To what extent can The integration of land use and transport planning influence Household Vehicle Ownership At New settlement developments through The Provision of railway services?

Transport Planning Society Bursary Submission
December 2017

Matthew Parker
74863048

4987 words

ACKNOWLEDGEMENTS

The author would like to thank the following persons for their support, guidance and encouragement in completing this research project:

- David Connolly – TPS mentor;
- Chris Ellis - South Western Railway;
- Lynne Milligan - Arriva Trains Wales; and
- Richard Kingdon – East Devon Survey Support.

Thanks also goes to Alice, Mum, Dad, Helen and Richard for their continued encouragement, and always believing that I would finish this project.

Thank you everyone.

Contents

List of Appendices

LIST OF FIGURES

INTRODUCTION

There is a developing pattern in the UK for the allocation of rural housing and employment within new settlements at a strategic land use policy level[15]. The recent Housing White Paper[7] encourages the allocation of new settlements and calls for the simplification of the new settlement planning process, recognising their role in meeting long-term housing need across the country.

Development in rural areas or within the urban periphery however requires significant transport infrastructure to 'bridge' the greenbelt and provide sustainable access to key urban areas for amenity, leisure and employment. Therefore, many rural development opportunities in villages and small towns propose new or improved rail services to meet this need.

This research seeks to contribute to the future integration of land use and transport planning by evaluating the impact of rail provision at new settlements on vehicle ownership levels and levels of vehicle use competition at household level. It seeks to identify the barriers and opportunities for new settlement railway provision influences on this.

The research questions are as follows:

1. To what extent will competition for vehicle use be accepted by new settlement residents, with improved railway service availability?
2. How can railway services at new settlement developments be improved to reduce car dependency?

The fundamental basis of this research is the comparison of baseline and current household vehicle ownership and competition levels at rural and new settlement locations before and after railway services have been implemented. Two study areas, along with representative control areas are considered.

The research goes on to engage with railway users to understand the barriers and opportunities for reduction in vehicle ownership, which is a good indicator of sustained travel behaviour change towards more sustainable modes. [12] [4]

RESEARCH APPROACH

- Establish the academic and industry background to the themes of new settlement development, rural rail provision and development and car ownership;
- Establish baseline levels of household car ownership, car competition and car use;
- Compare baseline and current levels for the study areas, which have seen the introduction of railway services, and control areas which have not; and
- Interrogate reasons for the estimated changes in car ownership and car use through qualitative research.

LITERATURE REVIEW

INTRODUCTION

A 2013 study[12] considers similar issues to this research; examining light-rail impact on vehicle ownership in inner and fringe urban areas. The analysis suggests that improved light-rail services help deliver a decrease in vehicle ownership, or a slower increase in the rate of vehicle ownership, compared to control sites.

This research engages with similar issues for rural new settlements, where vehicle ownership levels are often higher than urban environments, due to the comparative lack of transport alternatives available.[19] [12]

NEW SETTLEMENT PRINCIPLES

Many proposed new settlements are closely aligned with 'garden settlements'. The TCPA[16] outline principles for 'garden cities', which for transport include:

- provision of local jobs within easy commuting distance of homes;
- provision of facilities in walkable neighbourhoods; and
- provision of integrated and accessible transport systems, with walking, cycling and public transport designed to be the most attractive options.

RAILWAY PROVISION AT DEVELOPMENT SITES: OPPORTUNITIES AND CONSTRAINTS

The scope of UK railways decreased over the 20th Century, with many lines shut down, due to decreasing profitability and increasing maintenance cost.[11]

This position seems to have shifted, with recent DfT publications[8] seeking to reopen these railway lines, stating that "rail services have the potential to unlock housing growth…" and "Network Rail is leading important work to release rail-linked land surplus to rail requirements, some of which could facilitate housing development…"[8]. Developments with associated railway services are therefore being considered an area for housing growth, with disused/underused railways opening up redevelopment opportunities, providing well connected sites.[7] [10]

Integration of new settlement developments and railway services produces sustainable transport opportunities, meeting the requirements for development included in the National Planning Policy Framework.[8] In rural settings, railways provide sustainable links to amenities in neighbouring cities/towns, boosting regional economic growth. Railway services can be a tool for reducing rural isolation and social exclusion and deliver comprehensive journey time savings, demonstrating the impact of rail links on rural-urban connectivity.[18]

Barriers to the delivery of railway services at new settlements sites include the fundamental requirement to allocate development on existing railway lines (operational or otherwise) or make available sufficient financial capital to support the creation of new infrastructure.[18] Constraints to this process include the fact that many disused railway lines have been converted into active travel routes.[10]

CAR OWNERSHIP BEHAVIOURS AND PATTERNS

The determinants of car ownership at a household level include:[13][3][4]

- Demographic characteristics (e.g. household composition);
- Socio-economic characteristics, (e.g. household income); and
- Transport characteristics (e.g. availability of alternative modes).

The propensity for car ownership is high when commute times are long, but low when the cost of that commute by private vehicle is high[1] compared to alternative modes of transport, due to costs for operation, maintenance and parking. Car ownership amongst English households is more sensitive to income reductions than to income increases.[4]

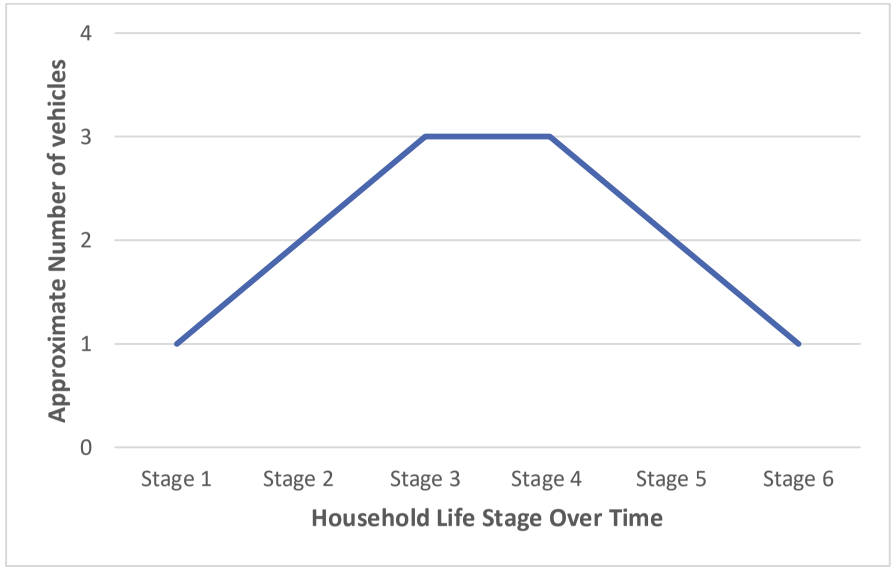
The propensity for change in household vehicle availability is influenced by the number of vehicles currently available, e.g. a single vehicle household is unlikely to reduce to a no-vehicle household if that vehicle is in use.

Clark, Chatterjee and Melia (2016)[4] provide a conceptual model for explaining the levels of household car availability. This follows a series of 'turning points', (e.g. transition of life stage) which provide the opportunity for behaviour change, with several factors affecting the outcome:

- personal history (e.g. experience using transport mode);
- intrinsic motivation (e.g. saving money, improving health); and
- environmental factors.

Furthermore Clark (2012)[5] sets out a framework for change in level of car ownership over household lifecycle. This has been adapted in **Figure 1**.

Figure 1: Household Car Ownership Model



Source: adapted from Clark (2012)

- Stage 1: Single/cohabiting young adults
- Stage 2: Cohabiting adults with/without children
- Stage 3: Families with children of driving age, or with leisure cars
- Stage 4: Families with children leaving home
- Stage 5: Cohabiting older adult, moving into retirement
- Stage 6: Older adults relinquishing cars, due to health or income constraints

Barriers to Railway Use

Blainey, Hickford, and Preston (2012)[2] have collated barriers to railway use which include:

- Perceived cost implications – despite evidence suggesting that rail travel is not necessarily more expensive than alternatives;[2]
- Journey times – rail can have higher end-to-end journey times than private cars, and cars are perceived to offer more control over journey time reliability;[14]
- Structural Car Dependence – up to 15% of journeys, especially in rural areas, have no suitable alternative to the private car, which indicates latent mode share change availability through the provision of rural rail services; [22][17] and;
- Land Use Patterns – the construction of dispersed settlement land use, particularly in rural areas, has encouraged the use of the private vehicle.[2] Rural developments often have abundant car parking which give priority to vehicles and not to sustainable or active travel. [6]

Research Methodology

Study and Control Areas

A review of new settlement sites has been conducted, but revealed few examples of occupied sites which have associated railway infrastructure. After consideration of options, the following have been identified as suitable 'study areas' for this research:

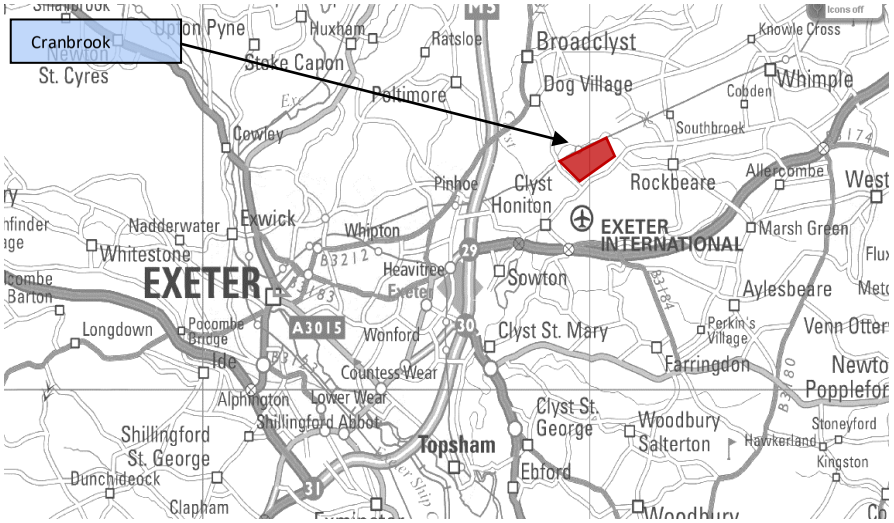
- **Cranbrook, East Devon** –an occupied new settlement with a new railway station opened in 2015**.** Cranbrook's location is shown in **Figure 2.**
- **Ebbw Vale, Blaenau Gwent** – an existing settlement in a rural location. A new station (Ebbw Vale Town) opened in 2015. This has been included as it is representative of a new settlement railway service, as the previous terminus was Ebbw Vale Parkway, some distance from the town centre. The location of Ebbw Vale is shown in **Figure 3.**

Photographs from Cranbrook and Ebbw Vale are included in **Figure 4** and **Figure 5.**

Control sites have been identified to isolate the effects of railway provision at the study areas, and to help correct for other influences which may affect car ownership.[12]

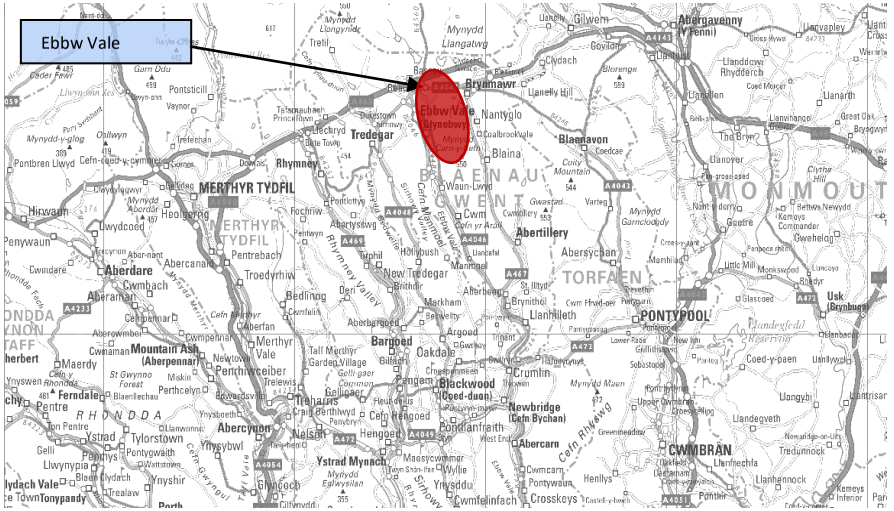
- **Ottery St Mary, East Devon** – 10km to the east of Cranbrook; and
- **Rhymney, Caerphilly** – two valleys to the west (6km) of Ebbw Vale.

Figure 2: Location of Cranbrook



Source: Streetmap (2017)

Figure 3: Location of Ebbw Vale

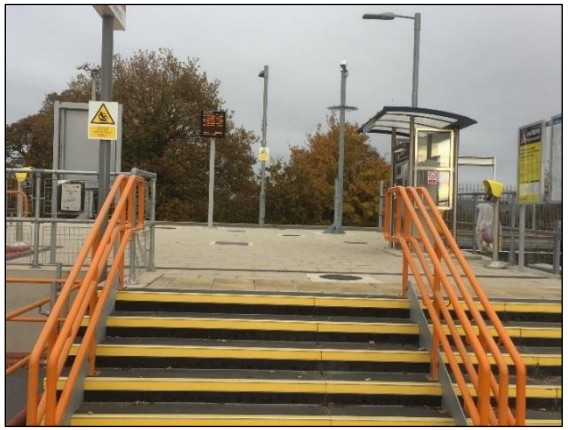


Source: Streetmap (2017)

Figure 4: Photographs: Cranbrook and Cranbrook Railway Station







Source: Author (2017)

Figure 5: Photographs: Ebbw Vale and Ebbw Vale Town Railway Station

Source: Author (2017)

Baseline Car Ownership Levels

Baseline 'pre-railway service' levels of household vehicle availability have been determined from 2011 census 'household composition by car or van availability' data. Output Areas (OAs) have been used for the analysis were possible, as these are the smallest geographies available.

