

Car Club Annual Survey for London

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Foreword

These are exciting times for London's transport. The way Londoners move around the city is constantly evolving and the pace of change has accelerated in recent years. But as London grows beyond its historic peak, we must prepare our transport infrastructure for a population that is expected to reach 10.8 million people by 2041.

Today our streets can often be congested and dangerous – unwelcoming places to walk or cycle. Some parts of London have been planned around private car use for so long that there are no decent alternatives. Car dependency has significantly contributed to an increase in poor public health. Road transport causes around half of London's air pollution, which is a factor in thousands of premature deaths every year and leads to serious health problems.

Even though reducing vehicle emissions and investing in better public transport infrastructure is crucial to tackling these challenges, changing how people travel is equally as important. London boroughs are working with the Greater London Authority, Transport for London and other partners to do this. This means providing tools to create a lasting shift towards more walking, cycling and public transport use, coupled with measures that encourage the use of only the cleanest vehicles on London's streets.

This year's Car Club Annual Survey for London reinforces evidence gathered previously which suggests that car sharing has the potential to encourage behaviour change and reduce levels of private car ownership.

When Londoners do need to use a car, they are able to access a clean fleet of shared vehicles. The car club fleet in London emits 28 per cent less CO₂ than the average vehicle in the UK and 100 per cent of car club cars are already compliant with the capital's Ultra Low Emission Zone.

Boroughs are responsible for 95 per cent of London's roads and must be ever more ambitious and innovative in promoting cleaner, greener and more active transport modes. That's why London Councils' officers have been at the forefront of developing London's car club policies. The Task & Finish Group on Car Clubs, which was brought together by London Councils in early 2019, has developed several policy recommendations to support the car club sector in becoming an important part of London's journey towards a more sustainable future.

London Councils is also working closely with the RAC Foundation and Imperial College London on a new research project exploring ways of improving data-sharing between car club operators and London local government. We anticipate that this project will lead to a closer partnership between the public and private sectors.

We see car clubs as playing an important role in helping Londoners make better-informed decisions about private car ownership and cementing behaviour change in favour of active and low emission travel.

The 2017-18 annual survey is a welcome contribution to the existing evidence base and will inform London Councils' car club policy. Working together, we can continue to transform our city, using local knowledge and expertise to create a future London that is not only home to more people, but is a better place for all of us to live, work and enjoy.

Cllr Julian Bell



Chair of London Councils' Transport and Environment Committee

Executive Summary

The Car Club Annual Survey, London 2017/18 was completed by almost 5,400 car club members in London, from a membership of around 245,000, a response rate of around 2%. Six car club operators were requested to submit information about their membership characteristics and car club usage. The report contains a section on round trip members, a section on flexible members and for the first time, a section on point-to-point members.

The responses from members indicate how all car club models can help to:

- ✓ Improve air quality across London
- ✓ Reduce carbon emissions from driving
- ✓ Reduce private car ownership and use
- ✓ Reduce congestion throughout London

Improved air quality across London and reduced carbon emissions

Car club cars are significantly cleaner and more fuel efficient than a typical private car, which can assist in addressing the air quality and carbon emissions reduction challenges across London:

- The car fleet is 100% Ultra Low Emission Zone¹ (ULEZ) compliant
- The average carbon emissions of the London car club fleet was 28% lower than the 2017/18 UK average and 2.3% lower than the previous year
- The London car club fleet includes no diesel cars, which make up 40% of the UK car fleet

Reduced private car ownership and use

The results suggest that clubs can encourage behaviour change and reduce levels of private car ownership:

- 41% of round trip and flexible members and 26% of point-to-point members would have bought a first or additional private vehicle had they not joined a car club. This equates to 100,000 deferred car purchases.
- 18% of round trip, 15% of flexible members and 10% of point to point members have sold a private vehicle after joining a car club and no longer own a vehicle. This equates to an additional 42,000 car-free households across Greater London.
- More than half of all members said joining a car club has made it less likely that they will purchase a first or additional private vehicle over the next few years.

¹ To help improve air quality, an Ultra Low Emission Zone was introduced in central London on 8 April 2019. Most vehicles including cars and vans will need to meet new, tighter exhaust emission standards (ULEZ standards) or pay a daily charge to travel within the area of the ULEZ.

- Car clubs reduce the need for car parking, those cars which have been removed from on-street due to deferred purchase create space for urban realm improvements and healthier streets.
- Average trip lengths differ by car club model; the average distance travelled per hire in round-trip car clubs is 34 miles, compared to 4 miles using point-to-point and flexible car clubs.

Reduced traffic congestion levels

Car club member travel patterns may help reduce traffic congestion levels:

- Three in four round-trip car club bookings in London start during off-peak or weekend periods
- Based on member surveys, round-trip members reported an average reduction in miles driven of 620 miles a year after joining a car club, similar to that of point-to-point members who reported a reduction of 680 miles while flexible members reported a lower level of reduction of 286 miles a year.
- Based on survey responses the average miles driven by a car club member in both car club and private cars is low at 3,602 miles for round trip members, 4,391 miles for flexible members and 4,001 miles for point-to-point members, compared to a Greater London average of 6,300 miles for Greater London residents that own at least one private vehicle (NTS, 2017).

The analysis presented based on the member survey is based on responses from 5,400 London car club members, this is supplemented by data about car club vehicles from car club operators. For the next Annual Survey we have identified a series of improvements to the survey methodology and data collection.

1 Introduction

- 1.1 This is the eleventh edition of the Car Club Annual Survey for London, and covers the period March 2017 – April 2018. It has been administered by consultants Steer on behalf of London Councils, with fleet profiling undertaken by GFleet Services. At the time of the survey there were seven car club operators with cars in London (Bluecity, Co-wheels, DriveNow, E-Car Club, Enterprise Car Club, Ubeeqo and Zipcar), although E-Car Club and Ubeeqo share the same parent company – Europcar.

The London Car Club Annual Survey

- 1.2 The Car Club Annual Survey for London has provided a standardised data collection system to assess the impacts of car clubs and to assist in informing the policy development for car clubs in London and to help boroughs make evidence-based decisions. Since 2007, a range of data has been collected from car club operators about their fleets and car club members about their travel habits and use of car clubs, through an online survey sent to members of car clubs and data collated from car club operators.

- 1.3 Within the Mayor's Transport Strategy car clubs are considered a means to reduce car ownership and private parking while allowing for infrequent car travel in inner and outer London². The strategy encourages boroughs to make decisions at the Local Authority level on using car clubs to enable car-free lifestyles and promote a reallocation of road space.

The members' survey was completed by members of 'round-trip' car clubs, 'flexible' car clubs and 'point-to-point' car clubs. Figure 1 illustrates the three models and Figure 2 shows the car club models operating within each London borough.

- For **round-trip** car clubs, cars are located in designated on-street bays (provided by local authorities) or off-street bays (in private car parks and developments). Users may book in advance. At the end of the hire period, users must return the car to the same bay they picked it up from.
- For **flexible** car clubs, cars may be located on-street (but not in designated bays) or off-street and do not need to be returned to the same location where they were picked up, but must be dropped off in a designated area. Users book spontaneously.
- For **point-to-point** car clubs, cars are located in designated bays (currently provided with charging infrastructure operated by Source London). Users may book in advance. At the end of the hire period, users must return the car to any available designated bay.

² Mayor's Transport Strategy, March 2018, Page 89, Proposal 19

Figure 1: Car club models

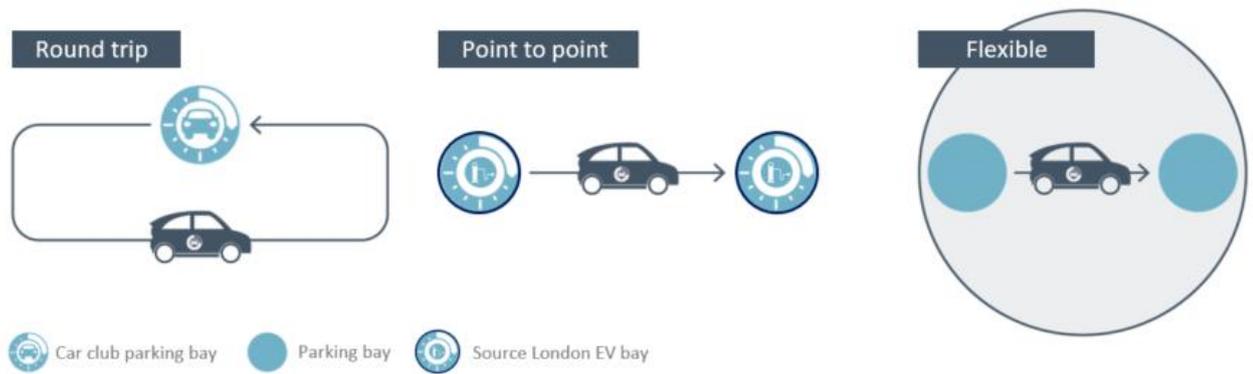
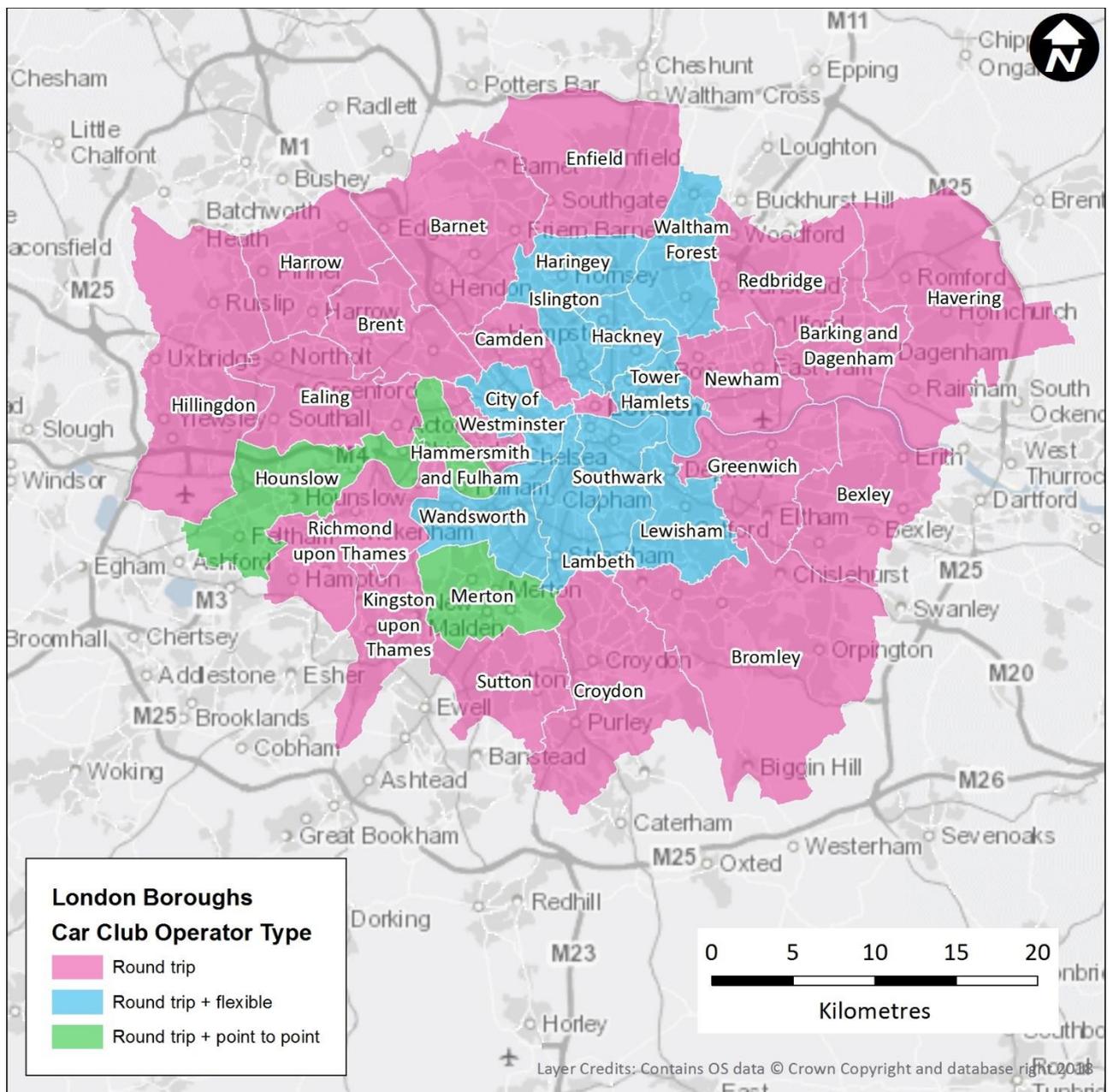


Figure 2: Car club models by borough



1.4 Similar to previous years, there was a members' survey and an operators' survey this year. Topics covered in the members' survey this year included:

- **Most recent car club journey:** purpose, number of passengers, reasons for choosing to use car club, alternatives
- **Reasons for joining**
- **Car ownership** before and after joining, influence of car club on decisions to buy or sell private cars
- **Private car mileage** and changes in mileage since joining
- **Frequency of using travel modes:** change in use of other modes since joining and modes used to travel to work
- **Electric vehicles:** Experiences of using electric vehicles (EVs) and charging infrastructure, reasons for using EVs
- Use of other **shared mobility** services

1.5 All members from six (out of seven) car clubs were invited to respond to the survey via an email invitation sent by each operator. This report analyses responses from the three types of car clubs separately. The operators represented in each types are round-trip (Co-Wheels, E-Car/Ubeequo, Enterprise Car Club, Zipcar), flexible (DriveNow, Zipcar Flex) and point-to-point (Bluecity). Responses from Zipcar members have been split between round-trip and flexible, depending on whether they used Zipcar Flex or Zipcar round-trip more frequently. Table 1 shows the number of member responses to the survey from each car club operator.

Table 1: Number of member responses by car club operator

Car club operator	Car club model	Number of member responses to survey
Bluecity	Point-to-point	323
Co-wheels	Round-trip	80
DriveNow	Flexible	1,080
E-Car / Ubeequo	Round-Trip	1,021
Enterprise Car Club	Round-Trip	527
Zipcar	Round-Trip and Flexible	2,331
Total		5,362

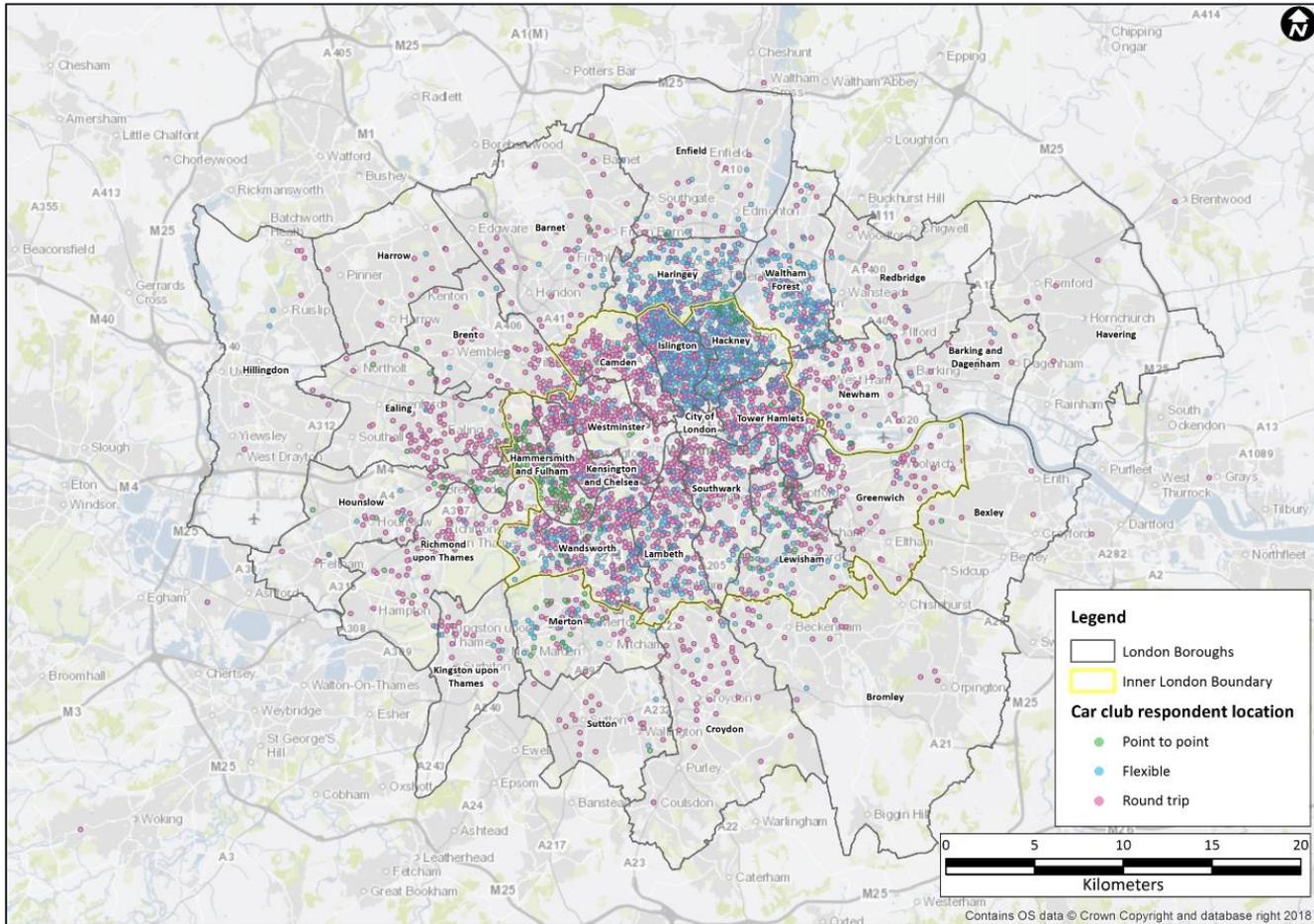
1.6 In addition to surveys of members, car club operators were requested to provide information about their operations through an operators' survey. The information collected from operators is summarised below and presented in Section 6.

- Number of members
- Gender profile of members
- Age profile of members
- Average distance travelled per hire
- Average length of hire period
- Average hires per active member
- Number of hires per member per year
- Miles travelled per hire
- Split of trips between peak, off-peak and weekend

Home locations of survey respondents

- 1.7 Figure 2 overleaf shows the home locations of survey respondents. Responses from inner London boroughs account for 70% of all responses. A fifth (1,015) of all responses are from the boroughs of Islington and Hackney and 40% of flexible trips are also from respondents in these boroughs. Wandsworth and Tower Hamlets have the highest number of round trip responses, both accounting for 9% (278) of the round trip responses.

Figure 2: Home locations of survey respondents



Structure of this report

- 1.9 Following this introduction, the report is structured as follows:
- **Section 2** contains the results of the round trip members' survey;
 - **Section 3** contains the results of the flexible members' survey;
 - **Section 4** contains the results of the point-to-point members' survey;
 - **Section 5** contains a summary of the emissions analysis and profiling of the car club fleet (full report found in Appendix A); and
 - **Section 6** contains the results of the operators' survey.

Evolution of the survey

- 1.8 The current report is based on a methodology which has evolved over recent years, but with a consistent methodology, relying on member surveys and specific questions asked to operators.

As the sector has evolved, new models of operation have been introduced. The methodology to date has been developed to deliver an evidence base recognising a balance between the most appropriate methodology, research costs and survey length (to avoid respondent fatigue and drop out).

1.9 In reviewing the methodology of the survey for the next year it will be important to build on the strengths of the survey to date (e.g. survey sent to all car club members, impacts of car clubs in London tracked over time to provide an evidence base for policy making) and improve on some of less developed elements of the survey (e.g. a lack of understanding of the spatial patterns of car club trips and emissions data for London car clubs compared to the UK fleet rather than the London fleet). In planning for the annual survey for next year we recommend considering how the following questions may be explored in more detail:

- What types of trips are members using specific car clubs for?
- The extent to which car club trips overlap with public transport and active travel trips?
- How well utilised are car club electric vehicles?
- To what extent are car clubs emitting less NOx and PMs compared to private cars?
- Can London car club vehicle emissions be compared to the London car fleet?

2 Round-trip Member Survey

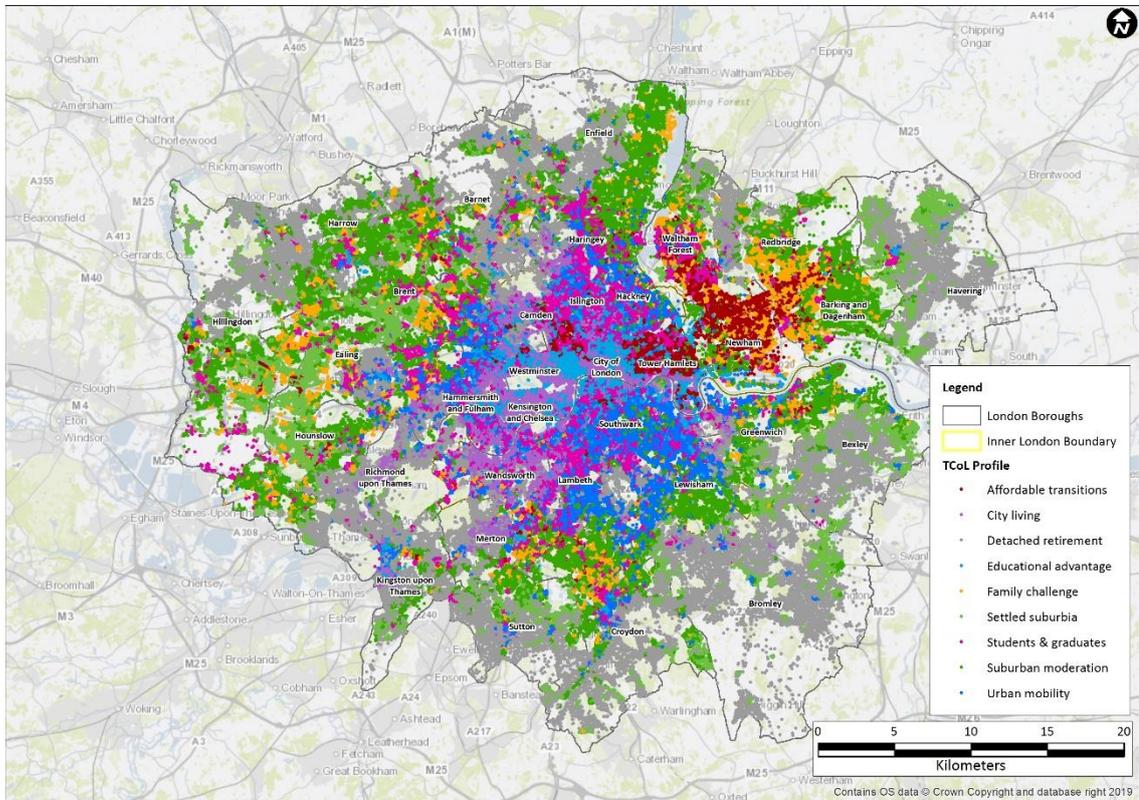
Introduction

- 2.1 This section provides the results of the surveys completed by 3,469 individual round-trip car club members in London. Of these, 1,906 were existing members and 1,563 were new members who joined in the last 12 months. There are a total of 214,000 round trip car club members in London, inclusive of all Zipcar members (who are able to use both round-trip and flexible services). A full set of survey questions are available on request.
- 2.2 The key findings from the members' survey are presented here, including headline results and key trends (showing comparisons with previous annual surveys) for the following topics:
- Profile of car club users
 - Reasons for joining a car club
 - Impact of car clubs on car ownership
 - Impact of car clubs on car purchasing
 - Impact of car clubs on miles travelled
 - Use of other shared mobility
 - Impact of joining car clubs on new members' travel behaviour
 - Travel behaviour of longer-term members
 - How car club vehicles are used
 - Why car club vehicles are used
 - Experiences of using electric vehicles
- 2.3 Unless otherwise stated, all data presented are for 2017/18, although the London Travel Demand Survey (LTDS) data are taken from 2016/17 as these are the most recent data available.
- 2.4 To ensure respondents of the survey are representative of all members in London, we worked with operators to profile their member base using TfL's Transport Classification of Londoners (TCoL)³ system and compared this profile to the survey respondents and, as necessary, weighted the survey data to the total member population profile, a map showing the TCoL classification across London is included in Figure 3.
- 2.5 This section includes responses from members of Co-wheels, E-Car, Enterprise Car Club, Ubeevo and Zipcar.
- 2.6 In order to classify Zipcar member responses to be analysed either as part of the round-trip or flexible survey they were asked how frequently they used Zipcar round trip and Zipcar Flex.

³ TCoL is TfL's geodemographic profiling tool which segments the population of London into nine defined subgroups with common characteristics, needs, wants and priorities. See: <http://content.tfl.gov.uk/transport-classification-of-londoners-presenting-the-segments.pdf>

Their responses have been split between the round trip and flexible members surveys depending on which they use more frequently.

Figure 3: Transport Classification of Londoners



Key findings

Car club members include a diverse range of people

Based on analysis of member postcodes using TCoL, we have compared the characteristics of London car club members to the Greater London population. Key characteristics include:

- A high proportion of young working adults in inner London (Urban Mobility – 23% of car club members and 11% of London population).
- A high proportion experiencing life transitions e.g. new jobs or moving home (Affordable Transitions - 18% of car club members and 11% of London population)
- A high proportion of highly educated residents in central London (Educational Advantages - 15% of car club members and 6% of the London population).
- Other TCoL types include families in outer London (Suburban Moderation - 15%) and residents with high incomes in more commonly living in inner London (City Living- 9%).

Table: TCoL profile of round trip car club members: key types

Type	% of London members	% of London population	Description
Urban Mobility	23%	11%	Young working adults with no children and reasonable incomes living in inner (though not central) London.
Affordable Transitions	18%	11%	People experiencing life transitions such as starting a first job or a new family.
Educational Advantages	15%	6%	Mainly living in central London, people in this segment tend to be highly educated and have above average incomes. Most do not have children in the household.
Suburban Moderation	15%	19%	Predominantly located in outer London, this segment is likely to have at least one child at home.
City Living	9%	7%	Residents with very high incomes living in trendy parts of London (e.g. Westminster/ Kensington/ Chelsea).
Students & Graduates	8%	13%	Based mainly in inner London, this segment includes a relatively high proportion of students and recent graduates.
Settled Suburbia	7%	9%	Lower income families that generally live in outer London and is likely to have at least one child at home.
Family Challenge	3%	7%	This segment includes a large proportion of young families with average to low incomes.
Detached Retirement	1%	21%	Typically, in the “empty-nest” or retired lifestyle groups, these residents generally live in the greener suburbs on the fringes of London.

