

Primary driving controls

Research report



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Executive Summary

Rica, experts in age and ability research, has been funded by the Motability Tenth Anniversary Trust to carry out a research project investigating driving controls.

The aim of the research is to better understand how disabled people find information about driving controls and what their understanding is of them. Particular attention was paid to researching disabled people who are new to driving controls as their experiences are less well informed than those of people who have been using driving controls for some years.

The findings from this research are presented in this research report, intended primarily for professionals advising disabled people on motoring choices. The findings have also been used to update and expand on Rica's existing online independent consumer guidance (www.rica.org.uk/content/car-controls)

This work comprised desktop research and two workshops with new users of driving controls held at QEF Mobility Services, Carshalton, Surrey on 13 January 2017.

The following conclusions have been drawn directly from the research findings and user comments, and highlight the need to understand the users' needs and circumstances:

- Online searches for driving controls are the main source of information for new users.
- Getting appropriate information from trusted sources is valued but it is difficult to find.
- Seeing other disabled people ask questions of equipment suppliers can be a positive and helpful way to explore issues. This is especially the case when their disabilities and/or situations are similar to the viewer's.
- New users of driving controls need to be encouraged to think about seating and posture especially in the context of longer journeys.
- Understanding the differences between driving controls and their possible impact on driving is difficult for new users of driving controls to understand.
- Assessments for new users of driving controls are vital as driving with ill-suited or poorly adjusted controls can lead to pain and discomfort, especially on longer journeys.
- New users of driving controls often think that once controls are fitted they are set in that position and cannot be changed.

The process of making the right choice needs to be more clearly understood and better communicated, especially to those new to driving controls. The following are some suggestions to help facilitate this:



- An industry / professionals working group to further develop the process chart outlined in Figure 1 on page 6.
- An industry / professionals working group to help simplify the process of finding appropriate driving controls.
- The use of publicity and social media channels to promote understanding of this process, including via Motability, Mobility Centres, Rica, Disabled Motoring UK (DMUK), British Healthcare Trades Association (BHTA), the College of Occupational Therapists, the National Wheelchair Managers Forum and national older people's and disability organisations.

There is also a need to offer more opportunities for people to try driving controls on a private track, in addition to the existing Mobility Roadshow, Get Going Live! and Motability One Big Day events.

Acknowledgement

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We would also like to thank all the staff at Motability for their help and guidance, as well as the stakeholders interviewed and the RicaWatch panel members who attended the workshop.

Rica

Research Institute for Consumer Affairs (Rica) specialises in consumer research with older and disabled consumers. Founded through the Consumers Association, publishers of Which?. Rica became independent in 1991.

Rica has its own [consumer panel – the RicaWatch panel](#) – of over 700 people and is a disability led organisation. Ten of the charity's 12 Trustees have a disability. Rica carries out [commissioned research work](#) with industry, other charities, service providers and policy makers to improve products and services. With grant funding Rica also publishes free [consumer reports](#) based on independent research.

1 Introduction

The use of primary driving controls has grown along with an aging population and a corresponding increase in the number of disabled people. Although there have been some developments in the technology used at the more expensive end of primary driving controls such as the use of wireless transceivers, the majority of controls look and work much the same as they did 10 years ago.

Rica, experts in age and ability research, has been funded by the Motability Tenth Anniversary Trust to carry out research investigating the usability and user understanding of primary controls. The findings from this research are presented in this research report, intended primarily for professionals advising disabled people on motoring choices. The findings have also been used to update and expand on Rica's existing online independent consumer guidance (www.rica.org.uk/content/car-controls).

The aim of the research was to discover how new or novice users of driving controls found information about driving controls and what language they used to enquire about the controls that might best suit their needs. This approach, of using novice users, meant the language used and enquiries made were not informed through past experience and consequently was more likely to expose misunderstandings at a fundamental level.

There are subtle differences in the designs of driving controls which are offered by the equipment suppliers, all of which can have an impact on the user's comfort while driving. Understanding these differences and ensuring the correct user-centred adjustments to the equipment are made during installation is vitally important to achieving successful use of driving controls.

2 Background

2.1 Driving Controls

Driving controls are adaptations to a vehicle's controls that make them accessible to disabled people. These controls are classified as either Primary controls or Secondary controls.

- Primary controls are those that you use to accelerate, brake and steer. They may be separate or combined so that a single control works more than one operation. They cover: steering, controlling speed, changing gear and setting the parking brake.
- Secondary controls cover everything from the ignition, lights and indicators to heating, air conditioning and in-car entertainment.

This report investigates the usability and understanding of primary controls from the perspective of a new or novice user.

2.2 Selecting driving controls

Selecting and acquiring suitable driving controls involves considering a number of factors: see Figure 1.