OAs which most closely represent the average vehicle ownership level for the whole area have been selected. For the control areas OAs which represent the study area built up area's average vehicle ownership levels have been used.

A challenge with this approach is obtaining suitable baseline data for Cranbrook, as it was not developed at the time of the 2011 census. A sample of other 2011 census OAs have been used to represent Cranbrook, selected based on the following criteria:

- Occupied by the 2011 census;
- Development site occupies most of a 2011 Census OA;
- A relatively new development in 2011, to capture similar demographics and income; and
- Within 20km of Cranbrook, to ensure capture of any geographic variables.

The following sites have since been identified to represent Cranbrook for baseline purposes:

- Claremont Fields – Ottery St Mary;
- Woodhill View Estate – Honiton; and
- Old Elm Road Estate – Honiton.

The OAs used for each of the study and control areas are shown in **Appendix A.** The full data for each has been included in **Appendix B.**

Current Car Ownership Levels

An indication of current household vehicle availability has been established using an on-site survey of parked vehicles at each of the study and control sites. These were conducted during a weekend pre-AM/post-PM peak hour period so the survey provided results as close as possible to real levels. The survey was carried out in the OAs used to obtain 2011 Census vehicle availability levels to provide direct comparison. The number of households was also surveyed, so that the current vehicle availability per dwelling could be estimated. The full results of the survey are presented in **Appendix C.**

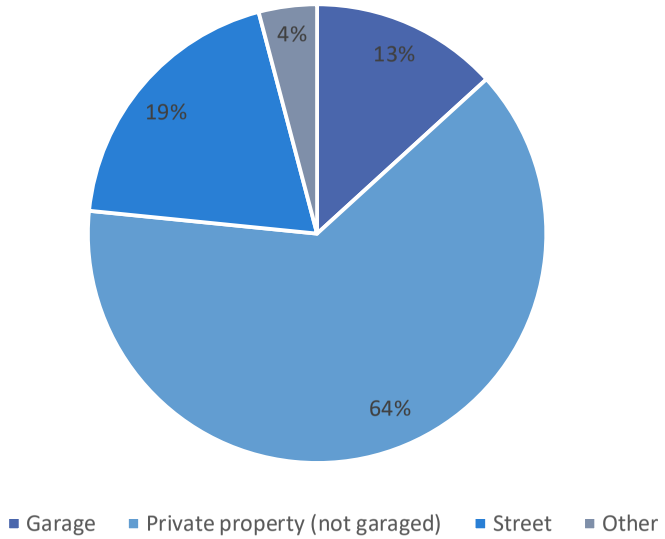
The on-site surveys of vehicles in the four locations were carried out at the times and dates shown below.

Site	**AM Survey**	**PM Survey**
Cranbrook	18/11/17 08:00-11:00	17/11/17 20:00-22:00
Ebbw Vale	26/11/17 08:00-11:00	24/11/17 18:30-20:30
Ottery St Mary	19/11/17 08:00-11:00	18/11/17 20:00–22:00
Rhymney	25/11/17 08:30-11:00	25/11/17 19:00-20:46

Additional analysis was undertaken to try to take account of any locally-owned vehicles which were not observed during these survey times. Adjustments have been made to the collected data accordingly.

The National Travel Survey (NTS) provides information on the overnight parking location of vehicles, summarised in **Figure 6.** For the purposes of this research, we have assumed that the 17% of available vehicles were parked in either garages (13%) or in 'other locations' (4%) and therefore not picked up by the vehicle counts.

Figure 6: Overnight Vehicle Parking location (rural town and urban fringe)



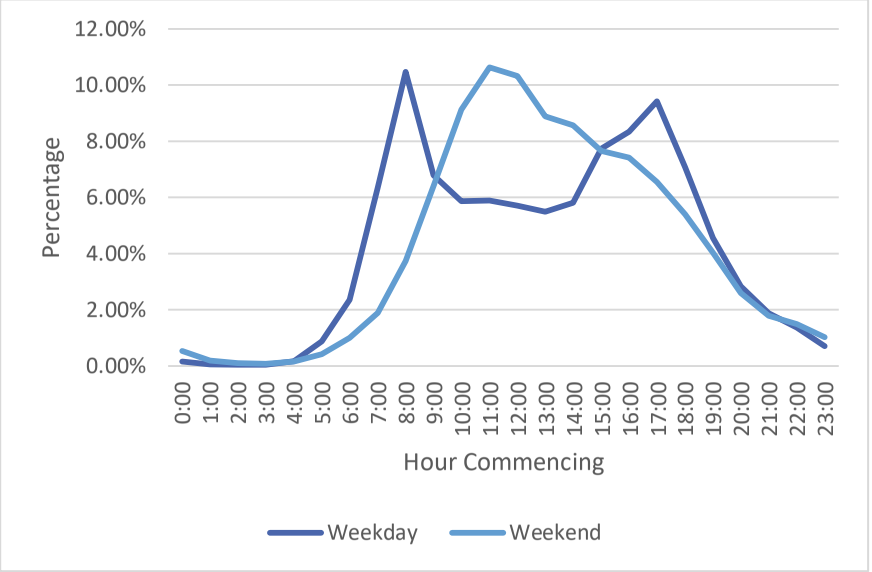
Source: NTS (2015).

Further account has been made for vehicles not surveyed due to being in use at the time of the survey. NTS 'trips in progress by time of day and day of week' data has been used to determine the proportion of car trips in progress at the time of the surveys (08:00-11:00 and 18:00-22:00). This is shown in **Figure 7.**
The relevant NTS data is provided in **Appendix D.**

The proportion of vehicle trips assumed to not be surveyed is as follows, based on the average proportion of trips in progress though the survey hours.

- Weekday PM average 4.09%
- Weekend AM and PM average 4.73%

Figure 7: Proportion of car trips in progress by time of day



Source: NTS (2015).

Rail User Questionnaire

Questionnaire interviews have been conducted with rail users on the following services and at the following times:

- Honiton and Pinhoe (travelling through Cranbrook) – 15:00-18:00 17/11/17; and
- Newbridge and Ebbw Vale Town – 15:00-18:00 24/11/17.

The survey started in the rear car of the train and each passenger was approached and asked if they would be willing to take part in the survey. All responses have been included in this study to ensure necessary volume of responses. Some responses are therefore not from local residents.

Participants were asked initial questions to determine the level of vehicle ownership and vehicle competition within their households, with subsequent questions chosen to match these levels.

The survey included questions relating to:

- Number of vehicle available;
- Number of licence holders in household;
- Reasons for the number of vehicles available;
- Alternative modes of travel used; and
- Factors influencing their car use.

Respondents in households with 'no vehicles', or households which compete for vehicle use (i.e. vehicles available < licence holders) were asked how a reduction in railway service provision would affect their household vehicle ownership level. Respondents from 'vehicle competition' and 'vehicles for all' households were asked how an increase in railway provision would impact their vehicle ownership level.

The questionnaire and detailed results from the survey are included in **Appendix E.**

Limitations and Constraints of the Methodology

There are some inherent and unavoidable limitations of the method described, which should be borne in mind when considering the results. These are summarised as follows:

- Overcoming absence of Cranbrook baseline data – mitigation approached described above.
- Logistical constraints, including limited access to a vehicle, which has influenced the selection of study and control areas;
- Only being able to use a single surveyor has limited the reliability of the data collected - ideally data would have been collected over wider areas with smaller intervals (e.g. 15-min);
- There has not been any opportunity to pilot the research methodology prior to implementation, and therefore some minor errors have had to be overcome during the data collection process; and
- Surveying only rail users (rather than undertaking a full household survey) will have resulted in a biased sample – the attitudes and behaviours reported here are therefore those of 'rail users', rather than all residents.

Results, Analysis and Discussion

Change in Study Area Vehicle Availability

Figure 8 suggests that household vehicle availability at Cranbrook has increased by 16.7%, (≈2.8% per annum on average) between 2011 and 2017.

Figure 9 demonstrates that all the OAs considered in Ebbw Vale have seen a decrease in vehicle ownership per household. The average for all OAs shows a 13.0% decrease in vehicle ownership per household between 2011 and 2017 (≈2.2% decrease per annum).

Figure 8: Estimated change in vehicle ownership per household - Cranbrook

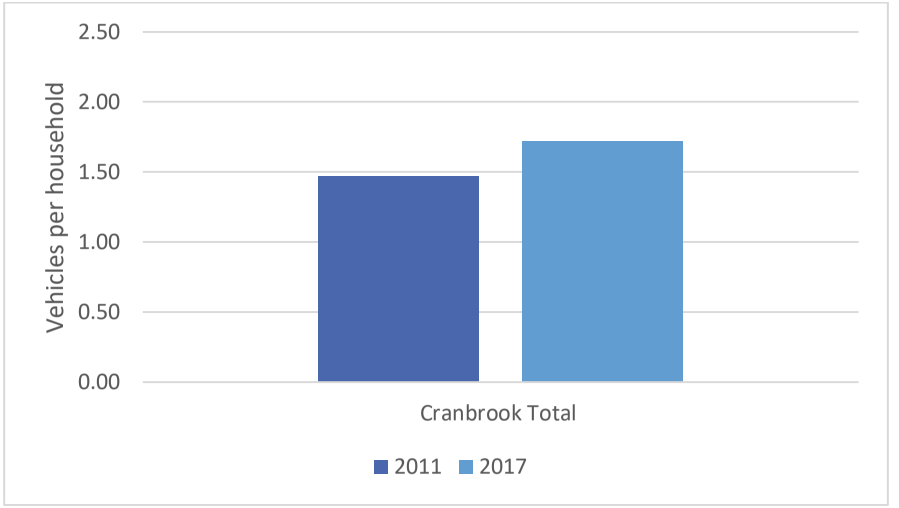
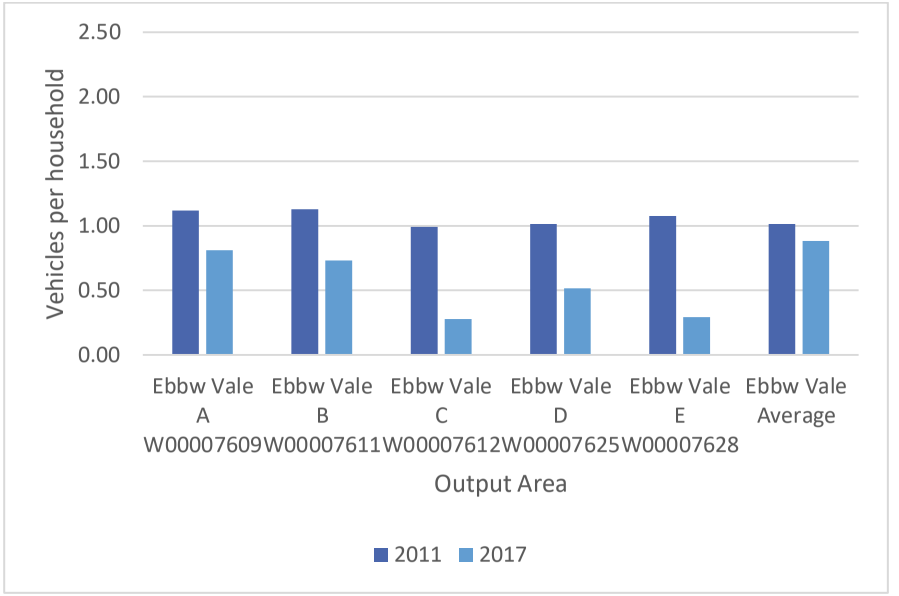


Figure 9: Estimated change in vehicle ownership per household – Ebbw Vale



Comparison of Study and Control Areas

Figure 10 shows the estimated change in average vehicles available per household for Ottery St Mary. Output Area A has seen an increase of 13.4% (+2.2% per annum), whereas Output Area B has seen a decrease of 16.4% (2.7% per annum). The average shows a 1.0% decrease in vehicle ownership per household (≈0.16% decrease per annum).

Figure 11 shows the estimated change in average vehicles available per household for Rhymney. All OAs considered have seen an increase in vehicle availability per household, with the average showing 28.8% increase (≈4.8% per annum).

Figure 12 and **Figure 13** compare vehicle availability per household for the study areas with the corresponding control areas for East Devon and Blaenau Gwent.

