FINAL REPORT

YOUTH CONCESSIONS RESEARCH

PRICE ELASTICITY OF BUS TRAVEL DEMAND

July 2016

WSP | PARSONS BRINCKERHOFF

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1.1 CONTEXT

1.1.1 The Department for Transport (DfT) wished to increase the evidence base of bus travel demand by conducting research into the price elasticity of young people (in England, including London). For the purposes of this research, young people are defined as those between the ages of 16 and 25 years old (inclusive).

1.1.2 Following a review of literature of both young people's travel demand and research into elasticities of bus travel, an analysis of the National Travel Survey indicated that young people do indeed have travel habits which are noticeably different to the population in general[1].

1.1.3 The main stage of the research, which is covered by this report, involved more detailed data collection from local authorities and operators and the completion of interviews with young people through focus groups, in order to explore specific price elasticities among the target group.

1.2 DATA

1.2.1 At its most basic level, estimating price elasticities requires data for ticket/pass prices and either the number of tickets/passes bought or the number of trips made by young people. Furthermore, price data needs to show sufficient variation over time to allow the relationship between the change in price and the consequences for the tickets bought/number of trips to be identified in the elasticity estimation. From this basic relationship, additional relevant factors can be controlled for in the process of estimating the elasticity.

1.2.2 In order to be usable within models to explore policy options, data must be sufficient in both quality and quantity. As youth travel concessions are a discretionary area of local authority passenger transport activity and a matter of commercial judgement for bus operators, it is almost inevitable that the availability of data will be as complex and varied as the availability of the concessions themselves.

1.2.3 The requirements of data for such a project cover a number of key points; firstly, each individual ticket scheme must be directly relevant to the scope of the study i.e. offer the right concession. Secondly, the data must be detailed in terms of providing the price, number of ticket sales and number of journeys made, ideally on a quarterly basis over a period of five years. Thirdly, there needs to be a price change in the period of the data, in order to provide some variation in the level of demand which is related to the change in price. When all of these conditions are fulfilled, the data can be regarded as sufficient for the purpose.

1.2.4 Local authority and bus operator stakeholders were therefore approached to provide data on a commercially confidential basis, with a simple data template created to provide the following details, on a quarterly basis, over a five-year term:

- → Ticket price;
- → Passes on issue; and

[1] Available in the report "Youth Concessions Research - Literature and National Travel Survey Review"

- Number of journeys made.

1.2.5 Over the course of the project, detailed data was provided from four areas however sufficiently detailed data for full inclusion in the analysis was only available from London (by Transport for London) and West Yorkshire (by Metro, the public transport brand of the West Yorkshire Combined Authority).

1.2.6 Concessions offered to young people fall broadly into two main categories:

- Discount card: a pass which entitles the holder to a reduction in the cost of travel, most normally for single and return tickets.
- Travelcard: a reduced-price season ticket which gives the holder the right to make multiple journeys within the period of validity.

1.3 ELASTICITY ESTIMATION AND VALUES

1.3.1 A price elasticity of demand is a measure used in economics to show the responsiveness of the quantity demanded of a good or service to a change in its own price with all other factors remaining constant. It is calculated by dividing the percentage change in the quantity demanded by the percentage change in price.

1.3.2 Thus, a price elasticity of demand -0.1 would indicate that for a 10% increase in price, demand would reduce by 1%. Under normal circumstances a price elasticity of demand is expected to be negative. In the case of bus usage, demand can be measured in terms of the number of passes issued or the number of trips made. From the point of view of a customer making a purchasing decision, passes issued would seem to be the more sensible metric for demand, because once the purchase is made additional trips are effectively costless; indeed a higher ticket purchase price may encourage greater usage so that the passenger feels that they have received value for money.

1.3.3 An initial investigation of the relationship between bus ticket prices and bus usage measured by passes and trips per capita reveals a strong negative association for the 18–25 years age group. The correlations between bus usage and ticket price for the 18–25 age group in Metro (West Yorkshire) and TfL (London) bus operating areas fall in the range of around -0.6 to -0.8 i.e. as the cost of bus travel increases, the number of passes and trips decreases.

1.3.4 Preliminary results provide plausible estimates of long-term price elasticities[2] at least for the approximate 18–25 age groups. In the 18–25 age group, a 10% increase in the price of youth tickets would result in a 9.23% decrease in the number of trips per capita.

1.3.5 The estimates found here are higher than those found in existing academic sources typically used by DfT for the entire population[3]. Higher elasticities for young people are however not illogical given the suggestions found in relevant literature and the finding of strong initial correlations between price and trips described above.

[2] Short-run elasticities cover the period soon after changes in fares, typically measurable over a number of months, while long-run elasticities measure effects some years after fare changes

[3] The Department for Transport (DfT) currently uses evidence published in a 2004 Transport Research Laboratory (TRL) publication based on analysis from the 1990s on bus fare and service elasticities – "The demand for public transport: a practical guide"; http://www.demandforpublictransport.co.uk/TRL593.pdf

1.3.6 Furthermore, these elasticities are also consistent with the findings of the focus groups where participants discussed strong price sensitivity to different pricing scenarios. The qualitative results also point towards the willingness of young people to walk rather than use paid alternatives, such as taking the bus, and may further explain the greater price sensitivity of young people.

1.3.7 One counterintuitive result is found for the younger sub-sample in Metro for trips per capita. The elasticity is positive for trips per capita but negative for passes per capita for the same sample. As the relationship with price is more closely linked to passes purchased rather than the trip taken this would seem to be a better measure of the relationship between price and demand. As additional trips on a purchased pass have no additional monetary cost, an increase in the price of bus passes could potentially encourage holders to make better use of the bus pass by taking more trips. This could include taking trips in preference to other transport modes such as by car, or to make trips that they may otherwise not have made, in order to reclaim some of the cost of the pass.

1.3.8 Thus the relationship between price and bus usage could indeed be positive even when the relationship with passes per capita is negative and this interpretation is corroborated by some of the feedback provided within the focus groups. However, the same result is not found in the TfL data which would seem to indicate at least some diversity in characteristics between the two locations, and a wider study of various bus areas would be needed to develop such an analysis. While no definitive conclusions can be drawn at this stage given the limitations of the data, this could be an area for specific exploration in any future research.

1.3.9 Additional models were estimated for both “younger” and “older” age group sub-samples for TfL (16–17 and 18+ students) and Metro (16–18 and 18–22, including mature students) as well as using passes per capita as an alternative dependent variable but these did not yield sensible results, at least for the Metro area.

Bus Area	Passes per capita	Trips per capita
Metro 16–18	-0.7685	1.4468**
TfL 16–17	-3.2856**	-3.3578**
Metro 18–22	-0.9726***	-0.9225*
TfL 18+	-2.9206***	-1.9752**

*** indicates significant at the 1% level of significance
** indicates significant at the 5% level of significance
* indicates significant at the 10% level of significance

1.3.10 The limited number of estimates which this research has provided suggests that the price elasticity of demand for young people is higher than that for the average of the population, and these estimates are supported by the results of the focus groups. The estimates help to indicate that young people have a greater responsiveness to price than is currently represented in the evidence which had previously been available to the DfT for the population as a whole. However, due to both the limited number of areas on which this observation is based, and the poor robustness of the data, it is not possible to estimate an average price-demand elasticity for young people or indicate the likely range of elasticity values.

1.3.11 The requirements of data for such a project cover a number of key points; firstly, and self-evidently, each individual ticket scheme must be directly relevant to the scope of the study. Secondly, the data must be detailed in terms of providing the price, number of ticket sales and number of journeys made, ideally on a quarterly basis over a period of five years. Thirdly, there needs to be a price change in the period of the data in order to provide some variation in the level of demand which is related to price. When all of these conditions are fulfilled, the data can be regarded as sufficient for the purpose.

1.3.12 At the very least, and in the absence of any further bus data being obtained, a meta-analysis would be required which researched and gathered together an evidence base on young people's travel behaviour and from which a well-founded estimate could be made (in a similar manner to that adopted in Balcombe et al (2004), which has been used for internal analysis by DfT).

1.3.13 Where it is possible to differentiate, the data for the older age-groups (18+) also are tending to give more sensible results than the younger age group (16–18). This is possibly because the younger group are coming from a free (school-age) transport environment whereas the older group (18+) are more adapted to making their own choices about travel arrangements; again this could be explored further in any future research.

1.4 FOCUS GROUPS

1.4.1 To gain an insight into young people's rationale behind travel choices and specifically bus ticket choices, two focus groups were held in Leeds to add context to the initial fare elasticities based on the operator data from Metro.

1.4.2 Students in the focus groups stated that they walk most local trips of up to half an hour, taking other forms of transport when the weather is bad or if it is late in the evening. Some may walk one way, and then use another mode to get home if they were carrying heavy items. Those who are unemployed tend to walk where they need to get to irrespective of distance and rarely travel outside their local area.

1.4.3 The groups were split between those who use the bus around twice a week, and those who use the buses nearly every day. Only those travelling by bus at least four days a week are using weekly or daily tickets as these afford best value for money. One student had an annual pass (£280), paid for by his mother, and as a result travels by bus nearly every day. The remainder however were not inclined to make such a significant investment due to lack of funds and doubt that it would be cost effective.

1.4.4 It is most economic for many to buy single tickets, particularly for those only paying single fares of £1, while a few travelling further afield are using day tickets at £4 each. Awareness of a recent fare rise for day riders was also not universal, suggesting that unless a day or weekly ticket offers significant benefit the prices are not reviewed by passengers regularly.

1.4.5 Weekly bus passes were not considered good value for money by most participants, mainly because weekly usage does not make them cost effective. Multi-operator tickets however are viewed positively. Some thought that weekly tickets encourage people to use buses more and if they purchased a weekly pass they would choose to use the bus in situations where previously they would have chosen to walk. Everyone thought the idea of a discount card was useful as it provided a financial benefit even when travelling twice a week or less.

1.5 FURTHER RESEARCH

1.5.1 The initial estimates provide an interesting insight to the price elasticity of young people's bus travel and indicate that further research to refine these would be worthwhile. An alternative to performing a large quantitative survey amongst young people could be to perform further qualitative research to verify similarities and differences in fare elasticity across the following segments:

- Geography – urban, small town/rural;
- Age – 16–18, 19–21, 22–25; and
- Working status – Student, working/apprentice, Not in Employment, Education or Training.

1.5.2 In respect of econometric estimation, the main requirement is for sufficient observations (i.e. a number of areas with youth concessionary schemes where price variation can be observed). It is difficult to be prescriptive about how many are needed, other than 'more is better', subject to any resource constraints. What can be done in terms of advanced and alternative estimation techniques depends on the amount of relevant data which can be obtained for the number of bus operating areas:

- If a reasonable number of schemes (perhaps around 15–20, each of which would have sufficient data) could be found for each type of area, it would be possible to test whether different types of area (e.g. metropolitan, rural etc.) exhibit different price-responsiveness; and
- If, on the other hand, it is not possible to obtain so many, a more general approach would be needed to answer a less specific question: whether young people on average are more price-responsive than the general population.

1.5.3 In the absence of sufficient quality data being obtained, another option is to use existing literature to see whether there are estimates of young person's price-demand behaviour from other locations around the world. It is possible that more studies exist where data are more readily available, and if this were the case then judgements could be made as to whether, and how, such information could be transferable to the UK context.

1.5.4 Ideally, a combination of qualitative analysis and more data-driven econometric work is the best way to answer the question of whether (and why) young people have different price-demand sensitivity than the general population. Qualitative work could reveal insights about changes in travel habits and the attitudes of young people to bus travel, although it would fall short of being able to provide a robust elasticity value to include in modelling of concessionary fare scenarios, as this requires quantitative analysis.

2 PROJECT BACKGROUND

2.1 SCOPE OF PROJECT

2.1.1 WSP | Parsons Brinckerhoff[4] (WSP | PB) was appointed by the Department for Transport (DfT) in 2014 to increase the evidence base of bus travel demand by conducting research into the price elasticity of young people. For the purposes of this research, young people are defined as those between the ages of 16 and 25 years old (inclusive).

2.1.2 The project consisted of two main stages; the first stage encompassed a literature review covering research specifically into young people's travel and their attitudes to public transport and more thematic research into the elasticity of demand for bus services. This was supplemented by analysis of the National Travel Survey (NTS) which indicated that young people do indeed have travel habits which are significantly different to the population in general. The report also included indications of the intended methodology for the second stage of the project, assuming availability of relevant data.

2.1.3 The second stage of the project, which is covered by this report, involved more detailed data collection from local authorities and operators and the completion of interviews with young people through focus groups. The first stage report, "Youth Concessions Research – Literature and National Travel Survey Review" is also available alongside this report.

2.1.4 This project aimed to disaggregate this broad age range into the following groups, subject to the robustness of the data:

- 16–18 year olds;
- 19–21 year olds; and
- 22–25 year olds.

2.1.5 It was also hoped to disaggregate those age groups into five categories:

- In compulsory education/training;
- In employment;
- Those that are NEET (Not in Education/Employment or Training)
- Urban/rural/London households; and
- Car availability/driving licence holding.

[4] The WSP | Parsons Brinckerhoff project team included Cambridge Econometrics and Dr John Bates as technical experts in relation to econometric modelling and surveying.

2.2 SCOPE OF REPORT

2.2.1 This report provides an overview of the data which was sought and became available, the estimation which has taken place within the confines of the available data and the results of the qualitative engagement undertaken, by means of holding two focus groups with young people (in Leeds). The report also provides suggestions on how the topic of the price elasticity for bus travel by young people could be explored in more detail in future.

2.2.2 The authors wish to thank all of the participants in the project – most notably the young people who participated in the focus groups on a snowy day and the bus operators and local authorities who explored and provided the data necessary to support this research.

3 PROJECT DATA

3.1 DATA REQUIREMENTS

3.1.1 The requirements of data for such a project cover a number of key points; firstly, each individual ticket scheme must be directly relevant to the scope of the study i.e. offer the right concession. Secondly, the data must be detailed in terms of providing the price, number of ticket sales and number of journeys made, ideally on a quarterly basis over a period of five years. Thirdly, there needs to be a price change in the period of the data, in order to provide some variation in the level of demand which is related to the change in price. When all of these conditions are fulfilled, the data can be regarded as sufficient for the purpose of estimating price elasticities.