- User needs, abilities and preferences.
- Whether they are buying a new vehicle or keeping an existing one – not all controls fit every make and model of vehicle on the road.
- Context of use – where and how frequently the vehicle will be driven and whether or not other people will be driving the car as well.
- Financing

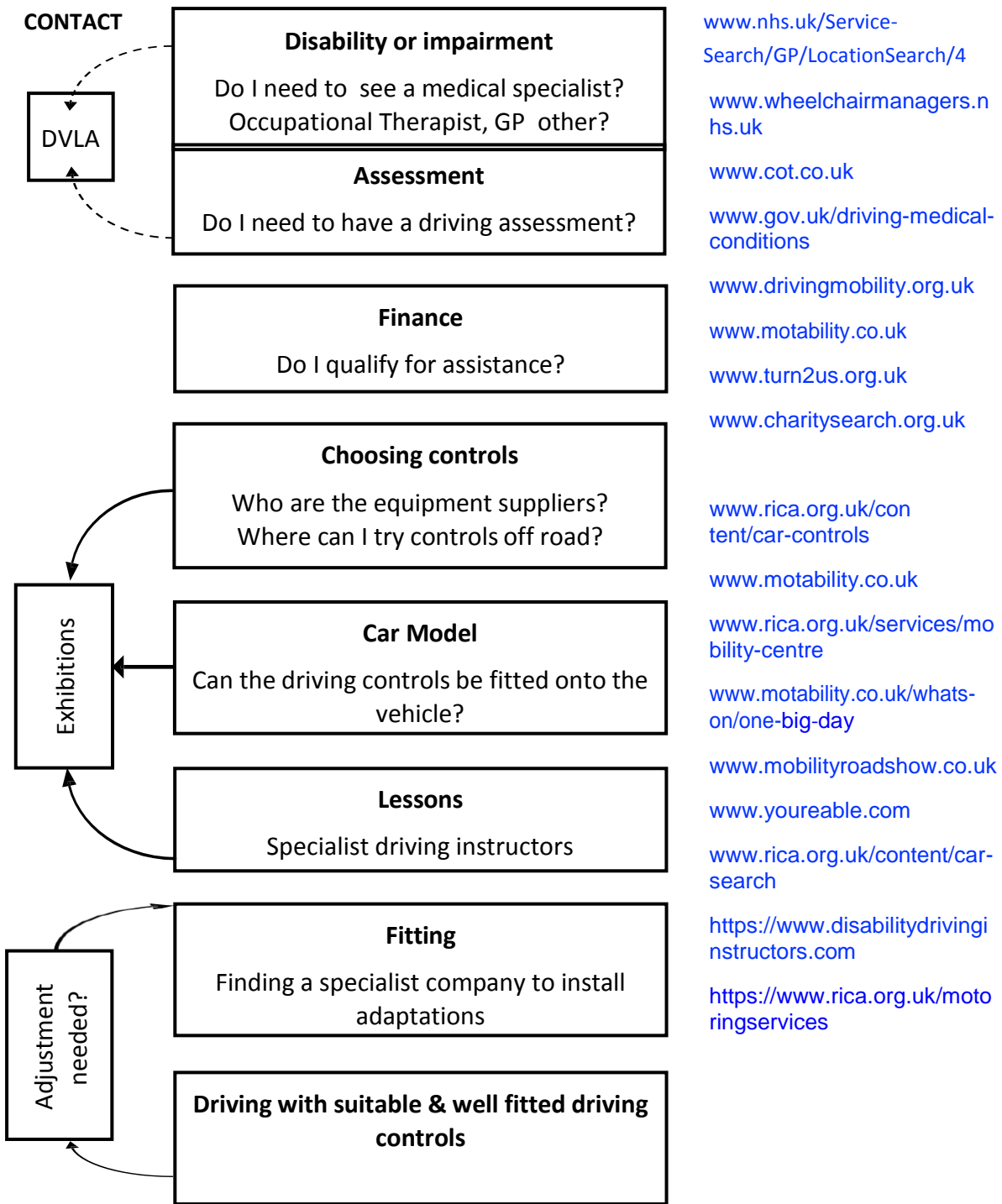
To ensure the correct driving controls are chosen, first time buyers are advised to have an assessment and take advice from a driving assessment centre.

Adapters also provide information about the vehicles they supply and will bring vehicles to potential customers for a demonstration. This gives users the opportunity to try all the operations of the vehicle to ensure they will be able to carry them out. Customers on the Motability scheme are encouraged to have an assessment.

Eligibility for the Motability scheme is determined by the receipt of a mobility allowance. Receiving any of the following allowances, providing there is at least 12 months left, qualifies an individual for the Motability scheme: Higher Rate Mobility Component of Disability Living Allowance (HRMC DLA), Enhanced Rate Mobility Component of Personal Independence Payment (ERMC PIP), War Pensioners' Mobility Supplement (WPMS) or Armed Forces Independence Payment (AFIP).

