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Forest Inhabitants Travel Survey

Initial Baselines of Rural Travel

PUBLISHED VERSION

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Summary

The Forest Inhabitants Travel Survey attracted over 440 responses of which some 392 were complete and usable. Respondents were spread across the district but were a little lighter in the Northern geographic third and some North Eastern parishes.

The data set would enable the analyst to drill down to particular responses in particular houses which would breach an individual's right to privacy. Through this report the data is typically analysed as the whole or into three aggregated categories of towns (the 4 towns), villages (the 20 major villages in the district) and hamlets (the remaining areas where there are houses but may not typically have a recognisable centre).

The majority of respondents were working (74%) either full-time, part-time or self-employed. The biggest age groups were between 55-64. The sample was therefore under-represented on the retired population over 64s and under 25's compared to the district population statistics. This may affect the results of the survey. However, it does contain a broad cross-section of the population upon which to base initial conclusions as to the feasibility and desirability of an integrated system of rural Mobility as a Service (MaaS).

The survey reveals a multitude of complex trips of varying lengths in different modes of life principally served currently by the car. Only 3% of the households surveyed did not have a car. However, this figure understates those with access to a car given the average number of cars per household is 1.98 and the mode 2. Two cars available is fine for a two-person household, when there is no alternative means of transport with an acceptable level of certainty, but not for third of households with more than 2 people or those where the individual is unable to drive.

As generalisations: the demand is for certainty and complex trips; the supply is linear and binary. This provides a good opportunity for MaaS where it has the flexibility to break down the operator siloes and enable them to work together. It has always been recognised that this is not an easy fix, but Covid provides the opportunity and carbon emergency the threat to make this work.

The perceptions analysis reveals that rural travellers want certainty. That is why they use their cars so much. The car is there and it's reliable. For public transport to be more attractive, travellers need to know when it will arrive and that it will keep to schedule. Having a single ticket for the journey or a reservable seat are the least of their worries compared to these. Cost of ticket, not crowded and quality waiting areas are secondary to the timing.

When asked to rank 5 factors. Time of arrival and departure is the highest. 40% ranked it first and 25% second. Perceptions around time are well-known and there is a difference between is it precisely on time to the second and if I'm late to the stop, have I missed it? Frequency of service is ranked second perhaps as a fallback to the first but also for it to be an option to consider. Affordability is ranked third with a split between those where it was the most important factor and those putting it bottom. A slight danger here was lower rankings amongst the retired who might equate cost with a free pass and therefore less of a consideration. Towns are less concerned about time of day than other settlements, but overall, it was the fourth ranked. 40% of respondents ranked no need to change services last.

55% of respondents use their car daily and a further 29.2% at least half of the week. 46.2% never use a bus and 42.6% use it every month or less. 30% never use rail but 63.6% only use it occasionally. A third use taxis occasionally. Three quarters never use something they would recognise as car share. 94.6% of this sample never used community transport, be that dialaride services or non-commercial bus routes. The reliance on the car is a major issue which arises through the lack of reasonable alternatives with associated high levels of uncertainty of service.

What would make bus services more attractive is that they go to more places. Provide and they will come is a commercially naïve approach. Give them the opportunity to book them and they will come provides certainty for the traveller and the operator. Consistently book and use at the same times means an expansion of service and perceived reliability of opportunity.

19.2% of respondents were honest enough to say that nothing would make them use their car less. What would, is bus services closer to destination (leaving and arriving), getting there on time and increased frequency. Each of these speaks to MaaS with the need for positive messaging and delivery of a consistent view of reasonable expectations.

Taxis are too expensive; cycling needs safer routes; and more people need to be aware of the community transport offer to take up more of these services.

Most people know where their local bus stop is. Some believe it is an unrealistic minute or two away, but most assume a round 5 or 10 minutes. This underlines the perceptions and realities of time estimates.

A substantial amount of travel data was collected with start and end points for shopping, leisure, work, health and study. Car again predominates but there are some interesting sub-trends. 17% of respondents use online shopping for the weekly household shop, but many still then go out shopping. Some use also for the daily shop but most don't and tend to go more locally and by more active means. Fewer shoppers in the sample are attracted to Newent than the other towns. While Chepstow, Gloucester, Ross and Monmouth also draw many for the weekly supermarket shop.

If you're employed to work five days a week, you get there by car. As work time becomes less, you're more likely to use alternative transport but even working a single day 58% use a car or motorbike. The concept that you live where you work is also well and truly dead given the multitude of start and end points. Contrary to this are the 32.1% who work primarily from home. 9% of those who work appear to already work from a home-based office, but can also cite another place of regular work perhaps on a flexible basis.

Leisure activity is also highly dependent on the car. Walking becomes an option for a pub or meal and in outdoor leisure where it's difficult perhaps to split the walking to the walk start-point from the start of the activity! A high proportion of respondents use a car to get to the place for their outdoor activity.

While the sample was not skewed to the elderly, 21.9% had regular monthly health appointments. 18% walked to the doctors and 89% drove to the hospital.

1. Introduction

1.1 The Funding

The Forest Inhabitants Travel Survey (FITS) was undertaken as part of Rural Technologies Ltd's MaaS: Enabling Rural Geospatial e-Solutions (MERGeS) project funded by the Geospatial Commission's Innovate UK SBRI competition: Using geospatial data to solve transport challenges phase 1. Alongside this survey there is a separate survey for businesses given that their employees travel to their sites from locations outside of the District of the Forest of Dean as well as within.

Rural Technologies was created for a simple reason. Its founders have backgrounds in technology and its application to real world problems. The more they looked at the digital world; the more they saw the creation of a two-tiered society resulting from strong urban presumptions.

In a net-zero carbon world, a fundamental challenge for the rural economy will be transport. This affects how society works, lives, plays, studies and ages. The concepts of mobility as a service do not cover rural areas yet underpin future transport use.

The Geospatial Commission is an independent, expert committee responsible for setting the UK's geospatial strategy and coordinating public sector geospatial activity. Its aim is to unlock the significant economic, social and environmental opportunities offered by location data and to boost the UK's global geospatial expertise.

The Geospatial Commission has partnered with Innovate UK to create a new £2 million competition which will look at how location data can spark innovation and support the future of mobility for the United Kingdom.

Phase 1 consisted of 28 winners who have developed feasibility studies to help create geospatial solutions to our transport challenges and support the future of mobility.

The Geospatial Commission & Innovate UK do not endorse any of the findings or positions outlined in the work being published by the projects.

1.2 The Context

Rural Mobility as a Service (MaaS) is poorly understood. Yet it provides an opportunity to overcome many of the obstacles of rural travel given the opportunities of Industry 4.0 and the threats created by the Carbon Emergency. Rural areas depend on car ownership to travel. The decision to sell no new purely petrol or diesel cars from 2030 will directly impact on the ability of rural areas to move around. If all owners were to move simply to electric vehicles there would be strain on the electricity generation and transmission networks. The rollout of mobile and broadband coverage does not augur well for a large-scale deployment in rural areas.

Can MaaS replace the need for cars? No, such a view is unrealistic but changes in models of car ownership and in the needs to travel suggest that a sensible target would be to challenge the need for a second or third car by being able to offer an alternative. The opportunities and threats from above do need a solution to avoid the creation of a potential two-tiered society that does not use its rural areas to best advantage. MaaS is a good tool to effect that modal change.

Both RTL and FEP are committed to making data-based decisions. Data on rural transport is relatively limited. Increasingly the world has become urbanised. In the UK urban areas account for 83% of the population. But rural areas cover 90% of the land space.

Data is available on the main trunk routes that cross the nation. Less well-known are the movements within districts partly because the presumption that they will be covered by using a car. However, there was no intention that this survey would seek to obtain all the data that would be required to understand the feasibility of a MaaS service. Instead with the constraints of Covid, it begins the collection of baselines on:

- behaviours,
- perceptions and
- outline use.

9.5M people live in rural areas. Quarterly Bus Statistics show that to June 2020 there were some 3.25B passenger journeys in that quarter, despite the onset of Covid. Longer-term, trips have increased by 1 in London and declined by 14 to 32 outside. The Department for Transport's NT9903 shows average number of trips by local buses as 21-28 in rural villages/towns – or 23M trips annually. The average rural day ticket is seen to be c£5 although this varies substantially by the distance travelled. There were 291,800 licensed taxis and private hire vehicles in England in 2019. Perhaps c80,000 are in rural areas with PHV licences increasing outside of London. The rural population typically takes 5 taxi trips pa for c10 miles each costing c£20.

The car is the predominant form of rural transport. Covid has made this more so with an edict not to use public transport cutting buses to 10-20% of capacity. Wave 4 of Travel Attitudes in Light of COVID, October 2020 showed c 85% of total population are concerned to use buses and 81% taxis. Yet the village inhabitant already drives almost three times as much as the urban at 5,715 miles pa. In the year ending March 2017, average weekly transport costs for those in rural areas were £131.80, accounting for 15.1 percent of disposable income, compared to £74.30 or 10.7 per cent for urban areas. The combination of the need to spend more on travel and increased job uncertainty does not bode well.

Travel is a significant issue for rural areas. This has a regional dimension with the creation of the region of the Western Gateway as an economic powerhouse. Its Ambition 1: is to “Deliver world class physical and digital connectivity, boosting productivity, unlocking housing growth and leading our transition to a net zero future. We want residents and workers to be able to travel within the area in a ‘golden hour’ with one Western Gateway smart ticket.” For this to be achievable it needs to use multiple modes of transport.

At a district level, preparations are being made for the new Local Plan to 2041 where the number of houses allocated to the district is equivalent an additional almost 20% of its current housing stock. This in turn puts a further 15,000 cars potentially on the road in the district. Transport connections underpin the effectiveness of that plan in order to meet the Carbon Emergency.

Behind this report is a significant dataset of responses that require a series of cross-analyses to reveal the full set of answers. It was never intended that this report would provide all those answers. Part of that analysis requires the use of GIS software after a thorough clean of the dataset.

In the use of that data, we need to ensure that the privacy of individuals is not compromised. This is one of the challenges for MERGeS itself to ensure the ethical use of data that is secure. Household densities within postcodes in rural areas means that it is easier to identify where an individual may reside. Often the perception of a survey respondent is that it clearly shows it is them, as they fail to realise that most people lack the vital piece of information - that they had responded. Work on the data will be ongoing; that this is so underlines the need for MERGeS Research and Analysis Database service.

Future cross-tabulations, where sample size allows, that inform the commercial opportunity include by:

- Age
- Employment status
- Those who say they will not give up a car disaggregated from the responses
- Those who don't have access to a car
- The 5-day worker versus 3-day worker
- GIS informed data eg is the area of Sedbury-Tutshill already acting with the behaviours of a town rather than a large village or do retired people living in hamlets also live on current main bus services rather than in unserved areas.

2. The Sample

The data for this survey was collected through an on-line questionnaire available from 20th January to 15th February 2021. The survey comprised 27 questions and took on average 8 minutes to complete with a 79% completion rate.

The survey was promoted widely:

- All 200+ organisations and individuals who are members of FEP received it in their monthly newsletter
- Blogs were posted and then promoted on FEP's social media outlets with additional tweets and posts through the fieldwork period
- Some limited social media advertising was undertaken to get the message out to the general Facebook audience within the district.
- Members of FEP promoted the survey to their friendship groups, associations and through local business networking meetings.
- The Forest of Dean District Council's promotional team prepared and released PR through their normal channels. Certain members also promoted the opportunity through their engagement channels.
- All secondary schools and colleges were contacted to help promote the survey. Online learning prevented a significant uptake.

Over 440 responses were received on-line. Unfortunately, during the fieldwork period an issue was discovered with the software being used. The survey had 2 mandatory questions to be used to confirm that the respondent was actually an inhabitant of the District of the Forest of Dean. To assist in the completion of the questionnaire as strongly suggested by the software, the questions

were split into sections on a number of pages. The unfortunate effect of this is to make the questions only mandatory if the respondent has got to that page. Some questionnaires have had therefore to be excluded as it could not be proven that they were an inhabitant.

For 59 respondents, it was possible to conclude the likely parish in which they resided, if not their precise location to provide a partial remedy to this defect. These have been typically used on the responses to perceptions but not the travel to/from questions. The total number of questionnaires that could be used was 392 for these results.

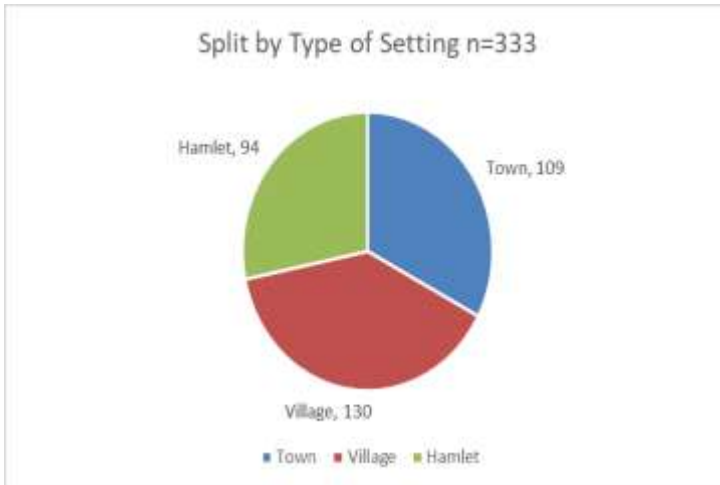
Other questionnaires were excluded for reasons of:

- incompleteness (only a couple of questions attempted),
- irrelevance (comments and approach suggesting that they were not a serious completion such as listing all towns in the district for all the answers)
- illogical (significant contradiction in responses across a range of questions)

The survey was open to all inhabitants of the district. While multiple answers from the same household was encouraged in order to discover the different travel approaches of multiple members, very few responses of this type were received. The district has a population of c87,000 with 38,000 households. 392 represents therefore 0.45% of the population and over 1% of households. While these are to the low ends of statistical validity; it does provide the necessary baseline.

