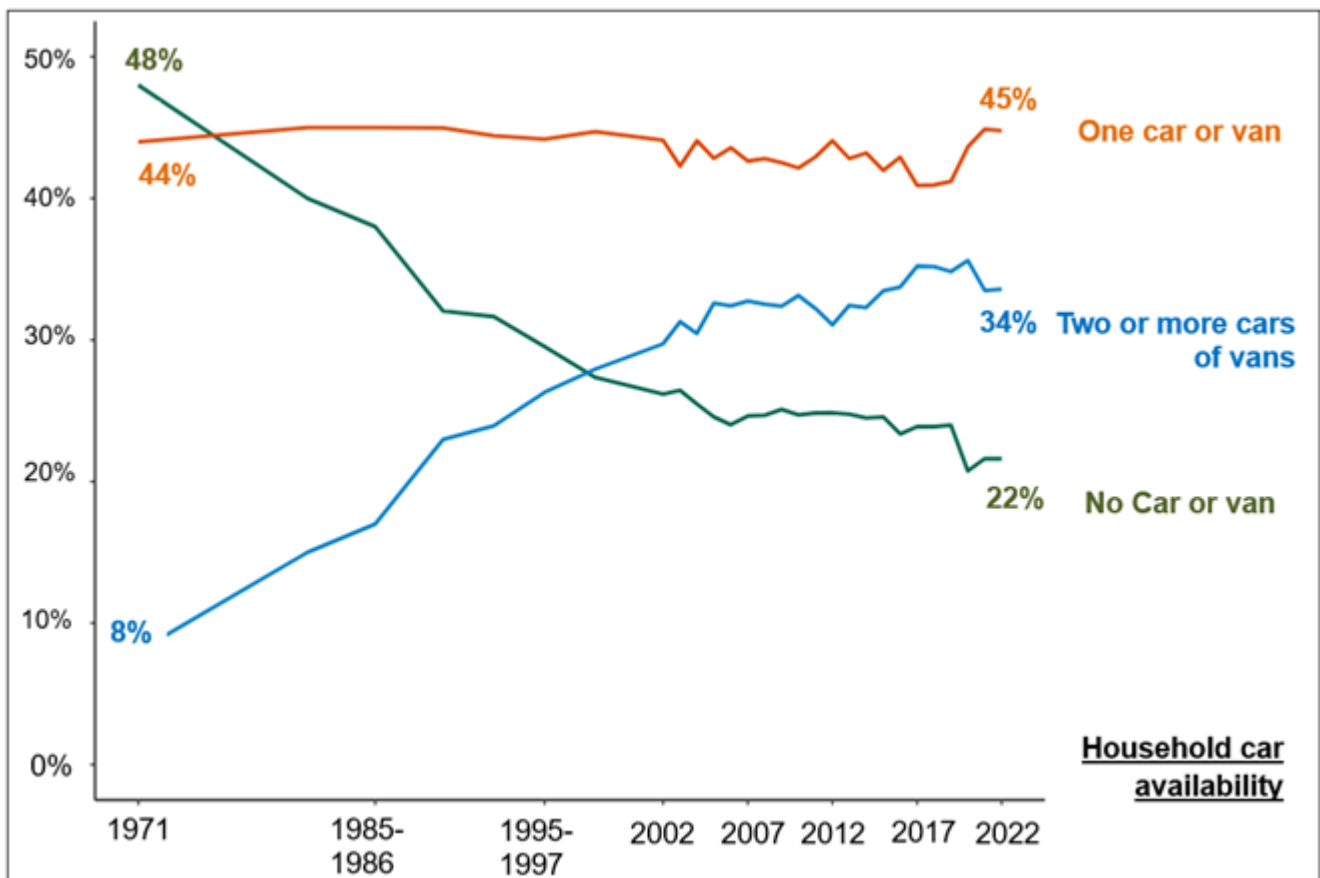
This chapter explores general trends in UK car ownership and household car access. It looks at both long-term patterns since the 1970s and more recent trends since 2019. The sections below address the research questions 1.a to 1.d focused on trends in car ownership, car types and ownership models.

## 3.1 Trends in car ownership and car sales

The long-term trend for car ownership over the last 50 years is that the proportion of households in Great Britain and England with access to one or more cars has steadily increased, from 52% in 1971 to 67% in 2022. Over this period, the proportion of households with one car has remained at around 45% and the proportion with two or more vehicles has increased from 8% to 34% (**Figure 1**).

The years 2020 to 2022 saw a slight reversal in this trend, with a small decrease observed in the proportion of households with two or more cars and a small increase in the proportion with one car only.

Figure 1: Percentage of households by car/van access: Great Britain (1971 to 1988) and England (1989 to 2021) NTS0205 (DfT, 2022a)



Evidence demonstrates that the recent changes in car ownership were coupled with lower levels of used and (in particular) new car sales in 2022 compared to 2019 as well as increases in the average age of vehicles.

- Between 2019 and 2022, used car sales dropped by 13% and new car registrations dropped by 30% (**Figure 2**).
- In 2023 the average age of vehicles increased to 9.3 years, up from 8.2 years in 2019 (**Figure 3**).

Figure 2: SMMT new and used car registrations 2016 to 2022 (millions) (SMMT, 2023a)

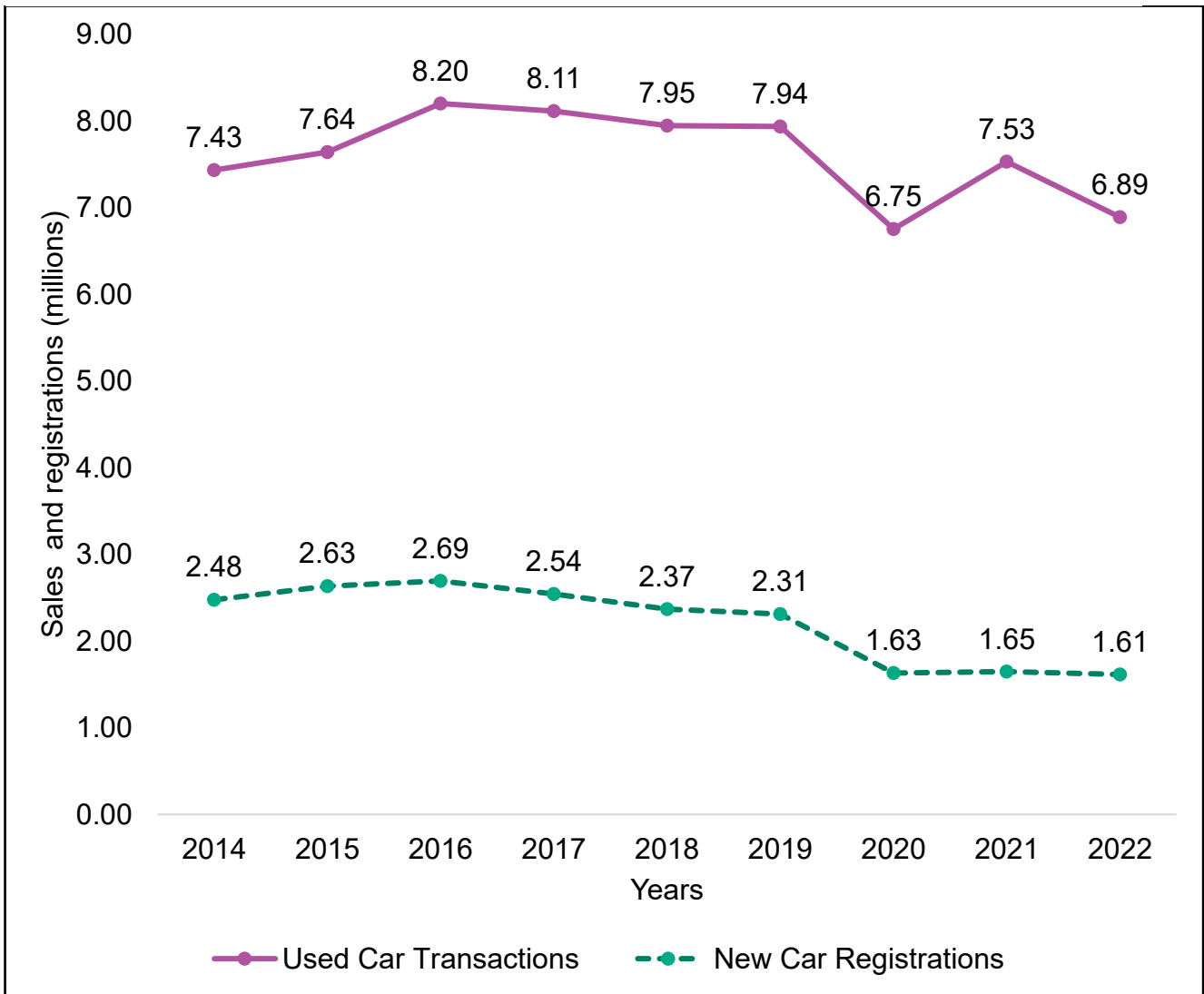
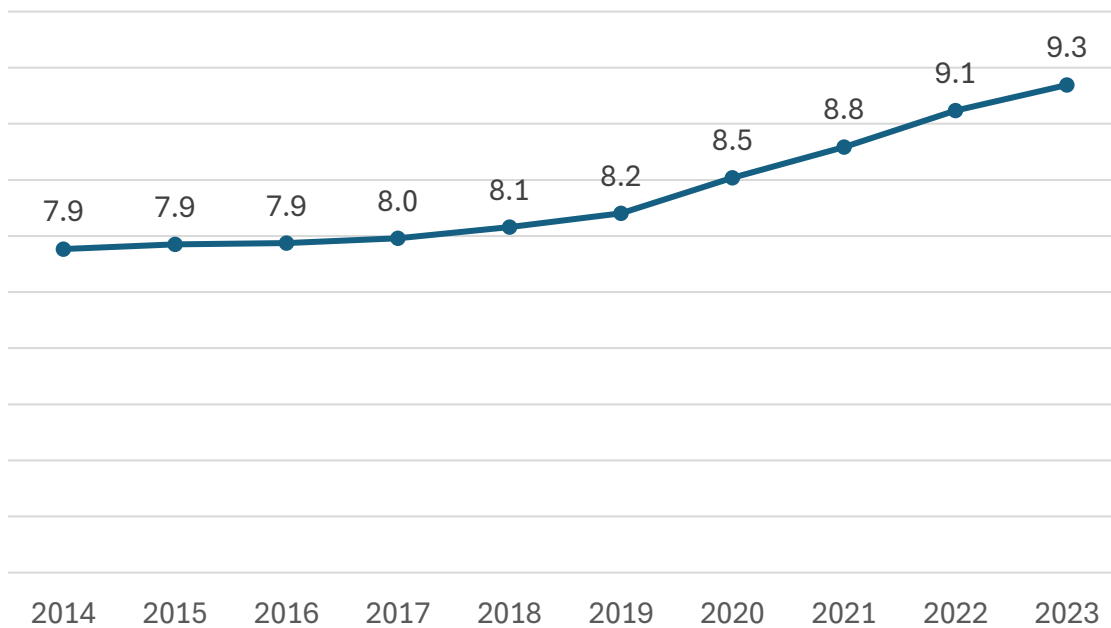


Figure 3: Average age of licensed cars in the UK since first use (2014 to 2023) VEH1107 (DfT & DVLA, 2024)



The evidence suggests that two main impacts of the COVID-19 pandemic drove this reduction in car sales between 2019 to 2022:

- On the supply-side, the trade and manufacturing industry saw widespread market closures, experienced frozen production and the number of vehicles produced in the UK dropped significantly from 1,303,135 units in 2019<sup>3</sup> to 775,014 units in 2022.<sup>4</sup> Showrooms were also closed, which was connected to fewer registrations of new cars (SMMT, 2021a).
- On the demand-side, people were put off making large purchases, travelled less, and had lower demands for vehicles (SMMT, 2021a).

However, in 2023 car sales appear to be on the rise again, with evidence showing that new car registrations in the UK increased by 17.9% in 2023 compared to 2022 and the used car market grew by 5.1% over this period – but remain below pre-pandemic levels:

- New car registrations in the UK increased from 1.614 million units in 2022 to 1.903 million in 2023 (DfT & DVLA, 2024) but still below the 2.31 million in 2019 (**Figure 4**).
- The UK used car market has risen over the same period, with 7.243 million units changing hands in 2023 compared to 6.890 million in 2022 (SMMT, 2024), but still below the 7.94 in 2019 (**Figure 4**).