Figure 10: Estimated change in vehicle ownership per household – Ottery

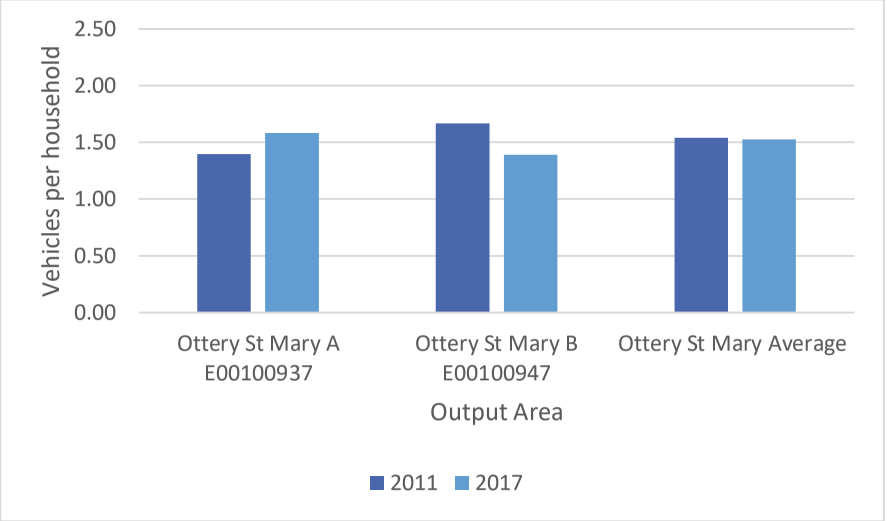


Figure 11: Estimated change in vehicle ownership per household – Rhymney

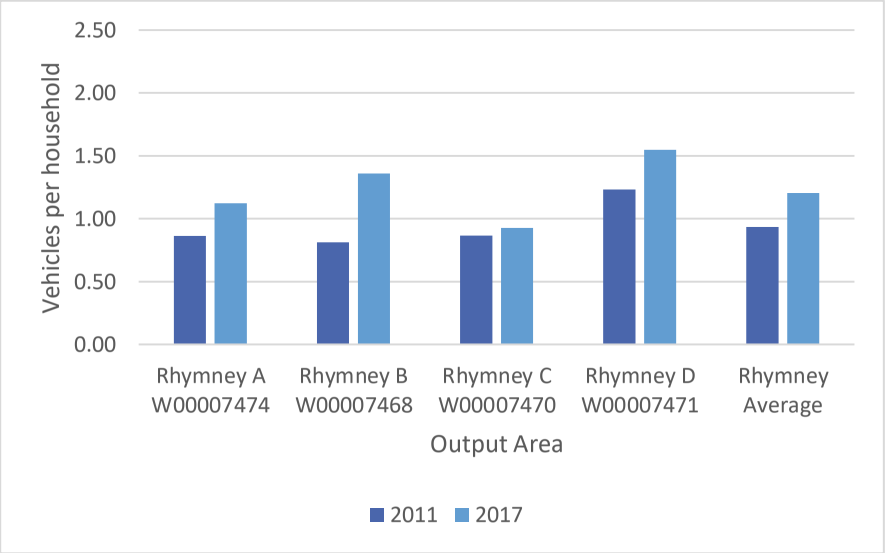


Figure 12: Comparison of study and control areas – East Devon

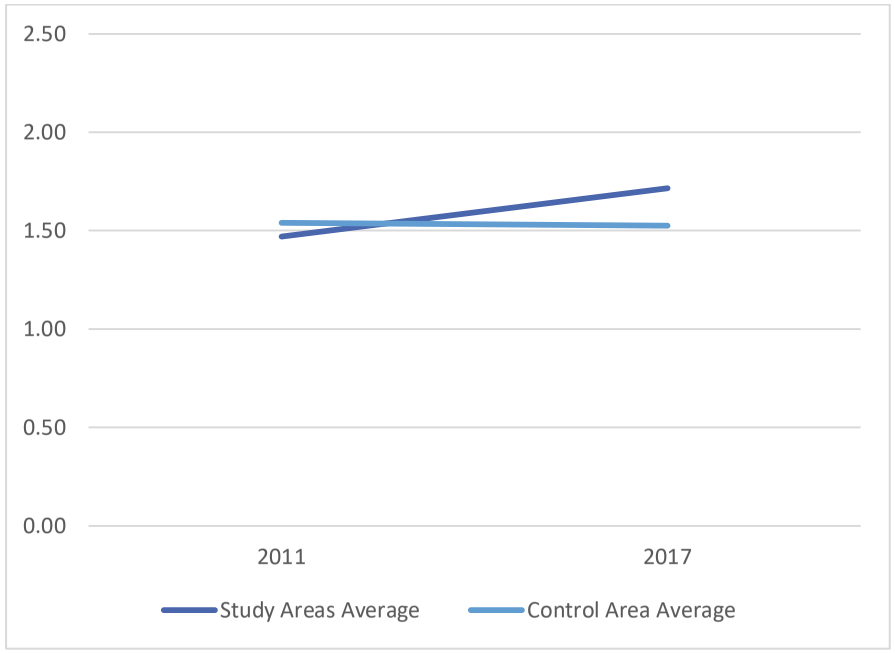
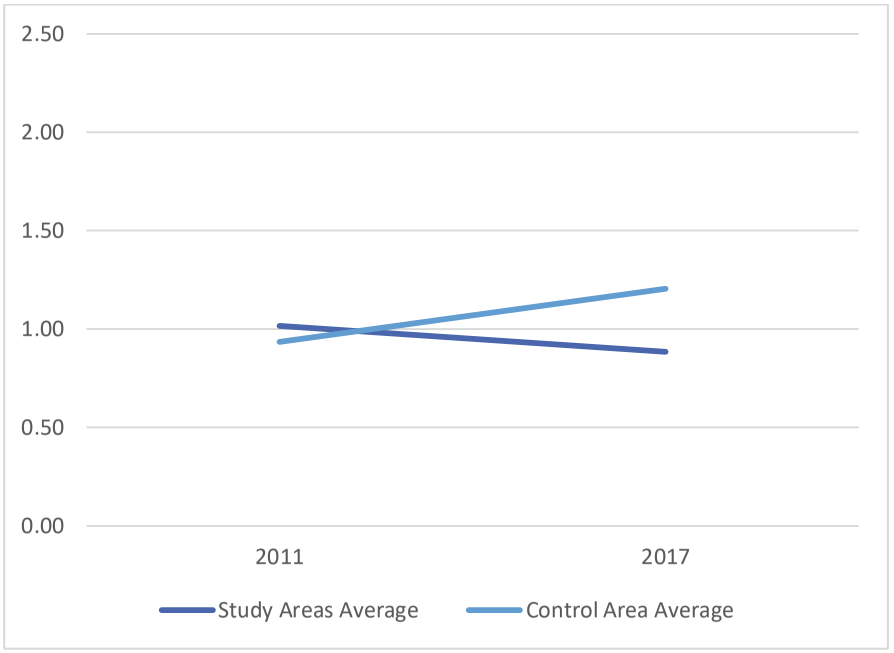


Figure 13: Comparison of study and control areas – Blaenau Gwent



Railway User Survey Results

There were 46 responses to the railway user survey across both locations:

- 16 (35%) completed between Honiton and Pinhoe; and
- 30 (65%) completed between Newbridge and Ebbw Vale Town.

The railway services were very different in nature between these locations. For example, the East Devon service provides strategic connections between Exeter and the South West with London Waterloo, whereas the Ebbw Vale Line is a local service operating trips to Cardiff down Ebbw Vale valley.

A summary of respondent's household vehicle availability is as follows:

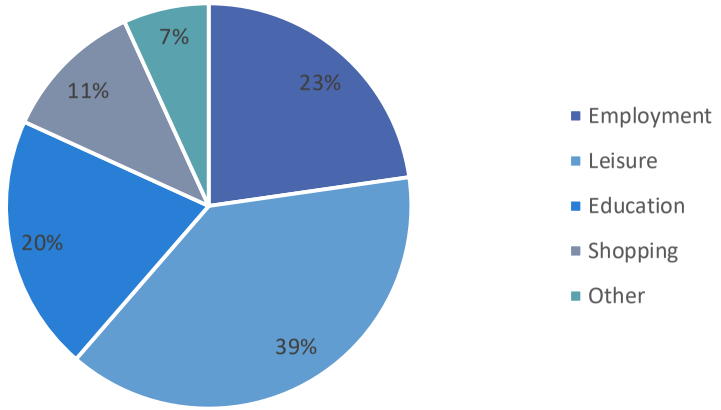
- 66% of households had 'vehicles for all', defined as having at least as many vehicles as licence holders;
- 21% of households had 'vehicle competition' defined as having less vehicles than licence holders; and
- 13% of households had 'no vehicles'.

Journey Purpose

Figure 14 summarises the purpose of the rail journey being made during the survey interview and shows that leisure was the most common journey purpose (39%), followed by 'employment' and 'education'.

The survey did not distinguish between journeys 'to/from place of work' or journeys 'in-work'. As the surveys were completed over the Friday PM peak hour it is assumed that any 'employment' trips are associated with journeys to/from work.

Figure 14: Rail Survey Respondent Journey Purpose



Car Ownership and Competition Decisions

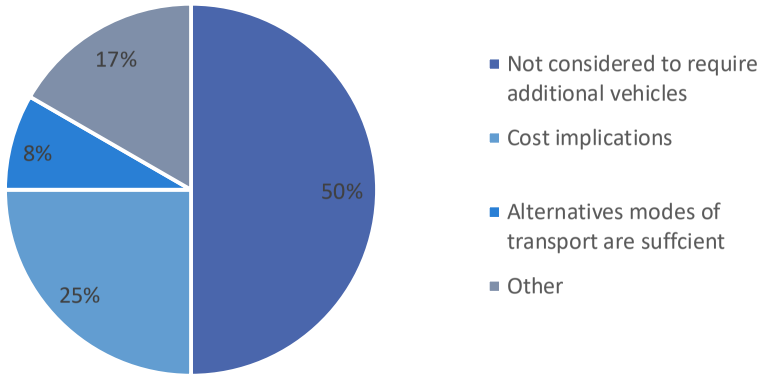
Respondents were asked:

- 'no vehicle' - why are there currently no cars/vans available to your household?
- 'vehicle competition' - why do you/your household not have more car/vans available?
- 'vehicles for all' - Why do you need a cars/van for each licence holder in your household?

For 'no vehicle' households, the main responses were:

- Consider them to be too expense/unaffordable (33%);
- Banned from driving (33%);
- Not able to drive (17%); and
- Other (17%)

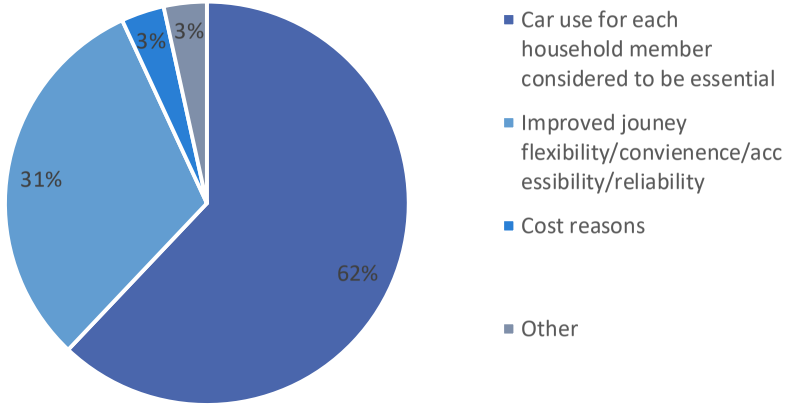
Figure 15: Why does your household not have more car/vans available?



Responses for 'vehicle competition' and 'vehicles for all' are presented in **Figures 15** and **16** respectively**.**

'Vehicle competition' households were asked how the decision over use of a vehicle is made. Most respondents cited work-related reasons as the primary consideration for vehicle use, followed by childcare, then household seniority.

Figure 16: Why do you need a vehicle per licence holder in your household?



Notional Changes in Railway Service Availability

Respondents from 'no vehicle' and 'vehicle competition' households were asked how a notional reduction in rail service availability would influence their household's level of car ownership. Their responses are shown in **Figures 17** and **18** respectively.

Respondents from 'vehicle competition' and 'vehicles for all' households were asked how a notional increase in rail service availability would influence their household's level of car ownership.

100% of respondents from 'competition' and the majority (87%) of respondents from 'vehicles for all' households indicated that such change would not make a difference to their level of household vehicle ownership. 14% of 'vehicles for all households' would consider discarding a vehicle.

Some respondents indicated that a change would depend of the quality and appropriateness of rail services available, e.g. linking up with their place of work.

Figure 17: Reduction in railway service accessibility impact (no vehicle households)

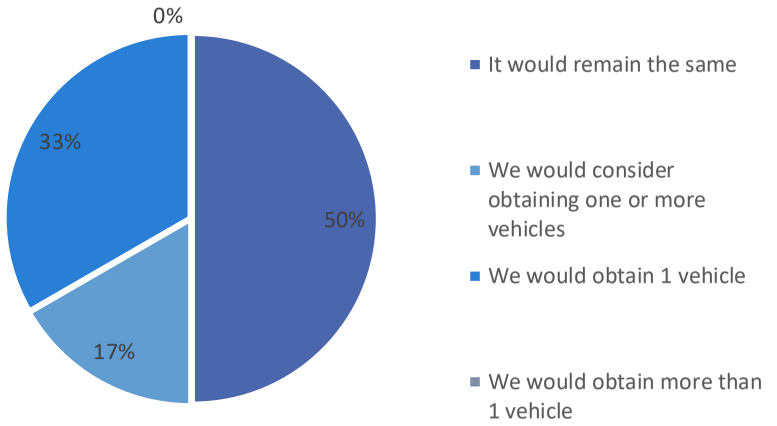
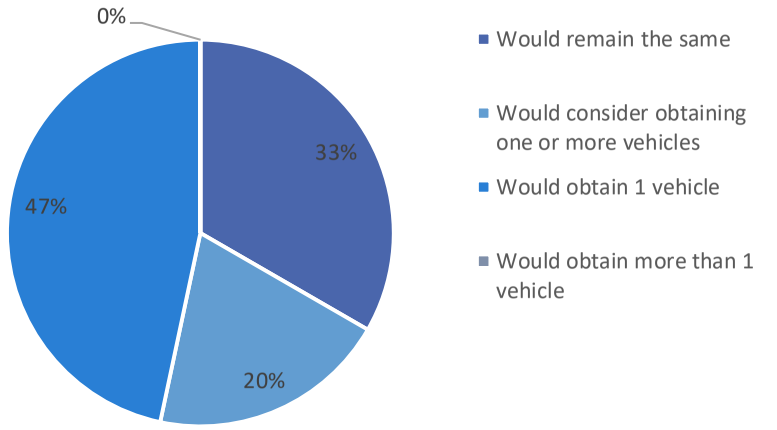