Parish	Responses	Parish	Responses	Parish	Responses
Alvington	1	Hewelsfield	2	Ruardean	7
Aylburton	2	Huntley	2	Ruspidge & Soudley	7
Awre	1	Littledean	3	St Briavels	13
Blakeney	11	Longhope	15	Staunton	1
Cinderford	43	Lydbrook	20	Staunton Coleford	2
Coleford	34	Lydney	40	Tibberton	4
Drybrook	12	Mitcheldean	11	Tidenham	59
Dymock	2	Newent	20	Upleadon	1
English Bicknor	2	Newland	6	West Dean	55
Gorsley & Kilcot	2	Newnham	5	Westbury	2
Hartpury	1	Pauntley	1	Woolaston	3

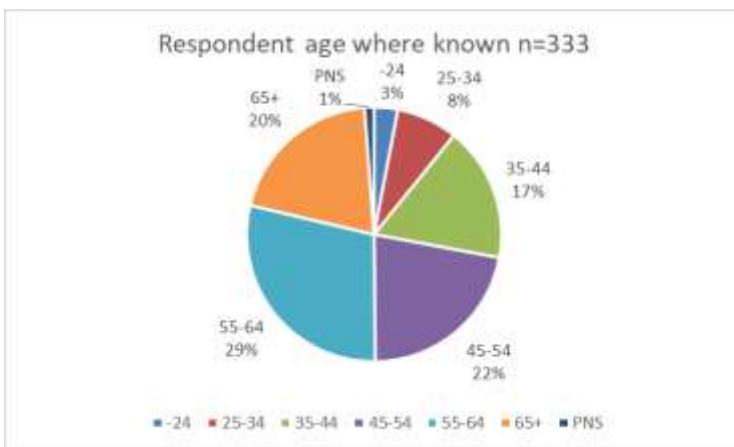
Parishes with no responses: Blaisdon, Bromesberrow, Churcham, Corse, Kempley, Oxenhall, , Redmarley, Rudford and Highleadon, and Taynton. These are typically in the North and East of the district. Overall, geographically there was a strong response from the Southern two thirds of the district.



For the 333 respondents where a specific address was given, we have been able to allocate them to 3 different types of settlement.

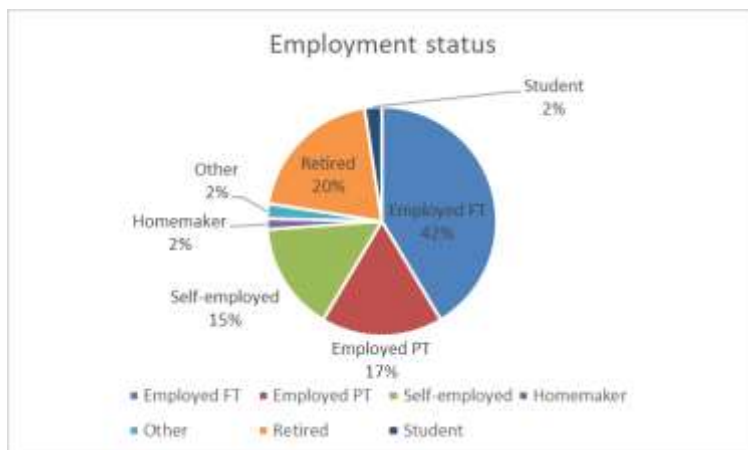
This is based upon the hypothesis that the needs and perceptions would vary on whether the individual was in the urban town setting of the 4 known towns in the District (Coleford, Cinderford, Lydney and Newent), or the 20 largest villages with suitable

smaller villages and settlements. In transport terms it also reflects that the towns are served frequently and reliably by the bus operators. Villages also receive a predetermined service either from the bus operators or by the community transport operating non-commercially viable bus services. A hamlet is a small group of dwellings that may be some distance from either a major trunk route or might be adjacent to that route. Future use of GIS will reallocate the membership of these groups more reliably. For example, it appears that the main settlements in the parish of Tidenham may act more as a small town than being in the village allocation.



Rural areas have ageing populations. If the sample reflected the proportion of over 65s it would need to increase to 28% on 2019 ONS statistics. 55-64 and 45-54 are over-represented when both are 16% of the actual population. As is 35-44 when it's 11%. These do however probably represent a good proportion of the parental taxi drivers. 0-24 are, as expected, significantly under-represented in this survey.

A future survey will need to target the 16-24 year-olds for their feedback.



Employment status shows a good cross-representation of the population. However, issues such as furlough and other Covid mitigations may disguise actual status.

Employment status was not used significantly for cross-analysis in this report given Covid and its effects on working practices.

Flexible working practices have confounded many hard-core managers' expectations on efficiency and need for staff direction. Change here could unravel conclusions based on this cross-analysis.

277 respondents or 70.7% declared that they did some kind of work for those who answered the question about how they travelled to work. Part of this difference is explained by 'retired' people who do voluntary work and by the students, who also work, but typify themselves as students. 64.8% of those that worked have a job for 5 days per week; 22.1% worked part-time 2-3 days per week and 13.2% worked for a day. The same respondent might have a number of jobs with different work patterns. 32.1% of working respondents worked primarily from home. This could be as a business owner or as a home-based employee.

	Town	Village	Hamlet
Employed Full-time	52 (65%)	57 (57%)	29 (45%)
Employed Part-time	10 (13%)	29 (29%)	18 (28%)
Self-employed	18 (23%)	16 (16%)	17 (27%)
Retired	19	26	22

(% of employed respondents)

There were more retired respondents in the sample proportional to other inhabitants in hamlets at 26% than in villages (20%) or in towns (19%). These seem contrary to the trend of older people moving to larger settlements in order to be able to access services eg medical, more easily. If this were true, it would have a key impact on the transport needs of an aging population.

How many of ?	None	One	Two	Three	Four	Five+	No answer
People Living	-	36	156	70	52	20	
Cars available	10	85	167	44	18	6	3
Motorbikes available	283	22	3	1	1	2	21
People using the bus	255	54	15	2	0	0	7

The sample covered the whole range of household size from those living by themselves (10.8%) to those living with five or more people in the household (6%). No questions were asked about the age ranges of those in the household as this was not the census! Larger households could include the parents of the adults of the household or their children or both. From this question 3% of households had no cars available. Demonstrating again the predominance of this type of transport and the impossibility of replacing the first car which accounts for a quarter of households. For households owning more than 5 cars there is evidence of a motoring hobby rather than vehicles by necessity.

10% of those responding to the motorbike question, had at least one motorbike in the household but 90% had none. The more worrying statistic is that for 79% of respondents who answered the question, no one in their household currently uses buses. This is partly a function of the awareness of where buses go and the behavioural change required to overcome the default certainty of using a car.

What is surprising is that there are not more larger families where the children who can't drive are not seen to be bus users, except for the school bus. There is a clear need for a future study on the role of the parental taxi in rural areas to inform why this, rather than a bus, appears to be the default service, unless there are higher than expected active travel options.

People in household	One person uses bus	2 people use the bus	3 people use the bus
One	10	-	-
Two	12	3	-
Three	14	2	2
Four	15	4	0
Five	3	6	0

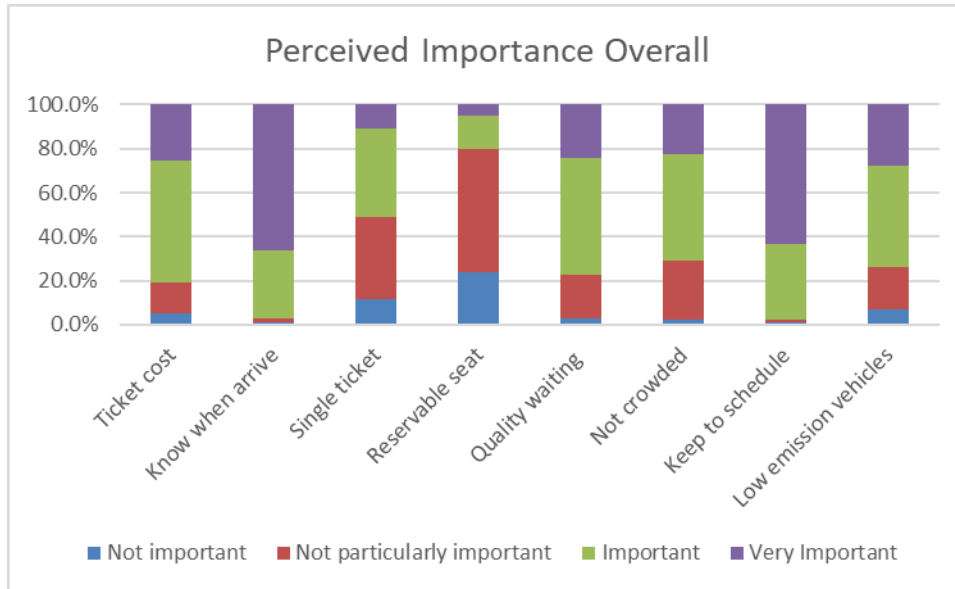
28% of one person households use the bus regularly, while just under 10% of two person households use a bus regularly either one off or singularly. There is a correlation between household members and use of buses so that for 36% of households with 4 members, at least one uses the bus.

Undertaking a survey during lockdown is neither ideal or easy. At various points throughout the survey, respondents were reminded that the answers needed should be related to more normal times. These were either those before 2020 or what they believed would be needed post-lockdown when the country had returned to 'normality'. Neither is a firm psychological anchor upon which to base perception related answers or normal usage. But as a baseline, the sample does provide some firm conclusions on the feasibility and desirability of a solution to increasing transport issues. In some cases, the feedback is stark; in others that nudges and greater awareness may reap rewards for more demand responsive options.

3. Perceptions

3.1 Public Transport Issues

Respondents were asked to rank 8 statements relating to public transport on a four-point scale. The results are shown for the overall sample as 100% bars to add comparability. The actual number of responses varied marginally around 384.



The statements have been abbreviated here for space. They were:

- Cost of ticket
- Knowing when it will arrive
- Ability to have a single ticket
- Having a reservable seat
- Good quality waiting places
- Not being overcrowded
- Keeping to a schedule time
- Use of low emission vehicles.

They were based on a recent report which identified success factors for public transport to gain increased use. The greater the purple segment, the more respondents identifying the factor as being very important. For public transport as a whole knowing when it will arrive and keeping to the schedule are key factors for rural areas. This reflects the importance of certainty. Arriving at say a bus stop, at around the time the bus is due does not tell one whether it has already been ie is early or is still come ie late. Without external data there is no information; only assumption. As no bus stop in the District has real time information systems installed, the default must be a mobile phone if there is signal.

Keeping to a scheduled time refers to both arrivals and departures in the sense of the stop at which the service is caught and the place it is due to arrive. Anecdotally arriving late at the terminus is often seen to cause significant angst when realistically very few services arrive precisely to the very minute they are scheduled.

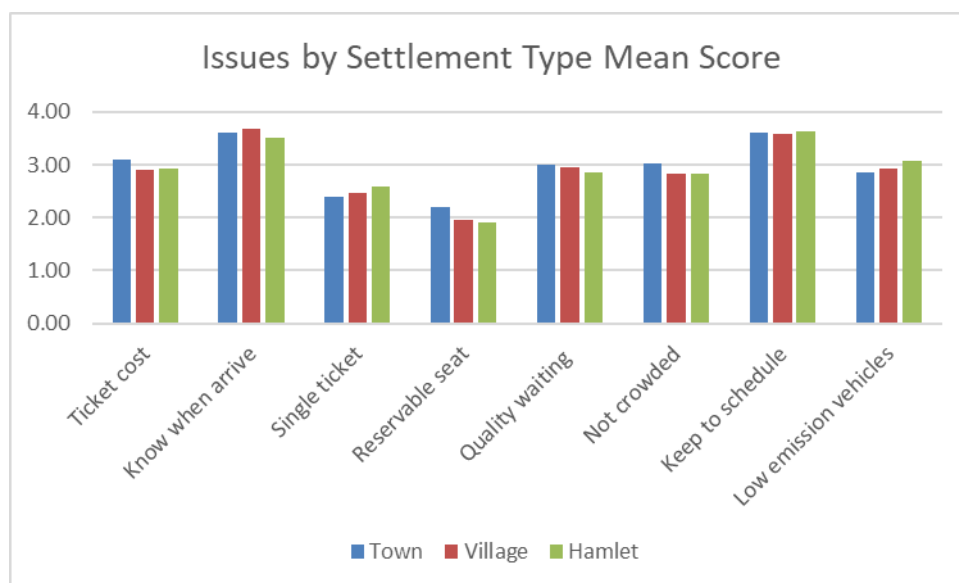
From the above it is also clear that the rural population is not overly fussed by the need for a single ticket or for a reservable seat. This may be the result of learnt behaviours. As a whole there is general acceptance that on a public service, a seat might not be available, because usually there is one on rural routes for those without accessibility issues. But if the definition is broadened beyond buses and trains to publicly accessible vehicles to include minibuses and taxis, then the counter presumption would come into play. In the latter two, you must have a seat.