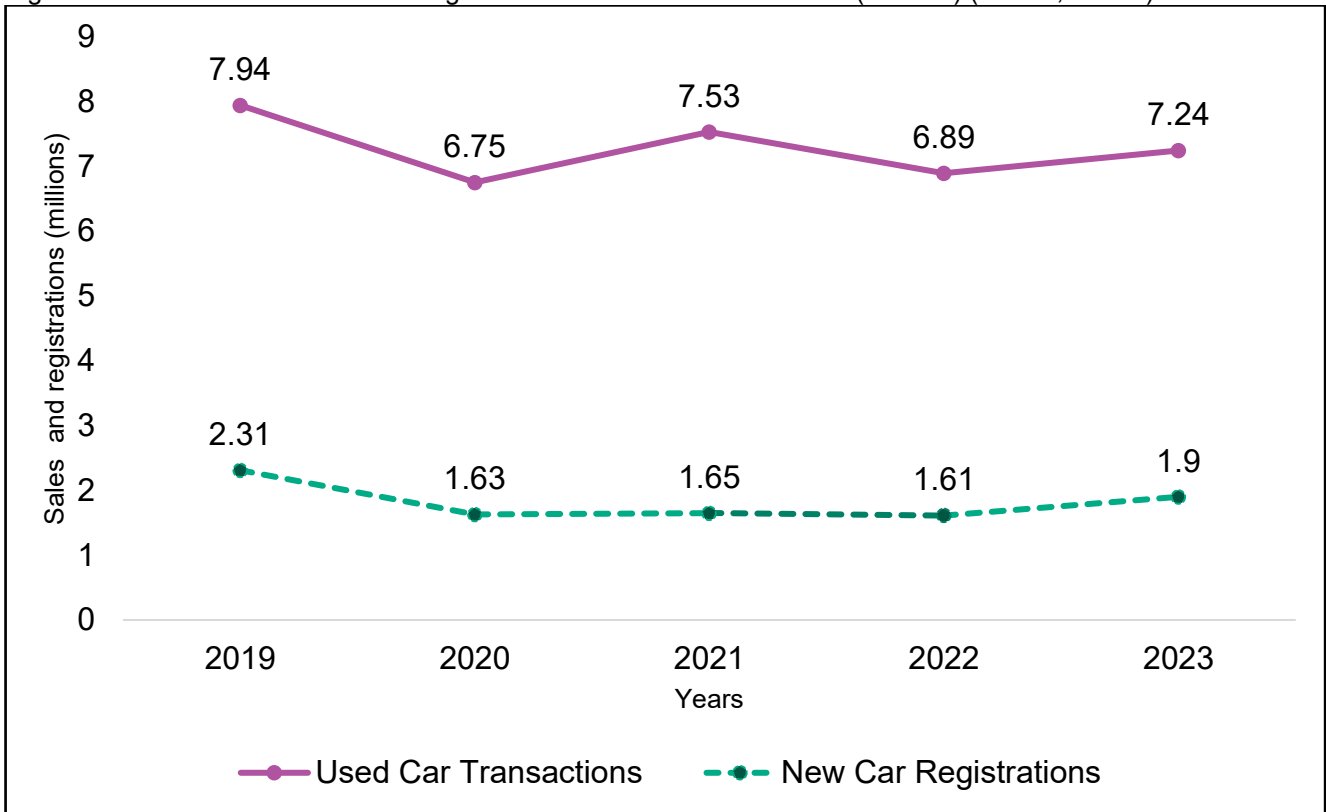
<sup>3</sup> <https://www.tyrepire.com/2020/01/uk-car-production-falls-14-2-per-cent-in-2019/>

<sup>4</sup> <https://media.smmt.co.uk/december-2022-uk-car-manufacturing/#:~:text=Total%20annual%20output%20for%20the,free%20and%20fair%20global%20trade.>



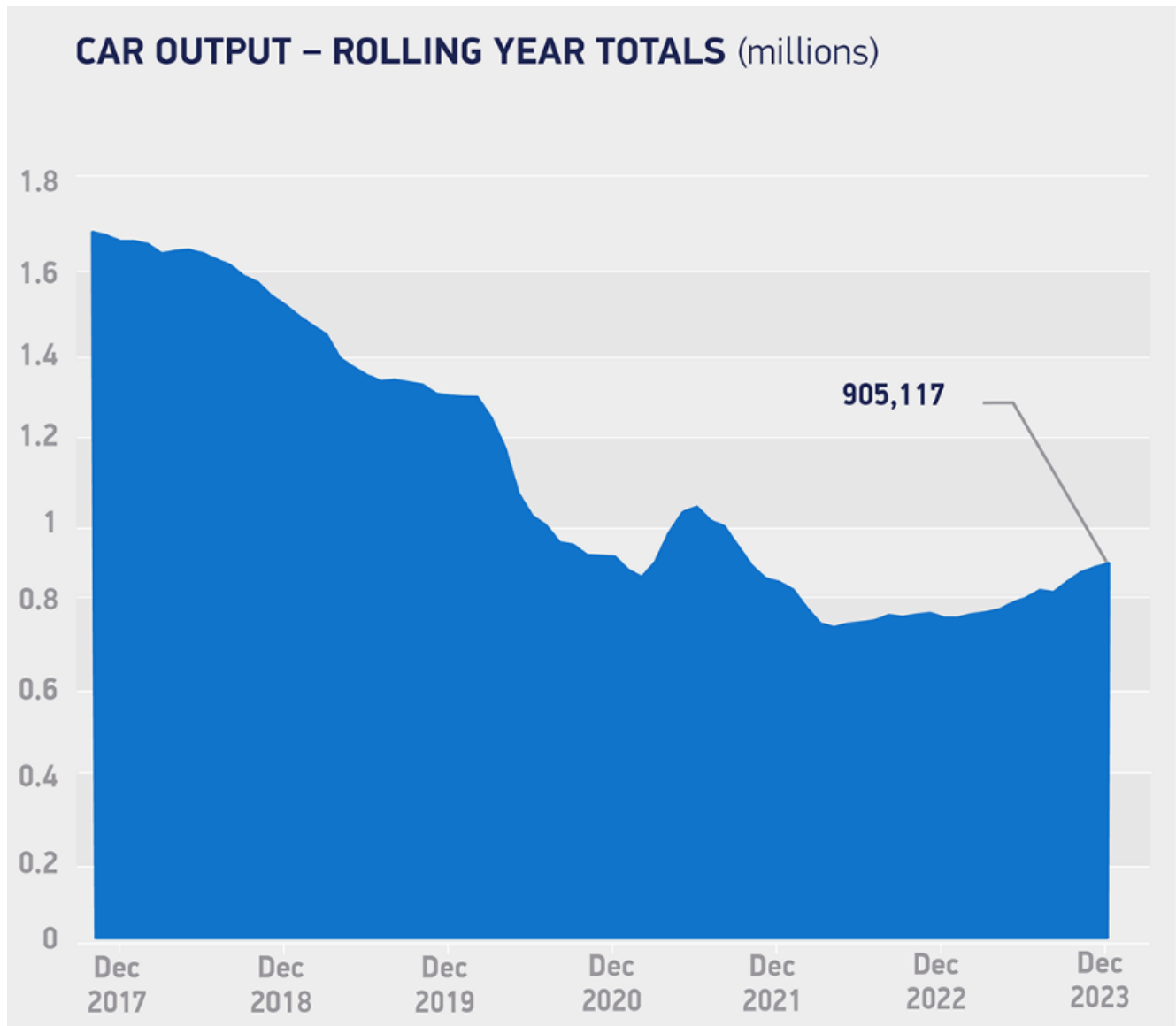
- Despite fluctuations, there seems to be a gentle upward trend from 2021 onwards in car manufacturing based on SMMT data<sup>5</sup> (**Figure 5**).

Figure 4: SMMT new and used car registrations in the UK 2019 to 2023 (millions) (SMMT, 2023a)



<sup>5</sup> <https://www.smmt.co.uk/vehicle-data/manufacturing/>

Figure 5: SMMT UK car output data



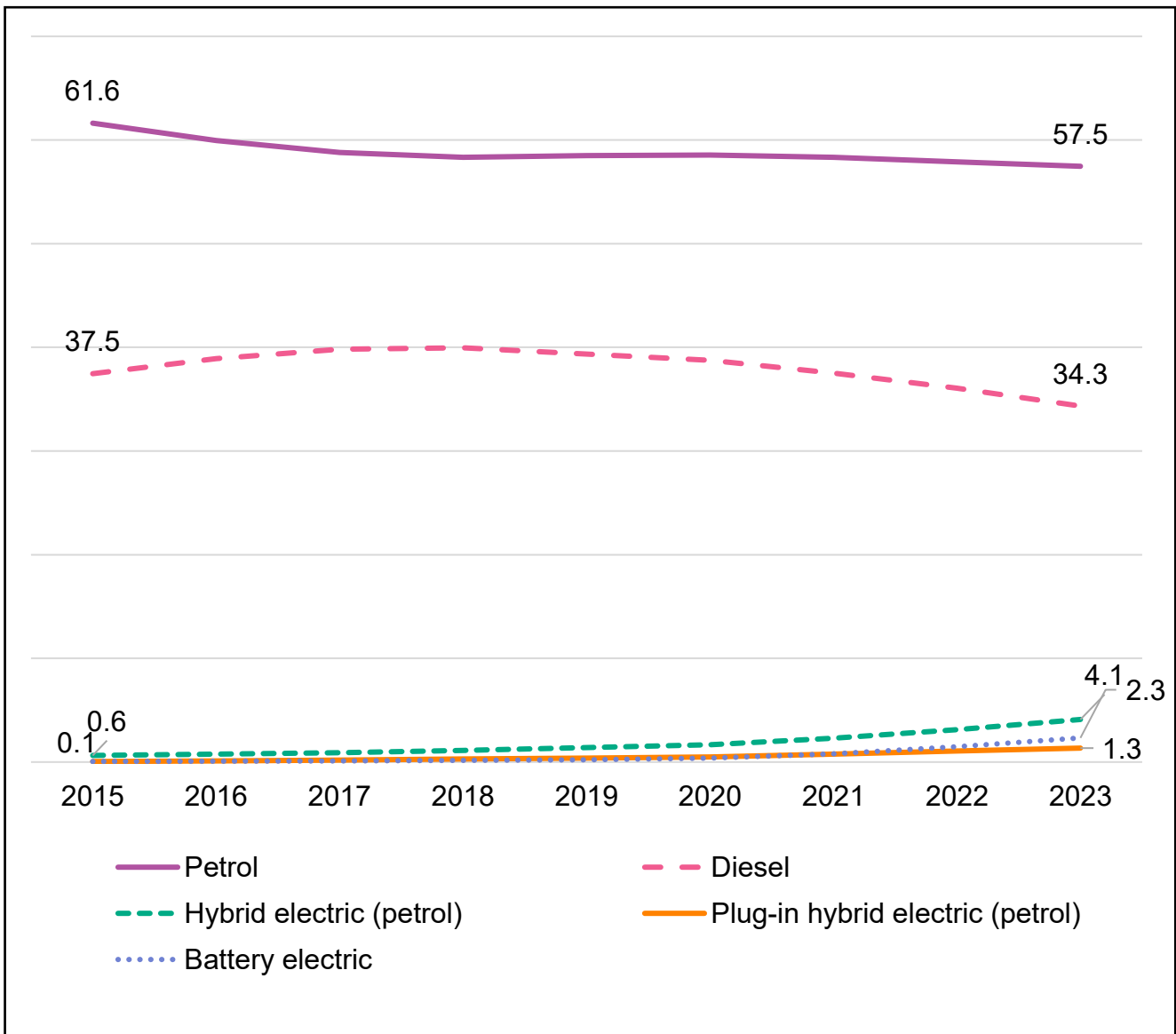
## 3.2 Trends in car types

The review identified trends in the types of cars the UK public have owned in recent years, across different categories. This included: fuel type, vehicle size, new and used cars.

### 3.2.1. Fuel type

- In 2023 most UK licensed cars were fuelled by petrol (58%) and diesel (34%) but these proportions have gradually fallen since 2015 (from 62% and 37% respectively) (**Figure 6**).
- During this period the proportions of hybrid and electric vehicles have risen - between them, in 2023, they accounted for around 8% of vehicles compared to just over 1% in 2015 (**Figure 6**).