Trends

Profile of car club members remains diverse

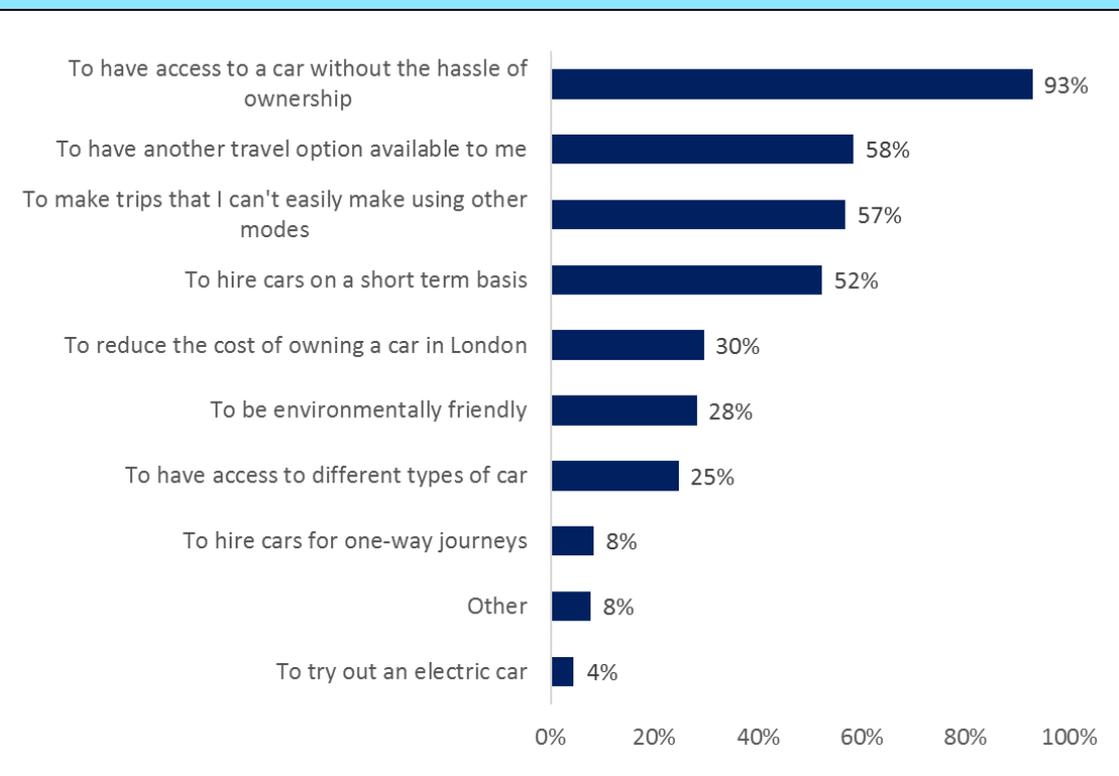
This is the first year that TCoL has been used to segment members, specifically developed by TfL to categorise Londoners. Previously, Mosaic, a commercial UK wide segmentation tool was used which also showed that members came from a wide variety of population segments. The change to TCoL makes this analysis more consistent with other work carried out by TfL.

Key findings

Members join car clubs to gain additional personal freedom and occasional access to cars

- The chart below shows that the most popular reason for joining was to have access to a car without the hassle of ownership (93%).
- The second and third most popular reasons both referenced the need for a different mode of transport for certain trips.
- The 8% of 'Other' responses included members who joined in order to hire a van, those who joined as the locations were more convenient than going to a rental car facility and members who joined a car club rather than purchasing a new car when their previous one needed replacing.

Chart: Reason for joining a round trip car club



Trends

Members continue to join a car club instead of choosing to own a vehicle

Although the response options were slightly different in the 2016/17 annual survey, the most popular option (my household did not have a car but joined a car club to gain additional personal freedom) in 2016/17 also alludes to members' desire to have access to a car without owning one, similar to this year's most popular response.

Key findings

Car ownership amongst new members falls after joining

- 49% of new members, who joined in the last 12 months, owned at least one car before joining, falling to 34% afterwards, as shown in the graph below. For new members the top three reasons for selling a vehicle are: 1. Cost of keeping car on the road, 2. Car not used often enough to justify keeping it, and 3. Change of personal circumstances (e.g. new job and moving house).

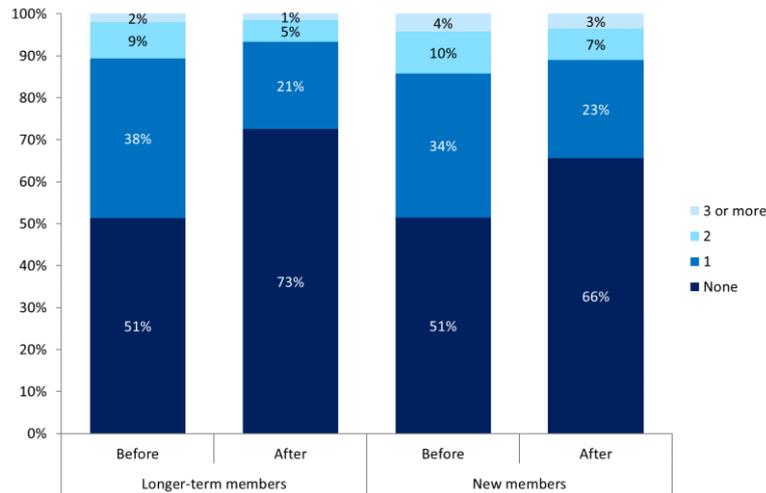
Car ownership remains low amongst longer term members

- Longer-term members, who have been a member for over 12 months, show a larger drop in car ownership after joining. 49% of longer-term members owned at least one car before joining, falling to just 27% afterwards. Longer-term members are those who have been members for at least a year – many have been members for a number of years. For longer-term members the top three reasons for selling a vehicle are the same as for new members.

Car club vehicles replace older vehicles and reduce use of diesel vehicles

- The average car sold by round trip car club members is a seven year old petrol vehicle. Round trip car clubs also reduce the number of trips made by diesel vehicles with a third of vehicles sold by round trip car club members powered by diesel.

Chart: Car ownership before and after joining a round trip car club



Trends

Round trip car clubs continue to promote car free households

- As car clubs expand, they continue to encourage more car free households.

Year	New members in car free households before joining a car club	New members in car free households after joining a car club
2014/15	54%	72%
2015/16	58%	76%
2016/17	52%	76%
2017/18	49%	66%

Key findings

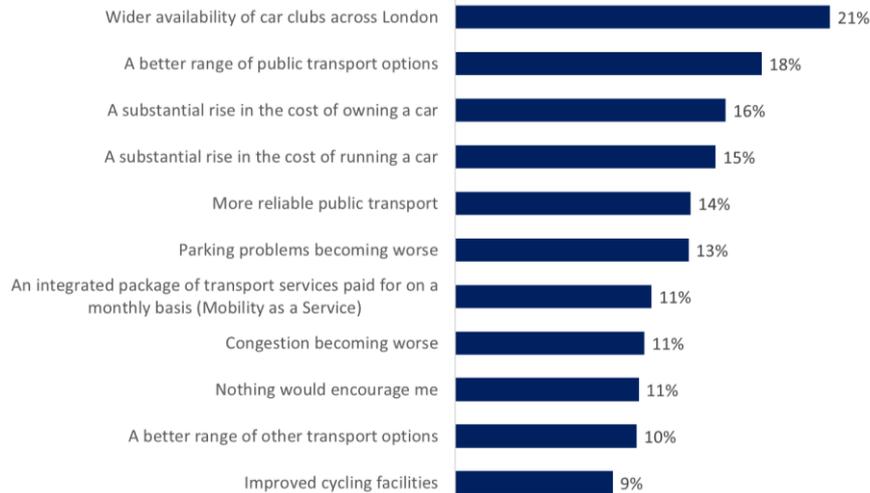
Car clubs reduce the need to purchase a private car

- Members were asked whether they would have bought a new car had they not joined a car club. 41% of round trip members reported that they would have done, equating to around 87,770 deferred car purchases from round trip members. This shows an upward trend from previous surveys (see trends below).
- 53% of members said that they are now less likely to buy a private car in the next few years, after joining a car club. 30% said it had had no effect on their decision, 10% said they were more likely and 7% did not know.

Wider availability of car club vehicles would encourage more members to sell their car

- Respondents who owned at least one car but had not sold a car in the last 12 months were asked to choose from a range of potential factors which would influence them to sell their car in the future. Wider availability of car club cars in London was the most popular factor, chosen by 21% of respondents, followed by a better range of public transport options (18%) and a substantial rise in the cost of owning a car (16%).

Chart: Factors that would impact members' decisions to buy a new car



Trends

Car clubs help to defer future car purchase by members

As shown in the table below, results from the 2017/18 survey indicate that car clubs continue to have an impact on the likelihood of purchasing a car though less than they used to have.

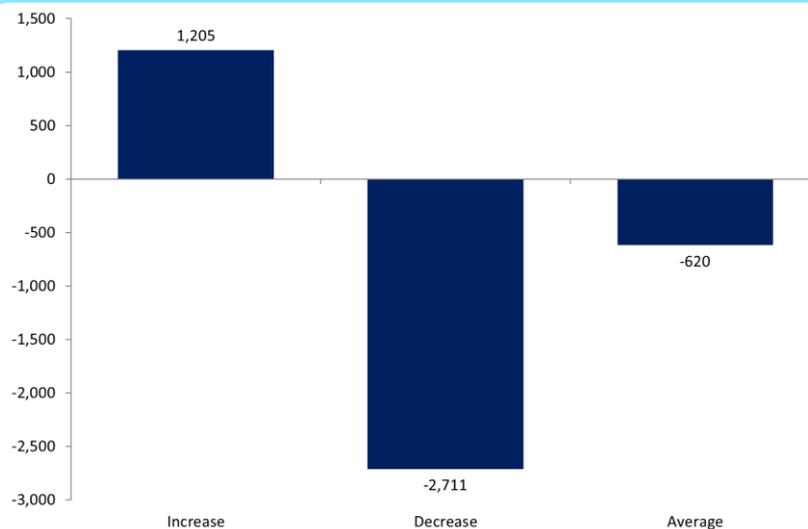
Year	Members for whom joining a car club has made it less likely that they will buy a car in the next few years	Members who would have bought a car if they had not joined a car club
2014/15	62%	30%
2015/16	51%	32%
2016/17	50%	34%
2017/18	53%	41%

Key findings

Joining a car club is associated with a reduction in annual car mileage

- The average change in annual household car mileage (for all cars in the household and car club cars) reported by longer-term members after joining was a decrease of 620 miles; please note 12% of longer-term members reported they did not know their change in annual mileage. These figures include both households owning a car and those who do not own a car.
- **Please note that as many respondents will not have accurate records of their mileage so the figures they have provided are likely to be estimates.**
- This average change is derived from estimated changes in mileage provided by the 29% of long-term members who reported a decrease in their mileage after joining a car club, the 20% who reported an increase and those members who reported no change (39%). The average change in annual mileage was a decrease of 620 miles annually.
- The distribution of change is shown below; the average increase in annual mileage was 1,205 miles whilst the average decrease was 2,711 miles.
- The estimated average annual mileage travelled by members by private car is 2,785 miles. When added to the estimated miles travelled in car club cars, the annual average is 3,602 miles. The average mileage driven by households in London with at least one vehicle is 6,300 miles (National Travel Survey, 2017) indicating that car club members drive roughly half the distance of an average London resident that owns a private vehicle (based on the data provided by members). It should be noted that the NTS methodology includes a more detailed household travel diary methodology.

Chart: Average change in long-term member annual mileage following joining a round trip car club



Trends

Average annual mileage in car club vehicles per member

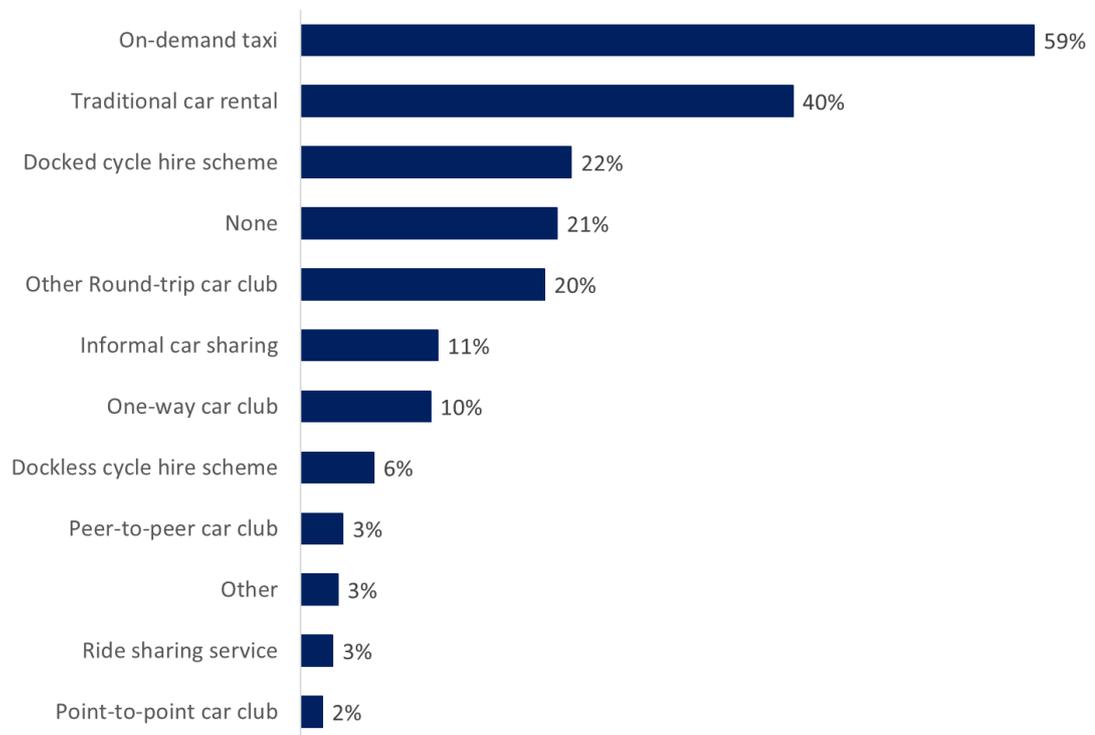
Year	2014/15	2015/16	2016/17	2017/18
Annual mileage	1,080	790	781	817

Key findings

Car club members also use other shared mobility services

- 79% of members use another shared mobility service alongside their car club reflecting the growth in shared mobility options.
- Aside from car clubs, 59% have used on demand taxis, 40% have used traditional car rental and 22% have used a docked cycle hire scheme. Only 6% have used peer-to-peer car clubs and ride sharing services in the last year.
- 10% of members were also members of a flexible car club, up from 1% in 2016/17, which is to be expected as Zipcar has started offering flexible services. 19% were also members of another round-trip club, an increase from 7% last year, showing that users are increasingly members of more than one car club.

Chart: Joining other shared mobility services before or after joining a round trip car club



Trends

Use of shared mobility modes increases

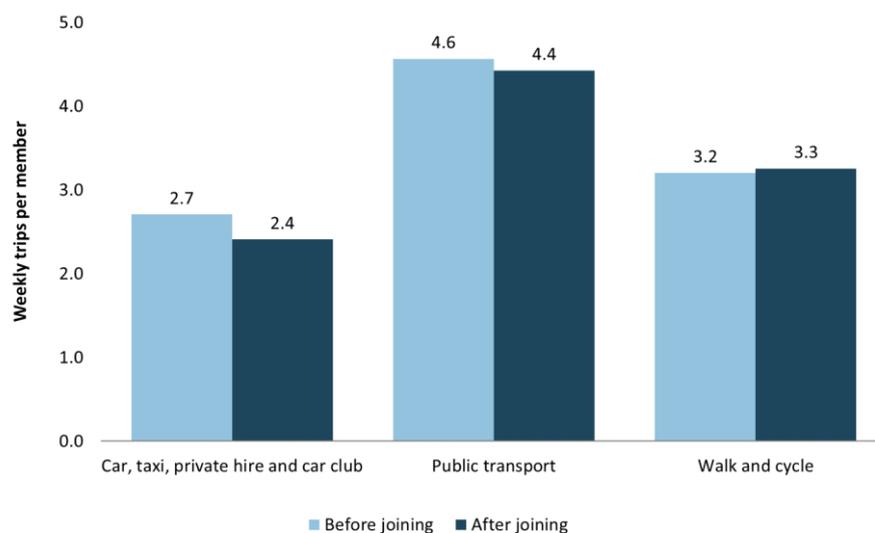
The proportion of members using shared mobility has increased significantly on previous years with 60% using other forms of shared mobility in 2016/17 compared to 79% this year. On-demand taxis were added as a new category in the survey in 2017/18 so it is likely that this is where the increase has come from.

Key findings

Members travel by car less after joining

- The survey shows a reduction in travel by new members of car clubs (those who have joined in the last 12 months) for both car travel and public transport. This is similar to trends across London where daily trips have reduced by 15% in the last four years⁴.
- After joining a car club, new members reduce their car use. Round-trip car club members who have joined a car club in the last 12 months have reduced their car use by 11% from 2.7 car trips per week to 2.4 car trips per week.
- Across London in 2017/18 the number of bus and underground trips reduced, despite the population of London increasing. This trend is mirrored by a 3.1% decrease in public transport use by new car club members. Further analysis in a future annual survey may help explain where car club trips overlap with public transport.

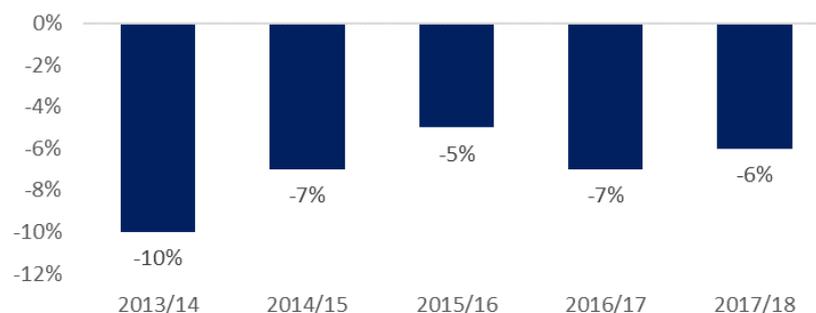
Chart: Weekly trips by mode, before and after joining a round-trip car club



Trends

Percentage point change in new members travelling by car as driver at least once a week

The Car Club Annual surveys consistently show a decrease in car use by new members.



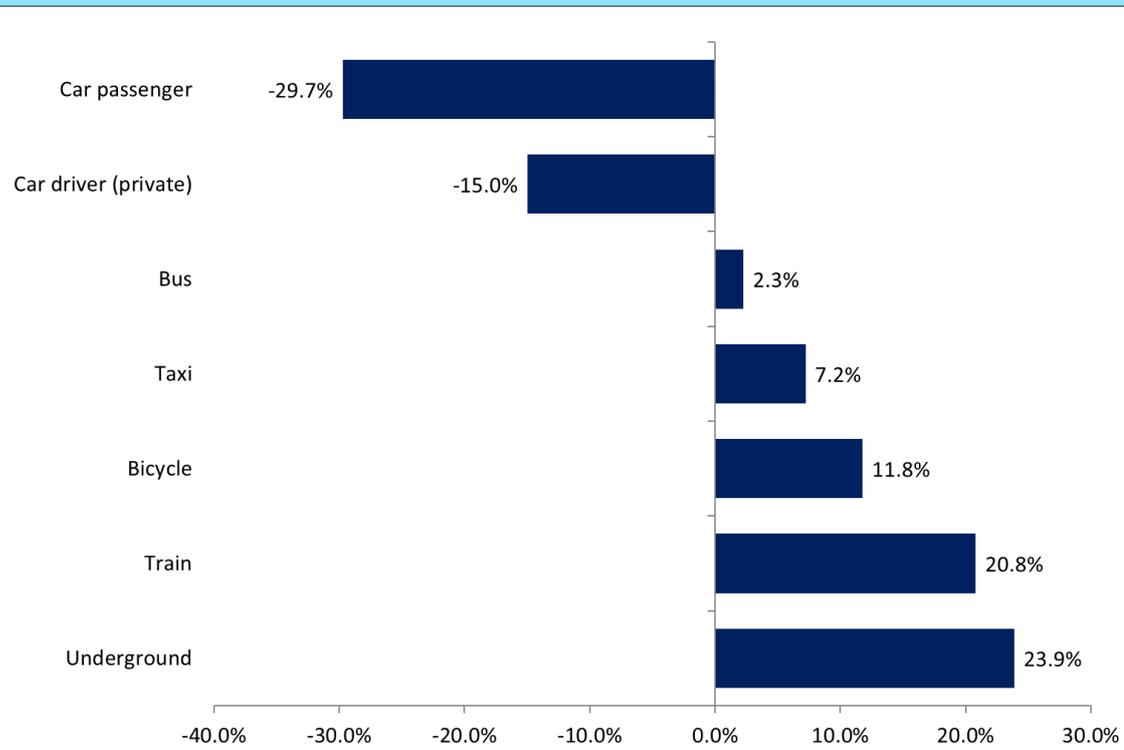
⁴ TfL business plan 2018

Key findings

Car club members use sustainable modes more frequently compared to other Londoners

- The Greater London population was used as a comparison group to see how Londoners’ travel patterns in general could become more sustainable if car clubs were more widely adopted.
- Members were asked how often they travel by each mode and the results show that they make more use of sustainable modes of transport and less use of private cars than the average Londoner, based on LTDS 2016/17.
 - 45% never travel by private car as driver;
 - 64% travel by Underground at least once a week compared to 41% of London’s population,
 - 37% travel by train at least once a week compared to 17% of the London population,
 - 24% travel by bicycle at least once a week compared to the London average of 13% and
 - 62% travel by bus at least once a week compared with the London average of 59%.

Chart: % of all respondents using modes at least once a week compared with the average Londoner (percentage point difference)



Trends

Members continue to use more sustainable modes than the average Londoner

The trend of car club members using sustainable transport options more often than the average Londoner has continued this year.

Key findings

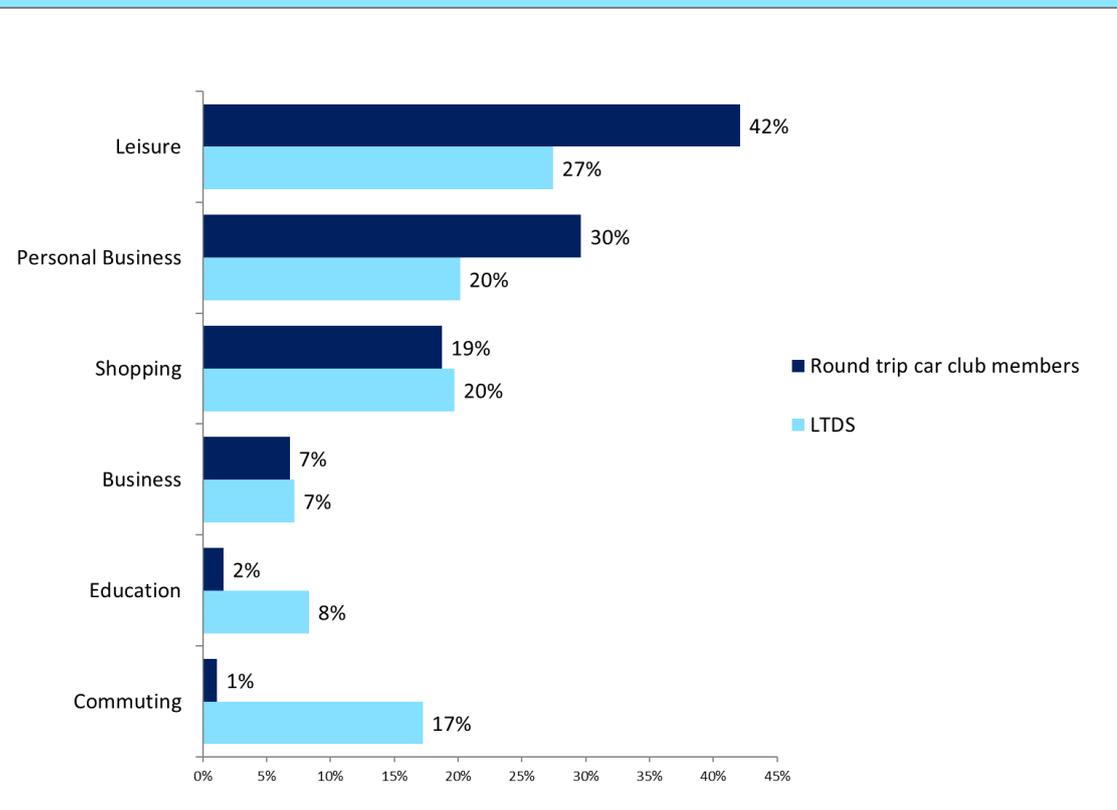
Car club cars in London have a higher occupancy than private cars

- Car club cars have an average vehicle occupancy of 2.1 people per trip (based on the last car club journey made) compared to 1.6 for private cars (LTDS, 2016/17). This may be a reflection of the different journey types as detailed below.

Car clubs are mostly used for personal and leisure purposes

- As shown in the chart below, leisure (42%), personal business (30%) and shopping (19%) are the most popular round trip car club journey purposes. Respondents could choose more than one journey purpose for this question. These are the same top purposes as in 2016/17 although leisure is now a more frequent purpose than personal business.
- Only 1% of journeys are for commuting compared to a London average of 17%.

Chart: Comparison of round trip car club journey purposes



Trends

Round trip car clubs continue to be used for leisure purposes rather than business or commuting

The top three trip purposes are the same as in 2016/17. Commuting has reduced from 3% last year to 1% this year.

Key findings

Half of all members have made a car club journey in the last month

- The table below shows that 51% of car club members have made a car club journey within the last month and a further 19% in the last three months.

