Technology Tracker: Wave 11

Report prepared for the Department for Transport

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Contents

1 Overview

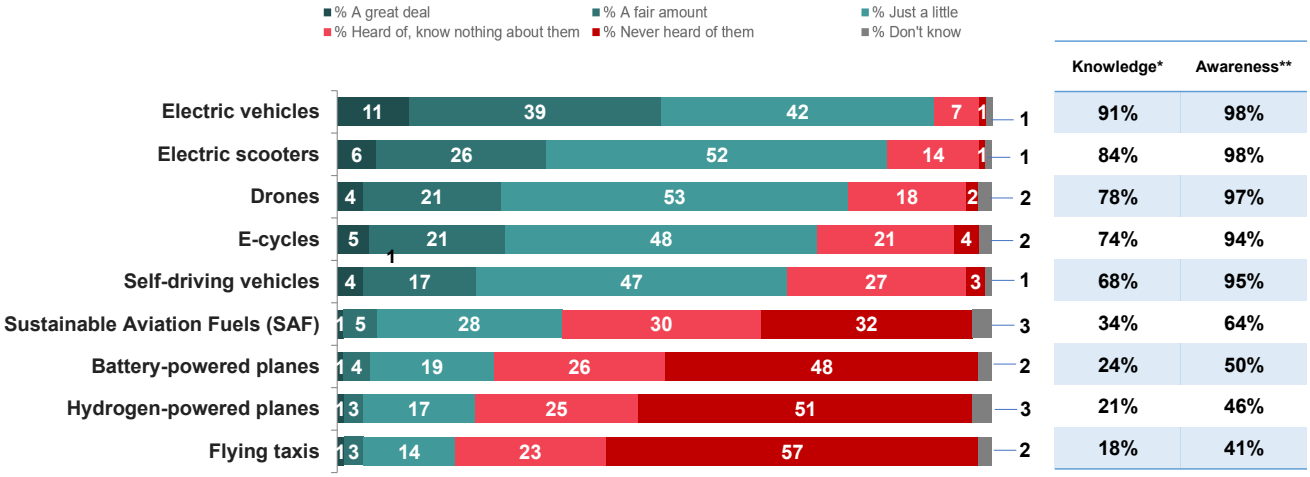
Wave 11 of the Department for Transport's Transport Technology Tracker series involved a survey of a representative sample of 3,622 adults aged 16+ across England, drawn from Ipsos' KnowledgePanel. The survey was conducted using random probability sampling and an online methodology for data collection. Fieldwork took place between 7th December and 13th December 2023.

Comparisons with previous waves are restricted to Wave 7 onwards due to a change in methodology at Wave 7. More information about the methodology and sample can be found in the Appendix. The survey questionnaire is also included in the Appendix including the descriptions and images used for several transport technologies.

1.1 Awareness and knowledge

Figure 1.1 below shows levels of awareness and self-reported knowledge for the range of transport technologies covered by Wave 11. They are presented in descending order of knowledge and awareness.

Figure 1.1 – Knowledge and awareness by technology



*Knowledge answer codes: A great deal, A fair amount, Just a little
**Awareness answer codes: A great deal, A fair amount, Just a little, Heard of, know nothing about them/it

Base: All 16+ in England Wave 11: (3622)
Fieldwork dates: Wave 11: 7-13 December 2023

'Awareness' encompasses all people who had heard of a particular technology, including those who know nothing (but have heard of the technology), those who know just a little, a fair amount or a great deal. 'Knowledge' is confined to those who said that they know just a little, a fair amount or a great deal, however this knowledge is self-reported, i.e., from the perception of the individual.

Individual sections of this report, and the summary sections at the start of each, describe awareness and self-reported knowledge for the technologies in more detail, outlining how these have changed over time.

Awareness and self-reported knowledge were in line with previous waves for most technologies, with some important exceptions:

- Knowledge was higher for electric vehicles than other technologies, as was the case at previous waves.

- Awareness and self-reported knowledge of sustainable aviation fuels were higher in December 2023 (Wave 11) than in June 2022 (Wave 9).
- Over the same period, awareness of battery-powered and hydrogen-powered planes increased and pulled ahead of flying taxis which became the least well-known technology in December 2023 (Wave 11).
- Self-reported knowledge of self-driving vehicles and drones was lower in December 2023 (Wave 11) than in June 2021 (Wave 7).
- The proportion of people reporting to have a great deal or fair amount of knowledge of drones, e-cycles and e-scooters was lower in December 2023 (Wave 11) than in June 2021 (Wave 7).

Increases in knowledge and awareness of sustainable aviation fuels and electric vehicles are likely to reflect media coverage including, for example, coverage in November 2023 of the first commercial transatlantic flight using 100 percent sustainable aviation fuel, announcements of Government policy about electric vehicles and ongoing interest in the provision of charging infrastructure.

1.2 Attitudes towards technology

Over time, and in respect of several different transport technologies, the Tracker series has shown growing concern about costs. In addition, the proportions of people perceiving that some of the technologies offer environmental benefits have decreased.

For example, the proportion who selected the cost of buying an e-scooter as a disadvantage in December 2023 (Wave 11) was higher than in June 2021 (Wave 7). This was also the case for e-cycles. In addition, the proportion identifying ‘affordability’ as a disadvantage of flying taxis was higher in December 2023 (Wave 11) than in June 2022 (Wave 9). There were similar increases in the proportion of people who selected ‘cost to buy’ and ‘expensive to run and maintain’ as disadvantages of electric vehicles (EVs).

Alongside a growing sensitivity to cost, in December 2023 (Wave 11) there was a further increase in the proportion of people who selected ‘no advantages’ of EVs. While ‘environmental benefits’ continued to be the most selected advantage, this sentiment has fallen over time. There were similar changes in the perceived environmental benefits of e-scooters and e-cycles.

Changes in attitudes were evident in terms of expectations of future behaviour. The proportion of people who expected to purchase or lease an electric vehicle in five years’ time was lower in December 2023 (Wave 11), 16%, than December 2022 (Wave 10) when it was 13%. There was a simultaneous increase in the proportion who expected to purchase a petrol or diesel vehicle. Moreover, higher proportions of people said they were unlikely to pay extra for a flight using sustainable aviation fuels than had previously been the case – for example, 23% were unlikely to pay £10 extra compared to 16% in June 2022.

1.3 Report structure

The remainder of this report covers each of the transport technologies included in Wave 11.

Summary boxes have been included at the start of each section to present key findings and trends. These signpost where further information is available.

Full survey data is available at: https://www.gov.uk/government/publications/transport-and-transport-technology-public-attitudes-tracker

2 Car access, purchase intentions

Summary

- While ownership and access to a car or van remains high, personal ownership/use decreased slightly between December 2022 (Wave 10) and December 2023 (Wave 11). However, the proportion of people who live in households with two or more cars remained stable (see **section 2.1**).
- The proportion who expected their next car or van be new rather than second hand was stable compared to previous waves (see section 2.3).
- The proportion who expected to purchase an electric or hybrid vehicle fell between December 2022 (Wave 10) and December 2023 (Wave 11). Over the same period, there was an increase in the proportion who expected to buy a petrol or diesel vehicle (see **section 2.4**).
- Petrol cars or vans were a more common option than electric vehicles in the short-term, but the gap narrowed as people looked further into the future (see **section 2.4**).

2.1 Ownership of licences and cars

Levels of licence-holding were stable compared to previous waves. In December 2023 (Wave 11), 78% of people said they held a full driving licence, 9% held a provisional licence and 12% did not hold a valid UK driving licence.

In December 2023 (Wave 11), a majority, 81%, of those who live in a household with a car/van said they *personally* owned or had continuous use of at least one car or van (a minority, 19%, did not). This decreased slightly from 83% in both June 2021 and December 2022 (Wave 10).

In December 2023 (Wave 11), 47% of people said their household owned or had continuous use of two or more cars or vans, up from 44% in June 2022 (Wave 9).

2.2 Purchase/lease intentions

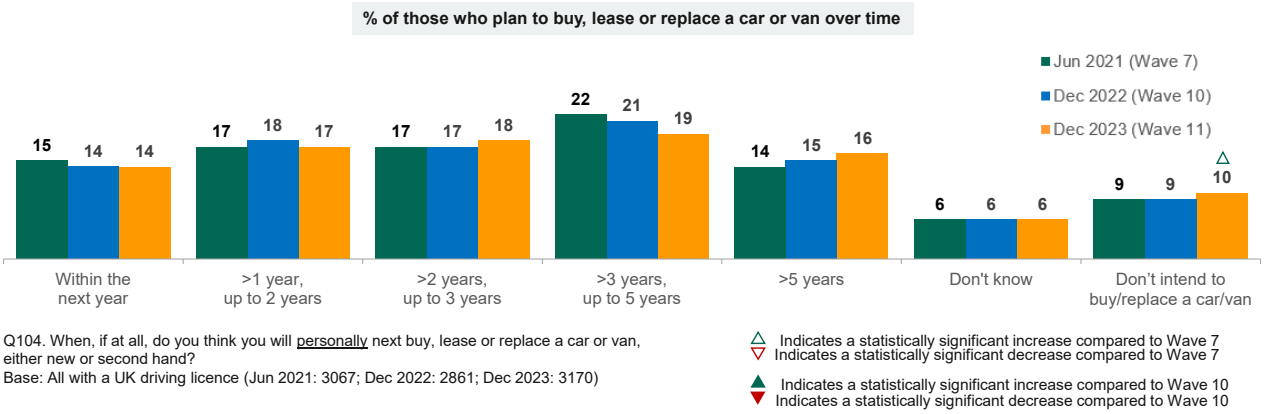
In line with previous waves, most people said they will personally buy, lease or replace a new or second hand car or van in the future. In December 2023 (Wave 11), seven in ten (68%) said they would purchase a vehicle within the next five years and a further 16% would in more than five years' time. One in ten, 10%, said they had no intention to purchase a car or van, and 6% answered 'don't know'.

- Those from the lowest income households, earning less than £25,999, were much more likely to have said they do not intend to purchase or lease a car/van (17%) than those in the highest income households (£100,000+) (6%).
- The oldest age groups were more likely to have said they had no intention to purchase or lease a car or van. More than two in ten (23%) of those aged 75 or over had no intention of doing this compared to 5% of 16-24-year-olds.

As shown in **Figure 2.1**, people's expectations of when they next expect to purchase or lease a car or van were in line with previous waves. In December 2023 (Wave 11), 31% of people said that they intended to do this within the next two years, including 14% who thought this would happen in the next year. Just under four in ten (37%) expected to do this in the next 2-5 years and 16% said they would in more than five years' time.

- Men were more likely than women to plan to purchase a vehicle sooner; 16% planned to do this within the next year compared to 11% of women, and 19% within 1-2 years compared to 15% of women.
- Owners of petrol vehicles were more likely than electric vehicle owners to intend to wait at least five years to purchase their next vehicle; 17% compared to 10%.

Figure 2.1 – Vehicle type purchase intentions by year of expected purchase



2.3 New or second hand?

Among those who intended to buy or lease a car or van at some point in the future, the proportion who expected this to be new remained stable compared to previous waves; 27% in December 2023 (Wave 11). Seven in ten (70%) said their next vehicle would most likely be second-hand.

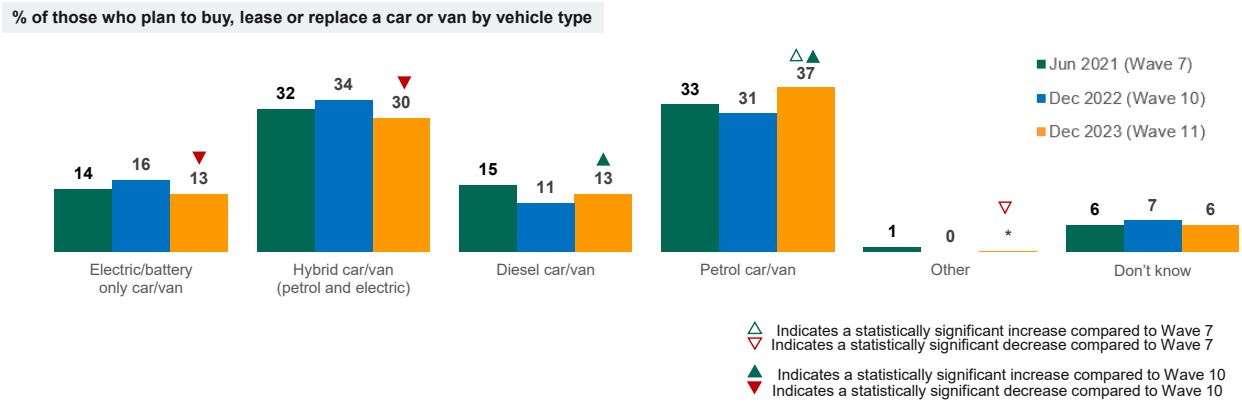
- Those aged over 75 (45%) and 65-74-year-olds (34%) were more likely to have said they would be likely to purchase or lease a new car or van compared to other age groups; those aged 16-24 (17%), 25-34 (21%), 35-44 (25%) and 45-54 (25%).
- People in the highest household income bracket with annual earnings of £100,000 or above (35%) were more likely to expect to buy new compared to those earning £25,999 or less (22%) or between £26,000-£51,999 (25%).
- Those living in households without access to or ownership of a car or van were more likely to expect to purchase or lease a second-hand vehicle (79%) than those in households who owned or had continuous use of one car or van (67%).

2.4 Vehicle type

As shown in **Figure 2.2**, the proportion of people who indicated that their next car or van would be electric/battery only declined three percentage points to 13% in December 2023 (Wave 11) from 16% in December 2022 (Wave 10). This meant a return to the level recorded in June 2021 (Wave 7) (14%).

The proportion who said that their next purchase or lease was likely to be a hybrid car or van declined by a similar degree; down four percentage points to 30% in December 2023 (Wave 11) from 34% in December 2022 (Wave 10).

Figure 2.2 – Vehicle type purchase intentions by year of expected purchase

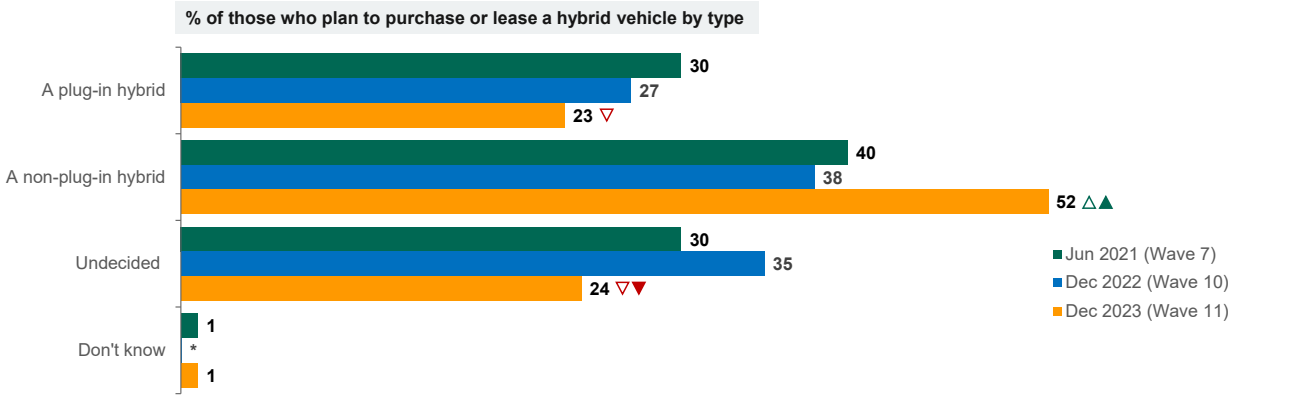


The proportion expecting to buy a diesel car or van increased to 13% in December 2023 (Wave 11) from 11% in December 2022 (Wave 10). Over the same period, the proportion who expected to purchase a petrol car or van increased to 37% in December 2023 (Wave 11) from 31% in December 2022 (Wave 10) and 33% in June 2021 (Wave 7).

- Choosing a hybrid car or van as their next purchase or lease was most popular among older age groups; 47% of those aged 75+ and 37% of 65-74-year-olds said they would do this compared to 20% of 16-24-year-olds.
- Residents in London were more likely than those in other regions to have said that they were most likely to purchase or lease an electric car or van next; 21% planned to do so compared to 13% of those in the North and 11% of those in the Midlands.
- Those in the highest income households, earning over £100,000, were significantly more likely than all other household income groups to expect to purchase or lease an electric car or van next. A quarter (24%) said that they were likely to do this compared to 11% of those in households earning up to £25,999, 10% in households earning up to £51,999 and 17% of households earning between £52,000-£99,999.

- Among those who say they will most likely purchase a hybrid car or lease next time, more than half (52%) say it would be a non-plug-in hybrid (shown in **Figure 2.3**). This is significantly higher than December 2022 when 38% said this. Less than a quarter (23%) of this group say they will purchase a plug-in hybrid – down from 30% in June 2021.

Figure 2.3 – Hybrid vehicle type purchase intention



- Plug-in hybrid (that plugs into an external power source to charge)
- Non plug-in hybrid (that recharges while driving and is ultimately fuelled by petrol or diesel – it cannot be plugged into an external power source)

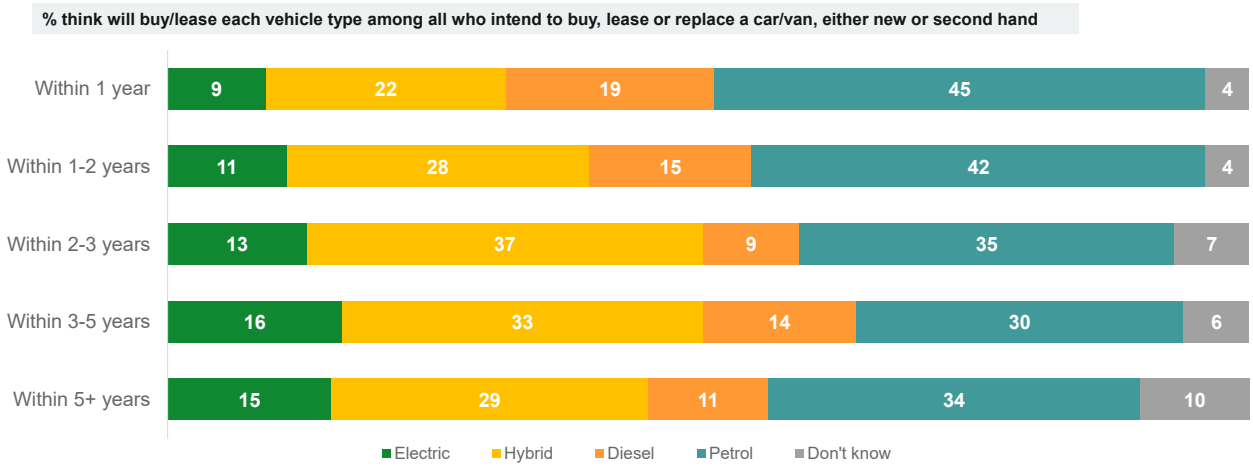
△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

Q107. What type of hybrid car or van do you think you will most likely purchase or lease next time?
Base: All who will most likely purchase a hybrid car/van (Jun 2021: 898; Dec 2022: 854; Dec 2023: 828)

As shown in **Figure 2.4**, people's expectation of the vehicle type of their next purchase changed the further ahead that purchase was expected to take place. Petrol cars or vans were a more popular option than electric vehicles in the short-term, but the gap narrowed as people looked further into the future.

- Among those expecting to purchase a vehicle *within one year*, 9% expected to purchase an electric/battery only vehicle, 22% a hybrid vehicle, 19% a diesel vehicle, and 45% a petrol vehicle.
- In contrast, among those expecting to purchase *in five or more years' time*, 15% expected to purchase an electric vehicle, 29% a hybrid vehicle, 11% a diesel vehicle, and 34% a petrol vehicle.
- Uncertainty increased a little as people looked further ahead. The proportion who said they don't know what type of vehicle they would purchase or lease next, was 4% when asked about the next year and 10% when asked about more than five years' time.

Figure 2.4 – Vehicle type purchase intentions by year of expected purchase



Q104: When, if at all, do you think you will personally next buy, lease or replace a car or van, either new or second hand?
Base: All with a UK driving licence (Dec 2023: 3170).

Q106. What type of car or van do you think you would purchase or lease next time? (%)
Base: All who intend to buy or replace a car or van (Dec 2023: 2652).

The proportion of people who expected to purchase or lease an electric vehicle in more than five years' time was lower in December 2023 (Wave 11) than December 2022 (Wave 10), falling from 22% to 15%. There was an even greater increase over the same period in the proportion who expected to purchase a petrol vehicle, rising from 24% to 34%.

3 Electric vehicles

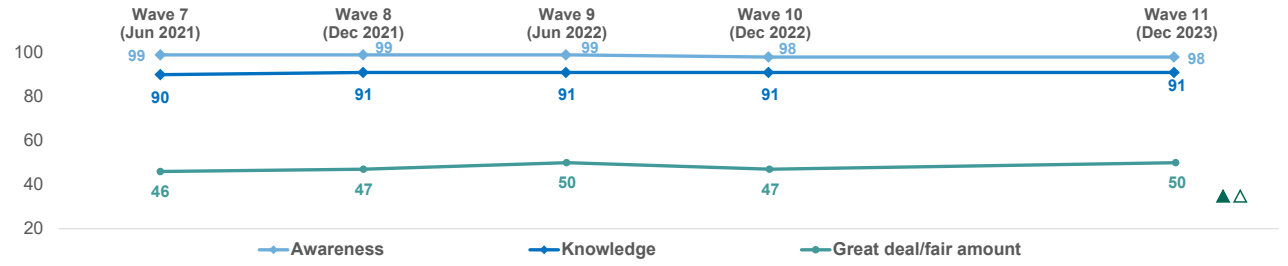
Summary

- ‘Environmental benefits’ continued to be the most selected advantage from a list of potential advantages of electric vehicles, but the trend we saw in previous waves of people selecting fewer of the listed advantages continued. The proportion who selected ‘no advantages’ increased again (see **section 3.2**).
- ‘The cost to buy’ remained the most selected disadvantage of EVs. Being ‘expensive to run or maintain’ was selected by a higher proportion of people compared to December 2022 (see **section 3.3**).
- The proportion of people who reported seeing an EV charging point has increased since previous waves; 61% reported seeing them in their local area and 76% saw them elsewhere (see **section 3.4**).
- ‘Recharge time’ was mentioned most often as a concern about using a public charging point, and displaced ‘accessing charging points’ which had been the top-mentioned concern in December 2022 (see **section 3.5**).

3.1 Awareness and knowledge

In December 2023 (Wave 11), levels of awareness and self-reported knowledge of electric vehicles (EVs) were in line with those of December 2022 (Wave 10), June 2022 (Wave 9) and June 2021 (Wave 7), as shown in **Figure 3.1**. Almost everyone (98%) claimed that they had at least heard of EVs, including 7% who said that they had heard of EVs but knew nothing about them.

Figure 3.1 – Awareness and knowledge of electric vehicles



*Self-reported knowledge answer codes: A great deal, A fair amount, Just a little
**Awareness answer codes: A great deal, A fair amount, Just a little, Heard of, know nothing about them/it

Q108. Before today, how much, if anything, would you say you knew about electric cars or vans?
Base: All 16+ in England (Jun 2021: 3392; Dec 2021: 3219; Jun 2022: 3162; Dec 2022: 3207; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

Self-reported knowledge of EVs - people knowing a ‘great deal’, a ‘fair amount’ or ‘just a little’ - was 91% in December 2023 (Wave 11). This was consistent with previous waves. The proportion of those who said they knew a ‘great deal/fair amount’ increased to 50% in December 2023 (Wave 11) from 47% in December 2022 (Wave 10), returning to the level seen in June 2022 (Wave 9).

- A higher proportion of those in the highest annual income bracket, households earning £100,000+ per year, said they know a 'great deal/fair amount' (62%) compared to those in the lowest income households, earning less than £25,999 per year (41%).