3.1.2 In addition to obtaining the required data of ticket/pass prices and either the number of tickets/passes bought or the number of trips made by young people, price data needs to show sufficient variation over time to allow the relationship between the change in price and the consequences for the tickets bought/number of trips to be identified in the elasticity estimation. From this basic relationship, additional relevant factors can be controlled for in the process of estimating the elasticity.

3.1.3 In evaluating the scope and detail of data which may be available now (and by extension, making assumptions about what future data might be available), a key issue to be considered is the purpose for which the data is to be used. Youth travel schemes have been reviewed to understand both validity and eligibility rules in order to confirm suitability for this research.

3.1.4 Following confirmation of the relevance of the ticket scheme to the study, the sufficiency of the data needed to generate elasticity values for bus travel is dependent upon both the quality (e.g. consistency and/or variability) and quantity (e.g. number of data points). A traffic light colour-coded matrix of usability, based on the balance of quality and quantity, is shown in Figure 1 below.

Figure 1 Data quality and quantity matrix

		Data Quality		
		Low	*Medium*	*High*
Data Quantity	*Low*			
	Medium			
	High			

Estimating elasticities with too few observations (low quantity) or with data which lacks consistency or variation (low quality) is not acceptable, as is shown by the red squares. Data quality and quantity should be at least medium (the orange square). It is more acceptable if data of at least medium quantity is also of high quality or vice versa (green squares). In other words, in order to use such data, neither quality nor quantity can be low and preferably at least one of them should be high[5].

3.1.5 These assessed levels of quality and quantity give rise to an overall rating of data sufficiency which would be appropriate for different types of research:

- High sufficiency – data must be open to rigorous external challenge against other detailed datasets – e.g. to be used in determining local government funding for concessionary fares and/or reimbursement to bus operators;
- Medium sufficiency – data should be capable of 'peer review' but would not be intended to be used directly without some other manipulation or qualification – e.g. to be used in the conceptual development of policy options as part of a modelling exercise; and
- Low sufficiency – data would be used internally for purely background or theoretical work, e.g. as a knowledge-building exercise or to identify areas for further research.

3.1.6 In order to establish robust price-demand elasticity estimates for young people which could be used in modelling exercises or for other policy uses, it is considered that a medium-to-high level of sufficiency is required. As described below, the suitability of the data available during this project has been reviewed in light of this requirement.

3.2 EXISTING YOUTH CONCESSIONARY FARE SCHEMES

3.2.1 As with any detailed econometric study, the robustness of the outputs is ultimately determined by the quantity and appropriateness of the data inputs. As youth travel concessions are a discretionary area of local authority passenger transport activity and a matter of commercial judgement for bus operators, it is almost inevitable that the availability of data will be as complex and varied as the availability of the concessions themselves.

3.2.2 As a starting point to consider how an extensive dataset could be created to underpin the price elasticity of demand estimates, it was appropriate to review 'Table BUS0842'[6], published by the DfT as part of the series of bus statistics tables, which lists all Travel Concession Authorities (TCAs) and their responses to an annual survey about concessionary bus travel.

3.2.3 Table BUS0842 shows whether the TCA provides a concession for 'young people' (excluding statutory travel to school responsibilities) and whether a concession is provided by at least one bus operator in the TCA area. Due to the complexity and range of schemes, details of what each concession provides are not published. It is also noted that a definition of 'young people' is not given by DfT to TCAs for the purpose of this survey and therefore the responses cover varying age groups and are therefore likely to include concessions provided to children under the age of 16.

[5] The terms low, medium and high are subjective and are intended to give a broad indication of the data quality issues inherent to such a project.
[6] https://www.gov.uk/government/statistical-data-sets/bus08-concessionary-travel

3.2.4 In respect of 2013/14, 26 of the 89 TCAs outside London offered a youth concession. A youth concession was also offered by at least one commercial bus operator in 77 TCAs outside London, with the result that in 81 of the 89 TCA areas, some form of concession was available. It is also noted that a preliminary review of the TCA responses suggests that the responses are not necessarily consistent in respect of operator concessions, although this again may be due to the local interpretation of the age range covered by the survey's designation of 'young people'.

3.2.5 The TCA areas (outside London) have the following distribution against area classifications devised by the Department for Environment, Food and Rural Affairs (DEFRA)[7]:

Table 1 Youth Concession Schemes by Area Type

Designation	All TCA areas	TCA-provided concession	Operator-provided concession
Metropolitan	6	6	5
Urban	20	5	19
Small Towns	19	7	16
Rural	44	8	37
Total[8]	89	26	77

3.2.6 It is the general experience of the authors, from conducting similar studies and working for both bus operators and local authorities, that local authorities provide this type of data in more complete, timely and consistent format than individual bus operators. It would therefore be expeditious to seek data from authorities that provide youth concessions, however, the small number of TCAs in each of the different area types means that it would not be realistically possible to produce robust elasticities based on area types using only data from TCAs.

3.2.7 For youth concessions provided by bus operators, only rural areas are large enough in number (37 areas) to provide a broad base of data. Even then, a concession may exist but it may not cover the major bus operator(s) in the TCA, or may not be of sufficient scope to be relevant to this work or may not have had a price variation in the period covered by the available data.

3.2.8 Nevertheless, the principal data which is being sought (price of ticket, number sold and number of trips made using the ticket) are conventional metrics for any concessionary ticket scheme and therefore the primary issue is access to data in a uniform format, rather than the lack of data *per se*.

[7] http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/guide-method/geography/products/area-classifications/rural-urban-definition-and-la/rural-urban-local-authority--la--classification--england-/index.html

[8] Some areas have both TCA and operator schemes and therefore the total number of schemes is greater than the total number of areas.

3.2.9 The alternative approach to seeking data by individual concessionary schemes, is to approach one or more of the national bus operating groups, as they have operating subsidiaries in a range of area types, and are typically the dominant, or at least major, operator in each of their operating territories. The scale of the potential data available through these channels is reflected in the fact that, for example, Arriva has operations in 51 of the TCAs and FirstGroup has operations in 45, giving a significant spread of area types. It is however the case that most UK bus groups typically operate as multiple subsidiary companies and therefore may lack central systems to record and analyse such ticket sales and journey data and therefore do not have centralised resources to be able to support such a project for all subsidiaries, within the overall timescales of the project.

3.3 DATA SOURCING

3.3.1 In light of the considerations set out above, data gathering took place on the basis of two related strands:

- Identified locations which were known, from WSP | PB's previous work with local authorities and bus operators, to offer concessionary fare schemes targeted at 16–25 year olds (or a sub-set of these young people); and
- Local authorities who had responded with most interest to an enquiry from DfT to those authorities which had most recently provided a statistical return in respect of Table BUS0842.

3.3.2 Local authority and bus operator stakeholders were therefore approached to provide data on a commercially confidential basis, with a simple data template created to provide the following details, on a quarterly basis, over a five-year term:

- Ticket price;
- Passes on issue; and
- Number of journeys made.

3.3.3 The data template (included in Appendix 1) was intended to provide a starting point with stakeholders to discuss the administrative and technical issues of providing data, given the different structures and systems used to store and analyse such data, either directly from electronic ticket machines or from spreadsheets and databases used to manage concessionary fare schemes. If further research were to be carried out in future, this template could again be used as the starting point although it should be borne in mind that stakeholders may prefer researchers to extract and process the data from existing data files and reports as this is less labour-intensive for the stakeholder.

3.3.4 Concessions offered to young people fall broadly into two main categories:

- Discount card: a pass which entitles the holder to a reduction in the cost of travel, most normally for single and return tickets.
- Travelcard: a reduced-price season ticket which gives the holder the right to make multiple journeys within the period of validity.

3.4 DATA USED IN THE ANALYSIS

3.4.1 Over the course of the project, detailed data was provided from four areas however sufficiently detailed data for full inclusion in the analysis was only available from London (by Transport for London) and West Yorkshire (by Metro, the public transport brand of the West Yorkshire Combined Authority). A description of the particular youth travel schemes covered by each is provided below.

LONDON

3.4.2 Student and child fare discounts have been in place over many years, with amendments typically made in response to the priorities of the Mayor. As TfL also designs and controls the public transport network, acceptance is universal on buses in London – www.tfl.gov.uk/fares-and-payments/students-and-children.

3.4.3 The data collection template was completed for Travelcards, Bus & Tram Passes and Pay As You Go (only applicable to 16+ Zip Oyster Photocards) for each quarter of the past 5 years, with a summary of ticket products listed below.

Table 2 TfL Youth Tickets

Ticket product	Usability for study
Travelcard season, 16–17 (not in full time education)	As the average price of tickets sold is influenced by both price change (inflation) and dynamic changes in the number of tickets purchased during the period of data, it is not possible to use this data directly in the estimation of elasticity because the average price per ticket sold varies in each quarter, although the price of the ticket to the passenger remains constant. Therefore, using this data would wrongly suggest that changes in demand are a result of changes in ticket prices.
Bus/Tram Pass season, 16–17 (not in full time education)	The cost of a weekly season ticket is fixed, and subject to a simple annual price increase, and is therefore usable for the estimation of elasticity.
Pay as you go, 16–17 (not in full time education)	As with the Travelcard season ticket, the average price is again based on dynamic changes in ticket purchases, not just the annual price increases. The data is therefore not suited to elasticity estimation.
Travelcard season, Job Centre Plus	In addition to dynamic changes in the average value of tickets sold, the scheme rules allow for passholders to be over the age of 25. Without the personal details of the passholders, it cannot therefore be guaranteed that all passholders are under the age of 25. Accordingly, this data has been rejected.
Bus/Tram Pass season, Job Centre Plus	Despite the fixed price of the pass, and as with the Travelcard season ticket for Job Centre Plus, the data has been rejected due to unknown proportions of passholders over the age of 25.
Pay as you go, Job Centre Plus	As with the 16–17 year old Pay as you go data, the prices are based on dynamic changes in ticket purchases, and not just the annual price increases. Similarly, the data has not been used in the elasticity estimation.
Travelcard season, 18+ students	As explained for the other categories of Travelcards, the prices of tickets sold are influenced by both price change (inflation) and dynamic changes in actual ticket purchases. Therefore, it

	is not possible to use this data directly in the estimation of elasticity.
Bus/Tram Pass season, 18+ students	As with the version for 16–17 year olds, the weekly season ticket is fixed (subject to a simple annual price increase). The data is therefore usable for the estimation of price elasticity.

3.4.4 In addition to the purchase of the weekly Bus and Tram Passes, eligible young people must be in possession of an age-appropriate photocard. The principal conditions applicable to the 16+ Zip Oyster Photocard and the 18+ Student Oyster Photocard are as follows

16+ ZIP OYSTER PHOTOCARD

Price
There is a £10 administration fee to obtain the photocard.
Thereafter, the travel costs are:

- Child-rate 7 Day, Monthly or longer period Travelcards and Bus & Tram Passes (usually 50% discount on the adult equivalent);
- Travel free on buses and trams (if age 16 or 17: a resident of a London borough, if 18: a resident of a London borough and in full-time education); and
- Pay as you go at half the adult rate on bus, Tube, tram, DLR, London Overground and most National Rail services in London

Validity
The pass is valid on the respective modes (bus, Tube, tram, DLR, London Overground and most National Rail services in London) at any time, any week of the year until the expiry date (end of August based on age).

Eligibility
To apply for a 16+ Zip Oyster Photocard, the card holder must be aged 16 or 17 – and can live in or outside of London (even including non-UK applicants). The application process requirements are slightly different for each category but there are no further eligibility criteria, although the travel benefits are different for London residents.

18+ STUDENT OYSTER PHOTOCARD

Price
There is a £10 administration fee to obtain the photocard.
Thereafter, the travel costs are:

- 30% off the price of adult-rate Travelcards and Bus & Tram Passes; and
- If also in possession of a 16–25 Railcard, the discount can be added to the 18+ Student Oyster photocard to get a 34% discount on off-peak pay as you go fares and off-peak daily caps on Tube, DLR, London Overground and most National Rail services in London.

Validity
The pass is valid on the respective modes (bus, Tube, tram, DLR, London Overground and most National Rail services in London) at any time, any week of the year until the expiry date (course end date, or no longer eligible).

Eligibility
To apply for an 18+ Student Oyster Photocard, the requirements are:

- A student aged 18 or over;
- Living at a London address during term time;
- Enrolled with a participating school, college or university registered on the TfL scheme; and
- Meeting one of a further 6 educational qualifying criteria (to meet the criteria of being a 'student').

WEST YORKSHIRE

3.4.5 As the body which has taken over the functions of the former West Yorkshire Passenger Transport Executive, the West Yorkshire Combined Authority (WYCA) continues to support and develop concessionary, multi-operator and multi-modal ticket schemes within its area. These are in addition to ticket products provided on a commercial basis by the individual transport operators - http://www.wymetro.com/TicketsAndPasses/Under26/.

3.4.6 The range of discounts for (school) children, students and young people is being migrated to the 'MCard' smartcard platform - for example, the former StudentPlus MetroCard, which was available to all young people under the age of 22, has been expanded to include all young people under the age of 26 and rebranded as '16–25 MCard'.