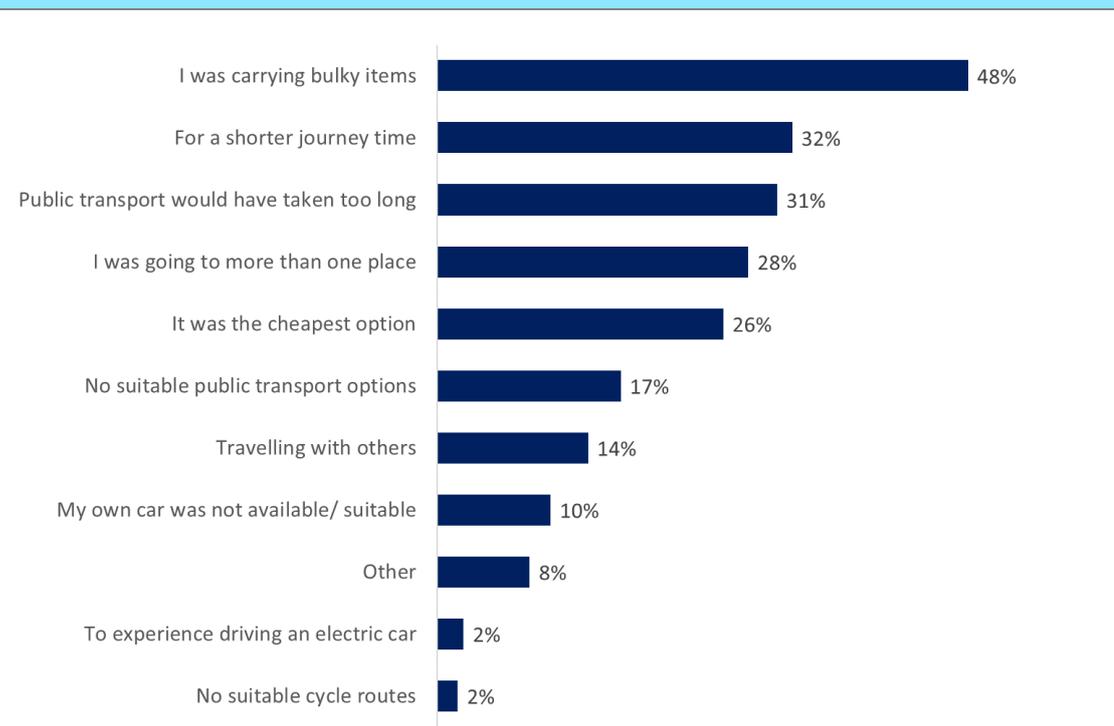
Members use car clubs for convenience

- When asked why they chose to use a car club most recently, the most popular was that respondents were carrying luggage or bulky items (48%) which made driving the most convenient option. Similarly, the second and third most popular answers both focussed on a reduced journey time, also related to convenience.

Chart: Most recent round trip car club journey

Last journey	% of members
In the last month	51%
In the last three months	19%
Between three and six months ago	11%
More than six months ago	12%
Have not yet made a journey	7%

Reason for using a round trip car club for your most recent car club journey



Trends

Members continue to use car clubs for convenience.

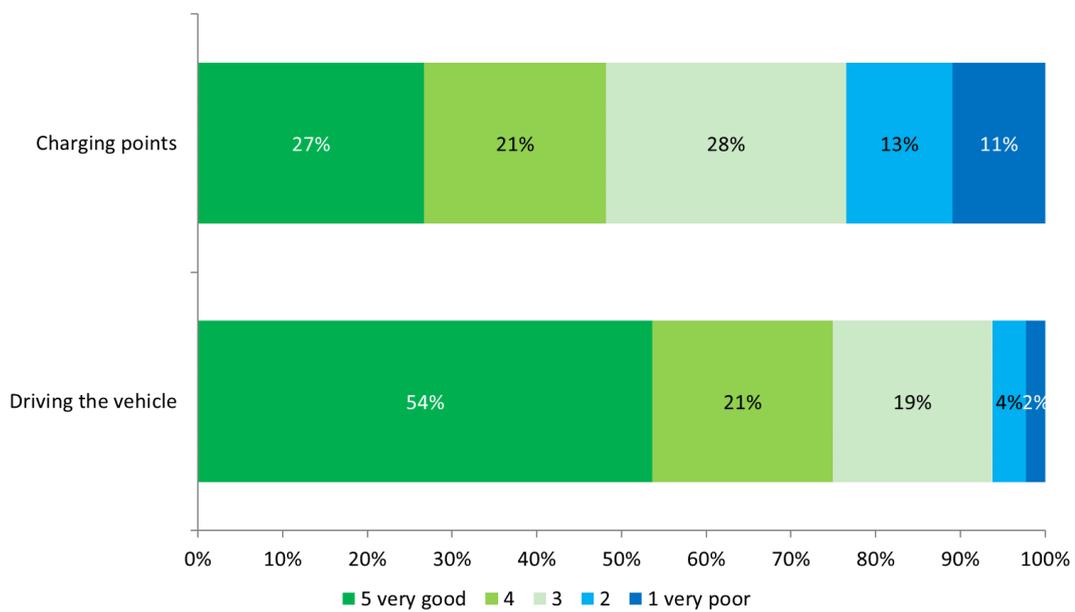
In 2016/17, the top two reasons for using a car club were the same as in 2017/18. The proportion of respondents using car club vehicles to transport luggage has risen from 42% in 2016/17 to 48% this year.

Key findings

Almost a fifth of respondents have tried an electric vehicle

- 18% of all respondents have used a car club electric vehicle. As shown in the chart below, 75% rated the experience of driving the vehicle 'good' or 'very good'.
- Members were less satisfied with the experience of using EV charging points with just under half rating the experience 'good' or 'very good'. Those who rated the charging points 'poor' or 'very poor' noted problems relating to previous users failing to correctly activate the charging point and therefore the car not having charge when picked up, the lack of charging points and the difficulty in locating them.

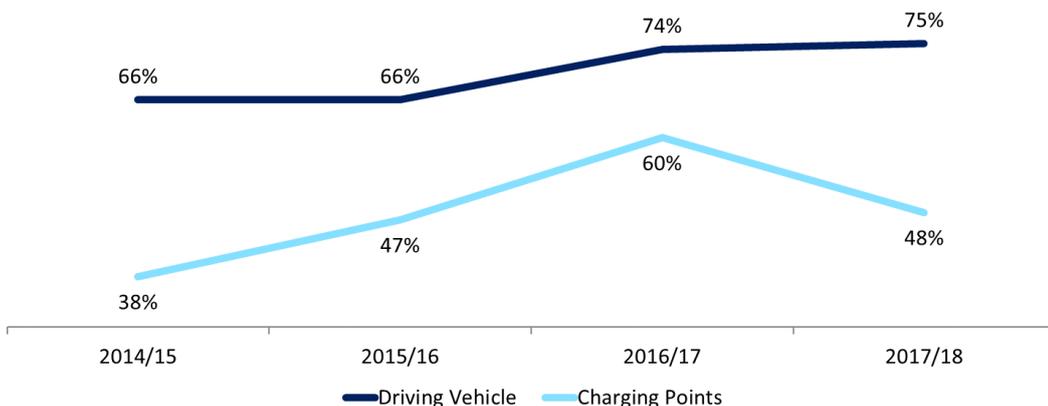
Chart: Experience of using electric vehicles and charging points



Trends

Experiences of driving electric vehicles have improved over time

The graph below shows the proportion of members who found driving the vehicle and using charging points 'good' or 'very good'. The proportion of those finding driving the vehicle good or very good has increased while members are becoming more dissatisfied with the use of charging points.



3 Flexible Member Survey

Introduction

- 3.1 This section provides the results of the surveys completed by 1,570 individual flexible car club members in London. Of these, 815 were existing members and 755 were new members who joined in the last 12 months. A full set of survey questions are available on request.
- 3.2 This section contains the key findings from the members' survey, including headline results and key trends (showing comparisons with previous annual surveys) for the following topics:
- Profile of car club users
 - Reasons for joining a car club
 - Impact of car clubs on car ownership
 - Impact of car clubs on car purchasing
 - Impact of car clubs on miles travelled
 - Use of other shared mobility
 - Impact of joining car clubs on new members' travel behaviour
 - Travel behaviour of longer-term members
 - How car club vehicles are used
 - Why car club vehicles are used
 - Experiences of using electric vehicles
- 3.3 Responses in this section are from members of DriveNow (1,080 respondents) and Zipcar Flex (475 respondents).
- 3.4 Zipcar members were asked how frequently they used Zipcar and Zipcar Flex. Their responses have been split between the round trip and flexible members surveys depending on which they use more frequently.
- 3.5 The comparison section on the bottom of each page summarises the differences and similarities between the responses from round trip members and flexible members.

Key findings

Most flexible car club members are young working adults

Based on analysis of member postcodes using TCoL, the characteristics of London car club members are shown in the table below and include:

- Young working adults in inner London (Urban Mobility – 31%).
- Highly educated residents in central London (Educational Advantages – 19%)
- Families in outer London (Suburban Moderation – 13%).
- Other TCoL types include people experiencing life transitions such as starting a new family (Affordable Transitions 12%) and lower income families in outer London (Settled Suburbia – 9%).

Table: TCoL profile of flexible car club members: key types

Type	% of London members	% of London population where Flexible Services operate*	Description
Urban Mobility	31%	20%	Young working adults with no children and reasonable incomes living in inner (though not central) London.
Educational Advantages	19%	16%	Mainly living in central London, people in this segment tend to be highly educated and have above average incomes. Most do not have children in the household.
Suburban Moderation	13%	8%	Predominantly located in outer London, this segment is likely to have at least one child at home.
Affordable Transitions	12%	10%	People experiencing life transitions such as starting a first job or a new family.
Settled Suburbia	9%	<1%	Lower income families that generally live in outer London and is likely to have at least one child at home.
City Living	7%	12%	Residents with very high incomes living in trendy parts of London (e.g. Westminster/ Kensington/ Chelsea).
Students & Graduates	5%	25%	Based mainly in inner London, this segment includes a relatively high proportion of students and recent graduates.
Family Challenge	4%	4%	This segment includes a large proportion of young families with average to low incomes.
Detached Retirement	<1%	5%	Typically, in the “empty-nest” or retired lifestyle groups, these residents generally live in the greener suburbs on the fringes of London.

*These boroughs are: Waltham Forest, Haringey, Islington, Hackney, Tower Hamlets, Southwark, Lambeth, Wandsworth and the City of Westminster.

Comparison

Flexible car clubs attract similar groups to round trip car clubs

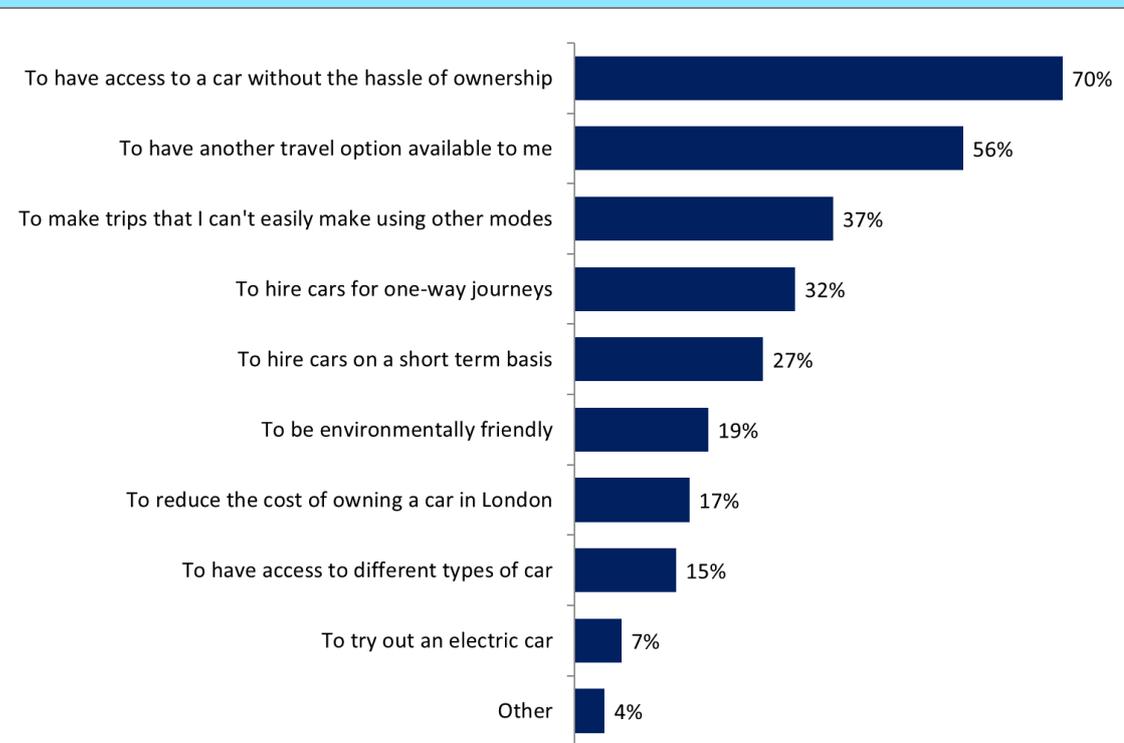
The top four groups for both flexible and round trip car clubs are the same although there is a higher proportion in the urban mobility segment for flexible car clubs, with 31% compared to 23% for round trip car clubs.

Key findings

Members join car clubs to gain additional personal freedom and occasional access to cars

- The chart below shows that the most popular reason for joining was to have access to a car without the hassle of ownership (70%).
- The second and third most popular reasons both referenced the need for a different mode of transport for certain trips.
- Other reasons provided in free-text responses included members who joined to avoid the hassle of parking, the possibility of using a car club car abroad and those that liked the model of car offered.

Chart: Reason for joining a car club



Comparison

Members join flexible and round trip car clubs for similar reasons

The most popular reason for joining for both flexible and round trip members was to have access to a car without the hassle of ownership, although a higher proportion of round trip members selected this option (93%). The rest of the options were also similar for both car club models, though unsurprisingly the proportion of members joining the car club to hire cars for flexible journeys was much higher for flexible members, with 32% compared to 8%.

Key findings

Car ownership amongst new members falls after joining

- 44% of new members owned at least one car before joining, falling to 29% afterwards, as shown in the graph below.
- For new members the top three reasons for selling a vehicle are: 1. Cost of keeping car on the road, 2. Change of personal circumstances (e.g. new job, moving house), and 3. Car not used often enough to justify keeping it.
- Only 1% of new members increased the number of cars they owned after joining.

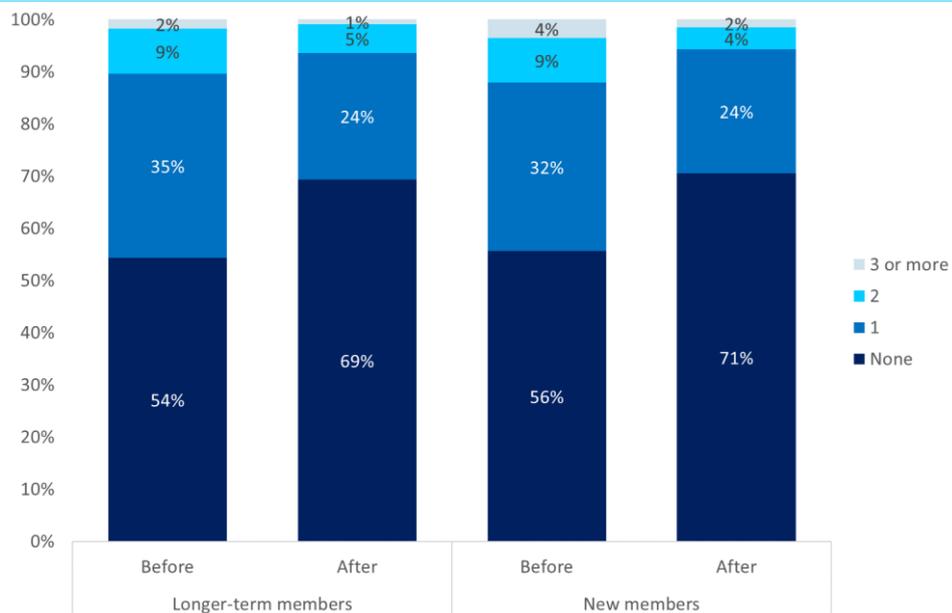
Longer term members continue to own fewer private cars

- Longer-term members also show a drop in car ownership after joining. 46% of longer-term members owned at least one car before joining, falling to 31% afterwards. For longer-term members the top three reasons for selling a vehicle are the same as for new members.

Car club vehicles replace older vehicles and reduce use of diesel vehicles

- The average car sold by flexible car club members is a seven year old petrol vehicle. Flexible car clubs also reduce the number of trips made by diesel vehicles with 42% of vehicles sold by flexible car club members powered by diesel.

Chart: Car ownership before and after joining a flexible car club



Comparison

Proportion of members owning private cars after joining continues to decline

Last year 43% of new members owned at least one private car after joining, this decreased to 39% in 2017/18. For longer term members the proportion decreased from 39% to 31%.

This indicates that flexible car clubs are having a long term impact in reducing levels of car ownership in London.

Key findings

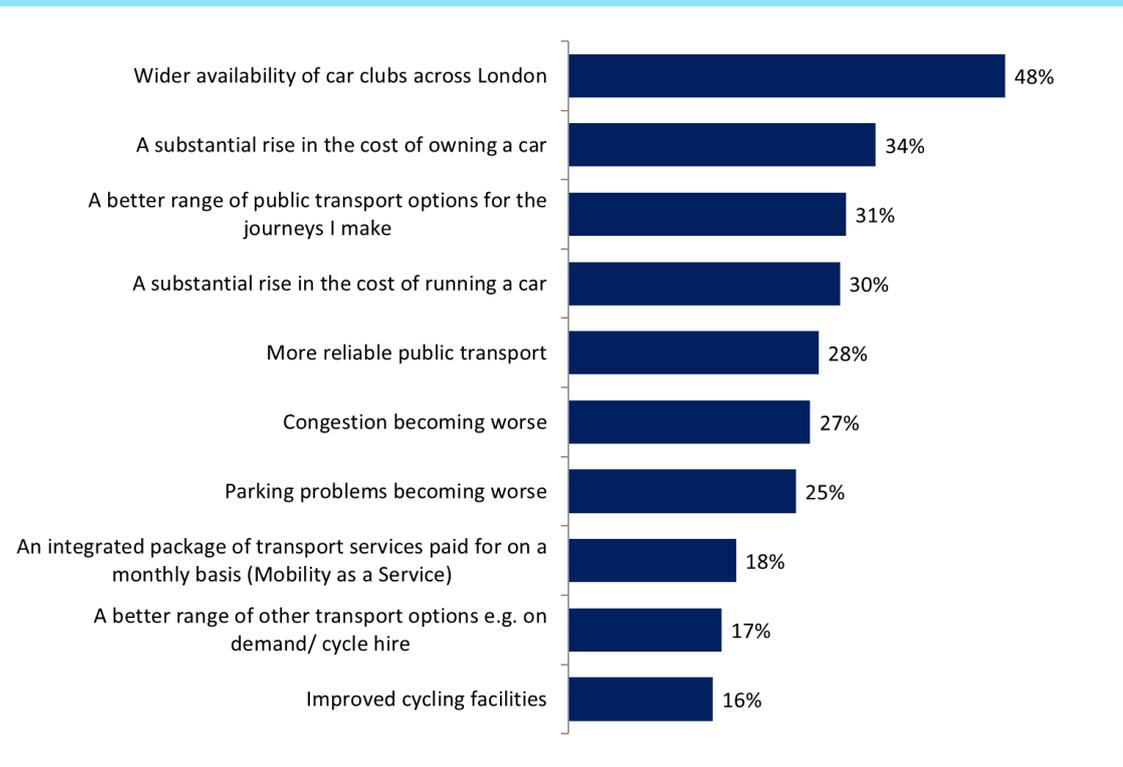
Car clubs can reduce the need to purchase a private car

- Members were asked whether they would have bought a new car had they not joined a car club. 41% of flexible members reported that they would have done, equating to around 11,986 deferred car purchases by flexible car club members.
- 53% of members reported that they are now less likely to buy a private car in the next few years, after joining a car club. 28% stated that there was no effect, 11% said it was more likely and 7% did not know.

Wider availability of flexible cars would encourage more members to sell their car

- Respondents who owned at least one car but had not sold a car in the last 12 months were asked to choose from a range of potential factors which would influence them to sell their car in the future. Wider availability of flexible car club cars in London was the most popular factor, chosen by just under half of the respondents, followed by a substantial rise in the cost of owning a car (34%) and a better range of public transport options (31%).

Chart: Factors that would impact members’ decisions to buy a new car



Comparison

Round trip and flexible car clubs help to defer future car purchase by members equally

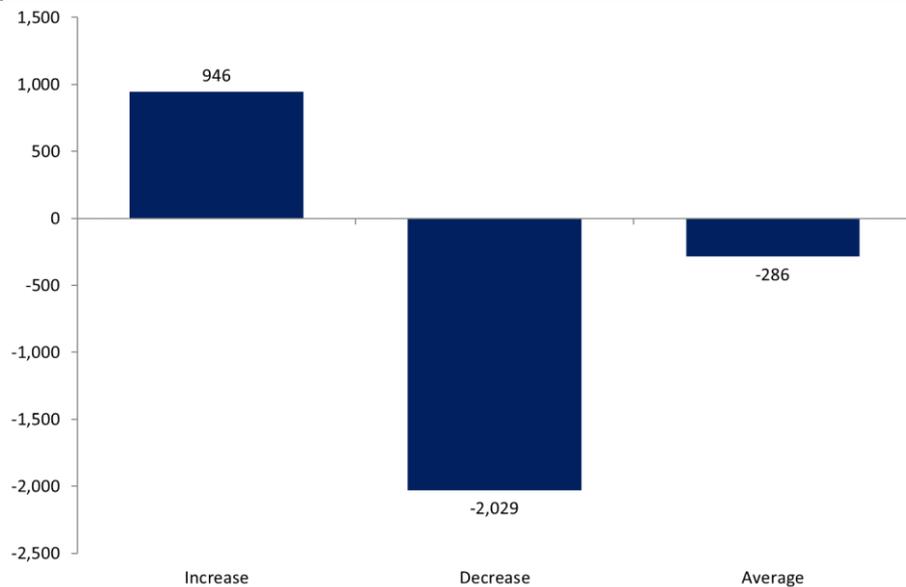
The proportion of members that would have purchased a car had they not joined the car club and the proportion of members that are less likely to purchase a new car are the same for round trip and flexible members, at 41% and 53% respectively.

Key findings

Joining a car club is associated with a reduction in annual car mileage

- The average change in annual household car mileage (for all cars in the household and car club cars) reported by longer-term members after joining was a decrease of 286 miles.
- **Please note that many respondents will not have accurate records of their mileage so the figures they have provided are likely to be estimates.**
- This average change is derived from estimated changes in mileage provided by the 24% of longer-term members who reported a decrease in their mileage after joining a car club, the 25% who reported an increase and those members who reported no change (37%). Although the percentage of long-term members increasing their mileage is higher than those reducing, decreases were generally larger, meaning the average change was a decrease of 286 miles annually (based on data provided by car club members).
- The distribution of change is shown below; the average increase in annual mileage was 946 miles whilst the average decrease was 2,029 miles.
- The estimated average annual mileage travelled by members (in their primary household car) is 3,114 miles. When added to the estimated miles travelled in car club cars, the annual average is 4,391 miles. The average mileage driven by households in London is 6,300 miles (National Travel Survey, 2017) indicating that car club members drive far less than the average London resident (based on data provided by car club members).

Chart: Average change in long-term member annual mileage following joining a car club



Comparison

Average annual mileage in car club vehicles per member

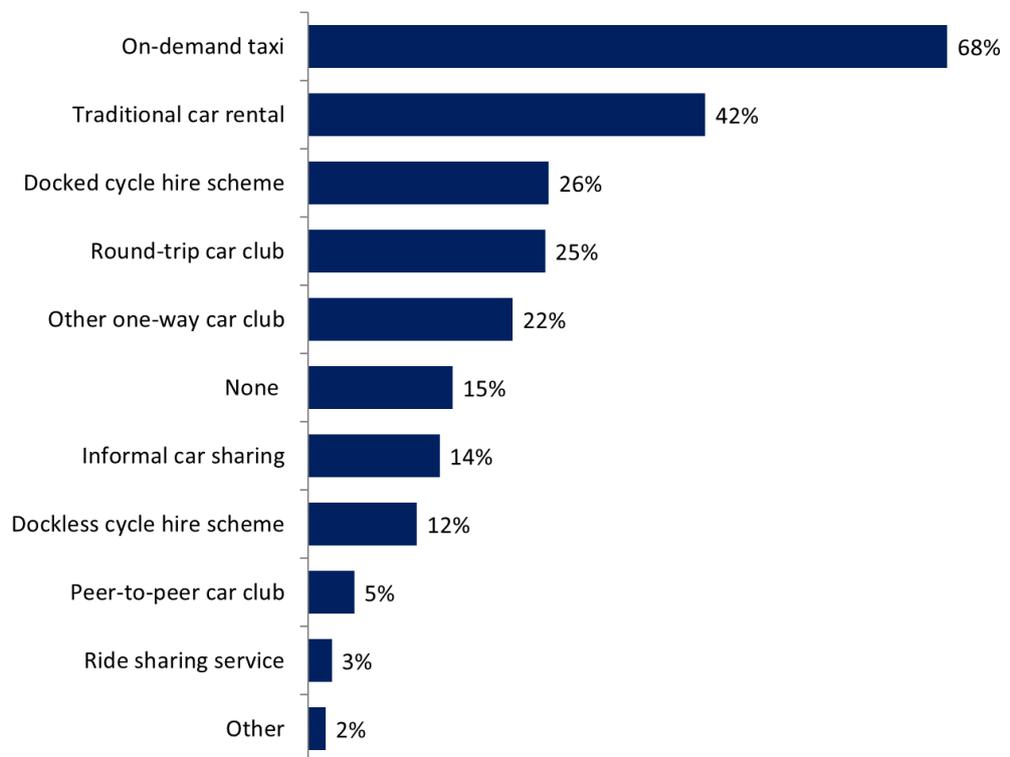
The average decrease in mileage for flexible members is much lower than that of round trip members which is 620 miles. The average miles driven in a flexible car club car is also higher than that of a round trip member; 1,277 miles compared to 817 miles.