Single ticketing again is important if the context is multi-modal use ie using more than one mode of transport on a trip. In rail services even if we have to change, our expectation is one ticket for the whole route. Currently on rural transport in a district where train services are limited it is seen as a nice to have rather than an essential.

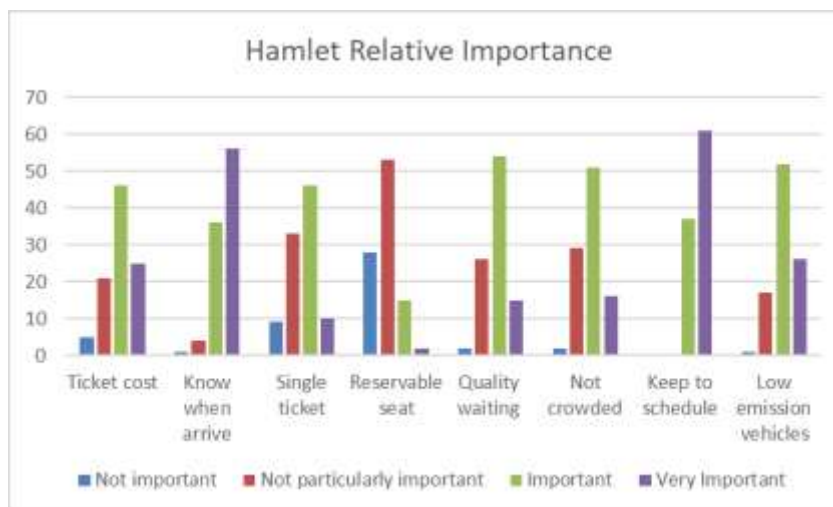
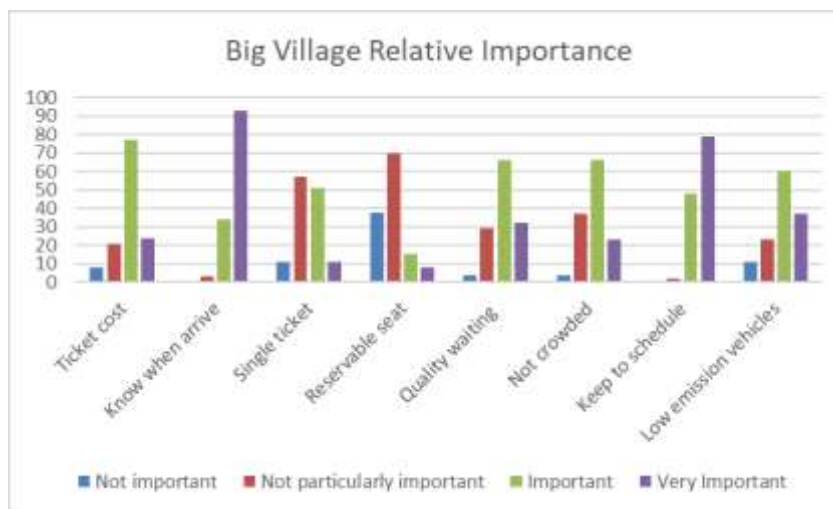
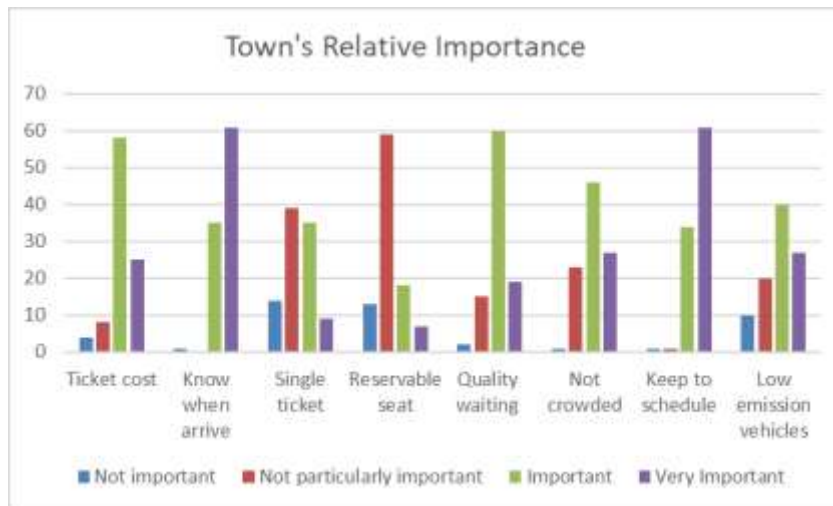
For 75% of respondents, ticket cost, quality waiting areas, low emission vehicles and not being crowded are seen to be important. What is significant is that overall they are not ranked as being very important. From the table below the means and median values confirm arriving and schedules are very important with median scores of 4 and mean averages over 3.6 on a 4-point scale. It is only ticket cost where the very important outweigh the nots that also achieves a mean score of 3. Quality waiting, low emission vehicles and not crowded have a mean score of 3.

	Ticket cost	Know when arrive	Single ticket	Reservable seat	Quality waiting	Not crowded	Keep to schedule	Low emission vehicles
Mean	3.02	3.62	2.50	2.02	2.99	2.91	3.60	2.94
Median	3	4	3	2	3	3	4	3
N=	382	385	385	386	383	385	385	384

Above we identified a presumption that expectations might vary by settlement type. As mean averages in the chart below, often the scores don't seem to vary much. Towns experience busier vehicles so might like the idea of a reservable seat or not crowded more than other areas, who might just want a vehicle to transport them. Those further from urban centres like single tickets more; while townies are more conscious of the ticket costs.



The following charts show the rating profiles by the settlement types:



The profiles with the differences are the hamlets. The vehicle for the hamlet must keep to schedule and for some reason preferably a lower emission vehicle from the important bar. Ticket cost and quality waiting have higher not particularly important bars. The former may reflect a thankfulness for a service and the latter the reality of a bus stop with no shelter.

Settlement Allocation	Ticket cost	Know when arrive	Single ticket	Reservable seat	Quality waiting	Not crowded	Keep to schedule	Low emission
Town	3.09	3.61	2.40	2.20	3.00	3.02	3.60	2.87
Village	2.90	3.67	2.48	1.95	2.96	2.83	3.58	2.94
Hamlet	2.94	3.52	2.58	1.91	2.85	2.83	3.62	3.07

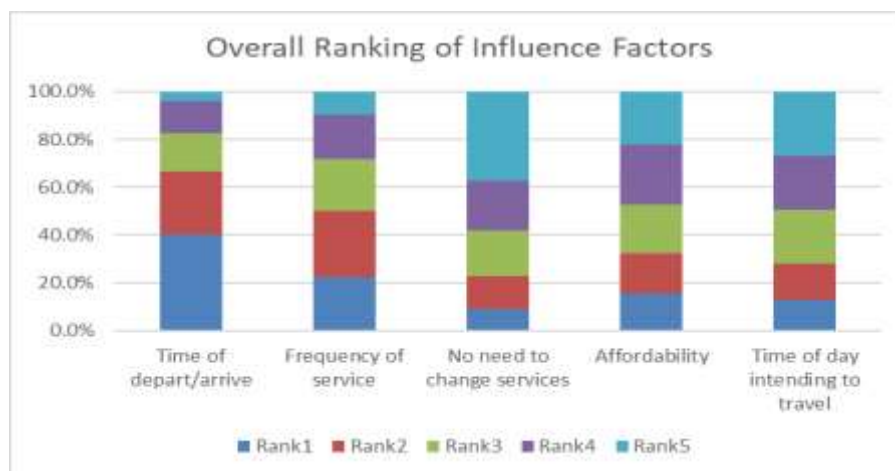
The bold figures above highlight potential significant differences by size of settlement. What is perhaps more interesting is the degree of similarity as an average. This could be the result of the groupings related to size and perceptions of service. Or that the 95% Defra specification of rurality does mean that the 5% urban does not sway the overall perception.

Age Range	Ticket cost	Know when arrive	Single ticket	Reservable seat	Quality waiting	Not crowded	Keep to schedule	Low emission
18-34	3.17	3.71	2.37	1.91	2.94	2.74	3.76	2.80
35-44	3.04	3.64	2.33	1.88	2.88	2.84	3.63	3.09
45-54	3.25	3.65	2.43	2.00	2.83	2.85	3.61	2.82
55-64	2.93	3.53	2.61	1.96	2.95	2.88	3.51	2.93
65+	2.59	3.59	2.57	2.21	3.06	3.00	3.58	3.11

Analysis by age reveals a few possible trends. Those over 65 rank ticket cost as less important as a mean than other age groups. This is probably due to the free bus pass expectation. As the survey ages so they get less worried about when the service will arrive and interestingly whether it keeps to schedule. But these are still both relative to age as still ranked as a mean as very important. As a 65+ the physical requirement for a seat is potentially greater on a long bus journey down country lanes and assuming a propensity to get to the bus stop to wait, waiting areas should be better quality. Again, what is surprising is the degree of conformity of opinion despite the old population probably having a better recollection of a fuller functioning public rural travel service.

3.2 Key Factors that Influence Travel Arrangements

On this question, respondents were asked to re-order the five factors in rank of importance where rank one was the highest and most important and five the lowest. The more dark blues and reds at the bottom of the stack the more rankings of the factor in first or second place.



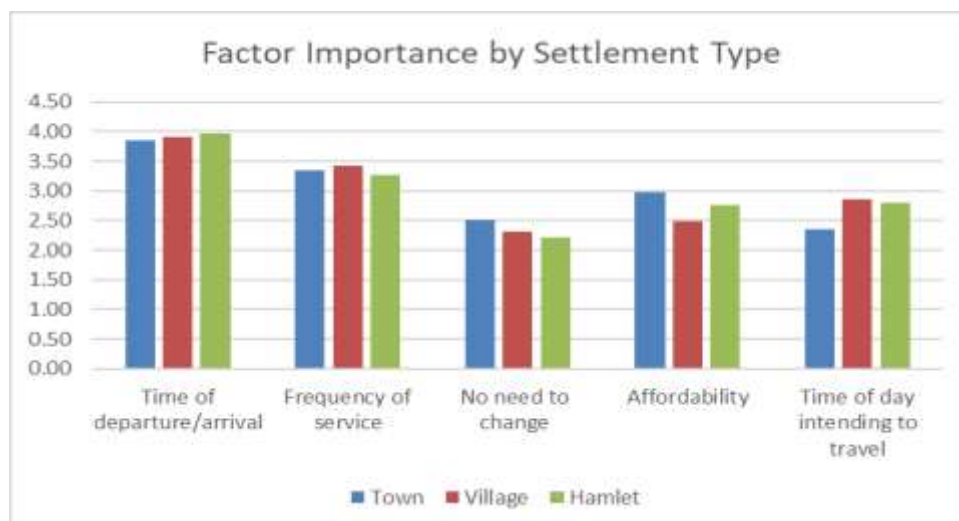
The most significant factor was time of departure and arrival. This confirms the previous section but what is striking is the degree that it is so consistently ranked first or second. 40% of respondents put it top and further 25% second.

The factor ranked second is frequency of service with half of respondents ranking it first or second. Work elsewhere suggests that modal shift in the take-up of bus travel is the provision of a service every twenty minutes. This might be longer in rural areas where the default could be a two-hourly interval between buses, or on one Forest route 7 days. Frequency is a difficult perception to pin down accurately. A more frequent service gives greater certainty that the trip will be successfully completed even if there is a delay. In urban areas the traveller needs only to sit and wait in a suitable coffee shop to kill the twenty minutes until the next bus. Standing next to a rural road does not have the same attraction.

The third rank is affordability behind time and frequency. While over a fifth ranked it last; for over half it was important enough to rank first, second or third. Given the higher costs of rural travel as a proportion of income, this is not surprising. The responses here of all surveyed; some of whom would never see the need to use a bus and if they did so would not consider the cost as unduly high as they lack a comparator.

Time of day beats no need to change services to the fourth rank. This seems to suggest that considering the time of day when intending to travel while making travel arrangements has less importance than time of depart. In other words, if the vehicle goes at 8am to arrive by 10am, pragmatically I would catch it and not say I'd prefer it left at 9am. From the below, those in towns are less concerned by time of day than the village or hamlets. This probably reflects the provision of lighting to and from the stop.

The lowest ranked was no need to change services. Again, this suggests a pragmatic approach relative to other 4 factors. For a few it is of the highest ranking, but for 40% it's the lowest. Perhaps perversely the people who care most over the need to change are those living in the four towns who rank it on mean average higher than villages or hamlets.