- As in previous waves, almost two-thirds of men said they know a 'great deal/fair amount' (64%), much higher than the proportion of women (36%).

3.2 Advantages – prompted

As was the case at previous waves, when shown a list of potential advantages of EVs over petrol or diesel cars or vans, 'environmental benefits (e.g. reduced pollution)' remained the advantage selected most frequently, as shown in **Figure 3.2.** However, the proportion who selected this continued to decrease, chosen by 69% in December 2023 (Wave 11), down from December 2022 (Wave 10) (75%), and June 2021 (Wave 7) (82%).

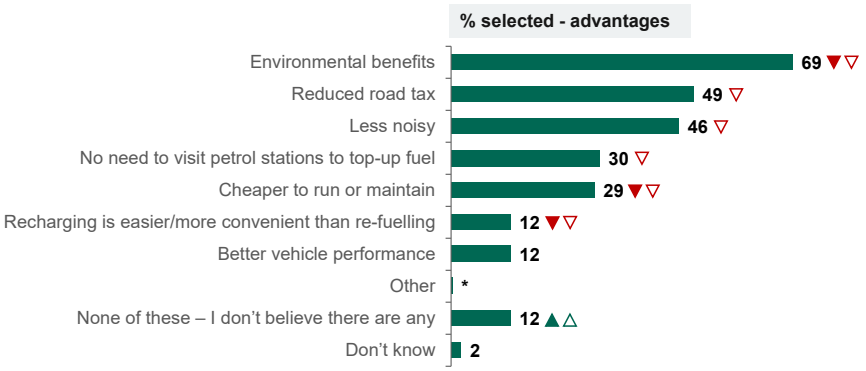
There were also decreases in almost all selected advantages. For example, selection of 'reduced road tax' as an advantage decreased from 57% in June 2021 (Wave 7) to 49% in December 2023 (Wave 11). and 'less noisy' from 53% to 46%. 'Cheaper to run or maintain' was 29% in December 2023 (Wave 11) which was lower compared to both December 2022 (Wave 10) (35%) and June 2021 (Wave 7) (38%).

The proportion who said they didn't believe there are *any* advantages continued to increase, reaching 12% in December 2023 (Wave 11), more than double the 5% of June 2021 (Wave 7).

- Those in the lowest income households earning less than £25,999 (24%) were much less likely to see 'cheaper to run or maintain' as an advantage than those in higher income households earning £100,000+ (36%).

- Those who said they intend to purchase an electric vehicle as their next vehicle were more likely to select advantages than those who intended to purchase other vehicle types. For example, 90% of this group selected 'environmental benefits' compared to 51% of those who intended to buy a diesel vehicle next.

Figure 3.2 – Advantages of electric vehicles



	Dec 2022 W10 (%)	Jun 2021 W7 (%)
Environmental benefits	75	82
Reduced road tax	49	57
Less noisy	49	53
No need to visit petrol stations to top-up fuel	32	32
Cheaper to run or maintain	35	38
Recharging is easier/more convenient than re-fuelling	14	14
Better vehicle performance	13	12
Other	*	*
None of these – I don't believe there are any	9	5
Don't know	2	2

Q111. Which of the following, if any, do you think are advantages of fully electric over petrol or diesel cars or vans?
Base: All 16+ in England (Jun 2021: 3392; Dec 2022: 3207; Dec 2023 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

3.3 Disadvantages – prompted

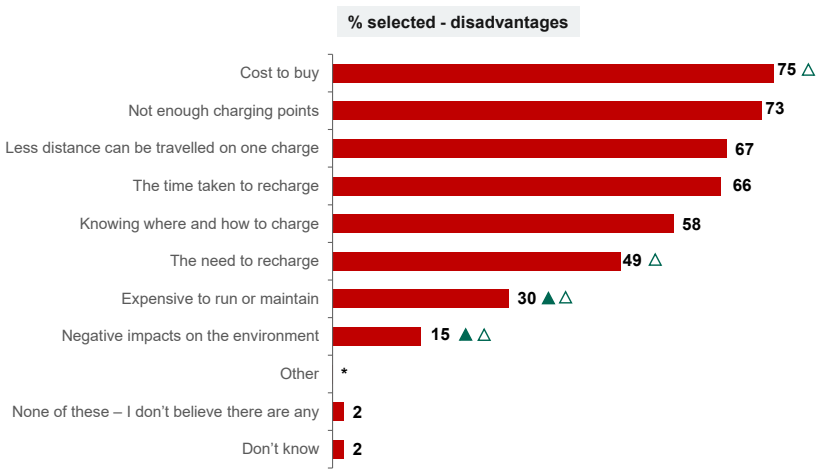
As seen in **Figure 3.3**, when shown a list of potential disadvantages of EVs over petrol or diesel vehicles, 'cost to buy' was the most selected disadvantage, chosen by 75% in December 2023 (Wave 11), in line with December 2022 (Wave 10), but a higher proportion than the 70% in June 2021 (Wave 7).

As was the case in previous waves, around seven in ten chose disadvantages relating to charging; 73% selected 'not enough charging points', 67% 'less distance can be travelled on one charge' and 66% 'the time taken to recharge'.

A higher proportion selected 'expensive to run or maintain' as a disadvantage in December 2023 (Wave 11) (30%) than in December 2022 (Wave 10) (26%) and June 2021 (Wave 7) (18%). There was also an increase in the selection of 'negative impacts on the environment', in December 2023 (Wave 11) (15%) compared to December 2022 (Wave 10) (11%) and June 2021 (Wave 7) (8%).

- 'Less distance that can be travelled on one charge' was selected by a higher proportion of those living in rural areas (73%) compared to those in urban areas (66%). This was also the case for 'cost to buy', selected by 81% in rural areas compared to 74% in urban areas.

Figure 3.3 – Disadvantages of electric vehicles



	Dec 2022 W10 (%)	Jun 2021 W7 (%)
Cost to buy	74	70
Not enough charging points	71	75
Less distance can be travelled on one charge	66	67
The time taken to recharge	64	63
Knowing where and how to charge	57	58
The need to recharge	46	46
Expensive to run or maintain	26	18
Negative impacts on the environment	11	8
Other	1	*
None of these – I don't believe there are any	1	2
Don't know	2	2

Q113. Which of the following, if any, do you think are disadvantages of electric over petrol or diesel cars or vans?
Base: All 16+ in England (Jun 2021: 3392; Dec 2022: 3207; Dec 2023: 3622).

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

3.4 Location of charging points

There were increases in the proportions who had seen an EV charging point in their local area and somewhere else, as shown in **Figure 3.4** (local was defined as within 15-20 minutes' walk/less than a 5-mile drive).

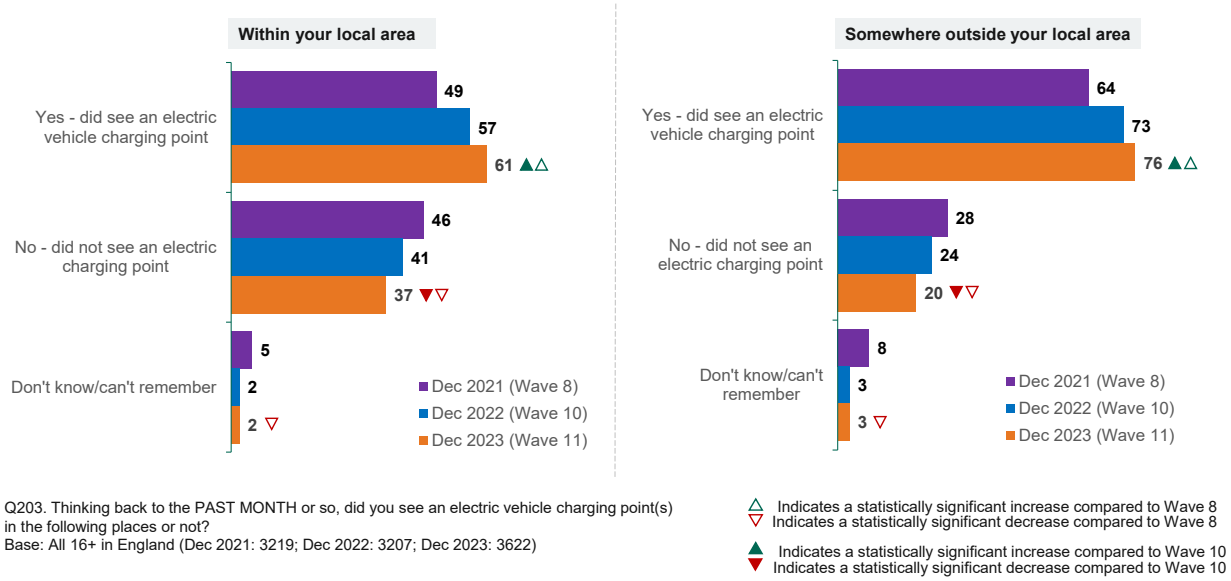
In December 2023 (Wave 11), six in ten (61%) reported having seen an electric vehicle charging point in their local area in the past month or so. This was an increase of four percentage points since December 2022 (Wave 10) (57%) and 12 points since December 2021 (Wave 8) (49%). The proportion who said they had *not* seen a charging point in their local area was 37%, down from 41% in December 2022 (Wave 10) and 46% in December 2021 (Wave 8).

- Recall of charging points in the local area was significantly higher among those living in urban areas (64%) compared to rural areas (48%).

- Recall of charging points in the local area was higher than average in the North East (69%) and, especially, in London (78%).

Three-quarters (76%) said they had seen a charging point *outside* their local area in the past month. This was an increase of three percentage points since December 2022 (Wave 10) (73%) and 12 percentage points since December 2021 (Wave 8) (64%). There was also a decrease in the proportion who said they had not seen a charging point outside their local area, down to 20% from 24% in December 2022 (Wave 10) and 28% in December 2021 (Wave 8).

Figure 3.4 – Recalled location of charging points



Q203. Thinking back to the PAST MONTH or so, did you see an electric vehicle charging point(s) in the following places or not?
Base: All 16+ in England (Dec 2021: 3219; Dec 2022: 3207; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 8
▽ Indicates a statistically significant decrease compared to Wave 8
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

In line with previous waves, a supermarket was the most common location people recalled seeing a charging point in the past month. Among those who had seen a charging point, 63% had seen one at a supermarket, an increase of four percentage points since December 2021 (Wave 8) (59%), shown in **Figure 3.5**.

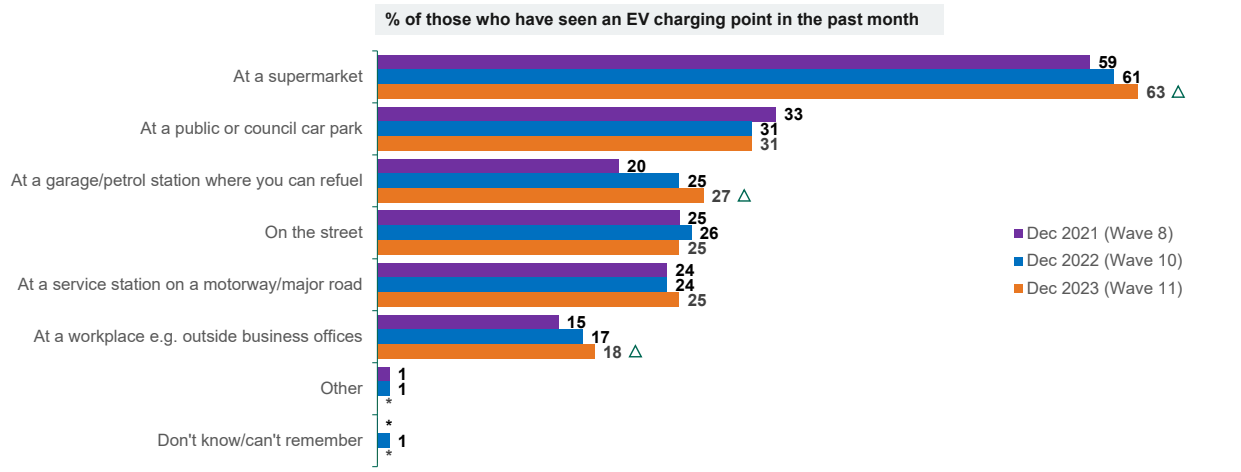
Similar proportions had seen a charging point in a public or council car park (31%), at a garage/petrol station (27%), on the street (25%), and a motorway service station (25%).

Sightings of points at a garage/petrol station increased by seven percentage points from 20% to 27% between December 2021 (Wave 8) and December 2023 (Wave 11), and by three points at a workplace increased from 15% to 18%.

- Those living in rural areas (31%) were more likely to report seeing a charging point at a service station than those in urban areas (24%). There was a similar gap in terms of report seeing a charging point at a public or council car park; 37% compared to 24%.

- Seven in ten people living in London (71%) reported seeing a charging point on a street, three times the proportion in all other regions.

Figure 3.5 – Location of charging points



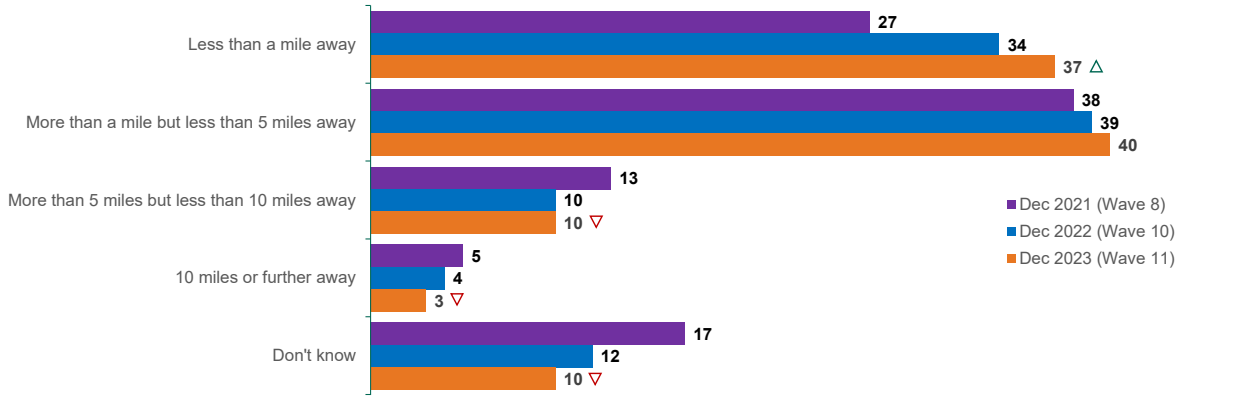
Q204. You said that you have seen an electric vehicle charging point(s) in the past month. Where did you see it/them?
Base: All 16+ in England who have seen EV charging points in the past month (Dec 2021: 2535; Dec 2022: 2719; Dec 2023: 3154)

△ Indicates a statistically significant increase compared to Wave 8
▽ Indicates a statistically significant decrease compared to Wave 8
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

Just under four in ten (37%) said their nearest charging point was less than a mile away from their home, as shown in **Figure 3.6**. This represented an increase of 10 percentage points since December 2021 (Wave 8) (27%). One in ten (10%) said they didn't know where the nearest EV charging point was, down two percentage points since December 2022 (Wave 10) (12%) and seven points since December 2021 (Wave 8) (17%).

- Six in ten people living in London (63%) knew of a charging point less than a mile away, significantly higher than the average across all regions (37%).
- Those living in rural areas (74%) were more likely than those in urban areas (49%) to have seen a charging point *outside* of their local area.

Figure 3.6 – Estimated proximity of charging points



Q205. Thinking about where you live most of the time, how far away is the nearest charging point for electric vehicles – that is, a point which can be used by any member of the public wanting to charge an electric vehicle?
Base: All 16+ in England (Dec 2021: 3219; Dec 2022: 3207; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 8
▽ Indicates a statistically significant decrease compared to Wave 8
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

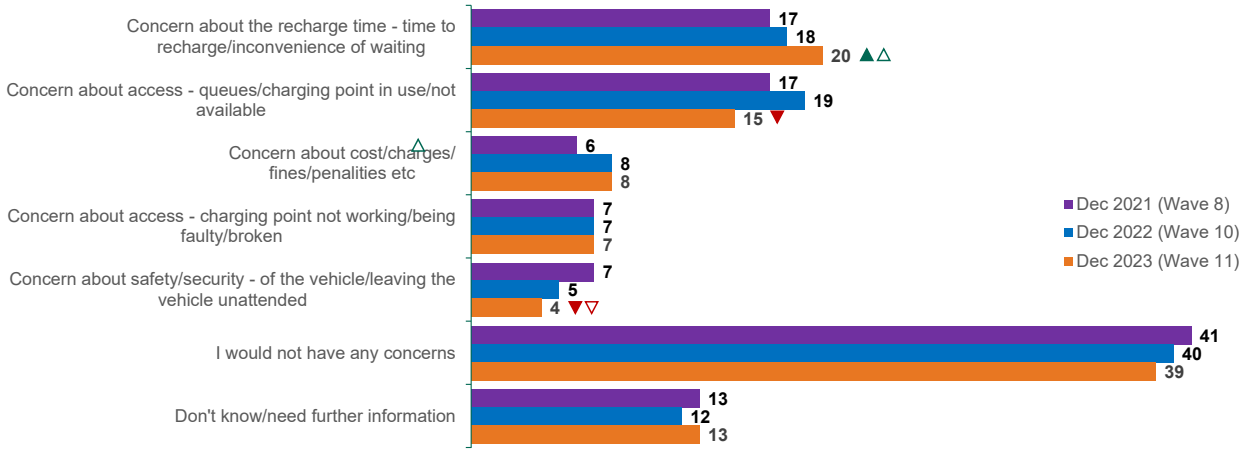
3.5 Concerns about using public charging points

Concerns about using charging points were collected via an open-ended question, with no prompts or response codes provided to respondents. Four in ten people (39%) said that they would have 'no concerns' about using an EV charging point, in line with December 2021 (Wave 8) and December 2022 (Wave 10), shown in **Figure 3.7.**

Among those who did have concerns, these most often related to the recharge time (20%) which overtook concern about access (15%) which had been the most common concern in previous waves. Concern about recharge time increased three percentage points from 17% to 20% between December 2021 (Wave 8) and December 2023 (Wave 11) while concern about access decreased from 17% to 15%. Concerns about the safety of leaving the vehicle unattended also fell over the same period, down from 7% to 4%.

- Recharge time was more of a concern for those living in rural areas (27%) compared to those living in urban areas (18%).

Figure 3.7 – Concerns about using public charging points (unprompted)



Q206. As you may know, some electric vehicle owners charge their vehicles at charging points situated in public places. What concerns would you have, if any, about using a charging point as this once you had got there?
Base: All 16+ in England (Dec 2021: 3219; Dec 2022: 3207; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 8
▽ Indicates a statistically significant decrease compared to Wave 8

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

4 Self-driving vehicles

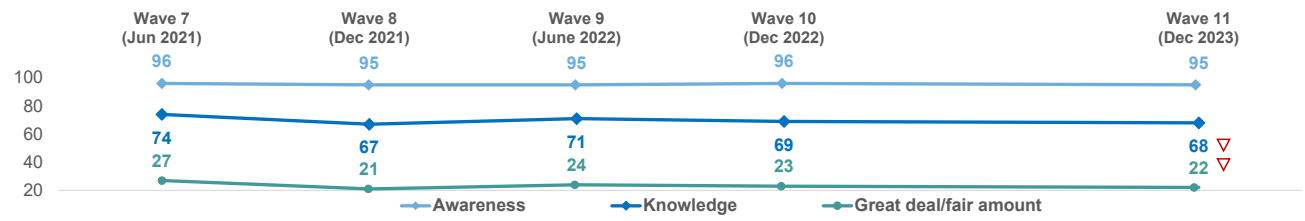
Summary

- In line with previous waves, people continued to select disadvantages of self-driving vehicles (SDVs) from a list of potential disadvantages more readily than they selected advantages. As before, perceived disadvantages related to 'over-reliance in the technology' and 'the technology is still unproven', as well as road and personal safety issues (see **section 4.3**).
- 'Controls/regulates speed' was the advantage chosen most often. Safety was selected less frequently as an advantage in December 2023 (Wave 11) than in December 2022 (Wave 10), as was 'enabling better traffic flow and less congestion' (see **section 4.2**).
- As with previous waves, most people incorrectly identified who is responsible for how the vehicle drives when it is in self-driving mode. There was an increase in the proportion of people who wrongly believed that the use of built-in screens is not permitted when in self-driving mode (see **section 4.4**).

4.1 Awareness and knowledge

In December 2023 (Wave 11), almost all respondents (95%) claimed that they had at least heard of self-driving vehicles (SDVs). Levels of awareness were in line with those of December 2022 (Wave 10), June 2022 (Wave 9) and June 2021 (Wave 7), as shown in **Figure 4.1**.

Figure 4.1 – Awareness and knowledge of self-driving vehicles



*Self-reported knowledge answer codes: A great deal, A fair amount, Just a little
**Awareness answer codes: A great deal, A fair amount, Just a little, Heard of, know nothing about them/it

Q117. Before today, how much, if anything, would you say you knew about self-driving cars or vans?
Base: All 16+ in England (Jun 2021: 3392; Dec 2021: 3219; Jun 2022: 3162; Dec 2022: 3207; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

Self-reported knowledge of self-driving vehicles - people knowing a 'great deal', a 'fair amount' or 'just a little' - was 68% in December 2023 (Wave 11). Levels of self-reported knowledge were similar to those in December 2022 (Wave 10) but lower than June 2021 (Wave 7) when 74% had self-reported knowledge.

- Self-reported knowledge was highest among 65-74-year-olds (76%) compared to other age groups, for example 45-54-year-olds (65%).
- The same proportion (76%) of those in the highest household income bracket, earning more than £100,000 per year, and those earning £52,000-£99,999, said they knew a great deal, a fair

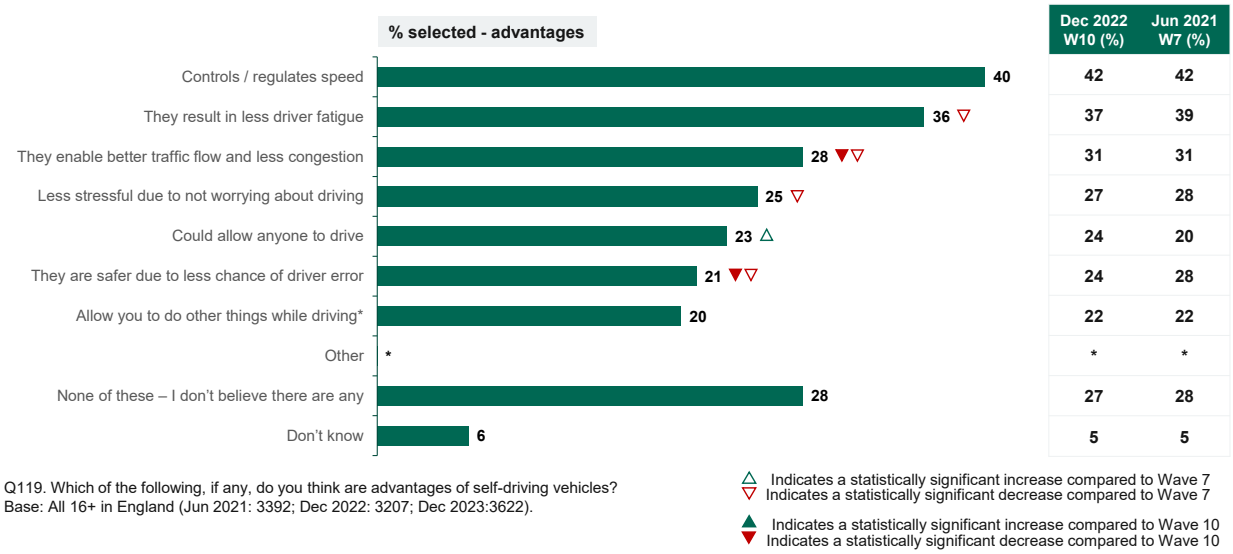
amount or just a little about SDVs. This compared to 63% of those in the lowest annual household income bracket, with earnings of less than £25,999 annually.