3.4.7 The data collection template was completed for half-fare single and Day tickets and School Plus (for 16–18 year olds) and 16–25 MCard tickets. The nature of the ticket products, and the method of data collection by Metro, gives rise to the following table of usability of ticket products:

Table 3 West Yorkshire Youth Tickets

Ticket product	Usability for study
Half-fare single	The data gives the average price of all half-fare tickets sold (as established by means of surveys) and therefore primarily reflects the different journey lengths of the single tickets, in addition to any changes in price (determined by the bus operators). Consequently, the data would be misleading for the purposes of elasticity estimation and has therefore not been used.
Half MetroDay	This product was introduced in January 2013 and although it has been subject to a price increase in the meantime, there are too few quarters of data to be able to use this ticket type in the elasticity estimation.
School Plus MCard	The data gives the number of weekly and monthly tickets sold during each month, with each ticket type only subject to one annual fares increase. These have been converted into quarterly volumes resulting in the data being usable for the elasticity estimation. It is noted that the data provided covered the whole eligible age range of 11–18 years. 16–18 years olds were isolated using 'smart' cardholder data from 2014 and apportioned to the total in order to remove 11–16 year olds.
16–25 MCard	As with School Plus MCard, the data gives the number of weekly and monthly tickets sold during each month. These tickets are subject to an annual fares increase and the sales have been converted into quarterly volumes in order to be used in the elasticity estimation. No disaggregation has been made of the age range.

3.4.8 In addition to the purchase of the weekly and monthly passes, eligible young people must be in possession of an age-appropriate photocard. The principal conditions applicable to the Scholar's PhotoCard (for School Plus MCard) and the 16–25 PhotoCard are as follows:

SCHOLAR'S PHOTOCARD

Price

There is a £5 administration fee to obtain the PhotoCard (or a replacement).
Thereafter, the PhotoCard can be used to get the following travel within West Yorkshire:

- Half-price bus and train travel;
- Half-price rail season tickets; and
- A School Plus MetroCard (costing a fixed price per week and month).

Validity

The Scholar's Photocard is valid for travel anywhere in West Yorkshire at any time of day, including evenings and weekends (except NightRider and special event services).

Eligibility

The Scholar's PhotoCard is for 16 to 18 year old students in full-time education. It is valid from the start of the school or college academic year until the following 15th September or the day before the holder's 19th birthday (whichever is first).

The applicant must apply in person and provide:

- A completed application form, supplied by their school or college and which will stamp and date the form or other official notification such as a course offer letter and then complete an application form at a Travel Centre;
- Proof of residence in West Yorkshire; and
- Proof of identity and age.

16–25 PHOTOCARD

Price

The first 16–25 PhotoCard is issued free of charge (subject to the applicant providing proof of age and a photograph). A £5 fee is charged for replacement PhotoCards.
Thereafter, the travel costs are:

- 16–25 rate weekly, monthly and termly passes.

Pay as you go is expected to be introduced during 2015.

Validity

A 16–25 PhotoCard is valid for unlimited travel throughout West Yorkshire on any bus or train, at any time day or night, based on whether it is loaded with a weekly, monthly or termly pass. The 16–25 PhotoCard is valid until the day before the cardholder's 26th birthday.

Eligibility

To apply for a 16–25 PhotoCard, the card holder must be aged between 16 and 25 and can live in or outside of West Yorkshire.

3.5 UNUSED DATA SOURCES

3.5.1 Other local authorities contacted during the research, with schemes which were able to produce relevant data at a sufficient level of granularity and without needing to make unreasonable assumptions, were Kent and Staffordshire County Councils. Unfortunately however, due to the timing of this study compared to price changes made by the respective schemes, there were insufficient data points (i.e. numbers of quarters of data) to be able to include the available data in the full analysis. Nevertheless, as a pointer to potential future research, a description of the particular youth travel schemes covered by each is provided below.

KENT

3.5.2 Kent County Council provides a discretionary travelcard scheme, which was developed following the very popular development of an under-16 equivalent, "Kent Freedom Pass".

3.5.3 "The Kent 16+ Travel Card" was introduced in September 2012 as part of a reviewed policy for post-16 travel assistance. The card is accepted by all operators in a scheme run by the local authority, based on concessionary travel legislation to secure operator participation.

Table 4 Kent Youth Ticket

Ticket product	Usability for study
Kent 16+ Travel Card	The template provided was completed for the quarters when the pass has been available (9 quarters). This gives a clear indication of pass cost, take-up of passes and number of journeys. During the first two years of the scheme, the price did not change (at £520 per annum) and therefore with a price change only taking place from September 2014 (reduced to £400 per annum), data following the price change is limited.

Price

There is no administrative fee – the cost of the pass is for the cost of travel, which is a maximum of £400 per student per annum (for those with a household income of more than £20,818 or in receipt of the full vulnerable learner bursary payment).

Participating schools, colleges and employers can reduce the cost of the pass to the student by using their 16 to 19 Bursary Fund, according to the following parameters:

- Students whose household income is between £16,191 and £20,817 a year could pay between £200 and £400;
- Students whose household income is less than £16,191 (the same as the authority's free school meals criteria) a year could pay no more than £200;
- An employed 16 to 19 year old apprentice who can demonstrate hardship caused by travel pressures could pay between £200 and £400; and
- Payment by instalment can also be arranged through schools, colleges and employers and part-year cards are also available, reducing by £60/£70 for each of the 6 terms.

Validity

The pass is valid on all local bus services where the passenger journey starts or finishes in Kent (excluding Medway) at any time, any week of the year until the expiry date (end of August each year).

Eligibility

To apply for a K16+TC for the period 1 September 2014 – 31 August 2015, every applicant must fulfil the following requirements:

- Over the age of 16;
- A resident of Kent (i.e. whose household pays Council Tax to a Kent district council for KCC services); and
- Attending a participating school, college, work-based learning provider or apprenticeship provider.

STAFFORDSHIRE

3.5.4 Staffordshire County Council (which does not include the urban conurbation of Stoke-on-Trent) operates a discretionary flat-fare scheme for young people, secured by negotiation on reimbursement terms with the participating bus operators.

3.5.5 Although flat fare (child) schemes are known to exist in areas covered by Passenger Transport Executives (PTEs), county council schemes have tended either to be of a travelcard (i.e. unlimited travel with a season ticket) or discount (e.g. half the adult fare) nature, rather than flat fares and therefore Staffordshire's scheme is considered to be fairly unique in nature.

Table 5 Staffordshire Youth Ticket

Ticket product	Usability for study
Bus Pass for Under Twenties	The £1.20 flat fare had been £1 since the scheme's launch in September 2011, so while there has been a price increase, there is only one quarter's worth of data to show the new level of demand and less than 5 years' worth of data in total, which restricts its potential usage. Under-16 and over-16 passes are however distinguished by colour and on-bus ticket sale recording is also split by age, and also by peak (0630 – 0930 hours, although only since 2014) and by boarding in/outside Staffordshire. Additionally, a travel survey of cardholders was conducted in December 2014 covering travel patterns and journey purpose (and achieved approximately 1,000 replies).

Price

There is a no fee to obtain the Bus Pass (although replacements cost £10).
Thereafter, the Bus Pass can be used to get the following travel within Staffordshire (excluding journeys wholly within Stoke-on-Trent):

- £1.20 flat fare bus travel for any journey which starts or ends in Staffordshire; and
- A range of attractions and other businesses (not related to transport) offer additional discounts to card holders.

Validity

The Bus Pass is valid for travel starting or finishing anywhere in Staffordshire at any time of day, including evenings and weekends.

Eligibility

The Bus Pass is for 11 to 19 year olds resident in the county, irrespective of being in full-time education (school or university) or working. It is valid from the passholder's 11th birthday until their 20th birthday.

A renewed card must be applied for from the 16th birthday as under-16 cards expire the day before the 16th birthday.
The applicant can:

- Apply online; and
- Visit a local library (if under 16, with parent/guardian) with proof of identity.

3.6 SCOPE OF DATA

3.6.1 The data researched in detail during the project has covered the following types of authorities, with the respective area classification shown in brackets:

- London (London);
- PTE, West Yorkshire (Metropolitan);
- County Council, South East (Rural);
- County Council, West Midlands (Rural);
- Unitary Authority, South East (Urban);
- PTE, West Midlands (Metropolitan);
- PTE, North East (Metropolitan); and
- Unitary Authority, South East (Small Towns).

3.6.2 This means that no data has been investigated in detail from the South West, East of England, East Midlands, Yorkshire and the Humber and the North West regions. There is also a predominance of 'Metropolitan' areas (London, West Yorkshire, West Midlands and Tyne and Wear) against 'Rural' authorities (Kent and Staffordshire). While the data in total is therefore not entirely representative of all local authorities in England, the process of seeking data and manipulating and standardising data across multiple sources was in line with the expectations of the WSP | PB project team, based on their extensive knowledge of local authority and bus operator ticket products and systems.

3.6.3 The consequent result that, of 8 potential sources, 2 areas have provided data of sufficient depth, scope and granularity is considered to be an accurate ratio for a study of this nature, but is not sufficient to enable a full-scale econometric analysis which would be needed to determine authoritative elasticity values. Extrapolating the number of data sources to all 81 geographic areas where a 'youth concession' is provided would mean that around 20 sources may be achievable if such a study were to be commissioned again in future, although this is by no means a guaranteed outcome as the age group(s) covered by respondents to the DfT's annual survey of local authorities will not always match the age range of this study.

3.6.4 It is important to stress that the unavailability of data to support the precise requirement of this research is in no way an omission or failure of local authorities and bus operators. All of their existing systems and processes are designed to meet the requirements of running each individual concession and cannot therefore automatically be expected to provide data which is neatly packaged in the form required for this type of econometric modelling. Moreover, as an area of discretionary policy for both bus operators and local authorities, the form of any concession can legitimately change radically over time and therefore some relevant schemes may only operate for a relatively short period (in terms of providing a time series of quarterly data).

4 ELASTICITY ESTIMATION

4.1 INTRODUCTION

4.1.1 A price elasticity of demand is a measure used in economics to show the responsiveness of the quantity demanded of a good or service to a change in its own price with all other factors remaining constant. It is calculated by dividing the percentage change in the quantity demanded by the percentage change in price.

4.1.2 Thus, a price elasticity of demand -0.1 would indicate that for a 10% increase in price demand would reduce by 1%. Under normal circumstances a price elasticity of demand is expected to be negative. In the case of bus usage, demand can be measured in terms of the number of passes issued or the number of trips made. From the point of view of a customer making a purchasing decision, passes issued would seem to be the more sensible metric for demand, because once the purchase is made additional trips are effectively costless; indeed a higher ticket purchase price may encourage greater usage so that the passenger feels that they have received value for money.

4.2 PROJECT ESTIMATION METHODOLOGY

4.2.1 Prior to receiving data to support the project, an initial methodology was developed to determine travel demand elasticity based on the WSP | PB project team's knowledge of the bus market.

4.2.2 The initial methodology considered the possibility of estimating a dynamic model so that short-run and long-run elasticities could be calculated, while highlighting that this depended on data availability and acknowledging it would be more likely only to be possible to estimate a long-term elasticity, which typically requires fewer observations. Nevertheless the following dynamic specification was proposed:

$$LnQ_t = \alpha + \beta_1 LnP_t + \beta_2 LnQ_{t-1} \sum_{i=3}^{n} \beta_i \, Ln(Conditioning\ Variables)_{it} + \epsilon_t$$

Where t is the time period indicator, Q is demand (patronage), P is a measure of the fare price, and 'Conditioning Variables' refers to other determinants of demand including service levels (i.e. supply), substitution effects (car ownership, fuel price) and also demographic factors -– deflating level data by population totals (e.g. service levels per capita) in order to remove scaling issues. In this model, the short-run elasticities are obtained directly from the coefficients equal to β_1 and the long-run fare elasticity would equal $\beta_1/1-\beta_2$.

4.2.3 The proposed methodology also considered possible identification problems because the model described above is a demand equation and does not directly account for supply-side changes. A separate supply equation or possibility of instrumenting for supply using an instrumental variable approach was proposed to resolve this. Panel data techniques such as fixed or random effects models were also suggested, but again this would require a greater availability of data.

4.2.4 It was also proposed to use the elasticity estimates from academic sources as a benchmark, around which to shrink estimates using Bayesian shrinkage methods. The Bayesian shrinkage methodology involves producing a weighted average between the youth population estimates and the more robust whole population estimates from academic sources. In practical terms this allows the model to trade off the robustness of the estimates from academic sources against the less certain characteristics of the (much smaller) sample of estimates for young people.

4.3 FUTURE ESTIMATION METHODOLOGY

4.3.1 Based on the findings from the pilot engagement with young people (as reported in Chapter 6), and assuming more detailed availability of background bus operating data, the following changes would be proposed to the estimation methodology.

4.3.2 The results obtained from the data are long-run elasticities, which is not considered to be a problematic outcome as policy tends to focus mostly on long-run effects. Short-run effects are associated with shocks and changes, and it takes some time for the effects of a change to affect a system. Hence more time periods are needed in order to investigate this type of behaviour and robustly estimate the associated short-run elasticities. This situation was considered initially and is described in paragraph 4.2.2.

4.3.3 As a result, it would be appropriate to adopt the alternative approaches suggested in the initial methodology:

(i) Long-term elasticity model

This is a simple estimation of patronage as follows;

$$LnQ_t = \alpha + \beta_1 LnP_t + \sum_{i=3}^{n} \beta_i \, Ln(Conditioning\ Variables)_{it} + \epsilon_t$$

The only difference between this model and the partial adjustment model is that the lagged trip per capita variable denoted by LnQ_{t-1} in the partial adjustment specification is dropped and thus the elasticity estimated is assumed to represent the long term elasticity.

(ii) Seasonal differences model as used by Kennedy (2013)

This model involves using annualised growth rates rather than absolute levels which is more likely to produce stationary time series which are robust over short periods and also reduce potential multi-collinearity (common correlations between explanatory factors) that occur when using levels data. To retain as much data as possible differencing quarter-on-quarter seasonally-adjusted data was preferred to using annual differences as in Kennedy (2013)[9].

4.3.4 Regarding the use of Bayesian shrinkage methods, this is a method that can only be applied with a larger number of elasticity estimates, so it remains an option to be considered. An alternative would be to view the individual estimated elasticities as part of a distribution, with each area/bus operator providing an observation to this distribution. As more estimates are added the distribution will build up and a better feel will be obtained for the average estimate. Again, however, much is dependent on getting more examples of youth concessionary schemes where changes to fares have occurred and where it is also possible to measure and to attempt to isolate the changes in demand that result.

[9] David Kennedy, (2013) – Panel data analysis of public transport patronage growth – an innovative econometric approach.