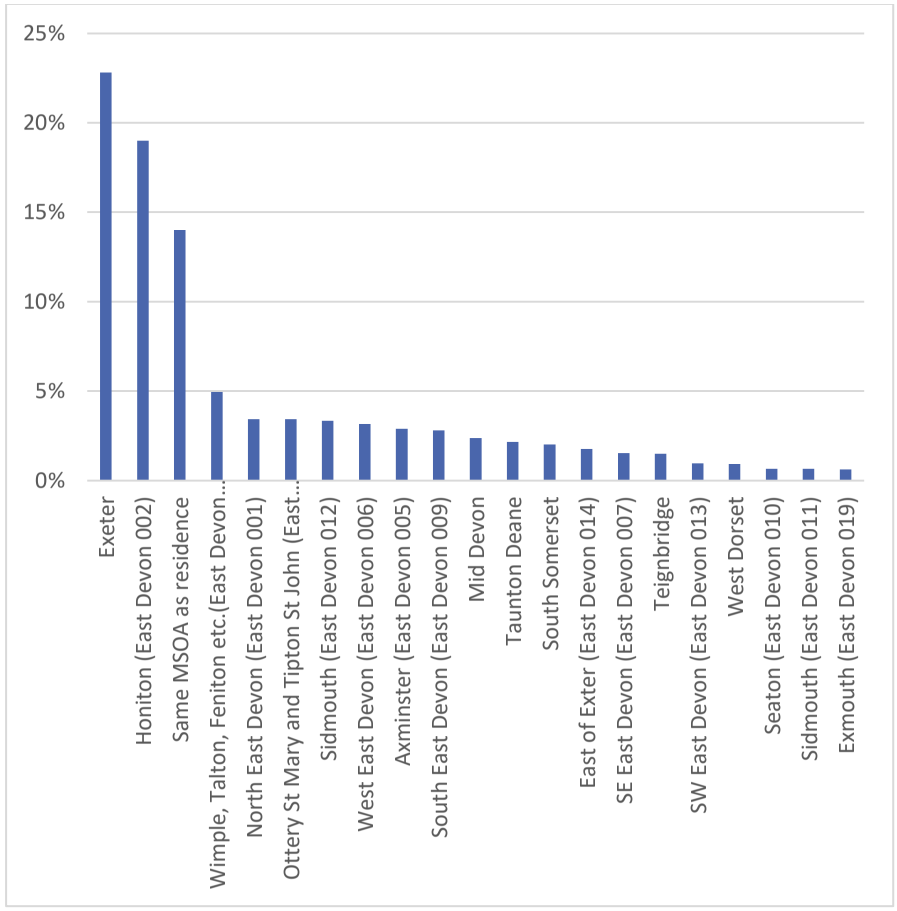
Figure 18: Reduction in railway service accessibility impact (vehicle competition households)



2011 Census Method of Travel and Place of Work

2011 census 'place of work' data has been obtained for the MSOA layers containing Ebbw Vale and the Cranbrook sample area OAs. MSOA level is the smallest available from the 2011 Census for this dataset. Places of work are shown in **Figure 19** and **Figure 20.**

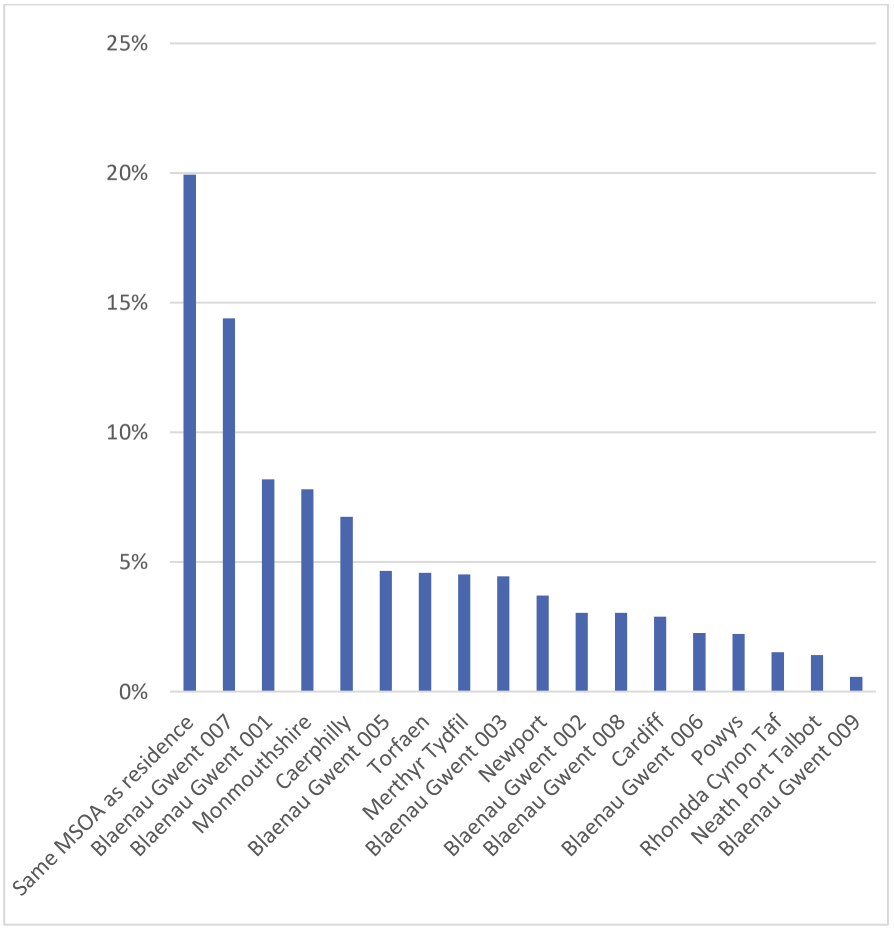
Figure 19: 2011 Census Place of Work (residence East Devon 003)



Source: Nomis (2017)

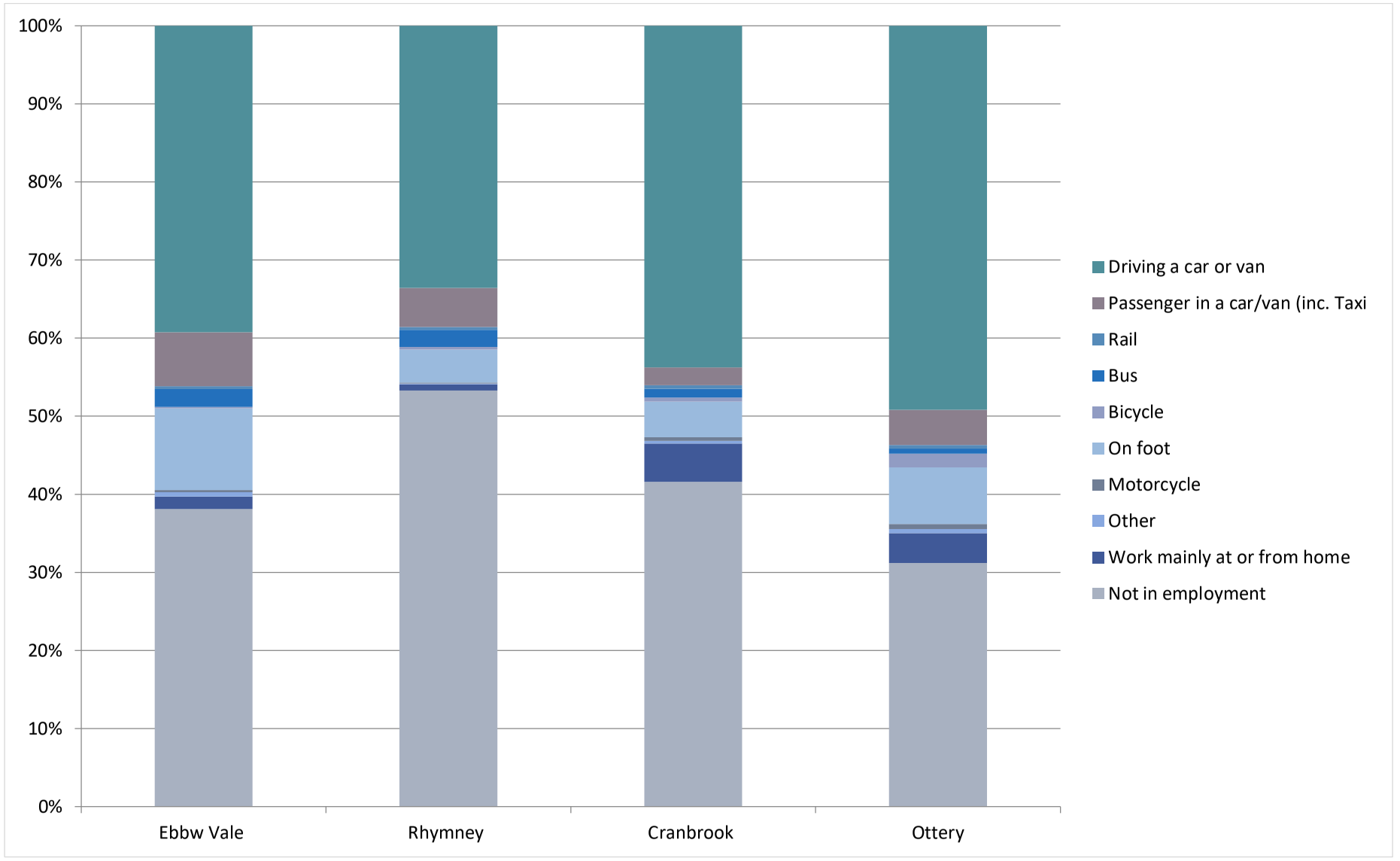
The OA average journey to work mode share for each of the areas under consideration is shown in **Figure 21.**

Figure 20: 2011 Census Place of Work (residence Blaenau Gwent)



Source: Nomis (2017)

Figure 21: 2011 Census Method of Travel to Work



Source: Nomis (2017)

Further Analysis

Effect of Railway Services

Household vehicle ownership at Cranbrook (**Figure 8**) has increased by 2.8% per annum, compared a 1.0% decrease estimated at Ottery St Mary. The evidence from Cranbrook therefore suggests that the introduction of a railway station at new settlements does not decrease the availability of vehicles. However, as on-site baseline vehicle availability could not be established for Cranbrook, these results do not necessarily prove this. A suitable baseline reference would need to be established at the site for this result to be confirmed.

On the other hand, Ebbw Vale has seen a 2.2% per annum decrease in household vehicle availability (**Figure 9**), compared to a 4.8% per annum increase estimated at Rhymney, which indicates that the increase in railway service availability could be reducing car ownership in this location.

As the results for Ebbw Vale are based on data directly from the area, this is considered to be the stronger of the two results, which would support a conclusion that rail service availability does reduce household vehicle ownership.

A decrease in household vehicle availability by 2.2% per annum compared to a the assumed (as per the control) trajectory of 4.8% per annum increase without railway service introduction shows considerable impact of Ebbw Vale Town railway station and demonstrates that rail services can reduce household vehicle ownership, as opposed to just slowing the rate of increase.

However, the conflicting patterns identified suggest that further data collection at additional sites would be required to support a robust conclusion.

Notional Changes in Rail Service Availability

The data collected shows that levels of household vehicle availability are responsive to a reduction in rail availability, whereas they are not responsive to increases in railway service availability.

When presented with a notional reduction in their availability to railway services, nearly half of 'no vehicle' and 'vehicle competition' households indicated that they would definitely increase their vehicle ownership by at least one vehicle, and a further 20% would consider increasing their vehicle availability.

The removal of existing rail provision would therefore significantly increase car ownership in rural areas and new settlements. This underlines the importance of ensuring the long-term passenger demand and financial viability of any rail service when planning a new settlement, so as to avoid significant vehicle ownership increase and corresponding vehicle trip generation.

The railway user survey indicated that 100% of 'vehicle competition' and the majority of 'vehicles for all' households would not change their current level of vehicle ownership given an increase in their availability to railway services. Only 14% of 'vehicles for all' households would consider decreasing vehicle ownership. This equates to around 9% of all households surveyed. Railway service provision will therefore only cause consideration for a reduction in vehicle ownership at households which do not already complete for car use.

Some respondents to the survey indicated that this decision would depend on a number of factors, including the quality of railway service provided (e.g. frequency of service) but also external factors (e.g. place of work). Therefore, when planning new settlement developments consideration should be made for these external factors and how railway services could maximise potential for reduced household vehicle availability.

The results demonstrate that increased rail service availability would do little to decrease car ownership levels, and corresponding vehicle trip generation, without careful consideration for the quality of that provision at the planning stages. However, there is likely to be some propensity for increased household vehicle competition if these are addressed appropriately.

Journey Purpose Implications Journey to Work Implications

Figure 14 shows that 'leisure' is the most common journey purpose (39%), followed by 'employment' (23%) on the rail services surveyed. For the purposes of this analysis, 'employment' has been determined to mean 'journeys to/from place of work'.

Examination of the journey purposes of respondents from households which would increase vehicle availability given a notional reduction in railway service availability reveals that 25% were commuting, with the remainder (75%) relating to non-employment purposes (e.g. leisure, shopping or to/from education). Commuting via railway in these locations is therefore less prevalent, and therefore a reduction in railway provision would have a greater impact on non-work journeys

'Vehicles for all' households were asked why their household had at least one vehicle per driving licence holder. 62% said it was because they considered vehicles to be essential for work. 'Vehicle competition' households have also indicated that the main factor influencing vehicle use decision was journey purpose, with travel to/from their normal place of work as the priority for the majority of households. 2011 census 'method of travel to work' data supports this, showing that on average (across all four sites under consideration) 41% used a private vehicle to travel to/from (**Figure 21)**.

It is therefore apparent that private vehicles are the preferred mode of travel for work related trips in these areas, which may explain why a large proportion of railway journey purpose responses were given as non-employment related. Therefore when planning new settlement railway services, there should be a focus on providing services which serve leisure, education and shopping trips, as well as journeys to/from work, as all these journey purposes are equally important in maximising the potential for a reduction in household vehicle ownership through the correct provision of railway services which meet the needs of residents.

Method of Travel to Work

Examination of 'place of work' data for the study areas (shown in **Figure 19** and **Figure 20)** reveals that up to half of workplace locations could have the potential to be reached using railway services. For both Cranbrook and Ebbw Vale, the main employment locations would be accessible by railway.

- Cranbrook: Exeter = 23%
- Cranbrook: Honiton = 19%
- Ebbw Vale: Ebbw Vale Valley Line locations = approximately 20%

Therefore, at least 42% of commutes to/from Cranbrook and 20% to/ from Ebbw Vale could be completed using railway services, although in practice, this would be unrealistic due to the inherent inability for rail to deliver direct origin-destination journeys[22]. However, further examination of 2011 census 'method of travel to work' data (**Figure 21)** demonstrates that on average only 0.4% of commutes were completed using railway services in these areas. Although this is likely to have increased since the introduction of railway services, the average for the control areas at Ottery St Mary and Rhymney show similar levels of rail use.