- People in London were most likely to have said they had a great deal/fair amount of knowledge (27%) compared to other regions of England (22% overall).

4.2 Advantages – prompted

In line with previous waves, when shown a list of potential advantages of SDVs, 'controls/regulates speed' (40%) and 'they result in less driver fatigue' (36%) were the advantages selected most frequently, as shown in **Figure 4.2**. 'They enable better traffic flow and less congestion' (28%) and 'less stressful due to not worrying about driving' (25%) were also frequently selected advantages.

Figure 4.2 – Advantages of self-driving vehicles



Some advantages were selected less frequently compared to previous waves. 'They enable better traffic flow and less congestion' (28%) was three percentage points lower than in December 2022 (Wave 10) and June 2021 (Wave 7) (25%). The proportions selecting 'they are safer due to less chance of driver error' fell to 21% in December 2023 (Wave 11) from 24% in December 2022 (Wave 10) and 28% in June 2021 (Wave 7).

There were also falls in the proportions selecting several advantages between June 2021 (Wave 7) and December 2023 (Wave 11). For example, selection of 'they result in less driver fatigue' as an advantage was three percentage points lower, at 36% compared with 39%, as was 'less stressful due to not worrying about driving', 25% compared to 28%.

As was the case in December 2022 (Wave 10), the proportion of people who selected 'could allow anyone to drive' is higher (23%) than it was in June 2021 (Wave 7) (20%).

There were some differences in perceptions of advantages by subgroups:

- Younger generations were more likely than other age groups to have selected 'allow you to do other things while driving,' chosen by 30% of 16-24-year-olds compared to 9% of those aged 75+.

- The proportion who did not believe there were *any* advantages of SDVs increased with age. For example, 15% of 16-24-year-olds took this view compared to 41% of 65-74-year-olds, and 45% of those aged 75+.

- Those living in rural areas were more likely than those in urban areas to have indicated they did not believe there were any advantages (33% compared to 27%).

- A third (32%) of those in non-car owning households selected SDVs 'could allow anyone to drive' as an advantage, compared to 19% of car-owning households.

4.3 Disadvantages – prompted

As in previous waves, the main perceived disadvantages of SDVs were an 'over-reliance in the technology' (69%), 'the technology is still unproven' (68%) and 'drivers will become lazy and pay less attention' (68%), as shown in **Figure 4.3**.

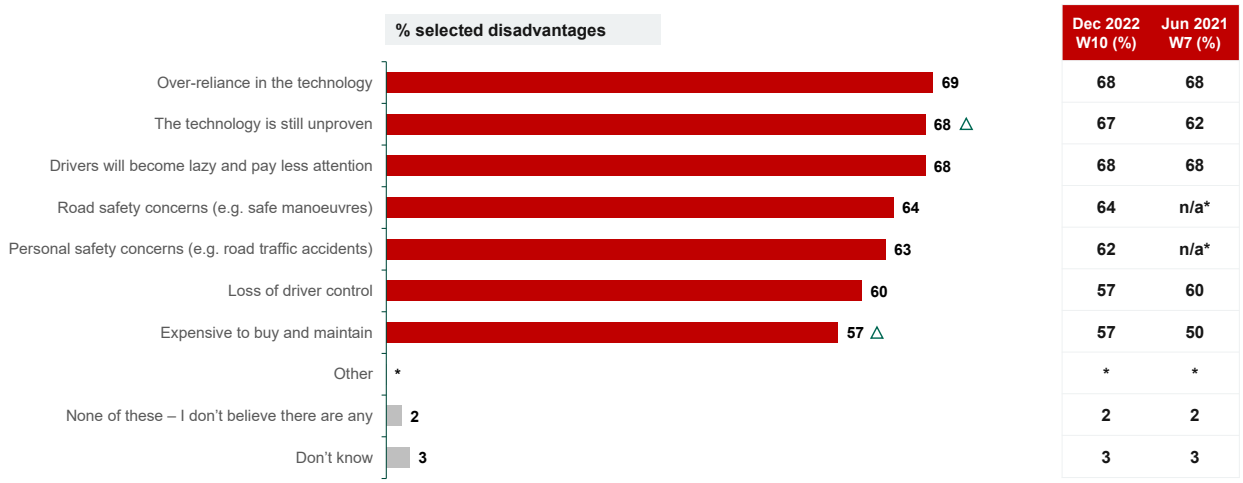
A higher proportion selected 'the technology is unproven' as a disadvantage in December 2023 (Wave 11) (68%) than in June 2021 (Wave 7) (62%).

Six in ten (64%) selected 'road safety concerns (e.g. safe manoeuvres)' as a disadvantage and 'personal safety concerns (e.g. road traffic accidents)' (63%), in line with December 2022 (Wave 10). Just over half (57%) selected 'expensive to buy and maintain' as a disadvantage, the same proportion as December 2022 (Wave 10) but an increase of seven percentage points compared to June 2021 (Wave 7) (50%).

- Older age groups were more likely to select 'over-reliance in the technology' as a disadvantage, with 75% of 65–74-year-olds choosing this compared to 64% of 16-24-year-olds.

- 'The technology is still unproven' was more of a concern for those in higher income households, earning £100,000+, (74%) and £52,000-£99,000 (76%) compared with the lowest income group. earning £25,999 or less, (63%).

Figure 4.3 – Disadvantages of self-driving vehicles



Q121. Here are some disadvantages other people have specified of self-driving vehicles. Which of the following, if any, do you think are disadvantages?
Base: All 16+ in England (Jun 2021: 3392; Dec 2022: 3207; Dec 2023: 3622).

*Safety concerns were split out in Wave 9 into road safety and personal safety. In the previous wave (Wave 8) safety concerns in general were selected as a disadvantage by 70% of people.

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

4.4 Knowledge of rules and regulations

In December 2023 (Wave 11), respondents were given the following information:

Self-driving vehicles are vehicles that are capable of safely and legally driving themselves in some circumstances and situations.

For the foreseeable future, they will have self-driving features, which means the vehicle will switch between the vehicle being in control (self-driving mode 'on') and the driver being in control (self-driving mode 'off').

They were shown a set of four statements, as shown in **Table 4.1**, and were asked if they believed them to be true or false. They were asked about a scenario '*when using a self-driving vehicle as a driver and the self-driving mode is 'on'*.'

Table 4.1 – Statements relating to self-driving vehicles

When using a self-driving vehicle as a driver and the self-driving mode is 'on':	Correct answer
I am **not** responsible for how the vehicle drives	TRUE
I am **allowed** to use built-in screens to watch TV (i.e., the infotainment system)	TRUE
I do **not** have to be fit to drive (e.g., I can sleep and drink alcohol)	FALSE
I am **allowed** to use a mobile phone (hand-held)*	FALSE

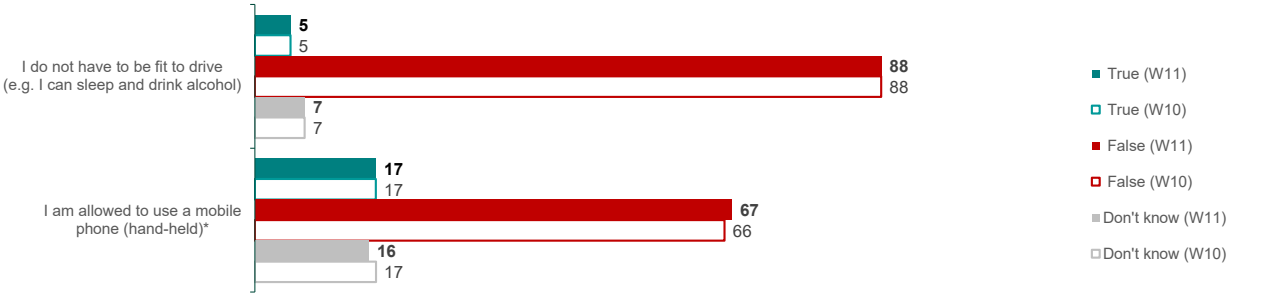
As seen in **Figure 4.4**, people were most likely to correctly identify that 'I do not have to be fit to drive' was a false statement. Just under nine in ten (88%) got this correct, the same proportion as December 2022 (Wave 10), and 5% were incorrect.

- Young people (aged 16-24) were more likely to incorrectly identify 'I do not have to be fit to drive' as true (10%).

Two-thirds (67%) correctly identified 'I am allowed to use a mobile a mobile phone (hand-held)' as false, the same proportion as December 2022 (Wave 10) on 66%.

- Those aged 16-24 and 25-34 were most likely to incorrectly state 'I am allowed to use a mobile phone (hand-held)' as true; 25% and 21% respectively.

Figure 4.4 – Statements relating to self-driving vehicles



Wave 11 | Denotes correct answer

Indicates a statistically significant increase compared to Wave 10
Indicates a statistically significant decrease compared to Wave 10

Rule	True %	False %	DK %
I do not have to be fit to drive **(FALSE)**	5	88	7
I am allowed to use a mobile phone (hand-held)* **(FALSE)**	17	67	16

*The clarification 'hand-held' was added at Wave 10 (Dec 2022).

Q302. Here are some statements about self-driving vehicles. For each one, please select whether you think it is true or false, or whether you don't know. (C) I do not have to be fit to drive (e.g. I can sleep and drink alcohol). (D) I am allowed to use a mobile phone.
Base: All 16+ in England: (Dec 2022: 3027; Dec 2023: 3622).

As seen in **Figure 4.5**, while 14% correctly thought 'I am allowed to use built-in screens to watch TV' - a drop of four percentage points from December 2022 (Wave 11) (10%) - 69% incorrectly thought this was false, an increase of four points since December 2022 (Wave 10) (65%)

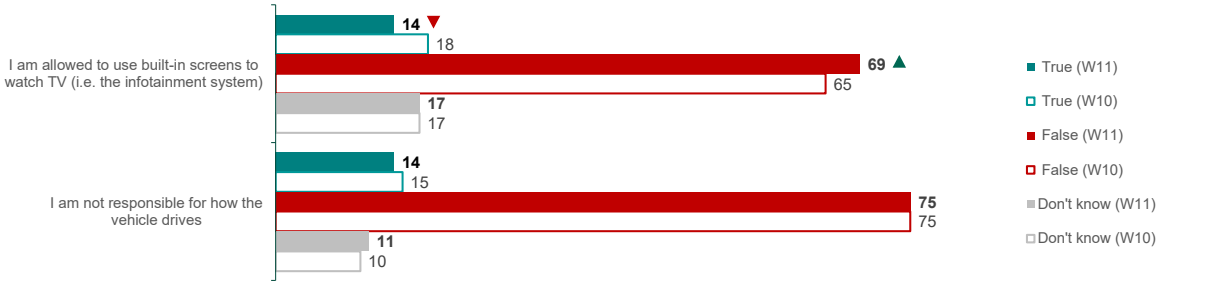
- 16-24-year-olds (31%) were more twice as likely than average (14%) to be correct that 'I am allowed to use the infotainment system'.

Three-quarters (75%) incorrectly answered 'false' to the statement 'I am not responsible for how the vehicle drives', the same proportion as December 2022 (Wave 10). One in ten (10%) said they did not know.

- Those aged 16-24 were most likely (23%) to be correct that 'I am not responsible for how the vehicle drives', compared to 14% overall.

Only 1% of people were able to answer all four statements correctly. Those who reported to know a great deal or fair amount about SDVs were no more likely to get all four statements correct than those who never heard of SDVs (both 1%).

Figure 4.5 – Statements relating to self-driving vehicles



Wave 11 | Denotes correct answer

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

Rule	True %	False %	DK %
I am allowed to use infotainment system **(TRUE)**	14	69	17
I am not responsible for how vehicle drives **(TRUE)**	14	75	11

Q302. Here are some statements about self-driving vehicles. For each one, please select whether you think it is true or false or whether you don't know. When using a self-driving vehicle as a driver and the self-driving mode is 'on'...
(A) I am not responsible for how the vehicle drives. (B) I am allowed to use built-in screens to watch TV (i.e. the infotainment system).
Base: All 16+ in England: (Dec 2022: 3207; Dec 2023: 3622).

5 E-scooters

Summary

- Levels of awareness and self-reported knowledge of e-scooters were high and in line with previous waves (**see section 5.1**), although the proportion of people knowing a great deal/a fair amount about e-scooters has decreased since June 2021 (Wave 7).
- Use of privately owned e-scooters has increased since December 2021 (Wave 8) while there has been no significant increase in relation to usage of rental e-scooters (see **section 5.2** and **section 5.4**).
- The proportion of people that selected 'environmental benefits' as an advantage of e-scooters from a list of potential advantages was lower in December 2023 (Wave 11) than in it had been in December 2022 (Wave 10) and June 2021 (Wave 7). Several features of e-scooters were identified as advantages less frequently than in June 2021 (Wave 7) (**see section 5.5**).
- As in previous waves, each of the questions about the use of rental e-scooters was answered correctly by around half of people (**see section 5.7**).

5.1 Awareness and knowledge

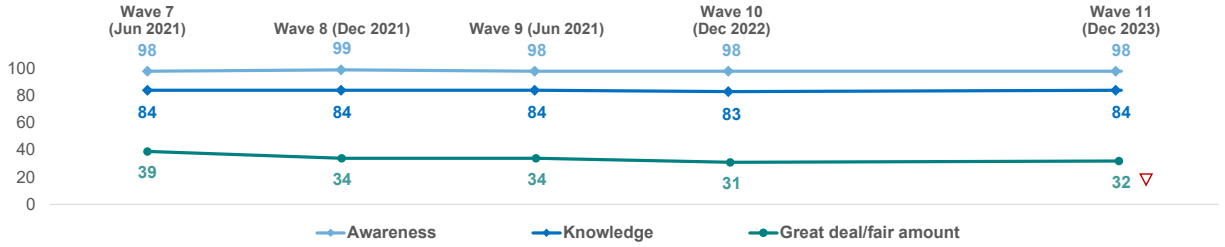
In December 2023 (Wave 11), levels of awareness and self-reported knowledge of e-scooters were in line with previous waves as almost everyone (98%) claimed that they had heard of e-scooters, as shown **in Figure 5.1**.

Self-reported knowledge - people knowing a great deal, fair amount or just a little - remained unchanged since previous waves (84%). Three in ten said they knew a *great deal or fair amount* about e-scooters (32%), similar to December 2022 (Wave 10) (31%), June 2022 (Wave 9) (34%) and December 2021 (Wave 8) (34%). However, this was seven percentage points lower than it had been in June 2021 (Wave 7) (39%).

In line with previous waves:

- The proportion that reported knowing *a great deal or fair amount* decreased with age. For example, 46% of 16-24-year-olds and 41% of 25-34-year-olds said this compared to 26% of 65-74-year-olds and 23% of those aged 75 or over.
- The proportion who reported knowing a *great deal or fair amount* was higher in London (43%) than in all other regions.
- Those living in urban areas were more likely to know *a great deal or fair amount* about e-scooters (33%) than those living in rural settings (27%).

Figure 5.1 – Awareness and knowledge of e-scooters



*Self-reported **knowledge** answer codes: A great deal, A fair amount, Just a little
****Awareness** answer codes: A great deal, A fair amount, Just a little, Heard of, know nothing about them/it

Q122. Before today, how much, if anything, would you say you knew about electric scooters
Base: All 16+ in England (Jun 2021: 3392; Dec 2021: 3219; Jun 2022: 3162; Dec 2022: 3207; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

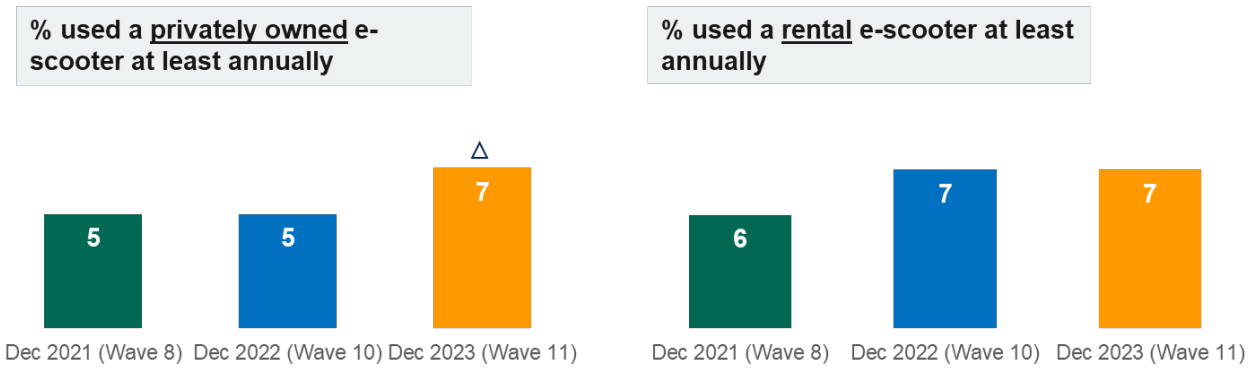
5.2 Ownership and usage

In line with previous waves, reported ownership of e-scooters was low. In December 2023 (Wave 11), only 2% said they owned an e-scooter.

The proportion of people using a privately owned e-scooter at least once a year was 7%, two percentage points higher than December 2021 (Wave 8) (5%), as shown on the left of **Figure 5.2**.

Usage of privately owned e-scooters at least annually was higher among those aged 16-24 (16%) compared to those aged 45-54 (5%) and 55+ (1%); ethnic minority groups (18%) compared to white respondents (5%); and people who did not own a car (12%) compared to those who owned one (5%).

Figure 5.2 – Frequency of use of privately-owned and rental e-scooters



Q124. How often, if at all, do you personally use a privately owned electric scooter in the UK?
Q125. How often, if at all, do you personally use a rental electric scooter in the UK?
Base: Q124/Q125. All aged 16+ in England (Dec 2021: 3219; Dec 2022: 3207; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 8
▽ Indicates a statistically significant decrease compared to Wave 8

Usage of rental e-scooters at least annually was at 7% in December 2023 (Wave 11) in line with December 2021 (Wave 8), as shown on the right of Figure 5.2.

Mirroring the use of privately owned e-scooters, at least annual use of rental e-scooters was higher among people aged 16-24 (20%) compared to those aged 75+ (1%); ethnic minority groups (16%) compared to white respondents (5%); and among people that did not own a car (12%) compared to those who owned one (5%).

The proportion of people who reported using rental e-scooters monthly or more often in December 2023 (Wave 11) was 3% - the same level as seen in both December 2022 (Wave 10) and December 2021 (Wave 8.

5.3 Reasons for use

People who said they had used a privately-owned or rental e-scooter were asked about the reasons for use. The main reason was ‘going for a ride’, selected by 39%, in line with December 2022 (Wave 10), 41%. This option replaced ‘just for fun’ used in December 2021 (Wave 8), so this data point is not directly comparable with Wave 8.

In line with December 2022 (Wave 10) and December 2021 (Wave 8), the other key reasons for using an e-scooter were ‘going to or from a leisure activity’ (30%), ‘visiting friends or family’ (15%), ‘going to or from work’ (15%), ‘going shopping’ (15%) and ‘to get to public transport’ (14%).

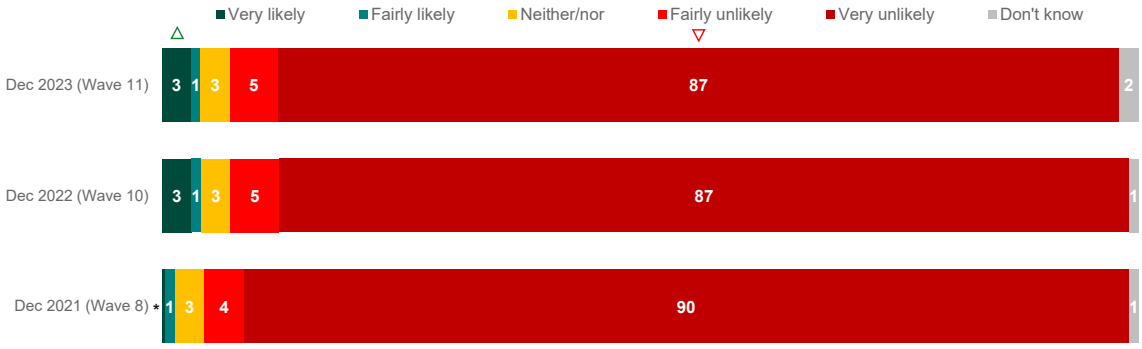
5.4 Purchase intention

The proportion of people who said they were *very likely* to purchase an e-scooter in the next 12 months was 3% in December 2023 (Wave 11), the same proportion as December 2022 (Wave 10) but higher than the 0% in December 2021 (Wave 8), as shown in **Figure 5.3**.

One in 25 (4%) reported being *very* or *fairly likely* to purchase an e-scooter and compared to 92% who said they were *very* or *fairly unlikely*. These matched the proportions recorded in December 2022 (Wave 10).

Ethnic minority groups were more likely to say that they would be very/fairly likely to purchase an e-scooter (6%) compared to white respondents (4%) while 94% of car owners said they would be very/fairly *unlikely* to purchase an e-scooter, compared to 87% who don’t own a car.

Figure 5.3 – Purchase intention of e-scooters



Q210. How likely or unlikely are you to purchase an e-scooter in the next 12 months?
Base: All 16+ in England (Dec 2021: 3219; Dec 2022: 3207; Dec 2023: 3622).

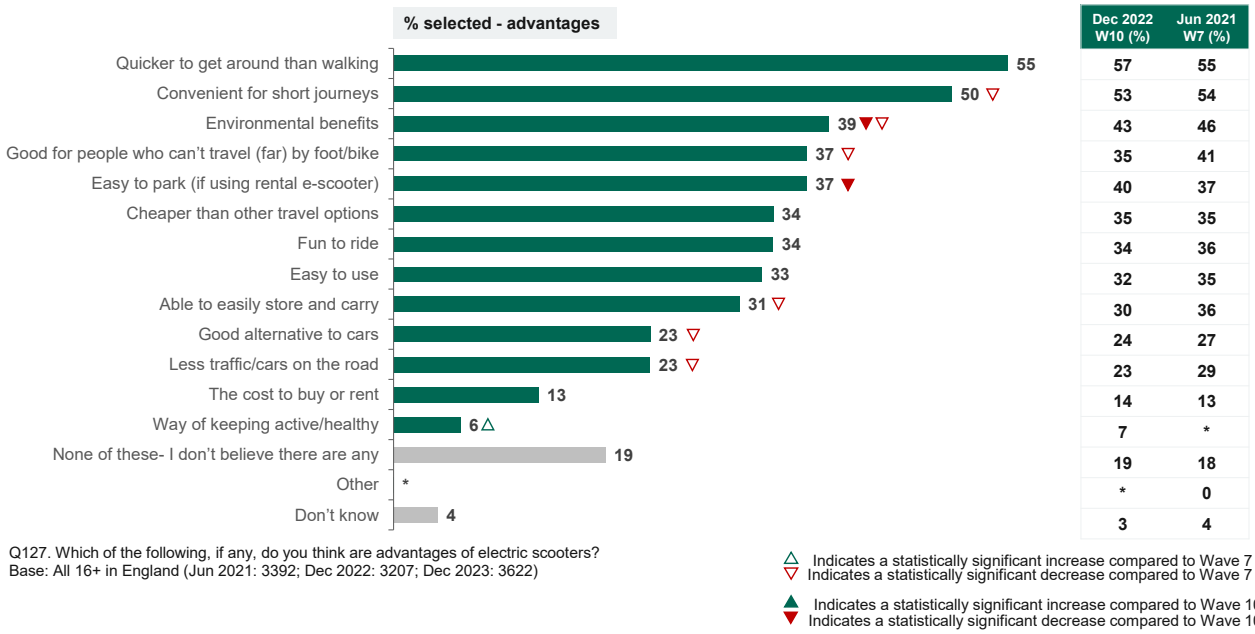
△ Indicates a statistically significant increase compared to Wave 8
▽ Indicates a statistically significant decrease compared to Wave 8

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

5.5 Advantages – prompted

E-scooters being 'quicker to get around than walking' was the advantage selected most frequently from a list. This was chosen by 55% in December 2023 (Wave 11), in line with previous waves, as shown in **Figure 5.4**. 'Convenient for short journeys' (50%) and 'environmental benefits' (39%) were the next most frequently selected advantages.