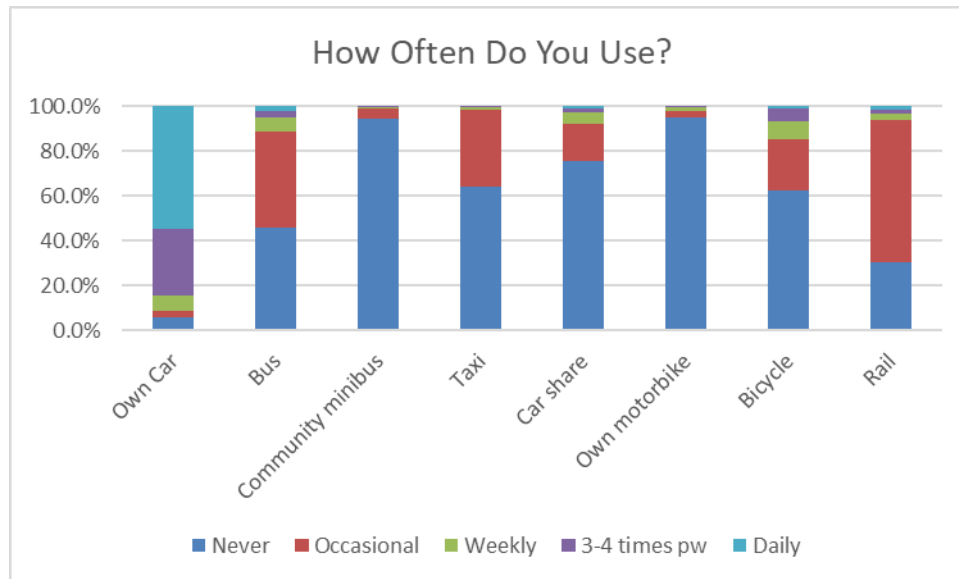


4. Usage

Before respondents were asked about where they went in different modes, some baseline data was gathered on the frequency they used the different types of transport in the area. There is already the significant and full range on offer from the expected buses through to active travel and trains.

4.1 Use by Types

There is no surprise that the car is the most actively used form of transport by the respondents with 55% using it daily. While 95% never used a motorbike.



	Own Car	Bus	Community minibus	Taxi	Car share	Own motorbike	Bicycle	Rail
Never	5.9%	46.2%	94.6%	64.2%	75.5%	95.2%	62.5%	30.5%
Occasional	2.8%	42.6%	4.4%	34.4%	16.5%	3.0%	22.9%	63.6%
Weekly	7.2%	6.5%	0.8%	1.1%	5.3%	1.3%	8.0%	2.6%
3-4 times pw	29.2%	2.9%	0.3%	0.3%	1.6%	0.5%	5.6%	1.8%
Daily	54.9%	1.8%	0.0%	0.0%	1.1%	0.0%	1.1%	1.5%

84% of respondents used their own car at least 3-4 times per week. Only 6% of those answering this question stated they never used a car. This is lower than data elsewhere that suggests 10% of the rural population do not have access to a car. This may be the result of the under-representation of younger respondents less likely to be able to afford to run a car.

Only 2% of those surveyed said before Covid that they used a bus daily. A further 3% used it 3-4 times per week. 11.2% used a bus at least weekly. Almost half of those surveyed never used a bus. Analysis suggests there is a strong correlation with those employed full-time and driving five days to work forming a proportion of this never use option. This is entirely rational as the time available to use the bus would be limited.

The core target market for community transport is often seen to be the retired and the infirm. Yet both community transport groups also use their minibuses to service a number of non-

commercially viable routes which are open to all travellers. Despite this, 95% of respondents have never used the community transport service in either mode. Overwhelmingly the root cause is a lack of awareness of the services and the eligibility criteria and where it applies.

Two thirds of respondents never use a taxi while a third use them occasionally. Car sharers have a higher proportion of never users but those who do use this option do so more frequently. Bicycles have a similar proportion of daily users as car sharers, but gains on the 3-4 and weekly use. Here leisure use may be coming in where the purpose of the trip is to cycle for exercise more like the trip out in the car for its own sake rather than the pragmatic of getting from A to B for something.

Rail for over 60% of people is an occasional or monthly use. A higher proportion use on this level than anything else, perhaps because they tend to be bigger journeys and stick longer in the perception. It is more difficult to tick I never use the train than for say a motorbike.

	Own Car	Bus	Community minibus	Taxi	Car share	Own motorbike	Bicycle	Rail
Mean average	3.24	0.72	0.07	0.37	0.36	0.07	0.60	0.80
Median	4	1	0	0	0	0	0	1
Sample N=	390	383	390	372	375	372	376	390

If the ratings are converted into 5-point scale where never is 0 and daily is 4, arithmetic means and medians can be calculated based on the numbers scoring. The car median is a 4 ie daily use and an average 3.24. On average bus and rail almost get to 1, which is their median. Both are drawn down by the never use. More use the train than bus caused by the higher occasional use. Surprisingly the use of a bicycle is similar as a mean. Taxis and car share have similar rates of use while community minibuses are the same as motorbikes for frequency of use.

Town	Own Car	Bus	Community minibus	Taxi	Car share	Own motorbike	Bicycle	Rail
Never	5	43	95	60	66	89	60	29
Occasional	4	40	1	31	19	3	18	61
Weekly	8	4	0	1	6	1	6	2
3-4 times pw	29	4	1	0	1	0	7	3
Daily	51	3	0	0	1	0	3	2
Village								
Never	8	57	129	75	98	117	74	43
Occasional	1	56	4	46	19	4	37	82
Weekly	5	11	0	3	5	3	10	5
3-4 times pw	40	3	0	1	3	0	5	2
Daily	79	3	0	0	2	0	0	1
Hamlet								
Never	3	48	88	65	74	94	58	27
Occasional	3	44	11	34	17	3	21	67
Weekly	12	6	1	0	5	0	11	2
3-4 times pw	53	0	0	0	1	0	0	2
Daily	53	0	0	0	1	0	0	2

The significance of the previous table are the bold highlights on the hamlet. The only viable service currently is one's own car or a car share for travel that is 3-4 times per week. At the weekly point then buses and bikes come in. The oddity is the proportion using the train daily or at least half weekly which is higher than town or village. This may reflect a journey to Chepstow or Gloucester rather than a Lydney start point. The question becomes whether the occasional use is a positive decision that travel is not per se needed or reflects de facto that the only solution is a car and to have no public travel expectation.

4.2 Affects Travel Take Up

The preceding section summarises current usages of different transport types. It underlines the predominance of the car. It serves to scale the size of the carbon problem and the crisis that will occur in 2030 when the costs of cars will increase at the same time as their ability to cope with a rural terrain decreases. And at a time when an increasing number of young people are no longer learning to drive.

For rural MaaS to succeed there needs to be a significant shift in behaviours and expectations. Those behaviours and expectations have received 2 significant shocks in the last 3 years.

The first is the acceptance that there is a climate emergency where the amount of carbon produced needs to be dramatically reduced. Transport has barely moved the dial on carbon reduction. 2030 will move that greatly but with significant consequences for rural areas.

The second shock is Covid and the growing popular realisation that while current versions will be beaten back, mutations will ensure that like flu, it will continue as a regular killer. More significantly it has led to a reappraisal of work and the need to attend daily with advances in connectivity. Industry 4.0 was already heralding the end of the industrial monolith where size and co-location was key.

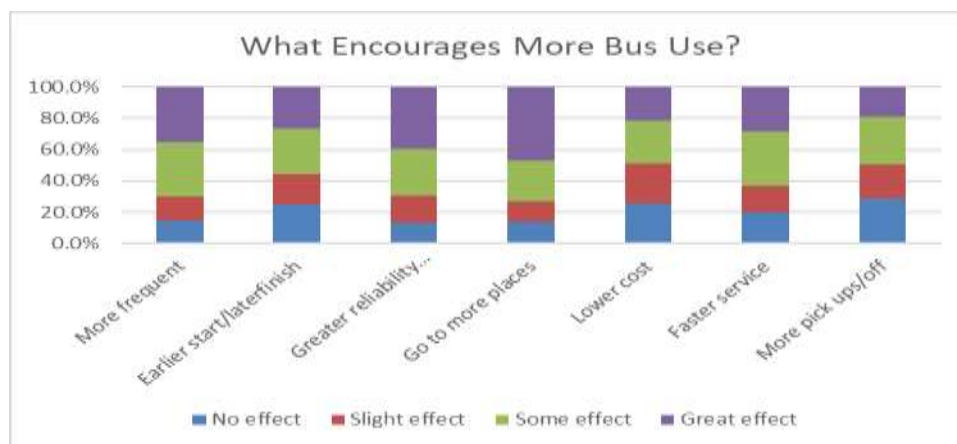
MaaS cannot have a shock effect. Rather it must evolve as part of the ecosystem of transport in rural areas. Encouragement of the behaviours that are likely to increase an accelerating uptake are key. Those needs don't culminate in the bald and meaningless question would you use a MaaS service. Far better is to anchor them against what might increase use of the most identifiable alternative the bus and away from the current supplier, the car.

4.2.1 Bus Use

Respondents were given 7 factors to rate on a scale of no effect, slight effect, some effect and great effect as to how it might affect their use of buses more. The factors in full were:

- More frequent service
- System starts earlier and finished later
- Greater reliability in arrival/departure times
- Service goes to more places
- Lower cost
- Faster service to destination
- More pick up/drop off points

All the factors would have a positive effect on the take-up of bus use. But what drives this faster is not the provision of a service at a lower cost per se nor of more set down and pick-up points to put you close to your home or destination. It is that the service actually goes to more places and removes the binary nature of bus travel, of there is either a service or not. MaaS can provide just that kind of service through the provision of multi-modal services to cover what is sometimes called the last or first mile, which rurally can be much more than a single mile. A bus service that went to more places creates a certainty and a schedule, but running a real bus may not be commercially viable, given the difference between saying I want a service to X but not being able to quantify how frequently I will use it. There is therefore a trade-off with flexibility while maintaining a certainty that it should be possible around the time it's needed.



The second effective driver is greater reliability ie consistency in arrival and departure times. Rarely is one told that a bus will leave at say 23 minutes past the hour, even when that is the time stated on the timetable. While schoolchildren have optimised their run to the bus to meet these constraints; they are also aware that the timetabled time is a best estimation, which is rarely met in a classic IT developer's binary world. It's fuzzy logic at best.

	More frequent service	System starts earlier finishes later	Greater reliability in arrival departure times	Service goes more places	Lower cost	Faster service to destination	More pick up/drop off points
Mean	2.91	2.57	2.95	3.07	2.45	2.71	2.40
Median	3	3	3	3	2	3	2
N=	364	358	362	364	359	360	364

	More frequent	Earlier start/late finish	Greater reliability arr/dep	Go to more places	Lower cost	Faster service	More pick ups/off
No effect	14.3%	25.1%	13.5%	13.7%	25.6%	20.3%	28.6%
Slight effect	15.7%	19.0%	17.1%	12.9%	25.3%	16.7%	21.7%
Some effect	34.9%	29.3%	29.8%	26.4%	27.3%	34.4%	30.5%
Great effect	35.2%	26.5%	39.5%	47.0%	21.7%	28.6%	19.2%
n=	364	358	362	364	359	360	364

The third most important factor is frequency of service which is the same as reliability as a mean and median value. 70% said it would have some or great effect on usage. Rural buses services are caught in a downward spiral where lack of passengers leads to greater reliance on subsidy and the cutting of frequency to the point where the bus service may exist merely in name. We're not sure that one service a week on an old route with the return 1.5 hours later is truly a bus service. Frequency relates to visibility. We know a bus is due because we see people at a bus stop waiting. The queue identifies the stop. Different queues at different times of day tell us, when passing by car, that there is a likely to be frequent service. Passenger interchanges create queues and therefore promote the perception of frequency because they are seen to be busy.

63% believe that faster services are effective in increasing bus use. But a fifth believe those services have no effect. Further cross-analysis here might reveal a correlation between this fifth and the 19.2% who stated that nothing would make them use their car less. The above responses suggests that frequency rather than speed per se might achieve a better uptake.