4.3.5 The Consumer Price Index (CPI) has been used to deflate value and price terms instead of the Retail Price Index (RPI) as this is understood to be more consistent with current DfT practice. Replacing the RPI with CPI has been suggested to be a better measure of the general basket of goods and service prices facing consumers as it excludes mortgage interest payments and some other housing component prices such as house depreciation, council tax, estate agent fees and building insurance which are included in the RPI.

5 INITIAL FARES ELASTICITY VALUES

5.1 INTRODUCTION

5.1.1 This Chapter presents the findings of the elasticity model estimations and begins with an examination of basic correlations among key relationships such as between price and passes and between trips per capita for different age groups and bus areas. Following this, some methodical considerations will be explained with relevance to the estimations and finally, the elasticity estimates will be presented and discussed including the relevance of the estimations to the values found in academic sources.

5.2 FINDINGS

5.2.1 An initial investigation of the relationship between bus ticket prices and bus usage measured by passes and trips per capita reveals a strong negative association for the 18–25 years age group. The correlations between bus usage and ticket price for the 18–25 age group in Metro (West Yorkshire) and TfL (London) bus operating areas fall in the range of around -0.6 to -0.8 i.e. as the cost of bus travel increases, the number of passes and trips decreases. The data for ticket prices were available for two age groups for Metro (16–18 and 18–22 (including mature students)) and TfL (16–18 and 18 + students) and as a result our analysis follows these groupings. For Kent, only the 16 – 19 grouping was available.

5.2.2 The correlation between real ticket prices for students (primarily aged 18-22 but also including mature students) and the number of tickets per capita (both in logs) indicates a strong negative correlation at -0.80 for Metro (West Yorkshire) over the 20 quarters (2009Q2 – 2014Q1) in the sample. A similarly high correlation of -0.81 was found for the relationship between ticket prices and passes per capita for Metro. Correlations for the 16-18 age group (school students in full time education) were much weaker with only a 0.03 correlation for trips per capita and -0.44 for passes per capita. This is further illustrated in the scatterplots below where the negative slope can be seen in Figures 2 and 3 for passes and trips per capita respectively.

Figure 2 Passes versus Real Fares, Metro 18–22+

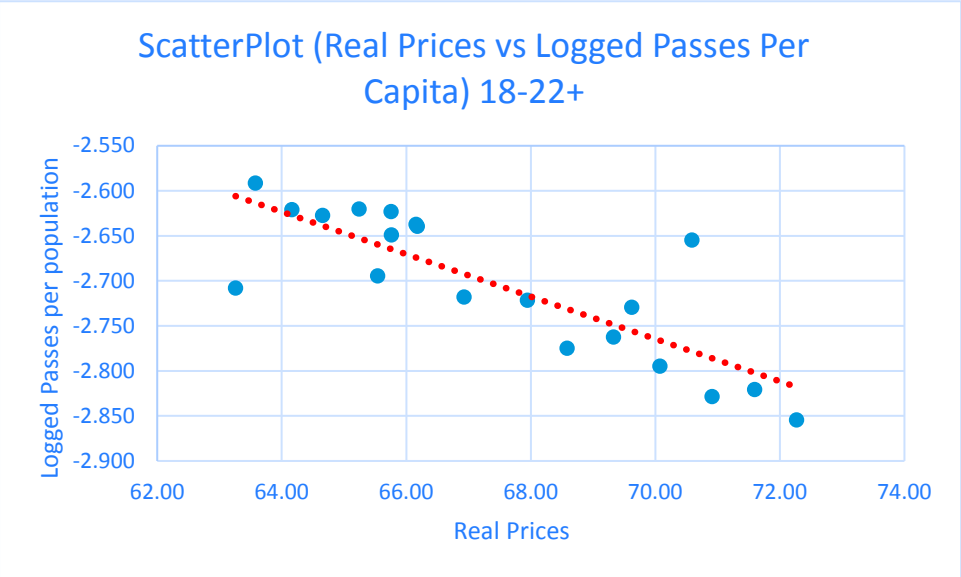
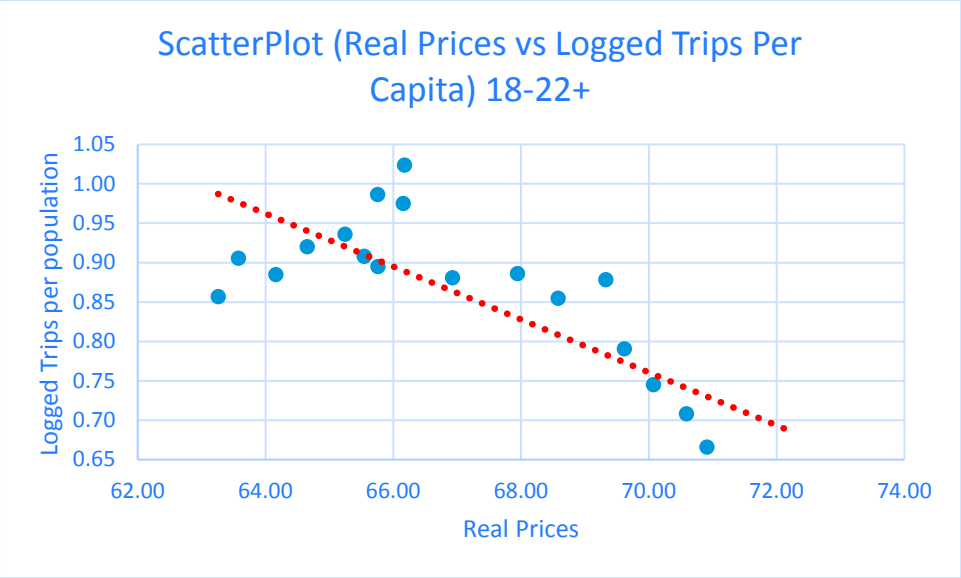


Figure 3 Trips versus Real Fares, Metro 18–22+



5.2.3 Similarly negative associations between price and passes/trips are found for TfL (London) also over a period of 20 quarters (2009Q4 – 2014Q3) and illustrated in Figures 4 and 5 respectively below. A large real price increase between 2009Q4 and 2010Q1 can be seen by the single data point plotted towards the left of the figures. As this represents an actual price change it is retained in the dataset and is not treated as an outlier[10]. The correlations are not as strong as those found for Metro with real price and passes per capita found to have a correlation of -0.72 and the correlation of real price with trips per capita is lower again at -0.66. Although these correlations do not imply causation, they are of the correct sign and size to be consistent with the background literature. For the 16-17 age group the correlations are weaker again at -0.57 for passes per capita and -0.52 for trips per capita.

[10] The elasticity calculations were also tested by removing the outlier in the TfL data, however this produced coefficients which were multiple times larger than the estimations which included it. Although the sign of the coefficient remained negative, the outlier was demonstrated to contain important information about the price changes in the sample and their relationship to passes and trips and therefore has been retained in the sample and estimations.

Figure 4 Passes versus Real Fares, TfL 18+

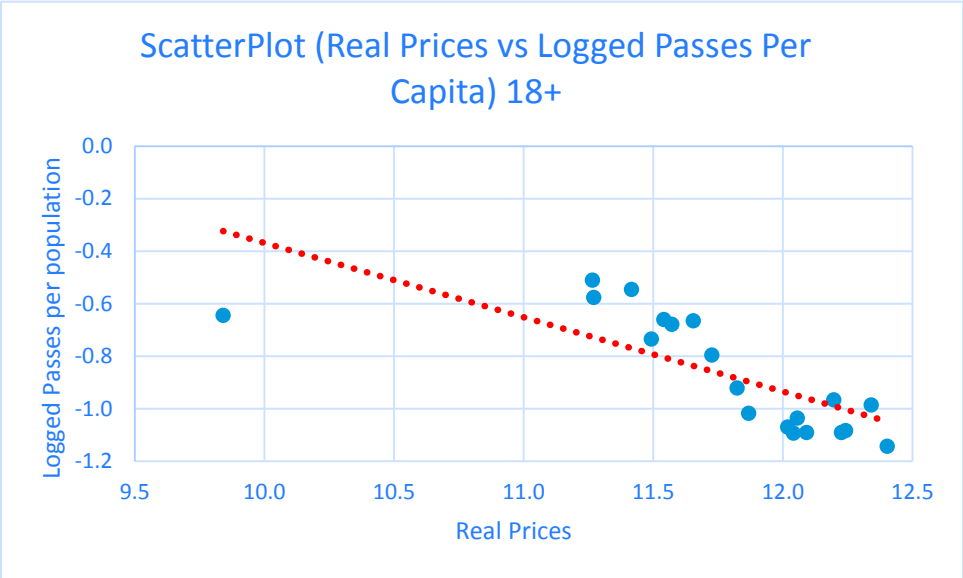
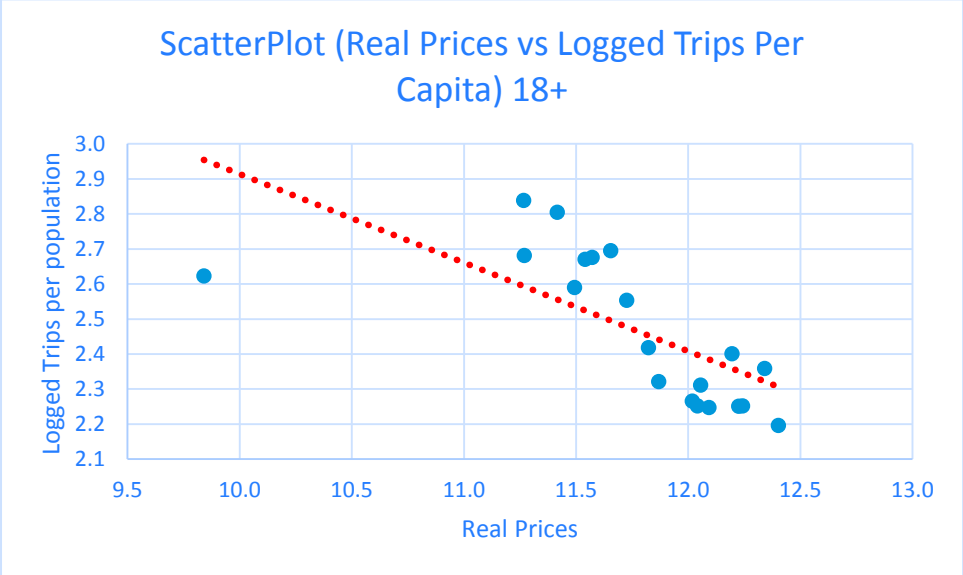


Figure 5 Trips versus Real Fares, TfL 18+



5.2.4 With regards to Kent, a negative slope is once again seen when plotting real bus ticket price against both trips and passes per capita for 16–19 year olds (the only age group available) illustrated in Figures 6 and 7 below. The correlation is particularly strong between real price and passes per capita at -0.91 but lower for trips per capita at -0.73. The difference in price correlations with passes and trips is larger than that found for TfL and Metro although it should be noted that difference is negligible for Metro. It must also be noted that only 10 quarters of data (2012Q3-2014Q4) were available for youth tickets in Kent and even fewer for other potential covariates, such as service levels (7 quarters) and car ownership (6 quarters), which means that there are too few observations for a regression model.

Figure 6 Passes versus Real Fares, Kent 16–19

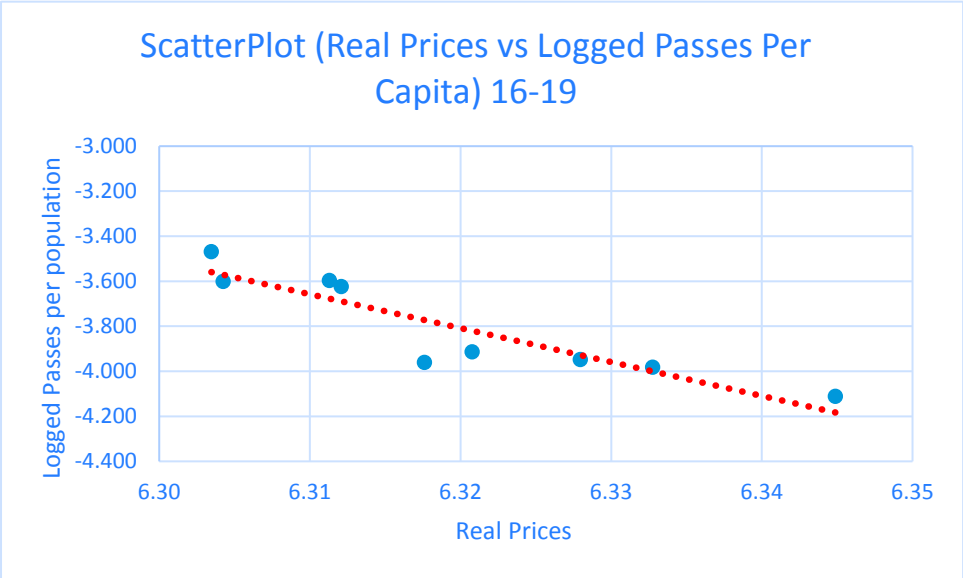
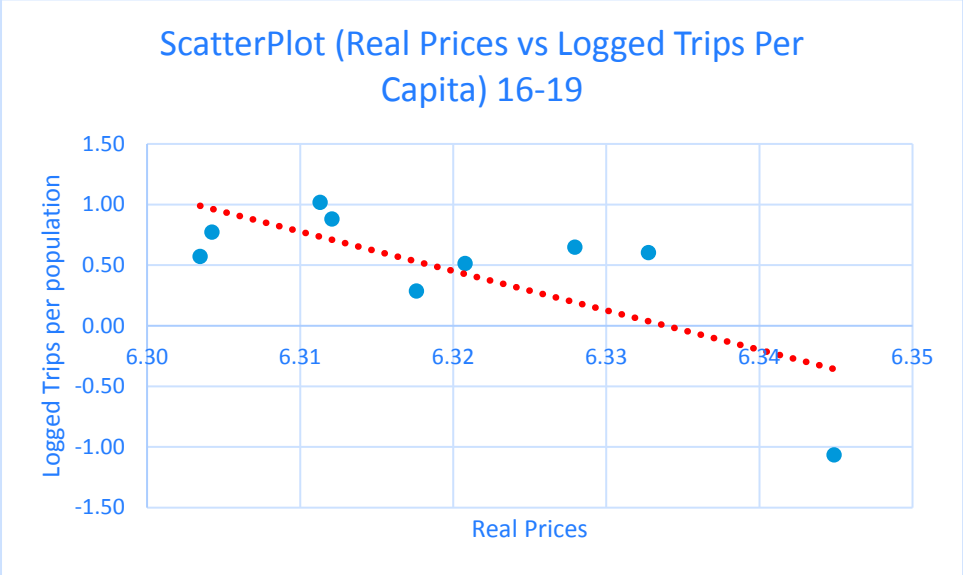


Figure 7 Trips versus Real Fares, Kent 16–19



5.2.5 As stated previously, simple correlations between variables do not imply causation because they do not account for other factors affecting the demand relationship. Therefore, for the TfL and Metro data sets, basic regression analysis was conducted to include other factors that might affect demand for bus transport.