Figure 5.4 – Advantages of e-scooters



There were decreases in the frequency of selection of several advantages over time, including most of the top ranked advantages. For instance, selection of 'environmental benefits' as an advantage fell to 39% in December 2023 (Wave 11) from 43% in December 2022 (Wave 10) and 46% in June 2021 (Wave 7). There was a similar decrease in selection of being 'good for people who can't travel (far) by foot/bike' as an advantage – down to 37% in December 2023 (Wave 11) from 41% in June 2021 (Wave 7).

- Respondents from ethnic minority groups were more likely to select 'good alternative to cars' than white respondents, 29% compared with 22%.
- Just over two in five (43%) of those aged 16-24 selected as an advantage that e-scooters are 'easy to use', compared with 24% of those aged 65-74 and 23% of those aged 75+.

5.6 Disadvantages – prompted

As seen in **Figure 5.5**, 'pose a safety risk to pedestrians (e.g. on the road, pavements)' was the most frequently selected disadvantage, selected by 76% in December 2023 (Wave 11). The next most frequently selected disadvantaged were 'poses safety risk on busy roads' (73%) and 'lack of regulation' (73%). These proportions were in line with December 2022 (Wave 10) and June 2021 (Wave 7).

Two in five (41%) selected 'risk of battery fire' as a disadvantage in December 2023 (Wave 11). This was added as a new option in this survey.

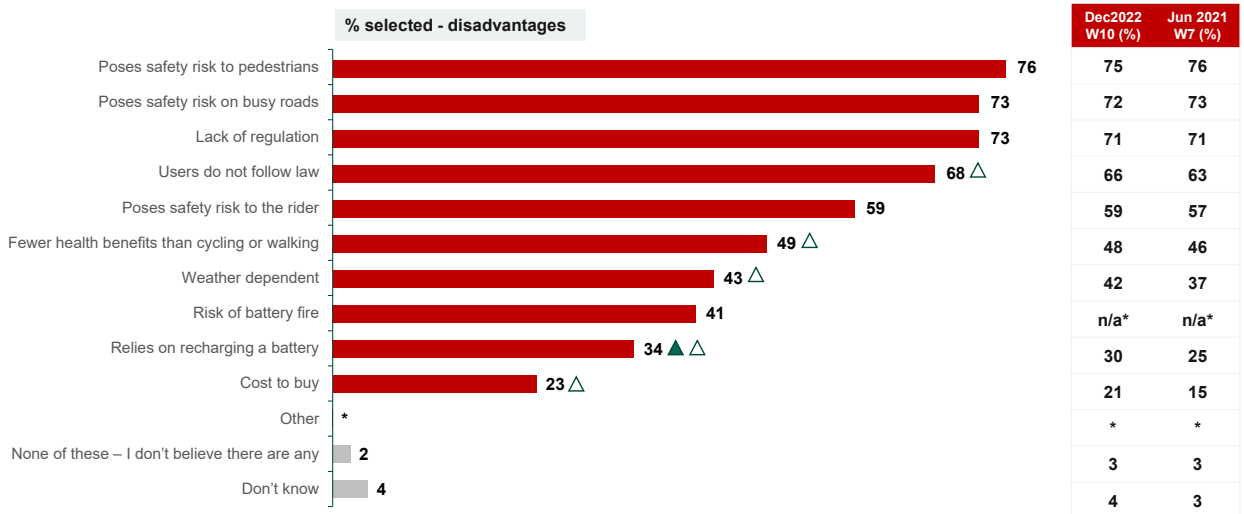
The proportion selecting 'relies on recharging a battery' was 34% in December 2023 (Wave 11), up from 30% in December 2022 (Wave 10) and 25% in June 2021 (Wave 7).

The proportions selecting several other disadvantages were in line with December 2022 (Wave 10) but were higher than they were in June 2021 (Wave 7). For example, the proportion choosing ‘users don’t follow the law’ was 63% in June 2021 (Wave 7) but had risen to 66% in December 2022 (Wave 10) and 68% in December 2023 (Wave 11).

There were some differences in perceptions of disadvantages by subgroups:

- Older generations were more likely to select disadvantages than younger age groups. For example, 86% of those aged 65-74 and those aged 75 or over selected ‘poses safety risk to pedestrians’ as a disadvantage compared to 60% of 16-24-year-olds.
- More than half of 55-64-year-olds (51%), 65-74-year-olds (54%) and over 75s (54%) chose ‘risk of battery fire’ compared to smaller proportions of 16-24-year-olds (31%), 25-34-year-olds (30%) and 35-44-year-olds (34%).
- 'Cost to buy' was selected as a disadvantage most often by 16-24-years old (32%) and 25-34-year-olds (28%) compared to people aged 65-74 (14%) and those aged 75 or older (16%). This was in line with previous waves.
- ‘Poses safety risk to pedestrians’ was selected as a disadvantage by 82% of rural residents compared to 75% of urban residents.

Figure 5.5 - Disadvantages of e-scooters



‘Risk of battery fire’ added at Wave 11.

Q129. Which of the following, if any, do you think are disadvantages of electric scooters?
Base: All 16+ in England (Jun 2021: 3392; Dec 2022: 3207; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

5.7 Understanding of rules about e-scooter use

People were shown a set of four statements relating to rules about e-scooters in the UK and asked if they believed each of them to be true or false. The statements, and whether they are true or false, are listed in **Table 5.1**.

Table 5.1 – Statements relating to rules about e-scooters in the UK

	Correct answer
If you **own** an e-scooter, you are legally allowed to ride it on pavements and footpaths	FALSE
If you **own** an e-scooter, you are legally allowed to ride it on roads and cycle lanes	FALSE
If you **hire** an e-scooter, you are legally allowed to ride it on pavements and footpaths	FALSE
If you **hire** an e-scooter, you are legally allowed to ride it on roads and cycle lanes	TRUE

The proportion of people who knew all the rules around e-scooter usage was low, with 15% not knowing any of the four rules.

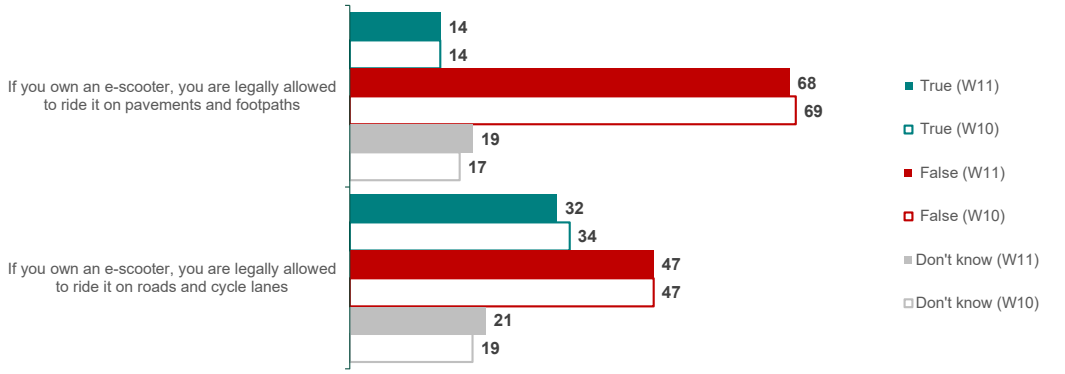
More than two-thirds (68%) of people were correct in stating that it is legal to ride a privately owned e-scooter on pavements and footpaths, as shown in **Figure 5.8**. This result was consistent with December 2022 (Wave 10).

- A quarter of those aged 16-24 (26%) incorrectly thought e-scooter owners can legally ride on pavements and footpaths, significantly more than every other age group.

Nearly half of people (47%) were correct in stating that it is illegal to ride a privately owned e-scooter on roads and cycle lanes, the same figure as December 2022 (Wave 10), while a third (32%) were incorrect, a similar proportion as December 2022 (34%).

- Those aged 16-24 (37%) and 25-34 (42%) were less likely to correctly identify that riding a privately owned e-scooter on roads and cycle lanes is legal than those aged 55-74 (53%) and 65-74 (56%).

Figure 5.8 – Statements relating to rules about use of privately owned e-scooters



Wave 11

Denotes correct answer

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

Rule	True %	False %	DK %
If you own an e-scooter, you are legally allowed to ride it on pavements and footpaths **(FALSE)**	14	68	19
If you own an e-scooter, you are legally allowed to ride it on roads and cycle lanes **(FALSE)**	32	47	21

Q212. Here are some statements about rules about e-scooters in the UK. For each one I would like you to tell me whether you think it is true or false or whether you don't know. (A) If you own an e-scooter you are legally allowed to ride on pavements and footpaths. (B) If you own an e-scooter, you are legally allowed to ride it on roads and cycle lanes.
Base: All 16+ in England: (Dec 2022: 3207; Dec 2023 (3622).

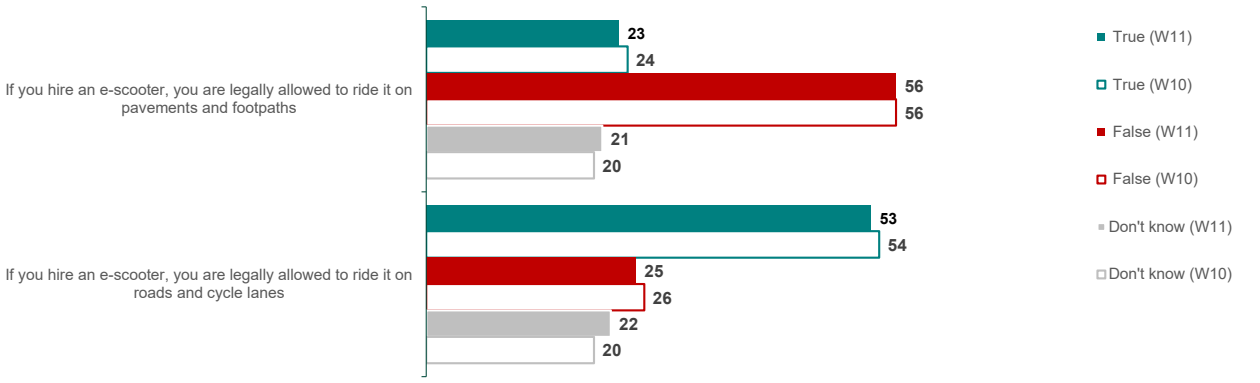
Most people (56%) were correct in stating that it is illegal to ride a rental scooter on a pavement or footpath, as shown in **Figure 5.9**. A quarter (23%) incorrectly thought it was legal, and one fifth (21%) answered 'don't know.' This result was consistent with December 2022 (Wave 10).

- There was greater uncertainty about the legality of use of rental e-scooters on a pavement or footpath among older age groups. For example, 33% of those aged 75+ and 26% of 65-74-year-olds said they didn't know, compared to 15% of those aged 16-24 and 17% of those aged 25-44.

Just over half of people (53%) were correct in stating that it is legal to ride a rental e-scooter on roads and cycle lanes. This result was consistent with December 2022 (Wave 10).

- Six in ten (61%) of those aged 16-24 correctly thought this to be true, compared to four in ten (42%) of those aged 75+.

Figure 5.9 – Statements relating to rules about use of rental e-scooters



Wave 11

Denotes correct answer

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

Rule	True %	False %	DK %
If you hire an e-scooter, you are legally allowed to ride it on pavements and footpaths **(FALSE)**	23	56	21
If you hire an e-scooter, you are legally allowed to ride it on roads and cycle lanes **(TRUE)**	53	25	22

Q212. Here are some statements about rules about e-scooters in the UK. For each one I would like you to tell me whether you think it is true or false or whether you don't know. (C) If you hire an e-scooter you are legally allowed to ride on pavements and footpaths. (D) If you hire an e-scooter, you are legally allowed to ride it on roads and cycle lanes. Base: All 16+ in England: (Dec 2022: 3207Dec 2023: 3622).

6 E-cycles

Summary

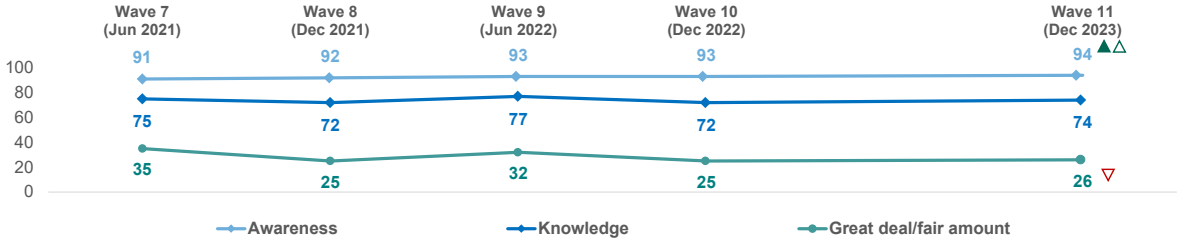
- Awareness and knowledge of e-cycles remained in line with previous waves, although the proportion knowing a great deal/fair amount was lower in December 2023 (Wave 11) than in June 2021 (Wave 7) (see **section 6.1**).
- While use of standard cycles at least once year was lower in December 2023 (Wave 11) than in December 2021 (Wave 9), use of e-cycles increased over this period (see **section 6.2**).
- The intention to purchase an e-cycle remained lower than the intention to use an e-cycle scheme. While 10% of people said they were likely to use an e-cycle scheme if available locally, 5% said they were likely to buy an e-cycle in the next 12 months (see **section 6.4**).
- 'Expensive to buy' was selected by more people as a disadvantage in December 2023 (Wave 11) compared to June 2021 (Wave 7), while 'environmental benefits' were chosen as an advantage by fewer people in December 2023 (Wave 11) compared to June 2021 (Wave 7) (see **section 6.5** and **section 6.6**).
- Risk of battery fire, which was included as a new disadvantage in this survey, was selected by two in five people in December 2023 (Wave 11) (see **section 6.6**).

6.1 Awareness and knowledge

Awareness of e-cycles increased to 94% in December 2023 (Wave 11) from 91% in June 2021 (Wave 7), as shown in **Figure 6.1**. In December 2023 (Wave 11), self-reported knowledge - people claiming to know a great deal, fair amount or just a little – (74%) was in line with December 2022 (Wave 10) (72%) and June 2021 (Wave 7) (75%). However, the proportion claiming to know a great deal or a fair amount was nine percentage points lower in December 2023 (Wave 11) (26%) than in June 2021 (Wave 7) (35%).

- Awareness was higher among those aged 45-54, 55-64 and 65-74 (all 97%) compared to 16-24-year-olds (88%).
- People in rural areas had higher awareness (97%) compared to those living in urban areas (94%) and greater levels of self-reported knowledge (81% compared to 72%).
- White respondents had higher self-reported knowledge (75%) than those from ethnic minority backgrounds (70%).
- Self-reported knowledge was lower among lower income households (on an income of up to £25,999 a year) (71%) compared to higher income households (with an annual income of £100,000+) (82%).

Figure 6.1 – Awareness and knowledge of e-cycles



*Self-reported **knowledge** answer codes: A great deal, A fair amount, Just a little
****Awareness** answer codes: A great deal, A fair amount, Just a little, Heard of, know nothing about them/it

Q137. Before today, how much, if anything, would you say you knew about e-cycles?
Base: All 16+ in England (Jun 2021: 3392; Dec 2021: 3219; Jun 2022: 3162; Dec 2022: 3207; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7

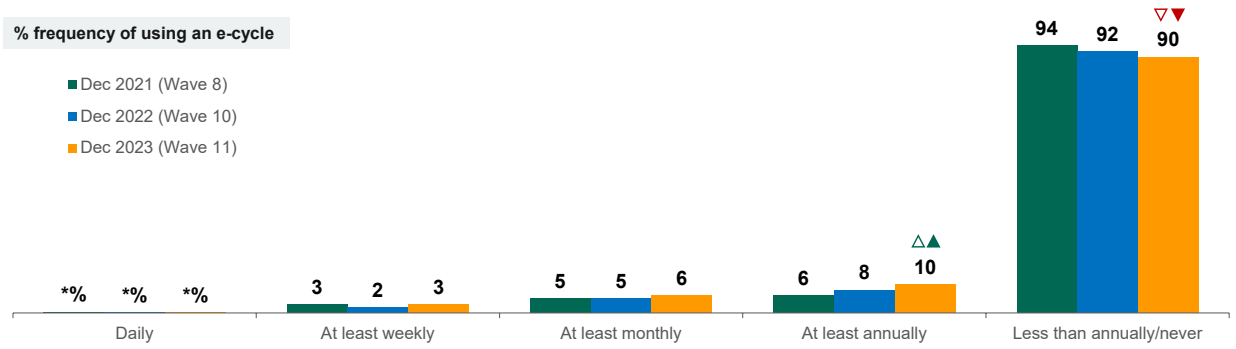
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

6.2 Usage

Use of e-cycles remained low overall but the proportion of people who used one at least once a year was higher in December 2023 (Wave 11) (10%) than in December 2022 (Wave 10) (8%) and June 2021 (Wave 7) (6%), as shown in **Figure 6.2**.

Use of e-cycles at least once a year was higher among people living in London (16%), ethnic minority people (16%) and those with an annual household income of £100,000 or more (17%), compared with the average proportion of 10%.

Figure 6.2 – Usage of e-cycles



Q138. How often, if at all, do you personally use an e-cycle?
Base: All 16+ in England (Dec 2021: 3219; Dec 2022: 3207; Dec 2023: 3622)

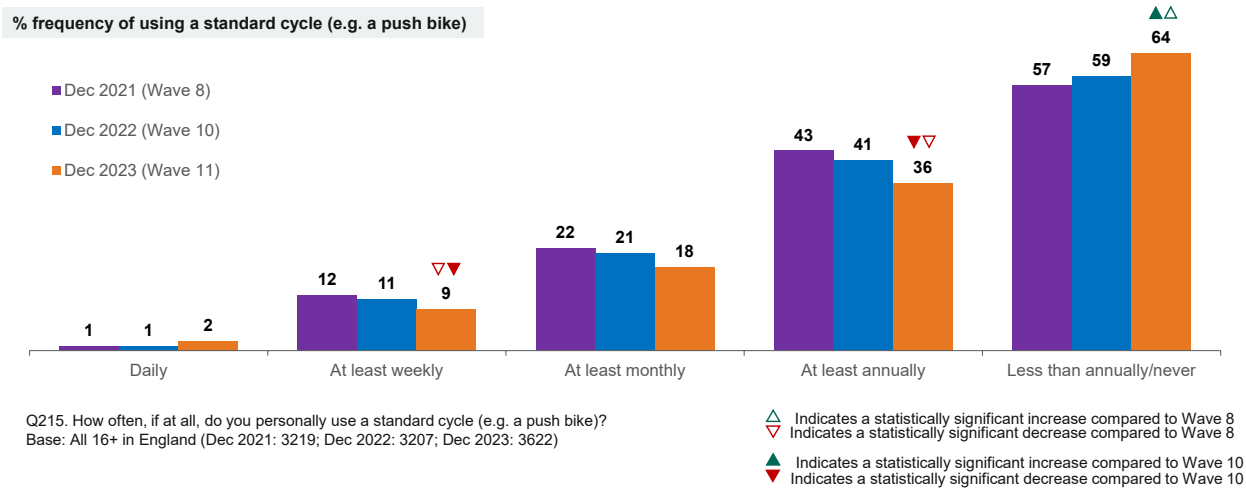
△ Indicates a statistically significant increase compared to Wave 8
▽ Indicates a statistically significant decrease compared to Wave 8

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

While use of e-cycles has increased over the Tracker time-series, use of standard cycles has fallen. Use of a standard cycle at least once a year was lower in December 2023 (Wave 11) (36%) than in December 2021 (Wave 8) (43%), shown in **Figure 6.3**. The proportion who use a standard cycle at least weekly was also lower in December 2023 (Wave 11) (9%) than in December 2021 (Wave 8) (12%).

Use of standard cycles at least once a year was higher among those aged 16-24 (47%), among men (44%), those living with children (45%), people living in the South of England (39%) compared with the average proportion of 36%.

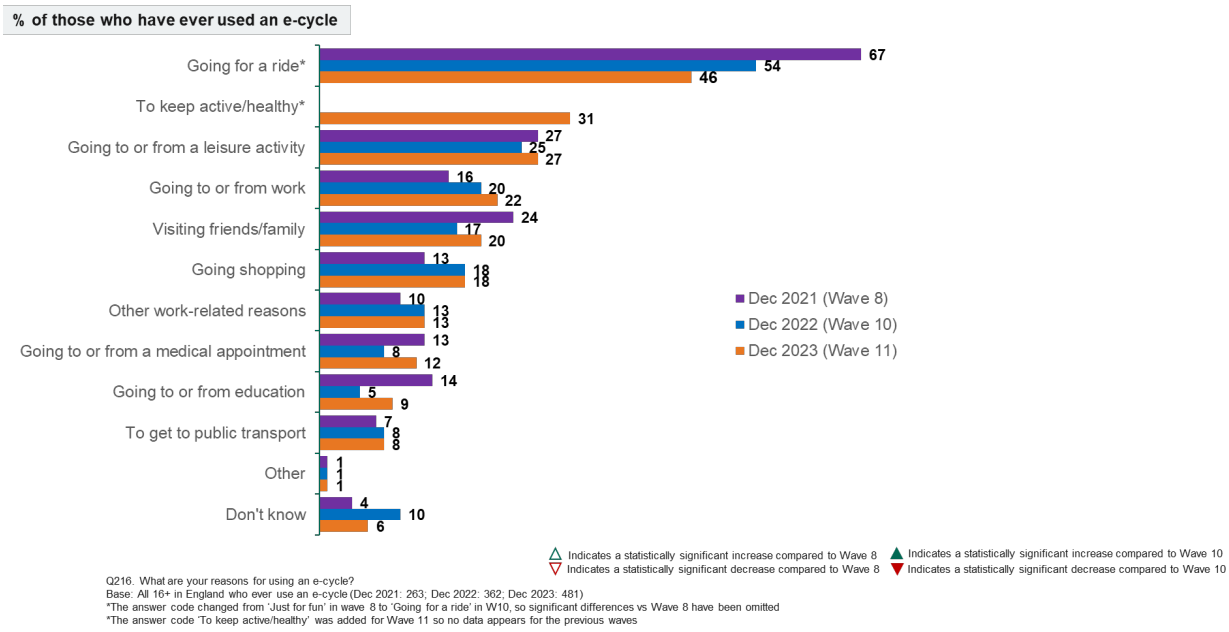
Figure 6.3 – Usage of standard cycles



6.3 Reasons for use

Among those who had ever used an e-cycle, the most common reason for doing so was ’going for a ride’. This was chosen as a reason by 67% of people in December 2023 (Wave 11) (this option replaced ‘just for fun’, used in December 2021).