Figure 1

New to driving controls — Things to consider



3 Workshops with people new to driving controls

3.1 Method

3.1.1 Workshop structure

On 13 January, 2017, Rica held two half-day workshops at QEF Mobility Services Carshalton Surrey, with people who were new or almost new to driving controls and who wanted to find out more about them.

Rica was interested in exploring the understanding that 'naïve' users of controls had and the methods they used to find more information about what controls were available.

16 people were recruited who wished to continue (or to start) driving, but felt they needed some additional support which driving controls might offer. The participant selection is discussed below in 3.1.3 'Participants'. The participants attended either a morning or afternoon workshop.

The workshop was divided into four sections:

1. A short questionnaire
2. Viewing driving controls with equipment suppliers with participants leading the enquiry
3. A second short questionnaire
4. A group discussion

While visiting the equipment suppliers the participants were grouped together into four groups, each of two participants.

The participant pairs were invited to visit each of the four equipment suppliers, one pair after another. A researcher accompanied the participants taking notes while they talked to the suppliers. Each pair had approximately 20 minutes with each supplier.

For the very first group visit to the equipment supplier, the order of how things worked was different to the subsequent three visits.



For the very first group visit, we wanted to let participants ask questions by themselves, rather than as a pair. One participant from each group visited a supplier alone without the other and had 10 minutes with the supplier to ask their own questions about the equipment. After 10 minutes they were then joined by the other participant who asked their own questions for a further 10 minutes while the first participant listened.

After 20 minutes the two participants went to the next equipment supplier together, taking it in turns to ask questions for approximately 10 minutes each. Both participants were there together. This was repeated for the last two visits.

Rica asked the participants to lead the conversation with the suppliers and asked them to think carefully about their physical, home and lifestyle needs, and to ask the suppliers questions about how their equipment might meet these needs.

Rica asked the suppliers not to provide their normal product sales pitch, but to answer the questions in a more direct way. The intention was to have the participants ask more questions than they would do normally.

Near the end of the workshop Rica approached two of the participants to see if they would be willing to be filmed being shown a specific driving control solution by an equipment supplier.

The participants were asked to sign a consent form at the start of the session, to say they understand the scope of the research and were happy to participate. The participants were paid travel expenses for attending the workshop and an additional £50 to compensate them for their time.

3.1.2 Driving controls demonstrated

In total six vehicles were used for the workshops which demonstrated 15 different driving controls from four suppliers, see Table 1. The 15 driving controls can be grouped into six categories of primary driving controls: manual push break, manual pull accelerator, left foot accelerator, electronic trigger accelerator, push pull 'over ring' and push pull 'under ring'. In addition to these there were a variety of steering aids and balls fitted to four of the six vehicles. All the driving controls demonstrated had subtle differences in their design.

QEF Mobility services at Carshalton in Surrey made available two stand-alone demonstration rigs which had a range of steering aids and balls mounted on steering wheels.

Table 1 List of driving controls brought by equipment suppliers

Supplier	Controls	Vehicle
Brig-Ayd	Push brake Electronic trigger accelerator Left foot pedal transfer Quick release steering ball	Ford Galaxy
Brig-Ayd	Push/pull hand control with rotary indicator Quick release steering ball Easy release handbrake Left foot pedal transfer accelerator	Ford Kuga
Elap (Auto adapt / Kivi)	Carospeed floor mounted hand control CT12 electronic sliding accelerator combined with a push forward braking system	Vauxhall Mokka
Elap (Auto adapt / Kivi)	K5 Under ring accelerator with a push down braking system KO Over ring accelerator with a push down braking system (both ring accelerators are normally referred to 'gas rings')	Ford Tourneo Connect
Alfred Bekker	Push/pull accelerator with indicator switch (In dash). Quick release handbrake Quick release steering ball Left foot pedal transfer accelerator	Ford Grand Tourneo Connect
Jeff Gosling	Push/pull brake accelerator Hand control with indicator switch Quick release steering ball Left foot pedal transfer accelerator Gearshift easy release	Ford Kuga

See Appendix F for a full description of each driving control.

3.1.3 Participants

Participants were mostly recruited from the RicaWatch Panel. This panel is used by Rica for a range of research activities. Panel members have been recruited over several years and they and their capabilities are known to Rica’s research team.