There is therefore be a disparity between the potential for work-related train journeys in these areas (maximum 20-40%) and the 2011 method of travel to work (0.4%) mode share. This suggests that there are some barriers to rail use for commuting purposes currently, and therefore services will need to be planned to ensure that they provide suitable commuting opportunities which overcomes these barriers, in addition to the more prevalent use for non-work purposes.

Conclusions

Study Findings

The data collected for this study has shown that at Cranbrook, household vehicle ownership has increased by 2.8% per annum, despite the development of a railway station with the new settlement, whereas at Ebbw Vale there has been a decrease by 2.2% per annum with the introduction of a more accessible service in an existing rural settlement. Ebbw Vale has seen this decrease against the backdrop of a control site which has increased household vehicle availability by 4.8% per annum.

The conflicting pattern between the two sites suggests that this research does not provide a definitive answer to the question of whether new/improved rail services can reduce vehicle ownership.

Whilst the results for Ebbw Vale are considered to be more valid, being based entirely on area-specific data, more analysis of other sites across the UK would be needed to draw a definitive conclusion.

This study has demonstrated that household vehicle availability at new settlement locations could be responsive to reductions in the availability of rail services, but less sensitive to increases in availability. Therefore, the removal or failure to secure long-term viability of railway services when planning new settlement developments will result in significant increase in car ownership and corresponding trip generation.

However, results indicate that approximately 9% of vehicles for all households would consider reducing vehicle ownership and possibly increasing vehicle competition if railway provision availability increased. This would be highly dependent on the quality of the service provided relative to each household.

Planning should therefore consider what service is being provided, and that it meets the needs of residents. This includes taking into consideration journey purposes of possible railway users.

This study has demonstrated that the majority of railway journeys are completed for leisure purposes and that private vehicles are preferred for work-related purposes. This may be due to the perceived reliability of private vehicles.[2] Rail services at new settlements should therefore consider the implications of the rail service for leisure, shopping and education trips, not just access to employment.

Having said this, access to employment is also important for consideration. There is a disparity between the proportion of commutes using railway services compared to the estimated potential at these locations. There is therefore potential for increased railway mode share for commuting, if the barriers which appear to be suppressing this railway use can be identified and overcome. Additional data gathering would be required to identify and fully understand these barriers.

New settlement rail services should therefore cater for leisure trips, but also plan and provide suitable connections to employment centres and seek to indentify ways in which railway services can begin to supersede private vehicles as a main method of travel to/from work.

Areas for Further Research

The following have been identified as possible lines of enquiry for future research:

- Validation of the results of this study using the 2021 census. This will provide more comprehensive indications of vehicle ownership patterns which can be compared to the 2011 baseline;
- Expansion on the ideas of how rail services can be provided to ensure that the propensity for reduction in household vehicle ownership with

rail service availability is increased from the 8% of the rail users reporting a willing to change their car ownership reported here; and

- Following on from this, analysis into determining reasons why 2011 railway mode share for journeys to/from work was so low, and how future railway services at new settlements can overcome the barriers in place to increase this.

REFERENCES

1. Bhat, C.R., and Guo, J. (2007). A comprehensive analysis of built environment characteristics on household residential choice and auto ownership levels. *Transportation Research Part B: Methodological.* 41 (5) pp. 506-526.
2. Blainey, S., Hickford, A, and Preston, J. (2012) Barriers to Passenger Rail Use: A Review of the Evidence. *Transport Reviews.* 32:6, pp675-696
3. Caulfield, B. and Adhern, A. (2014) The Green Fields of Ireland: the Legacy of Dublin's Housing Boom and the impact on commuting. *Case Studies on Transport Policy*. 2(1) pp 20-27.
4. Clark, B., Chatterjee, K and Melia, S. (2016). Changes in level of household car ownership: the role of life events and spatial context. *Transportation.* 43:566-599.
5. Clark, B. (2012) *Understanding how household car ownership changes over time.* PhD, University of the West of England.
6. Curtis, C., Renne, J.L., & Bertolini, L. (2009). *Transit oriented development—making it happen.* Farnham: Ashgate.
7. Department for Communities and Local Government (2017) *Fixing our broken housing market*. London: The Stationary Office. (Cm 9352).
8. Department for Communities and Local Government (2012) N*ational Planning Policy Framework*. London: The Stationary Office.
9. Department for Transport (2017) *Connecting people: a strategic vision for rail. Moving Britain Ahead.* London: The Stationary Office. (Cm 9519).
10. Ferretti, V. and Gegioanni, A. (2017). How to support the design and evaluation of redevelopment projects for disused railways? A methodological proposal and key lessons learned. *Transportation Research Part D: Transport and the Environment.* 52 (A) pp. 29-48
11. Guerrieri, M., Ticali, D., (2012) Design standards for converting unused railway lines into greenways. *Integrating Sustainability Practices in the Construction Industry*. pg. 654-660.
12. Lee, S., Senior, M. (2013) Do light rail services discourage car ownership and use? Evidence from Census data for four English Cities. *Journal of Transport Studies.* 29, pp. 11-23.
13. McGoldrick, P and Caulfield, B. (2015) Examining the changes in car ownership levels in the Greater Dublin Area between 2006-2011. *Case Studies on Transport Policy* (3) 229-237.
14. Metz, D. (2008). *The limits to travel: How far will you go?* London: Earthscan.
15. Taylor, M (2015) *Garden Villages: Empowering localism to solve the housing crisis.* Policy Exchange.
16. Town and Country Planning Association (2017) *Garden City Principles*. Accessed from: https://www.tcpa.org.uk/garden-city-principles (Accessed 20/12/17)
17. University of Oxford Transport Studies Unit (1995). *Car dependence.* London: RAC Foundation.
18. Urban Transport Group (2017) *The Transformational Benefits of Investing in Regional Rail. Four Case Studies.*
19. White, P. (2009) *Public Transport: Its Planning, Management and Operation.* 5th ed. London: Routledge.

Appendix A – Selected 2011 Census Output Areas

Appendix B – 2011 Census Data

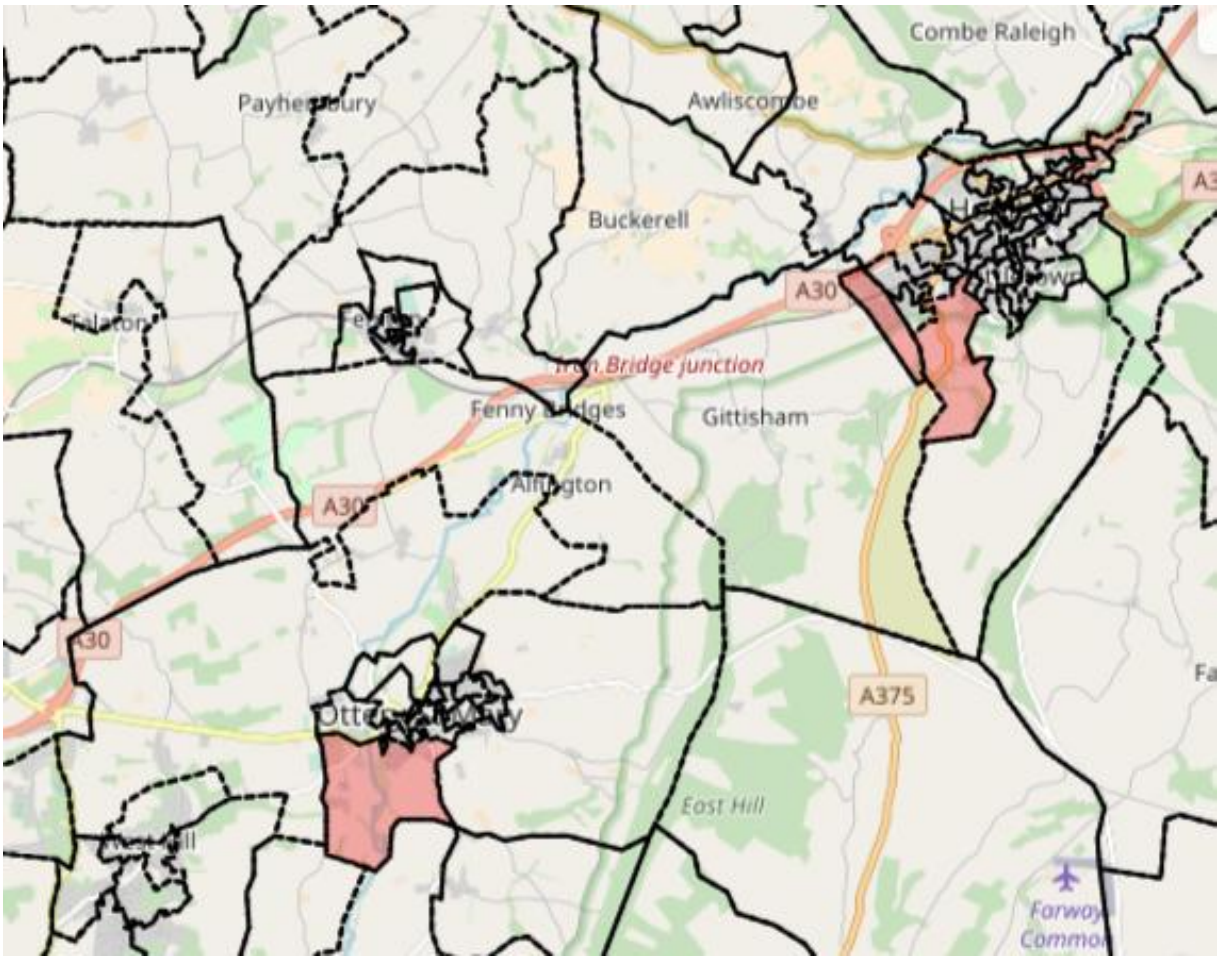
Appendix C – On Site Survey Data

Appendix D – English National Travel Survey Data

Appendix E – Rail User Questionnaire and Results

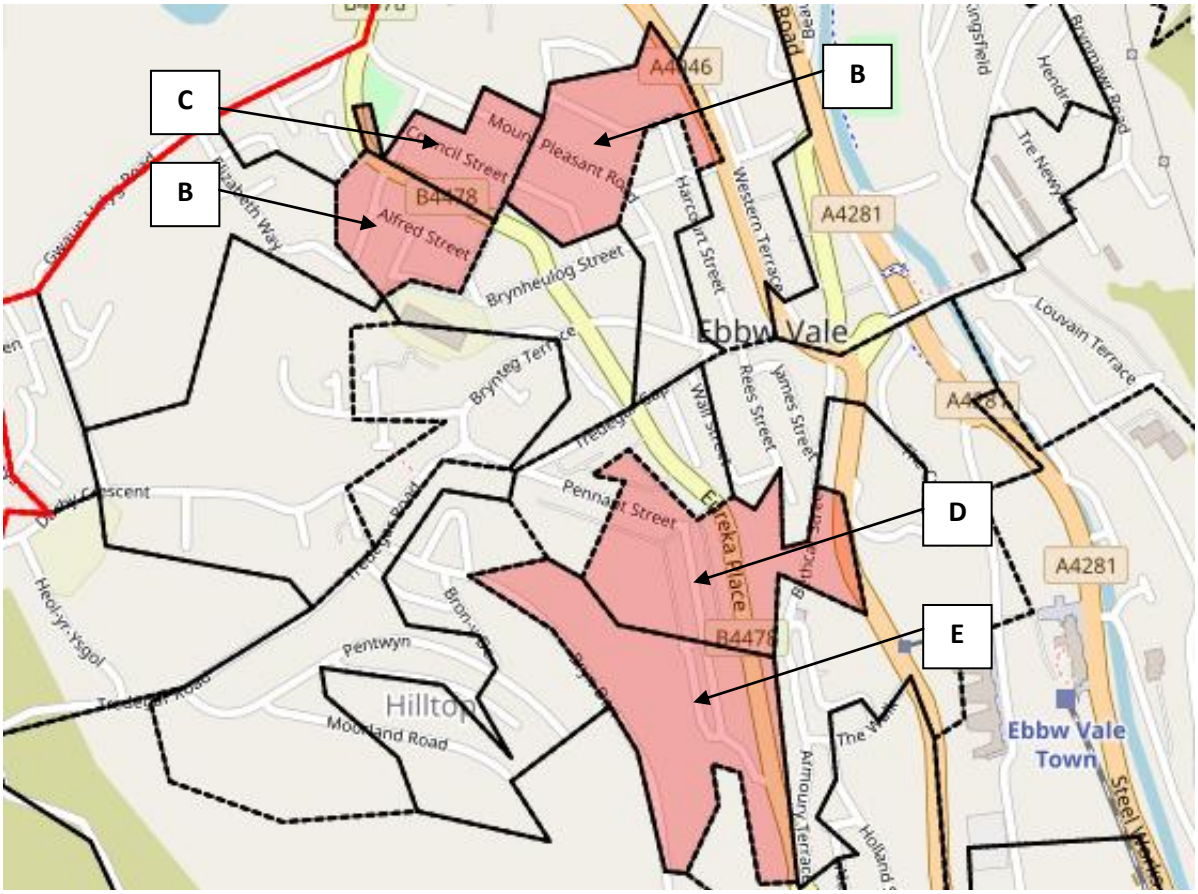
Study and Control Area Output Areas

Cranbrook (sample areas)