Figure 6.4 – Reasons for using an e-cycle



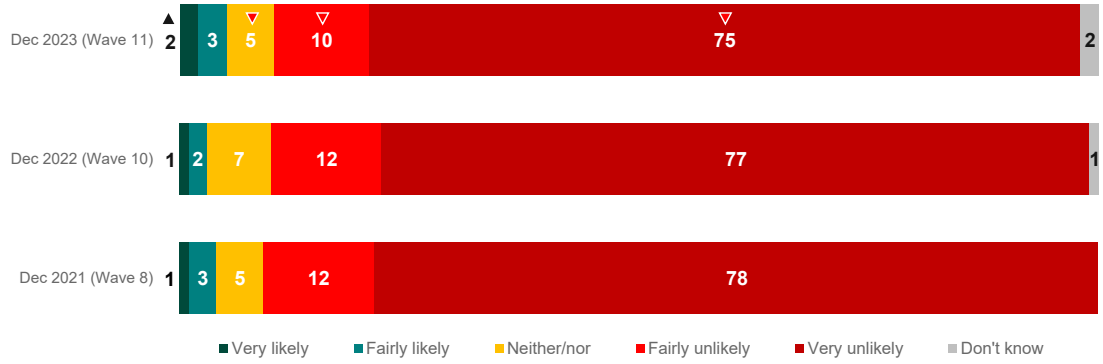
In December 2023 (Wave 11), other key reasons for use were ‘to keep active/healthy’ (a new answer code this wave selected by 31%), ‘going to or from a leisure activity’ (27%), ‘going to or from work’ (22%), and ‘visiting friends or family’ (20%).

6.4 Purchase intention and use of schemes

As shown in **Figure 6.5,** intention to purchase an e-cycle remained low. There was no change in the very small proportion of people who said they were very or fairly likely to purchase an e-cycle which was 5% in December 2023 (Wave 11), 3% in December 2022 (Wave 10) and 4% in December 2021 (Wave 8). The proportion very or fairly unlikely to purchase an e-cycle was lower than previously; it was 85% in December 2023 (Wave 11), 87% in December 2022 (Wave 10) and 90% in December 2021 (Wave 8).

- In December 2023 (Wave 11), white respondents were more unlikely to purchase an e-cycle in the next 12 months (87%) than ethnic minority groups (79%).
- Women were more unlikely to purchase an e-cycle in the next 12 months (87%) than men (83%).

Figure 6.5 – Purchase intention of e-cycles



Q214. How likely or unlikely are you to purchase an e-cycle in the next 12 months?
Base: All 16+ in England who do not own an e-cycle (Dec 2021: 3100; Dec 2022: 3066; Dec 2023: 3622).

△ Indicates a statistically significant increase compared to Wave 8
▽ Indicates a statistically significant decrease compared to Wave 8
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

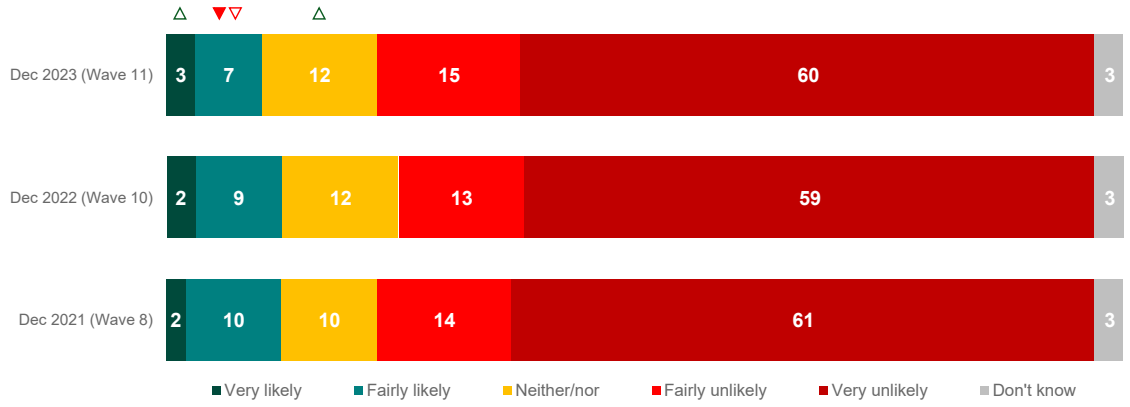
Respondents were provided with the following text about an e-cycle share scheme before being asked about their likelihood of using such a scheme:

> An e-cycle share scheme is a service that allows people to pay to hire an e-cycle by collecting it from a “docking” point such as a bike rack or a “dockless” location such as a pavement or where it has been left by previous users. This could involve share schemes that are available to anyone, or they could be targeted share schemes that are available to employees in a workplace, or community groups.

As shown in **Figure 6.6**, people were more likely to expect to use an e-cycle scheme than they were to buy an e-cycle, 11% compared with 5%. The proportion who said they were very or fairly likely to use one was 11% in December 2023 (Wave 11) and 12% in both December 2022 (Wave 10) and December 2021 (Wave 8).

- Young people were more *likely* to use a scheme - 16-24s (15%), 25-34s (16%) and 35-44s (13%) - compared to those aged 55-64 and 65-74 (both 6%) and over 75+ (4%).
- People living in rural areas were more *unlikely* to use a scheme (11%) than those in urban areas (7%).

Figure 6.6 – Likelihood of using e-cycle schemes



Q216B. How likely or unlikely would you be to use an e-cycle scheme if it was available in your area?
Base: All 16+ in England (Dec 2021: 3219; Dec 2022: 3207; Dec 2023: 3622).

△ Indicates a statistically significant increase compared to Wave 8
▽ Indicates a statistically significant decrease compared to Wave 8

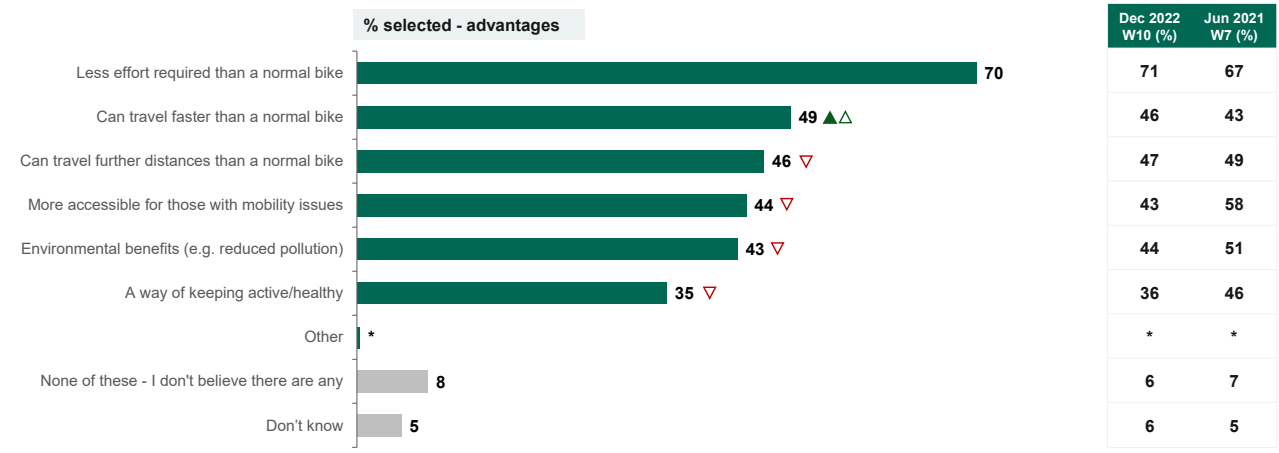
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

6.5 Advantages – prompted

As was the case in previous waves, the most frequently selected advantage of e-cycles was 'less effort required than a normal bike'. Seven in ten (70%) selected this in December 2023 (Wave 11), as shown in **Figure 6.7**.

The next most selected advantages were 'can travel faster than a normal bike' - selected by a larger proportion in December 2023 (Wave 11) (49%) than in June 2021 (Wave 7) (43%) – and 'can travel further distances than a normal bike' - chosen by a smaller proportion in December 2023 (Wave 11) (46%) than in June 2021 (Wave 7) (49%).

Figure 6.7 – Advantages of e-cycles



	Dec 2022 W10 (%)	Jun 2021 W7 (%)
Less effort required than a normal bike	71	67
Can travel faster than a normal bike	46	43
Can travel further distances than a normal bike	47	49
More accessible for those with mobility issues	43	58
Environmental benefits (e.g. reduced pollution)	44	51
A way of keeping active/healthy	36	46
Other	*	*
None of these - I don't believe there are any	6	7
Don't know	6	5

Q140. Which of the following, if any, do you think are advantages of e-cycles?
Base: All 16+ in England (Jun 2021: 3392; Dec 2022: 3207; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7
▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

'Environmental benefits (e.g. reduced pollution)' was selected as an advantage by 43% in December 2023 (Wave 11), down eight percentage points since June 2021 (Wave 7) (51%). Similarly, 'more accessible for those with mobility issues' was selected by fewer people in December 2023 (Wave 11) (44%) in comparison with June 2021 (Wave 7) (58%). Selections of 'a way of keeping active and healthy' were also lower (35% compared to. 46%).

There were some differences in perceptions of advantages by subgroups:

- The advantage of 'less effort required than a normal bike' appealed more to older generations. A higher proportion of those aged 55-64 (75%), 65-74 (79%) and 75+ (77%) selected this as an advantage compared to 16-24-year-olds (60%). It was also selected more frequently by with those living in rural areas (77%) than those living in urban areas (68%).

- Women were more likely than men to select 'environmental benefits' as an advantage than men, 46% compared to 41%.

- 'More accessible for those with mobility issues' was selected as an advantage by more of those with a limiting health condition (49%) compared to those without one (41%).

6.6 Disadvantages – prompted

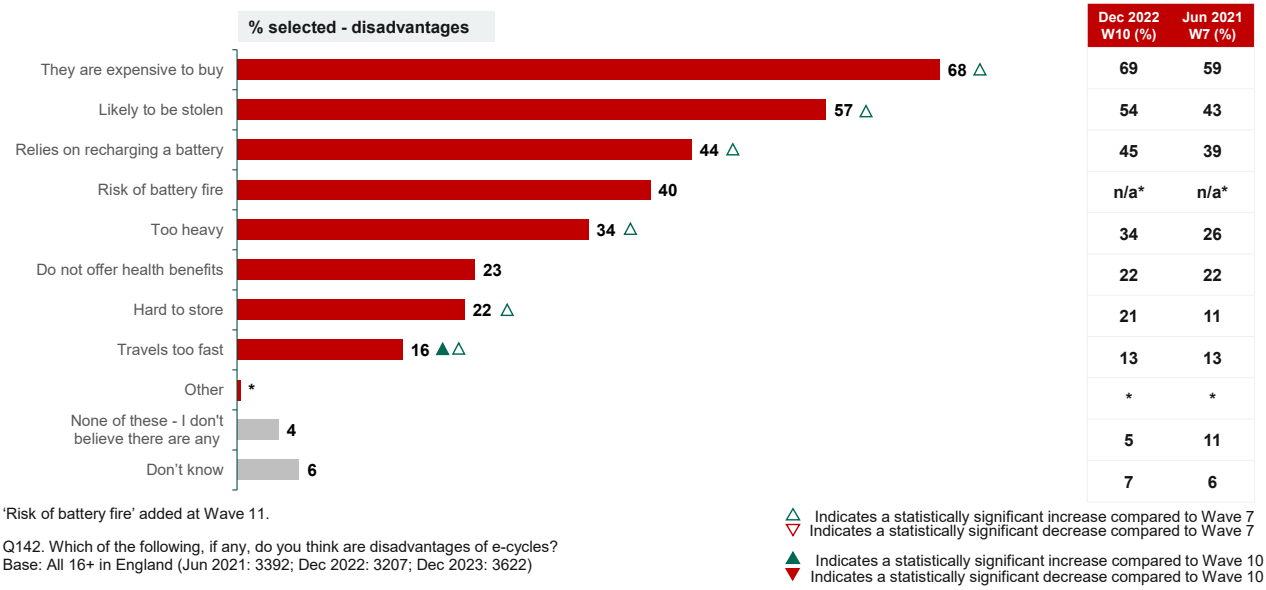
The most frequently selected disadvantage of e-cycles was 'they are expensive to buy'. This was selected by 68% of people in December 2023 (Wave 11), which was a similar proportion to in December 2022 (Wave 10) (69%) but nine percentage points higher than June 2021 (Wave 7) (59%), see **Figure 6.8**.

More than half of people (57%) selected 'likely to be stolen' as a disadvantage in December 2023 (Wave 11), in line with December 2022 (Wave 10) (54%) but an increase of 14 percentage points since 43% in June 2021 (Wave 7).

Two in five (40%) selected 'risk of battery fire' as a disadvantage in December 2023 (Wave 11), a new option added in this survey.

'Relies on recharging a battery' (44%), being 'too heavy' (34%), 'hard to store' (22%) and 'travels too fast' (16%) were selected as disadvantages of e-cycles by higher proportions compared to June 2021 (Wave 7).

Figure 6.8 – Disadvantages of e-cycles



There were some differences in perceptions of advantages by subgroups:

- 'They are expensive to buy' was of greatest concern to those aged 45-54 (72%) and 55-64 (71%) compared to those aged 65-74 (62%). This was also selected as a disadvantage by a higher proportion of white respondents (70%) than ethnic minority groups (58%).
- Those living in urban areas were more concerned about e-cycles being 'hard to store' (23%) than those in rural areas (16%).
- 'Risk of battery fire' was selected as a disadvantage by a higher proportion of those aged 75+ (56%) compared to those aged 16-24 (34%). It was also more commonly selected as a disadvantage by people who had never used an e-cycle or had only used one very infrequently, i.e., less than once a year (42%).

7 Drones

Summary

- Levels of awareness of drones remained high but self-reported knowledge was lower in December 2023 (Wave 11) than in June 2021 (Wave 7) (see **section 7.1**).
- As in previous waves, most people were aware of the use of drones for leisure and photography. Over time, there has been an increase in awareness of military use and emergency response (see **section 7.2**).
- There continued to be strong support for the use of drones for emergency response but levels of support for use by the armed forces/military was lower, and strong opposition higher, in December 2023 (Wave 11) than in June 2022 (Wave 9) (see **section 7.3**).
- When prompted, seven in ten people had concerns about the privacy or intrusion and potential misuse of drones. Concern about military use of drones increased sharply between June 2022 (Wave 9) and December 2023 (Wave 11) (see **section 7.4**).

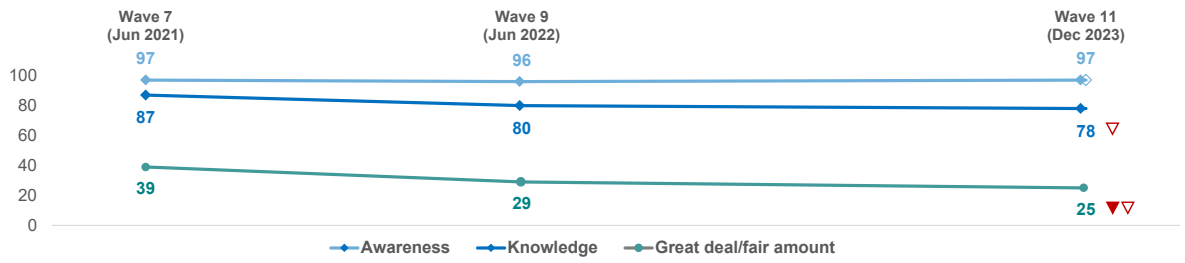
7.1 Awareness and knowledge

Awareness of drones has remained consistently high over time. In line with previous waves, 97% of people were aware of drones in December 2023 (Wave 11), shown in **Figure 7.1**.

Self-reported knowledge of drones - people knowing a great deal, fair amount or just a little - fell nine percentage points to 78% in December 2023 (Wave 11) from 87% in June 2021 (Wave 7). The proportion who said they know a great deal/fair amount decreased to 25% in December 2023 (Wave 11) from 39% in June 2021 (Wave 7).

- Self-reported knowledge was higher among those in the higher income households earning between £52,000 and £99,999 per year (84%) and over £300,000 per year (87%) than those earning less than £25,999 per year) (73%) and those earning between £26,000 and £51,999 per year (79%).
- Those aged 16-34 were more likely to self-report having a great deal/fair amount of knowledge (31%) than those aged 75+ (17%).

Figure 7.1 Awareness and knowledge of drones



Knowledge answer codes: A great deal, A fair amount, Just a little
Awareness answer codes: A great deal, A fair amount, Just a little, Heard of, know nothing about them/it

Q130. Before today, how much, if anything, would you say you knew about drones?
Base: All 16+ in England (Jun 2021: 3392; Jun 2022: 3162; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7

▲ Indicates a statistically significant increase compared to Wave 10
▼ Indicates a statistically significant decrease compared to Wave 10

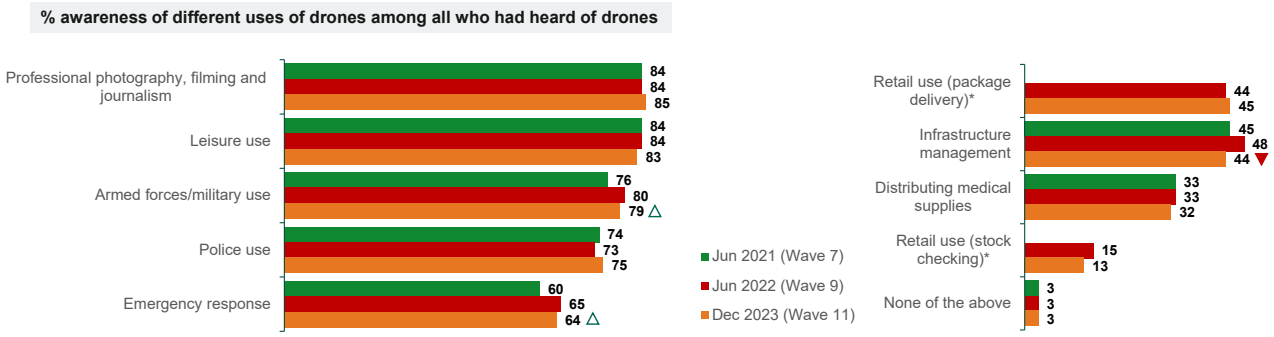
7.2 Awareness of different uses

In line with previous waves, professional photography, filming and journalism (85%) and leisure use (83%) were the most common uses of drones people had heard of in December 2023 (Wave 11), see **Figure 7.2**. These were followed by armed forces/military use (79%), which had risen from 76% in June 2021 (Wave 7), possibly due to media coverage of the conflict in Ukraine and Gaza.

There was an increase in awareness of the use of drones for emergency response to 64% in December 2023 (Wave 11) up from 60% in June 2021 (Wave 7). Awareness of use for infrastructure management (e.g. building/bridge inspection, monitoring crops/livestock) fell to 44% in December 2023 (Wave 11) from 48% in June 2022 (Wave 9), returning to a similar level to June 2021 (Wave 7) (45%).

- Older people aged 75+ were more likely to be aware of the different uses of drones than 16-24-year-olds; for example, their awareness was higher for armed forces/military use (89% compared to 71%), police use (81% compared to 59%) and emergency response (77% compared to 58%).

Figure 7.2 - Awareness of use of drones



* The answer codes for retail use were split into package delivery and stock checking from Wave 9. In Wave 7 these codes were combined.

Q132. Which of these uses of drones have you personally heard of before today?
Base: All who have heard of drones before today (Jun 2021: 3335; Jun 2022: 3162; Dec 2023: 3517)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7

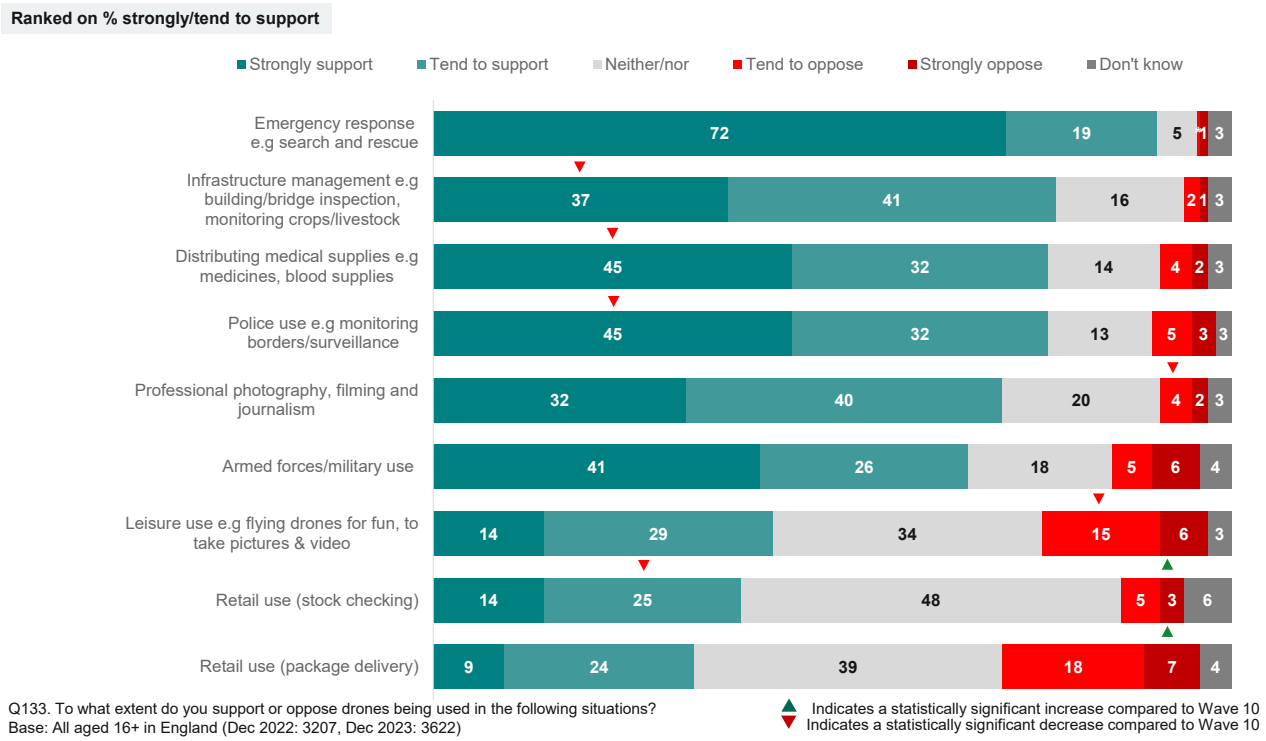
▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

7.3 Support and opposition to different uses

Support for the use of drones was strongest in terms of emergency response, with 91% of people supporting the use of drones for this reason, in line with previous waves, see **Figure 7.3**. Levels of support were also high for infrastructure management (78%), distributing medical supplies (77%), use for policing (e.g. monitoring borders/surveillance) (76%), and armed forces/military purposes (68%). There was also a high level of support for professional photography, filming and journalism (71%).

As was the case in previous waves, support for leisure use (e.g. flying drones for fun, to take pictures and video) was lower than it was for most of the other uses covered; 43% supported this in December 2023 (Wave 11) and 33% were neutral. A similar proportion supported the use of drones for retail stock-checking (39%). Support for the use of drones was lowest for delivery of packages (32%).

Figure 7.3 - Support and opposition for different uses of drones



In comparison to June 2022 (Wave 9), shown in **Table 7.1**, support was lower in December 2023 (Wave 11) for distributing medical supplies - down two percentage points from 79% - and use by armed forces/military - down four percentage points from 72%.

In December 2023 (Wave 11), support for the use of drones for retail stock-checking (39%) was four percentage points lower in comparison to June 2022 (Wave 9) (43%).

Levels of opposition to the use of drones were in line with previous waves. In December 2023 (Wave 11), one in ten (11%) opposed the use of drones for armed forces/military purposes, although the proportion who strongly opposed this increased by three percentage points to 6% from 3% in June 2022 (Wave 9). Opposition to drones being used for professional photography, filming and journalism fell to 6% in December 2023 (Wave 11) from 8% in June 2021 (Wave 7).

Levels of opposition to the use of drones was lowest for delivery of packages were higher in December 2023 (Wave 11) than in June 2022 (Wave 9) (22%).