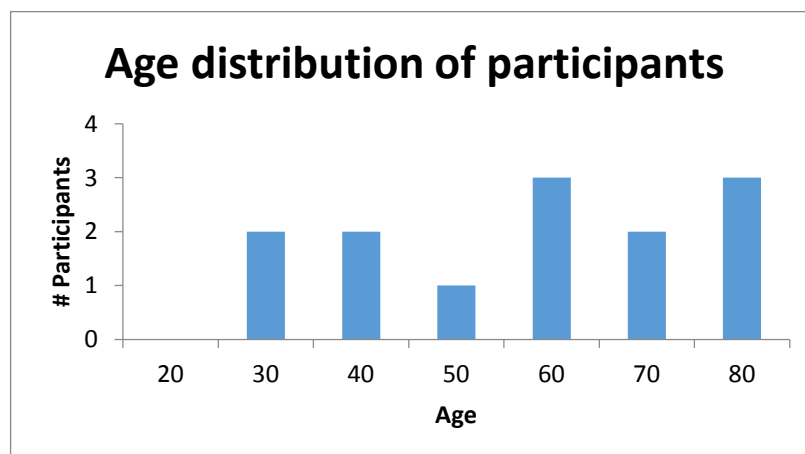
Further recruitment was necessary to make up the numbers to ensure at least 4 participants were in each session. This additional recruitment was initiated through Rica’s outreach manager and supported by: mobility centres, garages, charities and local driving instructors.

Table 2 shows a list of the participants all of whom have been given a pseudonym, while Figure 2 shows the distribution of their ages.

Table 2

Name	Years driving	Years driving with controls	Age
George	30	8 months	56
Peter	30	2 years	50
Richard	12	0	32
Dominique	40	0	73
James	40	0	75
Jenifer	33	0	52
Mathew	41	1 year	64
Sandy	17	0	31
John	0	0	56
Mandy	5	0	64
Susan	40	0	76
Tony	1	1 year	30
Nicola	0	3 months	23

Figure 2





The participants were selected to have a range of age. We were especially interested in finding people of retirement age and those under 40 years old who were new to driving controls.

Three Rica researchers and one staff member from QEF attended each workshop. Each pair of participants was accompanied by a researcher who took notes while participants enquired about the steering controls on the demonstration vehicles.

3.2 Findings


3.2.1 Participants' enquiry into primary hand controls


Overview

The participants led their enquiry into primary driving controls with the equipment suppliers, while researchers recorded the questions being asked and noted which ones required the most explanation from the equipment supplier.

The role of secondary controls such as ignition, lights and indicators was not the main part of these discussions, however it is recognised these will in many cases have an impact on the choice of primary controls.

These conversations are detailed in the following section and are organised by driving control type such as accelerator, brake, pedal transfer, steering aids, gear change and handbrake.

 = A green cell background colour indicates something that one or more of the participants were unaware of and they found the answers given to be particularly helpful in making informed choice of driving controls.

 = An amber cell background colour indicates something that needs further explanation and is discussed separately in another section.

Push / pull – brakes and accelerators

These hand controls are combined into one control which is fitted to a position close to the steering wheel. A push force by the driver onto the control will translate to the brake pedal and apply the brake. In a similar fashion a pull force from the driver onto the control will apply force to the acceleration pedal and increase the speed of the engine.

Many of the participants showed concern about the level of control that was needed for each brake / accelerator solution and in particular whether or not the participants could meet that requirement.



Questions about the force and accuracy of control movement were their main concerns, such as:

- Would the device translate their acceleration intention accurately?
- Could they exert the particular amount of force needed to work the brake in an emergency?
- How is the control impacted by the movement of the steering wheel?

The response to these questions needed most explanation by the equipment suppliers because each solution operated slightly differently to another's.

Table 3 Typical questions and responses to mechanical push / pull controls

Participant's questions	Supplier's responses	Comment
General concerns		
It feels stiff when I push	The engine is not switched on. It will feel very different with the engine on	The benefit of people trying out driving controls while driving on a track was seen as important by the participants. See 3.2.2
How do you coordinate steering with one hand while pushing or pulling with the other?	We would always recommend steering wheel knobs [balls]	
The mechanical rods rub against my right leg	Can be placed on the left side of the steering column or to the left along the floor	It is possible to have some hand controls with rods fitted, hidden within the dashboard, but these cannot be fitted to all cars
What are the differences between the push / pull systems?	The answer to this question depended on the system being shown	The equipment suppliers will naturally promote what they see as their unique selling point. See 3.2.2
Will it be tiring to use these controls on long journeys?	The use of cruise control in conjunction with the hand controls was offered as a solution	

Participant's questions	Supplier's responses	Comment
Adjustments to the controls		
I'm concerned about when my disability [Multiple Sclerosis] changes, my ability to use these controls will also change	In many of the push / pull models, adjustments can be made to the force needed	Future proofing of decisions made for selection of equipment was a reoccurring theme across all driving controls
	Push / pull systems have steering wheels in a fixed position	A fixed steering wheel could be a problem for other people who share the use of the vehicle
Sensitivity and control of the accelerator and brake		
How to accelerate and brake at the same time as with hill starts	These mechanical car controls are fitted to automatic vehicles which usually have a 'creep' i.e. moves slowly forward	It was mentioned by one supplier that the inclusion of an electronic accelerator with a push brake could allow for hill starts. See 3.2.2
Push [with hand] to brake seems counter intuitive. Concerned about 'kangarooing' when braking	There is a bit of getting use to these driving controls	Try out driving controls off road was seen as the best solution to reassure people
What happens in unforeseen events		
What happens if my foot goes into spasm?	A metal guard can be placed over the pedals to provide a rest plate for your feet as well as help prevent any inadvertent control interference	
Concerned about emergency braking	There is a bit of getting use to these driving controls	Try out driving controls 'off-road' e.g. at a Mobility Centre, Motability One Big Day or Mobility Roadshow