5.2.6 Initial models excluding service levels and using trips per capita as the dependent variable produced a reasonable (correctly signed and significant[11]) elasticity estimate for Metro 18–22 year olds and mature students but the estimate for TfL for those aged 18+ students was positive and insignificant. However, the specifications in these models do not take into account supply-side effects and as such the models are unlikely to be correctly identified. This is because some of the demand changes are likely due to supply effects, i.e. changing service levels, and do not reflect changes in bus ticket prices.

[11] The threshold at which variables are accepted as significant or rejected as insignificant is used in the context of the 90% level of confidence i.e. the statistical probability that the effect of the variable exists and is different from zero.

5.2.7 Therefore service levels were included, which causes the price elasticity estimate to become insignificant in Metro while for TfL it remains positive and insignificant. Although in one sense the inclusion of service levels helps deal with the problem of identification, there is now an issue of endogeneity[12] to deal with between supply and demand, (i.e. the difficulty in identifying supply and demand effects in a single equation), which seemingly makes things worse in terms of the parameter estimates.

5.2.8 It was therefore considered better to include service levels and then attempt to deal with the problem of simultaneity rather than to simply ignore it (as some studies do). In theory there are methods (e.g. IV[13], 2SLS[14]) that could be used to deal with simultaneity, but in practice (in particular for this research) data limitations prevent their use. For this project, the WSP | PB project team felt that the option of restricting the service impact to 0.6 was a pragmatic one which both allows estimation and improves the results by taking into account estimates of service elasticity in the literature[15].

5.2.9 Regarding how service levels affect demand, certainly a lagged effect might be expected, but in a long-run model this becomes somewhat irrelevant as (in theory) time effects are not important. This is because in the long run, sufficient time has passed for all dynamic effects to have worked their way through the system. However, changing the specification in such small samples which this project is working with would inevitably show differences with the contemporaneous effect.

5.2.10 Without sufficient observations or an alternative indicator to use as an instrument it is reasonable to assume that changes in service levels move in proportion as changes in demand, i.e. the coefficient on service levels is restricted to 0.6, based on academic evidence[16]. This has the effect of helping to remove the effect of endogeneity on the model. Other explanatory factors are also restricted to zero (i.e. effectively remove their influence from the model) if they are insignificant. In the case of the final regression for TfL, it was decided that the coefficient on real petrol prices, although statistically significant, is incorrectly signed. There is less theoretical justification for including real petrol prices in the model specification for London as a mode of personal transport rather than as a passenger (which is captured in the car ownership variable) and so this is restricted to zero. The result is that the price elasticity estimates for both Metro and TfL become significant with the expected signs.

5.2.11 These preliminary results provide plausible estimates of long-term price elasticities at least for the approximate 18–25 age groups in table 6 below. In the 18–25 age group, a 10% increase in the price of youth tickets would result in a 9.23% decrease in the number of trips per capita.

5.2.12 The Metropolitan and London estimates found here are higher than those found in existing academic sources typically used by DfT for the entire population. However, higher elasticities for young people are not illogical given the suggestions found in relevant literature and the finding of strong initial correlations between price and trips described above.

5.2.13 Furthermore, these elasticities are also consistent with the findings of the focus groups where participants discussed strong price sensitivity to different pricing scenarios. The qualitative results also point towards the willingness of young people to walk rather than use paid alternatives, such as taking the bus, which is not captured in these econometric models due to a lack of data. The willingness to walk, particularly among students, may further explain the greater magnitude of elasticity estimates for young people in comparison to the broader population in Metro and TfL.

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[12] A basic consideration when thinking about estimation of a demand equation is how to ensure proper identification of supply versus demand effects. The key problem is one of endogeneity (i.e. something related to both demand and supply but not in itself a variable). If supply-side influence is not take account of the result is an omitted variable problem, with the omitted variable (service levels) correlated with key

5.2.14 One counterintuitive result is found for the younger sub-sample in Metro for trips per capita. The elasticity is positive for trips per capita but negative for passes per capita for the same sample. As the relationship with price is more closely linked to passes purchased rather than the trip taken this would seem to be a better measure of the relationship between price and demand. As additional trips on a purchased pass have no additional monetary cost, an increase in the price of bus passes could potentially encourage holders to make better use of the bus pass by taking more trips. This could include taking trips in preference to other transport modes such as by car, or to make trips that they may otherwise not have made[17], in order to reclaim some of the increased cost of the pass. Thus the relationship between price and bus usage could indeed be positive even when the relationship with passes per capita is negative and this interpretation is corroborated by some of the feedback provided within the focus groups. However, the same result is not found in the TfL data which would seem to indicate at least some diversity in characteristics between the two locations, and a wider study of various bus areas would be needed to develop such an analysis. While no definitive conclusions can be drawn at this stage given the limitations of the data, this could be an area for specific exploration in any future research.

5.2.15 Additional models were estimated for both younger and older age group sub-samples; TfL (16–17 and 18+ students) and Metro (16–18 and 18–22 and mature students) as well as using passes per capita as an alternative dependent variable (both shown in table 6 below) but these did not yield sensible results, at least for the Metro area.

Table 6 Youth bus travel elasticities

Bus Area	Passes per capita	Trips per capita
Metro 16–18	-0.7685	1.4468**
TfL 16–17	-3.2856**	-3.3578**
Metro 18–22	-0.9726***	-0.9225*
TfL 18+	-2.9206***	-1.9752**

*** indicates significant at the 1% level of significance
** indicates significant at the 5% level of significance
* indicates significant at the 10% level of significance

explanatory variables such as price, as well as the dependent variable. However, if service levels are included there is a problem of simultaneity with influence moving in both directions in the equation (i.e. supply influencing demand and demand influencing supply).

[13] IV, or instrumental variables, uses a variable as an instrument correlated with supply but not with demand to control for endogeneity in the estimation.

[14] 2SLS or two-stage least squares is a technique which first regresses the endogenous supply variable on the other variables in the equation, keeps the predicted values of the equation estimated in the first stage and then controls for the predicted values in the second equation to account for endogeneity in the estimation.

[15] See Balcombe et. al (2004)

[16] According to the findings of Balcombe et. al (2004)

[17] Journeys made simply because more travel is possible at no additional charge is the concept of generated travel, which is a key element for local authorities and operators when agreeing reimbursement for concessionary fares schemes.

5.2.16 Regression analysis to test the internal validity of these young people's elasticities with existing ones available from DfT's evidence base has not been undertaken since there is insufficient information from the project data upon which to base judgement. In the event of more data becoming available shrinkage or Bayesian techniques[18] could be considered which would take account of the whole population estimate, but in the meantime it is interesting to see what values could be obtained in a 'relatively' unconstrained model.

5.2.17 More generally, the elasticities available from DfT's evidence base are not the result of a single model that has been estimated; but rather a culmination of different studies i.e. a meta-analysis which averages over different estimates (Balcombe et al, 2004). DfT provided a summary of these estimates as shown in Table 7.

Table 7 Balcombe et al (2004) elasticities

Variable	Timescale	London	Metropolitan areas and conurbations	Small towns	Rural	Average	Sources
Fare	Short Run	-0.41	-0.3	-0.5	-0.6	-0.42	Balcombe et al (2004)
	Long Run	-1.2	-0.6	-1.0	-1.2	-1.0	Balcombe et al (2004)

5.2.18 The limited number of estimates which this research has provided suggests that the price elasticity of demand for young people is higher than that for the average of the population, and these estimates are supported by the results of the focus groups. The estimates help to indicate that young people have a greater responsiveness to price than is currently represented in the Balcombe et al (2004) study for the population as a whole. However, due to both the limited number of areas on which this observation is based, and the insufficient quality and quantity of the data for the purpose, it is not possible to estimate an average price-demand elasticity for young people would be or indicate the likely range of elasticity values. At the very least, and in the absence of any further bus data being obtained, a meta-analysis would be required which researched and gathered together an evidence base on young people's travel behaviour and from which a well-founded estimate could be made (in a similar manner to that adopted in Balcombe et al (2004)).

[18] Bayesian shrinkage estimators use estimates from a broader sample (i.e. population for all ages) to anchor estimates of the sub-sample (i.e. youth sub-sample). This method is known to improve upon the accuracy of the estimates by incorporating additional information as shown in Maddala et al., (2011) 'A Comparative Study of Different Shrinkage Estimators for Panel Data Models'

6 FOCUS GROUPS

6.1 OVERVIEW

6.1.1 To gain an insight into young people's rationale behind travel choices and specifically bus ticket choices, two focus groups were held in Leeds to add context to the initial fare elasticities based on the operator data from Metro. The groups were held in a centrally located hotel in Leeds, to provide easy access for participants.

6.1.2 In particular, interrogation of the National Travel Survey can explore whether walking behaviour noted within the Leeds groups is replicated elsewhere and to what extent this is related to population density (i.e. metropolitan areas and London affording easy access to all facilities while less populated areas will have greater distance to travel to local amenities).

6.2 GROUP RECRUITMENT AND MODERATION

Group participants were recruited by specialist recruiter Fieldforce, against a defined specification based on WSP | PB's substantial experience of such engagement, as follows:

- Group to last 90 minutes;
- Aim for eight participants in each group, recruiting 10 to allow for drop out, with attendance incentive of £40;
- All participants to live within 20 miles of Leeds, to travel by bus at least two days a week and to have been doing so for at least three months;
- No one to have attended a group in the past 6 months; and
- No friendship group recruitment (i.e. for a group travelling together, only one person can be recruited from that group).

6.2.1 It is important in constructing a group profile to ensure some synergy across the group to aid bonding, while at the same time ensure there is representation across a range of factors that are considered pertinent to the study. Amongst young people in particular, it is important that the participants are fairly close in age since younger participants may feel totally unconnected with people five or more years older than themselves. The specified group composition is shown in Table 8, along with the actual composition on the evening:

Table 8 Focus group composition - specification and actual

	Group 1 - 8 participants		Group 2 - 6 participants	
	Actual	Specification	Actual	Specification
Male	4	4	5	3+
Female	4	4	1	3+
Student	4	4	3	2+
Working/apprentice	2	1+	2	2+
NEET	2	2	1	2+
Driver	3	2+	2	2+
Learning to drive	3	2+	2	2+
No driving licence	2	2+	2	2+

6.2.2 It should be noted that the groups were held on Wednesday 21st January, when snow had been falling during the afternoon, and it is therefore not surprising that the latter group had fewer participants. A topic guide was developed and approved by DfT in advance of the focus groups and was used to steer conversation to ensure all relevant issues were covered, but it is noted that within qualitative research the guide acts as a prompt to the moderator and is not administered verbatim.

6.2.3 The groups were moderated by a researcher with extensive qualitative experience, with a colleague taking notes and assisting participants on arrival. It was noted that the groups were being conducted in compliance with the Market Research Society Code of Conduct[19], and agreement was unanimously given for the groups to be recorded for analysis purposes, assuming participant anonymity. In both groups, all participants contributed to the discussion, with anonymised transcripts of the recordings provided separately to this report.

6.3 FINDINGS FROM FOCUS GROUPS

6.3.1 As set out in a topic guide developed to structure the discussion, the sequence of the discussion began by understanding the participants' travel behaviour in general terms, then sought to understand car travel options (as an alternative mode to bus travel) and to conclude by seeking reactions to concessionary bus fare scenarios.

GENERAL TRAVEL BEHAVIOUR

6.3.2 Participants were recruited if they travel by bus at least two days a week and have been doing so for the last three months. However two participants (one in each group) had recently passed their driving test or had a car which was changing their travel behaviour, using the car for long distance trips rather than local trips as the cost of car parking in Leeds is expensive and buses are the cheaper option.

6.3.3 According to participants, students walk most local trips of up to half an hour, taking other forms of transport when the weather is bad or if it is late in the evening. Some may walk one way, and then use another mode to get home if they were carrying heavy items. Those who are unemployed reported that they tend to walk where they need to get to irrespective of distance and rarely travel outside their local area.

'I would say [I walk up to] *about six miles. I walk loads.'*

Female 16–19 NEET

'I walk for about half an hour. Nothing over half an hour.'

Male 16–19 Student

I'll walk anywhere if I've got the time… if I'm skint'

Male 20–25 NEET

6.3.4 A low level of cycling was noted, with no-one in group 1 and half in group 2. Amongst cyclists, the main use is as a transport mode locally or to/from the railway station.

'I have a bike but I don't really use it….Everywhere is in walking distance.'

Male 16–19 Student

[19] https://www.mrs.org.uk/pdf/mrs%20code%20of%20conduct%202014.pdf

'It gets me to the train station quicker so I can get out of bed later.'
Male 20–25 Working

6.3.5 One participant cycles to the station, taking him approximately 15 minutes, which is slightly quicker than the bus route. He chooses this route for convenience and because it is more time efficient. Others noted that cycling along the towpaths was an effective way to get around locally.