Table 7.1 – Support and opposition for different uses of drones – trends

	% support - Wave 11	% support - Wave 10	% support - Wave 9	% oppose - Wave 11	% oppose - Wave 10	% oppose - Wave 9
Emergency response e.g. search/rescue	91	92	92	2	1	2
Infrastructure management e.g. building/bridge inspection, monitoring crops/livestock	78	80	79	3	2	3
Distributing medical supplies e.g. medicines, blood supplies	77 ▼	79	77	6	5	5
Police use e.g. monitoring borders/surveillance	76	76	77	7	8	8
Professional photography, filming and journalism	72	71	69	6 ▼	7	8
Armed forces/military use*	68 ▼	72	n/a	11	10	n/a
Leisure use e.g. flying drones for fun, to take pictures & video	43	43	41	21 ▽	22	26
Retail use (stock checking)*	39 ▼	43	n/a	9	7	n/a
Retail use (package delivery)*	32	34	n/a	25 ▲	22	n/a

Q133. To what extent do you support or oppose drones being used in the following situations?
Base: All aged 16+ in England (Jun 2021: 3392; Jun 2022: 3162; Dec 2023: 3622)
% support = % strongly support/tend to support, % oppose = % strongly oppose/tend to oppose
* Armed forces split out into two codes at Wave 7, Retail use split out into x2 codes at Wave 9 meaning data not comparable with measures before these changes.
△▽ indicates statistically significant increase compared to Wave 9, ▲▼ compared to Wave 10.

7.4 Concerns

People were most likely to select the 'potential misuse of drones' (73%) and 'privacy or intrusion' (72%) from a list of potential concerns about drones, in line with previous waves, as shown in **Figure 7.4**. The proportion selecting 'potential misuse of drones' increased by three percentage points in December 2023 (Wave 11) (73%) compared to June 2022 (Wave 9) (70%) but was at a similar level to June 2021 (Wave 7) (72%).

There was a similar pattern in terms of concerns about the 'difficulty of tracing drone owners/operators and who can buy them'. This concern was selected by 54% of people in December 2023 (Wave 11) which was a higher proportion than in June 2022 (Wave 9) (50%) but similar to the level in June 2021 (Wave 7) (55%). Concerns about the 'use of drones if used in the military' were mentioned by 32% of people in December 2023 (Wave 11), an increase of eight percentage points from the level in June 2022 (Wave 9) (24%).

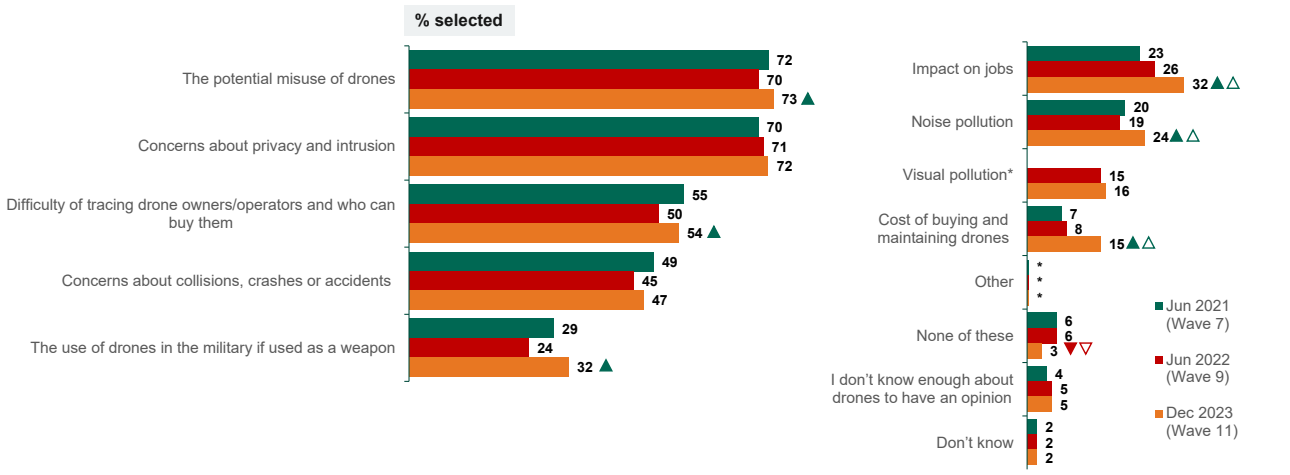
Several concerns were selected more often in December 2023 (Wave 11) compared to June 2021 (Wave 7). Their 'impact on jobs' was nine percentage points higher in December 2023 (Wave 11) (32%) compared to June 2021 (Wave 7) (23%). Over the same period, 'noise pollution' increased four percentage points to 24% from 20% and the 'cost of buying and maintaining' increased by eight points to 15% from 7%.

There were some differences in perceptions of concerns by subgroups:

- Those aged 65-74 (86%) and 75+ (87%) were more concerned about the 'potential misuse of drones' than younger age groups, for example 63% of 16-24-year-olds (63%). 65-74-year-olds were more concerned about 'privacy and intrusion' (79%) compared to 16-24-year-olds (61%).

- 16-24-year-olds were more concerned about the 'impact of drones on jobs' (41%) than average (32%). Concern among this age group regarding the use of drones as military weapon was also higher (42%) compared to those aged 75+ (27%).

Figure 7.4 – Concerns about drone use



*New code for W9 Jun 2022
Q135. Which of the following concerns, if any, do you have about the use of drones?
Base: All 16+ in England (Jun 2021: 3392; Jun 2022: 3162; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7
▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

8 Flying taxis

Summary

- Awareness and self-reported knowledge of flying taxis remained low. More than half of people said they had never heard of them (see **section 8.1**).
- People were more likely to identify disadvantages than advantages for flying taxis and the proportion selecting disadvantages relating to 'affordability', 'hacking' and 'electricity production' increased between June 2022 (Wave 9) and December 2023 (see **section 8.3**).
- Fewer people chose the top selected advantages of flying taxis in December 2023 (Wave 11) compared to June 2022 (Wave 9) and more said there were no advantages (see **section 8.2**).
- One in six people said they were either *fairly or very likely* to use flying taxis if they were proven and available to use, lower than in June 2022 (Wave 9). The proportion who said they were either fairly or very unlikely to use a flying taxi in future increased over this period (see **section 8.4**).

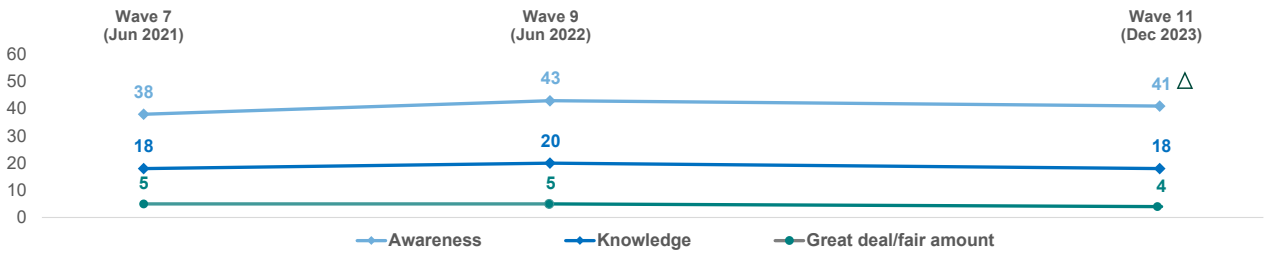
8.1 Awareness and knowledge

In December 2023, four in ten people had some awareness of flying taxis (41%), an increase of three percentage points since June 2021 (Wave 7) (38%). More than half (57%) said they had never heard of them and almost a quarter (23%) had heard of them but knew nothing about them.

Self-reported knowledge of flying taxis - people knowing a great deal, fair amount or just a little - was 18% in December 2023 (Wave 11), with 4% saying they know a *great deal* or a *fair amount* about flying taxis, both in line with previous waves.

- Awareness was higher among those aged 65-74 and 75+ (both 47%) compared to 16-24-year-olds and 25-34-year-olds (both 36%).
- Self-reported knowledge was higher among respondents from ethnic minority groups (28%) than white respondents (16%).

Figure 8.1 - Awareness and knowledge of flying taxis



Knowledge answer codes: A great deal, A fair amount, Just a little
Awareness answer codes: A great deal, A fair amount, Just a little, Heard of, know nothing about them/it

▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

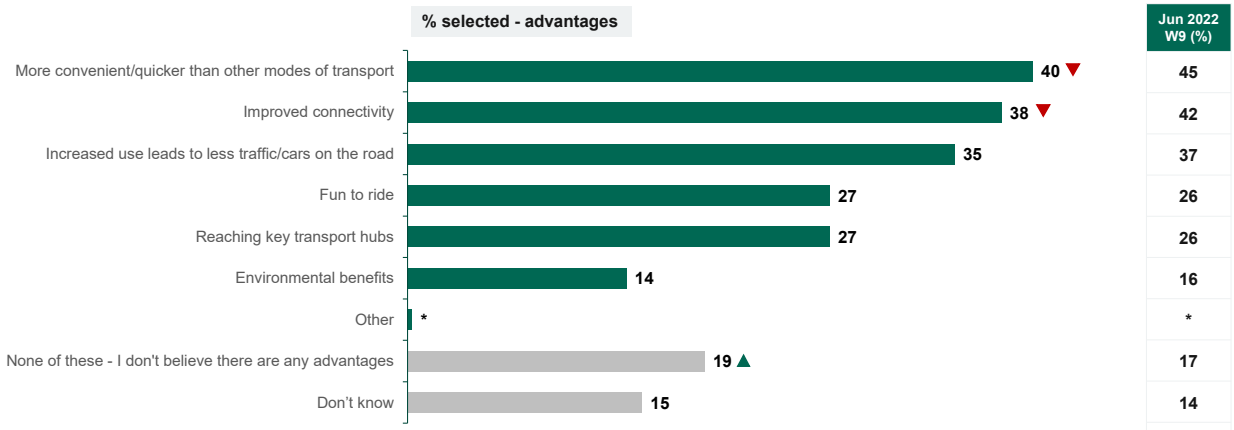
Q304. Before today, how much, if anything, would you say you knew about flying taxis?
Base: All 16+ in England (Jun 2021: 3392; Jun 2022: 3162: Dec 2023: 3622)

8.2 Advantages – prompted

When shown a list of potential advantages of flying taxis, 'more convenient/quicker than other modes of transport' (40%) and 'improved connectivity' (38%) were the advantages selected most frequently in December 2023 (Wave 11), as shown in **Figure 8.2**. However, the proportion selecting both was lower than in June 2022 (Wave 9). Selections of 'more convenient/quicker than other modes of transport' had fallen by five percentage points from 45% to 40% and 'improved connectivity' had fallen by four points from 42% to 38%.

'Increased use leads to less traffic/cars on the road' was selected as an advantage by 35% of people, followed by 'fun to ride' and 'reaching key transport hubs (e.g. train stations, airports)' (both selected by 27%). The least frequently selected advantage was 'environmental benefits' (14%). One in five (19%) said they didn't believe there are *any* advantages, up from 17% in June 2022 (Wave 9).

Figure 8.2 - Advantages of flying taxis



Q306. Which of the following, if any, do you think are advantages of flying taxis?
Base: All 16+ in England (Jun 2022: 3162; Dec 2023: 3622)

▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

There were some differences in perceptions of advantages by subgroups:

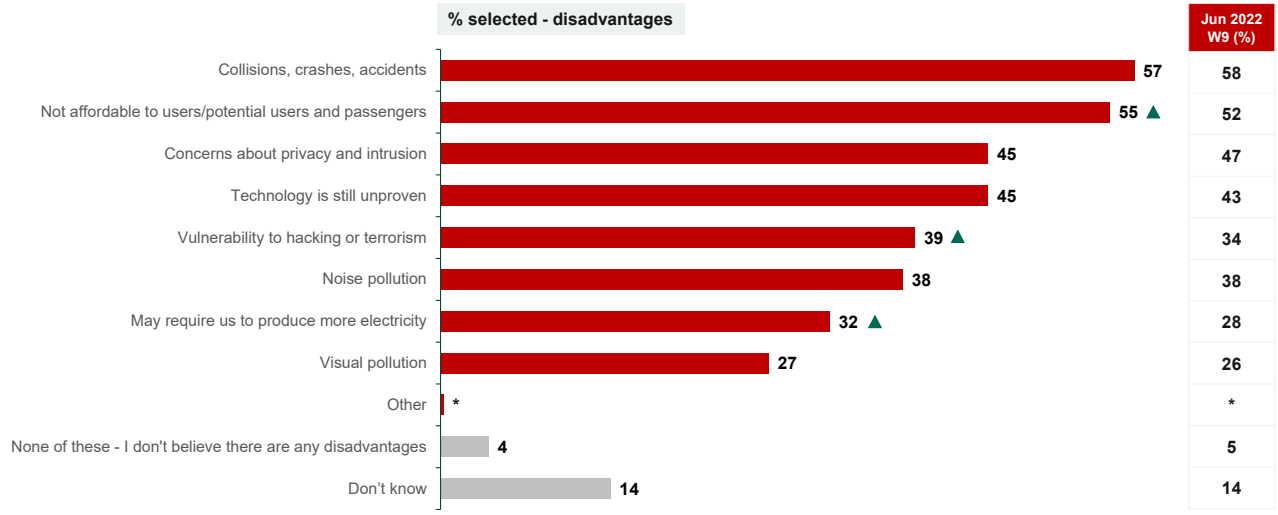
- Those in higher income households (earning £52,000-£99,999 and more than £100,000 annually) were more likely than lower income households (earning less than £25,999 annually) to select advantages. For example, 45% of both the higher income groups selected 'more convenient/quicker than other modes of transport' compared to 36% of lower income households.
- A higher proportion of people living in rural areas (19%) selected 'environmental benefits' than those in urban areas (13%).
- Car owners were more likely to select 'more convenient/quicker than other modes of transport' (42%) compared to non-car owners (36%).

8.3 Disadvantages – prompted

When shown a list of potential disadvantages of flying taxis, 'collision, crashes or accidents' was selected most frequently, by 57% of people, followed by 'not affordable to users/potential users and passengers' (55%), as shown in **Figure 8.3**. The next most frequently selected disadvantages were 'concerns about privacy and intrusion' and 'technology is unproven' which were both selected by 45% of people. 'Vulnerability to hacking or terrorism' was selected as a disadvantage by 39%, 'noise pollution' by 38% and 'may require us to produce more electricity' by 32%.

The proportion selecting ‘not affordable to users/potential users and passengers’ increased three percentage points from 52% in June 2022 (Wave 9). There were also increases in the proportion selecting ‘vulnerability to hacking or terrorism’, up from 34% to 39%, and ‘may require us to produce more electricity’, up from 28% to 32%.

Figure 8.3 – Disadvantages of flying taxis



Q308. Which of the following, if any, do you think are disadvantages of flying taxis?
Base: All 16+ in England (Jun 2022: 3162; Dec 2023: 3622)

▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

There were some differences in perceptions of disadvantages by subgroups:

- Those aged 75+ were more likely to select ‘collisions, crashes, accidents’ than 16-24-year-olds (68% compared to 46%).
- The oldest age group were also more likely to select ‘concerns about privacy and intrusion’ than 16-24-year-olds (60% compared to 39%). This was also the case for ‘vulnerability to hacking or terrorism’, although the margin was narrower (47% compared to 37%).
- ‘May require us to produce more electricity’ was of particular concern to those aged 16-24 (41%), compared to those aged 75+ (31%) and 65-74-year-olds (24%).

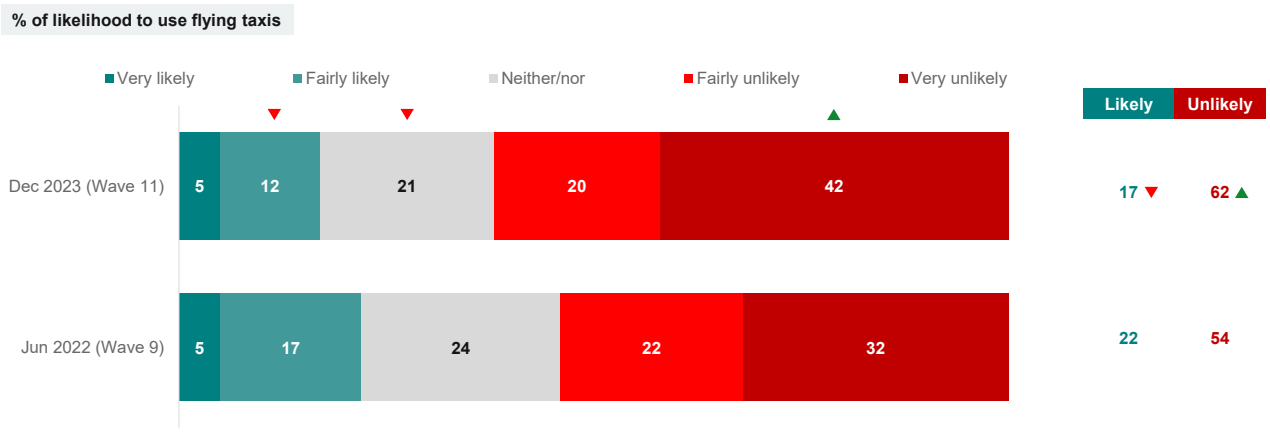
8.4 Likelihood of use

In December 2023 (Wave 11), 17% of people said they were either *very or fairly likely* to use flying taxis if they were proven and available to use, as shown in **Figure 8.4**. This was five percentage points lower than June 2022 (Wave 9) (22%). The proportion who said they would be *unlikely* increased to 62% in December 2023 (Wave 11) from 54% in June 2022 (Wave 9).

Reported likely use of a flying taxi was higher among some groups:

- 35-44-year-olds (27%), higher than all other age groups.
- Respondents from ethnic minority groups (29%) compared to white respondents (15%).
- People in urban areas (18%) compared to those in rural areas (12%).
- People in the highest income households (earning more than £100,000 annually) (23%) compared to those in the lowest income households (earning less than £25,999 annually) (15%).

Figure 8.4 – Likelihood of using flying taxis



***Likely** answer codes (%): very likely, fairly likely
****Unlikely** answer codes (%): fairly unlikely, very unlikely

▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

Q309. If flying taxis were proven and available to use, how likely or unlikely would you be to use one?
Base: All 16+ in England (Jun 2022: 3162; Dec 2023: 3622)

9 Sustainable aviation

Summary

- While levels of awareness and self-reported knowledge of sustainable aviation fuels were lower than for most other transport technologies covered by the survey, they have increased across the tracker time-series, potentially reflecting media coverage in November 2023 (see **section 9.1**).
- In line with previous waves, support exceeded opposition to paying extra for flights using sustainable aviation fuels, but opposition has increased since June 2022 (Wave 9) (see **section 9.2**). People's stated likelihood of paying an extra £10 or £20 on a £100 flight was lower than it was in June 2022 (Wave 9), although support continued to exceed opposition (see **section 9.3**).
- Awareness and self-reported knowledge of battery-powered electric planes remained low but awareness was higher than in June 2021 (Wave 7) (see **section 9.4**).
- This was also the case for hydrogen-powered planes. Awareness increased in June 2022 (Wave 9) and again in December 2023 (Wave 11) (see **section 9.5)**.

9.1 Awareness and knowledge

Respondents were provided with the following definition:

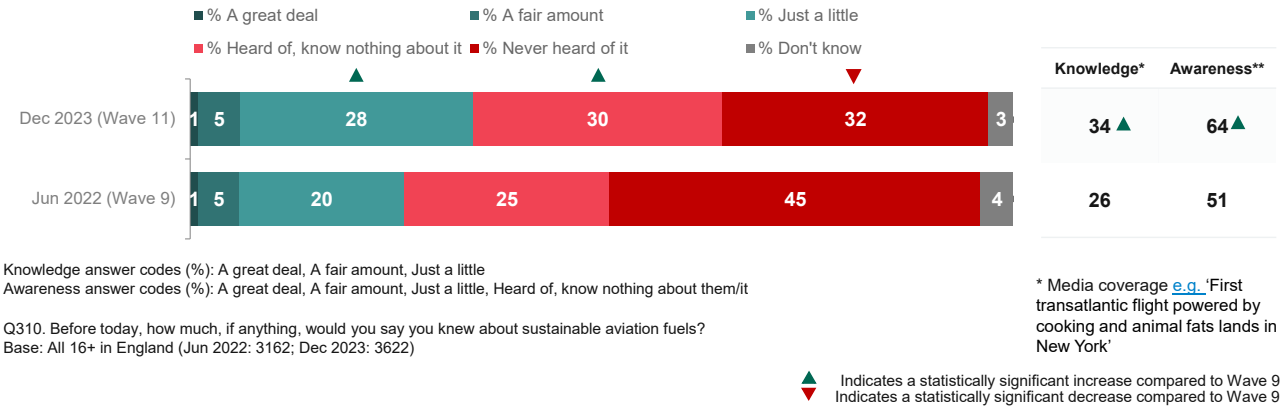
> Sustainable aviation fuels are greener alternatives to aviation fuels currently in use, produced from sources such as household and industrial waste.

The proportion of people who claimed to have *at least heard of* sustainable aviation fuels increased to 64% in December 2023 (Wave 11) from 51% in June 2022 (Wave 9), while the proportion who said that they had *never heard of* them fell to 32% from 45%, as shown in **Figure 9.1**.

This, and other changes, were potentially influenced by media coverage in November 2023 of the first commercial transatlantic flight using 100 percent sustainable aviation fuel, made from used cooking oil.[1]

[1] See for example 'First transatlantic flight powered by cooking and animal fats lands in New York' (https://www.ft.com/content/385952bf-dea3-4239-9987-706f6fdafa7b)

Figure 9.1 – Awareness and knowledge of sustainable aviation fuels



Knowledge answer codes (%): A great deal, A fair amount, Just a little
Awareness answer codes (%): A great deal, A fair amount, Just a little, Heard of, know nothing about them/it

Q310. Before today, how much, if anything, would you say you knew about sustainable aviation fuels?
Base: All 16+ in England (Jun 2022: 3162; Dec 2023: 3622)

* Media coverage e.g. 'First transatlantic flight powered by cooking and animal fats lands in New York'

▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

Self-reported knowledge - people knowing a *great deal*, *fair amount* or *just a little* - about sustainable aviation fuels was 34% in December 2023 (Wave 11), up from 26% in June 2022 (Wave 9). This included 7% who said that they knew either a *great deal* or a *fair amount*, the same proportion as June 2022 (Wave 9). Three in ten people (30%) in December 2023 (Wave 11) said they had heard of sustainable aviation fuels but knew nothing about them, an increase from 25% in June 2022 (Wave 9).

- Self-reported knowledge was higher among 65-74-year-olds (43%) compared to those aged 25-34 (27%).
- Self-reported knowledge was also higher among those in the highest income households (earning £100,000 or more) (46%) compared to those in the lowest income group (earning up to £25,999 per year) (30%).
- Men were more likely to report having heard of sustainable aviation fuels than women (75% compared to 54%).

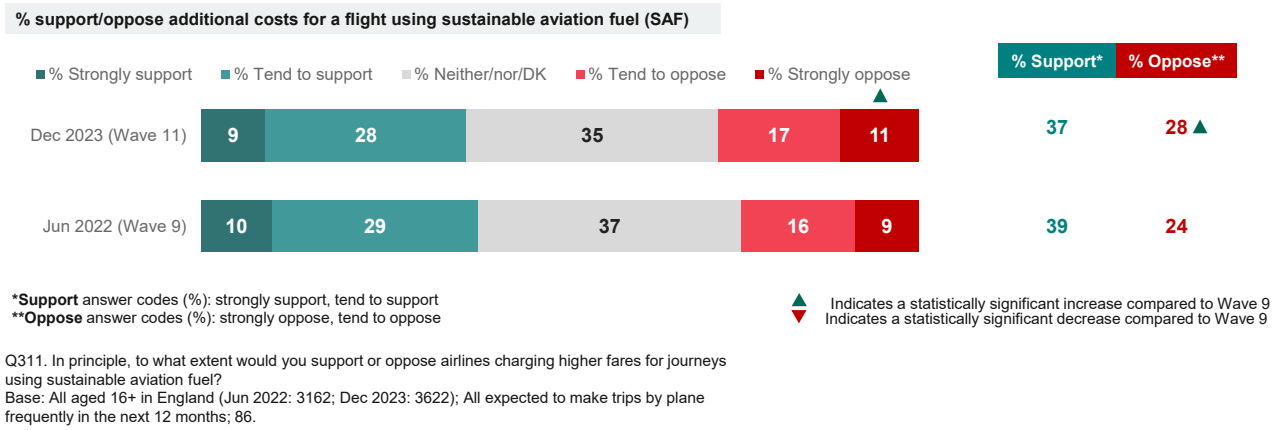
9.2 Support for charges

As was the case in June 2022 (Wave 9), in December 2023 (Wave 11) there was more support than opposition for the principle of airlines charging higher fares for a flight using sustainable aviation fuels, as shown in **Figure 9.2.**

Just under four in ten people (37%) said they would *strongly support* or *tend to support* higher fares, in line with June 2022 (Wave 9) (39%). However, opposition was four percentage points higher in December 2023 (28%) than it was in June 2022 (Wave 9) (24%). Just under three in ten people (29%) said they *neither support nor oppose* this.