The number of push / pull solutions offered, and the variety of vehicles available on to which these can be applied, create a complexity in choosing hand controls. When a person's needs and abilities are added it can become even more difficult to be sure of making the right choice.

Most of the participants found it difficult to see the differences between each push / pull solution and asked the suppliers to explain what these differences were. The equipment suppliers were able to talk about their particular equipment and what was special about it, but not necessarily how it differed from the other supplier's equipment. This made making comparisons between equipment tricky.

There also seemed to be confusion about what the participant's foot could or could not do with a pull accelerator fitted. Although there were many configuration options, from pedals that lifted out of the way through to guard plates placed in front of the accelerator, the solution was best informed by considering the seating and posture requirements of participant.

Push brakes and electronic accelerators (trigger and rings)

Electronic accelerators offer a lighter application of force to accelerate the vehicle and are not directly coupled to the accelerator pedal. They can be rings that fit over or under the steering wheel or triggers that are squeezed to apply the throttle. These controls are typically combined with a mechanical push brake.

Many of the participants saw the value of the lighter touch needed to use these controls but needed convincing about their ergonomic benefits.

The participants were further concerned about the over and under ring accelerators because of their high price. Although it is worth noting that the over and under rings took away some of the stigma attached to driving controls since they were less visible to the casual observer.

Table 4 Typical questions and responses about mechanical push (brake) / electronic or wireless accelerators

Participant's questions	Supplier's responses	Comment
General remarks		
	Applying the accelerator and brake at the same time is useful for hill starts	This feature was promoted as a unique selling point (USP) suggesting that without it, hill starts will be problematic. See 3.2.2

Participant's questions	Supplier's responses	Comment
Using the electronic accelerator and brake at the same time confused my last car and it went into 'limp mode' ¹	There is an option to have a limited throttle for certain situations	
These controls are very expensive. It's a big decision	Finance options explained	The scope and amount of the funding which Motability offers is important to understand. It is cheaper to order adaptations with Motability at point of application. People who are unable to fund themselves may approach Motability Grants, however not everyone qualifies. See 3.2.2
Sensitivity and control of the accelerator		
I'm a bit anxious about applying too much acceleration with this system. What happens if I am shaking?	Talks about how push / pull systems can be heavy to operate. There is a bit of getting used to these controls	Promotion of equipment by demonstrators will often centre on perceived strengths or weaknesses of the competition.

Pedal transfer – left foot accelerators

There are a number of alternative designs to provide a left foot accelerator pedal, all of them making the right foot accelerator pedal inoperative while the replacement left foot accelerator is active.

How the right foot accelerator is made inoperative can impact the driver's resting foot position and needs to be considered on a person to person basis.

¹ Limp home mode is a way the engine computer will use to get you home without causing further damage to a vehicle's engine or transmission.

Table 5 Typical questions and responses about left foot accelerators

Participant's questions	Supplier's responses	Comment
General remarks		
Had a push / pull for a little while and found them difficult to use	Left foot accelerator might be a solution	
Struggle with getting my right leg up into that position with the accelerator pedal being there	The accelerator pedal can be flipped up out of the way	This seemingly small feature can have a big impact on driving comfortably and exemplifies the importance of understanding the ergonomic capabilities of each driver. See 3.2.2

Steering aids

The steering wheel can be used to mount different types of steering aids called spinners. Spinners come in a variety of shapes to suit different types of grips, the most common is the steering ball which allows the driver to turn the wheel with one hand.

Since many of the driving controls shown require one hand to leave the steering wheel from time to time, the use of a spinner is necessary.

“I also like the ball, you can hold onto it and give yourself lots of support. So cruising on straight lines you can support yourself on the ball, I would like to try that one out” – Peter

Some of the steering balls have a quick release so they can be removed when someone else is driving or transferred to another vehicle.

Gear change and handbrake

Most cars have an automatic gearbox option, providing a solution to changing gear. Similarly, some cars have an electronic parking brake which is considerably easier to use than the manual hand brake. Solutions and adaptations for manual gear change and handbrake operation were not discussed in this research. Motability does not allow their cars to have hand controls fitted if the car has a manual gearbox.



3.2.2 Group discussion

The two group discussions were semi structured explorations into the participants' experience of getting information about driving controls.