6.3.6 The majority of group 1 travel by train once or twice a month, often to travel home from their place of study, and book in advance to maximise the value of their ticket. Many have student rail cards which they have acquired through a student bank account, which entitles them to a free 4-year 16-25 Railcard. Another point was raised that if you need to get to a place you have to pay no matter what it costs, with this discussion illuminating the issue of fare evasion:

I don't think price matters, because if you've got to get somewhere you're going to pay it whatever, or you're going to get on the train and hope you don't get stopped by the ticket man. I don't think price matters. Male 20–25 Working

6.3.7 In general there is not a lot of rail travel amongst participants, with group 2 acknowledging fare evasion and little incentive for those working to purchase a 16–25 Railcard.

I think there's an 80:20 chance of getting stopped… To be honest I think everyone's jumped on the train….Not from the mindset of doing it deliberately, it's more sort of like you're on there and you've got your fingers crossed. Male 20–25 Student

6.3.8 Our evidence of rail fare evasion amongst young people confirms observations from train operators, as highlighted by Passenger Focus:

'Research including data from the National Passenger Survey and qualitative research with passengers on the Northern and TransPennine Express (TPE) services examined passenger' views of the current operations and identified the issues that the new franchise should address. ……. Other concerns include access, security and staffing at smaller stations, availability of information, the adequacy of timetables for modern lifestyles, and confusion about fare structures and rules, ***with notable unease about levels of fare evasion'***

6.3.9 However it is difficult to quantify since few people are likely to admit fare evasion within the context of a structured travel survey. It is well documented that young people are under-represented in survey response on any subject[20] hence national datasets need to be interpreted carefully. While DfT may be surprised by apparent low awareness of the 16–25 Railcard, it is more a question that if they are not paying at all, then why get a discount card? Some of those making regular long distance rail journeys (students) did have a railcard, which had been obtained free through their bank account.

6.3.10 The groups were split between those who use the bus around twice a week, and those who use the buses nearly every day. Only those travelling by bus at least four days a week are using weekly or daily tickets as these afford best value for money. One student does have an annual pass (£280), paid for by his mother, and as a result travels by bus nearly every day. The remainder however were not inclined to make such a significant investment due to lack of funds and doubt that it would be cost effective.

6.3.11 It is most economic for many to buy single tickets, particularly for those only paying single fares of £1, while a few travelling further afield are using day tickets at £4 each. Awareness of a recent fare rise for day riders was also not universal, suggesting that unless a day or weekly ticket offers significant benefit they are not reviewed regularly.

'I just get singles from Headingly into the City Centre, it is £1, but on the other one it is £3.80 for a day ticket.' Male 16–19 Student

'No, It is £4 for a day rider, they have gone up. It used to £3.80, but it is gone up.'
Female 16–19 NEET

'I use a single, our office is based in town, and one of the lads will probably give me a lift home, so I gamble on a single. But if not I get the same back.'

Male 16–19 Working

6.3.12 There was discussion over use of single operator day riders versus multi-operators, with annoyance over having to let buses pass if they have a sole operator ticket. One girl believes that multiple operator tickets would encourage more people to use the bus, with an Oyster-card equivalent for Leeds.

'I think it is stupid if you get a bus ticket, that you can't use it on different services, like Arriva and stuff like that. It is still part of West Yorkshire, so I don't understand why you have to pay extra to get another bus. … it would encourage more people to do it, [use the bus more]'
Female 16–19 NEET

6.3.13 Several agreed that a stored value card would be beneficial and preferred this form of ticketing to a general day or weekly ticket. Several people take the bus into town and hope to get a lift back, therefore saving even more money. The bus is a desirable method of travel to avoid the inconvenience of parking/travelling around the city centre.

6.3.14 All were happy with the level of bus service available (both during the day and evening), although over-crowding is an issue, with many never getting a seat. The older age group generally considered that bus fares were reasonable, although some cited other cities (Sheffield / Manchester) that offer better value. No complaints were raised over the scope of destinations served by buses, although one participant noted that buses in Sheffield are better quality, offering comfortable leather seats and are uncrowded. Megabus is used for long distance travel, where destinations are served, as it is cheaper than rail.

CAR TRAVEL OPTIONS

6.3.15 The frequency of car use by participants is given in Table 9.

Table 9 Car trips by participants

Travel Behaviour	Car Trips			
	4+ / week	**1-3 week**	**1-3 month**	**Less**
Group 1	1	2	1	4
Group 2	1	2		3

[20] E.g "Response Problems in Surveys - Improving response & minimising the load", Cornish (2002)

6.3.16 It is interesting to note that most of the participants do not use car as their main mode of travel, with half travelling less than once a month by car. These results should be taken into consideration in any future research, particularly when reviewing behaviour in non-metropolitan areas, where car usage is likely to be greater.

6.3.17 There is little appetite to drive. Those who can drive or are learning to drive cite cost as the prohibiting factor, coupled with parking costs. Those currently not driving are not desperate to do so and believe that public transport in and around Leeds suits their current needs. Young people are driven by value for money options of travel, and even though many of the younger age group think bus travel is too expensive, it is still cheaper to travel by bus rather than travel by car. Very few consider the impact of their travel choice on the environment, with cost being the key factor. One male participant has a full motorcycle licence but had to sell his bike to help pay for university.

6.3.18 The majority have some access to a car and travel with other people (either access from friends or with parents). As a passenger, most do not share the cost of fuel, unless travelling longer distances and then divide fuel costs by passengers in the car.

It depends who you're with. For instance there's quite a few of us who go back to Manchester frequently, like weekends basically, and it works out a lot cheaper for all of us having to get in one car and drive home than it is to get a train home, a bus or a Megabus. For a Megabus it' £5 each, which is £20[for four], While when we go to Manchester and back [by car] we only pay £5[on petrol each] Male 20–25 Student

REACTION TO CONCESSIONARY FARE SCENARIOS

6.3.19 Three scenarios were presented to each group, with participants split into two teams to discuss their initial reactions to each scenario. One member of each team then fed back their opinions to the whole group. The scenarios were presented with the higher value in each case, with subsequent group discussion around whether a reduction in the price would change opinion.

6.3.20 This methodology was applied to ensure all members of the group spent time considering the scenarios in detail and allowed for more robust debate at the end of the section.

6.3.21 **Scenario A: Weekly multi-operator bus pass £24/£20** – for all aged 16–25, regardless of whether in education/working etc. [NB – for West Yorkshire, the current fare for the weekly multi-operator 16–25 MCard is £21.50].

6.3.22 Weekly bus passes are not considered good value for money by most participants, mainly because weekly usage does not make them cost effective. Multi-operator tickets however are viewed positively. The attitude is the same if the ticket is priced £24 or £20, however, the lower fare is considered more reasonable, and if they were frequent bus users, some would use this option. Some think that the option would be good for long distance travelling or if you are travelling more than twice a day, other than that, this option would work out more expensive than other bus tickets.

If you were doing long distance travelling or travelling more than twice a day. Other than that it would work out more expensive. Female 16–19

Maybe £20 instead of the £24[to make it better value] *It would make more sense; people would be more interested in buying it if it's £20 than £24 as well.*
Female 20–25 Working

6.3.23 A participant currently looking for work noted that it was unfair to have 'student offers' as it segmented students from other young people who may also have a low income and welcomed generic 16–25 validity. However, another suggested that there should be an income ceiling (e.g. £18,000 pa) where anyone earning more than this was excluded from the concessionary fare offer.

6.3.24 **Scenario B: Weekly sole-operator bus pass £16/£12** – for all aged 16–25, regardless whether in education/working etc. [NB – for Leeds only, the current Arriva weekly price is £14.00; the First weekly price is £14.50].

6.3.25 Single operator passes are seen as only useful when the destination is provided exclusively by one operator. Many felt it unfair to pay more for multi-operator ticket but also recognised the need to agree reimbursement settlement from multi-operator tickets. Monthly tickets were viewed as potentially better value for money than weekly.

I think it's too expensive and you'd never get all the bus companies to agree - they're be too busy rowing between in each other on how much money it costs. If you put like a monthly bus ticket on it rather than a weekly and you made the monthly bus ticket cheaper I think a lot more people would be more willing to use it.

Male 20–25 Student

6.3.26 The single operator weekly fare (First) is £14.50 so participants would not pay any more than this. However some were unaware of this current offer, and thought c. £16 reasonable for passengers travelling longer distances (over five miles), five times a week, and made good value against £4/day, which is the current day ticket price with First.

6.3.27 Some think that the weekly tickets encourage people to use buses more and if they purchased a weekly pass they would choose to use the bus in situations where previously they would have chosen to walk.

If I pay for a weekly ticket I'd milk it. I'd be getting on the bus everywhere. I'm one of them guys that goes to like an all you can eat buffet and walk out with carrier bags you know.

Male 20–25 Student

6.3.28 **Scenario C: Discount card costing £10/£20 to give a third off all adult fares** – for all aged 16–25, regardless whether in education/working etc., for one year. [NB – for West Yorkshire, the current Scholar's PhotoCard for 16–18 year olds costs £5 for the academic year].

6.3.29 This scenario was on assumption that a discount would be available on all adult ticket products including daily and weekly savers. Everyone thought the idea of a discount card was useful as it provided a financial benefit even when travelling twice a week or less.

Yes you're still going to get a discount every time you use it. I'd probably save more money that way I think. Female 20–25 Working

6.3.30 The annual fee was discussed in depth, with few aware of the cost of an annual 16–25 Railcard [currently £30]; with those who had the card being given it free as part of their banking package. All participants would be willing to pay an annual fee of £10 and even £20 was acceptable since a saving could be assumed at current levels of bus usage. Few had 16–25 Railcards with some voicing the actual process of getting the discount card as their barrier to use, especially as it requires a photo – others noted that online applications were available using digital photos.

6.3.31 Both groups concluded that Scenario C is the most cost effective, and that they would take this up if it was available. When asked if there were any other ideas that they would like bus operators to consider, the suggestion was made for a group saver that would benefit friends going out for a night out.

I think it's too expensive. I think as well if you're going to have a group saver, if you're wanting a suggestion I don't think there's a group saver on the bus at the minute is there?
Male 20–25 Student

7 CONCLUSIONS

7.1 INITIAL ELASTICITY ESTIMATION

7.1.1 With limited data (around 20 quarters of observations) from each of the study areas (TfL, London and Metro, West Yorkshire), the WSP | PB project team have managed to produce price-demand elasticity estimates which are broadly in line with expectations arising from literature reviews and other pre-existing knowledge. Data availability issues preclude much in the way of advanced estimation techniques, but it is nonetheless encouraging that where price variation is observed for youth concession schemes, there is generally a negative link with passenger demand. In addition, this link appears to be more price-sensitive than the traditional research literature estimate for the general population, although without more in-depth analysis this result is uncertain.

7.1.2 Where it is possible to differentiate, the data for 18+ age groups also are tending to give more sensible results than the younger age group (16–18). This is possibly because the younger group are coming from a free (school-age) transport environment whereas the older group (18+) are more adapted to making their own choices about travel arrangements. More research on this would be helpful to explore whether there are significant differences in fare elasticity between different age cohorts across the 16–25 spectrum.

7.2 FOCUS GROUPS

7.2.1 The focus groups identify that travel behaviour amongst young bus users (16–25) and attitudes towards bus fares are different from older bus users. One significant difference is the willingness of young people to walk considerable distance rather than pay to use an alternative mode. It is stressed, however, that these findings are based on residents within a metropolitan area, and further research is needed to verify if such travel behaviour is manifest amongst young people living in areas of less population (and bus service level) density.

7.2.2 It could be useful to undertake further groups amongst graduates aged 22–25 who are now working to examine rail travel behaviour post-university to see if previous railcard usage when a student has translated to ongoing 16–25 Railcard usage. Although no investigation has been made at this stage, relevant data could potentially be more plentiful as the 16–25 Railcard is a universal discount card for young people.

7.2.3 Nearly all group participants are using the bus less than four times a week, which appears to be a watershed over whether a weekly travelcard offers better value than single trip or daily tickets. Thus there is evidence that suggests that only very frequent young bus users are in the scope of concessionary period tickets.

7.2.4 Amongst a range of different concessionary fare models, a discount card valid for a year proved most popular since this will provide immediate monetary benefit to bus users travelling once or twice a week by bus.

8 FUTURE RESEARCH

8.1 NEXT STEPS

8.1.1 The initial estimates provide an interesting insight to the price elasticity of young people's bus travel and indicate that further research to refine these would be worthwhile. Interrogation of the National Travel Survey is recommended to review walking behaviour across the age cohorts and also to consider whether there is statistical justification to review data within the disaggregated age bands or whether behaviour is more a factor of working status.

8.1.2 An alternative to performing a large quantitative survey amongst young people, could be to perform further qualitative research to verify similarities and differences in fare elasticity across the following segments:

- Geography – urban, small town/rural;
- Age – 16–18, 19–21, 22–25 and
- Working status – Student, working/apprentice, NEET.

8.1.3 In respect of econometric estimation, the main requirement is for sufficient observations (i.e. a number of operator areas with youth concessionary schemes where price variation can be observed). It is difficult to be prescriptive about how many are needed, other than 'more is better', subject to any resource constraints. What can be done in terms of advanced and alternative estimation techniques depends on the amount of relevant data which can be obtained for the number of bus operating areas:

- If a reasonable number of schemes (perhaps around 15–20, each of which would have sufficient data) could be found for each type of area, it would be possible to test whether different types of area (e.g. metropolitan, rural etc.) exhibit different price-responsiveness; and
- If, on the other hand, it is not possible to obtain so many, a more general approach would be needed to answer a less specific question: whether young people on average are more price-responsive than the general population.

8.1.4 This project has proved that youth concession schemes can in theory and, in some cases, in practice provide the necessary data for this type of analysis, but that it is not an automatic feature of all youth concessions.

8.1.5 In the absence of sufficient quality data being obtained, another option is to use existing literature to see whether there are estimates of young person's price-demand behaviour from other locations around the world. It is possible that more studies exist where data are more readily available, and if this were the case then judgements could be made as to whether, and how, such information could be transferable to the UK context.