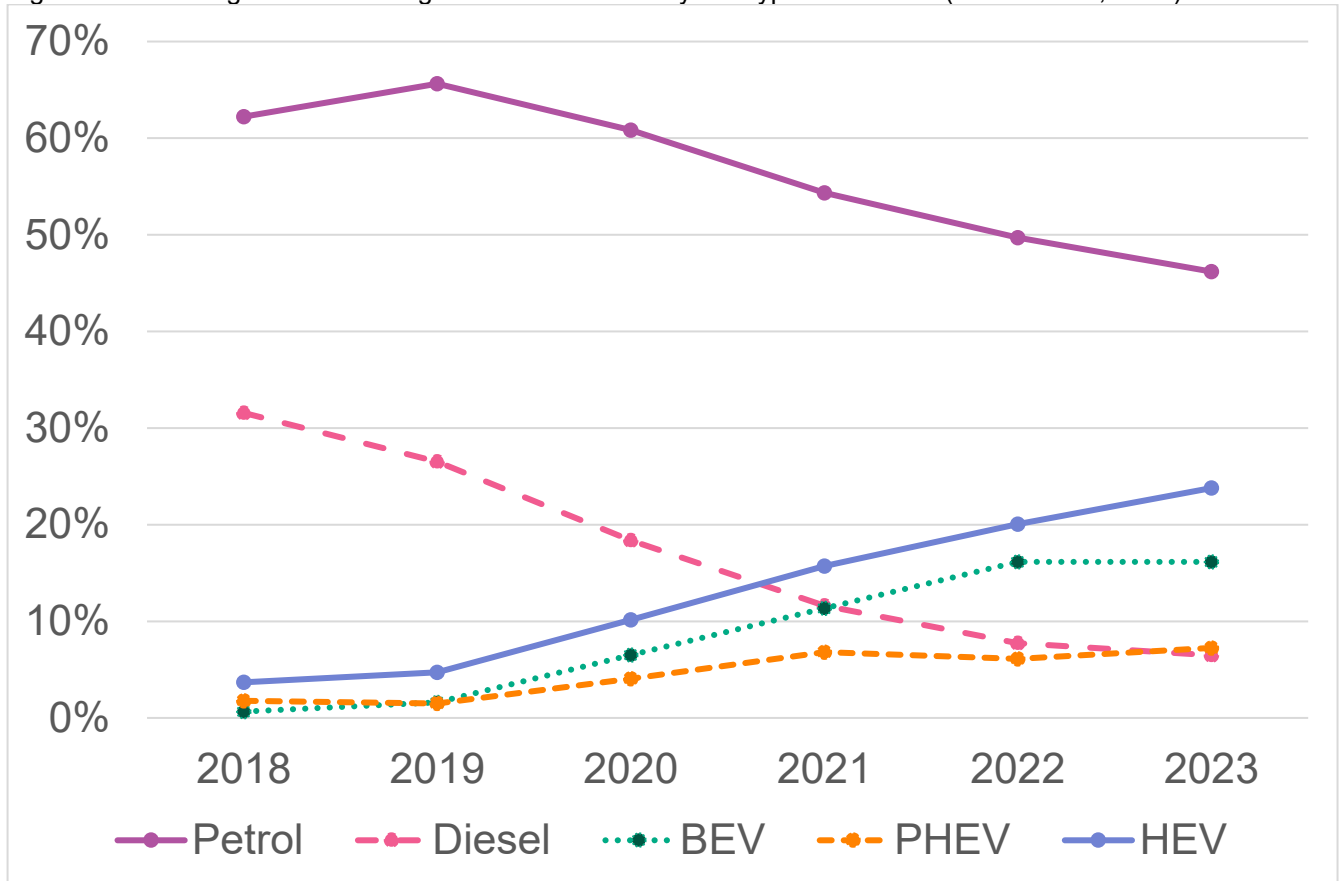
Figure 6: Percentage of Licensed cars in the UK by fuel type since 2015, VEH1103 (DVLA & DfT, 2023)



Recent sales data shows that the new car market is moving quickly to low emission vehicles. The second-hand market for hybrid and electric vehicles is at an earlier stage than petrol and diesel.

- In 2023, hybrid and electric vehicles<sup>6</sup> accounted for 47% of new car registrations, an increase from 8% in 2019. Over the same period, diesel cars fell to 6% from 27% of new car registrations and petrol fell to 46% from 66% (**Figure 7**).
- In 2023 hybrid and electric vehicles<sup>7</sup> accounted for 5.6% of used car sales an increase from 1.7% in 2019 (**Figure 8**).

Figure 7: Percentage of new car registrations in the UK by fuel type since 2018 (DfT & DVLA, 2024)

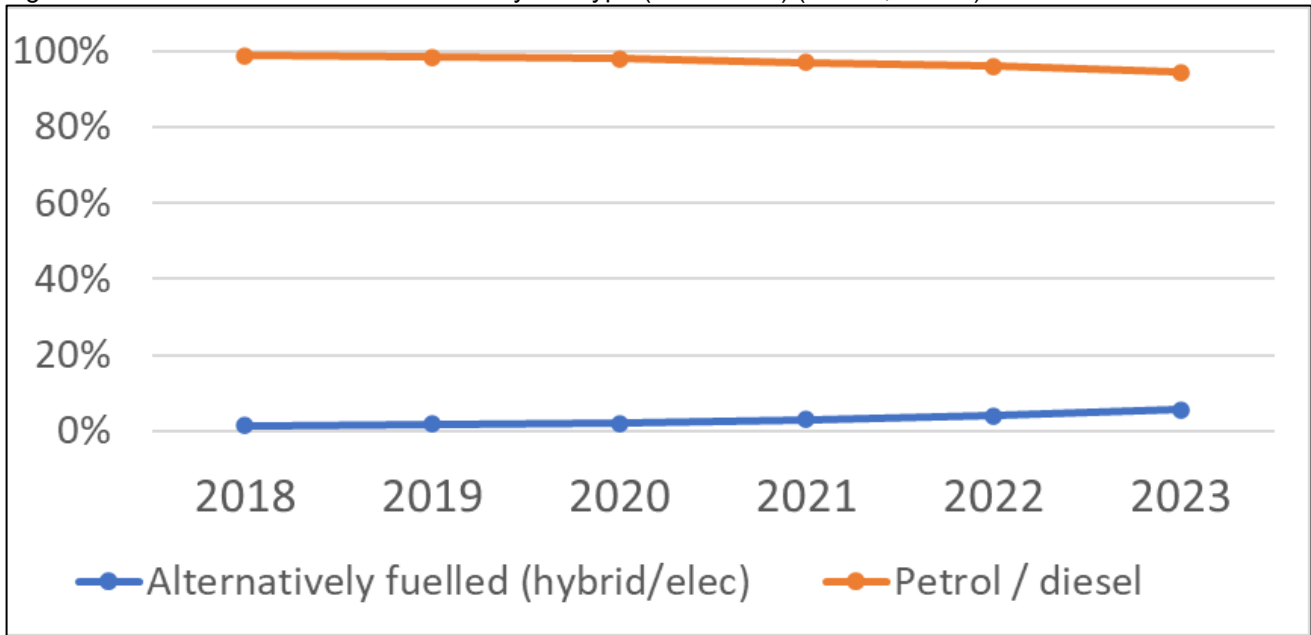


Note: MHEV = mild hybrid electric; BEV = battery electric; PHEV = plug-in hybrid electric; HEV = hybrid electric.

<sup>6</sup> 'Hybrid and electric' includes battery electric, plug-in hybrid electric, and hybrid electric

<sup>7</sup> 'Hybrid and electric' includes battery electric, plug-in hybrid electric, hybrid electric and mild hybrid electric vehicles

Figure 8: Used car transactions in the UK by fuel type (since 2018) (SMMT, 2023a)



### 3.2.2. Trends in fuel type by UK nation

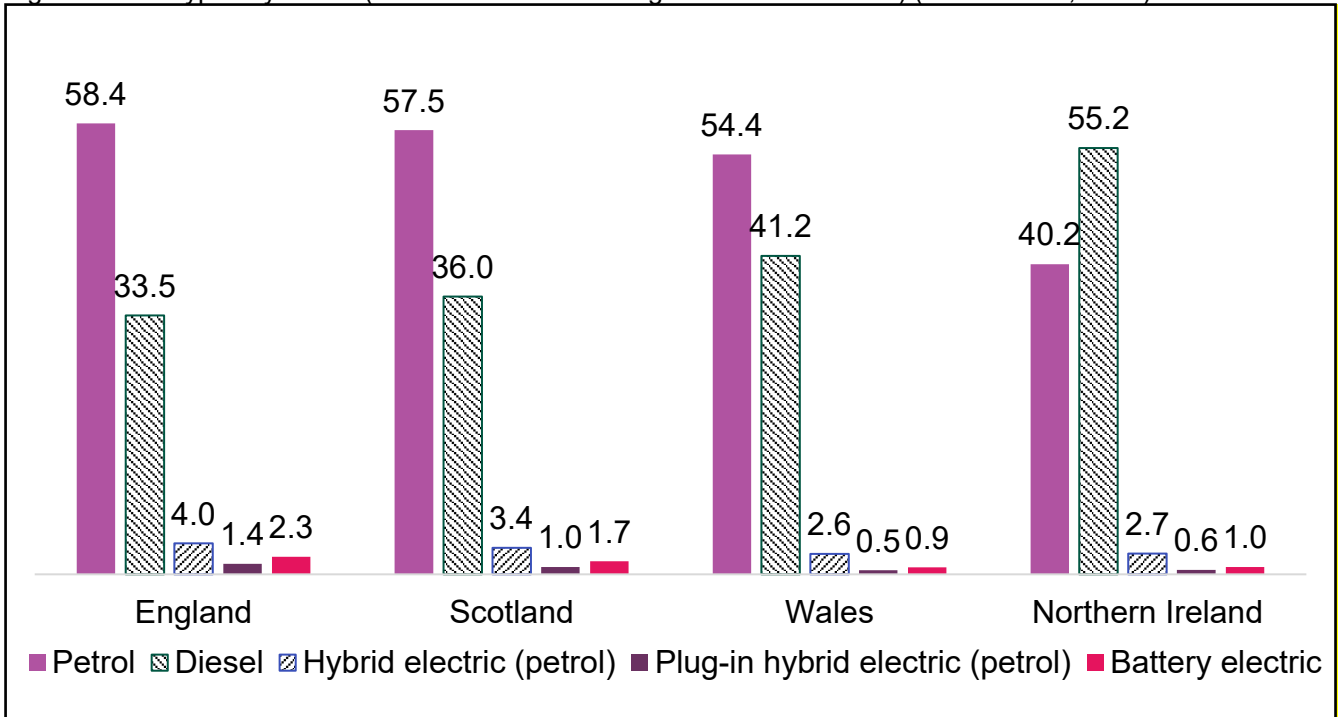
A UK comparison shows that in 2023 petrol was the dominant fuel-type in England, Scotland and Wales but diesel was dominant in Northern Ireland based on the location of the registered keeper of the vehicle. Caution should be exercised when interpreting this data as it will be skewed towards England because the majority of new car registrations are to businesses and leasehold companies located predominantly in England.

England had the highest proportion of battery electric and hybrid cars (8.7% of cars had these fuel types), followed by Scotland (6.1%), Northern Ireland (4.3%) and Wales (4.0%) (**Figure 9**).

Looking at trends between 2015 and 2023, all four UK nations saw small reductions in the proportions of petrol cars (between -4.2pp and -6.2pp<sup>8</sup>) and increases in the proportions of electric and hybrid cars (between +3.7pp and +7pp).

<sup>8</sup> PP=percentage points

Figure 9: Fuel types by nation (% of licensed road using cars in March 2023) (DVLA & DfT, 2023)



During this period, there were reductions in the proportion of diesel cars in England (-2.8pp) and Scotland (-1.8pp) but slight increases in Wales (+1.7pp) and Northern Ireland (+2pp) (Figure 10).

Figure 10 Fuel type by nation over time (% of licensed cars) (DVLA & DfT, 2023)

Nation	Year	Petrol	Diesel	Hybrid electric (petrol)	Plug-in hybrid electric (petrol)	Battery electric	Net: Hybrid / electric
England	2015	62.8	36.3	0.7	-	-	0.7
	2023	58.4	33.5	4.0	1.4	2.3	7.7
Scotland	2015	61.7	37.8	0.4	-	-	0.4
	2023	57.5	36.0	3.4	1.0	1.7	6.1
Wales	2015	60.0	39.5	0.3	-	-	0.3
	2023	54.4	41.2	2.6	0.5	0.9	4.0
Northern Ireland	2015	46.4	53.2	0.2	-	-	0.2
	2023	40.2	55.2	2.7	0.6	1.0	4.3

### 3.2.3. Vehicle size

A comparison of the top ten new and used purchased car models in 2017 and 2022 suggests limited changes in preferences of car size, with the majority of the top ten comprising medium cars in both years.