- What sort of information do they find useful?
- How should it be presented?
- What are the barriers to finding it?

The following three questions were used to guide the conversations and prompts given where necessary:

- Q 1. Did you find the information you received useful?
- Q 2. Was it helpful listening to the other group member's conversation with the equipment supplier?
- Q 3. What is the biggest barrier to finding information about driving controls?

Choice and options

Overall the participants expressed surprise at the large choice of variants addressing particular solutions. For example a push / pull solution was seen as 'one solution' which was expected to be essentially the same from all suppliers. The participants did not expect to find so many variants of look, control feel and geometry.

This was the same for other solutions such as electronic accelerators, left foot accelerators and steering spinners.

"What I liked most of all was I saw the trigger accelerator, I've never seen that before" – George

Different information at different times

Participants recognised the complex nature of finding the 'right' information for them, their circumstances and how the type of information changed as they understood more about their needs and the equipment's capabilities.

Jenifer suggested that having two appointments could help people make the right choice of driving control: the first to explore what controls are available and the second to focus on one or two options which might include a test drive with them fitted. She also promoted the idea of having some prep information before a visit and take home fact sheets after the visit.

Both of these she saw as condensed sheets of information covering the important points.

Emotional Journey



When people are new to driving controls knowing where to start to find information can be daunting. Both Ben and Dean pointed out the emotional side of accepting a disability could lead to being keen to quickly get back independence. While this is generally seen as a good thing to aspire to, it can lead to hasty decisions resulting in buying solutions that are not necessarily the most suitable to people's needs.

"I wanted to start straight away rather than go the long way around, I thought it could be another six months before I got to start" – Tony

During the workshop, Tony discovered that the push / pull solution he currently has fitted to his vehicle, which runs down the right side of his steering column and has been knocking his kneecap, can in some makes of vehicle be placed to the left of the steering column.

While Peter was in hospital he was put in contact with an assessment centre. Since his closest one [QEF Carshalton] had a long waiting list, he went to Kent for his assessment. It was at this point that he found out about the Motability scheme.

"I was still in the hospital bed recovering from my accident when I got a visit from a lady selling driving lessons and Motability, before I got home to see my mum!" – Peter

Although Peter had gone for an assessment, and chosen his driving controls solution, he still found equipment features at the workshop he did not know about. These were primarily about improving posture while driving, features such as a flip accelerator pedal and positioning the steering ball to support his hand on long journeys.

Asking the right questions

Participants' enquiries to the equipment suppliers were largely driven by their physical needs and home requirements. Once they had identified a solution that broadly suited the needs of their disability, some participants went on to ask further questions about posture and comfort. It was noted that these considerations about posture and comfort came largely from the participants that already had some experience of using driving controls: Peter, Tony and Mathew.

"I did not know I could be reassessed and not stuck with the same controls for three years" – Mathew



These person-centred questions were often answered by the equipment suppliers by explaining how the technology worked. Although the workings of each solution were of interest to the participants, the answers given could get overly techy and contain jargon that needed further explaining.

“Friction free control ...”, “infrared systems work by ...”, “10 - 18 way controls ...” – All quotes from equipment suppliers

When asked about the value of listening to the questions that other people asked of equipment suppliers, the participants were generally in favour, although not unanimously. Some questions asked of the suppliers from the other participant’s slightly different perspective were seen to prompt people to ask further questions.

“It does depend who you are with, I was with this gentleman and we have similar problems ... So we were asking the same [similar] questions, ‘Oh yes I could have asked that’ or ‘I didn’t think of that’” – James

It was evident that as time went by the participants became more comfortable about discussing their needs with the suppliers. This increased confidence of the participants, allowed the conversations to be more focused on solutions to their particular needs.

Test drive

To be able to try out driving controls while driving around a test track was seen as essential in convincing people of their suitability. However there was confusion about finding a place to do this. Attending the Mobility Roadshow, one of Motability’s ‘One Big Day’ or ‘Big Event’ held around the country was suggested as a solution, providing an opportunity to test drive adapted and non-adapted cars.

Difficulties in getting to these events was raised as a problem for some people especially if they are not close to where they live.

Barriers

Not having a simple start point to finding information meant some people were left searching the internet for information on what is available for them. This can mean a lot of dredging through irrelevant information before finding something applicable to their needs.

As Nicola points out, certain things are well catered for when searching on the internet, such as information on driving controls for people in wheelchairs. However Nicola’s situation is different, she has no upper right limb.



“Typing ‘driving with one hand’ into google, gets me lots of YouTube videos of abled bodied people showing off their driving skills and are not relevant to me! – Nicola

Nicola ended up just phoning around. She wanted to start driving at the age of 17 and now at 23 has only just started driving with a specialist driving instructor.