8.1.6 Ideally, a combination of the qualitative analysis and the more data-driven econometric work is the best way to answer the question of whether (and why) young people have different price-demand sensitivity than the general population.

8.1.7 This is certainly the case in London, where the fixed number of schemes is (for the purposes of this research) rather limited and would benefit greatly by more qualitative information on young persons' travel habits and attitude to price. In other geographical areas, the study has generally highlighted the limitations of data in terms of how fares are divided across age groups and also the restricted number of explanatory variables. The focus group work would help to improve understanding of age-related price sensitivity and non-quantifiable factors that affect bus use – this does not mean that the qualitative work will be able to directly change any of the econometric estimates, but rather they can help to nuance the results by adding more context to the findings.

8.1.8 While future research will of course depend upon the priorities and resources of the DfT, the in-depth understanding of the data needed to underpin elasticity estimations illustrated in this research enables an informed opinion to be given on the appropriateness of the principal options which can be considered to exist for further research. In any event, this research should be capable of being used as the starting point from which to carry out further tailored investigation.

8.1.9 The data gathering approaches reported in this project have proved that it is indeed possible to obtain some datasets which are appropriate to elasticity estimation. In addition to the requirements of data sufficiency, data gathering does of course remain dependent upon the participation and goodwill of third-parties (local authorities and/or bus operators at the local level) and is therefore considered to be an option which carries a reasonable degree of risk. The principal advantages and disadvantages are given below:

Table 10 Advantages and disadvantages of quantitative research using youth concessionary fare scheme data

Advantages	Disadvantages
Would result in full completion of study, based on the most robust methodology	Lack of certainty that sufficient data is available
Would strengthen stakeholder engagement about youth bus travel	Potential need for significant manual resources to obtain and process the data
	Risk of insufficient stakeholder engagement

8.1.10 Potential locations for future data sourcing do of course include those which have provided data for this research, even where it was not used due to the time series not being long enough at this time. In theory these areas could be augmented by locations which confirm that a youth concession is provided in the DfT's annual survey of local authorities and which have some other relationship or data sharing arrangement with the DfT, e.g. Better Bus Areas (where authorities have already become more involved in the finances of the bus network), Smart Cities (which are implementing smartcard ticketing) or any area which is advanced in plans for Bus Franchising (and which will therefore need to understand the existing bus market and ticket range in detail).

8.1.11 Apart from the North East, West Midlands and West Yorkshire, who were engaged with as part of this research, no assessment of ticket scheme applicability or approach has been made at this stage to the areas listed in Table 11. Such an approach could however be made by DfT in advance of commissioning further youth bus travel research in order to improve the data provision process.

Table 11 Possible locations for future data sourcing (alphabetical order)

Location	Better Bus Area	Smart City	Confirmed Franchise interest	Youth Concession scheme
Bristol (West of England)	✓	✓		✓ (operator)
Cornwall			✓	
Leicester		✓		
(Greater) Manchester		✓	✓	✓ (operator)
Merseyside	✓	✓		✓
North East		✓		✓
Nottingham	✓	✓		✓ (operator)
South Yorkshire	✓	✓		✓
West Midlands		✓		✓
West Yorkshire		✓		✓
York	✓			✓ (operator)

On this basis, potential data exploration could be best to take place in Bristol (West of England), (Greater) Manchester, Merseyside, Nottingham and South Yorkshire, although if successful this would again result in strong input from metropolitan and urban areas and no input from rural areas and small towns.

8.1.12 Another possible approach is for online qualitative research with young people. Although this project has focused on the analysis of concessionary ticket scheme data, it would be possible to adopt an approach based more on direct engagement with young people, particularly in those areas which have been identified as having had a recent price change. In the event that any concessionary ticket scheme owners have carried out their own customer surveys, it may also be possible to incorporate the findings from such surveys in any future research.

8.1.13 Such an approach would give the opportunity to contrast the reported findings of the focus groups in West Yorkshire with other locations and to consider all of these in light of the National Travel Survey, although it would not support full econometric analysis as the sample size(s) would not be statistically significant. The principal advantages and disadvantages of this approach are given below:

Table 12 Advantages and disadvantages of qualitative research with young people

Advantages	Disadvantages
Increases learning and understanding, consistent with previous stages of project	Only provides qualitative insight, rather than comprehensive statistical analysis
Focus groups can be organised effectively and reliably using existing materials	Limitations of subjective inputs by young people

8.1.14 On balance, qualitative work could reveal insights about changes in travel habits and the attitudes of young people to bus travel, although it would fall short of being able to provide a robust elasticity value to include in modelling of concessionary fare scenarios, which requires quantitative analysis.

Appendix A

DATA REQUEST TEMPLATE

DfT Youth Travel - 16 - 25 year olds
WSP | Parsons Brinckerhoff data provision template

Ticket Name:						
Year	Quarter	Ticket price	Passes on issue	Journeys made - PEAK	Journeys made OFF PEAK	Change to price, validity, eligibility etc
2015 - 2016	1 July - 30 September 2015					
	1 April - 30 June 2015					
2014 - 2015	1 January - 31 March 2015					
	1 October - 31 December 2014					
	1 July - 30 September 2014					
	1 April - 30 June 2014					
2013 - 2014	1 January - 31 March 2014					
	1 October - 31 December 2013					
	1 July - 30 September 2013					
	1 April - 30 June 2013					
2012 - 2013	1 January - 31 March 2013					
	1 October - 31 December 2012					
	1 July - 30 September 2012					
	1 April - 30 June 2012					
2011 - 2012	1 January - 31 March 2012					
	1 October - 31 December 2011					
	1 July - 30 September 2011					
	1 April - 30 June 2011					
2010 - 2011	1 January - 31 March 2011					
	1 October - 31 December 2010					
	1 July - 30 September 2010					
	1 April - 30 June 2010					
2009 - 2010	1 January - 31 March 2010					
	1 October - 31 December 2009					
	1 July - 30 September 2009					
	1 April - 30 June 2009					

Passes on issue = this is the total number of passes available to be used in the quarter, not just the number issued in the quarter
Journeys made = this is the recorded number of journeys made by the holders of the passes
Change to price, validity, eligibility etc = this is to record any changes which would affect the number of passholders. If none, leave blank

ON

Appendix B

ECONOMETRIC ESTIMATIONS

Model 1 – Metro; base specification, dependent variable is trips (18–22+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18–22+	-1.3786	0.5055	-2.73	0.016
Unemployment*	0.0516	0.0170	3.04	0.009
Car Ownership*	3.6606	2.2820	1.60	0.131
Petrol Price	-0.1314	0.2119	-0.62	0.545
Constant	26.5444	11.0707	2.40	0.031

Note: R^2 = 0.7946, Adjusted R^2 = 0.7359, all variables except petrol are logged
*Variable is per population aged 18–24

Model 2 – Metro; including service level, dependent variable is trips (18–22+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18–22+	0.5624	1.0271	0.55	0.593
Unemployment*	0.0599	0.0157	3.81	0.002
Car Ownership*	2.5048	2.1173	1.18	0.258
Petrol Price	0.1705	0.2379	0.72	0.486
Service Levels*	2.5836	1.2270	2.11	0.055
Constant	0.2208	15.9592	0.01	0.989

Note: R^2 = 0.8468, Adjusted R^2 = 0.7879, all variables except petrol are logged
*Variable is per population aged 18–24

Model 3 – Metro; imposing restrictions, dependent variable is trips (18–22+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18–22+	-0.9225	0.4634	-1.99	0.065
Unemployment*	0.0525	0.0152	3.45	0.004
Car Ownership*	3.5792	2.0076	1.78	0.095
Petrol Price	0.0000	(omitted)		
Service Levels*	0.6000	(constrained)		
Constant	21.3848	9.6953	2.21	0.043

Note: all variables except petrol are logged
*Variable is per population aged 18–24

Model 4 – TfL; base specification, dependent variable is trips (18+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18+	0.6131	1.3614	0.45	0.661
Unemployment*	-0.0531	0.0695	-0.76	0.459
Car Ownership*	-10.6051	3.1808	-3.33	0.006
Petrol Price	-2.3791	1.2711	-1.87	0.086
Constant	-57.0426	19.1890	-2.97	0.012

Note: R^2 = 0.6620, Adjusted R^2 = 0.5494, all variables except petrol are logged
*Variable is per population aged 18–24

Model 5 – TfL; including service level, dependent variable is trips (18+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18+	0.0159	1.2351	0.01	0.990
Unemployment*	-0.1277	0.0709	-1.80	0.099
Car Ownership*	-13.5653	3.1429	-4.32	0.001
Petrol Price	-2.3229	1.1224	-2.07	0.063
Service Levels*	0.6702	0.3196	2.10	0.060
Constant	-75.5476	19.1013	-3.96	0.002

Note: R^2 = 0.7585, Adjusted R^2 = 0.6488, all variables except petrol are logged
*Variable is per population aged 18–24

Model 6 – TfL; imposing restrictions, dependent variable is trips (18+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18+	-1.9752	0.7414	-2.66	0.019
Unemployment*	-0.1355	0.0661	-2.05	0.061
Car Ownership*	-10.1012	2.5662	-3.94	0.002
Petrol Price	0.0000	(omitted)		
Service Levels*	0.6000	(constrained)		
Constant	-52.8411	14.8557	-3.56	0.004

Note: all variables except petrol are logged
*Variable is per population aged 18–24

Model 7 – Metro; base specification, dependent variable is passes (18–22+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18–22+	-1.3412	0.4696	-2.86	0.013
Unemployment*	0.0074	0.0157	0.47	0.646
Car Ownership*	0.7266	2.1202	0.34	0.737
Petrol Price	-0.0578	0.1968	-0.29	0.773
Constant	6.9511	10.2859	0.68	0.510

Note: R^2 = 0.6344, Adjusted R^2 = 0.5300, all variables except petrol are logged
*Variable is per population aged 18–24

Model 8 – Metro; including service level, dependent variable is passes (18–22+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18–22+	0.1369	1.0063	0.14	0.894
Unemployment*	0.0137	0.0154	0.89	0.389
Car Ownership*	-0.1536	2.0744	-0.07	0.942
Petrol Price	0.1721	0.2331	0.74	0.474
Service Levels*	1.9673	1.2021	1.64	0.126
Constant	-13.0934	15.6360	-0.84	0.418

Note: R^2 = 0.6969, Adjusted R^2 = 0.5803, all variables except petrol are logged
*Variable is per population aged 18–24

Model 9 – Metro; imposing restrictions, dependent variable is passes (18–22+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18–22	-0.9726	0.2707	-3.59	0.002
Unemployment*	0.0000	(omitted)		
Car Ownership*	0.0000	(omitted)		
Petrol Price	0.0000	(omitted)		
Service Levels*	0.6000	(constrained)		
Constant	-1.2498	1.1388	-1.10	0.288

Note: all variables except petrol are logged
*Variable is per population aged 18–24

Model 10 – TfL; base specification, dependent variable is passes (18+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18+	-0.0336	1.2004	-0.03	0.978
Unemployment*	-0.0444	0.0612	-0.72	0.483
Car Ownership*	-10.0429	2.8048	-3.58	0.004
Petrol Price	-2.7180	1.1208	-2.43	0.032
Constant	-55.2581	16.9206	-3.27	0.007

Note: R^2 = 0.7703, Adjusted R^2 = 0.6937, all variables except petrol are logged
*Variable is per population aged 18–24

Model 11 – TfL; including service level, dependent variable is passes (18+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18+	-0.4660	1.1578	-0.40	0.695
Unemployment*	-0.0984	0.0665	-1.48	0.167
Car Ownership*	-12.1865	2.9462	-4.14	0.002
Petrol Price	-2.6773	1.0522	-2.54	0.027
Service Levels*	0.4853	0.2996	1.62	0.134
Constant	-68.6587	17.9057	-3.83	0.003

Note: R^2 = 0.8145, Adjusted R^2 = 0.7303, all variables except petrol are logged
*Variable is per population aged 18–24

Model 12 – TfL; imposing restrictions, dependent variable is passes (18+) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 18+	-2.9206	0.7436	-3.93	0.002
Unemployment*	-0.1291	0.0663	-1.95	0.074
Car Ownership*	-9.0799	2.5739	-3.53	0.004
Petrol Price	0.0000	(omitted)		
Service Levels*	0.6000	(constrained)		
Constant	-48.0345	14.8999	-3.22	0.007

Note: all variables except petrol are logged
*Variable is per population aged 18–24

Model 13 – Metro; base specification, dependent variable is trips (16–18) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-18	1.0046	0.6195	1.62	0.127
Unemployment*	0.3826	0.1239	3.09	0.008
Car Ownership*	4.0964	1.3844	2.96	0.010
Petrol Price	0.4356	0.3134	1.39	0.186
Constant	16.1536	6.5321	2.47	0.027

Note: R^2 = 0.7946, Adjusted R^2 = 0.7359, all variables except petrol are logged
*Variable is per population aged 16–17

Model 14 – Metro; including service level, dependent variable is trips (16–18) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-18	1.5578	1.0811	1.44	0.173
Unemployment*	0.3485	0.1377	2.53	0.025
Car Ownership*	3.4014	1.7929	1.90	0.080
Petrol Price	0.5026	0.3375	1.49	0.160
Service Levels*	0.4873	0.7719	0.63	0.539
Constant	8.4989	13.8430	0.61	0.550

Note: R^2 = 0.8468, Adjusted R^2 = 0.7879, all variables except petrol are logged
*Variable is per population aged 16–17

Model 15 – Metro; imposing restrictions, dependent variable is trips (16–18) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-18	1.4468	0.6287	2.30	0.036
Unemployment*	0.1889	0.0869	2.17	0.046
Car Ownership*	4.8285	1.0405	4.64	0.000
Petrol Price	0.0000	(omitted)		
Service Levels*	0.6000	(constrained)		
Constant	14.6473	4.6343	3.16	0.006

Note: all variables except petrol are logged
*Variable is per population aged 16–17