Key findings

Flexible car club members also use other shared mobility services

- 85% of members use another shared mobility service alongside their car club reflecting the growth in the shared economy.
- Aside from car clubs, 68% have used on-demand taxis, 42% have used traditional car rental and 26% have used a docked cycle hire scheme.
- 25% of members were also members of a round trip car club and 22% were members of another flexible club.

Chart: Joining other shared mobility services before or after joining car club



Comparison

Flexible members are more likely to use other shared mobility services than round trip members

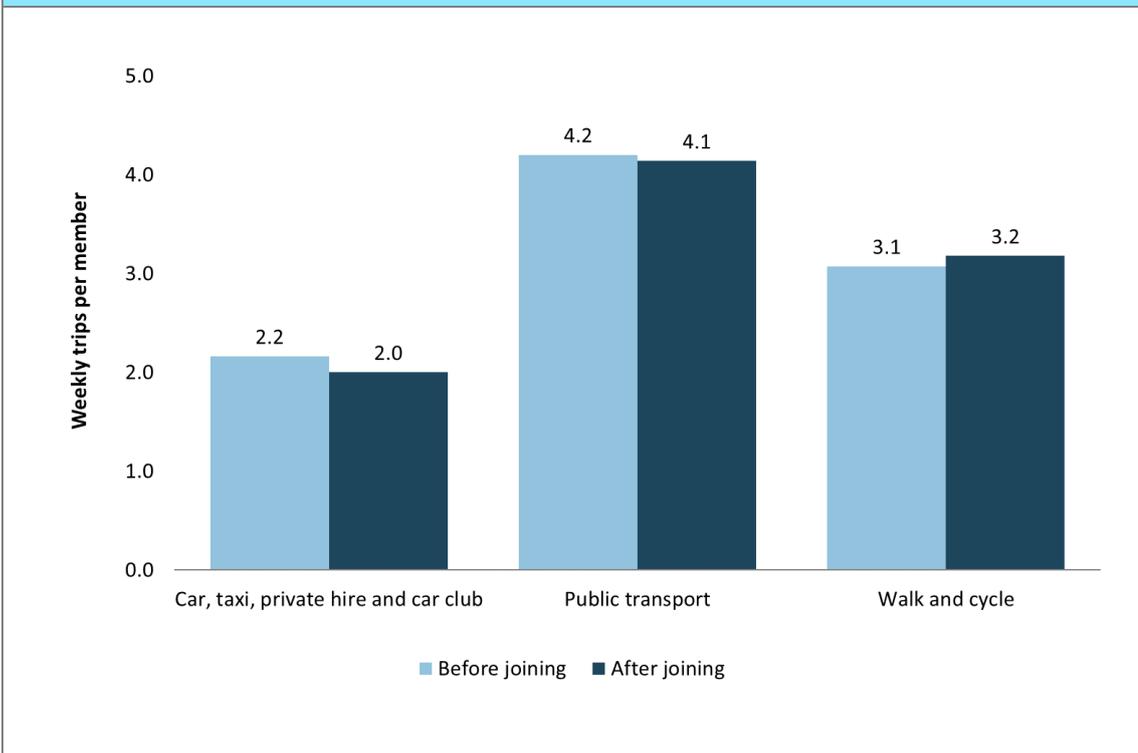
Shared mobility services are popular among all car club members but 85% of flexible members use other services compared to 79% of round trip members. Both flexible and round trip members are similarly likely to be a member of another car club of the same type (22% of flexible members and 20% of round trip members).

Key findings

New members travel by car less after joining

- After joining a car club, new members reduce their car use. Round-trip car club members who have joined a car club in the last 12 months have reduced their car use by 7.5% from 2.2 car trips per week to 2.0 car trips per week.
- Across London in 2017/18 the number of bus and underground trips reduced, despite the population of London increasing. This trend is mirrored in public transport use by new car club members, although the reduction is low at 1.5%. Further analysis in a future annual survey may help explain where car club trips overlap with public transport.
- New member of flexible car clubs report a slight increase in the number of weekly walk and cycle trips after joining a car club.

Chart: Weekly trips by mode, before and after joining a flexible car club



Comparison

Travel behaviour in new flexible and round trip members show similar trends.

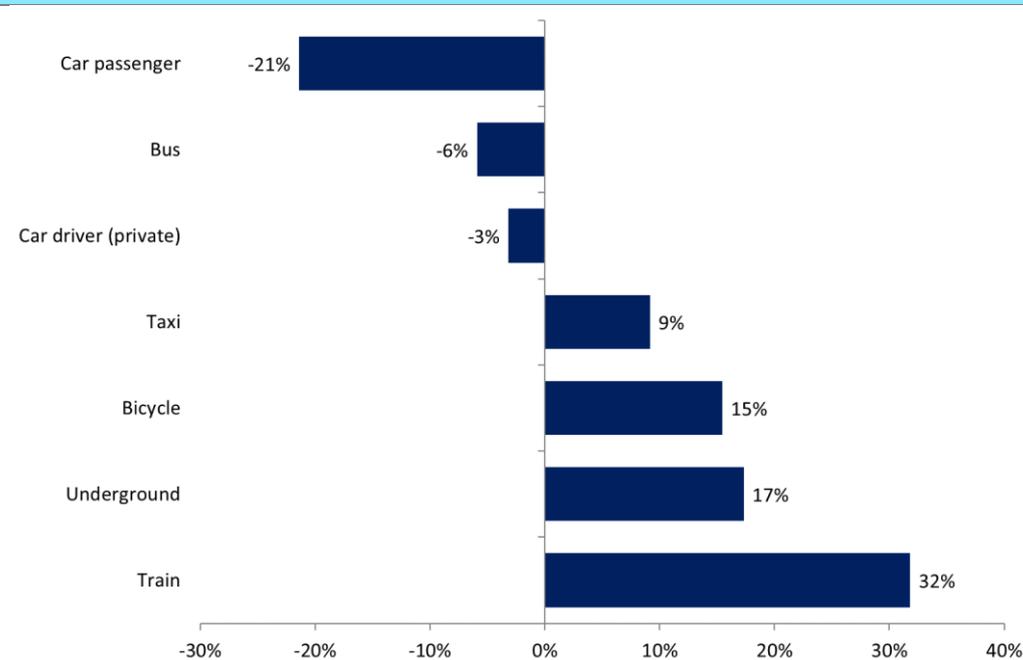
Both flexible and round-trip members change their behaviour similarly on joining with both types of members reducing their private car use and slightly increasing walk and cycle trips.

Key findings

Flexible car club members use sustainable modes more frequently compared to other residents in the same boroughs

- The Greater London population was used as a comparison group to see how Londoners’ travel patterns in general could become more sustainable if car clubs were more widely adopted.
- Members were asked how often they travel by each mode and the results show that they make more use of sustainable modes of transport and less use of private cars than the average resident of a borough in which the flexible car clubs operate, based on London Travel Demand Survey (LTDS) 2016/17.
 - 51% never travel by private car as driver;
 - 65% travel by Underground at least once a week compared to 48% of the population in these boroughs;
 - 39% travel by train at least once a week compared to 7% of the average population;
 - 30% travel by bicycle at least once a week compared to the average in these boroughs of 15%; and
 - 62% travel by bus at least once a week compared with the London average of 68%.

Chart: % of all respondents using modes at least once a week compared with the average Londoner (percentage point difference)



Comparison

Flexible members use sustainable transport modes more than round trip members

- 30% of flexible members cycle at least once a week compared to 24% of round trip members
- 51% never drive a private car compared to 45% of round trip members
- Bus, underground and train travel are similar levels for both models

Key findings

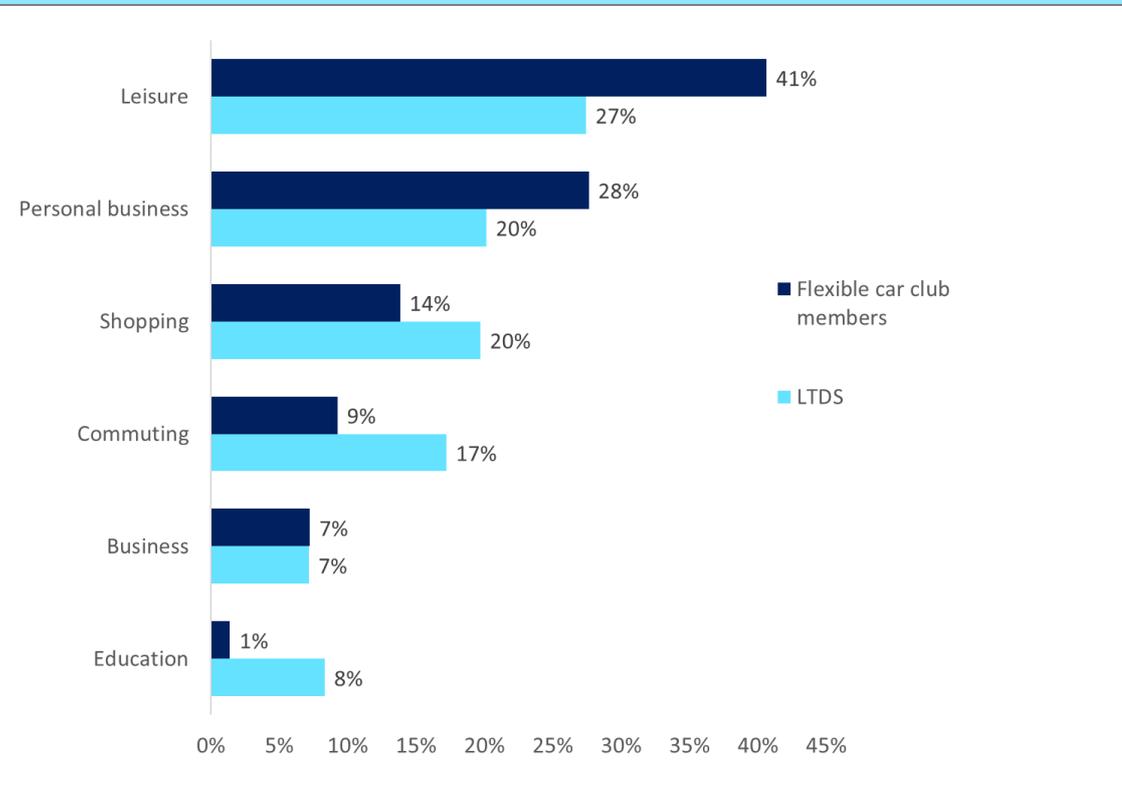
Car club cars in London have a higher occupancy than private cars

- Flexible car club cars have an average occupancy of 2.0 people (based on the last car club journey made) compared to 1.6 for private cars (LTDS, 2016/17). This may be a reflection of the different journey types as detailed below.

Car clubs are mostly used for personal and leisure purposes

- As shown in the chart below, leisure (41%), personal business (28%) and shopping (14%) are the most popular car club journey purposes. Respondents could choose more than one journey purpose for this question. These are the same top purposes as in 2016/17.

Chart: Comparison of journey purposes



Comparison

Flexible and round trip car club vehicles are used for similar purposes.

The top three journey purposes are the same for both round trip and flexible car clubs with a similar proportion of trips (leisure 42%, personal business 30% and shopping 19%).

Key findings

Almost three quarters of all members have made a car club journey in the last month

- The table below shows that 71% of flexible car club members have made a car club journey within the last month and a further 16% in the last three months.

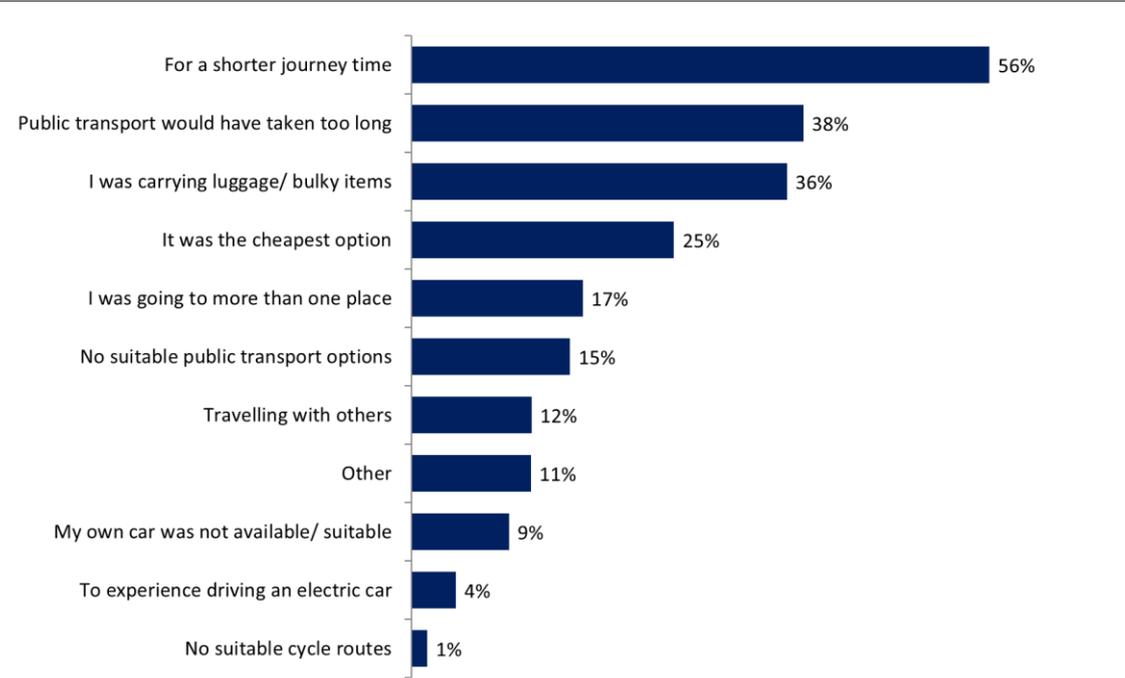
Members use car clubs for convenience

- When asked why they chose to use a car club most recently, the most popular was for a shorter journey time (56%) which made driving the most convenient option. Similarly, the second most popular answer also focussed on journey times while the third was to accommodate bulky items or luggage.

Chart: Most recent car club journey

Last journey	% of members
In the last month	71%
In the last three months	16%
Between three and six months ago	5%
More than six months ago	4%
Have not yet made a journey	5%

Reason for using a car club for your most recent car club journey



Comparison

Flexible car club users use cars more frequently.

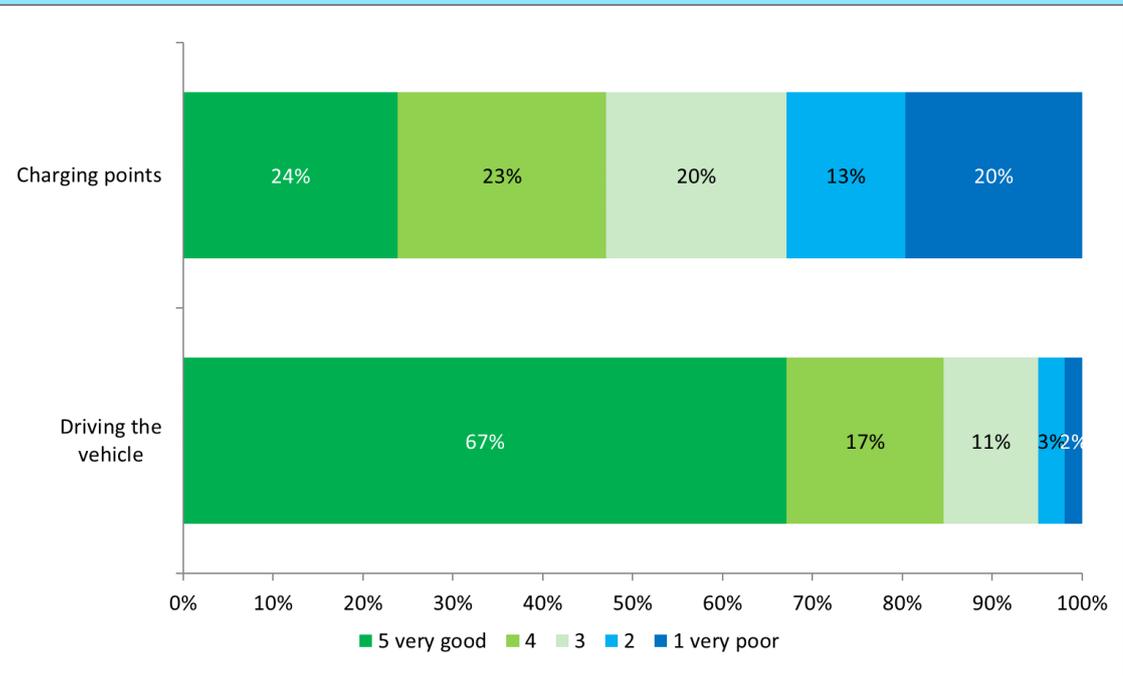
71% of flexible members have used a car club vehicle in the past month compared to 51% of round trip members. The top purpose for round trip members was carrying bulky items (48%) although the three top journey purposes are the same.

Key findings

Half of respondents have tried an electric vehicle

- 49% of all respondents have used a car club electric vehicle. As shown in the chart below, 84% rated the experience of driving the vehicle ‘good’ or ‘very good’.
- Satisfaction levels were lower for EV charging points with 47% of members rating the experience ‘good’ or ‘very good’. Those who rated the charging points ‘poor’ or ‘very poor’ wrote that charging points were difficult to locate across London and often occupied and that poor instructions were provided on how to charge the vehicle.
- Fewer members responded to the question on charging points as many have not yet used one within a flexible car club, despite making a trip with an EV.

Chart: Experience of using electric vehicles and charging points



Comparison

More flexible members have used electric vehicles

49% of flexible car club member respondents have used electric vehicles compared to 18% of round trip members reflecting the larger proportion of electric vehicles in the flexible fleet.

Both types of members have had similar experiences of charging points with 48% of round trip members finding charging points ‘good’ or ‘very good’ although flexible members have had a more positive experience driving the vehicles with 84% rating it as ‘very good’ or ‘good’ compared to 75% of round trip members.

4 Point-to-point Member Survey

Introduction

- 4.1 This is the first year that point-to-point members have been surveyed in the annual car club survey. All responses in this section are from members of Bluecity. Bluecity is the first point-to-point car club in London and exclusively comprises electric vehicles. Bluecity operates in three London Boroughs with vehicles primarily based in these areas (Hammersmith & Fulham, Merton and Hounslow), but members can drop and collect a vehicle at any Source London charging point throughout the city. If a vehicle is left or put on charge outside of the three operating London Boroughs, Bluecity will collect and redistribute the vehicles within the operating Boroughs.
- 4.2 This section provides the results of the surveys completed by 323 individual point-to-point car club members in London. Of these, 66 had been members for more than 12 months and 257 had joined within the past year.
- 4.3 This section contains the key findings from the members survey, including headline results and key trends (showing comparisons with previous annual surveys) for the following topics:
- Profile of car club users
 - Reasons for joining a car club
 - Impact of car clubs on car ownership
 - Impact of car clubs on car purchasing
 - Impact of car clubs on miles travelled
 - Use of other shared mobility
 - Impact of joining car clubs on new members' travel behaviour
 - Travel behaviour of longer-term members
 - How car club vehicles are used
 - Why car club vehicles are used
 - Experiences of using electric vehicles

Key findings

Most point-to-point car club members are highly educated residents

Based on analysis of member postcodes using TCoL, the characteristics of London car club members are shown in the table below and include the following groups. These may in part, be shaped by the average resident living in the boroughs where BlueCity operate.

- Highly educated residents in central London (Educational Advantages - 23%)
- Young working adults in inner London (Urban Mobility – 19%)
- Families in outer London (Suburban Moderation – 16%)
- Other TCoL types include students and recent graduates (Students & Graduates – 14%) and people experiencing new life transitions such as starting a family (Affordable Transitions – 14%)

Table: TCoL profile of point-to-point car club members: key types

Type	% of London members	% of London population with significant point-to-point activity*	Description
Educational Advantages	23%	8%	Mainly living in central London, people in this segment tend to be highly educated and have above average incomes. Most do not have children in the household.
Urban Mobility	19%	21%	Young working adults with no children and reasonable incomes living in inner (though not central) London.
Suburban Moderation	16%	17%	Predominantly located in outer London, this segment is likely to have at least one child at home.
Students & Graduates	14%	19%	Based mainly in inner London, this segment includes a relatively high proportion of students and recent graduates.
Affordable Transitions	14%	1%	People experiencing life transitions such as starting a first job or a new family.
Settled Suburbia	9%	5%	Lower income families that generally live in outer London and is likely to have at least one child at home.
Family Challenge	2%	6%	This segment includes a large proportion of young families with average to low incomes.
City Living	2%	12%	Residents with very high incomes living in trendy parts of London (e.g. Westminster/ Kensington/ Chelsea).
Detached Retirement	1%	10%	Typically, in the “empty-nest” or retired lifestyle groups, these residents generally live in the greener suburbs on the fringes of London.

*Significant activity deemed as over 10 members residing in that borough. These boroughs are: Hackney, Wandsworth, Hammersmith and Fulham, Lewisham, Merton and Hounslow.

Differences from round trip and flexible models

Point-to-point car clubs attract similar groups to other car clubs

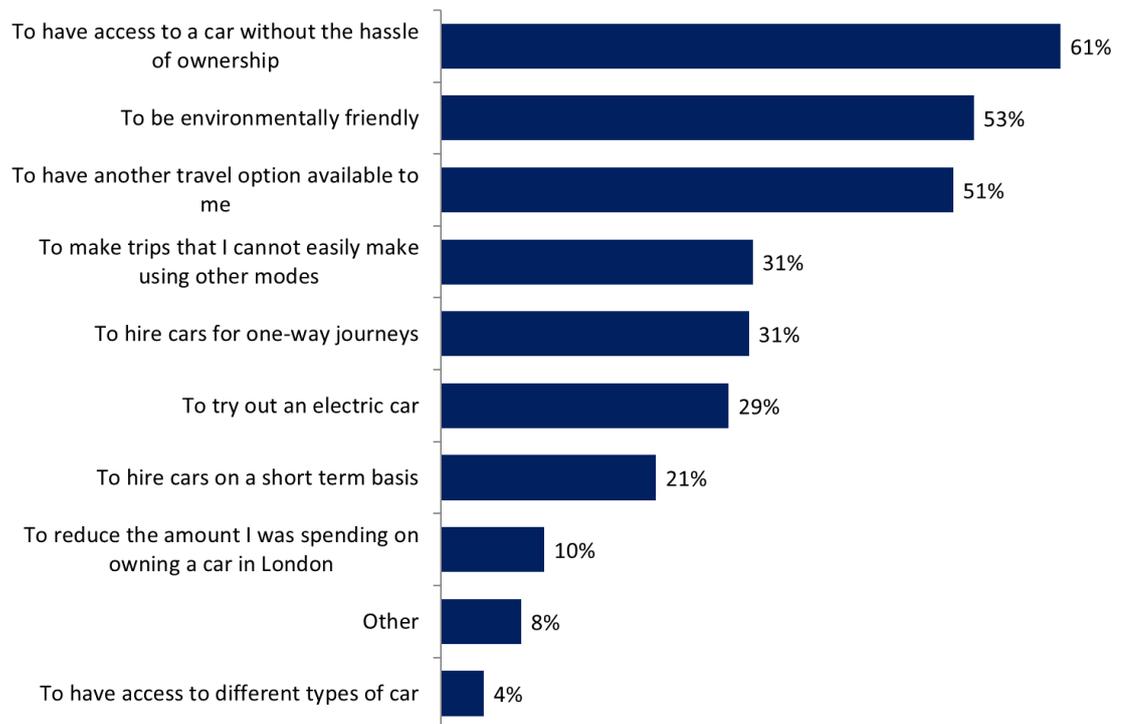
Similarly to the other models, point-to-point car clubs attract a wide variety of members from different population segments. Compared to other car club models point-to-point car clubs particularly attract peoples form the Educational Advantage and Affordable Transitions groups.

Key findings

Members join a point-to-point car club to gain additional personal freedom and occasional access to cars

- The chart below shows that the most popular reason for joining was to have access to a car without the hassle of ownership (61%).
- The second most popular reason was to be environmentally friendly (53%) which may reflect the 100% electric fleet.
- The third and fourth most popular reasons referenced the need for a car to make certain trips and 29% joined in order to try out an electric vehicle.
- ‘Other’ responses included joining to test the service, to use a promotional joining offer and to use while awaiting delivery of a new EV.

Chart: Reason for joining a car club



Differences from round trip and flexible models

The electric fleet plays an important role in attracting members

The option ‘To be environmentally friendly’ is more important to point-to-point members than for other models. Over half of point-to-point members chose this as a reason for joining whereas it was chosen by just 28% of flexible members and 18% of round trip members. 29% also joined the point-to-point car club in order to experience driving an electric vehicle.

Key findings

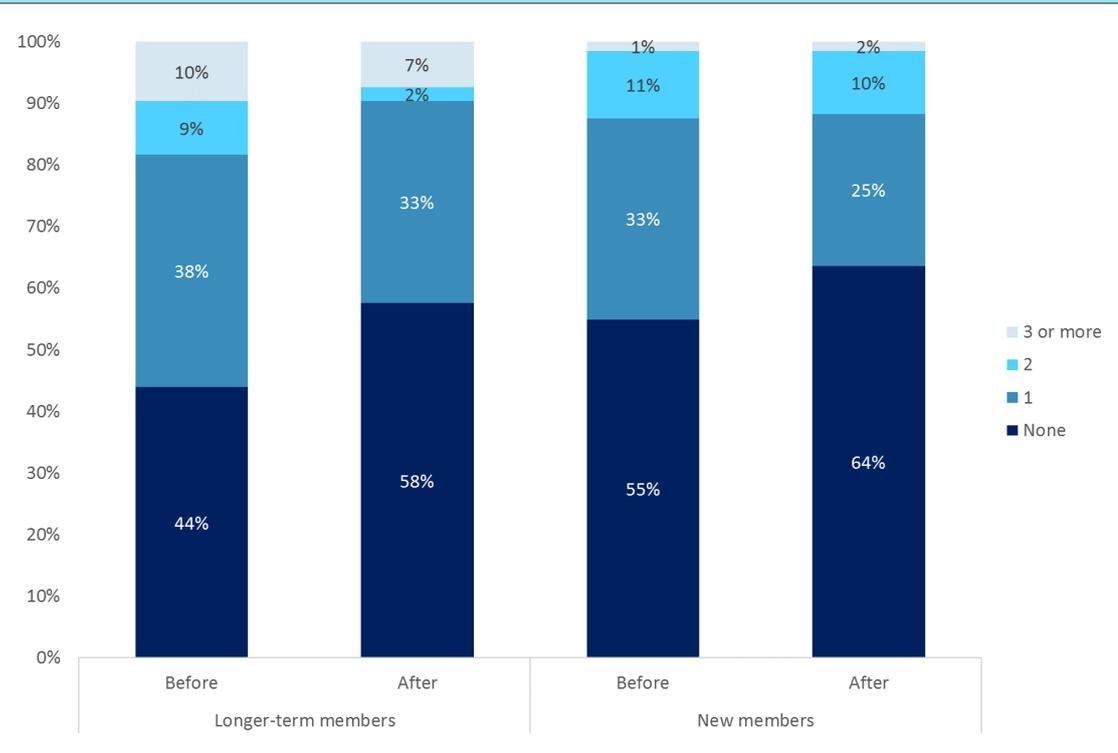
Car ownership amongst new members falls after joining

- 45% of new members owned at least one car before joining, falling to 36% afterwards, as shown in the graph below.