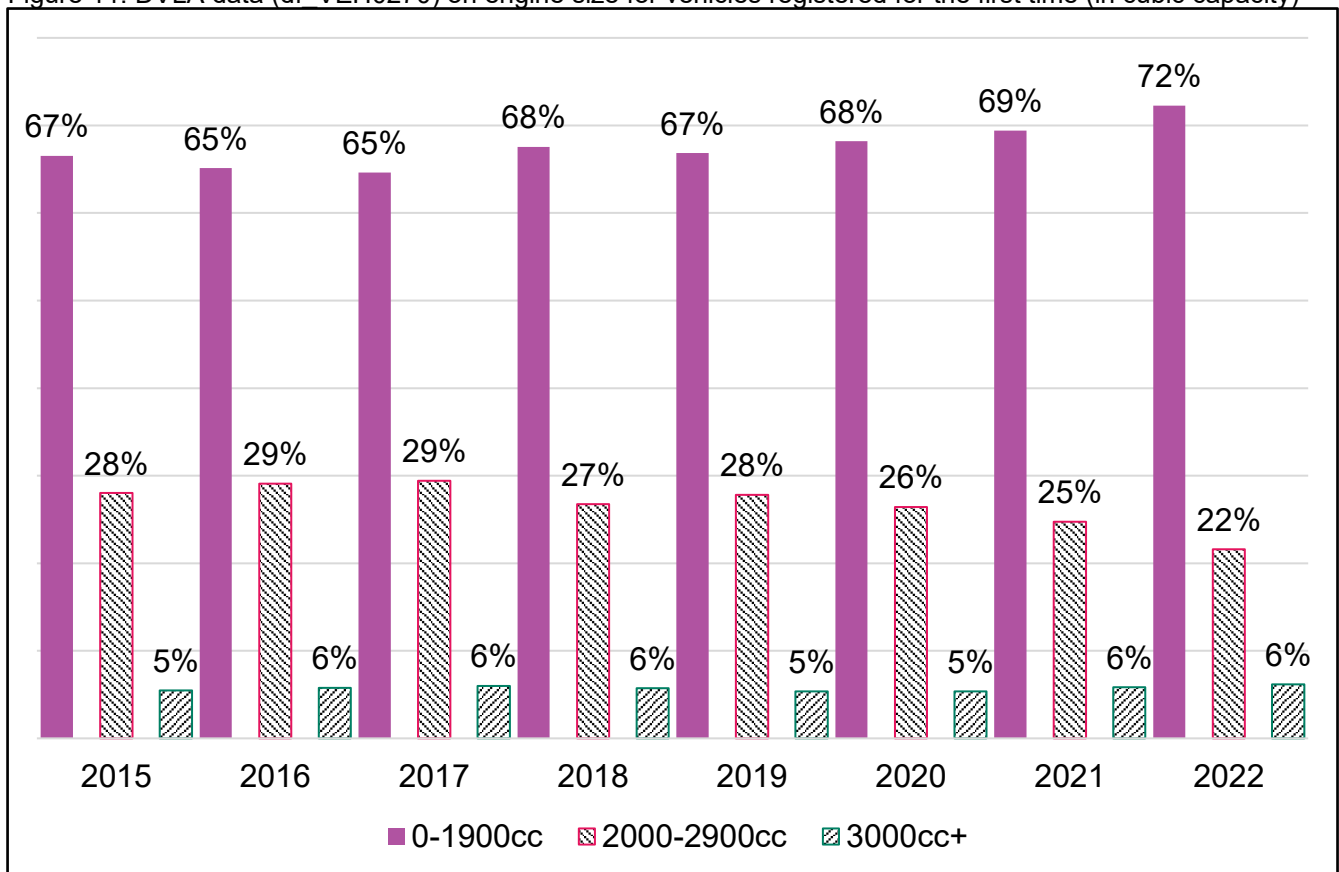
However, in the new car market there is evidence of a steady and potentially growing demand for SUV models, with 5 out of 10 of the top registered / purchased models being SUVs in 2022, compared with 3 out of 10 in 2017.

- The top 5 most registered new car models (1<sup>st</sup> place to 5<sup>th</sup> place) were the Ford Puma, Nissan Qashqai, Vauxhall Corsa, Kia Sportage and Tesla Model Y<sup>9</sup>.
- The top 5 most purchased used car models (1<sup>st</sup> place to 5<sup>th</sup> place) were the Ford Fiesta, Vauxhall Corsa, Volkswagen Golf, Ford Focus, and Vauxhall Astra<sup>10</sup>.

In the new car market, there is also evidence of a modest shift towards smaller engine sizes (Figure 11):

- Between 2015 and 2022, the proportion of newly registered vehicles that had smaller engine sizes (0-1900cc) increased from 67% to 72%.
- Over the same period, the proportion that had medium engine sizes (2000-2900cc) decreased from 28% to 22% and the proportion with larger engine sizes (3000cc+) remained broadly stable at around 5%.

Figure 11: DVLA data (df VEH0270) on engine size for vehicles registered for the first time (in cubic capacity)



<sup>9</sup> <https://www.smmmt.co.uk/vehicle-data/car-registrations/>

<sup>10</sup> <https://www.smmmt.co.uk/2023/12/used-car-sales-q3-2023-2/>

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### 3.2.4. New and used cars

In 2020, levels of new car registrations and used car sales both fell and have since remained lower than pre-pandemic levels.

Used cars have always been a higher proportion of total vehicle purchases than new cars and this gap has increased since 2020 (following supply-side issues in the new car market during the pandemic), with sales of used cars making up 79% of all car purchases in 2023 compared to 77% in 2019 (**Figure 4**, above).

### 3.2.5. Purchasing and selling locations

Evidence on where people choose to buy and sell cars is limited. However, survey data from 2019 suggests that most people buy newer cars (under 7 years old) via dealerships and a 2023 survey of AA members suggests dealerships are the most popular way of selling used cars.

- The National Franchised Dealers Association (NFDA) ‘Consumer Attitude Survey’ (2019) found that 75% of car purchases, for cars under seven years old, were made at franchised dealers; 14% at independent garages; 5% at used car supermarkets and 5% from private sellers.<sup>11</sup> (NFDA, 2019)
- When considering only brand-new cars, 93% were bought at franchised dealerships (NFDA, 2019).
- When the NFDA survey asked where consumers were likely to buy their next cars, 63% selected ‘franchised dealer showroom’ (NFDA, 2019).
- The AA (2023) asked panellists from their Driver Poll how they planned to sell their cars in the future. Just over half of respondents answered ‘via dealerships’ (51%), while 28% were unsure, and 14% intended to sell privately (AA, 2023).

## 3.3 Ownership and access models

In 2022, 84% of new cars and 22% of used cars were bought on finance (**Figure 12** and **13**). The amount people borrowed to acquire cars hit a new record (£41 billion, an increase of £4 billion compared to 2021) (**Figure 16**).

Beneath these headline figures there had been:

- A downward trend since 2020 in the proportion of new cars bought on finance (**Figure 12**). This was linked in the literature to increasing EV sales, where consumers were more likely

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<sup>11</sup> The location for the remaining 7% was not specified in the source



to reject dealer-sourced finance in favour of options such as salary sacrifices<sup>12</sup>, which come with significant tax benefits (Masson, 2023).

- An increase since 2021 in the proportion of used cars bought on finance and in the amount borrowed for used car purchases (**Figure 13**). This was linked in the literature to increased demand for near-new used cars<sup>13</sup> after the shortage of new cars during the pandemic drove-up prices resulting in increased use of car financing, and an increased market for more expensive used EVs (Masson, 2023).

Figure 12: Finance penetration – new cars – 2017 to 2022 (FLA)

Year	Consumer new car sales	Consumer new car finance deals	Finance penetration
2017	1,123,885	990,029	88%
2018	1,052,202	959,729	91%
2019	1,018,258	933,417	92%
2020	747,507	696,737	93%
2021	802,504	737,053	92%
2022	818,192	684,327	84%

Figure 13: Finance penetration – used cars – 2021 to 2022 (FLA)

Year	Used car sales <sup>14</sup>	Used car finance deals	Finance penetration
2021	7,530,956	1,361,878	18%
2022	6,890,777	1,530,572	22%

Figure 14: Amounts borrowed – new, used and total car finance – 2021 to 2022 (FLA)

	2021	2022
New car finance	£17.5 billion	£17.3 billion
Used car finance	£19.2 billion	£23.4 billion
Total car finance	£36.7 billion	£40.7 billion

- There had also been reported growth of personal contract hire leasing, which is a form of long-term rental with fixed monthly fees. This has been linked to leasing companies offering lower monthly payments than dealers on personal contract purchase (Masson, 2023).

<sup>12</sup> The article does not provide data on the proportion of consumers moving from finance to salary sacrifice

<sup>13</sup> 'Near-new' was not defined in the article

<sup>14</sup> <https://www.smm.co.uk/category/vehicle-data/used-car-sales-data/>

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# 4. Consumer profiles and purchase considerations

This chapter describes the characteristics associated with people owning vehicles. It also describes the priorities and preferences that influence the types of vehicles that people choose to purchase. The chapter draws largely on UK evidence alongside some European evidence. It addresses research question 1.e.

## 4.1 Consumer profiles

The review found that factors such as household demographics, income, life stage and geography played a role in car ownership.

### 4.1.1. Transport User Personas

DfT produced nine transport ‘personas’ (2023a) which describe different segments of the adult population in England with cars and without cars.

- The segments most likely to own multiple cars were ‘Heavy Car Users / Frequent Flyers’, ‘Suburban Families’ and ‘Comfortable Empty-Nesters’.
- The segments most likely to own one car only were ‘Less Mobile, Car Reliant’, ‘Young Urban Families’ and ‘Older Less Affluent’.
- The segments least likely to own cars were ‘Elderly And Low Income Without Cars’, ‘Urban Professionals Without Cars’ and ‘Young Low-Income Without Cars’.

### 4.1.2. Income

Analysis of Understanding Society survey data on behalf of the Health Foundation quantified the scale of the income inequality in household car access.<sup>15</sup>

- In 2019/20, more than one-third (37%) of UK households on the lowest incomes (the bottom quintile) did not have access to a car.
- This was 4.5 times higher than the 8.3% of households on the highest incomes (the top quintile) that did not have car access.

### 4.1.3. Geography

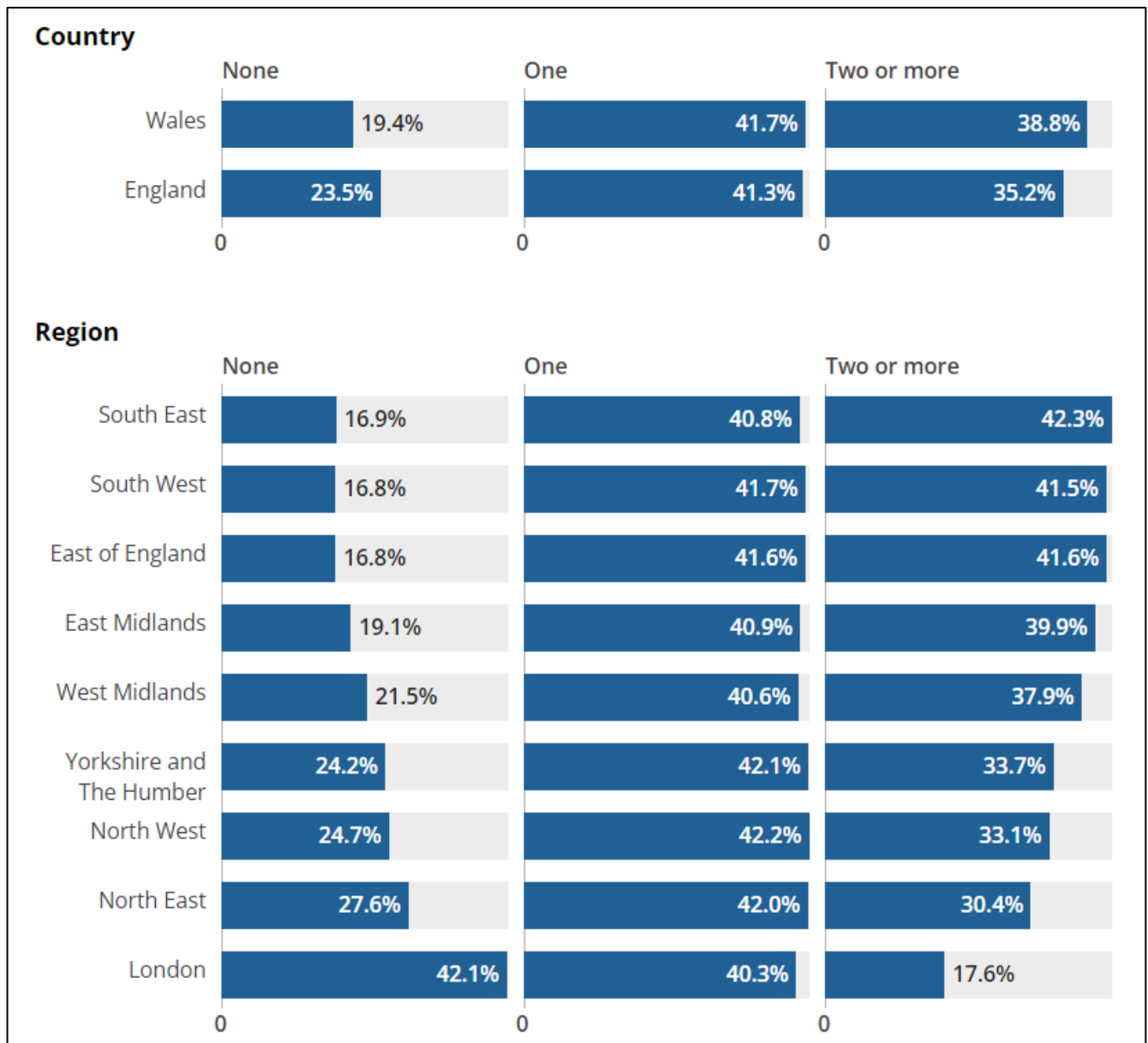
The review found that car ownership was less prevalent in large urban areas.

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<sup>15</sup> Health Foundation analysis of University of Essex - Institute for Social and Economic Research, Understanding Society, UK, 2010–11 to 2019–20.

- The 2021 Census (ONS, 2023a) found that London had a higher percentage of households with no cars or vans (42.1%) than the other English regions (all below 27.6%) and Wales (23.5%) (ONS, 2023a).
- The percentage with two or more cars was also lowest in London (17.6%) compared to the other England regions (all more than 30%) and Wales (38.8%).
- There was less variation in the percentage owning one car across regions as can be seen in the **Figure 15** below.

Figure 15: Car or van availability, 2021, England, Wales, and regions of England (ONS, 2023a)



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- DfT's Transport User Personas study (2023a) linked lower levels of car ownership in urban areas with the availability of public transport, and with proximity to shops, amenities, and recreational facilities.
  - Evidence from France (Bayart et al 2020) also links lower car ownership in urban areas with better public transport provision, as well as reduced parking access and higher fuel prices in these areas.