Another participant said that her first point of call was Motability and she never considered going online. This worked well for her and they guided her through the various options available to suit her needs.

3.3.1 Questionnaires

The participants were given two short questionnaires to fill in: one before they visited the equipment suppliers and the other once their visits were complete.

Questions asked **before** visiting the equipment suppliers:

- QB 1. What sort of driving controls do you think might match your needs?
- QB 2. Can you name any types of driving controls?
- QB 3. Where do you go to find out information about driving controls

Questions asked **after** visiting the equipment suppliers:

- QA 1. What sort of driving controls do you think might match your needs?
- QA 2. In the light of your six visits to the equipment suppliers, is there a question that you would have liked to have asked the first supplier that you failed to ask? If so what is it?
- QA 3. What is your biggest worry in choosing driving controls?

Responses:

QB1 & QA1 – asks what driving controls the participants thought they might need before and after their visit to the equipment suppliers and used the same wording in each case.

In 10 of the 13 responses the participants elaborated on, or changed, their first answer. This was largely expected and not surprising.

QB2 – asks about the participant’s knowledge of driving controls at the start of the workshop. Ten of the 13 participants could at best only name one car control with four of the 10 being unable to name a single one.

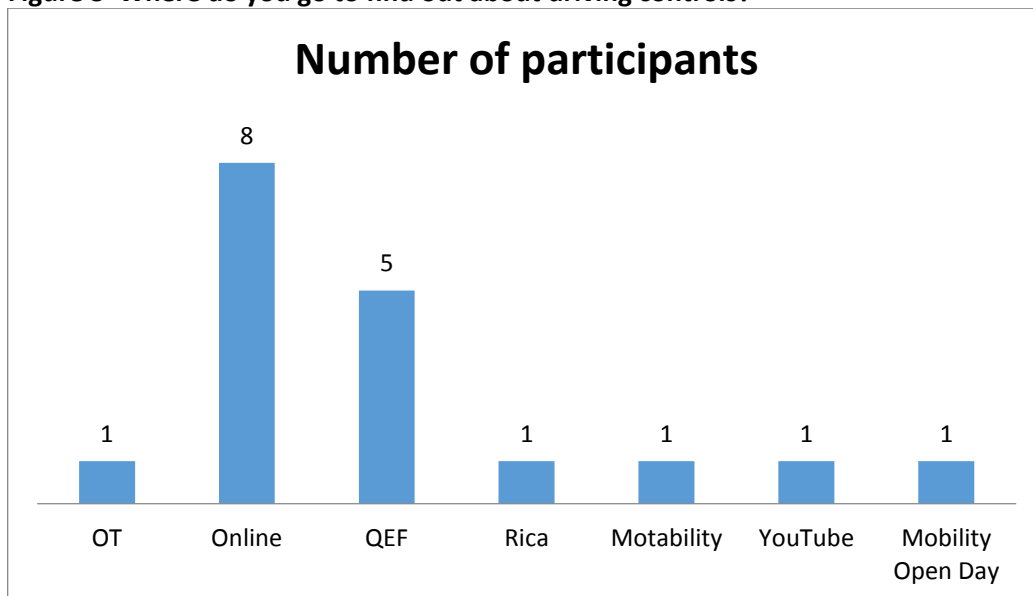
QB3 – asks the participants where they go to find out about driving controls. They could provide more than one answer.



The answers to this question, which can be seen in Figure 2, shows the main route to finding out information is by searching on the internet, which is not necessarily straight forward and can lead to frustration.

There is helpful information about the range of car controls available on Motability and Rica websites. However, only two participants mentioned these organisations as somewhere they would directly go to. It is noted that online searches such as “driving controls for disabled people” do provide specific links to these sites.

Figure 3 Where do you go to find out about driving controls?



QEF Mobility Services was cited as a place to find out information about car controls, which was perhaps to be expected as over half of the participants lived locally and two had been through an assessment there.

QA2 – asks if the participant would have asked the first equipment supplier they saw something in retrospect. This question was asked to find out if the participant learnt any key questions to ask the equipment suppliers.