Longer term members also own fewer private cars

- Longer-term members also show drop in car ownership after joining. 56% of longer-term members owned at least one car before joining, falling to 42% afterwards.
- 15% of all members stated that they had sold or disposed of a car in the 12 months prior to completing the survey (22% of members and 13% of new joiners). Of these, the top three reasons for selling a vehicle are: 1. Cost of keeping their car on the road, 2. Car not used often enough to justify keeping it, and 3. Environmental reasons (e.g. Low emission zones, air quality).
- Unlike in other models, a higher proportion of longer-term members have sold a car in the previous 12 months than new joiners. This may be because the point-to-point car club is still quite new, meaning that there is likely to be less difference in the behaviour of new and longer term members.

Chart: Car ownership before and after joining a car club

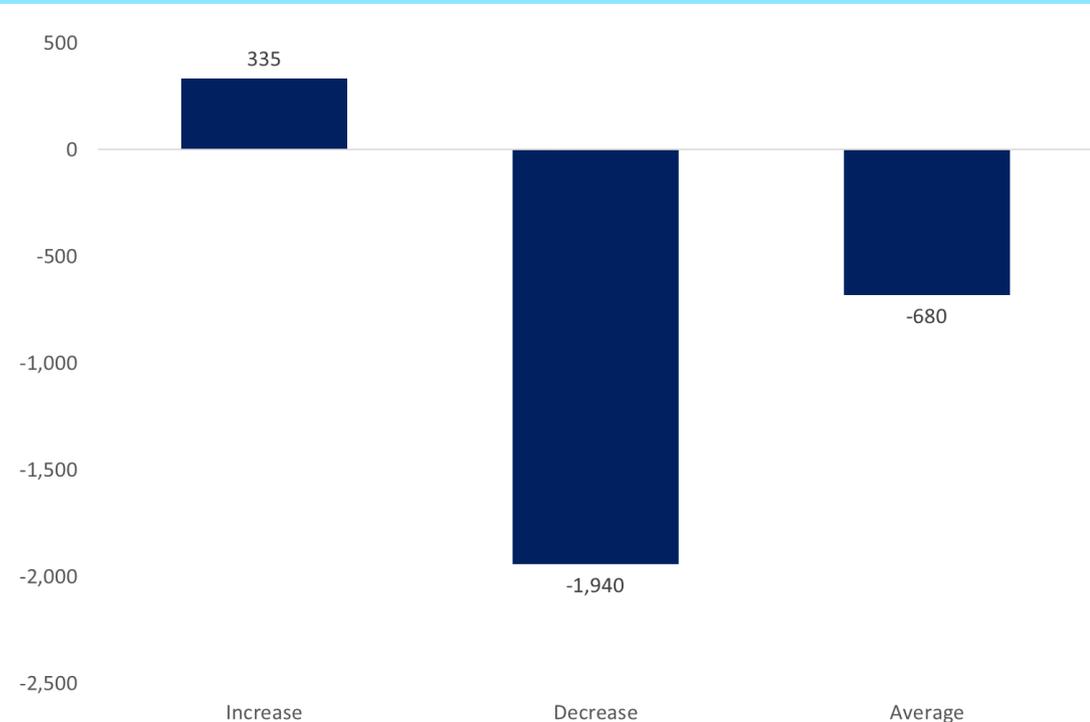


Key findings

Joining a car club is associated with a reduction in annual car mileage

- The average change in annual household car mileage (for all cars in the household and car club cars) reported by longer-term members after joining was a decrease of 680 miles.
- **Many respondents will not have accurate records of their mileage so the figures they have provided are likely to be estimates.**
- This average change is derived from estimated changes in mileage provided by the 30% of long-term members who reported a decrease in their mileage after joining a car club, the 9% who reported an increase and those members who reported no change (43%).
- The distribution of change is shown below; the average increase in annual mileage was 335 miles whilst the average decrease was 1,940 miles.
- The estimated average annual mileage travelled by members (in their primary household car) is 2,953 miles. When added to the estimated miles travelled in car club cars (1,048 miles), the annual average is 4,001 miles. The average mileage driven by households in London is 6,300 miles (National Travel Survey, 2017) indicating that car club members drive far less than the average London resident (based on data from car club members).
- The average change is similar to round trip members with a decrease of 620 miles and higher than flexible members with an average decrease of 286 miles.

Chart: Average change in long-term member annual mileage following joining a car club

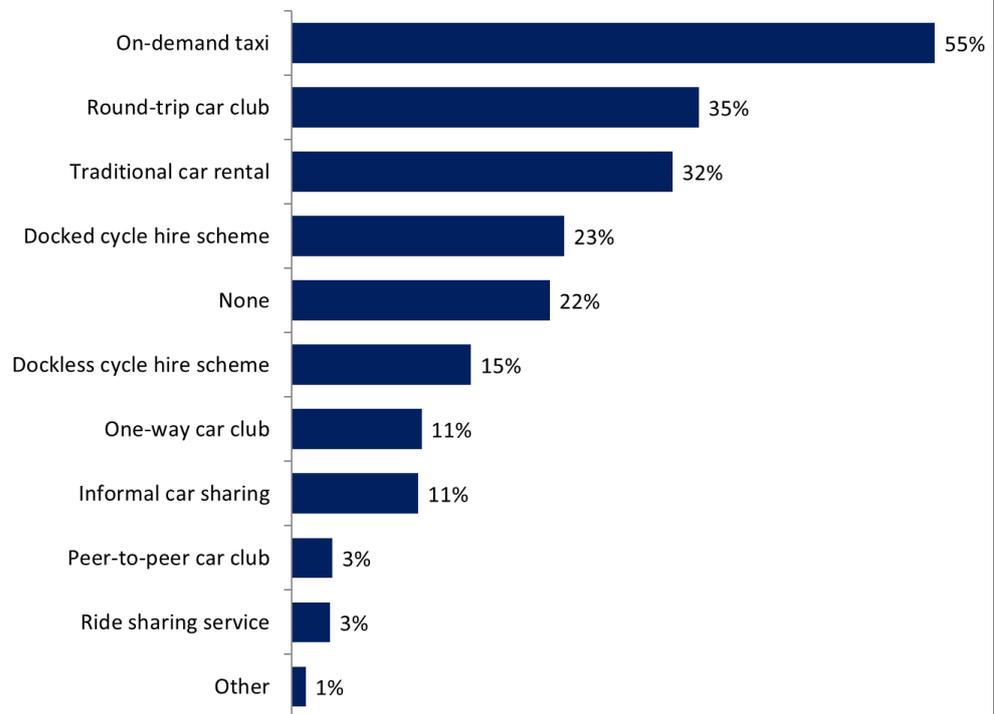


Key findings

Flexible car club members also use other shared mobility services

- 78% of members use another shared mobility service alongside their car club reflecting the growth in the shared economy.
- Aside from car clubs, 55% have used on-demand taxis, 32% have used traditional car rental and 23% have used a docked cycle hire scheme
- Over a third of members have also used a round trip car club and 11% have used a flexible car club.

Chart: Joining other shared mobility services before or after joining car club

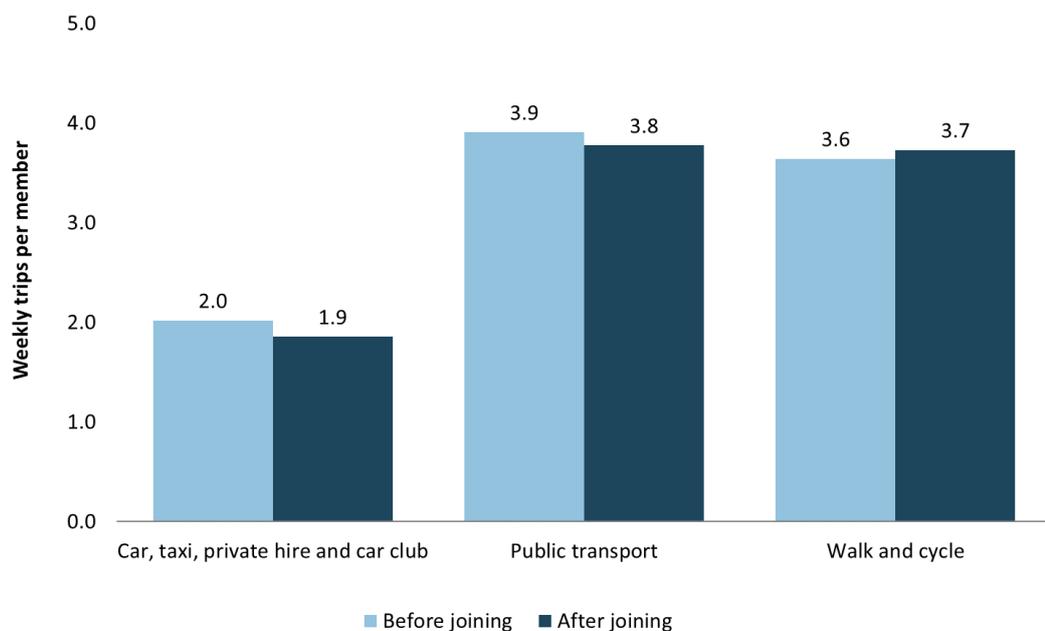


Key findings

New members travel by car less after joining

- After joining a point-to-point car club, new members reduce their car use. Point-to-point car club members who have joined a car club in the last 12 months have reduced their car use by 8.1% from 2.0 car trips per week to 1.9 car trips per week.
- Across London in 2017/18 the number of bus and underground trips reduced, despite the population of London increasing. This trend is mirrored in public transport use by new point-to-point car club members, with a reduction of 3.4%. Further analysis in a future annual survey may help explain where car club trips overlap with public transport.
- New member of point-to-point car clubs report a slight increase in the number of weekly walk and cycle trips after joining a car club.

Chart: Weekly trips by mode, before and after joining a point-to-point car club

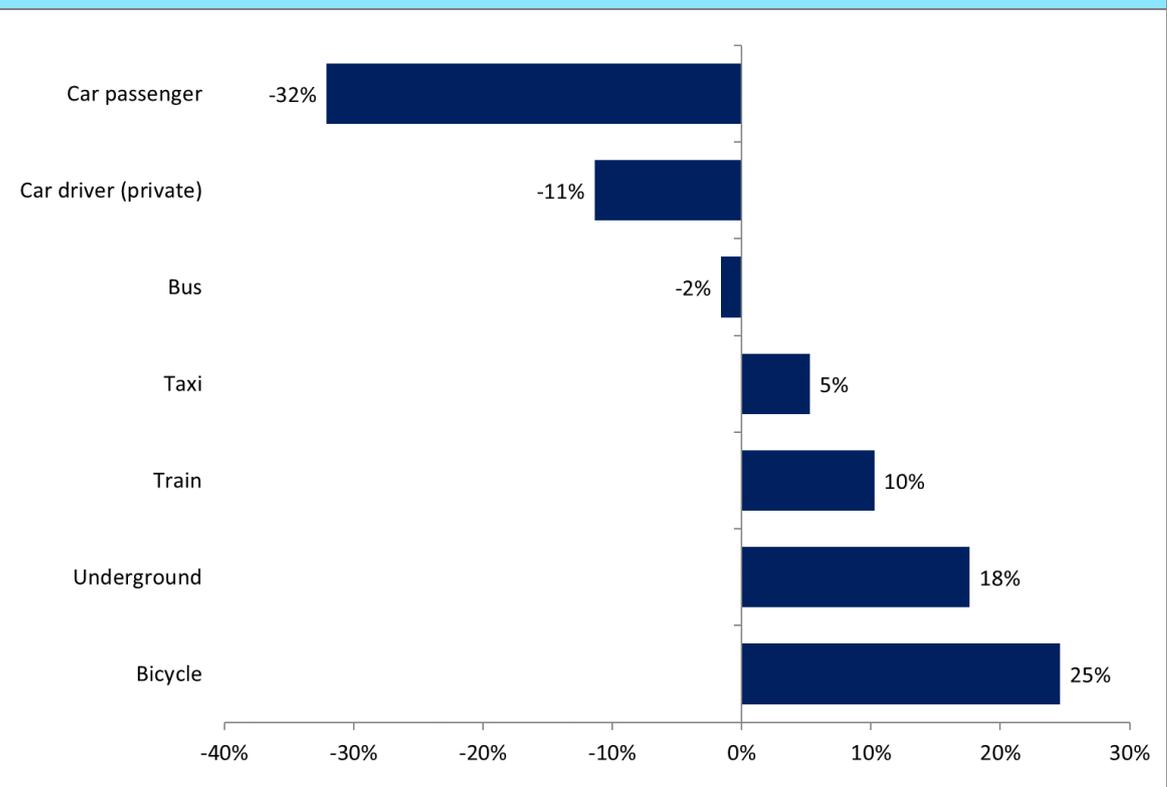


Key findings

Point-to-point members use car modes less than the average Londoner

- The Greater London population was used as a comparison group to see how Londoners’ travel patterns in general could become more sustainable if car clubs were more widely adopted.
- Members were asked how often they travel by each mode and the results show that they make more use of sustainable modes of transport and less use of private cars than the average London resident based on LTDS 2016/17.
 - 58% travel by Underground at least once a week compared to 41% of London’s population;
 - 27% travel by train at least once a week compared to 17% of the London population;
 - 37% travel by bicycle at least once a week compared to the London average of 13%; and
 - 58% travel by bus at least once a week compared with the London average of 59%.
- The chart below shows that point-to-point members use private cars (both as drivers and passengers) less than the average Londoner.

Chart: % of all respondents using modes at least once a week compared with the average Londoner (percentage point change)



Key findings

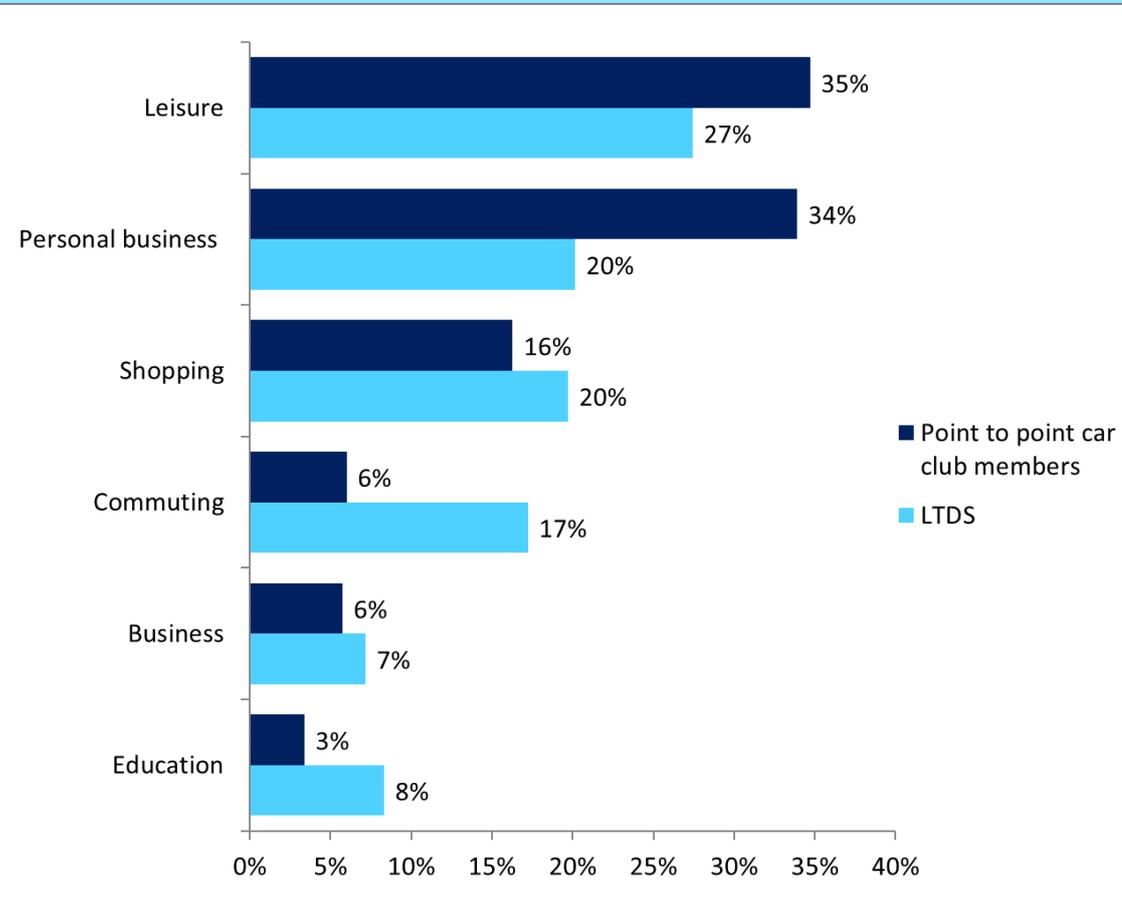
Car club cars in London have a higher occupancy than private cars

- Point-to-point car club cars have an average occupancy of 2.0 people (based on the last car club journey made) compared to 1.6 for private cars (LTDS, 2016/17). This may be a reflection of the different journey types as detailed below.

Car clubs are mostly used for personal and leisure purposes

- As shown in the chart below, leisure (35%), personal business (34%) and shopping (16%) are the most popular car club journey purposes. Respondents could choose more than one journey purpose for this question.
- These are the same top journey purposes as for flexible and round trip car clubs.

Chart: Comparison of journey purposes



Key findings

Half of all members have made a car club journey in the last month

- The table below shows that just over half of point-to-point car club members have made a car club journey within the last month and a further 20% in the last three months.

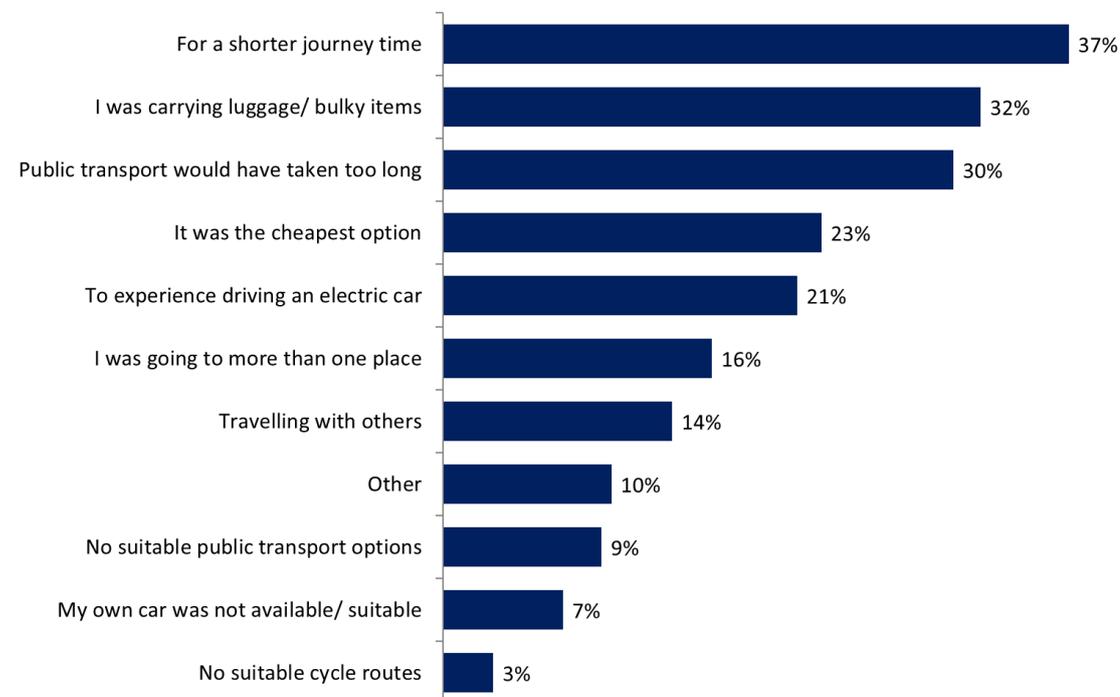
Members use car clubs for convenience

- When asked why they chose to use a car club most recently, the most popular reason was for a shorter journey time (37%) which made driving the most convenient option. 32% of respondents were carrying bulky items which made a car necessary and 30% said that public transport would have taken too long.
- The top reason is the same as for flexible members while the second and third most popular reasons are in the opposite order for flexible members.

Chart: Most recent car club journey

Last journey	% of members
In the last month	54%
In the last three months	20%
Between three and six months ago	10%
More than six months ago	4%
Have not yet made a journey	12%

Reason for using a car club for your most recent car club journey

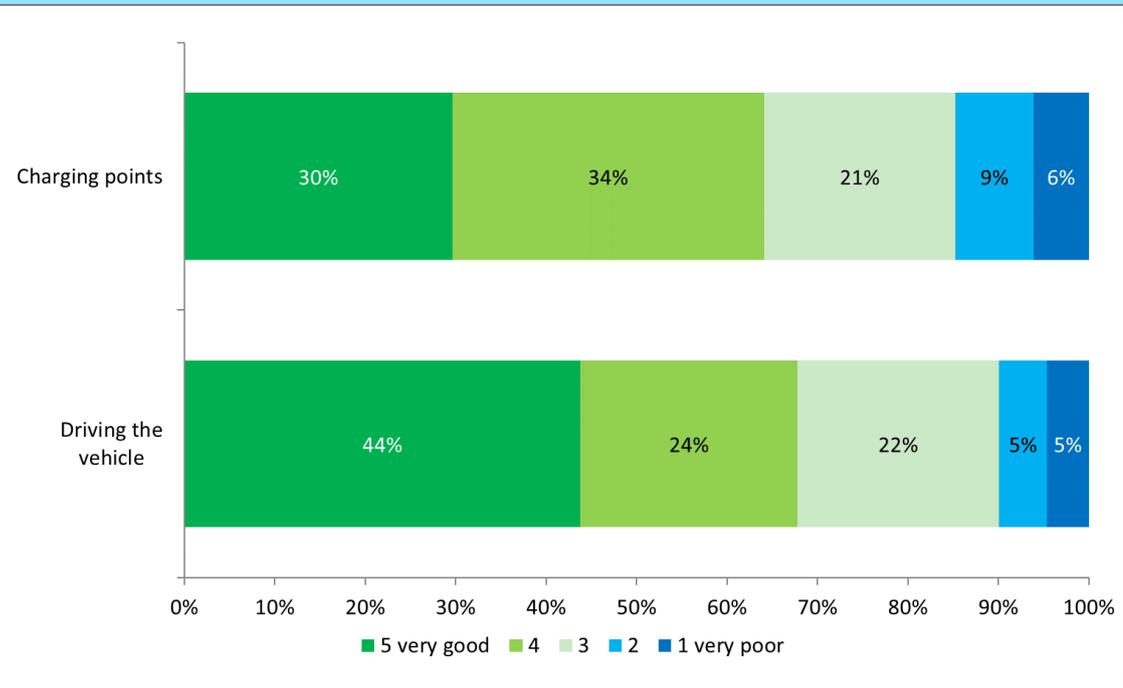


Key findings

A third of respondents have tried an electric vehicle

- As Bluecity is a 100% electric car club, all members that have used a car club vehicle have experienced driving an electric vehicle.
- 68% of members rated driving the vehicle as ‘very good’ or ‘good’ and 64% rated the use of the charging points as ‘very good’ or ‘good’.
- Those who rated the charging points ‘poor’ or ‘very poor’ were asked why they had chosen this rating. Responses included that charging screens on the vehicles sometimes were not working, that there was a lack of charging points and that non-car club cars were found parked in the charging bays.

Chart: Experience of using electric vehicles and charging points



5 Profile of the car club fleet

Introduction

- 5.1 This section reports on the car club vehicles in use in London during 2017/18. It is based on a comprehensive set of fleet data that has been collected from London car club operators. The data has been independently verified by Gfleet Services Ltd using the vehicle registration marks (VRM) and published datasets from the DVLA (Driver and Vehicle Licensing Agency), VCA (Vehicle Certification Agency) and vehicle manufacturers, which enables the production of more comprehensive and accurate fleet profiling. This section contains the key findings and comparisons with previous years. The full emissions analysis and profiling is contained in Appendix A.
- 5.2 All London car club operators were asked to provide the VRM of all their car club vehicles that were operational during the 12 months between 1st April 2017 and 31st March 2018 together with the mileage driven during that period, the fuel or energy used and the dates when the vehicles joined or left the fleet. Six car club operators (out of seven) supplied data.
- 5.3 The VRM data from all the clubs was submitted to Carweb⁵ and a full environmental data set was obtained for each vehicle based on the information held by the DVLA and the manufacturer. For most vehicles, the air quality emission data (nitrogen oxides NO_x, particulates PM₁₀, hydrocarbons HC, and carbon monoxide CO) was not available from this data set. The air quality data was obtained by matching, as closely as possible, the DVLA vehicle details with the VCA data set which holds the official emission figures. The vehicle's safety performance in the European New Car Assessment Programme (NCAP) was established by matching the vehicle to the NCAP data set using DVLA make, model and year of registration.