#### 4.1.4. Low emission vehicle user profiles

Analysis of DfT's Transport and Technology Tracker Wave 10 (DfT, n.d) identified the characteristics of people whose most used car or van (either as a driver or passenger) was an electric or battery vehicle compared to a hybrid (plug-in or non-plug-in).

People who mainly used electric or battery vehicles were more likely to:

- Be male and not be impacted by a health condition that reduces their mobility.
- Live in urban areas in the least deprived parts of the country.
- Be working full-time in managerial and professional roles and have higher household incomes (greater than £52,000 a year).
- Own two cars and use the car as their main mode of transport or as part of a mix of different modes.
- Be categorised as a 'Heavy Car Users, Frequent Flyers' or 'Well-educated Suburban Families' transport persona.

People who mainly used hybrid vehicles were more likely to:

- Be male, aged 65-74 and own one car.
- Live in urban areas in the least deprived parts of the country.
- Be retired, own their home outright and be categorised as a 'Comfortably Empty Nesters' transport persona.

When looking at people's intentions to purchase or lease a low emission vehicle in the future:

- In 2021, 57% of respondents to the National Travel Attitudes Study reported that they were likely to purchase or lease an ultra-low emission car in the future (DfT, 2023b).
- According to Wave 10 of DfT's Technology Tracker (DfT, n.d), in 2022 the following groups were most likely to say they would purchase or lease a low emission vehicle in the future:
  - Hybrid:
    - 65+ years old and retired
    - Managerial and intermediate occupations
    - Residing in London or Yorkshire and the Humber

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- Electric:
    - Residing in London
    - Managerial occupation

## 4.2 Purchasing considerations

The review identified a range of factors that influence the types of vehicles that people choose to purchase.

### 4.2.1. Factors affecting purchasing considerations

Chng et al (2019) found that three broad factors tend to influence those considering purchasing cars:

- Utilitarian factors: this refers to practical considerations such as price, size, performance and running costs.
- Image and status factors: referring to identity-based attitudes around how a car would make a person look to others, such as the brand or colour of the vehicle.
- Environmental factors: referring to pro-environmental attitudes and the preference for environmentally friendly EVs and cars with small engines.

These (and other) factors are discussed in more detail in the sections that follow.

### 4.2.2. Utilitarian factors

Across the evidence, utilitarian factors – primarily affordability but also durability and reliability – were found to be the most important purchasing considerations.

- When asked about the priorities for buying a car, the AA's Driver Poll found that the top answers were 'affordable enough to buy it outright' (39%), 'low running costs' (31%), and 'a car that will last a long time' (30%) (AA, 2023).
- Survey respondents in the DfT Transport Personas study (DfT, 2023a) indicated that the factors they considered most important when buying a car were: costs (70%), reliability (71%), comfort (61%), safety (59%), interior/ boot size (43%), environmentally friendly/ low CO2 emissions (39%).

### 4.2.3. Image and status

The evidence suggests that image and status related considerations are more important to high-income purchasers.

- Analysis of Understanding Society data (Chng et al, 2019) into the relative importance of car purchasing preferences found that that income was positively associated with "image related" concerns, such as the brand of the vehicle.

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#### 4.2.4. Environmental factors

There were mixed findings on the association between the importance of environmental considerations and wealth and education level.

- Chng et al (2019) found that in the UK, wealthier and more educated respondents were less likely to consider environmental factors when making a car purchase. They also found that considering environmental factors during car purchases was more likely among those who already had higher climate change concerns and pro-environmental behaviour.
- However, this finding challenges the wider evidence that wealthier or more educated consumers prefer purchasing low emission cars or EVs – for example, Autotrader (2023).
- In France, Bassem et al (2022) found that the French regions with more educated residents had higher sales of BEVs. The authors speculated that this group had greater awareness of environmental challenges and therefore a greater receptiveness to investing in a car which produced no emissions.

#### 4.2.5. Other behavioural and social factors

A study drawing on European data found that behavioural and social factors are continuing to drive a preference for the purchasing of cars with combustion engines.

- Evidence from the Netherlands involving a representative sample of the Dutch adult population (Paradies et al, 2023) highlighted that car owners tended to be habitual when it came to the types of vehicle that they purchased, with 34% of surveyed consumers being placed into this category. As such, combustion car owners were more likely to buy another combustion vehicle than an electric one.
- The same study found that the “social factors” of wanting to look like others or wanting to distinguish oneself from others both play an important role in vehicle purchasing preferences, calculating a combined “effect size” of 33%.
- The authors explain that the desire to ‘look like others’ has a larger effect on consumer preferences, and thus the desire to fit in and purchase a combustion engine vehicle is currently more prevalent.
- Paradies et al. (2023) argued that there is a need for policies that can break these routine purchase behaviours and social factors to increase the uptake in BEVs in line with government targets.

#### 4.2.6. Vehicle features

Evidence was found about the features that car purchasers considered to be most important in a new vehicle. AA’s Driver Poll of its members (AA, 2023) reported the top “must have” features as:

- Parking sensors (60%)
- Sat Nav (57%) – with older drivers being more likely to select this option

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- Heated windscreens (53%)
  - USB charging (48%)
  - Bluetooth connectivity (47%) – with younger drivers being more likely to select this option

#### 4.2.7. Purchase considerations for electric vehicles

In terms of public appetite to consider purchasing EVs, the review found some positivity about the potential environmental benefits, while concerns about affordability, the availability of charging points and concerns about vehicle range and battery life were the key barriers to uptake.

- DfT's Transport and Technology Tracker Wave 10 (DfT, n.d), conducted in December 2022, asked respondents to select the advantages and disadvantages of EVs compared to petrol and diesel vehicles.
- Three quarters (75%) selected environmental benefits, followed by road tax (49%), less noisy (49%) and cheaper to run or maintain (35%).
- The perceived barriers to EVs were purchase cost (selected by 74% of respondents), followed by not enough charging points (71%), less distance can be travelled on one charge (66%), the time taken to recharge (64%) and knowing where and how to charge (57%).
- The findings indicate a reduction in support for EVs at Wave 10 compared to the previous wave (conducted June-July 2022), with a smaller proportion of respondents selecting environmental benefits (-7pp) and an increase in the proportion selecting cost of buying (+4pp).

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# 5. Changes in car ownership

This chapter describes the different factors that can influence changes in household car ownership, covering research questions 3.a. to 3.i. The chapter covers influencing factors at the household level (e.g. changes in household size) as well as wider external factors (e.g. increases in the cost of living).

The evidence cited is largely from the UK, alongside several international sources.

## 5.1 Increasing household car ownership

Factors identified in the literature associated with increased household car ownership included changes in income and household size, occupation, having a child and moving to a new house.

- Haque et al. (2019) found that in the UK context, increased car ownership was associated with the following life events:
  - 39.7% purchased their first car and 53.6% purchased a second car when their income increased.
  - 47.3% purchased their first car and 88.5% purchased a second car after owning a house (as opposed to renting a house).
  - 19.1% purchased their first car and 15.2% purchased a second car after their household size increased.
- Similarly, (Clark, et al., 2015) found that in the UK context, the likelihood of car ownership increased or was associated with the number of adults in the household, gaining a partner, having a child, moving into employment and an increase in household income.
- This is further supported by studies in Europe which found that the likelihood of owning a vehicle was higher in households with children, compared to those without (Bahreini et al., 2022 and Bayart et al., 2020).

## 5.2 Decreasing or relinquishing household car ownership

There is evidence that life events and economic factors are associated with people relinquishing their cars.

- Research in the UK carried out by Clark et al. (2016) found that these factors included:
  - Losing an adult in the household
  - Moving out of employment or a decrease in household income



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- After controlling for income, living in an area of higher deprivation
  - Moving to an area with a higher number of bus stops
  - Individuals in a single occupancy household
  - Having a child
- Similarly, European evidence found that decreasing car ownership was associated with a decrease in household size, divorce, a fall in household income and moving to a central location, with the latter linked to the greater availability of public transport, and closer proximity to shops and recreational amenities (Aguilera et al., 2020).
  - The evidence related to relinquishing car ownership completely or delaying car purchases identified broadly the same set of factors, alongside a desire to avoid the ‘hassle’ associated with ownership (Autotrader, 2018).

The evidence demonstrated that car owning households have high dependency on their cars – particularly, to visit family and friends, maintain relationships and to get to work – and face high barriers to relinquishing their vehicles.

The AA Driver Poll of members (2023) found that:

- 96% of respondents indicated that losing their car would negatively impact their lifestyle. Of those, 57% said that without a car they would struggle to leave their local area.
- 77% used their car to visit family and friends and to maintain important relationships.
- 26% said that losing their car would force them to change job.

There is evidence that single car households face higher barriers to relinquishing their vehicles compared to households owning second or third vehicles (Roorda, et al., 2009). It was found that the “utility loss” of losing a first car was likely to be significantly higher compared with losing a second or third car.

## 5.3 Wider external factors associated with changes in car ownership and usage

Wider factors associated with a reduction in car ownership and usage found in the evidence included the increased cost of living, trends in working from home and online shopping and uptake of alternatives to car ownership.

### 5.3.1. Cost of living increases and the affordability of cars

There is evidence that recent increases in the cost of living, and the rising costs of purchasing a car exacerbated by high rates of inflation have resulted in some people putting off car purchases and in reducing the number of trips that they make by car and van.

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- A third of car owners in England (33%) who responded to the NTAS reported that they had pushed back buying a vehicle because of the fuel and energy price rises in August/September 2022 (DfT, 2022b). Although, 61% of car owners reported no impact on the timing of their next vehicle purchase.
  - DfT's Technology Tracker Wave 9 survey (Marshall, et al., 2022) also conducted in 2022, when fuel and energy prices were rising, found that:
    - 31% adults in England who responded said that they were likely to put off a decision to buy or replace a car or van in the next six months.
    - 3% reported reducing the number of cars or vans in their household as a way of reducing expenditure.

Evidence also exists on the rising cost of vehicles and the potential impact on household budgets:

- In 2011<sup>16</sup> the average weekly household expenditure on motoring (including new cars or vans, second hand cars or vans and motorcycles) was £25.10 compared with £36.80 in 2021 (ONS, 2022).
- Research carried out in the UK in 2022 by Moneybarn found that car prices are rising twice as fast as wages, going up 1.94 times quicker than the average UK salary, with a car now costing almost 39% more on average than it did in 2012.<sup>17</sup>

### 5.3.2. Working from home and shifts in mobility patterns

There is evidence that increases in working from home alongside shifts in mobility patterns exacerbated by the COVID-19 pandemic have persisted to some degree. These trends have led to reductions in driving and in turn could be impacting levels of car ownership.

Drawing on longitudinal datasets for 10 areas<sup>18</sup> in the UK, Anable et al. (2022) found that:

- Car usage in Summer and Autumn 2021 remained lower than pre-pandemic levels. In England specifically, regular car use (defined as using one's vehicle three days per week or more) reduced "to 85% of the pre-pandemic level by Summer 2021."
- Weekday traffic had not returned to pre-pandemic levels because of the continued prevalence of home working. Car usage was found to reduce as working from home increased. It was also estimated that even if people who were working from home went back to travelling for half of their working week, there would still be a 16% reduction in car commute miles.

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<sup>16</sup> Available at <https://www.racfoundation.org/wp-content/uploads/2017/11/ons-car-owning-household-expenditure-on-motoring.pdf>

<sup>17</sup> Available at <https://www.moneybarn.com/carflation/>

<sup>18</sup> The ten areas comprise four in Scotland (Aberdeen & Aberdeenshire, Edinburgh, Glasgow, and Ayrshire) and six in England (Bristol, Lancashire, Liverpool, London, Manchester, and Newcastle).

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- Retail spending has been broadly stable although people have visited ‘bricks and mortar’ shops less often possibly due to more intensive shopping and more online purchasing.

Evidence from the AA Driver Poll (2023) found that 37% of AA members were eating out less and 31% were driving less, both of which could result in fewer (car) trips.

No evidence was found on how working from home has impacted on wider trends in car travel/usage. This is a potential area for further research.

### 5.3.3. Alternatives to car ownership

Whilst many households are highly dependent on their vehicles, there is some evidence of a growing interest amongst UK drivers in flexible forms of car access rather than ownership. This includes car subscription services and car sharing. In terms of non-car owners’ attitudes, Auto Trader (2018), drawing on a nationally representative survey of the UK public aged 18+, reported that 11% of respondents did not want to own one in the future. Of these respondents, 28% did not want to do so because of the ‘hassle’ of owning one and for 16-34-year-olds, 34% said that the main reason was the cost of running a car.

#### Car subscription services

There is some evidence of a growing interest in car subscription services, which involves users paying a monthly flat fee to access a car with no commitment or hidden/additional costs.