- Those in higher income households (earning £100,000 or more) were more likely to support paying extra compared to lower income households (earning up to £25,999 per year) (49% compared to 33%).
- Support was higher among those who expected to make trips by plane frequently in the next 12 months (10 or more times) than for those who do not expect to take any flights in the next 12 months (51% compared to 37%).

Figure 9.2 – Support for airline charges for sustainable aviation fuels



***Support** answer codes (%): strongly support, tend to support
****Oppose** answer codes (%): strongly oppose, tend to oppose

▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

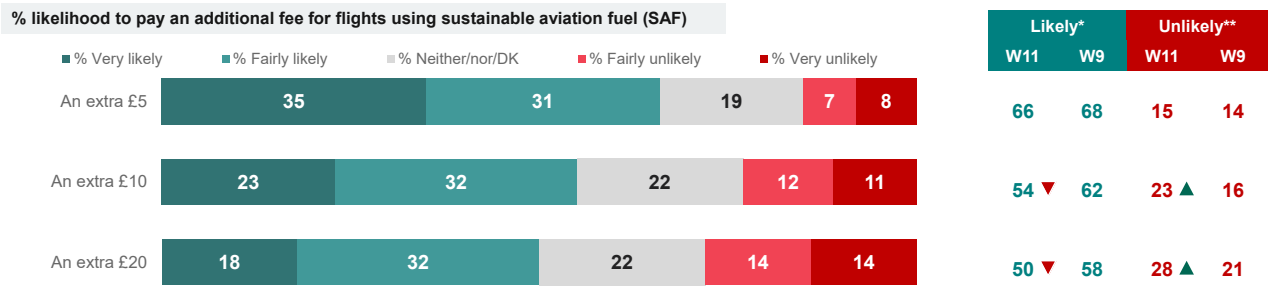
Q311. In principle, to what extent would you support or oppose airlines charging higher fares for journeys using sustainable aviation fuel?
Base: All aged 16+ in England (Jun 2022: 3162; Dec 2023: 3622); All expected to make trips by plane frequently in the next 12 months; 86.

9.3 Likelihood of paying charges

Respondents were asked about the likelihood of paying an extra charge for a £100 short haul flight using greener alternatives, with three cost options presented. Respondents were randomly selected to answer about one of the cost options only - £5, £10, or £20. This was to avoid respondents being influenced by which order they saw the responses (order effects), or which price they had seen first (anchoring effects).

The stated likelihood of paying extra for flights using sustainable aviation fuels or a hydrogen-powered plane decreased as the potential extra cost increased, as shown in **Figure 9.3**. Just over two-thirds of people (66%) said that they would be *likely* to pay an extra £5, in line with June 2022 (Wave 9).

Figure 9.3 – Sustainable aviation fuel - likelihood to pay



***Likely** answer codes (%): very likely, fairly likely
****Unlikely** answer codes (%): fairly unlikely, very unlikely

▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

Q312. How likely or unlikely do you think you would personally be to pay extra for a flight that was made using greener alternatives such as sustainable aviation fuel or a hydrogen-powered plane if you were charged: an extra £5, an extra £10, an extra £20?
Base: All aged 16+ in England (Jun 2022: 3162 – split sample - £5 (1033), £10 (1050), £20 (1079); Dec 2023: 3622– split sample - £5 (1201), £10 (1187), £20 (1234)

The proportion who said they were *likely* to pay an extra £10 fell to 54% in December 2023 (Wave 11) from 62% in June 2022 (Wave 9). The proportion likely to pay an extra £20 was lower, at 50%, a decrease of eight percentage points compared to June 2022 (Wave 9) (58%).

The proportion who said they were *unlikely* to pay an extra £10 increased between to 23% December 2023 (Wave 11) from 16% in June 2022 (Wave 9) and there was a similar increase in the proportion *unlikely* to pay an extra £20, to 28% from 21%. Despite these changes, and regardless of the amount of

extra payment, a higher proportion of people said they were likely to pay extra than said they were unlikely.

There were some differences by subgroups:

- People in higher income households were more likely to pay an extra £10 than low-income households (earning up to £25,999 per year) (74% comparted to 44%).
- A higher proportion of those intending to take a trip by plane in the next 12 months said they would be likely to pay an extra £20 compared to those who said they did not expect to fly at all (54% compared to 44%).

9.4 Battery-powered electric planes – awareness and knowledge

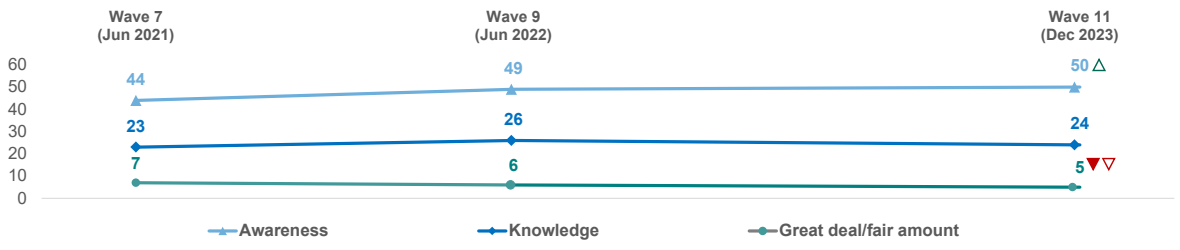
In December 2023 (Wave 11), half of people had some awareness of battery-powered electric planes (50%), an increase of six percentage points since June 2021 (Wave 7) (44%), shown in **Figure 9.4**. A similar proportion had *never heard of* the technology (48%).

- Those in the lowest income households (earning less than £25,999 annually) were more likely to have *never heard of* battery-powered electric planes (53%), than all other income groups, including the highest income households (earning over £100,000) (38%).
- Awareness was higher among those aged 75+ (57%) compared to those aged 16-24 and 25-34 (both 43%).

Self-reported knowledge of battery-powered electric planes - people knowing *a great deal*, *a fair amount* or *just a little* - was 24%, in line with June 2021 (Wave 7) (23%) and June 2022 (Wave 9) (26%).

- Self-reported knowledge was higher in highest income households (earning £100,000 or more) (29%), compared to the lowest income households (earning up to £25,999 per year) (22%).

Figure 9.4 – Battery-powered electric planes - awareness and knowledge



Knowledge answer codes (%): A great deal, A fair amount, Just a little
Awareness answer codes (%): A great deal, A fair amount, Just a little, Heard of, know nothing about them/it

Q146. Before today, how much, if anything, would you say you knew about battery-powered electric planes?
Base: All 16+ in England (Jun 2021: 3392; Jun 2022: 3162: Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7

▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

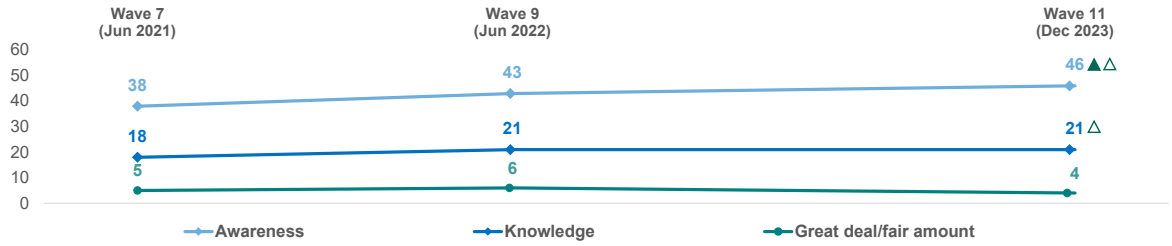
9.5 Hydrogen-powered electric planes – awareness and knowledge

Levels of awareness of hydrogen-powered planes has increased. It was higher in December 2023 (Wave 11) (46%) than in June 2022 (Wave 9) (43%) and June 2021 (38%), as shown in **Figure 9.5**.

Self-reported knowledge of hydrogen-powered planes - people knowing *a great deal*, *a fair amount* or *just a little* - was 21% in December 2023 (Wave 11), the same proportion as June 2022 (Wave 9) and a three-percentage point increase since June 2021 (18%). However, awareness remained lower than for any other transport technology. More than half of people (51%) said they had *never heard of* them, and a further quarter (25%) said they had *heard of but know nothing* about them.

- Self-reported awareness was highest among those aged 65-74 (54%) and 75+ (56%) compared to those aged 16-24 and 25-34 (both 42%).
- Those in the highest income households (earning over £100,000) were more likely to report knowing at least a little (29%) than those in the lowest income households (earning less than £25,999) (19%).

Figure 9.5 – Hydrogen-powered planes - awareness and knowledge



Knowledge answer codes (%): A great deal, A fair amount, Just a little
Awareness answer codes (%): A great deal, A fair amount, Just a little, Heard of, know nothing about them/it

Q148. Before today, how much, if anything, would you say you knew about hydrogen-powered planes?
Base: All 16+ in England (Jun 2021: 3392; Jun 2022: 3162; Dec 2023: 3622)

△ Indicates a statistically significant increase compared to Wave 7
▽ Indicates a statistically significant decrease compared to Wave 7

▲ Indicates a statistically significant increase compared to Wave 9
▼ Indicates a statistically significant decrease compared to Wave 9

10 Appendix

10.1 Methodology

The Department for Transport (DfT) commissioned Ipsos to undertake a series of surveys to measure public awareness, attitudes and behaviours in relation to existing and emerging transport technologies, aiming to:

- fill gaps in knowledge about what the public know and think via a survey representative of those aged 16+ living in England; and
- identify and analyse differences between population subgroups.

DfT's Technology Tracker series involved a biannual face-to-face omnibus survey up from 2017 until Wave 5, conducted in December 2019. Due to the Coronavirus pandemic and the halt to face-to-face in-home interviewing, the survey moved to an online methodology for Wave 6, in August 2020, with a small number of respondents interviewed over the phone. All previous wave data can be found here: https://www.gov.uk/government/publications/transport-and-transport-technology-public-attitudes-tracker

On behalf of DfT, Ipsos used its UK KnowledgePanel for the Technology Tracker series for the first time for Wave 7, conducted in June 2021, and this entirely online methodology has been used since. Due to a change in methodology, it is not possible to provide direct comparisons with previous waves. This comparison is not possible because:

- The survey wording has changed from previous waves so will not allow for direct comparison.
- The methodology change from face-to-face to online may have caused selection effects, i.e. the different individuals taking part in the survey as a result of the change in sampling approach.
- The change in interview mode may also have caused measurement effects, i.e., the difference in response given by respondents would not have been like-for-like considering the change in method.

A representative sample of 3,622 adults aged 16+ across England completed the survey between 7th December and 13th December 2023. Wave 10, like Wave 7, Wave 8, Wave 9 and Wave 10, involved random probability sampling, meaning that quotas were not used. Instead, Ipsos stratified KnowledgePanel sample to account for over-/under-representation of groups and geographies within the composition of the panel as well as different response rates, before inviting panel members to take part.

To allow comparisons between ethnic minority groups and white respondents, the Department for Transport requested that Ipsos boosted the number of respondents from ethnic minority backgrounds in Wave 7 (resulting in an additional sample of 432) but this has not been done since.

A full list of waves and sample sizes can be seen below:

Wave	Fieldwork dates	Sample size (total, including boost)	Ethnic minority boost
Wave 7	24th – 30th June 2021	3,392	432
Wave 8	9th – 15th December 2021	3,219	N/A
Wave 9	30th June – 6th July 2022	3,162	N/A
Wave 10	8th – 14th December 2022	3,207	N/A
Wave 11	7th – 13th December 2023	3,622	N/A

Each of these waves used a fresh sample of KnowledgePanel members.

Data are weighted by age, gender, region, Index of Multiple Deprivation quintile, education, ethnicity and number of adults in the household in order to reflect the profile of the adult population in England.

This report focuses on the following demographic groups: age, ethnicity, urbanity, and household income based on the following categories: <£25,999, £26,000-£51,999, £52,000-£99,999, £100,000+.

Commentary focuses on significant differences *between* sub-groups in the same category (e.g. different age groups) based on a 95% confidence interval. Lack of reference to other groups and geographies does not mean there are not statistically significant differences – for example, men's claimed levels of awareness and knowledge tend to be higher than women's, and there are some differences between regions. Data tables of the full Wave 11 dataset are available on request and are published alongside this report.

The total sum of answer codes may appear to be higher/lower than 100% and combinations might not sum to their constituent parts (e.g. 'agree' relative to 'strongly agree'/'tend to agree'). This is due to the rounding of results to the nearest whole number.

10.2 KnowledgePanel methodology

Panellists are recruited via a random probability unclustered address-based sampling method. This means that every household in the UK has a known chance of being selected to join the panel. Letters are sent to selected addresses in the UK (using the Postcode Address File) inviting them to become members of the panel. Invited members can sign up to the panel by completing a short online questionnaire or by returning a paper form. Up to 2 members of the household can sign up to the panel. Members of the public who are digitally excluded can register to the KnowledgePanel either by post or by telephone, and are given a tablet, an email address, and basic internet access which allows them to complete surveys online.

The survey was designed using a 'mobile-first' approach, which took into consideration the look, feel and usability of a questionnaire on a mobile device. This included: a thorough review of the questionnaire length to ensure it would not over burden respondents from focusing on a small screen for a lengthy period, avoiding the use of grid style questions (instead using question loops which are more mobile friendly, and making questions 'finger-friendly' to they're easy to respond to. The questionnaire was also compatible with screen reader software to help those requiring further accessibility.

The KnowledgePanel is a random probability survey panel. Therefore, the KnowledgePanel does not use a quota approach when conducting surveys. Instead invited samples are stratified when conducting waves to account for profile skews within the panel.

Two members per household are allowed to register on the KnowledgePanel. Therefore, we employ a design weight to correct for unequal probabilities of selection of household members.

Calibration weights are also applied using the latest population statistics relevant to the surveyed population.

- Calibration weighting was applied using the following variables: Region and an interlocked variable of Gender by Age. Both used ONS 2020 mid-year population estimates as the weighting target.

- Demographic weights were then applied to correct for imbalances in the achieved sample; the data was weighted on: Education, Ethnicity, Index of Multiple Deprivation (quintiles), and number of adults in the household. Estimates from the ONS 2020 mid-year population estimates and Annual Population Survey were used as the weighting target.

10.3 Questionnaire

The first set of questions are asked on behalf of the Department for Transport. The questions are about the different types of transport that you may use and your plans for the future.

ASK AGED 17+ ONLY
SINGLE CODE
Q101
Do you hold a valid UK car driving licence?
This includes international permits or other foreign licences valid in the UK.
Please select one option only

1. Yes, full licence for car
2. Yes, provisional licence for car
3. Currently disqualified
4. No, I do not hold a valid UK driving licence
998. Don't know

ASK ALL
SINGLE CODE
Q102
How many cars or vans does <u>your household</u> own or have continuous use of at present?
Please include company cars if available for your private use. Please also include any broken-down cars or vans which may be in use within the next month.
Please select one option only
1. 1
2. 2
3. 3 or more
4. None
998. Don't know

ASK ALL WITH CARS/VANS IN HOUSEHOLD OR HAVE USE OF THEM (CODES 1-3 AT Q102)
SINGLE CODE
Q103
Do you personally own or have continual use of a car or van?
Please include company cars if available for your private use. Please also include any broken-down cars or vans which may be in use within the next month.
Please select one option only
1. Yes
2. No
998. Don't know

ASK ALL WHO HAVE PERSONAL USE/OWN A CAR OR VAN [CODE 1 AT Q103]
SINGLE CODE
W8 INT Q201
Thinking now about the one car or van that you personally use the most, whether as driver or passenger, what fuel does the engine use?
If you use two or more cars/vans equally, please think about the one you used most recently.
Please select one option only
1. Petrol
2. Diesel
3. Electric/battery only
4. Non-plug-in hybrid
5. Plug-in hybrid
6. Liquified Petroleum Gas (LPG)
7. Bi-fuel (a combination of any two of petrol or diesel or ethanol with natural gas or LPG)
8. Other (please specify)
998. Don't know

ASK ALL WITH CARS/VANS IN HOUSEHOLD OR HAVE USE OF THEM (CODES 1-3 AT Q102)
SINGLE CODE
W8 INT Q202
Which ONE of the following best describes where you/your household typically parks your vehicle?
Please think about parking at the property where you live most of the time.
Please select one option only
1. In a space I own or that is allocated to me/us such as a private driveway or garage
2. In a communal or shared car park at the property
4. In a private car park
5. In a public or council car park
6. On a road or street
6. Where a friend or family member lives
7. Other (please specify)

ASK ALL WITH A VALID UK DRIVING LICENCE [CODES 1-3 AT Q101]
SINGLE CODE
Q104
When, if at all, do you think you will personally next buy, lease or replace a car or van, either new or second hand?
Please select one option only
1. Within the next year
2. In more than 1 year, but up to 2 years
3. In more than 2 years, but up to 3 years
4. In more than 3 years, but up to 5 years
5. In more than 5 years
6. I don't intend to ever buy or replace a car/van
998. Don't know

ASK ALL WHO INTEND TO BUY OR REPLACE A CAR/VAN- (CODES 1-5 AT Q104)
SINGLE CODE
Q105
And is the car or van that you intend to buy or lease in the future more likely to be new or second hand?
Please select one option only
1. More likely to be a new car/van
2. More likely to be a second-hand car/van
998. Don't know

ASK ALL WHO INTEND TO BUY OR REPLACE A CAR/VAN (CODES 1-5 AT Q104)
SINGLE CODE
Q106
What type of car or van do you think you will most likely purchase or lease next time?
If you would buy more than one type, please select which one you would use for your main vehicle.
Please select one option only
RANDOMISE CODES 1-4
1. Petrol car or van
2. Hybrid car or van (petrol and electric)
3. Diesel car or van
4. Electric/battery only car or van
5. Other (please specify) **[FIX]**
998. Don't know **[FIX]**

ASK ALL WHO WILL MOST LIKELY PURCHASE A HYBRID CAR/VAN (CODE 2 AT Q106)
SINGLE CODE
Q107
What type of hybrid car or van do you think you will most likely purchase or lease next time?
Please select one option only
RANDOMISE CODES 1-2
1. A plug-in hybrid (that plugs in to an external power source to recharge)
2. A non-plug-in hybrid (that recharges while driving and is ultimately fuelled by petrol or diesel – it cannot be plugged in to an external power source)
3. Undecided **[FIX]**
998. Don't know **[FIX]**

ASK ALL
SINGLE CODE
Q108
Unlike hybrid cars or vans, battery electric vehicles run fully off electricity. These fully electric cars or vans plug in to an external power source to recharge.
Before today, how much, if anything, would you say you knew about electric cars or vans?
Please select one option only
1. A great deal
2. A fair amount
3. Just a little
4. Heard of, know nothing about them
5. Never heard of them
998. Don't know

ASK ALL
ALLOW MULTICODE 1-8
Q111
Which of the following, if any, do you think are advantages of fully electric over petrol or diesel cars or vans?
Please select all that apply
RANDOMISE CODES 1-7
1. Environmental benefits (e.g. reduced pollution)
2. Cheaper to run or maintain
3. Less noisy
4. Reduced road tax
5. Better vehicle performance (e.g. speed, handling, size, looks)
6. No need to visit petrol stations to top-up fuel
7. Recharging is easier/more convenient than re-fuelling
8. Other (please specify) **[FIX]**
9. None of these – I don't believe there are any advantages **[FIX] [EXCLUSIVE]**
998. Don't know **[FIX] [EXCLUSIVE]**

ASK ALL
ALLOW MULTICODE 1-9
Q113
Which of the following, if any, do you think are disadvantages of electric over petrol or diesel cars or vans?
Please select all that apply
RANDOMISE CODES 1-8
1. Less distance can be travelled on one charge
2. Not enough charging points
3. Expensive to run or maintain
4. Knowing where and how to charge
5. The time taken to recharge
6. Cost to buy
7. The need to recharge
8. Negative impacts on the environment
9. Other (please specify) **[FIX]**
10. None of these – I don't believe there are any disadvantages **[FIX] [EXCLUSIVE]**
998. Don't know **[FIX] [EXCLUSIVE]**

ASK ALL
SINGLE CODE PER STATEMENT
W8 PUR Q203
These next questions are about electric vehicle charging points – that is, places where members of the public can charge an electric vehicle perhaps when they are en route somewhere or because they cannot charge their vehicle at home. These are found in some car parks, at garages and service stations on motorways/major roads and in towns and cities. The images show some examples.

Thinking back to the PAST MONTH or so, did you see an electric vehicle charging point(s) in the following places or not? It does not matter whether or not you used the charging point.
ALWAYS IN THIS ORDER
a) …within your local area – that is within 15-20 minutes' walk or less than 5 minutes' drive?
b) …somewhere outside your local area?
Please select one option only
1. Yes – did see an electric vehicle charging point
2. No – did not see an electric vehicle charging point
3. Don't know/can't remember

ASK ALL WHO RESPONDED A/1 OR B/1 AT W8 PUR Q203
ALLOW MULTICODES AT 1 - 7
W8 PUR Q204
You said that you have seen an electric vehicle charging point(s) in the past month. Where did you see it/them?
Please select all that apply
1. On the street
2. At a supermarket
3. At a public or council car park
4. At a workplace e.g. outside business offices
5. At a garage/petrol station where you can refuel
6. At a service station on a motorway/major road
7. Other (please specify)
998. Don't know/can't remember **[EXCLUSIVE]**

ASK ALL
SINGLE CODE
W8 PUR Q205
Thinking about where you live most of the time, how far away is the nearest charging point for electric vehicles – that is, a point which can be used by any member of the public wanting to charge an electric vehicle? If you are not sure, please give your best estimate.
Please select one option only
1. Less than a mile away (approximately a 3-minute drive, 20-minute walk)
2. More than a mile but less than 5 miles away (up to a 15-minute drive, 1 hour walk)
3. More than 5 miles but less than 10 miles away (up to a 30-minute drive, 1.5 hour walk)
4. 10 miles or further away
998. Don't know

ASK ALL
OPEN ENDED
W8 PUR Q206
As you may know, some electric vehicle owners charge their vehicles at charging points situated in public places. What concerns would you have, if any, about using a charging point such as this once you had got there?
[INCLUDE POP-UP QUESTION ICON WITH THE TEXT: For example at car parks, at garages and service stations on main roads and in towns cities.]
Please type your response in the text box below
[OPEN ENDED TEXT BOX]
2. I would not have any concerns [EXCLUSIVE]
998. Don't know/need further information [EXCLUSIVE]

ASK ALL
SINGLE CODE
Q117
Now a few questions about self-driving cars or vans, sometimes referred to as automated or autonomous cars or vans.
Self-driving vehicles are not yet available for everyday use in the UK.
Before today, how much, if anything, would you say you knew about self-driving cars or vans?
Please select one option only
1. A great deal
2. A fair amount
3. Just a little
4. Heard of, know nothing about them
5. Never heard of them
998. Don't know

ASK ALL
ALLOW MULTICODES 1-8
Q119
Which of the following, if any, do you think are advantages of self-driving vehicles?
Please select all that apply
RANDOMISE CODES 1-7
1. They are safer due to less chance of driver error
2. Allow you to do other things while driving
3. They result in less driver fatigue
4. They enable better traffic flow and less congestion
5. Could allow anyone to drive
6. Less stressful due to not worrying about driving
7. Controls/regulates speed
8. Other (please specify) **[FIX]**
9. None of these – I don't believe there are any advantages **[FIX], [EXCLUSIVE]**
998. Don't know **[FIX], [EXCLUSIVE]**

ASK ALL
ALLOW MULTICODES 1-8
Q121
Which of the following, if any, do you think are disadvantages of self-driving vehicles?
Please select all that apply
RANDOMISE CODES 1-7
1. Personal safety concerns (e.g. road traffic accidents)
2. Road safety concerns (e.g. vehicles' ability to safely complete a manoeuvre)
3. Loss of driver control
4. Drivers will become lazy and pay less attention
5. Over-reliance on technology
6. The technology is still unproven
7. Expensive to buy and maintain
8. Other (please specify) **[FIX]**
9. None of these – I don't believe there are any disadvantages **[FIX], [EXCLUSIVE]**
998. Don't know **[FIX], [EXCLUSIVE]**

ASK ALL
SINGLE CODE PER STATEMENT
W9 SDV Q302
Self-driving vehicles are vehicles that are capable of safely and legally driving themselves in some circumstances and situations.