For 55% of respondents starting buses earlier or finishing them later would push up use. A quarter believe it will have no effect. First and last buses are always a bone of contention. The last bus can never be late enough for some. At some point the cost becomes that of a taxi based on commercial choice and need. Running more flexible demand response services enables patterns to be determined and the most appropriate size vehicle to be used cost effectively (and taking into consideration capital costs)

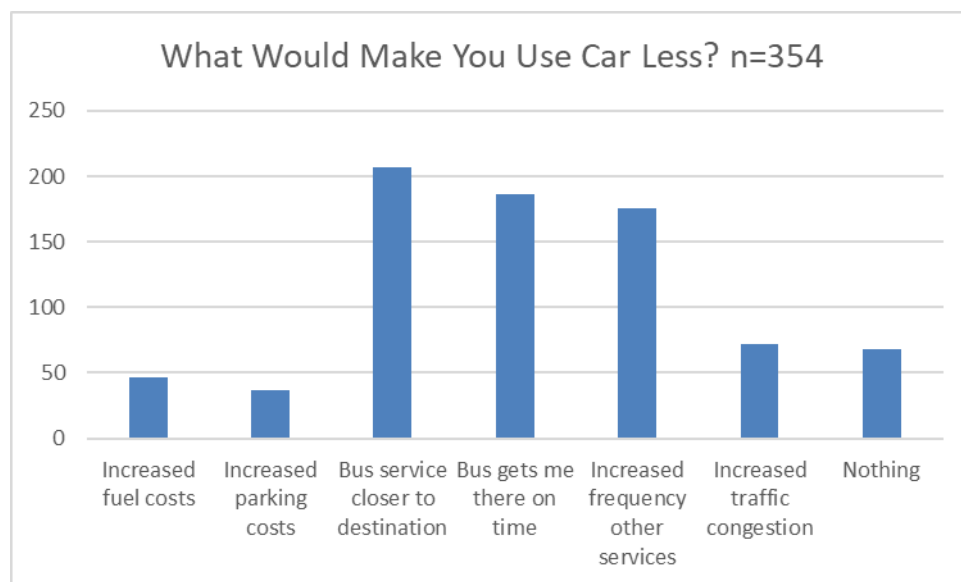
	More frequent	Earlier start /later finish	Greater reliability arr/dep	Go to more places	Lower cost	Faster service	More pick ups/ off
Town							
no effect	14	24	14	15	24	16	32
slight effect	17	16	14	8	19	11	22
some effect	29	25	26	27	20	34	28
great effect	36	32	43	46	32	36	15
Mean	2.91	2.67	3.01	3.08	2.63	2.93	2.27
N=	96	97	97	96	95	97	97
Village							
no effect	19	33	17	18	38	29	38
slight effect	18	27	21	20	29	23	32
some effect	57	39	52	33	41	41	43
great effect	39	32	41	61	23	37	19
Mean	2.87	2.53	2.89	3.04	2.37	2.66	2.33
N=	133	131	131	132	131	130	132

Hamlet							
no effect	14	23	13	13	22	21	25
slight effect	16	18	20	12	32	22	18
some effect	27	29	20	28	27	33	28
great effect	40	22	43	44	15	19	26
Mean	2.96	2.54	2.97	3.06	2.36	2.53	2.57
N=	97	92	96	97	96	95	97

From the above towns want buses to be cheaper and faster than villages and hamlets to attract the respondents' custom. In this they are asking more urban-like questions based on presumption of service! Hamlets want more drop off points which might translate as simple inclusion in the route ie one stop.

4.2.4 Car Use

Having given them the opportunity to state positively what would make them use buses more; it was deliberately switch round to ask what would make you use a car less. Feedback from a number of respondents suggested that being asked this question did lead them to question the level of their car use and whether alternatives were available. The three big winners here relate to the need for awareness of what is actually on offer, not just a perception of what might be available based on presumption. Being asked how long it takes you to get to your bus stop has allowed other respondents to see other bus stops in their vicinity, of which they had been unaware while hiding in plain sight.



	Increased fuel costs	Increased parking costs	Bus service closer to destination	Bus gets me there on time	Increased frequency other services	Increased traffic congestion	Nothing
Number	47	37	207	186	176	72	68
Percent	13.3%	10.5%	58.5%	52.5%	49.7%	20.3%	19.2%

Frequency, proximity and timeliness all amount to certainty and control. All are positive messages for half of the potential audience. All are enabled by MaaS. Congestion is twice as effective as a negative tool than parking costs or increased fuel costs. Both of the latter have been prime causes of previous outcries and campaigns. What may be different here is an acceptance that even if they change adversely, it will not change the need for and use of a car.

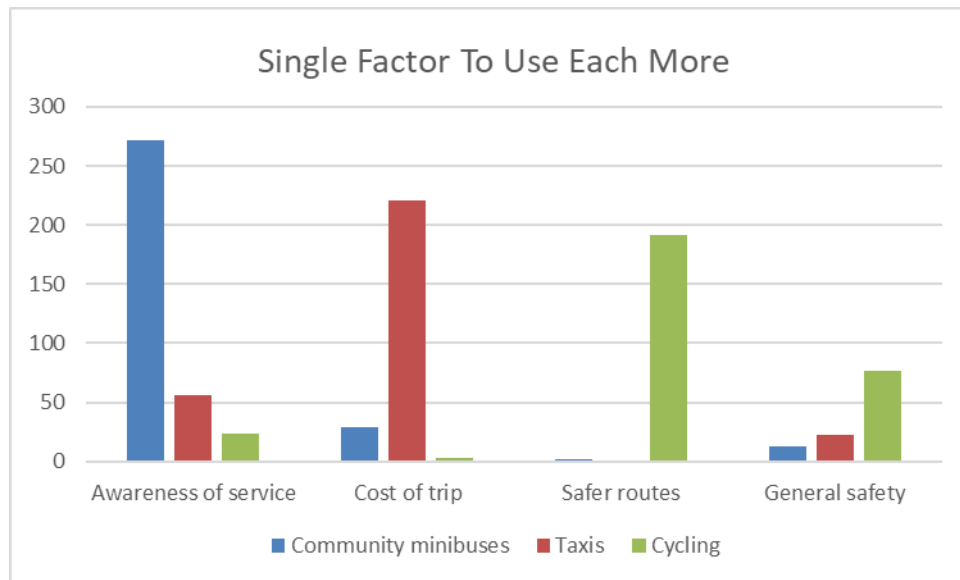
Positive messages will therefore work for 70% of the audience to encourage a move away from car use. NB reduction of car use is not the same as car replacement. For rural households the certainty of fallback on their own single vehicle in emergencies is a given for the foreseeable future. 19.2% have been honest and stated ‘nothing’ out of the 354 who answered this question. Further work is required to see whether this data can shed further light on the characteristics of those respondents or whether it should be the subject of an additional survey. The former might inform MaaS uptake while the latter might be an interesting academic survey because MaaS’ aim is not to serve all people for all modes, but to offer them alternatives and opportunities for some modes and journeys. If someone in the middle of nowhere needs a vehicle to transport them now, then that is a taxi request not a MaaS request. For 70% there might be a reasonable chance of a sensible conversation on the 3 positive messages.

Those stating	Increased fuel costs	Increased parking costs	Bus service closer to destination	Bus gets me there on time	Increased frequency other services	Increased traffic congestion	Nothing
Town	18.9%	14.7%	56.8%	55.8%	61.1%	24.2%	17.9%
Village	9.6%	8.0%	58.4%	49.6%	50.4%	17.6%	18.4%
Hamlet	13.3%	9.2%	61.2%	53.1%	45.9%	22.4%	20.4%

Fuel and parking are higher for towns than villages and hamlets. But within these figures, villages are somewhat confused and it is the hamlets that provide the outlier responses. The destination approach works both ways for hamlets. It is the destination from their home as well as the return back. They need to travel to a bus service so bringing it closer might enable them to use it. Hamlets want a service other than car but are less concerned that it is provided frequently. This is the provide 2-3 times per day expectation not per hour for modal change. Hamlets are also realists. A higher percentage won’t be tempted from their car as they need that certainty of use.

4.2.4 Other Modes

When asking the question what single factor would make you use community minibuses, taxis and cycling more, we did not expect such uniformity of opinion. Taxis are seen to be too expensive partly through a lack of understanding of the constraints of operation. If a taxi takes you to Gloucester, she needs a backhaul to pay the fare back, while waiting in a rank is more efficient than trying to chase down the next fare. Cycling needs safer routes and less so general safety. This might say more about other road users and the realities of shared country roads. For community transport the message is clear but harsh: who are you? Again, a lack of awareness of the constraints under which these services are provided on a charitable basis.



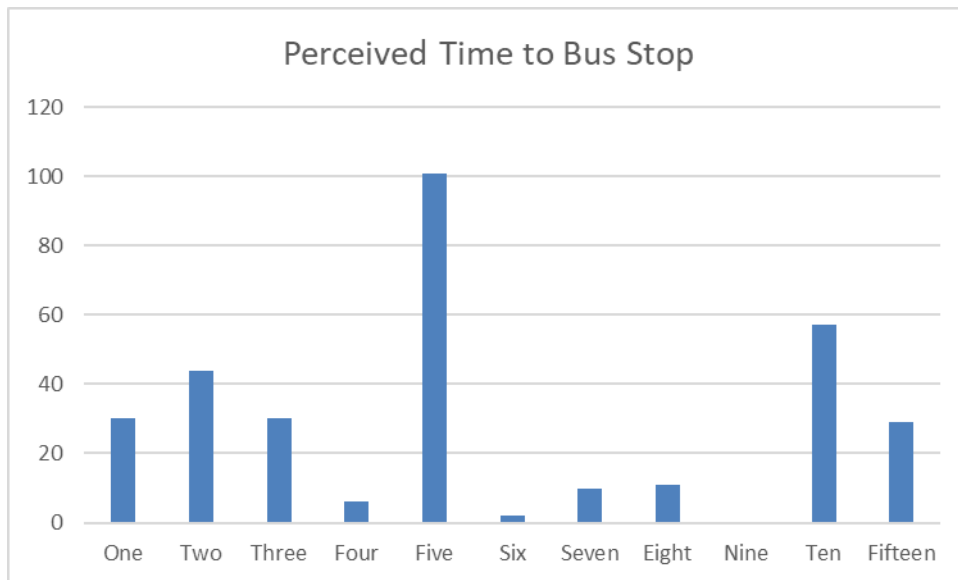
4.3 Time to Bus Stop

Rural MaaS assumes the availability of common transport interchanges as individuals change transport mode from active travel walking/cycling to a vehicle and then perhaps onwards to a vehicle-to-vehicle interchange. The starting point would also be the local stop often already seen as the established bus stop network subject to the legality of a vehicle using such stops. (Again this is very complex with multiple authorities having responsibility for different parts of the physical stop and operators restricted by their status). All bus stops are covered by a central register which carries over from the National Bus Company and its operating facilities created in 1969 from the previous entities. The register can therefore reveal all bus stops whether in use or not. Traveline is more likely to provide a picture of stops to which there are services, but stops away from main roads may not be demarcated; yet are known to the locals historically.

Respondents were asked to simply state how far they were from their bus stop in minutes. The average from those given is 8 minutes; but this needs to be treated with caution given our laxness with time. Consider the 30 respondents who said the stop is a minute away. For all these respondents the stop cannot be situated just outside their house on their side of the road accessible through a permanently open front door.

Similarly, the biggest peak for 100 respondents is 5 minutes. The lower numbers for four and six strongly suggests a rounding up and down.

Outliers over fifteen minutes have been excluded from the graph. More than one respondent suggested the answer was over an hour. From their locations this was unlikely except in the instance of mobility and accessibility issues.



Most people believe that their local bus stop is within 5 to 10 minutes of where they live.

5. Transport Use in Different Modes

In any geospatial project there must be questions that relate to a start and end point and probably the reason for the journey. Travel patterns within the Forest of Dean are not well-known and are subject across the 203 square miles to many presumptions and assumptions.

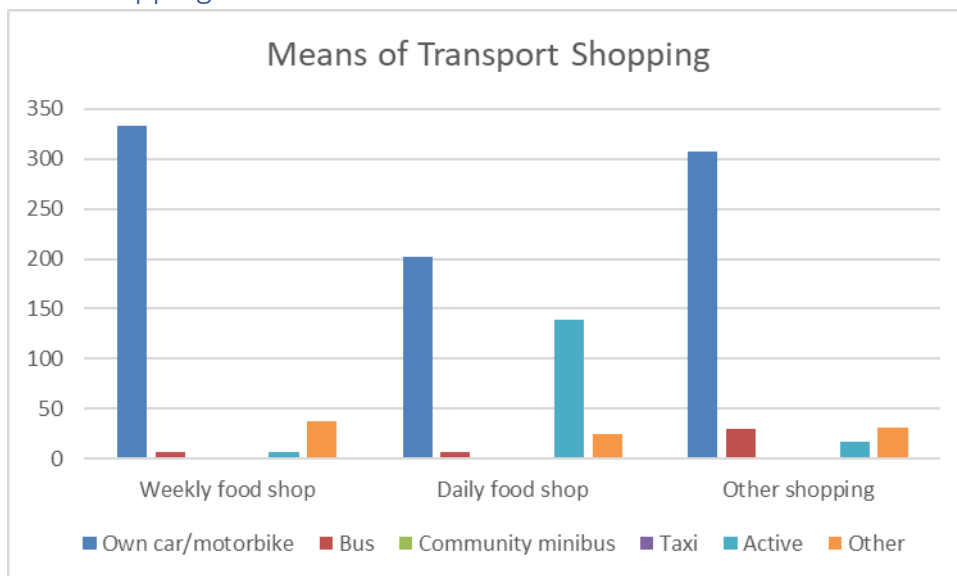
MaaS systems generate supply and demand data along with actual trips that can be used to inform transport planning. This data set provides an opportunity for pseudo-realistic modelling of services.