⁵ Carweb, www.carweb.co.uk is a commercial database which provided information about vehicles based on their registration numbers

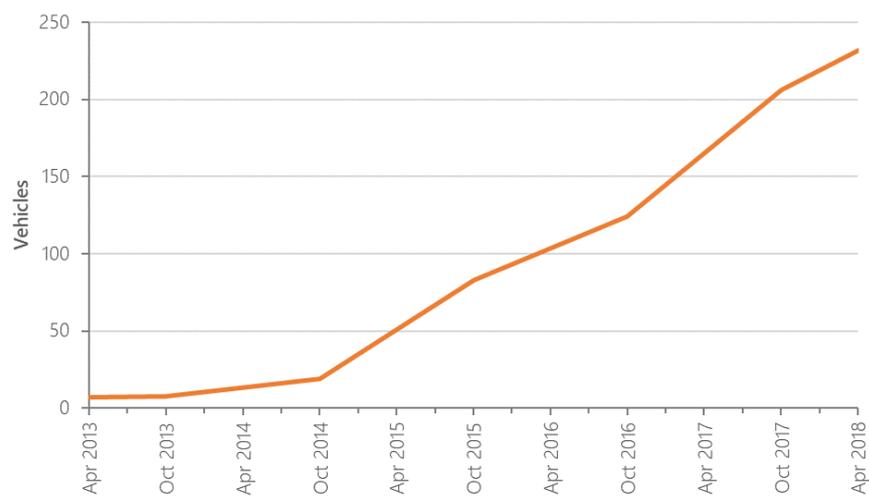
Greenhouse Gas and Air Quality Impacts

Key Findings

The car club car fleet is 100% Ultra Low Emission Zone compliant, for the first year.

- Of the 2,636 car club cars, only one (Euro 6) diesel car remains on the fleet; the rest are Euro 6 petrol, electric or hybrid.

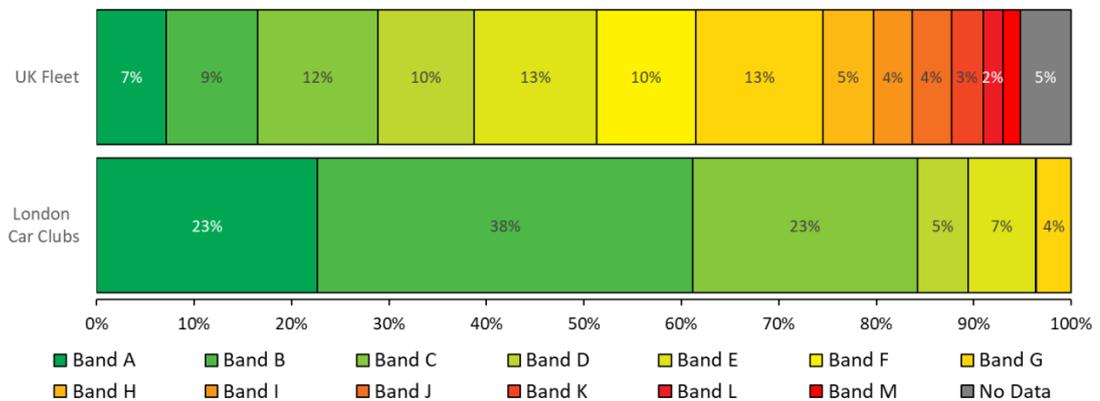
Ultra Low Emission Vehicles (under 75 g/km) on the car club fleet since 2013



Car club cars reduced transport carbon dioxide emissions by at least 1,014 tonnes in 2017/18.

- The average carbon emission of the London car club fleet was 28% lower than the 2017/18 UK average car and 2.3% lower than the London car club average for 2016/17.
- There are 232 Ultra Low Emission Vehicles on the car club fleet with carbon emissions under 75 g/km and all can drive at least 10 miles in zero emission (electric) mode. 173 of these are zero emission electric vehicles. This represents 8.8% of the car club fleet.

Carbon profile of the London car club fleet based on VED 2006 banding scheme



- 23% of the London car club fleet is in Band A (0-100 g/km) compared to only 7% of the UK car fleet. The fleet's published average carbon emissions have fallen almost every year since 2011.

Average carbon emissions of London Car Clubs 2011 to 2017 (g/km)

Fleet	2011	2012	2013	2014	2015	2016	2017/18
London Car Clubs	129.6	110.1	107.3	108.3	107.3	106.6	104.1
UK Car Fleet ⁶	162.8	160.1	157.0	153.9	150.6	147.3	144.3

Car club carbon savings when compared with the average UK car (tonnes)

Average car club CO ₂ emissions	CO ₂ from the same mileage in an average UK car	Potential CO ₂ saving	Percentage reduction
7,269 t	8,284 t	1,014 t	12.3%

Trends

⁶ Sub-national level data for vehicles registered in London is not available. Analysing vehicle registration data at a sub-national level is problematic as more than 50% of new registrations are registered to the head-office location of the fleet owner, not where the vehicle is based. We recommend exploring with TfL whether it is possible to consider vehicles used in London from ANPR datasets for the next Annual Survey.

Petrol vehicles have improved air quality without increasing fleet carbon emissions, due to the choice of lower emission petrol vehicles.

The fleet has moved to the use of petrol vehicles, but this has not resulted in an increase in carbon emissions. It is possible that the use of diesel vehicles would have resulted in a larger carbon reduction but at the expense of air quality.

The number of car club electric vehicles has more than doubled since the last survey, but the impact is not reflected in the tailpipe emission figures as the fleet is still small compared to the overall London car club fleet and no mileage data was made available for most of the electric vehicles.

Safety

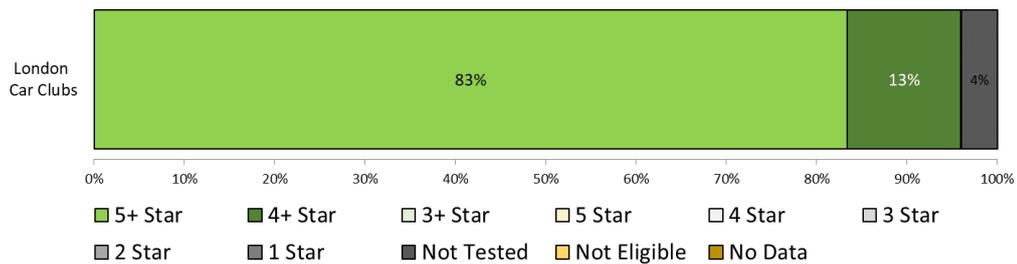
Key Findings

Most car club cars meet the highest safety standards.

- 96% of the London car club fleet has achieved the NCAP 5+ or 4+ Star safety standard.

Safety of the London car club fleet based on Euro NCAP star rating

NCAP profile of the London car club fleet



A new car club provider is using a range of vehicles that have not been NCAP safety tested, these are included as 'Not Tested' in the graph above.

Trends

Although a higher proportion of the fleet now meets the NCAP 5+ Star standard (up from 80% in 2016) there is now a small group of untested vehicles operated by one car club company. There is no evidence to suggest these cars are unsafe, but they have not been tested by NCAP.

6 Operator Survey

6.1 Introduction

- 6.2 This section contains the information provided by car club operators about their service. Each car club operator has provided details of their vehicle fleet, membership numbers and characteristics of members and data regarding use of car clubs by their members such as mileage travelled. The data was collected across the London fleet by means of a self-completion questionnaire.
- 6.3 Data was provided by four round-trip car clubs (Co-wheels, E-Car, Enterprise and Zipcar), one flexible car club (DriveNow) and one point-to-point car club (Bluecity) with a combined membership of 245,000. Data for Zipcar was not split by round-trip/flexible, hence all Zipcar data is reported in the round-trip figures.
- 6.4 Due to commercial sensitivities, data was not provided from flexible and point-to-point car clubs for all questions. This means that some of the data presented is just with respect to round trip car clubs and is labelled accordingly.
- 6.5 Data regarding the NO_x, CO₂ and PM₁₀ emissions from car club vehicles were collected separately through the emissions analysis and profiling process and was reported in Section 2 (and Appendix A).

Characteristics of car club members

Key findings

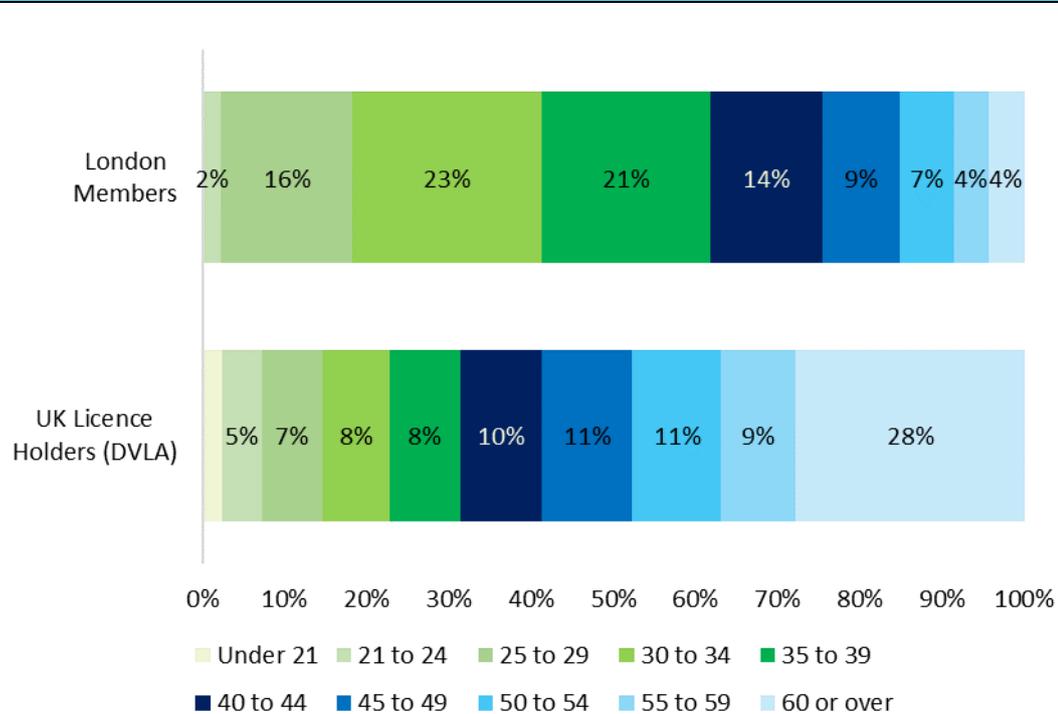
Car clubs attract a young profile of members

- The chart below shows that 75% of London car club members are under 45, compared to 43% of UK driving licence holders (data for London licence holders were unavailable). The key age range for car club membership is predominantly amongst the 30-39 age group.

Men are more likely to join car clubs than women

- 72% of car club members are men compared to 54% of UK licence holders who are men.
- These figures include round trip, flexible and point-to-point car club members.

Chart: Age of members compared to age of national licence holders



How car clubs are used

Key findings

Round-trip car club hires are longer in duration and length than flexible hires

- The average duration of hire for round-trip car clubs is 6 hours 20 minutes, a decrease from the average last year of 7 hours 12 minutes. The hire period is likely to include both driving time and some time when the vehicle was parked.
- In comparison, the average duration for flexible and point-to-point car clubs is 44 minutes reflecting the differing car club models and users' ability to use the vehicle for one one-way trip.
- The average distance travelled per hire in round-trip car clubs is 34 miles, compared to 4 miles using point-to-point and flexible car clubs. The distribution of mileage for round trip bookings are shown in the chart below.

Chart: Distribution of mileage per booking (round-trip)

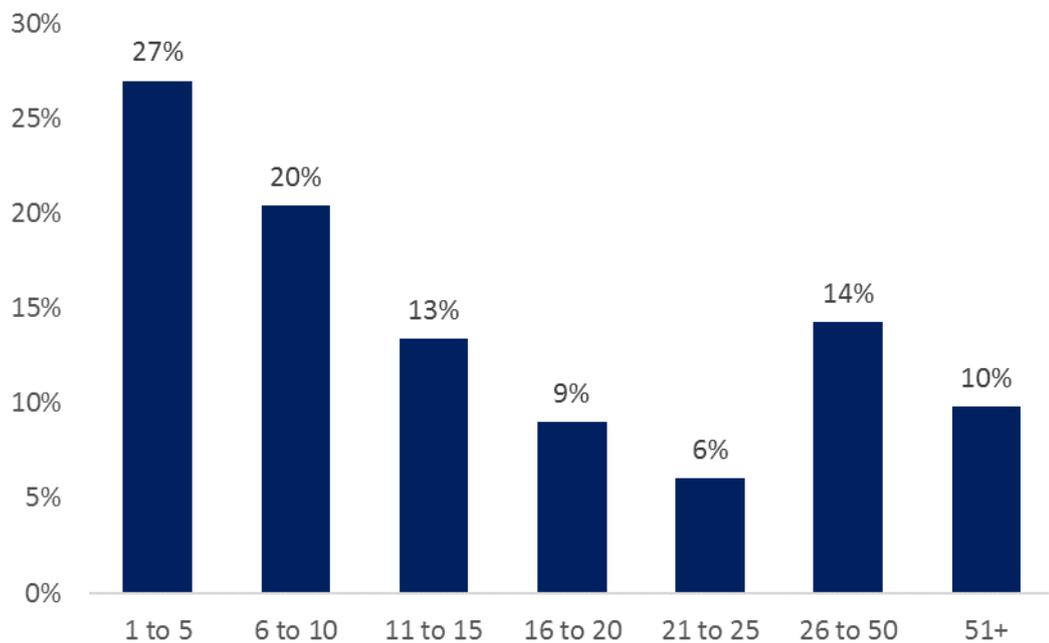


Table: Trip duration, distance and number of hires in London for round trip car clubs

Measure	Round-trip	Flexible and point-to-point	Measure	Round-trip
Average duration of hire	7 hours 12 minutes	44 minutes	Average number of hires per active member ⁷ per year	7 hires
Average distance per hire	34 miles	4 miles	Implied miles per member per year ⁸	245 miles

⁷ An active member is defined as a member who has hired a car at least once in the last 12 months

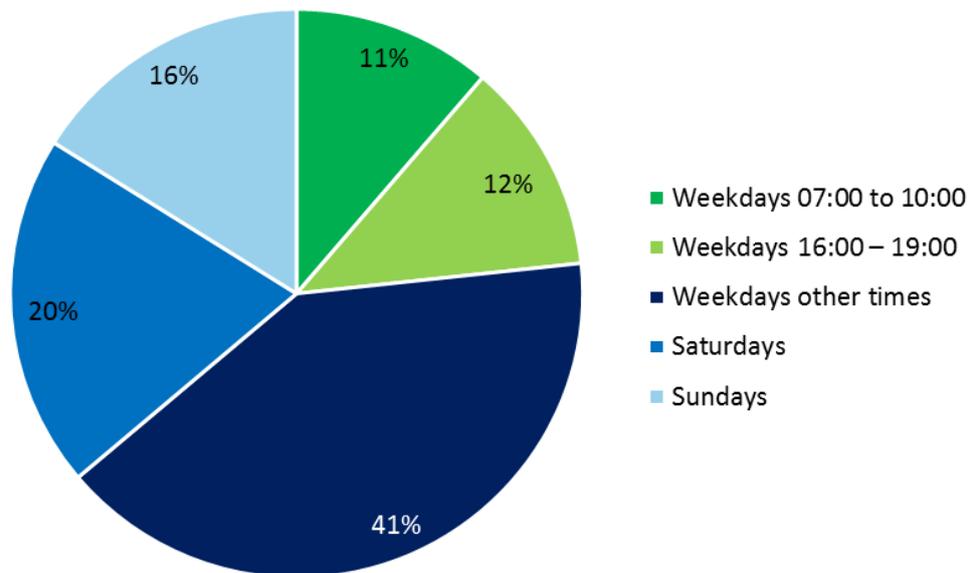
⁸ Calculated as average number of hires per year multiplied by average distance per hire.

Key findings

Most car club journeys are made off-peak

- Only one in four round-trip car club bookings starts during weekday peak times as shown in the chart below.
- The majority of bookings start during off-peak weekday times or at weekends with two fifths starting on weekdays outside of peak hours, 20% starting on Saturdays and 16% starting on Sundays.

Chart: Booking start times (round-trip)



A Appendix: Fleet analysis and profiling

A1 Introduction

This section reports on the car club vehicles in use in London during 2017/18. It is based on a comprehensive set of fleet data that has been collected from London car club operators. The data has been independently verified by Gfleet Services Ltd using the vehicle registration marks (VRM) and published datasets from the DVLA (Driver and Vehicle Licensing Agency), VCA (Vehicle Certification Agency) and vehicle manufacturers which enables the production of more comprehensive and accurate fleet profiling.

All seven London commercial car club operators were asked to provide the vehicle registration marks (VRM) of all their club vehicles that were operational during the 12 months between 1st April 2017 and 31st March 2018 together with the mileage driven during that period and the dates when the vehicles joined or left the fleet. Six of the seven car club operators responded to the data request and the club that did not respond had reported less than 20 vehicles on fleet in previous years.

The VRM data from all of the car clubs was submitted to Carweb⁹ (a DVLA agent who have access to the DVLA database) and a full data set was obtained for each vehicle based on the information held. For most vehicles, the published air quality emission data (nitrogen oxides NO_x, particulates PM₁₀, hydrocarbons HC, and carbon monoxide CO) was not available from this data set. The air quality data was therefore obtained by matching, as closely as possible, the DVLA vehicle details with the VCA data set which holds the official type approval emission figures. The vehicle's safety performance in the European New Car Assessment Programme (NCAP) was established by matching the vehicle to the NCAP data set using DVLA make, model and year of registration. The car fleet is reported below and the van fleet is considered separately in [Section 3](#) following the car fleet profile.

A2 London Car Club Cars

The data presented in this section relates to the fleets of the six car club operators that had vehicles available for use in London during 2017/18 and that responded to the survey. The names of the car club operators have been replaced by numbers (e.g. Club 01) which correspond to those used in reports produced in previous years.

The data made available relating to fleet changes meant it was possible to accurately determine the number of vehicles on fleet at the period end. A total of 4,756 cars were used by the London car club fleet during 2017/18 and of those 2,636 were on the fleet and active at the year-end (31st March 2018). The difference between these two numbers is the turnover in the fleet as older vehicles are replaced with new ones or vehicles are relocated to and from other parts of the country. For profiling the fleet, we used the vehicles that were on-fleet and active at the year end – this is line with the methodology used in previous years. When calculating the annual mileage driven by car club vehicles and the associated carbon emissions we use the whole fleet mileage in year. The 2,636 on fleet at the year end represents a

⁹ <http://www.carweb.co.uk/Vehicle-Registration-Lookup>

substantial 22% increase from November 2016 when there were 2,049 active cars on the fleet at the year-end.

Carbon Dioxide Emission Profile - Cars

When a car is registered with the DVLA its carbon dioxide emissions (usually shortened to carbon emissions) measured in grams of carbon dioxide emitted per kilometre (gCO₂/km and usually shortened to g/km) must be submitted. The data is supplied by the original equipment manufacturer (OEM), is produced using laboratory tests paid for by the manufacturer and is related to the specification of the vehicle.

Changes to VED Classification

Since April 2001 the carbon emissions of a car (g/km) has been used by HM Treasury to determine the Vehicle Excise Duty (VED) payable. With a small change in 2006 the system remained essentially the same from April 2001 until April 2017 when new bands were introduced by HM Treasury. In 2017 the 2006 Band A (0-100 g/km) was sub-divided into five new bands (Band A to Band E) while the bands above 100 g/km were merged or modified so that the total number of bands (13) did not change. The new Treasury scheme does not directly relate to the old scheme and so the UK Department for Transport (DfT) now reports all new UK car purchases using both 2006 and 2017 VED emission bands.

Table 6-1 shows the number and proportion of London car club cars in each VED emission band at the end of March 2018 using both the 2006 scheme and the 2017 scheme. The shaded area maps the impact of the changes to Band A. The 598 cars in Band A₂₀₀₆ falls to 173 in Band A₂₀₁₇ with most being recategorized as Band E₂₀₁₇.

Table 6-1 Vehicle Excise Duty emission band profile comparison of car club vehicles (2006 Scheme v 2017 Scheme)

Band	2006 Scheme g/km range	Number	%	2017 Scheme g/km range	Number	%
Band A	0-100	598	22.7%	0	173	6.6%
Band B	101-110	1,014	38.5%	1-50	59	2.2%
Band C	111-120	608	23.1%	51-75	49	1.9%
Band D	121-130	137	5.2%	76-90	31	1.2%
Band E	131-140	182	6.9%	91-100	286	10.8%
Band F	141-150	3	0.1%	101-110	1,014	38.5%
Band G	151-165	94	3.6%	111-130	745	28.3%
Band H	166-175			131-150	185	7.0%
Band I	176-185			151-170	94	3.6%
Band J	186-200			171-190	0	0.0%
Band K	201-225			191-225	0	0.0%
Band L	226-255			226-255	0	0.0%
Band M	256+			256+	0	0.0%
No data available						
Total		2,636			2,636	

Figure 6-1 (below) shows the VED₂₀₀₆ carbon emission profile of the whole London car club fleet and each individual car club operator fleet in comparison to 2017/18 UK national car

fleet data¹⁰. Most London car club vehicles (84%) are in the three lowest emission bands (Bands A, B and C), with just under one quarter of the cars (23%) in Band A (0-100 g/km). This compares with only 28% of the UK fleet in Bands A to C and just 7% in Band A.

Figure 6-1 Comparison of London car clubs' VED (2006) emission band profile with the UK Fleet

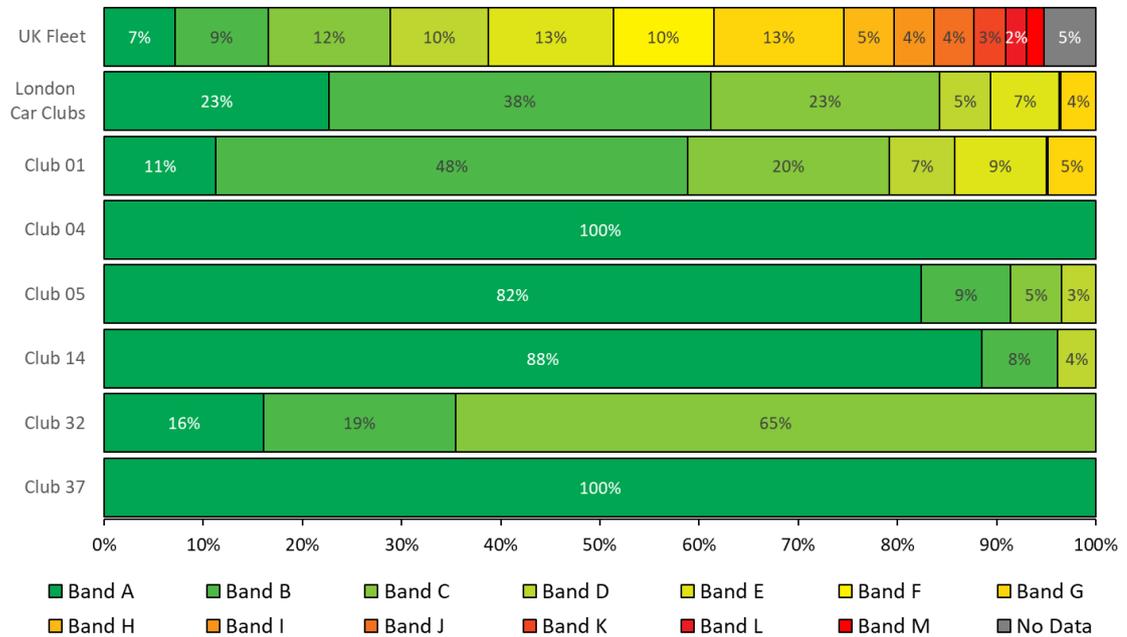
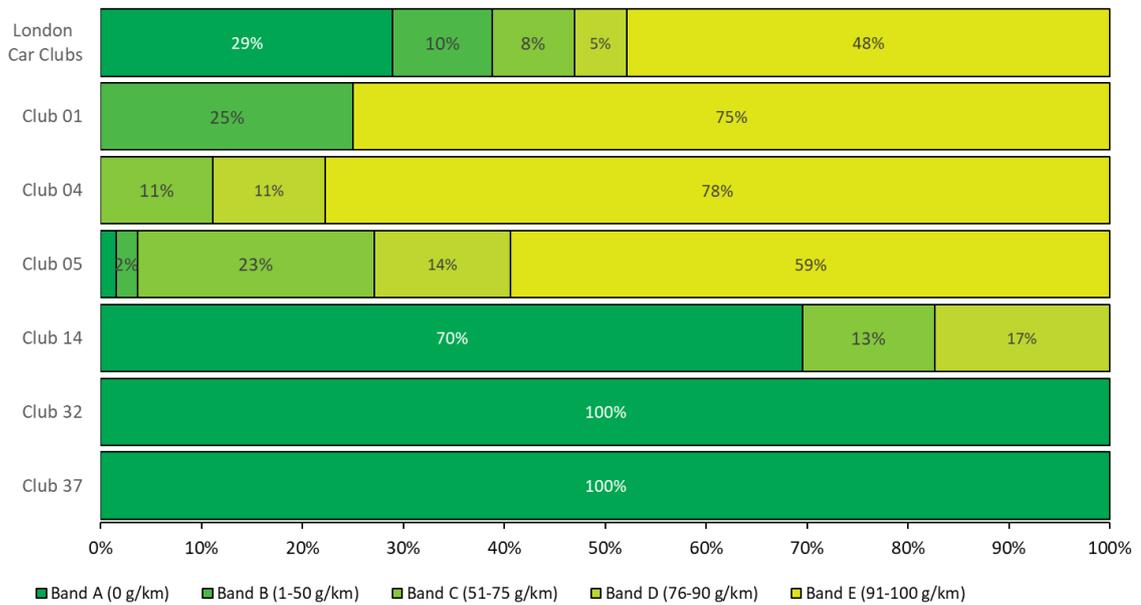


Figure 6-2 (below) shows the 2006 Band A vehicles (598 vehicles – 23%) reassigned to the 2017 VED Band A to E emission boundaries. Of note is the large proportion (48%) in Band E (91-100 g/km); these are all conventionally powered petrol vehicles. All the vehicles in Bands C and D (13%) are petrol hybrids with no plug-in capability. There are 59 (10%) Band B (1-50 g/km) vehicles in the fleet and these are all plug-in hybrid electric vehicles (PHEV). The vehicles in zero emission Band A (29%) are all battery electric. There were no hydrogen fuelled vehicles in the London car club fleet.