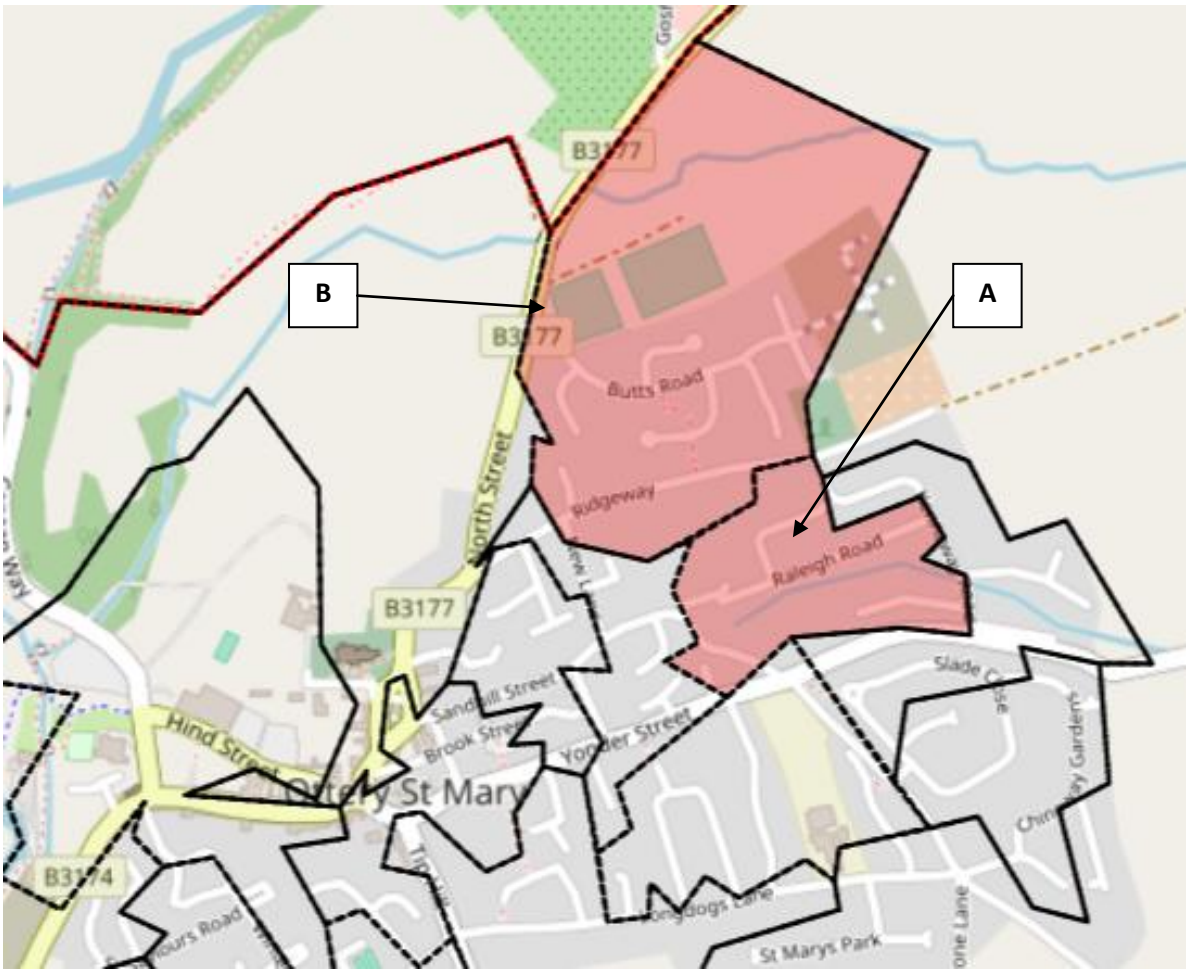
Source: Nomis (2017)

Ebbw Vale



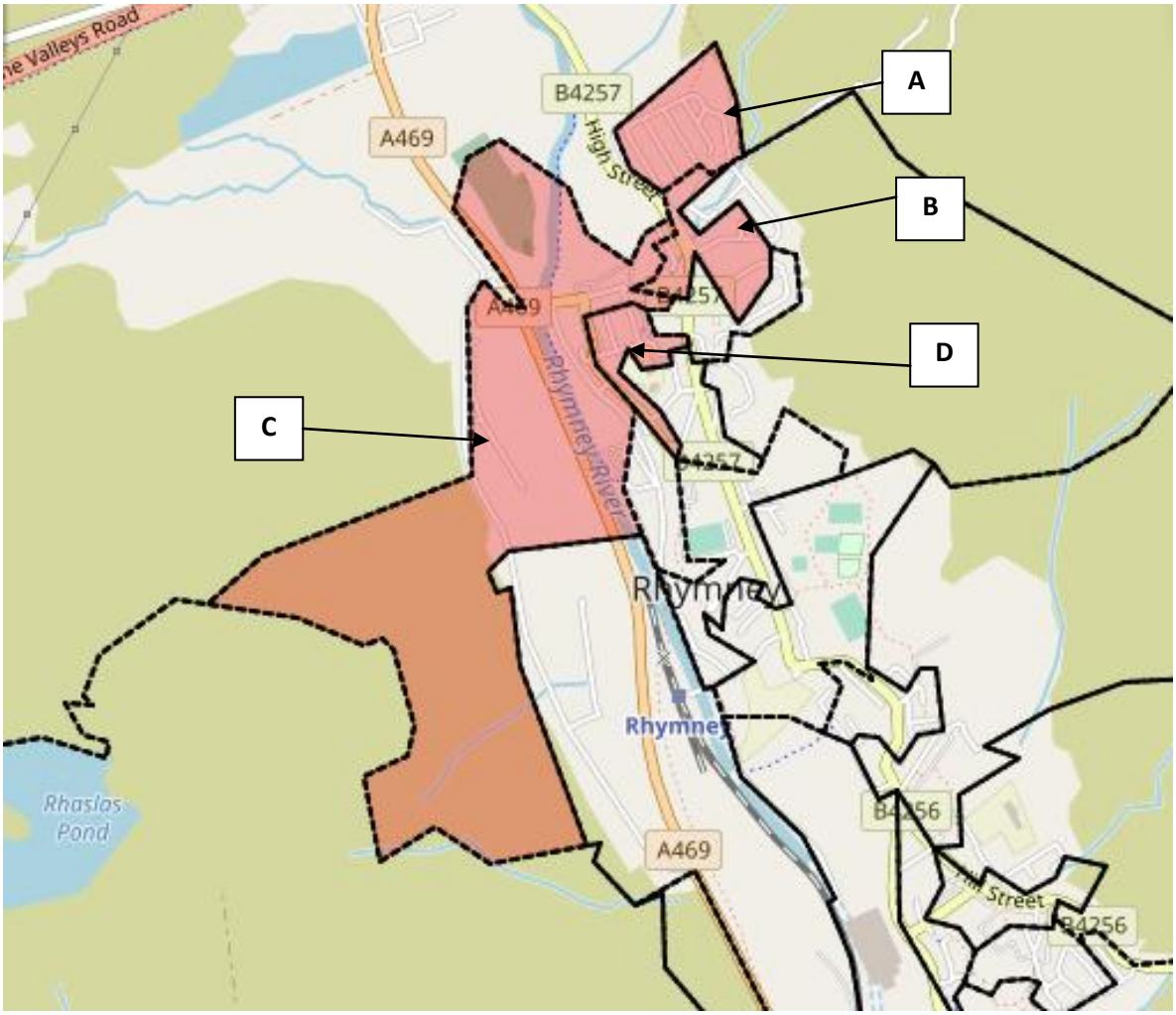
Source: Nomis (2017)

Ottery St Mary



Source: Nomis (2017)

Rhymney



Source: Nomis (2017)

Household Composition by car/van availability - Cranbrook Sample

LC1401EW - Household composition by car or van availability

population	All households
units	Households
date	2011
cars or vans	All categories: Car or van availability

Household Composition	E00100858	E00100878	E00100934
All categories: Household composition	184	130	198
One family only: Married or same-sex civil partnership couple: No children	34	28	28
One family only: Married or same-sex civil partnership couple: Dependent children	9	12	46
One family only: Married or same-sex civil partnership couple: All children non-depender	6	5	16
One family only: Cohabiting couple: No children	3	5	9
One family only: Cohabiting couple: Dependent children	1	1	7
One family only: Cohabiting couple: All children non-dependent	0	0	1
One family only: Lone parent: Dependent children	2	4	13
One family only: Lone parent: All children non-dependent	2	3	2

LC1401EW - Household composition by car or van availability

population	All households
units	Households
date	2011
cars or vans	No cars or vans in household

Household Composition	E00100858	E00100878	E00100934
All categories: Household composition	33	14	9
One family only: Married or same-sex civil partnership couple: No children	0	0	0

One family only: Married or same-sex civil partnership couple: Dependent children	0	0	0
One family only: Married or same-sex civil partnership couple: All children non-depender	0	0	0
One family only: Cohabiting couple: No children	0	1	0
One family only: Cohabiting couple: Dependent children	0	0	0
One family only: Cohabiting couple: All children non-dependent	0	0	0
One family only: Lone parent: Dependent children	0	1	1
One family only: Lone parent: All children non-dependent	0	0	0

LC1401EW - Household composition by car or van availability

population	All households
units	Households
date	2011
cars or vans	1 or more cars or vans in household

Household Composition	**E00100858**	**E00100878**	**E00100934**
All categories: Household composition	151	116	189
One family only: Married or same-sex civil partnership couple: No children	34	28	28
One family only: Married or same-sex civil partnership couple: Dependent children	9	12	46
One family only: Married or same-sex civil partnership couple: All children non-depender	6	5	16
One family only: Cohabiting couple: No children	3	4	9
One family only: Cohabiting couple: Dependent children	1	1	7
One family only: Cohabiting couple: All children non-dependent	0	0	1
One family only: Lone parent: Dependent children	2	3	12
One family only: Lone parent: All children non-dependent	2	3	2

Household Composition by car/van availability - Ebbw Vale

LC4110EW - Car or van availability by household composition

population	All households
units	Households
date	2011
cars or vans	All categories: Car or van availability

Household Composition	W00007609	W00007611	W00007612	W00007625	W00007628
All categories: Household composition	120	126	123	138	117
One person household: Aged 65 and over	17	19	17	13	9
One person household: Other	17	14	17	23	26
One family only: Couple household: No children	13	19	17	23	17
One family only: Couple household: Dependent children	30	26	22	32	23
One family only: Couple household: All children non-dependent	10	13	11	12	9
One family only: Lone parent household	15	17	22	23	19

LC4110EW - Car or van availability by household composition

population	All households
units	Households
date	2011
cars or vans	No cars or vans in household

Household Composition	W00007609	W00007611	W00007612	W00007625	W00007628
All categories: Household composition	29	34	31	35	36
One person household: Aged 65 and over	13	16	11	9	4
One person household: Other	6	5	6	10	15

One family only: Couple household: No children	1	1	1	4	3
One family only: Couple household: Dependent children	1	1	2	6	1
One family only: Couple household: All children non-dependent	1	1	0	0	0
One family only: Lone parent household	4	3	8	5	9

LC4110EW - Car or van availability by household composition

population	All households
units	Households
date	2011
cars or vans	1 car or van in household

Household Composition	**W00007609**	**W00007611**	**W00007612**	**W00007625**	**W00007628**
All categories: Household composition	56	54	68	70	47
One person household: Aged 65 and over	4	3	5	4	5
One person household: Other	11	8	9	11	10
One family only: Couple household: No children	7	11	12	15	10
One family only: Couple household: Dependent children	14	12	15	14	9
One family only: Couple household: All children non-dependent	3	4	4	4	2
One family only: Lone parent household	7	9	12	14	7

LC4110EW - Car or van availability by household composition

population	All households
units	Households
date	2011
cars or vans	2 or more cars or vans in household

Household Composition	**W00007609**	**W00007611**	**W00007612**	**W00007625**	**W00007628**
All categories: Household composition	35	38	24	33	34

One person household: Aged 65 and over	0	0	1	0	0
One person household: Other	0	1	2	2	1
One family only: Couple household: No children	5	7	4	4	4
One family only: Couple household: Dependent children	15	13	5	12	13
One family only: Couple household: All children non-dependent	6	8	7	8	7
One family only: Lone parent household	4	5	2	4	3

Household Composition by car/van availability - Ottery St Mary

LC1401EW - Household composition by car or van availability

population	All households
units	Households
date	2011
area type	2011 output areas
area name	E00100937

Household Composition	All categories: Car or van availability	No cars or vans in household	1 or more cars or vans in household
All categories: Household composition	122	20	102
One family only: Married or same-sex civil partnership couple: No children	15	1	14
One family only: Married or same-sex civil partnership couple: Dependent children	31	0	31
One family only: Married or same-sex civil partnership couple: All children non-depender	4	1	3
One family only: Cohabiting couple: No children	4	0	4
One family only: Cohabiting couple: Dependent children	2	0	2
One family only: Cohabiting couple: All children non-dependent	2	0	2
One family only: Lone parent: Dependent children	5	0	5
One family only: Lone parent: All children non-dependent	9	1	8

LC1401EW - Household composition by car or van availability

population	All households
units	Households
date	2011
area type	2011 output areas
area name	E00100947

Household Composition	All categories: Car or van availability	No cars or vans in household	1 or more cars or vans in household
All categories: Household composition	140	9	131
One family only: Married or same-sex civil partnership couple: No children	21	0	21
One family only: Married or same-sex civil partnership couple: Dependent children	31	0	31
One family only: Married or same-sex civil partnership couple: All children non-depender	16	0	16
One family only: Cohabiting couple: No children	1	0	1
One family only: Cohabiting couple: Dependent children	9	0	9
One family only: Cohabiting couple: All children non-dependent	1	0	1
One family only: Lone parent: Dependent children	6	0	6
One family only: Lone parent: All children non-dependent	6	0	6

Household Composition by car/van availability - Rhymney

LC4110EW - Car or van availability by household composition

population	All households
units	Households
date	2011
household composition	All categories: Household composition

2011 output area	All categories: Car or van availability	No cars or vans in household	1 car or van in household	2 or more cars or vans in household
W00007197	171	86	69	16
W00007198	127	57	40	30
W00007199	127	22	57	48
W00007202	119	32	59	28
W00007205	122	48	53	21
W00007206	135	26	61	48
W00007207	109	47	42	20
W00007212	83	36	37	10
W00007468	134	55	59	20
W00007469	128	73	49	6
W00007470	134	51	58	25
W00007471	122	22	62	38
W00007472	138	42	62	34
W00007474	145	52	68	25
W00007475	136	57	63	16

Method of Travel to Work - All Areas

QS701EW - Method of travel to work

population	All usual residents aged 16 to 74
units	Persons
date	2011
rural urban	Total

2011 output area	All categories: Method of travel to work	Work mainly at or from home	Underground, metro, light rail, tram	Train	Bus, minibus or coach
W00007609	208	5	0	1	5
W00007611	225	2	0	0	4
W00007612	217	2	0	1	2
W00007625	257	7	0	1	10
W00007628	207	2	0	1	5
W00007468	226	0	0	1	4
W00007470	210	4	0	1	2
W00007471	212	2	0	1	4
W00007474	293	1	0	5	12
E00100858	187	9	0	1	2
E00100878	174	6	0	0	3
E00100934	375	24	0	3	2
E00100937	196	8	0	1	1
E00100947	251	9	0	1	2

In order to protect against disclosure of personal information, records have been swapped between different geographic areas. Some counts will be affected, particula

	Taxi	Motorcycle, scooter or moped	Driving a car or van	Passenger in a car or van	Bicycle
W00007609	0	1	83	11	2
W00007611	0	0	90	18	0
W00007612	0	1	77	12	0
W00007625	0	0	100	13	0
W00007628	1	1	87	21	0
W00007468	1	0	63	6	1
W00007470	2	0	67	5	2
W00007471	0	1	109	15	0
W00007474	3	0	66	16	0
E00100858	1	1	80	5	1
E00100878	0	0	64	4	1
E00100934	0	3	194	5	2
E00100937	0	1	96	13	3
E00100947	0	2	124	6	5

	On foot	Other method of travel to work	Not in employment
W00007609	26	2	72
W00007611	24	1	86
W00007612	27	2	93
W00007625	23	0	103
W00007628	16	1	72
W00007468	8	1	141
W00007470	11	0	116
W00007471	9	0	71
W00007474	11	0	179
E00100858	6	0	81
E00100878	8	1	87

E00100934	22	2	118
E00100937	12	2	59
E00100947	21	0	81

arly small counts at the lowest geographies.