Respondents were asked how they went to places in different modes of:

- Shopping weekly for the household
- Daily household shopping
- Other shopping
- Various leisure activities
- Work
- Health and
- Study

And also where they went. We are then able to plot their rough journey from A to B. What we cannot predict is which roads they might have taken precisely. We all have routes of habit, which might not be the quickest or the safest, but may be the ones where you never meet or are held up by a bus or a tractor!

5.1 Transport for Shopping



Unsurprisingly the main vehicle used for shopping was the car, regardless whether it was weekly, daily or other shopping. What may be more significant is:

- the high proportion of respondents using active travel options (cycling/walking) for a daily food shop
- the proportion of other which is mainly online shopping.

Overall, 17% of respondents used online shopping for weekly or daily food shops. 8% only do their household shopping online and do not travel. 4% even do their daily household shop online as well as visiting shops. What was less expected was that some respondents do not buy all their weekly shopping on-line, but also combine this with physical shopping. Those who only do online is provided in the second table.

The first table shows the home location for all who used online either as the single solution or combined with a physical shop. What jumps out is the number of town-based respondents, who have the alternative of a physical supermarket. The expansion of supermarket availability in Coleford is not seen in the numbers using online. Except if those orders are to their local store and what is avoided is the journey to the store.

Weekly Online									
Alvington		Coalway		Joys Green		Newnham		Tidenham	2
Beachley		Coleford	8	Longhope	2	Oldcroft		Tutshill	4
Berry Hill	2	Drybrook	2	Lydbrook	3	Parkend		Upleadon	
Bream		Gorsley		Lydney	4	Ruspidge		Whitecliff	
Buckshaft		Huntley		Mitcheldean	5	Soudley		Whitecroft	2
Cinderford	4			Newent	5	St Briavels		Woodcroft	2
Only Online									
Alvington		Coleford	4	Longhope		Oldcroft		Upleadon	
Beachley		Drybrook		Lydbrook		Ruspidge		Whitecliff	
Buckshaft		Gorsley		Lydney		Soudley		Woodcroft	
Cinderford	2	Joys Green		Mitcheldean		Tidenham			
Coalway				Newent	4	Tutshill			

The numbers in the tables show where there was more than one similar response eg 5 people in Berry Hill do a weekly shop online, but no one in the Berry Hill sample does a daily household shop online. While in Newent for 4 people, online was the default for daily and weekly household shopping and for one person they only did their weekly shop online and their daily shop in person.

The wordcloud shows all the destinations for weekly food shops for the district. The size of the word is in rough proportion to the number of respondents identifying it.



Lydney is the most popular location for all the respondents followed by Chepstow and Coleford. A significant note of caution is that these are absolute figures. They make no allowance for the southern skew of the sample. GIS plots provide a better understanding of the actual situation.

The following tables demonstrate the wide reach that each of the towns in and out of the district have for the weekly food shop. The significant exception is Newent which is not shown in the table because of very low numbers identifying it as the place for a weekly food shop. This may be numbers because of the relatively lower responses in that general area. But the numbers from Newent going to Ledbury, Gloucester and online suggests it does not operate in the same way despite being an established market town.

CINDERFORD		COLEFORD		LYDNEY	
Awre	1	Aylburton	1	Awre	1
Blakeney	1	Berry Hill	2	Aylburton	2
Cinderford	23	Bream	5	Blakeney	4
Drybrook	2	Broadwell	3	Bream	9
Joys Green	1	Christchurch	1	Broadwell	1
Longhope	1	Cinderford	1	Cinderford	1
Lydbrook	3	Coalway	1	Clements End	1
Lydney	1	Coleford	11	Coleford	2
Mitcheldean	1	English Bicknor	1	Lydney	26
Newnham	4	Fetter Hill	1	Milkwall	1
Pillowell	2	Gorsty knoll	1	Oldcroft	3
Plump Hill	1	Joys Green	1	Parkend	4
Ruardean	1	Lydbrook	4	Pillowell	2
Ruardean Hill	1	Lydney	6	Sedbury	2
Ruardean Woodside	1	Milkwall	3	Sling	1
Ruspidge	1	Newland	1	Soudley	1
Soudley	1	Oldcroft	1	St Briavels	4
Whitecroft	1	Parkend	2	Stroat	1
Yorkley	1	Pillowell	4	Viney hill	1
		Shortstanding	1	Whitecroft	5
		Sling	3	Yorkley	8
		St Briavels	5		
		Tutshill	1		
		Whitecroft	3		
		Yorkley	3		
	48		66		80

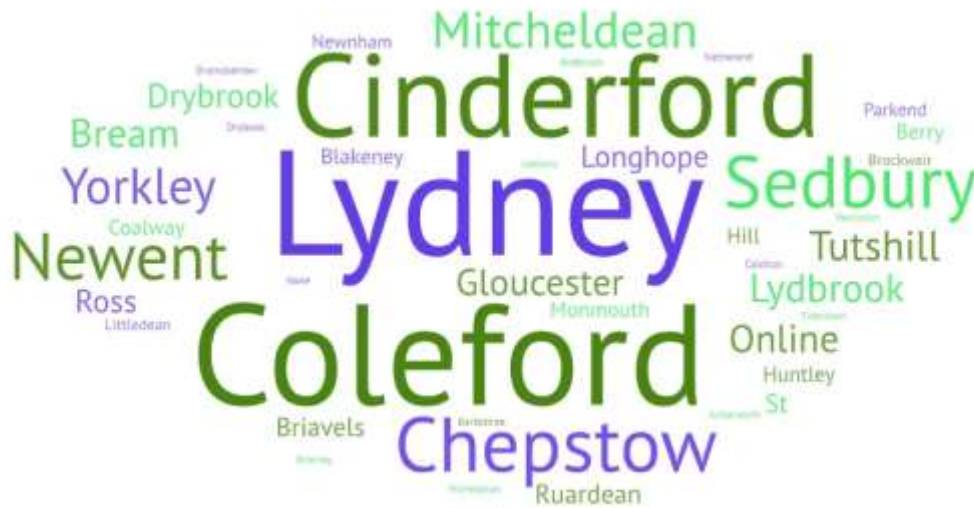
For 80 respondents Lydney was the destination for their weekly shop with a strong showing of local Lydney residents. Coleford was the destination for 66 drawn from 25 different locations. 48 went to Cinderford with half from the town itself. The results show that people travel to shop and do not

necessarily go in the most logical or shortest direction. Indeed, the weekly shop may involve going to two different towns in completely opposite directions to the starting point.

Despite the offerings in these towns, Gloucester draws 58 respondents and Chepstow 59. The very south of the Forest does shop internationally across the bridge with the communities acting as the Eastern bank of the Chepstow conurbation. Perhaps more surprising are the 6 Lydney residents that use Chepstow given similar alternatives in their own town.

CHEPSTOW		GLOUCESTER		MONMOUTH		ROSS	
Beachley	1	Berry Hill	1	Bream	2	Cinderford	5
Bream	1	Brierley	1	Broadwell	1	Coleford	1
Coleford	1	Cinderford	11	Brockweir	1	Drybrook	3
Lydney	6	Coalway	1	Christchurch	1	Lea Bailey	1
Sedbury	14	Coleford	2	Cinderford	1	Longhope	4
Sling	2	Drybrook	3	Coleford	3	Lydbrook	10
St Briavels	8	Hartpury	1	Crookers Ash	1	Lydney	1
Stroat	1	Hillend Green	1	Hewelsfield	1	Mitcheldean	5
Tidenham	2	Huntley	2	Lydbrook	2	Newent	3
Tutshill	16	Littledean	1	Lydney	1	Ruardean	1
Whitecroft	5	Longhope	10	Milkwall	1	Ruardean Hill	1
Woolaston	1	Lydbrook	1	Redbrook	1	Ruspidge	3
		Lydney	5	Ruardean	1	Soudley	1
		May Hill	1	St Briavels	3	Westview	1
		Mitcheldean	2	Tutshill	1	Whitecroft	1
		Newent	4	Whitecliff	1		
		Newnham	2				
		Nottwood Hill	1				
		Ruardean	1				
		Staunton	1				
		Tibberton	3				
		Walmore Common	1				
		Westbury	1				
		Westview	1				
	59		58		22		41

This second wordcloud shows the daily destinations for household shopping with a much greater variety. Here there is a strong likelihood to shop local either from home or from a work location.

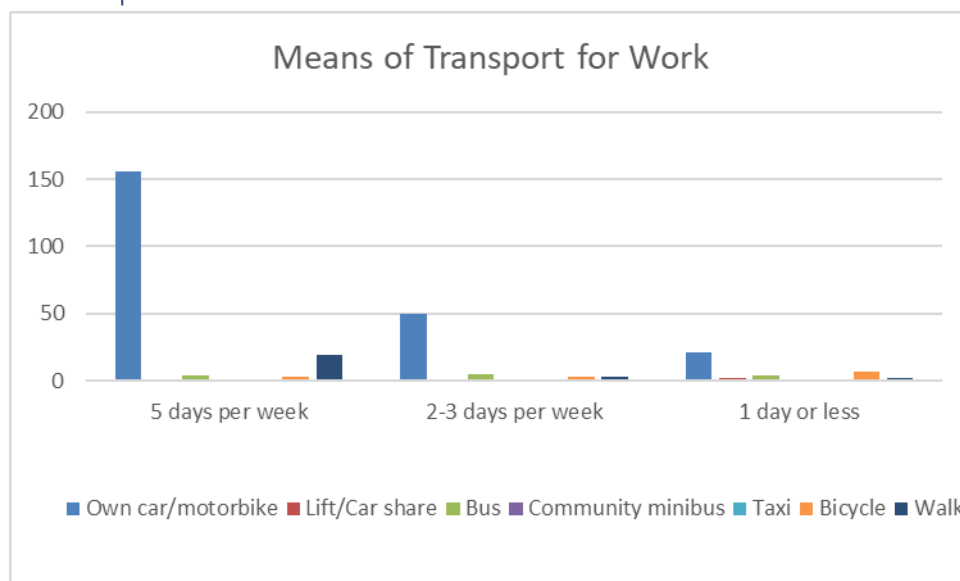


5.2 Transport for Work

277 respondents or 70.7% declared that they did some kind of work. 64.8% of those that worked have a job for 5 days per week; 22.1% worked part-time 2-3 days per week and 13.2% worked for a day. The same respondent might have a number of jobs with different work patterns.

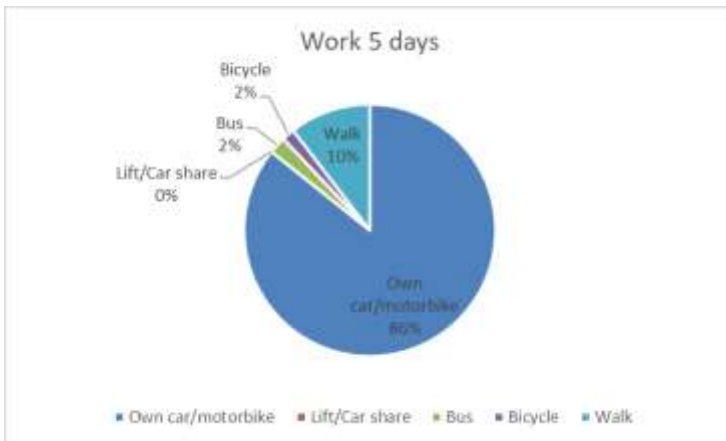
32.1% worked primarily from home. This could be as a business owner or as a home-based employee. This one third proportion tallies with the House of Lords report Time for a Strategy for the Rural Economy.

5.2.1 Means of Transport to Get to Work



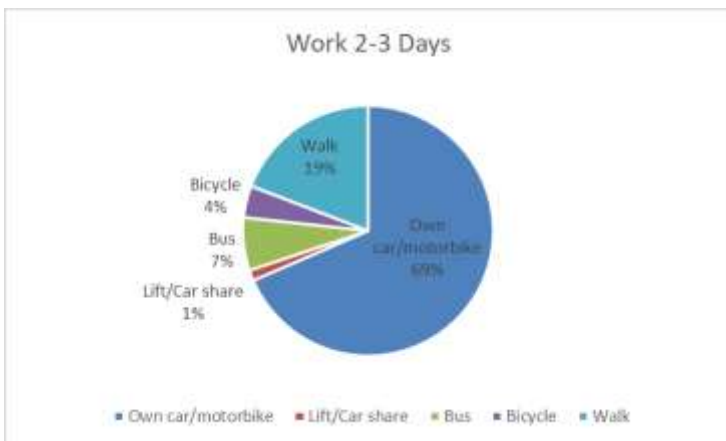
The prime means of transport to work is the car. For five-day workers, it dominates to such an extent that very little detail is possible from the above chart. That domination is significant and suggests a potential destination-based opportunity if a more flexible approach to hours of work

might be considered. Publicly accessible transport has peak use in the morning from 7.30 to 9.00 for schools and for those who use it for work. Core hours of 10-4 might open up access to the capital-intensive vehicle fleet.



86% of Forest inhabitants working 5 days a week not at a home location, use their own car to get to work.