- 23% of drivers in Britain agreed that ‘they did not want to be locked into owning a car because their needs may change’ according to a survey carried out by YouGov<sup>19</sup>. This compares to 33% of drivers in France and 39% of drivers in Hong Kong.
- A UK survey reported that 71% of consumers aged 21-55 would consider a car subscription for their next car and a further 90% agreed that car subscription should be offered as a standard alternative alongside leasing and financing options.<sup>20</sup>

#### Car sharing

In the UK, there is evidence of growing demand for car sharing, which allows people to rent or access cars for a short period of time without being tied to ownership. Car sharing includes both the renting of cars through commercial car clubs who own and maintain fleets of vehicles, and a peer-to-peer model where a member of a scheme may rent their vehicle to another member. The evidence found that:

The number of UK car club members in 2022 was 752,560, up 113% from 2019 (CoMoUK, 2022) indicating growth in this form of car sharing.

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<sup>19</sup> Available at <https://business.yougov.com/content/38601-global-attitudes-towards-car-ownership>

<sup>20</sup> Research cited in Global Car Subscription and New Mobility report: <https://www.loopit.co/whitepaper>

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- Car club members were motivated to use car clubs because they did not need a car very often (71%), to avoid the 'hassle' of car ownership (46%) and to have access to a van or because parking was challenging where they lived (both 25%). 35% of members were motivated by reducing their environmental impact (CoMoUK, 2022).
  - Significant savings were expected by for participation in car sharing schemes. For example, evidence from an Auto Trader survey (2018) found that UK car owners reportedly wanted an average saving of 55% in their monthly automotive expenditure to switch from a direct access to a sharing model.

There is some evidence that car sharers are less likely to own their own cars compared to non-car sharers. In 2022, 67% of car club members in the UK said that their household does not have access to a privately owned car (CoMoUK, 2022) compared with 23% of all households in England and Wales in 2021 (ONS, 2023a).<sup>21</sup>

- In the UK context, 19% of car club members in 2022 reported relinquishing a car (CoMoUK, 2022).
- In the Belgium and Norwegian contexts, participating in car sharing was associated with not purchasing second vehicles (Wiegmann, et al., 2020) (Nenseth & Ingunn Opheim, 2022).

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<sup>21</sup> This comparison is indicative because of the differences in geography and the timings of data collection.

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## 5.4 Factors associated with the uptake of EVs

The literature identified a range of policy interventions that have broad public support and have been shown to increase EV take-up in the UK and other European countries.

A study analysing 15 European metropolitan areas (Wappelhurst et al., 2020) found a relationship between markets with higher shares of electric vehicles and policies responding to barriers to electric vehicle adoption – specifically:

- Affordability
- Charging infrastructure
- Investment in information and marketing on EVs

Additionally, policies that deterred the use of combustion vehicles and older vehicles, scrappage schemes, plug-in grants and policies aimed at improving air quality could also lead to reductions in the use of the most polluting vehicles and prompt wider electric vehicle adoption.

### 5.4.1. Affordability

The evidence found that financial incentives would be important in making EVs more affordable:

- The DfT's NTAS (2023b) asked respondents in England to identify which actions might encourage them to purchase a low-emission car. Three quarters of respondents (76%) said lower purchase costs, with a similar proportion (75%) saying lower running costs, i.e. recharging costs.
- The AA's Driver Poll (2023) asked their members which incentives would be most likely to encourage them to move to electric car ownership:
  - 16% answered 'a 0% interest loan over 3-5 years'.
  - 13% answered 'remove VAT from new EV sales'.<sup>22</sup>

In Europe where EV roll out has been most successful, Wappelhorst et al. (2020) identified fiscal measures, such as one-time subsidies and tax breaks on EV purchases, as being an important factor.

Along with financial incentives for EVs, Logan et al. (2021) found that there needs to be a set of accompanying policies to further encourage EV adoption. These include policies on increasing taxation on petrol and diesel vehicles and older vehicles, higher fuel duties, scrappage schemes, and lower VAT and electricity prices for EV users.

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<sup>22</sup> Data for the other response options were not reported

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## 5.4.2. Charging infrastructure and EV battery life

In the UK and Europe, both Reiner et al. (2020) and Wappelhorst et al. (2020) found that investment in accessible and convenient charging points was a significant factor impacting the viability and take up of EVs.

In England, the DfT's NTAS (2023b) found that:

- 59% of respondents felt that there were not enough charging points to meet demand.
- The most popular forms of government-led action were linked with charging points – with 48% calling for funding for the installation of on-street charge points, 46% for ultra-rapid charge points at motorway service stations and 44% for the reliability of charge points to be improved.

There was also evidence of concerns about EV battery life.

- The majority of respondents (60%) to the DfT's NTAS (2023b) did not believe that EVs had sufficient range and 59% reported having a low level of confidence that they could make a long-distance journey in an EV.
- 45% of respondents to the AA Driver Poll of members (2023) would prefer not to buy a used EV due to concerns about their battery of life.

## 5.4.3. Low emission zones

In order to encourage EV uptake, the UK's environmental and health policies represented the biggest catalysts (Simpson et al, 2019). Examples of such policies included higher Vehicle Excise Duty on diesel cars, and plug-in grants. They also included the London Mayor's Ultra Low Emission Zone (ULEZ), formerly London's Toxicity Charge, a congestion charge targeting the most polluting vehicles and Clean Air Zones across the country.

- In October 2023, the number of older, more polluting non-compliant vehicles seen driving in London on an average day had decreased by 77,000 compared to June 2023 - a reduction of 45 per cent.

## 5.4.4. Information and marketing schemes

Transport experts and stakeholders in five European countries including the UK, felt that schemes which provided information on EVs to potential buyers via websites, blogs, specialised magazines, and social networks had the potential to positively influence the uptake of EVs (Santos et al, 2020).

- Most UK respondents participating in the study felt that these schemes, such as the 'Go Ultra Low' campaign run by the UK Government in conjunction with major automotive manufacturers, have improved confidence and decreased concerns surrounding the adoption of lower-emission alternatives.
- Wappelhorst et al. (2020) found evidence that information and public awareness raising campaigns were associated with successful EV transitions when comparing different European metropolitan areas. Examples cited (which were not assessed for their

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effectiveness) included an Electric Mobility Information Centre in Amsterdam, a yearly exhibition providing test rides with EVs in Madrid and, a two-week electric car race through 10 countries to demonstrate battery life.

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# 6. Forecasted trends in car ownership

This chapter explores how car ownership is forecast to change in the next five years and further ahead. It addresses research question 2.a and mainly cites UK and European evidence. Where possible, it draws on evidence published post-2021, i.e. after the UK had begun to emerge from the pandemic. Overall, there were evidence gaps around trends in vehicle size, vehicle age, length of ownership and future trends beyond 2030, specifically in the UK.

It should be noted that the reliability of the following forecasts have not been assessed as a part of this review. Therefore, any conclusions derived from these forecasts should be treated with caution.

## 6.1 Forecasted trends in car sales

Evidence from the UK forecasts that UK car sales will increase until at least 2028. International evidence also suggests car sales will increase in the UK and in Europe in the next few years but will eventually decrease after 2030.

- Using sales of new passenger cars and applying forecasting techniques, Statista (2023) estimated that the unit sales of passenger cars in the UK are expected to rise from 1.11 million vehicles in 2022 to 1.90 million vehicles in 2028.
- Data from an international annual consumer survey by McKinsey estimated that car sales were likely to rise globally over the next few years, peaking by the end of this decade, and then falling by 2035 (Heineke, et al., 2023). In 2035, the source states that car sales in the European Union are forecasted to be almost 20 percent lower.

## 6.2 Forecasted trends in electric vehicle ownership

### 6.2.1. Forecasted changes to the EV market

Evidence from the UK and Europe suggests that ownership of EVs will grow in the future whilst sales of petrol and diesel cars will fall.

- The UK new car registrations outlook as at January 2024 (SMMT, 2024) forecasts the following changes by 2025.
  - Battery electric vehicles (BEV) to increase by 68%, from 315,000 to 530,000 units (from 13% of new registrations to 26%)
  - Plug-in hybrid vehicles (PHEV) to increase by 33%, from 141,000 to 187,000 units (from 7% of new registrations to 9%)
  - Hybrid electric vehicles (HEV) to increase by 26%, from 239,000 to 302,000 units (from 17% of new registrations to 15%)



- Diesel to fall by 30%, from 142,000 to 99,000 units (from 8% of new registrations to 5%)
- Petrol to fall by 14%, from 1.07 million to 919,000 units (from 56% of new registrations to 45%)
- The Zero Emission Vehicle (ZEV) mandate sets out the percentage of new zero emission cars and vans manufacturers will be required to produce each year up to 2030. At the time this evidence review was conducted, 80% of new cars and 70% of new vans sold in Great Britain were required to be zero emission by 2030, increasing to 100% by 2035.<sup>23</sup>
- Looking at the used EV market it is estimated that of all annual used car sales, the proportion of BEVs will rise from 2% in 2021 to almost a third (31%) by 2030 in the UK (LV=General Insurance, 2022). The research used data from DfT and DVLA to model expected changes in the number of electric car sales and petrol car registrations based on current growth rates.

International evidence forecasts a similar trend in other countries in Europe:

- In the Netherlands, the estimated BEV market share in new car sales is estimated to increase to between 26% and 40% in 2030 from 20.3% in 2020 (Paradies, et al., 2023).
- By 2030, it is predicted that there will only be a small, single-digit percentage (potentially less than 5%) of combustion engine new car sales in Europe with the remaining new car sales expected to be partially electrified. More than 55% of new cars will already be fully electrified, while 45% of new vehicles would combine an electric motor with a combustion engine (Kuhnert, et al., 2018)

Although the EV market is expected to grow substantially in the UK over the next 25 years, the end of the transition to EVs is estimated to be later for the UK compared with other European countries (Ruoso & Ribeiro, 2022).

- In the UK, Switzerland, Belgium, France, and Portugal, the end of the transition is expected to be close to 2040.
- In Norway and Iceland, transition is expected to end by 2026 and 2029, respectively.
- In most other countries in Europe, the end of the transition is expected to occur after the year 2030.

### 6.2.2. Potential factors affecting future increases in EV ownership

Higher purchase price and lower driving range are the main current barriers preventing prospective car buyers from purchasing an EV in the UK and other European countries (Paradies, et al., 2023). However, Paradies et al. (2023) predicted that in the Netherlands these barriers would become less important after 2030. This is because over time the price of EVs is assumed to decrease while the driving range is assumed to increase.

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<sup>23</sup> <https://www.gov.uk/government/news/pathway-for-zero-emission-vehicle-transition-by-2035-becomes-law>

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However, if government financial incentives, where available, are prematurely removed, this is expected to have a negative impact on the BEV market, as EV prices will continue to be perceived as too high by consumers in the UK and other European countries (Gómez Vilchez, et al., 2019). It was also noted that incentives should be applied at the point of purchase, rather than afterwards with VAT and purchase tax exemptions being the most effective.

In 2030 Paradies et al. (2023) predicted that other barriers to buying an EV would be more significant particularly consumers' tendencies to 'go with what they know and are used to' and thus buy a car with a combustion engine. Although EV uptake is expected to increase, there is the tendency for consumers to want to conform with their peers which may mean favouring the purchase of cars with a combustion engine over EVs.

## 6.3 Forecasted trends in car ownership models

### 6.3.1. Changes in car ownership models

There is a lack of recent evidence about the future of different financing methods in the UK. However, research by Autotrader (2018) indicated a shift from 'ownership' to 'usership' (paying for exclusive access to a vehicle for a specific period), driven by pay monthly models and subscriptions. The evidence also found that:

- Hire purchase (HP) and personal contract purchase (PCP) could make the car market more accessible to lower income groups who could not afford an outright purchase model.

Whilst leasing models are currently a relatively small market in the UK, their popularity is expected to increase as the demand for greater flexibility, cost efficiency and choice increases for consumers (Autotrader, 2018).

This is mirrored in the European context, where the evidence suggests that there will be a decrease in outright purchases due to an increase in general consumer choice as to how to access cars. HP, PCP, personal contract hire (PCH), leasing and sharing are all forecast to rise. (Autotrader, 2018; Kuhnert, et al., 2018; Heineke, et al., 2023).

- Leasing models were predicted to account for nearly 10% of all new vehicle sales in the US and Europe by 2025 (Autotrader, 2018).
- There was predicted to be a worldwide rise of shared mobility as consumers looked for transportation options that were more convenient, cost-effective, and sustainable (Heineke, et al., 2023). Shared mobility in this context considers car sharing, shared micro mobility (short-term access to vehicles for trips within a defined area) and ride hailing.

### 6.3.2. Reasons for changes in car ownership models

The shift from outright purchase to 'usership', could be explained by several factors (Autotrader, 2018; Kuhnert, et al., 2018):

- PCH offers consumers lower up-front costs, lower monthly payments, and no resale 'hassle' compared to buying cars (Autotrader, 2018).

- 
- PCH often includes maintenance and insurance as part of the package, avoiding any unexpected or hidden costs and less responsibility for maintenance and damage (Autotrader, 2018).
  - Leasing models provide greater flexibility with the length of usership, rather than being committed to a two- or three-year contract as with PCH (Autotrader, 2018).
  - Consumers are able to access a variety of cars that they would not have been able to afford if they were buying the car (Autotrader, 2018; Kuhnert, et al., 2018).