Cranbrook - Vehicle and Household Survey Results

Road Name	Number of Dwellings	Number of Gararges	Number of Vehicles (AM)	Number of Vehicles (PM)	Max Number of Cars (from AM and PM survey
Oakbeer Orchard	11	38	47	13	47
Wheat Field Lane	8	11	11	11	11
Old Garden Pasture	16	7	23	21	23
Broom Park	6	0	11	14	14
Borough Fields	20	17	22	21	22
Farm Park	11	25	22	32	32
Lower Barton	9	15	12	12	12
Younghayes Road	69	0	36	15	36
Seven Acres	44	21	64	47	64
Alma Villa Rise	6	10	10	15	15
Best Park	42	30	59	48	59
Kemps Field	14	11	17	16	17
Hayes Square	32	2	25	29	29
Summer Meadow	38	26	67	68	68
Barn Orchard	77	45	71	68	71
Long Orchard	5	4	7	-	7

Ottery St Mary - Vehicle and Household Survey Results

Road Name	Number of Dwellings	Number of Gararges	Number of Vehicles (AM)	Number of Vehicles (PM)	Max Number of Cars (from AM and PM survey
The Nursary	29	-	-	32	32
Abbott Close	18	17	22	23	23
Butts Road	116	50	135	151	151
Thackery Close	15	5	25	20	25
Coleberd	4	3	3	5	5
Fairfax Road	11	4	8	11	11
Grandisson Drive	28	34	20	32	32
Kennaway Road	24	28	25	21	25
Patterson Drive	31	31	51	50	51
Raleigh Road	63	50	66	63	66
Ridgeway	65	25	64	66	66
Ridgeway Gardens	40	28	53	61	61
Shutes Mead	10	2	10	6	10
Beauvale Close	8	6	8	-	8
Brookdale	11	8	13	-	13
New Lane	6	1	2	-	2
New Street	15	3	14	-	14
Sunny Hill	20	10	18	-	18

Ebbw Vale - Vehicle and Household Survey Results

Road Name	Number of Dwellings	Number of Gararges	Number of Vehicles (AM)	Number of Vehicles (PM)	Max Number of Cars (from AM and PM survey
Eureka Place	126	32	92	93	93
Pennant Street	137	30	98	100	100
Valley Road	34	10	27	35	35
Mount Pleasant Road	81	36	65	46	65
Tothill Street	43	6	30	36	36
Hughes Avenue	6	4	25	36	36
John Street	20	32	52	45	52
Council Street	63	6	45	48	48
Letchworth Street	66	11	25	26	26
Alfred Street	57	11	33	36	36
Moor View	24	3	28	32	32

Rhymney - Vehicle and Household Survey Results

Road Name	Number of Dwellings	Number of Gararges	Number of Vehicles (AM)	Number of Vehicles (PM)	Max Number of Cars (from AM and PM survey
Pen-y-Dre	69	0	44	63	63
Hoel Uchaf	18	1	11	16	16
Heol-y-twyn	28	1	25	26	26
Is-fryn	29	1	20	18	20
Aneurin Terrace	19	13	12	24	24
Ty-Coh	49	0	45	42	45
Glan-Y-Nant	29	21	33	38	38
Bryn-Carno	27	7	37	37	37
Carno Street	35	15	16	14	16
Bryn Seion Street	38	28	8	42	42
Gladstone Terrace	7	1	15	20	20
Harcourt Place	33	7	27	36	36
Correnation Terrace	49	23	38	40	40
Oakland Terrace	12	17	13	21	21
Glan-Y-Afon	82	8	53	50	53
Glen Elyrch	9	4	10	10	10

Department for Transport statistics
National Travel Survey

Table NTS0501

Trips in progress by time of day and day of week - index: England, 2015[1]

	Index: average hour = 100					
	All trips			Car driver trips		
Time of day	Monday to Friday	Saturday	Sunday	Monday to Friday	Saturday	Sunday
0000 - 0059	4	11	14	4	9	12
0100 - 0159	2	4	5	1	3	4
0200 - 0259	1	3	2	1	2	2
0300 - 0359	1	3	2	1	2	1
0400 - 0459	3	3	2	4	4	2
0500 - 0559	16	8	5	23	9	7
0600 - 0659	46	19	12	61	23	15
0700 - 0759	133	37	26	165	44	28
0800 - 0859	293	82	51	272	90	52
0900 - 0959	168	148	98	176	149	95
1000 - 1059	151	211	168	152	200	148
1100 - 1159	155	239	202	153	223	182
1200 - 1259	152	212	208	148	205	188
1300 - 1359	140	192	180	143	175	163
1400 - 1459	150	190	177	151	170	156
1500 - 1559	258	175	161	201	151	140
1600 - 1659	206	162	149	217	153	130
1700 - 1759	212	147	118	245	138	111
1800 - 1859	169	126	100	184	115	90
1900 - 1959	111	100	71	118	86	68
2000 - 2059	68	66	48	74	53	46
2100 - 2159	47	44	30	49	37	31
2200 - 2259	32	37	25	35	35	22
2300 - 2359	20	36	13	18	27	12
All day (average day = 100)	106	94	77	108	89	71
Unweighted sample size: trips ('000s)	193	33	28	82	13	11

1 The table above shows how the number of trips in progress changes throughout the day. The table is presented as an index, which compares the number of trips in progress per hour with the average number of trips in progress per hour. For example, if the number of trips in progress during a particular hour is twice as many as the average number of trips in progress per hour, its index number would be 200 relative to the average hour (index number equals 100).

Telephone: 020 7944 3097
Email: national.travelsurvey@dft.gsi.gov.uk
Notes & definitions

Source: National Travel Survey
Last updated: 8 September 2016
Next update: Summer 2017

The figures in this table are National Statistics

The results presented in this table are weighted. The base (unweighted sample size) is shown in the table for information. Weights are applied to adjust for non-response to ensure the characteristics of the achieved sample match the population of Great Britain (1995-2012) or England (2013 onwards) and for the drop off in trip recording in diary data.
The survey results are subject to sampling error.

Department for Transport statistics QUESTIONS ASKED IN EVEN YEARS ONLY - NEXT UPDATE SUMMER 2017
National Travel Survey

Table NTS0908

Where vehicle parked overnight by Rural-Urban Classification: England, 2014[1]

	Percentage				
	Rural-Urban Classification[2] of residence				
	Urban Conurbation	Urban City and Town	Rural Town and Fringe	Rural Village, Hamlet and Isolated Dwelling	All areas
Garage	*9*	*12*	*13*	*17*	*12*
Private property (not garag	*55*	*62*	*63*	*72*	*61*
Street	*34*	*24*	*19*	*9*	*25*
Other	*2*	*3*	*4*	*3*	*3*
Total	*100*	*100*	*100*	*100*	*100*
Unweighted sample size: vehicles	2,805	3,896	962	1,203	8,866

1. Questions are not asked in all years
2 For more information on Rural-Urban Classifications see:
https://www.gov.uk/government/collections/rural-urban-definition

Telephone: 020 7944 3097
Email: national.travelsurvey@dft.gsi.gov.uk
Notes & definitions

Source: National Travel Survey
Last updated: 2 September 2015
Next update: Summer 2017

The figures in this table are National Statistics

The results presented in this table are weighted. The base (unweighted sample size) is shown in the table for information. Weights are applied to adjust for non-response to ensure the characteristics of the achieved sample match the population
The survey results are subject to sampling error.

	Respondent ID	1	2
1	Which Rail Line?	Honiton - Pinhoe	Honiton - Pinhoe
2	How many cars?	1	0
3	How many licences	1	0
	Compete?	NO	NO
7	How frequently do you use this train service?	Less than once a week	Less than once a week
e	What type of ticket have you used today?	-	-
8	What is the purpose of your journey today?	Leisure	Leisure
9	Where did you get onto this service?	-	Yeovil Junction
10	Where will you be getting off this service?	-	Paignton
11	Which of the following categories represents your total household income?	-	Less than £15,000 a year
12	Co-ordinates of place of residence - or postcode)	-	PA21 5LN
4a	Why are there currently no cars/vans available to your household?	-	Consider them to be too ex
4b	Which of the following modes of transport do you use most often?	-	Walk, Car Share, Train
4ci	Have you or anyone in your household previously owned a car/van?	-	No
4cii	If yes, what was the main reason for getting rid of that vehicle?	-	-
4d	How would a reduction in the availability of rail services in your area influence your household	-	It would remain the same
5a	Why do you/your household not have more car/vans available?	-	-
5b	Competition decision?	-	-
5c	How many days per week do you drive a car/van?	-	-
5d	Which of the following modes of transport do you use most often?	-	-
5e	How would a reduction in the availability of rail services near you influence your household'	-	-
5f	How would an increase in the availability (e.g. improved frequency and destinations) of rail s	-	-
6a	Which of the following modes of transport do you use most frequently?	Taxi	-
6b	Why do you need a cars/van for each licence holder in your household?	To improve accessibility	-
6c	Do you have any plans to change the number of vehicles available to your household in the	No	-
6d	How would an increase in the availability of rail services near you influence your household'	Would remain the same	-

3	4	5	6	7
Honiton - Pinhoe	Honiton - Pinehoe	Honiton - Pinhoe	Honiton - Pinhoe	Honiton - Pinhoe
3	1	1	2	1
3	2	1	2	1
NO	YES	NO	NO	NO
Less than once a week	1-2 times a week	4-6 times a week	Daily	Daily
-	-	-	-	-
Leisure	Leisure	Commute	Other - eduction	Commute
Southampton	Exeter Central	Exeter St Davids	Exeter Central	Exeter Central
Exeter Central	Sherbourne	Yeovil Junction	Honiton	Honiton
-	£15-£30k / year	-	£60-75k / year	£30-45k / year
PO34 5ED	DT2 8SE	-	EX14 2GN	EX14 1RN
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	Do not require extra car,	-	-	-
-	Work reasons are prioriti	-	-	-
-	2-4 times a week	-	-	-
-	Walk, Car Share, Train	-	-	-
-	Would obtain 1 vehicle	-	-	-
-	Would remain the same	-	-	-
Walk, Bus, Bicycle	-	Walk, Train	Walk, Car Share, Train	Train
Cars are essentail for trav	-	Cars are essentail for travell	Improved flexibility	Cheaper than alternatives
Yes - decrease	-	No	No	No
Would consider discardir	-	Would remain the same	Would remain the same	Would remain the same

8	9	10	11	12	13
Honiton - Pinhoe	Honiton - Pinhoe	Honiton - Pinhoe	Honiton - Pinhoe	Honiton - Pinhoe	Honiton - Pinhoe
0	1	3	2	2	1
0	2	1	2	3	2
NO	YES	NO	NO	YES	YES
1-2 times a week	Less than once a week	Less than once a week	1-2 times a week	Less than once a week	Less than once a week
-	-	-	-	-	-
Leisure	Leisure	Leisure	Other - meeting client	Leisure	Leisure
Exeter Central	Feniton	Exeter Central	Exeter Central	Cranbrook	Gillingham
Honiton	Exeter St Davids	Axminster	Honiton	Axminster	Exeter Central
Pensioner	-	-	£30-45k / year	-	-
EX14 2DL	BS5 8ND	EX4	-	-	-
Don't drive	-	-	-	-	-
Walk, Bus, Train	-	-	-	-	-
Yes	-	-	-	-	-
Wasn't being used	-	-	-	-	-
It would remain the sar	-	-	-	-	-
-	Do not require an extra ca	-	-	Other - in the process o	Consider them to be to
-	Work is proritised	-	-	It's my parents car - the	Who has the greatest n
-	Daily	-	-	Daily	1-2 times a week
-	Bus, Car Share, Train	-	-	Bus, Car Share	Bicycle
-	Would consider obtaining	-	-	Would consider obtaini	Would obtain 1 vehicle
-	Would remain the same	-	-	Would remain the sam	Would remain the sam
-	-	Walk, Bus, Train	Train, Motorcycle	-	-
-	-	Learning to drive	Cars are essentail for t	-	-
-	-	Yes - increase the numb	Yes - decrease the nur	-	-
-	-	Would remain the same	Would remain the sam	-	-