¹⁰ DfT Statistics: Table VEH0206. Licensed cars by CO₂ emission band, Great Britain, April 2018. Next Update April 2019. Sub-national level data for vehicles registered in London is not available. Analysing vehicle registration data at a sub-national level is problematic as more than 50% of new registrations are registered to the head-office location of the fleet owner, not where the vehicle is based. We recommend exploring with TfL whether it is possible to consider vehicles used in London from ANPR datasets for the next Annual Survey.

Figure 6-2 Analysis of the 2006 Band A (0-100g/km) fleet using 2017 Band A to Band E boundaries



At the end of March 2018, the average carbon emission (OEM g/km) of the London car club fleet (Table 6-2) was 28% lower than the 2017/18 UK average car and 2.3% lower than the average London car club car in November 2016. This data is all based on the manufacturers’ published emission factors; it has not been corrected for real-world use. When calculating the carbon emissions from car club mileage a real-world adjustment is made and that is discussed in full in that section.

Table 6-2 Average carbon emissions of London car clubs (g/km) – Manufacturers’ Data

Fleet	2011	2012	2013	2014 ¹¹	2015 ¹¹	2016 ¹¹	2017/18 ³
London Car Clubs	129.6	110.1	107.3	108.3	107.3	106.6	104.1
UK Car Fleet ¹⁰	162.8	160.1	157.0	153.9	150.6	147.3	144.3

Table 6-3 Minimum, average and maximum carbon emissions (g/km) of London car clubs

Fleet	Min g/km	Av g/km	Max g/km
Club 01	38	114	158
Club 04	75	91	95
Club 05	0	92	129
Club 14	0	35	124
Club 32	0	95	119
Club 37	0	0	0

From Table 6-3 it can be seen that Club 37 has a 100% battery electric fleet. Three other clubs (05, 14 and 32) also operated battery electric vehicles.

¹¹ Average includes “zero emission” electric vehicles as 0 g/km.

Ultra Low Emission Vehicles

When reporting on the number of ULEVs registered in the UK for 2018, the Department for Transport (DfT) uses the definition of all propulsion types with tailpipe emissions less than 75 g/km¹² (DfT Table VEH0150¹³) this has changed since 2016 when the definition was 75 g/km or less so it no longer includes vehicles with carbon emission of exactly 75 g/km. Other definitions of ULEV widely used include a requirement to be able to travel a given distance (in the range 10 to 25 miles) in zero emission mode. There are 232 vehicles (8.8%) in the London Car Club fleet that meet the criterion of less than 75g/km (Table 6-4) and they are all battery electric or plug-in petrol-electric hybrid vehicles capable of travelling at least 10 miles in zero emission mode. Had the older definition been used a further 49 petrol-electric hybrids (all Toyota Yaris) with emissions of exactly 75 g/km would have been included in the ULEV total.

Table 6-4: Ultra Low Emission Vehicles (all propulsion types less than 75g/km).

Propulsion Type	Number	% Fleet	Models in Use
Petrol-Electric Hybrid	0	0	
Plug-In Petrol-Electric Hybrid	59	2.2%	Toyota Prius Plug-In, VW Golf Plug-In
Electric	173	6.6%	Nissan Leaf, Renault Zoe, BMW i3, Bluecar
Hydrogen Fuel Cell	0	0.0%	
Total ULEV	232	8.8%	

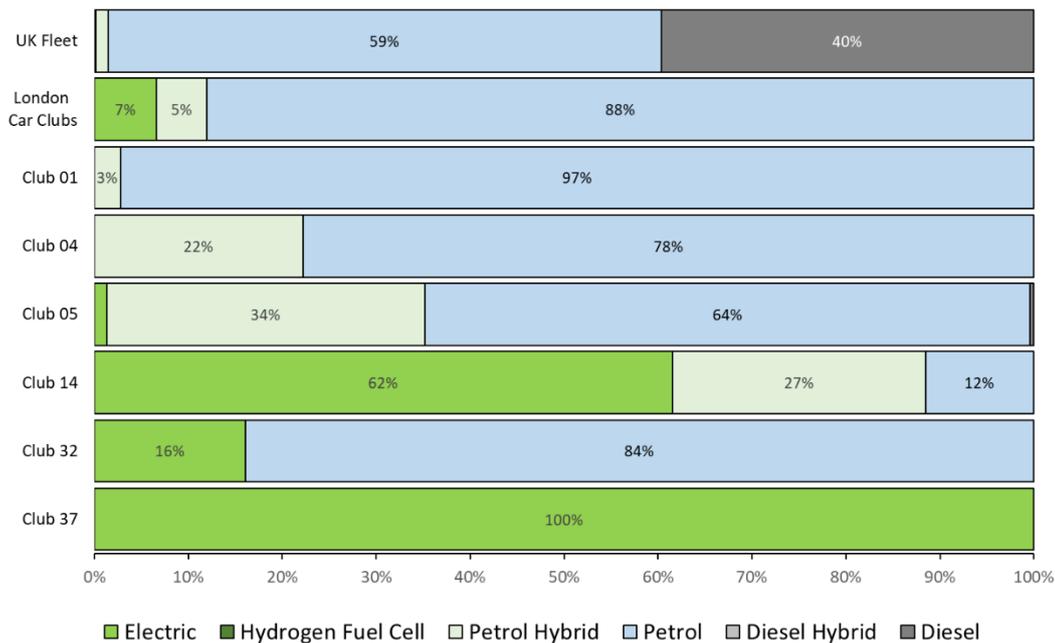
Fuel Profile - Cars

In terms of the fuels used (Figure 6-3), car clubs in London have adopted petrol as the preferred fuel type and only one vehicle was diesel powered at the point of analysis (March 2018). Petrol hybrids of all types and battery electric vehicles make up 1.5% of all cars in the UK (90% being hybrids), comprise 12% of the London car club fleet, down from 17% in 2016, but this is explained by the large number of new vehicles made available to car club members, most of which were petrol powered internal combustion engine (ICE) vehicles.

¹² Number of newly registered ultra low emissions vehicles, DfT business plan, DfT and OLEV, Updated July 2015.

¹³ <https://www.gov.uk/government/statistical-data-sets/all-vehicles-veh01>

Figure 6-3: London car clubs' fuel profile



Battery electric vehicles (BEVs) are rated as zero emission (0 g/km) by the DVLA and VCA because, according to international greenhouse gas (GHG) reporting standards, their Scope One emission which covers fuel burnt and is measured by the g/km factor is zero. Their GHG impact will depend on the source of the electrical energy used to charge the vehicle and that is reported as a GHG Scope Two emission (electricity generation, transmission and generation).

The VCA records electric vehicle energy efficiency in miles/kWh and Wh/km. BEV performance in the car club fleet ranges from 3.8 miles/kWh (2014 Nissan eNV-200 people carrier) to 4.3 miles/kWh (Renault Zoe). For comparison, a diesel vehicle with carbon emissions of 100 g/km will be achieving 1.5 miles/kWh (there is about 10.6 kWh of energy in a litre of diesel).

The Department for Business, Energy and Industrial Strategy (DBEIS) GHG emission reporting factor for the UK grid in 2017/18 was 283 g/kWh and by using this factor together with the VCA miles/kWh data the average GHG emissions of BEVs charged from the grid can be estimated. In 2013/14 the DBEIS GHG factor for the UK grid was 494 gCO₂e/kWh so in four years it has fallen by 211 gCO₂e/kWh (43%) and the carbon emissions of electric cars charged from the grid will have fallen by the same proportion. The DBEIS GHG reporting factor is based on generation data that is two years out of date due to the verification process, the actual grid emissions in 2017/18 were lower at an estimated 247 g/kWh and ranged during the year from a minimum of 76 g/kWh to a maximum of 437 g/kWh depending on weather, demand and generation mix. We have not requested information about the energy consumption of the car club electric vehicle fleet and this is not unusual as the metering of EV charging systems is poor – this is a national problem and does not just affect London car clubs.

Air Quality - Cars

As well as carbon dioxide emissions, ICE vehicles also produce a range of other gases and these impact on ambient air quality and on public health. These harmful emissions are meant

to be regulated by the Euro emission standards scheme. The current ICE standard is Euro 6, which became mandatory for all newly registered cars from September 2015 and for vans from September 2016. The DVLA classifies battery electric and hydrogen fuel cell cars as Euro 6, which does not reflect the fact that they have zero tailpipe emissions, so for clarity all battery electric cars (but not PHEVs) have been categorised in this report as ZE (Zero Emission). As can be seen in Figure 6-4 all the London car club fleet is Euro 6, Euro 5 (1%) or Zero Emission. 7% of the London car club fleet is Zero Emission compared to about 0.15% of the UK car fleet.

Figure 6-4 Euro Emission profile of London car club fleets

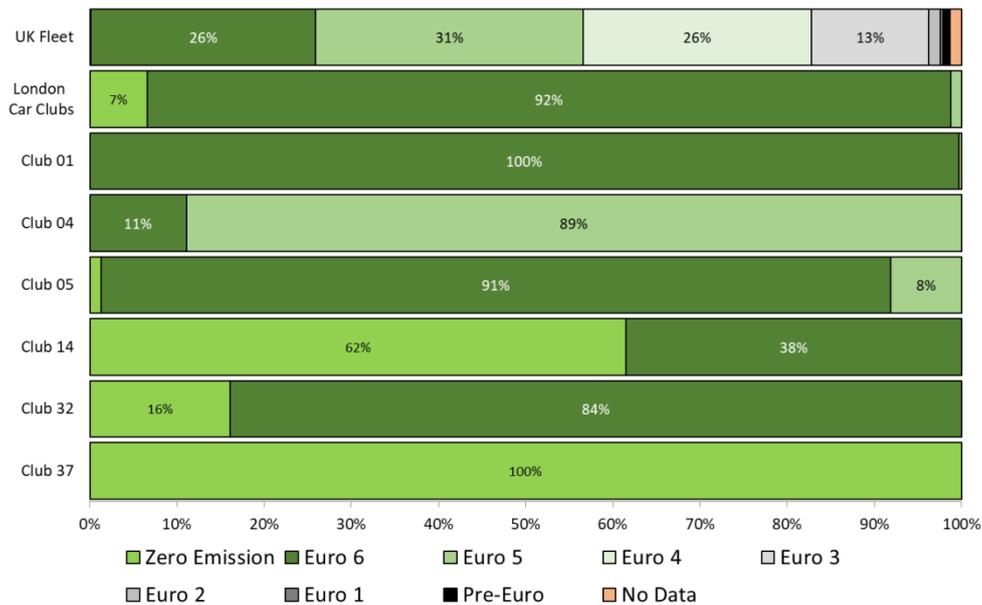


Table 6-5 shows the impact of the fleet fuel profile on air quality emissions. The principal pollutants of concern across London are NO_x (nitrogen oxides, especially nitrogen dioxide, NO₂) and PM₁₀ (particulates 10 microns in diameter or less) and their output by vehicles is measured in milligrams per kilometre (mg/km).

With only one diesel vehicle on the fleet the average PM₁₀ relates to that one vehicle. Although direct injection petrol engines do produce particulates and must be tested for PM none of the petrol vehicles in use recorded any particulate emissions according to the VCA data set. The average OEM nitrogen oxides (NO_x) emissions of the fleet were well below the permitted Euro 6 petrol engine limit of 60 mg/km.

Table 6-5: Fuel type and air quality emissions

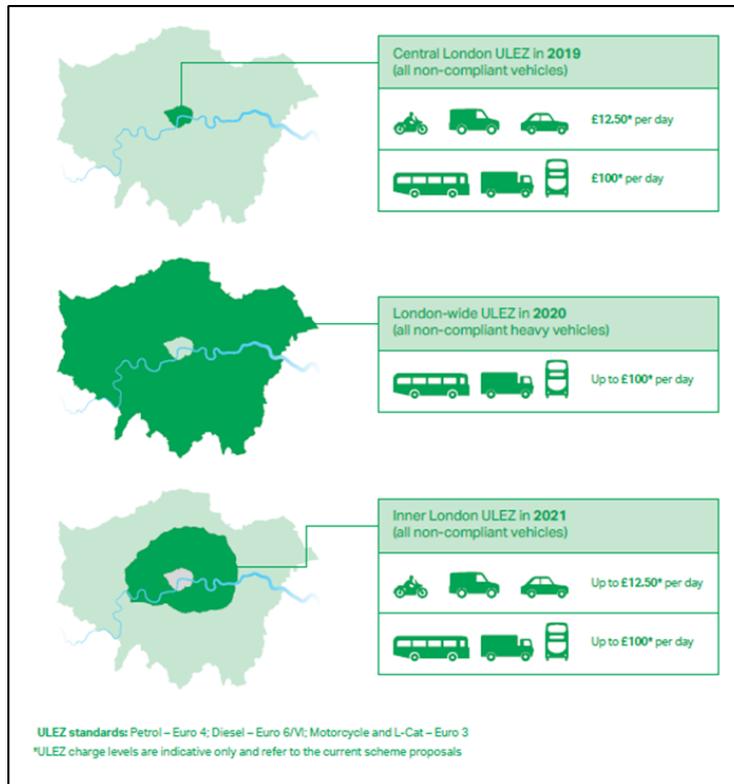
Car Club	Electric	Hydrogen	Hybrid	Petrol	Diesel	Average NO _x mg/km	Maximum NO _x mg/km	Average PM ₁₀ mg/km	Maximum PM ₁₀ mg/km
All Clubs	7%		5%	88%	(1)*	28	55	0.70	0.70
Club 01			3%	97%		29	40		
Club 04			22%	78%		8	8		
Club 05	1%		34%	64%	(1)*	11	55	0.70	0.70
Club 14	62%		27%	12%		13	32		
Club 32	16%			84%		33	37		
Club 37	100%					0	0		

*Note: There is one diesel car in the Car Club fleet, the PM₁₀ is therefore an average of one.

Ultra-Low Emission Zone Compliance

In London, an Ultra-Low Emission Zone (ULEZ)¹⁴ will replace the current London Low Emission Zone (LEZ) in 2019.

Figure 6-5: Summary of standards for the London ULEZ



As Figure 6-5 shows the ULEZ will start with the current Central London Congestion Charging Zone in April 2019 and will apply to all vehicle types.

Table 6-6 shows the minimum emission standards for charge free access to the ULEZ.

From 2020 the ULEZ will be London wide covering the same area as the current LEZ, but it will only apply to lorries and other vehicles over 3.4 tonnes.

In 2021 all vehicle types operating within the “inner London” area defined by the north and south circulars will be required to meet the ULEZ standard.

The Euro emission standards for diesel and petrol cars are not the same and for any given standard the diesel vehicle is permitted to produce a higher level of pollutants. A Euro 4 (2005) petrol car’s NO_x emissions are capped at 80 mg/km whereas a Euro 4 diesel car is permitted NO_x emissions of up to 250 mg/km.

A new 2018 Euro 6 diesel car is limited to NO_x emissions of 80 mg/km, the same standard that a Euro 4 petrol car was required to meet in 2005. A Euro 6 petrol car’s NO_x emission are capped at 60 mg/km. This has been considered when setting the proposed standards (

Table 6-6) for the London ULEZ and that is why different standards have been set for diesel and petrol vehicles.

Table 6-6: Standards for charge-free access to the London Ultra Low Emission Zone

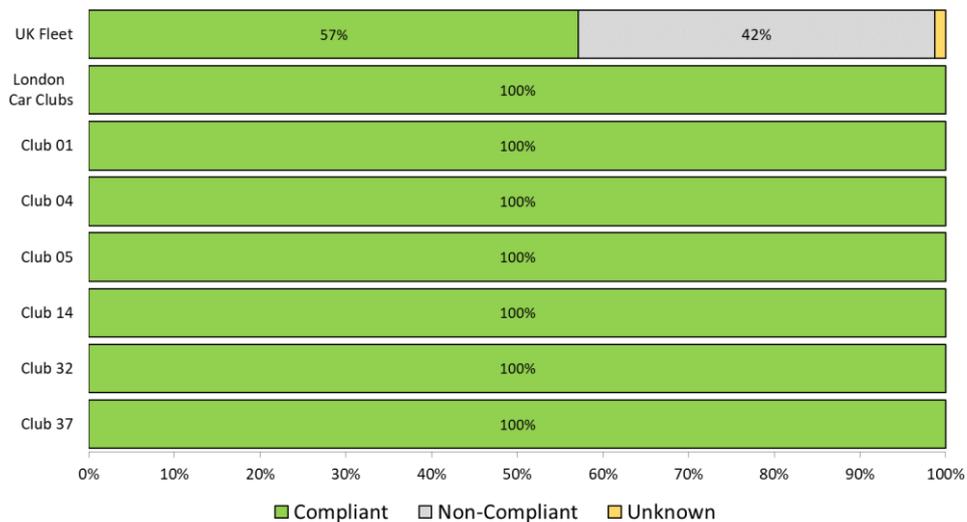
Fuel	Vehicle Type	Minimum Standard
Diesel	All types	Euro 6/VI
Petrol	Cars, Vans, HCVs, Buses	Euro 4/IV
Petrol	Motorcycles	Euro 3
Electric	All types	All Charge Free

The same standards will be used for all Clean Air Zones (CAZ) in Scotland, England and Wales.

¹⁴ <https://tfl.gov.uk/modes/driving/ultra-low-emission-zone>

By applying the standards in Table 6-6 to the London car club fleets it is possible to identify the proportion of vehicles that are already compliant, and this is shown in Figure 6-6.

Figure 6-6: Car club fleet compliance with London Ultra Low Emission Zone standards



There are no non-compliant vehicles in the London car club fleet. The UK car fleet has a high level of compliance because of the high proportion of petrol vehicles (60%). Euro 4 compliant petrol cars have been available since 2001 and in July 2001 there were over 200 Euro 4 petrol cars on the market (from VCA data) including basic models like the Ford Fiesta and the VW Lupo.

Mileage & Carbon Emissions

The mileage of all the cars that were in the car club fleet during 2017/18 was used in conjunction with the published carbon dioxide emissions of the vehicles (g/km) to estimate the total carbon dioxide emissions from London car club cars. Unfortunately, not all car clubs were able to provide mileage data and the reporting of ULEV mileage was disproportionately impacted by this. As a result, the emission estimate is based on 92% of the fleet, most of which was ICE powered.

In the 2014/15 GHG reporting methodology DBEIS moved to using an age-related uplift of the manufacturers' published data to reflect the fact that in 2001 the average difference between the manufacturers' carbon emission data and real-world performance was only 7.5% but by 2015/16 it had risen to 41.5%¹⁵ falling to 38% in 2016/17. A 2017 car with published emissions of 99 g/km can be expected to achieve 137 g/km in real world usage. As we have the date of first registration for the whole fleet the age-related uplift methodology has been used and the results can be compared with the same methodology used for the 2015/16 data set.

In the future a new testing regime called the Worldwide Harmonised Light Vehicle Test Procedure (WLTP) should address this problem and reduce the variance between the OEM data and the real-world performance. WLTP has applied since September 2017 for new type approvals and for all new cars since September 2018. The WLTP test is referred to as Euro 6c. Alongside WLTP is on-the-road testing known as the Real Driving Emissions (RDE) test

¹⁵ 2018 Government GHG Conversion Factors for Company Reporting, Methodology Paper, Table 14, Page 40.

procedure which is being introduced in two stages with all new vehicles having to conform to RDE1 in September 2019 and RDE2 in January 2021. These two stages are referred to as Euro 6d-TEMP and Euro 6d. The difference in RDE 1 and RDE2 is the degree of "conformity"; a RDE1 vehicle can exceed the Euro 6 NOx limit by 110% but a RDE2 vehicle is only permitted a 50% exceedance on-the-road so, under RDE1, a diesel vehicle is limited in the lab to 80 mg/km by Euro 6 but is permitted on-the-road emissions of 168 mg/km. The new WLTP test regime will also improve the accuracy of the fuel consumption (mpg) and carbon emission (g/km) factors.

Table 6-7: Carbon Dioxide (CO₂e) emissions of the London car club fleet 2015/16 (all vehicles on fleet in year).

	2017/18			2015/16
Car Club	Vehicles in Fleet in Year	Total Reported Mileage	Annual kg CO ₂ (Age Related Uplift)	Annual kg CO ₂ (Age Related Uplift)
Club 01	3,596	25,335,252	6,636,033	5,147,297
Club 04	9	53,645	11,026	8,129
Club 05	706	2,926,227	614,090	606,723
Club 14	35	188,632	8,331	2,444
Club 32	305	No Data	No Data	No Data
Club 37	105	No Data	No Data	New 2017/18
Total	4,756	28,503,756	7,269,479	
Average UK Car			8,284,320	
Carbon Saving			1,014,840	

If the 7.2 million miles driven by 92% of the car club fleet had been driven by the average 2017/18 UK car (emissions, including age-related uplift, of 180.6 g/km) the total CO₂e emissions would have been 8,284 tonnes so there was a carbon saving of 1,014 tonnes or 12.3%. This is less than the 17% saving made in 2016/17 but may reflect the move away from diesel to petrol, the large increase in the number of petrol cars available to members and the lack of mileage data for a significant proportion of zero emission vehicles.

These reductions in carbon emissions do not include any additional carbon savings arising from other modal changes made by car club members.

Safety Assessment

Advances in vehicle safety are in part responsible for the reduction in the number of car driver and passenger fatalities and casualties on UK roads which have been falling year-on-year and car occupant fatalities are now down 49% from 2006 levels¹⁶. Passive safety features such as seat belts and air bags assist in the survivability of collisions while active features such as Electronic Traction Control help drivers avoid the accident.

All new cars must meet minimum construction standards but the actual behaviour of a car in a collision is dependent on how well those mandatory standards have been integrated. The European New Car Assessment Programme (Euro NCAP) was introduced in 1996 and has been independently testing cars to assess how well they perform in collisions, designed to represent the more frequent real-world events: head-on, side impact, pole impact and rear impact.

¹⁶ Reported Road Casualties Great Britain: 2016, Annual Report, DfT, September 2017

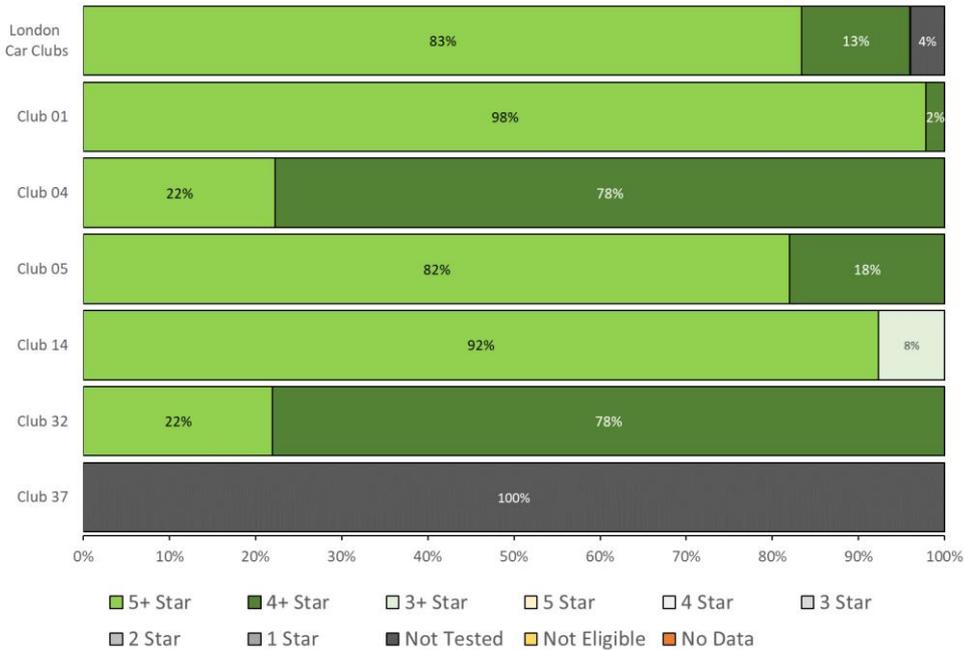
Since February 2009 all new Euro NCAP test results have been reported as a single overall rating that covers Adult Occupant Protection, Child Occupant Protection, Pedestrian Protection and Safety Assist technology. The post-2009 assessment added Rear Impact (Whiplash) tests as well as separately considering all safety technology on the car as standard. From 2016 two ratings may be given by NCAP for new cars; one with the standard equipment and one with all safety options fitted. We use the standard rating for our reporting as it is not possible to determine if a vehicle has been specified with the additional safety pack and there is a view that safety features should not be optional.

In London there is a focus on the safety of Vulnerable Road Users (VRU); pedestrians and cyclists who do not benefit from a cocoon of steel, carbon fibre and airbags. Much of the effort is focused on heavy vehicles and in particular the removal of blind-spots and the active detection of VRUs on the nearside of vehicles but the same technology is now becoming available for both cars and vans including Blind Spot Detection (BSD) as well as Pedestrian and Cyclist Detection with Emergency Braking (PACD+EBR). These features are rewarded with points under the Euro NCAP scheme.

The Mayor of London’s Transport Strategy has set the goal of eliminating all deaths and serious injuries from London’s transport network by 2041. The action plan has five elements: “Safe Speeds”, “Safe Streets”, “Safe Vehicles”, “Safe Behaviours” and “Post Collision Response”. The “Safe Vehicles” element applies to London’s bus fleet and there is a new “Direct Vision Standard” for HGVs but there are currently no minimum safety standards for taxis, private hire vehicles, cars or vans.

Figure 6-7 shows the NCAP safety profile of the London car club fleet; it assumes a standard safety specification. Where a vehicle has achieved a rating since 2009 it is indicated with a “+” sign; e.g. 5+ Star. In 2017/18 98% of the London car club fleet met the NCAP 5+ Star or 4+ Star standards.

Figure 6-7: Safety Profile (NCAP rating) of the London car club fleet



Almost all the cars in the London car club fleet have been tested since 2009 and comply with the NCAP 5+ Star (83%) or 4+ Star (13%) standard. There are just two NCAP 3+ Star vehicles

(Fiat 500). The vehicles used by Club 37 have not been NCAP tested; there is no evidence to suggest the cars are less safe than the rest of the car club fleets, but their safety has not been independently assessed by NCAP.

A3 London Car Club Van Fleet

Carbon Emission Profile - Vans

There is no carbon banding scheme in place for vans and the car banding scheme is not applicable as it does not reflect the wide range in size and load carrying capability of vans. Published carbon emission data (g/km) is available for most vans registered since 2009 but was not obligatory until 2010. The van fleet available to car club members is almost all “Heavy Vans” (2.6 to 2.5 t) but its average OEM carbon emission was 157 g/km which is well below the UK average for the class of 227 g/km (DBEIS GHG Reporting Factors).