### 6.3.3. Changes in vehicle inventory numbers

The vehicle inventory in Europe currently consists of more than 280 million vehicles, almost all of which are privately owned and used (Reiner, et al., 2020). Analysis by PWC has predicted that the percentage shifts towards autonomous and shared forms of mobility will mean that by 2030 the inventory could potentially drop to just over 200 million vehicles.

At the same time, the vehicles in the inventory could cover a higher mileage, from 3.7 trillion kilometres today to over 4.2 trillion kilometres, due to the higher utilisation of autonomous and shared vehicles (PWC, 2018).

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# 7. Evidence gaps

The following evidence gaps were found in the reviewed evidence:

- Regarding trends in household car ownership and purchase behaviours, there was limited evidence on the impact of vehicle age and length of ownership on this.
- Demographic profiles of those most likely to purchase a certain type of car, relinquish ownership or delay purchases were not fully explored.
- In terms of financing, the review did not find evidence about the demographic profile of people using the different finance types outlined in section 3.3, and limited evidence about how financing varied by car type and value.
- Evidence about where most people buy their cars was also not found. Accessing vehicles through subscriptions, sharing and leasing has been predicted to increase. However, projections across these models of access were not identified in the UK.
- In terms of future trends, evidence around vehicle size, vehicle age, length of ownership and future trends beyond 2030 specifically in the UK were not found.
- Detailed evidence was not found about the relationship between car ownership and purchasing and working from home.
- Evidence was not found about the relationship between car ownership and parking availability and costs, the supply of cars, and changes in the company car market (including the role company tax relief has on purchasing decisions).

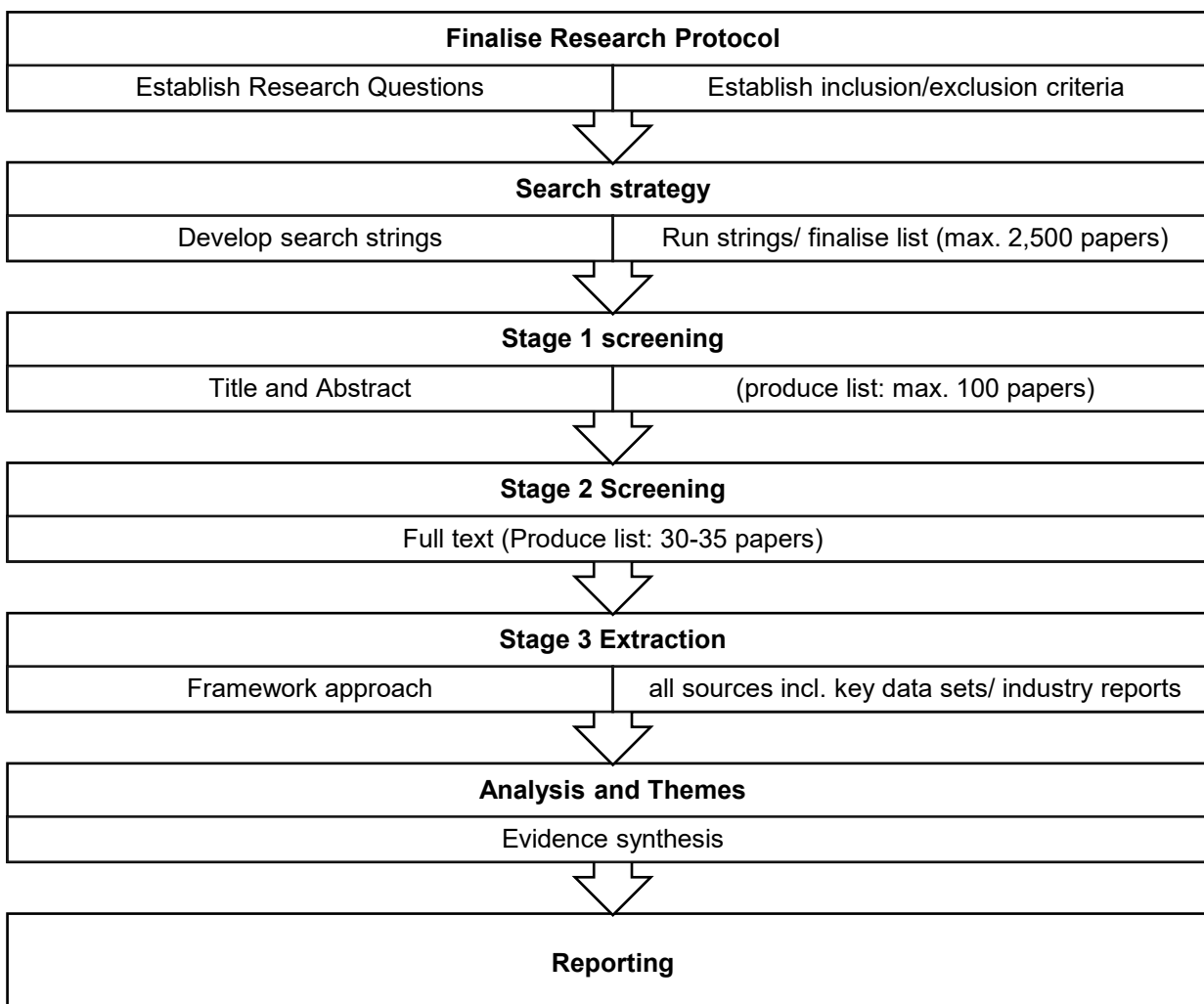
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# 8. Methodology

This chapter provides a summary of the methodological approach used to complete this REA including the criteria and processes for the search strategy, screening, data extraction and synthesis. Further details of the database searches can be found in Appendix A.

## 8.1 Overview

The process for the REA is summarised below:



### 8.1.1. Search strategy

The study involved separate searches for academic papers and grey literature (including industry articles and data sets) relevant to the research questions.

- The academic search involved database searches in Scopus, EconLit, Business Source Premier, and Transport Research International Documentation (TRID). Search strings were

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developed in line with the inclusion and exclusion criteria to identify peer-reviewed evidence within exclusion.

- In addition to academic database searches, key grey literature and data sets were explored through manual Google Scholar searches and recommendations from DfT and a small number of key industry stakeholders.
- The inclusion criteria of the screening process for this literature review are based on the overall project aims and are set out below.

### 8.1.2. Inclusion criteria

The eligibility criteria for all sources included are as follows:

- **Language.** Studies written in English only.
- **Publication status.** Published academic literature in addition to published grey literature. DfT data sets such as the National Travel Survey, the National Travel Attitudes Study, Transport Technology tracker, Transport User Personas have been analysed and included. In addition to this, the 2021 Census data has also been included.
- **Date of publication.** We have included studies published from 2015 onwards but prioritised sources from the last 5 years. To address the research questions, we will focus on both pre pandemic and post pandemic evidence.
- **Countries.** The included sources are from the UK, Ireland, the Netherlands, Germany, Denmark, Norway, France, and Belgium.
- **Topic.** Evidence relating to car ownership. This includes recent trends, the profile of car ownership, car ownership models, the types of vehicles that are being bought, how observed trends have changed, key factors that drive car ownership decisions and how car ownership is projected to change in the future.
- **Study design.** The design criteria were left relatively open and has included primary and secondary research studies, descriptive papers, forecast data, evaluations, and recommendation reports.

### 8.1.3. Database Searches

The development and implementation of the search strategy was supported by a literature searching expert. This expert informed and ran a set of search strings across key databases. The table below presents the result from this search.

Database Name	Platform	Date of search	# of results
Scopus	Elsevier	August 31, 2023	592
EconLit, Business Source Premier	Ebsco	August 31, 2023	446
TRID (Transport Research International Documentation)	<a href="https://trid.trb.org/">https://trid.trb.org/</a>	August 31, 2023	340
<b>Total results from all databases</b>			<b>1378</b>
<b>Total duplicates removed</b>			<b>443</b>
<b>Total after deduplication</b>			<b>935</b>

See Appendix A for the search strings used in each database.

#### 8.1.4. Screening process

##### **Academic studies**

The academic papers were screened at two stages - at title and abstract and at full text.

A total of **935** studies were screened at title and abstract. These studies were considered against the inclusion and exclusion criteria.

**163** studies were then screened at full text. A systematic prioritisation process was undertaken based on assessing the relevance and quality of each paper. This included a Weight of Evidence (WoE) criteria to rate the evidence according to relevance and robustness which asks if the source has:

- a clear statement of the aims/objectives or clear research questions
- a clear and appropriate sampling strategy (or data selection strategy if not collecting primary data)
- a clearly described data collection methods
- any concerns regarding accuracy of findings

This left a final list of **33** academic articles for extraction.

##### **Data sets and industry papers**

Key grey literature and data sets were identified through:

- Recommendations from DfT and key industry stakeholders

- 
- Manual and targeted Google scholar searches

Once these were identified, the same inclusion and exclusion criteria and prioritisation processes were applied to ensure relevant and high-quality data is included.

This produced a final list of **32** sources, comprised of **15** data sets and **17** industry papers (See References ).

## Data extraction and synthesis

Based on the research questions and prioritisation process tool a thematic framework was developed. This framework was created in an Excel document as a tool to extract the relevant data from each source into research question themes. Members of the research team read each paper in full and populated the framework with the relevant evidence.

Once extraction was complete, the evidence was narratively synthesised by research question. This was done by using a 'framework method', employing analytical matrices reflecting our primary and secondary research questions. This method had the advantage of linking summarised evidence to thematic areas, enabling the evidence for each research question to be easily viewed and interpreted.

## 8.2 Data sets

### 8.2.1. National Travel Survey

The National Travel Survey (NTS) (DfT, 2022a) is a household survey of England commissioned by DfT. It is designed to monitor long-term trends in personal travel, such as household car availability, with the aim of informing policy. The NTS covers travel by all age groups and uses a random probability sampling approach to produce representative results. Data collection is face-to-face. However, from 2020 up to the first quarter of 2022 telephone was used due to the COVID-19 pandemic. The survey also has a 7-day travel diary component. The 2021 results draw on a sample of 9,971 individuals and the 2022 results on a sample of 8,087 individuals.

### 8.2.2. National Travel Attitudes Study

The National Travel Attitudes Study (NTAS) (DfT, 2023b) is English panel survey commissioned by DfT. It explored attitudes towards travel and other transport-related topics. The survey targets English adults aged 16+ and uses a random probability sampling approach and so the findings can be representative. It is conducted online and via telephone. Wave 7 of this survey published in 2023 was conducted in 2022 with 2,171 respondents.

### 8.2.3. Technology Tracker

The Technology Tracker is a public attitudes survey commissioned by the DfT which explores awareness of, and attitudes towards, various types of technology. This includes car access and purchasing intentions, as well as knowledge of, and attitudes towards, EVs and self-driving vehicles. The survey is run by Ipsos, drawing on members of their Knowledge Panel. It is run online, targets adults aged 16+ based in England and uses random probability sampling to produce representative results. Wave 9 of the Technology Tracker (Marshall, et



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al., 2022) was conducted in 2022 and had a sample of 3,162 people. Data from *Wave 10* of the Technology Tracker (DfT, n.d), conducted in late 2022, has also been cited in this report, with a sample of 3,207 people, although this data has not yet been published. We have therefore italicized this throughout the report.

#### 8.2.4. Census 2021

The Census (ONS, 2023a) contains travel related questions, including vehicle availability and the number of vehicles owned by households in England and Wales. The Census is conducted by the Office for National Statistics every ten years, and a population estimate is created through combining Census data with the Census Coverage Survey (CSS). The CSS is conducted in the weeks following the Census, with a sample gained through random selection of postcodes in England and Wales. Unlike the Census, which is a legal requirement for all households to partake in, the CSS was voluntary. This survey, conducted in 2021, gained data from approximately 350,000 households.

#### 8.2.5. AA Driver Poll

The AA conducts a monthly poll of UK drivers (AA, 2023). Respondents are members of an opinion panel that is managed by Yonder. The topics vary each month and include remote car shopping, electric vehicle views, and used car buying. Completion is online with a self-selecting sample panel. Panelists are self-selecting and must be AA members, so the findings do not provide a representative picture. Evidence included in this review comes from the survey conducted in February 2023 with 14,666 responses.

#### 8.2.6. Annual Consumer Survey

The McKinsey Center for Future Mobility conducts an annual consumer survey that looks at four major trends (Heineke, et al., 2023): autonomous driving, electrification, connectivity, and shared mobility. The evidence in this report comes from the survey that was conducted in December 2022 with a sample of 27,039 respondents. Detailed information about the sampling strategy was not provided.

#### 8.2.7. SMMT new car and van forecasts

The Society of Motor Manufacturers and Traders (SMMT) publishes quarterly forecasts for new van and car registrations in the UK (SMMT, 2023b). These forecasts are prepared by the SMMT Economics Team and are based on new vehicle registration volumes in the UK. SMMT began publishing their forecasts in 2011. Their January 2024 publication has been cited in this report.

#### 8.2.8. SMMT used car sales

The Society of Motor Manufacturers and Traders (SMMT) publishes quarterly updates and monthly reports of used car sales, drawing on all changes of registered keeper recorded by the DVLA (SMMT, 2023a).