For the foreseeable future, they will have self-driving features, which means the vehicle will switch between the *vehicle being in control* (self-driving mode 'on') and the *driver being in control* (self-driving mode 'off').

Here are some statements about self-driving vehicles. For each one, please select whether you think it is true or false or whether you don't know.

When using a self-driving vehicle as a driver and the self-driving mode is 'on'

LOOP, SINGLE CODE PER ROW, RANDOMISE ROWS
A. I am **not responsible** for how the vehicle drives
B. **I am allowed** to use built-in screens to watch TV (i.e. the infotainment system)
C. I **do not have to be fit to drive** (e.g. I can sleep and drink alcohol)
D. **I am allowed** to use a mobile phone (hand-held)

Please select one option only
1. True
2. False
998. Don't know

ASK ALL
SINGLE CODE
Q122
An electric or motorized scooter is a scooter with a small engine or electric motor. An electric scooter is commonly referred to as an e-scooter. E-scooters can be purchased for private use or hired in a number of locations across the country.
Before today, how much, if anything, would you say you knew about electric scooters?

Please select one option only
1. A great deal
2. A fair amount
3. Just a little
4. Heard of, know nothing about them
5. Never heard of them
998. Don't know

ASK ALL
SINGLE CODE
Q123
Do you <u>personally</u> own an electric scooter?
Please select one option only
1. Yes
2. No
998. Don't know

ASK ALL
SINGLE CODE
Q124
How often, if at all, do you personally use a <u>privately owned</u> electric scooter in the UK?
Please select one option only
1. At least once a day
2. 5 or 6 times a week
3. 3 or 4 times a week
4. Once or twice a week
5. Less than that but more than twice a month
6. Once or twice a month
7. Less than that but more than twice a year
8. Once or twice a year
9. Less than once a year
10. Never

ASK ALL
SINGLE CODE
Q125
How often, if at all, do you personally use a rental electric scooter in the UK?
Please select one option only
1. At least once a day
2. 5 or 6 times a week
3. 3 or 4 times a week
4. Once or twice a week
5. Less than that but more than twice a month
6. Once or twice a month
7. Less than that but more than twice a year
8. Once or twice a year
9. Less than once a year
10. Never

ASK ALL WHO RESPONDED 1–9 AT Q124 OR Q125
MULTICODES 1-10
W8 ES Q209
What are your reasons for using an e-scooter?
Please only include travel within the UK.
Please select all that apply
RANDOMISE CODES 1-9
1. Going to or from work
2. Other work-related reasons e.g. travelling to a meeting outside my usual place of work
3. Visiting friends/family
4. Going shopping
5. Going for a ride
6. Going to or from education (e.g. school, college, university etc.)
7. Going to or from a leisure activity (e.g. eating/drinking, cinema, music venue, playing sport etc.)
8. Going to or from a medical appointment (e.g. doctor, hospital, dentist etc.)
9. To get to public transport
10. Other (please specify) **[FIX]**
998. Don't know **[FIX], [EXCLUSIVE]**

ASK ALL
SINGLE CODE
W8 ES Q210
How likely or unlikely are you to purchase an e-scooter in the next 12 months?
REVERSE SCALE FOR HALF OF RESPONDENTS
Please select one option only
1. Very likely
2. Fairly likely
3. Neither likely nor unlikely
4. Fairly unlikely
5. Very unlikely
998. Don't know

ASK ALL
ALLOW MULTICODES 1-14
Q127
Which of the following, if any, do you think are advantages of electric scooters?
Please select all that apply
RANDOMISE CODES 1-13
1. Environmental benefits (e.g. reduced pollution)
2. Quicker to get around than walking
3. Easy to use
4. Cheaper than other travel options
5. Able to easily store and carry (e.g. onto other forms of transport, into work)
6. Good alternative to cars
7. Convenient for short journeys
8. Increased use leads to less traffic/cars on the road
9. Fun to ride
10. Easy to park (if using rental e-scooter)
11. Good for people who can't travel (far) by foot/bike
12. The cost to buy or rent
13. A way of keeping active/healthy
14. Other (please specify) **[FIX]**
15. None of these – I don't believe there are any advantages **[FIX], [EXCLUSIVE]**
998. Don't know **[FIX], [EXCLUSIVE]**

ASK ALL
ALLOW MULTICODES 1-11
Q129
Which of the following, if any, do you think are disadvantages of electric scooters?
Please select all that apply
RANDOMISE CODES 1-10
1. Poses safety risk on busy roads
2. Poses safety risk to pedestrians (e.g. on the road, pavements)
3. Users do not follow law
4. Poses safety risk to the rider
5. Relies on recharging a battery
6. Fewer health benefits than cycling or walking
7. Weather dependent
8. Lack of regulation (e.g. no licence/insurance/helmet required)
9. Cost to buy
10. Risk of battery fire
11. Other (please specify) **[FIX]**
12. None of these – I don't believe there are any disadvantages **[FIX], [EXCLUSIVE]**
998. Don't know **[FIX], [EXCLUSIVE]**

ASK ALL
SINGLE CODE PER STATEMENT
W8 ES Q212
ROTATE STATEMENTS A/B, AND C/D FOR HALF OF RESPONDENTS
E-scooters can be purchased for private use or hired in a number of locations across the country. Here are some statements about rules about using e-scooters in the UK. For each one I would like you to tell me whether you think it is true or false or whether you don't know.

A) If you own an e-scooter, you are legally allowed to ride it on pavements and footpaths?
B) If you own an e-scooter, you are legally allowed to ride it on roads and cycle lanes?
C) If you hire an e-scooter, you are legally allowed to ride it on pavements and footpaths?
D) If you hire an e-scooter, you are legally allowed to ride it on roads and cycle lanes?

Please select one option only
1. True
2. False
998. Don't know

ASK ALL
SINGLE CODE
Q137
An electric cycle or e-cycle, commonly referred to as an e-bike, is one that is powered by electricity as well as propelled by pedals.
Before today, how much, if anything, would you say you knew about e-cycles?

Please select one option only
1. A great deal
2. A fair amount
3. Just a little
4. Heard of, know nothing about them
5. Never heard of them
998. Don't know

ASK ALL
SINGLE CODE
W8 EC Q214
How likely or unlikely are you to purchase an e-cycle in the next 12 months?
REVERSE SCALE FOR HALF OF RESPONDENTS
Please select one option only
1. Very likely
2. Fairly likely
3. Neither likely nor unlikely
4. Fairly unlikely
5. Very unlikely
6. I already own an e-cycle
998. Don't know

ASK ALL
SINGLE CODE
Q138
How often, if at all, do you personally use an e-cycle?
Please select one option only
1. At least once a day
2. 5 or 6 times a week
3. 3 or 4 times a week
4. Once or twice a week
5. Less than that but more than twice a month
6. Once or twice a month
7. Less than that but more than twice a year
8. Once or twice a year
9. Less than once a year
10. Never

ASK ALL
SINGLE CODE
W8 EC Q215
How often, if at all, do you personally use a standard cycle (e.g. a push-bike)?
Please select one option only
1. At least once a day
2. 5 or 6 times a week
3. 3 or 4 times a week
4. Once or twice a week
5. Less than that but more than twice a month
6. Once or twice a month
7. Less than that but more than twice a year
8. Once or twice a year
9. Less than once a year
10. Never

ASK ALL WHO RESPONDED 1 – 9 AT Q138
MULTICODE CODES 1-10
W8 EC Q216
What are your reasons for using an e-cycle?
Please only include travel within the UK.
Please select all that apply
RANDOMISE CODES 1-10
1. Going to or from work
2. Other work-related reasons e.g. travelling to a meeting outside my usual place of work
3. Visiting friends/family
4. Going shopping
5. Going for a ride
6. Going to or from education (e.g. school, college, university etc.)
7. Going to or from a leisure activity (e.g. eating/drinking, cinema, music venue, playing sport etc.)
8. Going to or from a medical appointment (e.g. doctor, hospital, dentist etc.)
9. To get to public transport
10. To keep active/healthy
110. Other **(PLEASE SPECIFY) [FIX]**
998. Don't know **[FIX, EXCLUSIVE]**

ASK ALL
ALLOW MULTICODES 1-7
Q140
Which of the following, if any, do you think are advantages of e-cycles?
Please select all that apply
RANDOMISE CODES 1-6
1. Environmental benefits (e.g. reduced pollution)
2. A way of keeping active/healthy
3. Less effort required than a normal bike
4. Can travel further distances than a normal bike
5. Can travel faster than a normal bike
6. More accessible for those with mobility issues
7. Other (please specify) **[FIX]**
8. None of these – I don't believe there are any advantages **[FIX, EXCLUSIVE]**
998. Don't know **[FIX, EXCLUSIVE]**

ASK ALL
ALLOW MULTICODES 1-8
Q142
Which of the following, if any, do you think are disadvantages of e-cycles?
Please select all that apply
RANDOMISE CODES 1-8
1. They are expensive to buy
2. Too heavy
3. Likely to be stolen
4. Travels too fast
5. Hard to store
6. Do not offer health benefits
7. Relies on recharging a battery
8. Risk of battery fire
9. Other (please specify) **[FIX]**
10. None of these – I don't believe there are any disadvantages **[FIX, EXCLUSIVE]**
998. Don't know **[FIX, EXCLUSIVE]**

ASK ALL
SINGLE CODE
W8 EC Q216B
An e-cycle share scheme is a service that allows people to pay to hire an e-cycle by collecting it from a "docking" point such as a bike rack or a "dockless" location such as a pavement or where it has been left by previous users. This could involve share schemes that are available to anyone, or they could be targeted share schemes that are available to employees in a workplace, or community groups.

How likely or unlikely would you be to use an e-cycle share scheme if it was available in your area?

REVERSE SCALE FOR HALF OF RESPONDENTS
Please select one option only
1. Very likely
2. Fairly likely
3. Neither likely nor unlikely
4. Fairly unlikely
5. Very unlikely
998. Don't know

ASK ALL
SINGLE CODE
Q130
A drone is an unmanned aerial vehicle guided by remote control or on-board computers.

Before today, how much, if anything, would you say you knew about drones?
Please select one option only
1. A great deal
2. A fair amount
3. Just a little
4. Heard of, know nothing about them
5. Never heard of them
998. Don't know

ASK ALL WHO HAVE HEARD OF DRONES BEFORE TODAY – CODES 1-4 at Q130
ALLOW MULTI-CODES 1-9
Q132
Here are a number of examples of things that drones have been used for.
Which of these uses of drones have you personally heard of before today? Please select all that apply.
Please select all that apply
RANDOMISE CODES 1-9
1. Leisure use (e.g. flying drones for fun, to take pictures & video)
2. Armed forces/military use (e.g. surveillance, airstrikes)
3. Police use (e.g. monitoring borders, surveillance)
4. Professional photography, filming and journalism
5. Emergency response (e.g. search and rescue)
6. Retail use (package delivery)
7. Retail use (stock checking)
8. Infrastructure management (e.g. building/bridge inspection, monitoring crops or livestock)
9. Distributing medical supplies (e.g. medicines, blood supplies)
10. None of the above **[EXCLUSIVE]**

ASK ALL
SINGLE CODE
Q133
To what extent do you support or oppose drones being used in the following situations?
Please select one option only
RANDOMISE CODES A – J
a) Leisure use (e.g. flying drones for fun or to take pictures & video)
b) Armed forces/military use (surveillance, air strikes)
d) Police use (e.g. monitoring borders, surveillance)
e) Professional photography, filming and journalism
f) Emergency response (e.g. search and rescue)
g) Retail use (package delivery)
h) Retail use (stock checking)
i) Infrastructure management (e.g. building/bridge inspection, monitoring crops or livestock)
j) Distributing medical supplies (e.g. medicines, blood supplies)

REVERSE SCALE 1-5
1. Strongly support
2. Tend to support
3. Neither support nor oppose
4. Tend to oppose
5. Strongly oppose
998. Don’t know **[FIX]**

ASK ALL
ALLOW MULTI-CODES 1-10
Q135
Which of the following concerns, if any, do you have about the use of drones?
Please select all that apply
RANDOMISE CODES 1 - 9
Concerns about privacy and intrusion
Concerns about collisions, crashes or accidents
The potential misuse of drones (e.g. hacking, terrorism, used by criminals)
Difficulty of tracing drone owners/operators and who can buy them
Noise pollution
Visual pollution
Impact on jobs (e.g. if drones take over human job roles)
The use of drones in the military if used as a weapon
Cost of buying and maintaining drones
Other (please specify) **[FIX]**
None of these **[EXCLUSIVE, FIX]**
I don't know enough about drones to have an opinion **[EXCLUSIVE, FIX]**
998. Don't know **[EXCLUSIVE, FIX]**

ASK ALL
SINGLE CODE
W9 FLY Q304

Flying taxis are aircraft that can fly passengers on short journeys, for example, within or between cities, towns and villages in the UK. The following questions are about <u>piloted flying taxis</u>.
Before today, how much, if anything, would you say you know about flying taxis?
Please select one option only
1. A great deal
2. A fair amount
3. Just a little
4. Heard of, know nothing about them
5. Never heard of them
998. Don't know

ASK ALL
ALLOW MULTICODES 1-7
W9 FLY Q306
Which of the following, if any, do you think are advantages of flying taxis?
Please select all that apply
RANDOMISE CODES 1-6
1. Environmental benefits (e.g. reduced pollution)
2. Fun to ride
3. Increased use leads to less traffic/cars on the road
4. More convenient/quicker than other modes of transport
5. Improved connectivity (e.g. between cities or rural areas)
6. Reaching key transport hubs (e.g. train stations, airports)
7. Other (please specify) **[FIX]**
8. None of these – I don't believe there are any advantages **[FIX, EXCLUSIVE]**

998. Don't know **[FIX, EXCLUSIVE]**

ASK ALL
ALLOW MULTICODES 1-9
W9 FLY Q308
Which of the following, if any, do you think are disadvantages of flying taxis?
Please select all that apply
RANDOMISE CODES 1 – 8
1. Concerns about privacy and intrusion (e.g. flying over private property at low altitude)
2. Collisions, crashes or accidents
3. Vulnerability to hacking or terrorism~~,~~
4. Technology is still unproven
5. Noise pollution
6. Visual pollution
7. Not affordable to users/potential users and passengers
8. May require us to produce more electricity
9. Other (please specify) **[FIX]**
10. None of these – I don't believe there are any disadvantages **[EXCLUSIVE, FIX]**

998. Don't know **[EXCLUSIVE, FIX]**

ASK ALL
SINGLE CODE
W9 FLY Q309
If flying taxis were proven and available for use, how likely or unlikely would you be to use one?
REVERSE SCALE FOR HALF OF RESPONDENTS
Please select one option only
1. Very likely
2. Fairly likely
3. Neither likely or unlikely
4. Fairly unlikely
5. Very unlikely

998. Don't know

ASK ALL
SINGLE CODE
Q146
Battery-powered electric planes use electricity rather than fuel for power.
Before today, how much, if anything, would you say you knew about battery-powered electric planes
Please select one option only
1. A great deal
2. A fair amount
3. Just a little
4. Heard of, know nothing about them
5. Never heard of them
998. Don't know

ASK ALL
OPEN-ENDED QUESTION
Q147
What concerns, if any, do you have about battery-powered electric planes?
Please write your answer in below
OPEN TEXT BOX
998. Don't know **[EXCLUSIVE]**
1. I do not have any concerns **[EXCLUSIVE]**

ASK ALL
SINGLE CODE
Q148
Hydrogen planes are powered by hydrogen fuel. They are powered either by converting hydrogen into electricity or by directly burning hydrogen fuel.
Before today, how much, if anything, would you say you knew about hydrogen-powered planes?
Please select one option only
1. A great deal
2. A fair amount
3. Just a little
4. Heard of, know nothing about it
5. Never heard of it
998. Don't know

ASK ALL
OPEN-ENDED QUESTION
Q149
What concerns, if any, do you have about hydrogen-powered planes?
Please write your answer in below
OPEN TEXT BOX
998. Don't know **[EXCLUSIVE]**
1. I do not have any concerns **[EXCLUSIVE]**

ASK ALL
SINGLE CODE
W9 SAF Q310
Sustainable aviation fuels are greener alternatives to aviation fuels currently in use, produced from sources such as household and industrial waste.
Before today, how much, if anything, would you say you knew about sustainable aviation fuels?
Please select one option only
1. A great deal
2. A fair amount
3. Just a little
4. Heard of, know nothing about it
5. Never heard of it
998. Don't know

ASK ALL
SINGLE CODE
W9 SAF Q311
Sustainable aviation fuels are greener alternatives to aviation fuels currently in use, however, they are currently more expensive.
In principle, to what extent would you support or oppose airlines charging higher fares for journeys using sustainable aviation fuel?
1. Strongly support
2. Tend to support
3. Neither support or oppose
4. Tend to oppose
5. Strongly oppose
998. Don't know

SAMPLE SPLITTING INTO 3 CELLS, RANDOM ALLOCATION WITH EACH RESPONDENT VIEWING ONE OPTION A/B/C
SINGLE CODE
W9 SAF Q312
Imagine you're about to book a short haul flight, that is a flight of three hours or less and the fare was £100.
How likely or unlikely do you think you would personally be to pay extra for a flight that was made using greener alternatives (such as sustainable aviation fuel or a hydrogen-powered plane) if you were charged:
A. An extra £5
B. An extra £10
C. An extra £20
Please select one option only
1. Very likely
2. Fairly likely
3. Neither likely or unlikely
4. Fairly unlikely
5. Very unlikely
998. Don't know

ASK ALL
SINGLE CODE
W9 SAF Q313
How many trips, if any, do you expect to make by plane in the next 12 months? Please count the outward and return flight, and any transfers as one trip.
1. One
2. Between 2 – 4
3. Between 5 – 10
4. More than 10
5. Won't do this
998. Don't know

NEW SCREEN
ASK ALL
GQ_INTRO

These next questions are about your general travel habits and personal circumstances.

ASK ALL
MULTICODE 1-14
RANDOMISE 1-13
B17.

Looking at this list, which of these things are important to you when buying a car or van?
Please select all that apply.
1. Comfort
2. Costs – purchase/running/resale value/tax/insurance
3. Small engine
4. Large engine
5. Environmentally friendly/low CO2 Emissions
6. Image of brand/brand preference
7. Image of model/model preference
8. Interior space/functionality/boot size
9. Reliability
10. Safety
11. Speed/performance
12. Style/design
13. Features – automated parking; adaptive cruise control; in-car Wi-Fi connection etc.
14. Other (please specify)
15. Don't know **[FIX, EXCLUSIVE]**

ASK ALL
SINGLE CODE
CN76
And how often nowadays, if at all, do you use home delivery (e.g. internet shopping/telephone ordering) for any non-food shopping, such as for buying books, music, clothes, holidays, or insurance?
Please select one option only
1. Regularly
2. Sometimes
3. Have only done this once or twice
4. Never
5. Don't know

ASK ALL
MULTICODE
B2.
Do you have any disability or other long-standing health problem that makes it difficult for you to do any of the following?
Please include difficulty due to old age.
Please select all that apply

1. Go out on foot
2. Use local buses
3. Get in or out of a car
4. None of these **[EXCLUSIVE]**

ASK ALL
SINGLE CODE
B39b
Do you have any disability or other long standing health problem that makes it/would make it difficult or impossible for you to ride a bicycle? Please include difficulty due to old age.
Please select one option only

1. Yes – impossible
2. Yes – difficult
3. No
4. Don't know

ASK ALL
SINGLE CODE
F5.
Do any children live with you either all or some of the time? By children, we are referring only to children under the age of 16.
Please select one option only.

1. Yes
2. No
3. Prefer not to say

ASK ALL
SINGLE CODE
F12.
Please look at this screen and indicate whether you have any of the educational or school qualifications listed. Start at the top of the list and indicate the first one you come to that you have.
Please select one option only

1. University Higher Degree (e.g. MSc; PhD)
2. First degree level qualification (e.g. BA; BSc) including foundation degrees; PGCE
3. Diploma in higher education; HNC; HND; Nursing or Teaching qualification (excluding PGCE)
4. A level; AS level; NVQ level 3; GNVQ Advanced; or equivalent
5. GCSE grade A* - C; O level; CSE grade 1; NVQ level 2; GNVQ intermediate; or equivalent
6. GCSE grade D – G; CSE below grade 1; NVQ level 1; GNVQ Foundation level; or equivalent
7. None of the above

999. Prefer not to say

Our standards and accreditations

Ipsos' standards and accreditations provide our clients with the peace of mind that they can always depend on us to deliver reliable, sustainable findings. Our focus on quality and continuous improvement means we have embedded a "right first time" approach throughout our organisation.

ISO 20252

This is the international specific standard for market, opinion and social research, including insights and data analytics. Ipsos UK was the first company in the world to gain this accreditation.

Market Research Society (MRS) Company Partnership

By being an MRS Company Partner, Ipsos UK endorse and support the core MRS brand values of professionalism, research excellence and business effectiveness, and commit to comply with the MRS Code of Conduct throughout the organisation & we were the first company to sign our organisation up to the requirements & self-regulation of the MRS Code; more than 350 companies have followed our lead.

ISO 9001

International general company standard with a focus on continual improvement through quality management systems. In 1994 we became one of the early adopters of the ISO 9001 business standard.

ISO 27001

International standard for information security designed to ensure the selection of adequate and proportionate security controls. Ipsos UK was the first research company in the UK to be awarded this in August 2008.

The UK General Data Protection Regulation (UK GDPR) and the UK Data Protection Act 2018 (DPA)

Ipsos UK is required to comply with the UK General Data Protection Regulation (GDPR) and the UK Data Protection Act (DPA). These cover the processing of personal data and the protection of privacy.

HMG Cyber Essentials

Cyber Essentials defines a set of controls which, when properly implemented, provide organisations with basic protection from the most prevalent forms of threat coming from the internet. This is a government-backed, key deliverable of the UK's National Cyber Security Programme. Ipsos UK was assessed and validated for certification in 2016.

Fair Data

Ipsos UK is signed up as a "Fair Data" company by agreeing to adhere to twelve core principles. The principles support and complement other standards such as ISOs, and the requirements of data protection legislation.

For more information

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About Ipsos Public Affairs

Ipsos Public Affairs works closely with national governments, local public services and the not-for-profit sector. Its c.200 research staff focus on public service and policy issues. Each has expertise in a particular part of the public sector, ensuring we have a detailed understanding of specific sectors and policy challenges. Combined with our methods and communications expertise, this helps ensure that our research makes a difference for decision makers and communities.