During 2017/18 there were 373 vans available to car club members in London as shown in Table 6-8; this is a small decrease from 2016 when 406 vans were available. Of note is the introduction of 10 new petrol-powered VW Transporter vans. VW now offers petrol engines across the company’s T6 Transporter and Caddy van range.

Only one electric van was available, but there are no economically priced battery electric models available in the popular Heavy Van size class (371 out of 373) so the move to using petrol Euro 6 vans may be the best option to car club operators from an emissions perspective until large battery electric vans are available.

Table 6-8: London car club van fleet

Model	Fuel	Quantity	Range OEM g/km	Average OEM g/km
VW Transporter	Petrol	10	208	208
VW Transporter	Diesel	339	153-198	157
Ford Transit Custom	Diesel	19	163-168	173
VW Crafter	Diesel	3	No data	No data
Peugeot Boxer	Diesel	1	163	163
Renault Kangoo Maxi ZE	Electric	1	0	0
Fleet Size		373	0-208	157

Air Quality - Vans

At the end of the survey period 321 car club vans met the Euro 6 air quality emission standard. Only 52 diesel vans met the superseded Euro 5 standard which means they will be charged for access to some parts of London’s Ultra Low Emission Zone unless replaced.

Manufacturers are not obliged to publish air quality emissions data (NO_x and PM₁₀) for vans and with no vehicle specific data no further analysis of van emissions can be carried out.

Safety (NCAP) - Vans

Safety testing of vans is relatively new, having been introduced into the NCAP scheme in 2012, although some people-carrier variants of vans sold as family cars had been tested before that. The Ford Transit Custom is a NCAP 5+ Star vehicle, the VW Transporter T5 is 4 Star, the newer T6 has not yet been tested, and the Renault Kangoo has not been tested since 2008 when a people-carrier version obtained 4 Stars under the old (pre-2009) test regime.

A4 Summary of Findings

Overall the car club operator fleets in London offer car club members vehicles that are low carbon compared to the average vehicle fleet and all cars are Ultra Low Emission Zone compliant, while almost all cars offer a proven high level of safety (NCAP rating).

There is a growing fleet of 173 electric cars with zero tailpipe emissions (up from 68 in 2015/16), but this fleet is not as large as would be expected in a city with such a significant air quality problem. There are also 59 plug-in petrol electric hybrids on the fleet (56 in 2015/16) and for short journeys (typically 15 to 20 miles) these can be zero emission but the data regarding use of electric-only mode is not readily available.

1. During 2017/18 the reported mileage by car club cars in London is estimated to have saved at least 1,014 tonnes of carbon dioxide. Not all car clubs reported driven mileage and a significant proportion of zero emission electric vehicles are missing from this estimate.
2. 84% of London's car club cars are in the lowest three VED₂₀₀₆ carbon emission Bands A, B and C. 23% of London's club cars are in Band A₂₀₀₆ with emissions in the range 0-100 g/km, but only 8.8% are Ultra Low Emission Vehicles (ULEV) with published emissions of less than 75 g/km.
3. The average OEM carbon emissions of the car club fleet in London is 28% lower than the UK average car (2017/18) and 2.3% lower than the average car club car as reported in November 2016.
4. At the end of March 2018 there were 232 electric cars and petrol-electric hybrids conforming to the ULEV standard (less than 75 g/km) in the London car club fleet and all of these vehicles could drive more than 10 miles in zero emission mode. There was only one diesel car in use in London car clubs.
5. Almost all the cars in the London car club fleet conform to the Euro NCAP 5 Star (83%) or 4 Star (13%) safety ratings and have been tested since February 2009 when standards were raised, and the assessment of electronic safety features added. The exception is a new fleet of electric vehicles that have not been NCAP tested.
6. The van fleet is slightly smaller than in previous years and only one electric van is now on offer to members (down from three) but this would seem to be due to the size of van members prefer to hire and the lack of battery electric models in that size class. Most vans now comply with the Euro 6 emission standard with a small residual fleet of older Euro 5 diesel vans.

London car clubs are providing members with cars that combine zero or low carbon dioxide emissions and reduced or zero tailpipe emissions of nitrogen oxides and particulates. The vehicles also meet a high overall safety standard.

However, given the very poor air quality in some parts of London and the prospect of zero emission zones being introduced, London car clubs will need to invest in more zero-tailpipe emission battery electric vehicles. To continue to achieve year on year reductions in carbon emissions there will also need to be a move away from conventional petrol engines to both petrol-electric hybrids and plug-in petrol-electric hybrids.

A5 The Development of Car Clubs 2013-2018

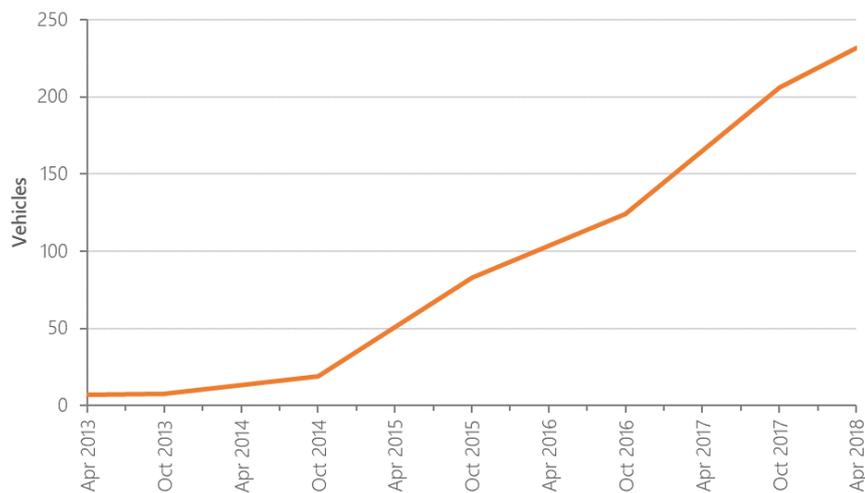
There have been five full profiles of the London car club fleet completed since 2013. Every year has seen improvements across the fleet and this year the data from all five data sets has been consolidated to provide a perspective of how the fleet available to club members has changed over the years.

The first profile was based on the cars available on 1st April 2013. From 2014 to 2016 the profiling was carried out every November and was based on the cars available to members on the 31st October. The last profile was carried out in 2018 and benchmarked the fleet on the 31st March 2018 and for this report the 31st October 2017 fleet was benchmarked to maintain continuity with previous reports.

Fleet Fuel Profile

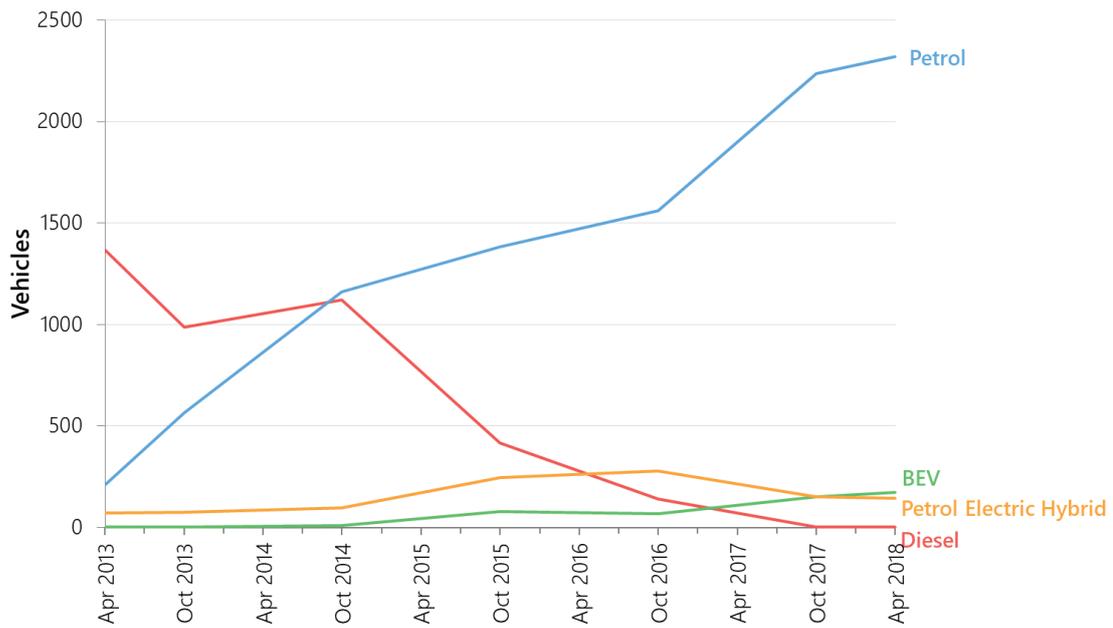
The big change has been in the number of ULEV available to car club members (Figure 6-8) and the rapid reduction in the number of diesel cars on the fleet (Figure 6-9).

Figure 6-8: The number of Ultra Low Emission Vehicles (under 75 g/km) on the car club fleet



The ULEV car club fleet (vehicles with carbon emissions below 75 g/km) has grown steadily since 2014. The majority of the 2018 London ULEV car club fleet (173 vehicles) comprises zero tailpipe emission battery electric vehicles (Figure 6-9) but there is also a smaller fleet of 59 plug-in petrol hybrids which are capable of 10 to 20 miles in zero emission electric mode if fully charged.

Figure 6-9: Propulsion types in use on the London car club fleet

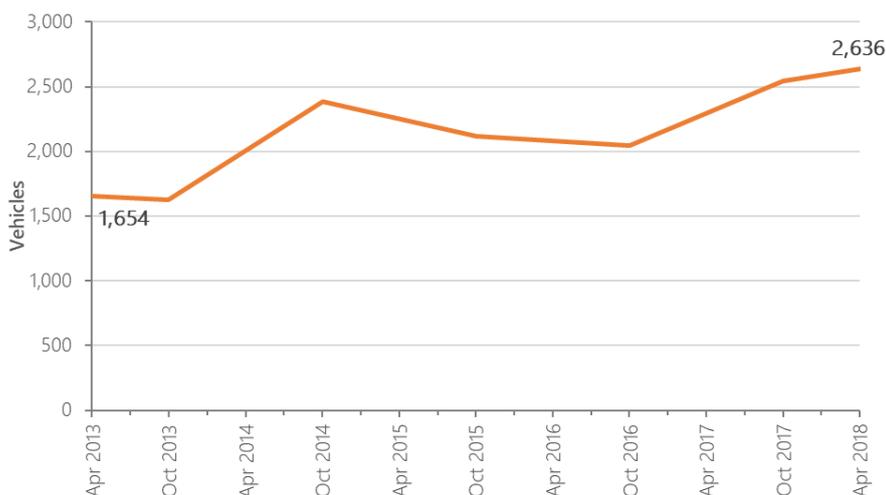


While London does have a large number of ULEVs in the car club fleet, they still comprise a small proportion of the car club fleet. Most of the growth in the car club fleet has been achieved by the addition of more petrol cars. However, it is understood that there are plans by some clubs to add more battery electric vehicles to the fleet in 2018/19.

Fleet size and age

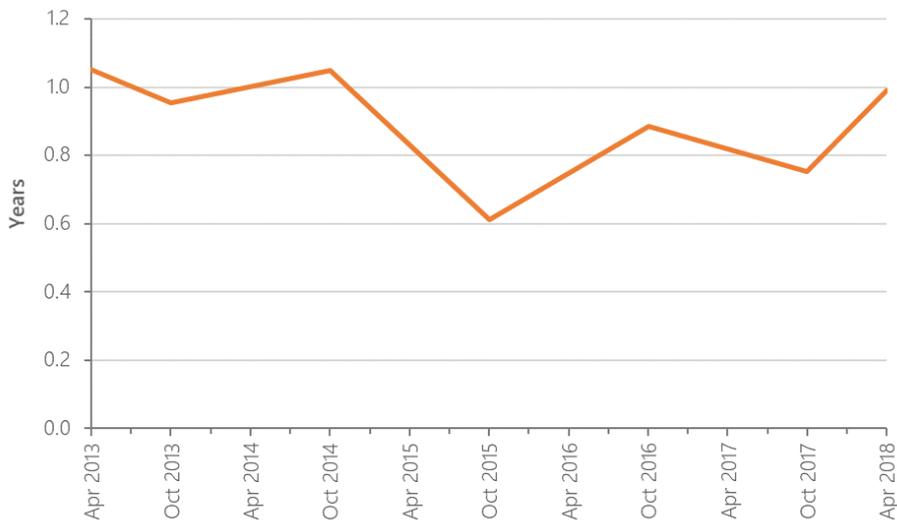
The number of car club cars (Figure 6-10) has grown from 1,654 cars in April 2013 to at least 2,636 at the end of March 2018. There was a small dip in the numbers available in 2015 and 2016 but this was at a time of change in the ownership of the clubs and was, to some extent, impacted by changes to the replacement and renewal programmes.

Figure 6-10: Car club fleet size 2013-2018



The average age of the cars available to members has remained stable at around one year (Figure 6-11). This low average age means that the car club fleet has been able to adopt new technologies, adapt to new policies and respond quickly to changes in legislation.

Figure 6-11: Average age of a car club car



Carbon Dioxide Emissions

Provisional UK greenhouse gas (GHG) emissions statistics for 2017¹⁷ show that for the second year in a row transport has been the UK's principal source of GHG emissions. Energy supply was previously the largest contributor of GHG emissions. While all the other sources of GHG emissions have fallen significantly since the UK baseline year of 1990, GHG emissions from transport have shown a 1% decrease.

Energy supply data would suggest that 2016 was the first year since the introduction of coal-powered railway transport in the first half of the 19th century¹⁸ that transport has been the UK's principal source of GHG emissions. This underlines the importance of encouraging the switch to low carbon cars and prioritising the use of other modes including active travel and public transport over the use of the car.

In April 2013 there were three zero-emission (Band A) vehicles in the fleet and 36% (592 cars) of the fleet had OEM carbon dioxide emissions of 100 g/km (Bands A to E) or less. By April 2018 there were 173 zero emission vehicles, 170 more, but only 425 vehicles with OEM emissions of 100 g/km or less because of the move to petrol power.

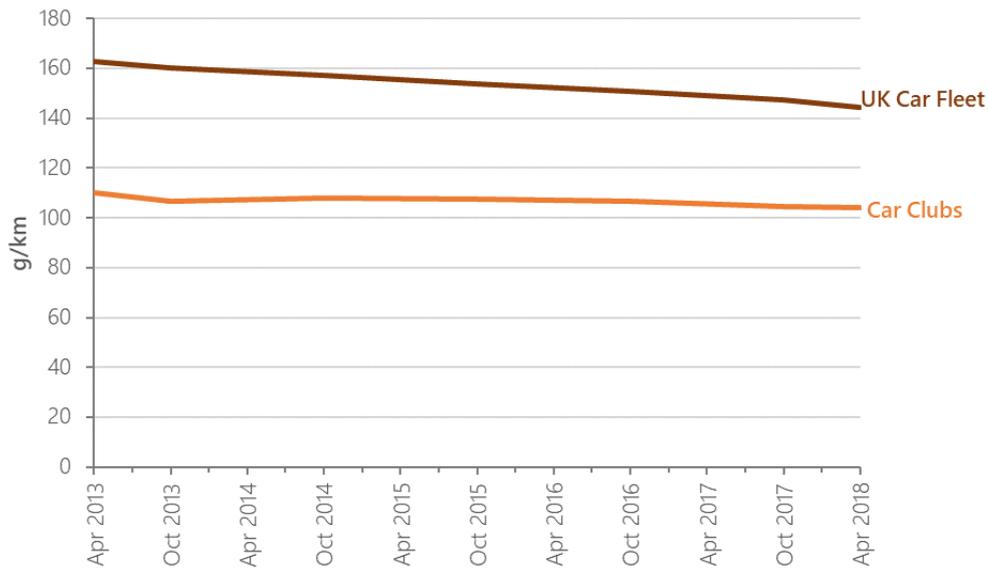
Despite the move to petrol power the average carbon emissions of the fleet (g/km) had still fallen from 107.3 g/km in 2013 to 104.1 g/km in 2018 and the switch to using new Euro 6 petrol cars will have substantially reduced emissions of NO_x and PM₁₀ which contribute to poor air quality in London and are a public health concern.

The car club fleet has always had substantially lower carbon emissions than the national fleet (Figure 6-12).

¹⁷ National Statistics, Provisional UK greenhouse gas emissions 2018, March 2017

¹⁸ DBEIS, Historical Coal Data: Coal Availability and Consumption, 1853 to 2016, July 2017

Figure 6-12: Published average carbon emissions (gCO₂/km) of the London car club fleet and the UK national fleet



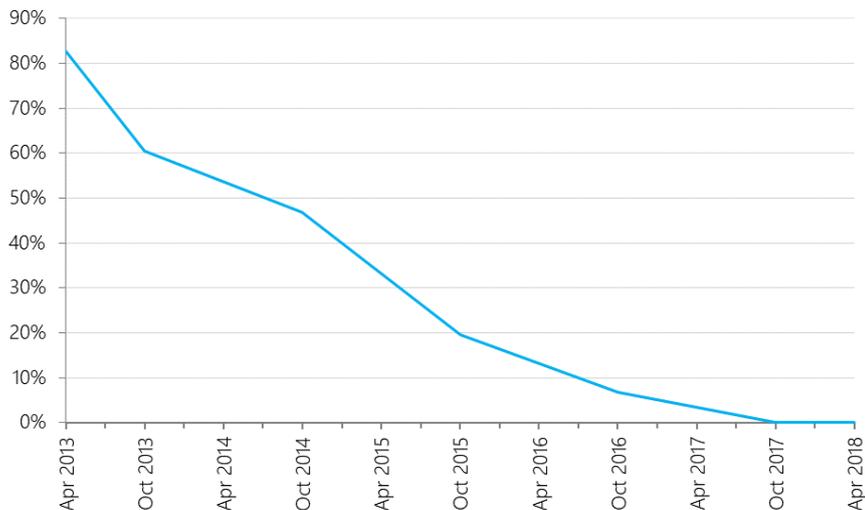
Fleet	2011	2012	2013	2014	2015	2016	2017/18
London Car Clubs	129.6	110.1	107.3	108.3	107.3	106.6	104.1
UK Car Fleet ¹⁰	162.8	160.1	157.0	153.9	150.6	147.3	144.3

The reduction in the carbon emissions of the London car club fleet has not been as fast as the reduction in the national fleet but this is due to the shift from diesel to petrol which has benefited air quality.

Air Quality

Poor air quality in London is a major concern and nitrogen oxide emissions from diesel vehicles are a major contributor. By 2018 the proportion of diesel vehicles in the fleet had fallen to almost zero (Figure 6-13).

Figure 6-13: Proportion of diesel vehicles in the car club fleet

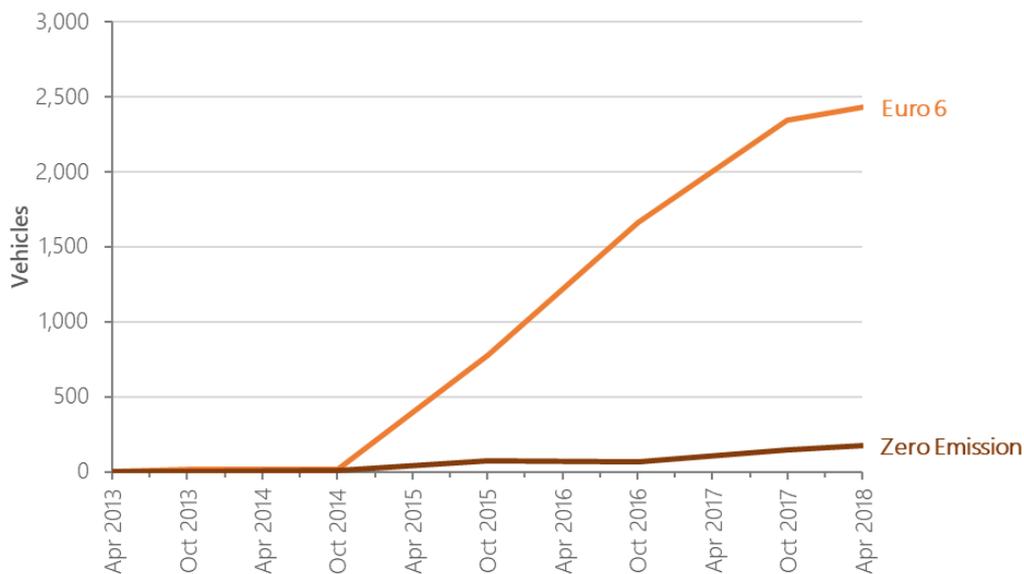


Between October 2013 and October 2014, the number of diesel cars in the London fleet increased from 985 to 1,121 but as a proportion it fell. As early as 2014/15, petrol cars were

identified as the better option for urban air quality and most London car clubs switched procurement to petrol, petrol-electric hybrid and electric vehicles. By 2018 there was only one diesel car left on the fleet.

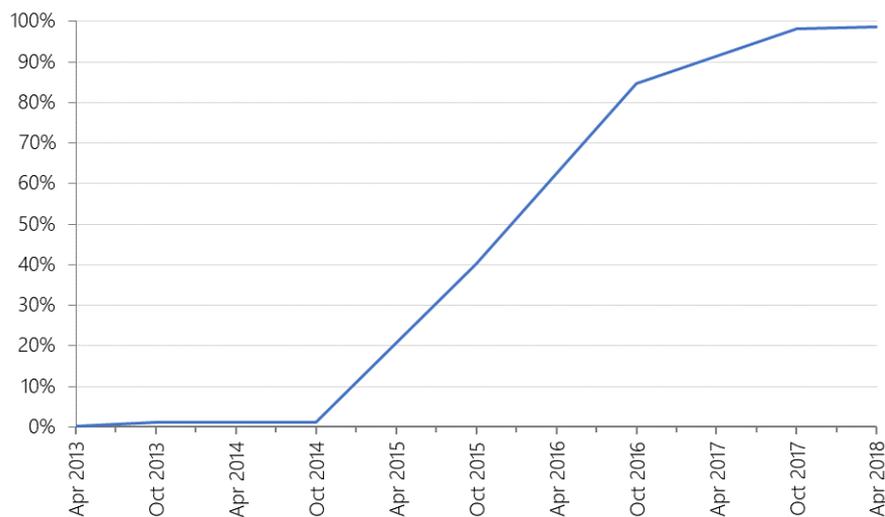
The current standard for vehicle emissions is Euro 6. The VCA categorises all electric vehicles as Euro 6 but for clarity we have designated them in our analysis as ZE – Zero Emission (Figure 6-14).

Figure 6-14: The number of Euro 6 and Zero Emission vehicles in the car club fleet



The number of VCA-designated Euro 6 vehicles on the fleet is the sum of these two categories and is shown as a percentage of the overall fleet in Figure 6-15.

Figure 6-15: Proportion of vehicles meeting the Euro 6 standard (including Zero Emission vehicles)

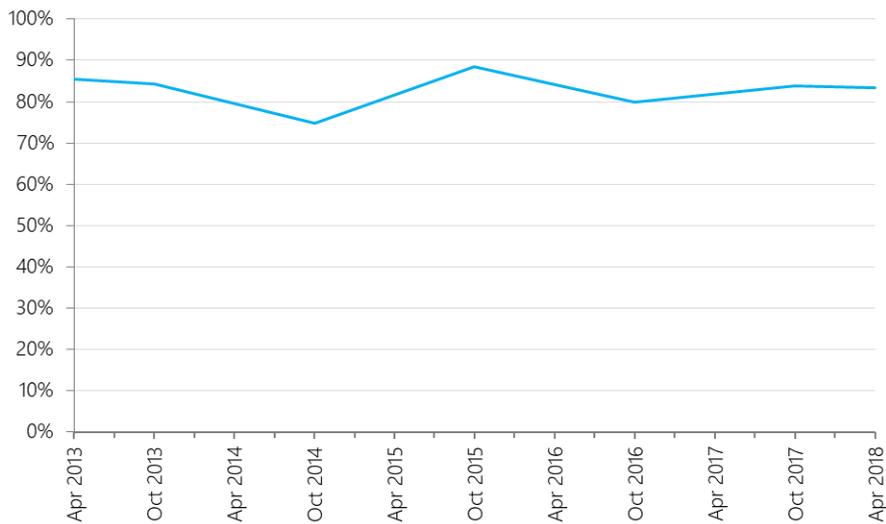


The London car club fleet has rapidly switched to the Euro 6 standard and only a very small proportion of older but petrol-powered Euro 5 vehicles remain on the fleet. As a result, the car fleet is now 100% compliant with the standard for the London Ultra Low Emission Zone.

Vehicle Safety

While no car can be considered fully “safe” the integration of both passive and active safety features can protect occupants in the event of a collision and can help the driver avoid a collision in the first place. The design of the exterior can also reduce the severity of the injuries that vulnerable road users will receive if struck by the vehicle. The European New Car Assessment Programme tests the performance of a vehicle in several different types of collisions, and then gives the vehicle a score with the maximum award being 5 Stars. The scheme was changed in early 2009 and vehicles that have been assessed since then have been identified with a “+” sign (e.g. 5+ Stars) in the car club annual reports.

Figure 6-16: Proportion of NCAP 5+ Star vehicles on the London car club fleet



By 2018 the proportion of NCAP 5+ Star vehicles had reached 83% of the fleet (Figure 6-16), down from a peak of 88% in 2015. Most of the remainder of the fleet met the good NCAP 4+ Star rating.

Summary

Over five years the London car club fleet has almost doubled in size, it has maintained a low average age, the number of zero emission vehicles has grown from three to over 170 and the carbon emissions of the fleet have remained well below those of the national average car. As a result, the fleet will have saved hundreds of tonnes of carbon dioxide emissions over the 5-year period (compared to the same mileage being driven in the average UK car).

The fleet responded early to concerns about the use of diesel engines in urban areas and, long before the issue became mainstream following the “dieselgate” crisis at VW (September 2015), the car club fleet had started the move to electric, petrol-electric and petrol vehicles.

The fleet is already ULEZ compliant but with Zero Emission Zones proposed for some areas of London the car clubs will need to increase the proportion of battery electric vehicles in their fleets.

In 2018 London car club members can be confident that they are driving low carbon, low emission and safe vehicles.