Model 16 – TfL; base specification, dependent variable is trips (16–17) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-17	-4.5770	2.5973	-1.76	0.103
Unemployment*	0.2337	1.8347	0.13	0.901
Car Ownership*	12.8070	12.2696	1.04	0.317
Petrol Price	5.2028	1.9452	2.67	0.020
Constant	58.3842	52.4064	1.11	0.287

Note: R^2 = 0.6620, Adjusted R^2 = 0.5494, all variables except petrol are logged
*Variable is per population aged 16–17

Model 17 – TfL; including service level, dependent variable is trips (16–17) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-17	-4.5902	2.7157	-1.69	0.119
Unemployment*	0.1646	2.0648	0.08	0.938
Car Ownership*	13.5904	15.5043	0.88	0.399
Petrol Price	5.2726	2.1752	2.42	0.034
Service Levels*	-0.0627	0.6994	-0.09	0.930
Constant	62.1120	68.7095	0.90	0.385

Note: R^2 = 0.7585, Adjusted R^2 = 0.6488, all variables except petrol are logged
*Variable is per population aged 16–17

Model 18 – TfL; imposing restrictions, dependent variable is trips (16–17) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-17	-3.3578	1.4837	-2.26	0.039
Unemployment*	0.0000	(omitted)		
Car Ownership*	0.0000	(omitted)		
Petrol Price	0.0000	(omitted)		
Service Levels*	0.6000	(constrained)		
Constant	2.5746	3.1497	0.82	0.426

Note: all variables except petrol are logged
*Variable is per population aged 16–17

Model 19 – Metro; base specification, dependent variable is passes (16–18) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-18	-1.1463	0.8994	-1.27	0.223
Unemployment*	0.2630	0.1799	1.46	0.166
Car Ownership*	1.0718	2.0099	0.53	0.602
Petrol Price	0.6915	0.4550	1.52	0.151
Constant	6.8441	9.4832	0.72	0.482

Note: R^2 = 0.4315, Adjusted R^2 = 0.2691, all variables except petrol are logged
*Variable is per population aged 16–17

Model 20 – Metro; including service level, dependent variable is passes (16–18) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-18	-0.5850	1.5818	-0.37	0.717
Unemployment*	0.2284	0.2015	1.13	0.278
Car Ownership*	0.3666	2.6233	0.14	0.891
Petrol Price	0.7595	0.4937	1.54	0.148
Service Levels*	0.4945	1.1294	0.44	0.669
Constant	-0.9236	20.2539	-0.05	0.964

Note: R^2 = 0.4397, Adjusted R^2 = 0.2243, all variables except petrol are logged
*Variable is per population aged 16–17

Model 21 – Metro; imposing restrictions, dependent variable is passes (16–18) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-18	-0.7685	0.9208	-0.83	0.416
Unemployment*	0.0000	(omitted)		
Car Ownership*	0.0000	(omitted)		
Petrol Price	0.0000	(omitted)		
Service Levels*	0.6000	(constrained)		
Constant	-1.5582	3.1690	-0.49	0.629

Note: all variables except petrol are logged
*Variable is per population aged 16–17

Model 22 – TfL; base specification, dependent variable is passes (16–17) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-17	-4.4377	2.4285	-1.83	0.093
Unemployment*	0.2068	1.7155	0.12	0.906
Car Ownership*	11.1540	11.4723	0.97	0.350
Petrol Price	4.7475	1.8188	2.61	0.023
Constant	48.1427	49.0010	0.98	0.345

Note: R^2 = 0.7703, Adjusted R^2 = 0.6937, all variables except petrol are logged
*Variable is per population aged 16–17

Model 23 – TfL; including service level, dependent variable is passes (16–17) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-17	-4.3975	2.5302	-1.74	0.110
Unemployment*	0.4185	1.9237	0.22	0.832
Car Ownership*	8.7553	14.4452	0.61	0.557
Petrol Price	4.5335	2.0266	2.24	0.047
Service Levels*	0.1921	0.6516	0.29	0.774
Constant	36.7286	64.0158	0.57	0.578

Note: R^2 = 0.8145, Adjusted R^2 = 0.7303, all variables except petrol are logged
*Variable is per population aged 16–17

Model 24 – TfL; imposing restrictions, dependent variable is passes (16–17) per population

	Coefficient	Std. Err.	T-statistic	P-value
Real price 16-17	-3.2856	1.3553	-2.42	0.028
Unemployment*	0.0000	(omitted)		
Car Ownership*	0.0000	(omitted)		
Petrol Price	0.0000	(omitted)		
Service Levels*	0.6000	(constrained)		
Constant	-0.9258	2.8771	-0.32	0.752

Note: all variables except petrol are logged
*Variable is per population aged 16–17

Appendix C

BUS USER RECRUITMENT FORM

DfT Youth Concessions study

Serial No

YOUNG BUS USER RECRUITMENT

S1 **Gender**

Male	1
Female	2

S2 **Which of the following age bands do you fall into?**

16-19	1
20 -21	2
22-25	3
Over 25	CLOSE

S3 **Working Status of Respondent:**

Working - Full time (30+ hrs)	1
- Part-time (9-29 hrs)	2
Apprentice/ skills training	3
Seeking work	4
In full time education	5
In part time education	6
Looking after house/children	7
Other (specify)	8

Occupation of Chief Income Earner

Position/rank/grade

Industry/type of company

Quals/degree/apprenticeship

Number of staff responsible for

Class

A	1
B	2
C1	3
C2	4
D	5
E	6

S4 How many people, including yourself, live in your household and are aged

Under 5	
5-15	
16-60	
Over 60	

S5 **Which of the following groups do you consider you belong to?** SINGLE CODE ONLY

White	1
White and Black Caribbean	2
White and Black African	3
White and Asian	4
Any other mixed background	5
Indian	6
Pakistani	7
Bangladeshi	8
Caribbean	9
African	10
Chinese	11
Any other background	12
Refused	x

S6 **Do you have any long-term illness, health problem or disability which limits your daily activities such as walking or climbing stairs?** SINGLE CODE ONLY

Yes	1
No	2

S7 **How many cars or light vans are there in your household?** SINGLE CODE ONLY

1 car or light van	1
2 cars/light vans	2
3+ cars/light vans	3
None	4
Refused/don't know	5

Good morning, afternoon, evening. My name is ……, and I am carrying out a study on behalf of WSP for the Department for Transport. We are looking to recruit some young people to attend a group discussion in Leeds on the evening of Wednesday, 21 January. To help me to do this . I would appreciate a little of your time to answer a few questions as we are seeking to get a cross section of people

Q1 **Do you hold either a full or provisional driving licence?** SINGLECODE

Full driving licence	1
Provisional driving licence	2
Hold neither	3

Q2 **Please tell me how often, if at all, you personally travel by the following**
ASK 'A' ONLY IF HOLD A FULL DRIVING LICENCE

		4+/week	1-3 times a week	1-3 times a month	Every 2-3 months	Less often	Never
A	**Car driven by yourself**	1	2	3	4	5	6
B	**Car as a passenger**	1	2	3	4	5	6
C	**Buses**	1	2	3	4	5	6
D	**Trains**	1	2	3	4	5	6
E	**Bicycle**	1	2	3	4	5	6
F	**Walking**	1	2	3	4	5	6

Q3 **What is the main purpose of your bus journey today [or last bus journey]?**
SINGLE CODE

Travelling to/from work	1
Travelling to/from education (e.g. college, school)	
Shopping trip	2
Personal business (e.g. dentist, bank)	3
Visiting friends or relatives	4
Leisure trip (e.g. day out)	5
Other *(Please write in)*	6

Q4 **What ticket or pass do/did you have for this bus journey?**
SINGLECODE

Standard Single	1
Standard Return	2
Half Metro Day	3
StudentPlus/ SchoolPlus	4
16-25 MCard	5
Scholars Photo Card	6
FirstDay/ week/ month	7
Arriva Day Saver / weekly/monthly saver	8
Arriva mobile phone ticket	9
K-Card	10
PlusBus	11
Other (specify)	12
Don't know – ASK TO SEE TICKET AND CODE	

Q5 **How much did you pay for this ticket?**
WRITE IN :

Q6 IF USING A PASS (CODES 4, 5, 6, 7) ELSE GO TO Q7
How long have you been buying this type of ticket for your bus travel?

f

Less than a month	1
1-6 months	2
7-12 months	3
Over a year	4
DK	5

Q7 ASK ALL **Do you travel more, less or about the same amount by bus now as you did a year ago?**

More	1
Same	2
Less	3
Don't know	4

ASK ALL

Q12 **Would you be willing to take part in a group discussion on 21 January at xx location. You will receive £40 to thank you for your time in attending?**

Yes	1	……..
No	2	THANK AND CLOSE

IIF YES **What number would be best to call you on?**

WRITE IN Full tel. No	

Name:

email address

THANK AND CLOSE

Appendix D

GROUP DISCUSSION TOPIC GUIDE

Bringing together young people aged 16-25 currently travelling by bus at least two days a week for the last three months and at least four in each group that currently use bus passes. A break out session will comprise two subgroups of those of similar work status using colour coded badges but not defined to participants as such.

Group 1 – 18.00 – 19.30

- Aged 16-19, mix gender, half in education, at least two not in work or training and the rest in work.
- At least two learning to drive and a couple with full driving licences

Group 2 – 20.00 – 21.30

- Aged 20-25, mix gender, half working, at least two not in work or training, at least two in further education (either full or part time)
- At least two learning to drive and at least two with full driving licences and at least two with no driving licence at all (full or provisional)

GUIDE SECTION	NOTES	TIME (90 mins)
WELCOME AND INTRODUCTIONS Brief welcome and introduction to the event, agenda for focus group.	Orientates participants and outlines the 'rules' of the session, and provides more information about the event (including recording). Introduce area for discussion – bus travel in the local area Participants asked to introduce themselves to the group.	10 mins
1: CURRENT TRAVEL BEHAVIOUR	Overview of current travel by mode to understand where bus travel fits into young people's lives Group to discuss previous experience of travelling by bus around Leeds Journey purpose and frequency ■ Ticket used and reason for choice ■ Whether alternative modes available	20 mins
2: :CAR TRAVEL OPTIONS	Details of car use – whether a driver/learning to drive, and how bus travel fits into decision making v car	20mins
3: REACTON TO CONCESSIONARY SCENARIOS	Group to split into 2, each subgroups consider three bus concessionary pricing options	30 mins
4: SUM UP	Group asked to consider how their behaviour might be affected under certain weather scenarios, with information, and without (including how it has been in the past).	10 mins

TIMINGS	KEY QUESTIONS	NOTES
10 mins	WELCOME AND INTRODUCTION ■ Thank participants for taking part. ■ Role of WSP – gather all opinions: all opinions valid, respect views, disagreements OK. ■ Confidentiality: reassure all responses will not be traced back in reporting to individuals, no detailed attribution. ■ Explain recording method, why this is being done (i.e. transcription), and explain it would be helpful to talk one at a time. ■ Outline purpose of focus group. ■ Housekeeping: Toilets; mobiles; fire alarm. ■ **Ice-breaker**: Participants to introduce themselves and how often they travel by bus	**Welcome**: orientates participants, gets them prepared to take part and outlines the 'rules' of the event (including MRS and Data Protection Act guidelines) Gives a bit more information about the evening. 'breaks the ice' between participants and starts the conversations.
20 mins	**1: GENERAL TRAVEL BEHAVIOUR** ■ Do you drive? Are you learning to drive? • Do you have own car/access to car? ■ Do you get lifts to go to places? How often and for what purpose? ■ Do you cycle? • When, what reasons, how far? ■ How often do you walk? • When, what reasons, how far? ■ How often do you travel by rail? • What type of journeys? • What ticket(s) do you use? Why? ■ How often do you travel by bus? • What type of journeys? • How satisfied are you with the current bus services in terms of frequency and accessing places you want to get to? • What ticket(s) do you use? Why?	Finds out more about participants'' general travel behaviour and where bus fits into their overall travel pattern.

TIMINGS	KEY QUESTIONS	NOTES
20 mins	**2: <u>CAR TRAVEL OPTIONS</u>** **Amongst current drivers/learner drivers** ■ When do you decide to travel by bus rather than by car? • Probe for convince/reliability/comfort ■ If you have own car : • What does it cost you to run your car each month, including insurance, tax, MOT, and maintenance? • How does this cost compare with bus fares? ■ If do not have a car • Why do you not have you own car? • Running costs? Initial outlay to buy car? Parking? • Think environmentally better to reduce car usage **Amongst non-drivers** ■ When do you decide to travel by bus rather than by car? • Probe for convince/reliability/comfort ■ Are you planning to learn to drive? ■ If yes, will you continue to use the bus after you pass your test? Why? Why not? ■ How do you think bus fares compare to travelling by car, including cost of insurance, tax, MOT, and maintenance Average running costs travel by car for young people with less than 2 years driving experience in a small petrol car are £30 per week. (AA based data)	
30 mins	**<u>3: REACTON TO COSTING SCENARIOS</u>** (split group into two sub group by badge colour) Moderator: I would like you to get into two groups at either end of the room [BY BADGE COLOUR] In your group discuss each of the options shown on the cards labelled A, B, and C and write down on your flipchart your ideas about each. You have 5 minutes for each option, considering if you would buy the pass, if not why and what would you do instead. ■ Weekly bus pass of £24/ £20 for all aged 16-25 regardless whether in education/working etc. across all operators ■ Weekly bus pass of £22/ £16 for all aged 16-25 regardless whether in education/working etc. to use with one operator only ■ Discount card for all aged 16-25 regardless whether in education/working etc., costing £10/£20 per year to give a third off all adult fares Groups come back together and use rest of session to discuss the points raised.	Splits group to allow greater opportunity for less vocal members of the group to be involved. Use 15 minutes to come up with bullet point comments for each scenario. 15 minutes with spokesperson from each group giving response to each scenario and general discussion
10 mins	**<u>4. SUM UP</u>** Sum up, identify the key points and thank participants for involvement. Sign for incentives, asking participants to indicate if they are willing to be re-contacted in future (MRS)	Formal close of the discussion