14	15	16	17	18
Honiton - Pinhoe	Honiton - Pinhoe	Honiton - Pinhoe	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge
0	1	3	1	1
0	1	4	2	1
NO	NO	YES	YES	NO
1-2 times a week	1-2 times a week	-	4-6 times a week	4-6 times a week
-	-	-	Other - weekly ticket	Other - weekly ticket
Leisure	Other - flyering	-	Shopping	Other - education
Axminster	Sailisbury	-	Cardiff Central	Ebbw Vale Town
Newton Abbot	Exeter Central	-	Newbridge	Llanhilleth
£15-£30k / year	Less than £15k / year	-	-	-
EX13 5HE	-	-	-	NP13 2RQ
Consider them to be tc	-	-	-	-
Bus, Train	-	-	-	-
No	-	-	-	-
N/A	-	-	-	-
We would obtain 1 vel	-	-	-	-
-	-	Not everyone needs on	Do not require an extra ca	-
-	-	Who has the most urge	Childcare takes precidence	-
-	-	Less than once a week	1-2 times a week	-
-	-	-	Train	-
-	-	-	Would obtain 1 vehicle	-
-	-	-	Would remain the same	-
-	Walk, Train	-	-	Train
-	More convieient	-	-	Cars are essentail for travelling to/f
-	No	-	-	No
-	Would remain the sam	-	-	Would remain the same

19	20	21	22
Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge
2	3	2	1
2	3	2	1
NO	NO	NO	NO
Less than once a week	-	4-6 times a week	4-6 times a week
Day Return	-	Season Ticket	Season Ticket
Leisure	-	Commute	Commute
Ebbw Vale Town	-	Cardiff Central	Cardiff Central
Cardiff Central	-	Ebbw Vale Town	Ebbw Vale Town
£60-75k / year	-	£30-45k / year	£15-30k/year
NP22	-	NP23 6AW	NP23 6EP
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
Walk, Bus, Train	Walk, Bus, Train	Walk, Train	Train
Cars are essentail for travelling to/f	Cars are essentail for travelling to/f	More convenient	More reliable
Yes - increase the number of cars a	No	No	No
Would remain the same	-	Would remain the same	Would remain the same

23	24	25	26
Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge
0	1	1	1
0	2	1	1
NO	YES	NO	NO
2-4 times a week	2-4 times a week	4-6 times a week	Less than once a week
Single	Other	Day return	Day return
Other	Other - education	Commute	Other - Royal British Legion meetin
Cross Keys	Cross Keys	Ty-Glas	Newbridge
Ebbw Vale Town	Ebbw Vale Town	Ebbw Vale Town	Ebbw Vale Town
£30-45k / year	-	£45-60k / year	Pensioner
NP23 5FB	NP23 5DN	NP23	NP23 5DG
Other - banned from driving	-	-	-
Walk, Bus, Train, Taxi	-	-	-
Yes	-	-	-
Because they were banned from dr	-	-	-
Would remain the same	-	-	-
-	Do not require an extra car	-	-
-	Work is given priority	-	-
-	Never	-	-
-	Train	-	-
-	Would remain the same	-	-
-	Would remain the same	-	-
-	-	Walk, Train	Bus, Car Share, Train
-	-	More convenient, improved flexibi	More convenient, used for shoppin
-	-	No	No
-	-	Would consider discarding a vehicl	Would remain the same

27	28	29	30
Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge
1	0	2	0
1	1	2	7
NO	NO	NO	NO
2-6 times a week	Less than once a week	2-4 times a week	Less than once a week
Single	Day return	Day return	Day return
Other - seeing friends	Leisure - music concert	Other - education	Leisure
Ebbw Vale Town	Ebbw Vale Town	Cross Keys	Cardiff Central
Cardiff Central	Cardiff Central	Ebbw Vale Town	Ebbw Vale Town
-	-	-	Student
-	-	-	BS16 1ZU
-	Other - banned from driving	-	Other - not allowed to have cars in
-	Walk, Train	-	Walk, Bus, Train
-	No	-	Yes
-	-	-	Couldn't bring their car to universit
-	Would obtain 1 vehicle	-	Would obtain 1 vehicle (at least)
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
Bus, Train	-	Train	-
Cars are essentail for travelling to/f	-	Cars are essentail for travelling to/f	-
No	-	Yes - increase the number of cars a	-
Would remain the same	-	Would remain the same	-

31	32	33	34
Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge
2	3	3	1
2	3	2	2 (inc. Motorbike)
NO	NO	NO	NO
4-6 times a week	4-6 times a week	Less than once a week	1-2 times a week
Day return	Day return	Day return	Day return
Other - education	Other - education	Shopping	Leisure
Cross Keys	Cross Keys	Cardiff Central	Cardiff Central
Ebbw Vale Town	Ebbw Vale Town	Ebbw Vale Town	Ebbw Vale Parkway
-	-	-	£15-30k / year
-	-	NP23 5UB	NP22
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
Walk, Bus, Train	Car Share, Train	Train	Walk, Motorcycle
Cars are essentail for travelling to/f	-	Other - each own a car, but partne	More convenient, other - the car is
No	No	No	Yes - increase the number of cars a
Would remain the same	Would remain the same	Would remain the same	Would remain the same

35	36	37	38
Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge
4	2	2	2
4	2	2	2
NO	NO	NO	NO
Less than once a week	Less than once a week	Less than once a week	4-6 times a week
Single	Day return	Single	Season Ticket
Leisure	Leisure - visiting family	Other - education	Other - education
Ebbw Vale Town	Ebbw Vale Town	Ebbw Vale Town	Ebbw Vale Town
Cardiff Central	Cardiff Central	Cardiff Central	Newbridge
>75k/year	£30-45k / year	-	-
Beaufort	NP23 5BQ	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
Train	Train	Walk, Train	Walk, Bus, Train
Cars are essentail for travelling to/f	Cars are essentail for travelling to/f	Cars are essentail for travelling to/f	Cars are essentail for travelling to/f
No	No	Yes - increase the number of cars a	No
Would remain the same	Would remain the same	Would consider discarding a vehicl	Would remain the same, but would

39	40	41	42
Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge
1	1	2	3
2	1	2	3
YES	NO	NO	NO
4-6 times a week	Less than once a week	4-6 times a week	Less than once a week
Other - yearly ticket	Day return	-	Day return
Commute	Commute	Other - education	Shopping
Cardiff Central	Cardiff Central	Cross Keys	Cardiff Central
Ebbw Vale Town	Ebbw Vale Town	Ebbw Vale Town	Ebbw Vale Town
£45-60k / year	£15-30k / year	-	-
NP23	NP22 3NY	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
Alternatives are suffcient	-	-	-
"Gallentry"	-	-	-
1-2 times a week (weekends)	-	-	-
Walk, Train	-	-	-
Would obtain 1 vehicle	-	-	-
Would remain the same	-	-	-
-	Train	Train	Walk
-	Cars are essentail for travelling to/f	Cars are essentail for travelling to/f	Cars are essentail for travelling to/f
-	No	Yes - increase the number of cars a	Yes - increase the number of cars a
-	Other - depends on what changes t	Would remain the same	Would remain the same

43	44	45	46
Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge	Ebbw Vale Town - Newbridge
2	1	2	2
2	2	1	3
NO	YES	NO	YES
4-6 times a week	Less than once a week	Less than once a week	Daily
Season Ticket	Day return	Day return	Other - weekly ticket
Commute	Shopping	Shopping	Commute
Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Queen Street
Llanhilleth	Ebbw Vale Town	Ebbw Vale Town	Newbridge
>£75k / year	-	-	-
NP13 2PA	NP23 4LT	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	Other - retired and isn't needed	-	Do not require an extra car
-	Respondent indicated that this is n	-	Work is prioritsed
-	2-4 times a week	-	4-6 times a week
-	Train	-	Train
-	Would remain the same	-	Would obtain 1 vehicle
-	Would remain the same	-	Would remain the same
Walk, Train, Taxi	-	Walk	-
Cars are essentail for travelling to/f	-	Cars are essentail for travelling to/f	-
No	-	Yes - increase	-
Would consider discarding a vehicl	-	Would remain the same	-

Matthew Parker | TPS Bursary Award Research
Car Ownership and Competition Survey

1) FOR INTERVIEWER RESPONSE ONLY: On which rail corridor has this survey been completed? How many in group? (make informal note)

☐ Honiton-Pinhoe ☐ Ebbw Vale Town - Newbridge

☐ Other (*Please specify)* _____

2) In total, how many cars or vans are owned, or available to use, by members of your household? *Include any company car(s) or van(s) available for private use.*

☐ None ☐ 1 ☐ 2 ☐ 3 ☐ 4 or more

3) In total, how many persons in your household have a full driving licence. *Not including provisional licences.*

☐ None ☐ 1 ☐ 2 ☐ 3 ☐ 4 or more

If 2 = None, then please complete Q4) before proceeding.

If 2) < 3), then please skip to Q5) before proceeding

If 2) > or = 3), then please skip to Q6) before proceeding

7) How frequently do you use this train service?

☐ Less than once a week ☐ 2-4 times a week ☐ Daily

☐ 1-2 times a week ☐ 4-6 times a week

e) What type of ticket have you used today?

☐ Mobile multi-flex ☐ Single ☐ Other (please specify)
☐ Season Ticket ☐ Day return

8) What is the purpose of your journey today?

☐ Commute ☐ Leisure

☐ Shopping ☐ Other (*Please specify)* _____

9) Where did you get onto this service?

_____

10) Where will you be getting off this service?

_____

11) Which of the following categories represents your total household income?

☐ Less than £15,000/year ☐ Between £45,000/year and £60,000/year

☐ Between £15,000/year and £30,000/year ☐ Between £60,000/year and £75,000/year

☐ Between £30,000/year and £45,000/year ☐ More than £75,000/year

12) Co-ordinates of place of residence - or postcode)

Matthew Parker | TPS Bursary Award Research
Car Ownership and Competition Survey

Please complete when the respondent has indicated that they do not own any cars/vans

4a) Why are there currently no cars/vans available to your household *(Select all which apply)*

- ☐ Do not require a car
- ☐ Environmental Consideration
- ☐ Alternatives are sufficient
- ☐ I can rely on relatives/taxis for when a car would be required
- ☐ Consider them to be too expensive/unaffordable
- ☐ Other (*Please specify)*

4b) Which of the following modes of transport do you use most often? (*Please select up to three options)*

- ☐ Walk
- ☐ Bus, mini-bus, coach
- ☐ Bicycle
- ☐ Passenger in Car (who?)
- ☐ Train
- ☐ Taxi
- ☐ Motorcycle
- ☐ Other (*Please specify)*

4ci) Have you or anyone in your household previously owned a car/van?

- ☐ Yes
- ☐ No

4cii) If yes, what was the main reason for getting rid of that vehicle?

4d) How would a reduction in the availability of rail services in your area influence your household's level of car ownership?

- ☐ It would remain the same
- ☐ We would obtain 1 vehicle
- ☐ We would consider obtaining one or more vehicles
- ☐ We would obtain more than 1 vehicle
- ☐ Other (please specify

Matthew Parker | TPS Bursary Award Research
Car Ownership and Competition Survey

Please complete when the respondent has indicated that car competition is present

5a) Why do you/your household not have more car/vans available? *(Select all which apply)*

- ☐ Do not require an extra car
- ☐ Environmental Consideration
- ☐ Alternatives are sufficient
- ☐ I can rely on lifts/taxis for when a car would be required
- ☐ Consider them to be too expensive/unaffordable
- ☐ Other (*Please specify)*

5b) In a scenario where more household members which to use a car/van than there are car/vans available, how is the decision about who uses the vehicle made?

5c) How many days per week do you drive a car/van?

- ☐ Never
- ☐ 1-2 times a week
- ☐ 4-6 times a week
- ☐ Less than once a week
- ☐ 2-4 times a week
- ☐ Daily

5d) Which of the following modes of transport do you use most often? (Please select three)

- ☐ Walk
- ☐ Bus, mini-bus, coach
- ☐ Bicycle
- ☐ Motorcycle
- ☐ Car Share
- ☐ Train
- ☐ Taxi
- ☐ None of these
- ☐ Other (*Please specify)*

5e) How would a reduction in the availability of rail services near you influence your household's level of car ownership?

- ☐ Would remain the same
- ☐ Would obtain 1 vehicle
- ☐ Would consider obtaining one or more vehicles
- ☐ Would obtain more than 1 vehicle

5f) How would an increase in the availability (e.g. improved frequency and destinations) of rail services near you influence your household's level of car ownership?

- ☐ Would remain the same
- ☐ Would discard 1 vehicle
- ☐ Would consider discarding 1 or more vehicles
- ☐ Would discard 1 or more vehicles
- ☐ Other (*Please specify)*

Matthew Parker | TPS Bursary Award Research
Car Ownership and Competition Survey

Please complete when the respondent has indicated more cars available than people in the household

6a) Which of the following modes of transport do you use most frequently? (select three)

☐ Walk ☐ Bus, mini-bus, coach ☐ Bicycle ☐ Car Share

☐ Train ☐ Taxi ☐ Motorcycle ☐ Other (*Please specify)*

6b) Why do you need a cars/van for each licence holder in your household? (Select all which apply)

☐ Cars are essential for travelling to/from work ☐ Improved flexibility

☐ More convenient ☐ Health reasons

☐ More reliable ☐ Considered safer

☐ Quicker than alternatives ☐ Considered to have a lack of viable alternatives

☐ Cheaper than alternatives ☐ Other (*Please specify)*

6c) Do you have any plans to change the number of vehicles available to your household in the next five years?

☐ Yes - decrease the number of cars available ☐ Yes - increase the number of cars available

☐ No

6d) How would an increase in the availability of rail services near you influence your household's level of car ownership?

☐ Would remain the same ☐ Would discard a vehicle

☐ Would consider discarding a vehicle ☐ Would discard more than 1 vehicle

☐ Other (*Please specify)* ☐ Would consider discarding more than 1 vehicle