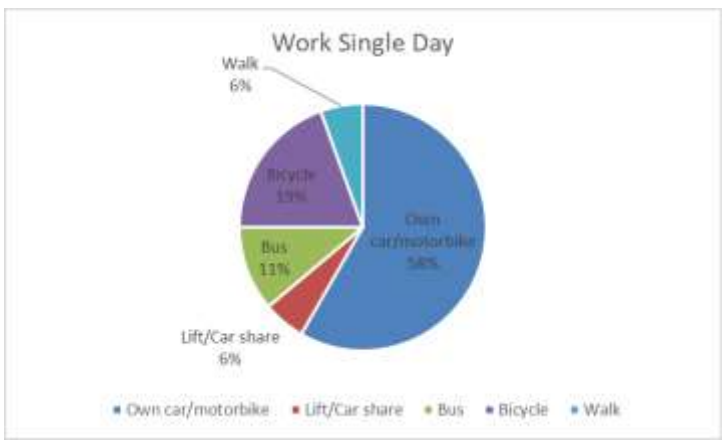
10% walk to work. 2% ie 4 people took the bus for an activity that occurs daily and predictably. In the sample of 182 respondents no one car-shared. It is hypothesised that the certainty and affordability of a car when working five days per week underpins this chart.



The proportion of own car or motorbike reduces with working only 2-3 days to 69% of the 62 respondents on this pattern.

Walking increases to 19% and other forms of transport come into play.

With reduced total numbers, care must be taken not to overplay the variations. Bus and car share are now options.



Those working a single day as their only or as an additional job still tend to use their own car or motorbike.

Active travel now accounts for a quarter of journeys. Again, this may feed into the affordability versus locality argument. "I work locally but only part-time so need to take an alternative form of transport than a car as I have no money."

5.2.2 Home to Workplace Summary Data

In the following pages summary data that looks at where people go to work from their starting location. This shows the diversity of travel destinations and the need to travel some distance. The second set of tables turns the data around for certain district locations and identifies where its workers come from.



The wordcloud on the left are all the places that people in the sample got to work from Cinderford with word size proportional to numbers excluding FromCinderford or ToCinderford. The right wordcloud is where the workers come from to work in Cinderford. While many come from Cinderford and work there; working in the same town is no longer the norm.

Home	Workplace	Home	Workplace	Home	Workplace
Bream	Cheltenham	Cinderford	Cinderford	Lydney	Mitcheldean
Bream	Cheltenham	Cinderford	Cinderford	Lydney	Viney Hill
Bream	Chepstow	Cinderford	Cinderford		
Bream	Coleford	Cinderford	Cinderford	Drybrook	Cheltenham
Bream	Coleford	Cinderford	Coleford	Drybrook	Cheltenham
Bream	Forest	Cinderford	Coleford	Drybrook	Cheltenham
Bream	Glouc'shire	Cinderford	Gloucester	Drybrook	Lydney
Bream	Lydney	Cinderford	Glouc'shire	Drybrook	Tewkesbury
Bream	Lydney	Cinderford	Hereford		
		Cinderford	Home	Longhope	Gloucester
Coleford	Brockworth	Cinderford	Pontrypridd	Longhope	Joys Green
Coleford	Cinderford	Cinderford	Ross on Wye	Longhope	Longhope
Coleford	Forest	Cinderford	Whitecroft	Longhope	Speech House
Coleford	Gloucester	Cinderford	Bristol	Longhope	Shropshire
Coleford	Gloucester	Cinderford	Cinderford	Longhope	Gloucester
Coleford	Hereford	Cinderford	Coleford	Longhope	Gloucester
Coleford	Newport	Cinderford	Gloucester	Longhope	Gloucester
Coleford	Coleford	Cinderford	Gloucester	Longhope	Gloucester
Coleford	Coleford	Cinderford	Mitcheldean	Longhope	Upton Bishop
		Cinderford	Monmouth	Newent	Cheltenham
		Cinderford	Newent	Newent	Gloucester
Lydbrook	Lydbrook	Lydney	Bristol	Newent	Gloucester
Lydbrook	Lydbrook	Lydney	Chepstow	Newent	Gloucester
Lydbrook	Lydney	Lydney	Cinderford	Newent	Gloucester
Lydbrook	Monmouth	Lydney	Coleford	Newent	Hereford
Lydbrook	Staverton	Lydney	Coleford	Newent	Newent
Lydbrook	Cheltenham	Lydney	Coleford	Newent	Newent

Home	Workplace		Home	Workplace		Home	Workplace
Lydbrook	Cheltenham		Lydney	English Bicknor		Newent	Redmarley
Lydbrook	Cinderford		Lydney	Gloucester		Newent	Tupsley
Lydbrook	Gloucester		Lydney	Gloucester		Newent	Wales
Lydbrook	Gloucester		Lydney	Gloucester		Newent	Worcester
Lydbrook	Lydbrook		Lydney	Gloucester		Newent	Eynsham
Lydbrook	Ruardean		Lydney	Gloucester		Newent	Gloucester
			Lydney	Hartpury			
Mitcheldean	Gloucester		Lydney	Lydney		Newnham	Cardiff
Mitcheldean	Hereford		Lydney	Lydney		Newnham	Cheltenham
Mitcheldean	Home		Lydney	Popes Hill		Newnham	Coleford
Mitcheldean	Mitcheldean		Lydney	Speech House		Newnham	Gloucester
Mitcheldean	Newent		Lydney	Yate		Newnham	Bristol
Mitcheldean	Gloucester		Lydney	Bristol		St Briavels	Coleford
			Lydney	Cardiff		St Briavels	Westbury
			Lydney	Chepstow		St Briavels	Cheltenham
Sling	Chepstow		Lydney	Gloucester		St Briavels	Chepstow
Sling	Cinderford		Lydney	Gloucester		St Briavels	Monmouth
Sling	Coleford		Lydney	Lydney		St Briavels	Parkend
Stroat	Upton Bishop		Tirley	Apperley		Whitecroft	Mitcheldean
Sedbury	Bristol					Whitecroft	Whitecroft
Sedbury	Cardiff		Tutshill	Cinderford		Whitecroft	Mitcheldean
Sedbury	Coleford		Tutshill	Newport			
Sedbury	Frenchay		Tutshill	North Bristol		Woodcroft	Bristol
Sedbury	Sedbury		Tutshill	Raglan			
Sedbury	Tutshill		Tutshill	Bristol		Yorkley	Bristol
Sedbury	Coalway		Tutshill	Bristol		Yorkley	Bristol
Sedbury	Cwmbran		Tutshill	Filton		Yorkley	Cheltenham
Sedbury	Nationally		Tutshill	Trowbridge		Yorkley	Yorkley
Tidenham	Oxford					Yorkley	Viney hill
Tidenham	Alton						
Tidenham	Newport						

The following tables reverse the direction of travel from the workplace to the home location. The numbers shown are where there are duplicates to the same location.

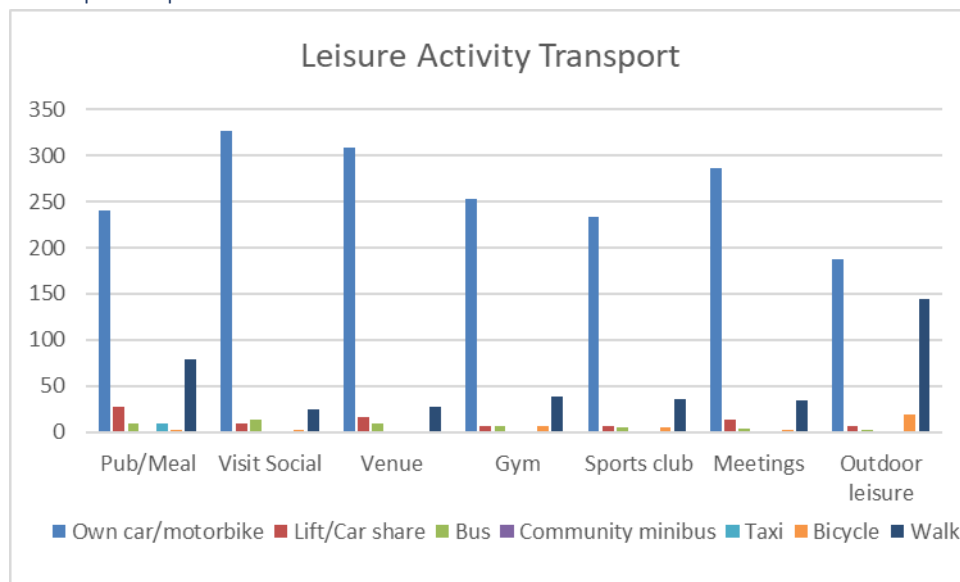
Workplace		Home location		Workplace		Home location	
Bristol		Blakeney		Cinderford		Sling	
Bristol		Brockweir		Cinderford		Tutshill	
Bristol		Lydney		Cinderford		Westview	
Bristol		Sedbury		Cinderford		Cinderford	
Bristol		Viney hill		Cinderford		Lydbrook	
Bristol		Woodcroft		Coleford		Beachley	
Bristol		Yorkley	2	Coleford		Bream	
Bristol		Cinderford		Coleford		Cinderford	3
Bristol		Lydney		Coleford		Lydney	3
Bristol		Newnham		Coleford		Milkwall	2
Bristol		Tutshill	2	Coleford		Newnham	
Bristol		Woolaston		Coleford		Redbrook	
Brockworth		Coleford		Coleford		Ruspidge	
Brockworth		Ruardean		Coleford		Sedbury	
Cardiff		Newnham		Coleford		Sling	
Cardiff		Sedbury		Coleford		St Briavels	
Cardiff		Walmore		Coleford		Bream	
Cardiff		Lydney		Coleford		Coleford	2
Cheltenham		Blakeney		Gloucester		Cinderford	
Cheltenham		Bream	2	Gloucester		Cliffords Mesne	
Cheltenham		Newnham		Gloucester		Coleford	
Cheltenham		Pillowell		Gloucester		Joys Green	
Cheltenham		Sedbury		Gloucester		Lydney	3
Cheltenham		Westbury-on-Severn		Gloucester		May Hill	
Cheltenham		Yorkley		Gloucester		Newent	1
Cheltenham		Drybrook	3	Gloucester		Newnham	
Cheltenham		Hartpury		Gloucester		Plump Hill	
Cheltenham		Lydbrook	2	Gloucester		Soudley	
Cheltenham		Newent		Gloucester		Brierley	
Cheltenham		Ruspidge		Gloucester		Cinderford	2
Cheltenham		St Briavels		Gloucester		Coleford	
Cheltenham		Tibberton		Gloucester		Huntley	
Chepstow		Bream		Gloucester		Longhope	5
Chepstow		Sling		Gloucester		Lydbrook	2
Chepstow		Alvington		Gloucester		Lydney	4
Chepstow		Lydney	2	Gloucester		Mitcheldean	2
Chepstow		St Briavels		Gloucester		Newent	3
Cinderford		Brierley		Gloucester		Tibberton	
Cinderford		Cinderford	4	Hereford		Cinderford	

Workplace		Home location		Workplace		Home location	
Cinderford		Coalway		Hereford		Coleford	
Cinderford		Coleford		Hereford		Mitcheldean	
Cinderford		Lydney		Hereford		Newent	
Cinderford		Sling					
				Monmouth		Lydbrook	
London		Clements End		Monmouth		St Briavels	
				Newent		Mitcheldean	
Longhope		Longhope		Newent		Newent	2
Longhope		Upleadon		Newent		Tibberton	
				Newent		Cinderford	
Lydbrook		Lydbrook	3	Newport		Chepstow	
				Newport		Coleford	
Lydney		Beachley		Newport		Tidenham	
Lydney		Bream		Newport		Tutshill	
Lydney		Drybrook		Oxford		Tidenham	
Lydney		Lydbrook		Pontypridd		Cinderford	
Lydney		Lydney	2	Raglan		Tutshill	
Lydney		Bream		Ross on Wye		Cinderford	
Lydney		Lydney		Ruardean		Ruardean	2
Lydney		Parkend		Ruardean		Lydbrook	
				Tewkesbury		Drybrook	
Mitcheldean		Lea Bailey		Tewkesbury		Staunton	
Mitcheldean		Lydney		Upton Bishop		Longhope	
Mitcheldean		Mitcheldean		Upton Bishop		Stroat	
Mitcheldean		Whitecroft		Wales		Newent	
Mitcheldean		Cinderford		Westbury		St Briavels	
Mitcheldean		Gorsley		Worcester		Newent	
Mitcheldean		Whitecroft		Worcester		Ruardean Woodside	
Monmouth		Cinderford		Yate		Lydney	
Homeworkers							
Home		Awre		Home		Tutshill	
Home		Aylburton		Home		Tutshill	
Home		Aylburton		Home		Tutshill	
Home		Berry Hill		Home		Whitecroft	
Home		Blakeney		Home		Whitecroft	
Home		Broadwell		Home		Whitecroft	
Home		Brooms Green		Home		Woodcroft	
Home		Cinderford		Home		Woodcroft	
Home		Coleford		Home		Mitcheldean	
Home		Parkend		Home		Mitcheldean	
Home		Sedbury		Home		Nottwood Hill	
Home		Tutshill		Home		Pillowell	
Home		Tutshill					

The last table above are the locations of home-workers, who also identified another normal work destination. These may work at home for 3 days per week but then in the company office or on client site for the remainder of the week. What might be significant is that the highest proportion are in the Southern parts of the district. Here in recent years, there has been an influx of people previously living in and around Bristol when the tolls came off the Severn Bridge. Again, further research is needed on this to confirm whether it is the case and how that might inform the Covid-inspired jump to the country for a more flexible and agreeable working pattern

5.3 Transport for Leisure

5.3.1 Leisure Transport Options



There is little real surprise that for leisure/social activities, the car is still the most predominant form of transport for the following reasons:

- To go to a pub/restaurant
- To visit friends/relatives
- To go to a venue eg cinema
- To go to the gym/leisure centre
- To go to a sports club
- To go to meetings for associations I am a member
- To undertake outdoor leisure.