#### 8.2.9. Vehicle licensing statistics: January to March 2023

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The Department for Transport (DfT) and the Driver and Vehicle Licensing Agency (DVLA) provide detailed statistics regarding vehicle licensing and registered vehicles in the UK (DVLA & DfT, 2023). These quarterly publications include statistics on all vehicles, as well as individual breakdowns for plug-in vehicles and ultra-low emission vehicles. They provide data regarding the licensing of vehicles by body type, fuel type, keepership, vehicle excise duty (VED) band and CO2 emissions, gross vehicle weight, year of registration and year of first use. The January to March 2023 publications (Q1) have been used in this report. The statistics are produced from extracts of the DVLA vehicle database. The initial registration of new vehicles is usually carried out by vehicle manufacturers at the point of sale. In a small number of cases, the information is keyed in manually by DVLA staff.

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# Appendix A. Academic search strategy

## 8.3 Searches

Database name: Scopus

Platform: Elsevier

Date searched: August 31, 2023

Number of results: 592

	Search String	Results
1	TITLE-ABS-KEY(((car* OR vehicle* OR automobile* OR van OR vans OR minivan* OR SUV*) W/3 (owner* OR purchas* OR "hire purchas*" OR lease* OR leasing* OR buy* OR "consumer preference*" OR "consumer choice*" OR "consumer behavio*")) OR ((ev OR "electric vehicle*" OR "electric car*" OR "electric auto*" OR "hybrid car*" OR "hybrid vehicle*" OR "hybrid auto*") W/3 (adopt* OR uptake)))	23,291
2	TITLE-ABS-KEY(trend* OR demographic* OR behavior* OR behaviour* OR choice* OR decision* OR "cost of living" OR ((remot* OR hybrid) W/3 work) OR "work* from home" OR shopping OR forecast* OR ("net zero" W/3 (policy OR policies OR target*)) OR carbon OR emission* OR greenhouse OR GHG OR household* OR "electric vehicle*" OR "electric car*" OR hybrid OR ev OR petrol OR "alternative fuel" OR diesel OR gas OR pandemic OR coronavirus OR covid OR access* OR ((number* OR type OR model* OR make OR fuel OR used OR new) W/3 (car* OR car* OR vehicle* OR automobile* OR van OR vans OR minivan* OR SUV*)) OR sell* OR relinquish* OR affordab* OR cost* OR parking OR traffic OR commut*)	23,553,644

	Search String	Results
3	TITLE-ABS-KEY(england or britain or uk or "united kingdom" or wales or cymru or scotland or ireland or british or irish or scottish or welsh or ulster or eire or belfast or london or edinburgh or cardiff or birmingham or manchester or liverpool or bristol or leeds or exeter or plymouth or glasgow or leicester or newcastle or norwich or nottingham or southampton or portsmouth or sheffield or stoke-on-trent or swansea or wolverhampton or bradford or (york and not "new york") or salford or oxford or cambridge or londonderry or derry or dundee or coventry or croydon or "tower hamlets" or hackney or haringey or newham or doncaster or enfield or southwark or brent or lambeth or sandwell or middlesbrough or knowsley or kingston or hullor norfolk or suffolk or barking or dagenham or cumbria or kirklees or lewisham or "blaenau gwent" or islington or tyneside or walsall or hartlepool or blackpool or burnley or blackburn or darwen or aberdeen or brighton or cork or dublin or limerick or galway or waterford or mayo or donegal or fingal or leinster or kildare or meath or munster or wexford or kerry or wicklow or louth or clare or "west midlands" or yorkshire or hampshire or tyneside or bournemouth or poole or merseyside or teeside or sunderland or "medway town*" or "tees valley" or "east midlands" or "east anglia")	38,934
4	TITLE-ABS-KEY(Belgium or France or French OR German or germany or Netherlands OR dutch OR belgian OR norway OR norwegian OR denmark OR danish OR "western europ*")	1,839,192
5	#3 OR #4	1,874,551
6	#1 AND #2 AND #5	1165
7	Limit 2015-2023	606
8	Limit to English	592

Database name: EconLit, Business Source Premier

Platform: Ebsco

Date searched: August 31, 2023

Number of results: 446

	Search String	Results
1	TI(((car* OR vehicle* OR automobile* OR van OR vans OR minivan* OR SUV*) N3 (owner* OR purchas* OR "hire purchas*" OR lease* OR leasing* OR buy* OR "consumer preference*" OR "consumer choice*" OR "consumer behavio*")) OR ((ev OR "electric vehicle*" OR "electric car*" OR "electric auto*" OR "hybrid car*" OR "hybrid vehicle*" OR "hybrid auto*") N3 (adopt* OR uptake))) OR AB(((car* OR vehicle* OR automobile* OR van OR vans OR minivan* OR SUV*) N3 (owner* OR purchas* OR "hire purchas*" OR lease* OR leasing* OR buy* OR "consumer preference*" OR "consumer choice*" OR "consumer behavio*")) OR ((ev OR "electric vehicle*" OR "electric car*" OR "electric auto*" OR "hybrid car*" OR "hybrid vehicle*" OR "hybrid auto*") N3 (adopt* OR uptake))) OR SU(((car* OR vehicle* OR automobile* OR van OR vans OR minivan* OR SUV*) N3 (owner* OR purchas* OR "hire purchas*" OR lease* OR leasing* OR buy* OR "consumer preference*" OR "consumer choice*" OR "consumer behavio*")) OR ((ev OR "electric vehicle*" OR "electric car*" OR "electric auto*" OR "hybrid car*" OR "hybrid vehicle*" OR "hybrid auto*") N3 (adopt* OR uptake)))	55,013

	Search String	Results
2	<p>TI(trend* OR demographic* OR behavior* OR behaviour* OR choice* OR decision* OR "cost of living" OR ((remot* OR hybrid) N3 work) OR "work* from home" OR shopping OR forecast* OR ("net zero" N3 (policy OR policies OR target*)) OR carbon OR emission* OR greenhouse OR GHG OR household* OR "electric vehicle*" OR "electric car*" OR hybrid OR ev OR petrol or "alternative fuel" OR diesel OR gas OR pandemic OR coronavirus OR covid OR access* OR ((number* OR type OR model* OR make OR fuel OR used OR new) N3 (car* OR car* OR vehicle* OR automobile* OR van OR vans OR minivan* OR SUV*)) OR sell* OR relinquish* OR affordab* OR cost* OR parking OR traffic OR commut*) OR AB(trend* OR demographic* OR behavior* OR behaviour* OR choice* OR decision* OR "cost of living" OR ((remot* OR hybrid) N3 work) OR "work* from home" OR shopping OR forecast* OR ("net zero" N3 (policy OR policies OR target*)) OR carbon OR emission* OR greenhouse OR GHG OR household* OR "electric vehicle*" OR "electric car*" OR hybrid OR ev OR petrol or "alternative fuel" OR diesel OR gas OR pandemic OR coronavirus OR covid OR access* OR ((number* OR type OR model* OR make OR fuel OR used OR new) N3 (car* OR car* OR vehicle* OR automobile* OR van OR vans OR minivan* OR SUV*)) OR sell* OR relinquish* OR affordab* OR cost* OR parking OR traffic OR commut*) OR SU(trend* OR demographic* OR behavior* OR behaviour* OR choice* OR decision* OR "cost of living" OR ((remot* OR hybrid) N3 work) OR "work* from home" OR shopping OR forecast* OR ("net zero" N3 (policy OR policies OR target*)) OR carbon OR emission* OR greenhouse OR GHG OR household* OR "electric vehicle*" OR "electric car*" OR hybrid OR ev OR petrol or "alternative fuel" OR diesel OR gas OR pandemic OR coronavirus OR covid OR access* OR ((number* OR type OR model* OR make OR fuel OR used OR new) N3 (car* OR car* OR vehicle* OR automobile* OR van OR vans OR minivan* OR SUV*)) OR sell* OR relinquish* OR affordab* OR cost* OR parking OR traffic OR commut*)</p>	5,789,555

3	<p>TI(england or britain or uk or "united kingdom" or wales or cymru or scotland or ireland or british or irish or scottish or welsh or ulster or eire or belfast or london or edinburgh or cardiff or birmingham or manchester or liverpool or bristol or leeds or exeter or plymouth or glasgow or leicester or newcastle or norwich or nottingham or southampton or portsmouth or sheffield or stoke-on-trent or swansea or wolverhampton or bradford or (york not "new york") or salford or oxford or cambridge or londonderry or derry or dundee or coventry or croydon or "tower hamlets" or hackney or haringey or newham or doncaster or enfield or southwark or brent or lambeth or sandwell or middlesbrough or knowsley or kingston or hullor norfolk or suffolk or barking or dagenham or cumbria or kirklees or lewisham or "blaenau gwent" or islington or tyneside or walsall or hartlepool or blackpool or burnley or blackburn or darwen or aberdeen or brighton or cork or dublin or limerick or galway or waterford or mayo or donegal or fingal or leinster or kildare or meath or munster or wexford or kerry or wicklow or louth or clare or "west midlands" or yorkshire or hampshire or tyneside or bournemouth or poole or merseyside or teeside or sunderland or "medway town*" or "tees valley" or "east midlands" or "east anglia")</p> <p>OR AB(england or britain or uk or "united kingdom" or wales or cymru or scotland or ireland or british or irish or scottish or welsh or ulster or eire or belfast or london or edinburgh or cardiff or birmingham or manchester or liverpool or bristol or leeds or exeter or plymouth or glasgow or leicester or newcastle or norwich or nottingham or southampton or portsmouth or sheffield or stoke-on-trent or swansea or wolverhampton or bradford or (york not "new york") or salford or oxford or cambridge or londonderry or derry or dundee or coventry or croydon or "tower hamlets" or hackney or haringey or newham or doncaster or enfield or southwark or brent or lambeth or sandwell or middlesbrough or knowsley or kingston or hullor norfolk or suffolk or barking or dagenham or cumbria or kirklees or lewisham or "blaenau gwent" or islington or tyneside or walsall or hartlepool or blackpool or burnley or blackburn or darwen or aberdeen or brighton or cork or dublin or limerick or galway or waterford or mayo or donegal or fingal or leinster or kildare or meath or munster or wexford or kerry or wicklow or louth or clare or "west midlands" or yorkshire or hampshire or tyneside or bournemouth or poole or merseyside or teeside or sunderland or "medway town*" or "tees valley" or "east midlands" or "east anglia")</p> <p>OR SU(england or britain or uk or "united kingdom" or wales or cymru or scotland or ireland or british or irish or scottish or welsh or ulster or eire or belfast or london or edinburgh or cardiff or birmingham or manchester or liverpool or bristol or leeds or exeter or plymouth or glasgow or leicester or newcastle or norwich or nottingham or southampton or portsmouth or sheffield or stoke-on-trent or swansea or wolverhampton or bradford or (york not "new york") or salford or oxford or cambridge or londonderry or derry or dundee or coventry or croydon or "tower hamlets" or hackney or</p>	1,725,176
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	Search String	Results
	haringey or newham or doncaster or enfield or southwark or brent or lambeth or sandwell or middlesbrough or knowsley or kingston or hullor norfolk or suffolk or barking or dagenham or cumbria or kirklees or lewisham or "blaenau gwent" or islington or tyneside or walsall or hartlepool or blackpool or burnley or blackburn or darwen or aberdeen or brighton or cork or dublin or limerick or galway or waterford or mayo or donegal or fingal or leinster or kildare or meath or munster or wexford or kerry or wicklow or louth or clare or "west midlands" or yorkshire or hampshire or tyneside or bournemouth or poole or merseyside or teeside or sunderland or "medway town*" or "tees valley" or "east midlands" or "east anglia")	
4	TI(Belgium or France or French OR German or germany or Netherlands OR dutch OR belgian OR norway OR norwegian OR denmark OR danish OR "western europ*") OR AB(Belgium or France or French OR German or germany or Netherlands OR dutch OR belgian OR norway OR norwegian OR denmark OR danish OR "western europ*") OR SU(Belgium or France or French OR German or germany or Netherlands OR dutch OR belgian OR norway OR norwegian OR denmark OR danish OR "western europ*")	791,672
5	S3 OR S4	2,433,172
6	S1 AND S2 AND S5	3,324
7	Limit 2015-2023	1256
8	Limit to Academic Journals and Working papers	451
9	Limit to English	446

Database name: TRID (Transport Research International Documentation)

Platform: <https://trid.trb.org/>

Date searched: August 31, 2023

Number of results: 340

("car owner\*" OR "car buy\*" OR "vehicle owner\*" OR "vehicle buy\*" OR "car purchas\*" OR "vehicle purchas\*" OR "ev adoption" OR "hybrid adoption") AND (trend\* OR demographic\* OR behavior\* OR behaviour\* OR choice\* OR decision\* OR "cost of living" OR "remote work" OR "hybrid work" OR "work\* from home" OR shopping OR forecast\* OR "net zero" OR policy OR policies OR target\*) AND (uk OR "united kingdom" OR englad OR wales OR ireland OR irish OR scottish OR british OR london OR dublin OR britain OR scotland OR



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belgium or france or french OR german or germany or netherlands OR dutch OR belgian OR norway OR norwegian OR denmark OR danish OR "western europ**")
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Limit 2015-2023
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n=340
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