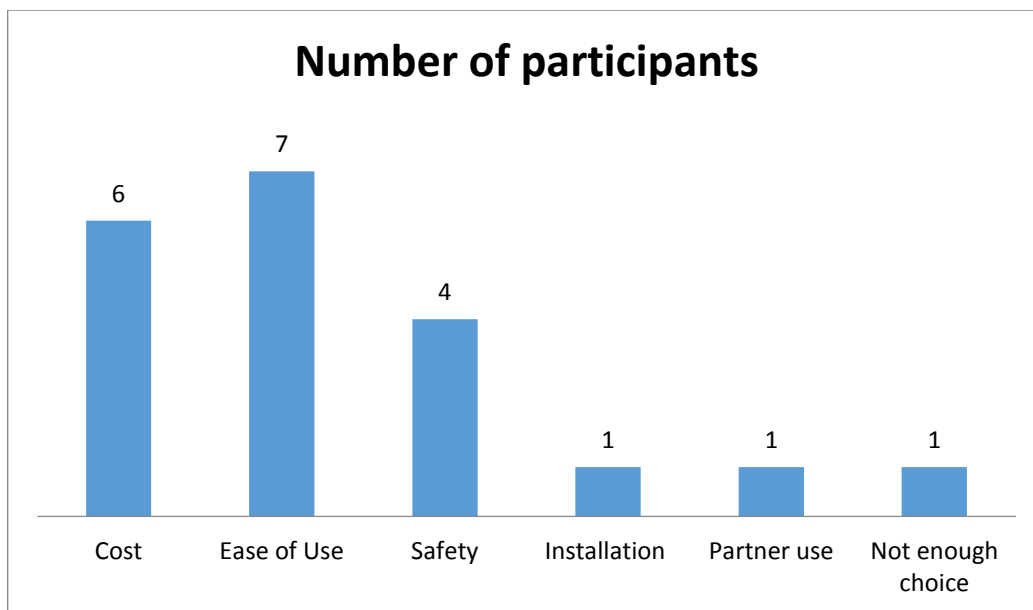
Only three participants answered this question: what are the differences between their and other supplier’s controls? Can the height of the push/ pull be adjusted? What is the impact of tiredness when using these controls?

QA3 – asks what the participants’ biggest worry is when choosing car controls.

See Figure 4. Approximately half the participants responded that 'ease of use' is their main concern when choosing car controls. Safety also scored quite high (four out of 13) and is similarly to do with the functioning of driving controls. These worries can be reduced as the participant becomes more familiar with the controls and gains experience using them. The benefit of off road testing can play a crucial role in this.

Five of the six people who mentioned cost as a worry in choosing driving controls did not qualify for the Motability scheme.

Figure 4 What is your biggest worry when choosing driving controls?



4 Conclusions

This research highlights a number of problems faced by disabled people when they first need to consider driving controls. Most notably there was no clear process roadmap showing how new users get to the right driving controls: from identifying need through to having a user assessment and on to buying and installing the controls. There are many stages to this process and one person's route can be quite different from another person's, depending on their personal circumstances.

4.1 Emergent themes

Finding appropriate and trustworthy information

- At each part of a person's journey to getting driving controls there was a need for information to help support the choices being made. Although this information was available both online and in print, new users often experienced difficulty finding it.
- New users of driving controls used the internet as their main source of information.
- When appropriate information was found, getting it from trusted sources was considered important. Website information from Motability, Driving Mobility, QEF and Rica all offer high quality user centred information that is trusted.
- The value of seeing other disabled people explaining how driving controls worked for them was recognised as helpful and added trust and context. However, it is noted that the particulars of a person's disability may mean that the advice and information given is less applicable.

Asking the right questions

- The questions asked by people new to driving controls were mostly motivated by concerns about ease of use and safety of the equipment.
- New users needed to be encouraged to think about seating and posture especially in the context of longer journeys.
- The merit of having an assessment at a mobility centre was recognized not only in helping to find the right driving controls, but also to draw attention to the right questions to ask equipment suppliers.
- More experienced users of driving controls typically knew the controls they were interested in and were more interested in the details of the technology.



Understanding the differences (same solutions but different suppliers)

- New users of driving controls needed to understand the subtle differences between the various suppliers' solutions and how these differences might impact their seating and posture needs. This would help make comparison easier and ensure better informed purchasing decisions.

Test driving with hand controls

- The lack of confidence that new users had about the ease of use and safety of driving controls could, to some extent, be mitigated by trying them out off-road.
- Opportunities for new users to do this should be better communicated.

Adjustments to driving controls

- Users need to be able to easily return to the fitters of the driving controls if they require adjustment.
- Taking time to be with the installers while they fit the driving controls is recommended to ensure the optimum setup for the user's seating and posture requirements.

4.2 Recommendations

It is clearly of benefit for users and suppliers alike to ensure that the driving controls meet the needs and situation of the disabled person. The process of making the right choice needs to be more clearly understood and better communicated, especially to those new to driving controls. The following are some suggestions to help facilitate this:

- An industry / professionals working group to further develop the process chart outlined in Figure 1 on page 6.
- An industry / professionals working group to help simplify the process of finding appropriate driving controls.
- The use of publicity and social media channels to promote understanding of this process, including via Motability, Mobility Centres, Rica, Disabled Motoring UK (DMUK), British Healthcare Trades Association (BHTA), the College of Occupational Therapists, the National Wheelchair Managers Forum and national older people's and disability organisations.

There is also a need to offer more opportunities for people to try driving controls on a private track, in addition to the existing Mobility Roadshow, Get Going Live! and Motability One Big Day events.