	Pub/Meal	Visit Social	Venue	Gym	Sports club	Meetings	Outdoor leisure
Own car /motorbike	241	326	308	253	234	286	187
Lift/Car share	28	10	16	7	7	13	7
Bus	10	13	9	6	5	4	2
Community minibus	0	0	0	0	0	0	0
Taxi	9	0	1	0	0	1	0
Bicycle	3	3	1	7	5	3	19
Walk	79	25	27	39	36	34	145

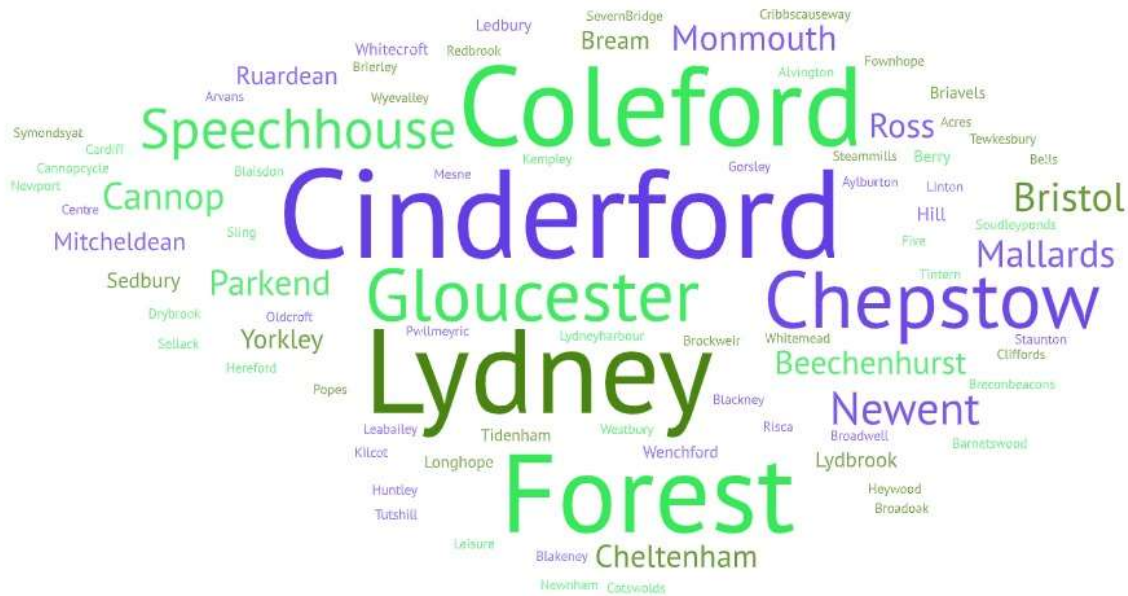
Community minibuses provide an armchair-to-armchair service for the older population, but none cited them in their leisure use. This would include the non-commercial bus routes. Yet it is clear from the wordcloud in 5.3.2 that a number of these destinations would be served by those services. The word Forest below is a catchall for the various citations of walking in the woods.

It is good to see the active travel option for the pub on both counts. Firstly, supporting a dying institution with frequent pub closures and secondly avoiding the mixing of drinking with driving. This is also the biggest response for car share.

Venues are an under-targeted area with high car use. Cinemas and music venues are known locations with known time slots for mass activity suggesting an opportunity for destination-based services using flexible transport options. Gyms, sports clubs and meetings may be solitary activities as one person from a household goes, but again provides a car-share opportunity depending on the nature of the event.

145 people walk to their outdoor leisure. For some of these, the walk is probably also the leisure they are taking. This is unavoidable in a rural area of national significance. This may be the case for the 19 bicycle-riders. However, there are still large numbers of mountain bike riders, who need to take a car to their desired venue rather than cycling to it.

5.3.2 Leisure Destinations



No excuses are offered that some of the smaller responses are illegible at this scale. Respondents go all over yet the publicly available transport network does not reflect this. MaaS provides the opportunity to introduce this flexibility and to aggregate services to destinations or for common purposes. It would allow individuals in their outdoor leisure to undertake linear rather than circular routes, which reduces the load and density on certain areas of the District.

5.4 Transport for Study (not for Schools)

Only 39 respondents undertook study of some form:

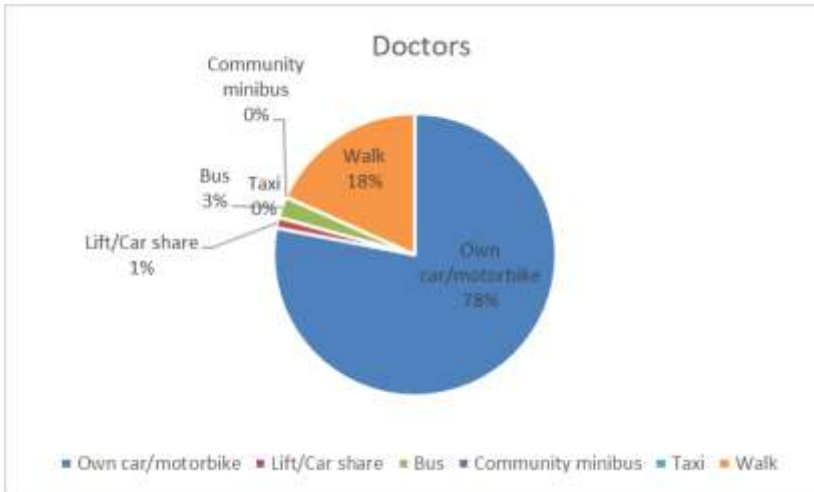
- 10 were undertaking full-time courses
- 16 were undertaking part-time courses
- 13 were undertaking other forms of training.

In terms of transport, 29 took either a car or a motorbike to the study venue. 9 took a bus and 5 of these were the full-time students. The respondents were generally in the younger age ranges and a mix of sixth form, college and university students.

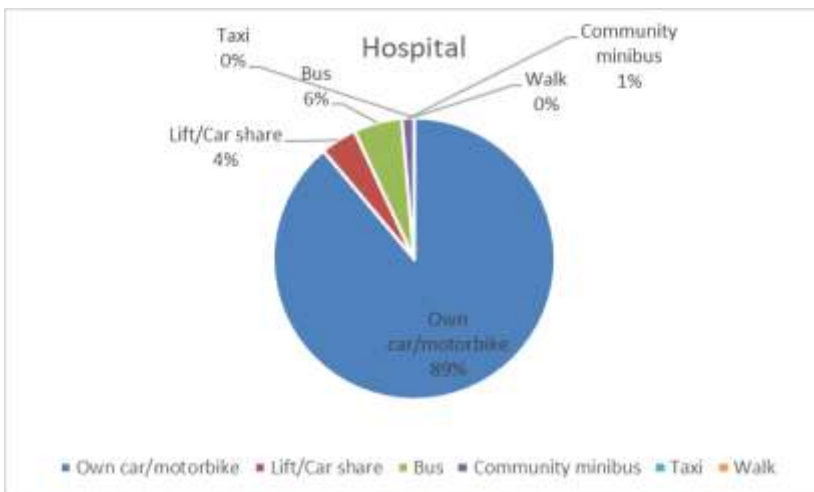
School transport is a complex area. For example, it is well-known that students from the South of the Forest attending Gloucester and Cheltenham grammar schools will catch the train from Lydney and then take bus services onward. How they get to Lydney station is less clear.

But the important issue is the differentiation between student-only transport such as a school bus where failure to arrive or stop can be dealt with at a school organisational level; and students on general public transport where failure of service is an individual problem. MaaS has no role in the designated school bus scenario that does not provide publicly accessible shared transport, but could have a key role in getting students to their place of study and back within reasonable periods flexibly

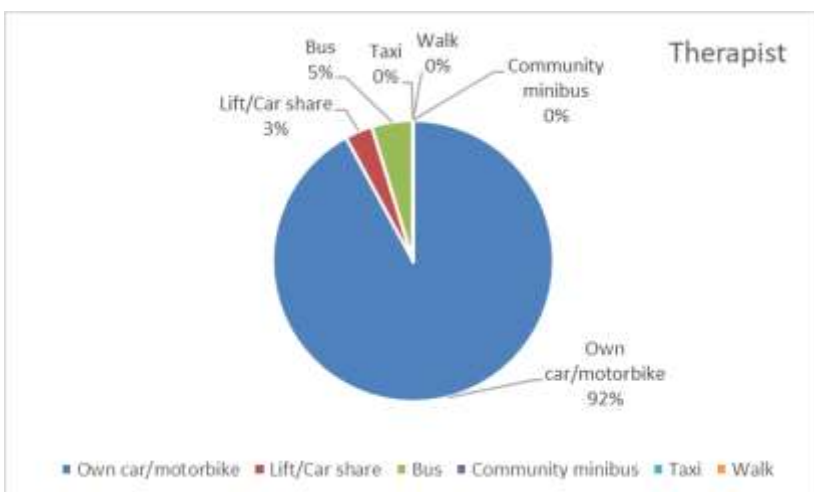
5.5 Transport for Health



21.9% of those surveyed, accessed healthcare on a monthly or weekly basis. This is the total number from all respondents. Predictably the older age groups had higher needs.



While 18% of all age groups walk to their doctors; 78% take their car for regular appointments. This would include the proportion where they are taken by another family member in a family car. In reality this is a car share, but the survey was not at the detail level of do you drive yourself!



89% of respondents with regular hospital appointments also go by car. Walking is excluded for most as few hospital appointments are in walking distance in the Forest. Here the proportion by bus (perhaps no other means available); car share (a neighbour offers) or community minibus (dialaride comes into play). The last proportion is low because our sample is unlikely to include that target audience typified as the frail, over 60's needing medical assistance.

If you are going to a therapist of any kind, it appears you drive or might take the bus.

The Forest Inhabitants Travel Survey (FITS) was undertaken as part of Rural Technologies Ltd's MaaS: Enabling Rural Geospatial e-Solutions (MERGeS) project funded by the Geospatial Commission's Innovate UK SBRI competition: Using geospatial data to solve transport challenges phase 1 in January to March 2021.

Rural Technologies was created for a simple reason. Its founders have backgrounds in technology and its application to real world problems. The more they looked at the digital world; the more they saw the creation of a two-tiered society resulting from strong urban presumptions.

In a net-zero carbon world, a fundamental challenge for the rural economy will be transport. This affects how society works, lives, plays, studies and ages. The concepts of mobility as a service do not cover rural areas yet underpin future transport use.

The Geospatial Commission is an independent, expert committee responsible for setting the UK's geospatial strategy and coordinating public sector geospatial activity. Its aim is to unlock the significant economic, social and environmental opportunities offered by location data and to boost the UK's global geospatial expertise.

The Geospatial Commission has partnered with Innovate UK to create a new £2 million competition which will look at how location data can spark innovation and support the future of mobility for the United Kingdom. Phase 1 consisted of 28 winners who have developed feasibility studies to help create geospatial solutions to our transport challenges and support the future of mobility.

Please note the Geospatial Commission & Innovate UK do not endorse any of the findings or positions outlined in the work being published by the projects.

Thank you's. The fieldwork for FITS was undertaken by FEP CIC and volunteers using automated software on behalf of Rural Technologies. The Countryside and Community Research Institute of the University of Gloucestershire through Dr John Powell provided input on the questionnaire design

The main analyst and author was Andrew Callard who runs Aimed Business, a management and marketing consultancy and is MD of Rural Technologies Ltd. Following his MBA at Warwick in 1985 he joined a Japanese market research consultancy using quantitative and qualitative methods to analyse the telecoms, office automation and consumer electronics markets in Europe. Subsequently he spent a decade working in Higher and Further Education increasing the volume and quality of applied & blue-sky research and vocational training. Lastly as Deputy Principal (Services for Business) at Hartpury. He has been a board member of the Institute for Research in Applicable Computing at the University of Bedfordshire.

Since 2007 he has worked extensively in the rural economy and assisting businesses based there. He was the first Chairman of FEP and is a member of the CIC Board. With David Trevelyan, he co-founded Rural Technologies Ltd in 2020 to drive the uptake of solutions such as Mobility as a Service tailored to the real needs of the rural economy through innovation. David reviewed this report as part of RTL's QA processes.

Other reports from the MERGeS project are the subject of academic publications proposed by WMG of Warwick University on Cyber-security and CCRI on rural transport systems. Further information has been requested by Innovate-UK; and separately by the Organisation for Economic Co-operation and Development (OECD) for a forthcoming report on Innovative Mobility for the Periphery.

