

OFF-PEAK RAIL FARE FLEXIBILITY AND THE WIDER IMPLICATIONS ON ACHIEVING MODAL SHIFT

William Murchison
Loughborough University

1. INTRODUCTION

Evidence from the Autumn 2006 National Passenger Survey (Passenger Focus, 2007) reveals that overall rail user satisfaction is at its highest level since the National Passenger Survey was first commissioned in 1999 with 81% of rail users very or fairly satisfied with their rail journey overall. However this aggregate figure masks some underlying poor ratings and downward trends.

The issue of climate change is higher on the political agenda currently than has ever been known in the past with ministers and shadow ministers competing to outdo each other in the contest to demonstrate their green credentials. Cautious moves to increase Vehicle Excise Duty (VED) for the most polluting vehicles have been outlined by the Treasury with a similar if somewhat timid doubling of air passenger duty from £5 to £10 announced in the Pre-Budget Report 2006 (HM Treasury, 2006) which states that the increase is in recognition of the environmental costs of flying. This rise in environmental awareness has led to a greater focus on modal shift. It can be considered that achieving modal shift from the most polluting modes of transport (notably car and aeroplane) to more sustainable modes such as cycling, rail and other public transport would represent a quick-win.

During the off-peak hours and in the context of leisure travel, the inherent flexibility of car travel is great owing to low levels of congestion and low cost air routes are plentiful. Rail offers a quality product and passenger numbers have been increasing for a decade, however, could more flexible off-peak train tickets attract more motorists and airline passengers to switch to rail?

1.1 Background

Under current government policy, franchises are let under fairly prescriptive contracts and for relatively short timescales. Coupled with a congested network with a finite capacity, there are reasonably few opportunities for the franchisees to increase revenue other than increasing load factors and/or charging more for the rail 'product'. Ultimately, successful franchisees must aim to increase the number of people travelling and charge higher fares where the market will bear.

When specifying a franchise, government aims to strike a balance between determining what users of the service must pay and what taxpayers should contribute (DfT, 2007).

Much of the country's rail services operate to a peaked demand function, where very heavy demands for travel are placed on services for relatively short periods. In the commuter market this equates to the traditional 'travel-to-work' rush hours on Mondays to Fridays, whilst for the Intercity (longer distance) market this may be centred on Friday and Sunday evenings and weekday interurban business travel. After the rush is over, although train lengths may be reduced, many services have spare capacity.

Attracting customers to use services where capacity is available is a sensible strategy for private sector operators to grow revenues. In addition, encouraging existing users of oversubscribed peak services to switch to quieter services would result in efficiency gains. These two complementary strategies can be categorised as revenue growth and demand management respectively.

In recent years, most longer distance operators have introduced a range of discounted, off-peak single tickets, priced on a yield management, variable fare basis. These tickets are sold on a quota basis per train, and universally carry the caveat that travel must be on the train specified at time of booking. A full fare is payable if the booked train is missed which could be 5-10 times (more at peak times) the price of the ticket already purchased.

The introduction of these fare structures to rail routes in the United Kingdom has brought new marketing strategies heralding the headline cheap fares available such as "Edinburgh to London from £12.50". While lower fares can only be welcomed by rail users, it is important to note the word 'from' in that sentence. A prospective customer will only be able to guarantee obtaining that fare by purchasing it as soon as they find it available, otherwise, upon the next check, the quota may have been sold and the fare will have risen. Once purchased, the customer will be locked into using the service upon which they booked. Any change to travel plans (even half an hour) will be subject to a financial penalty.

Thus a trade-off situation exists, with operators offering low headline fares in exchange for all conventional flexibility over departure times and routeing being withdrawn. This pricing structure can be considered to assist with both the objectives of attracting additional customers to off-peak services to facilitate revenue growth opportunities, and of demand management by encouraging customers to travel on quieter services with the offer of cheaper fares.

The government regulates the price increases of two fare types: the Season and the Saver. Increases of price are restricted to RPI+1% per year. The Saver is an off-peak walk-on ticket (advance booking not required and available on all operators' services) and thus government does ensure that flexible off-peak travel is available for rail journeys. However, the operating periods of Savers is less regulated with many operators choosing to restrict the number of trains on which Savers are valid.

2. INTRODUCTION TO CONSUMER SURPLUS AND PRICE DISCRIMINATION

The rationale for the strategy of offering the heavily discounted advance purchase tickets can be explained using economic theory. When the rail operator charges a fare, there will be some consumers who would have been prepared to pay a higher price for that service. The difference between what they are willing to pay and what they actually pay is the consumer surplus. Put simply, the fare from Stonehaven to Aberdeen is £3.70, however there will be some groups of people who would be prepared to pay £4.70 for that service, and some who might even pay £5.70, perhaps up to one consumer who would be prepared to pay £10. Therefore operators employ a concept known as price discrimination in order to obtain the additional revenue that these consumers are prepared to pay. Figure 1 shows the revenue received (a function of price and quantity sold) for a given price of P_1 and the consumer surplus.

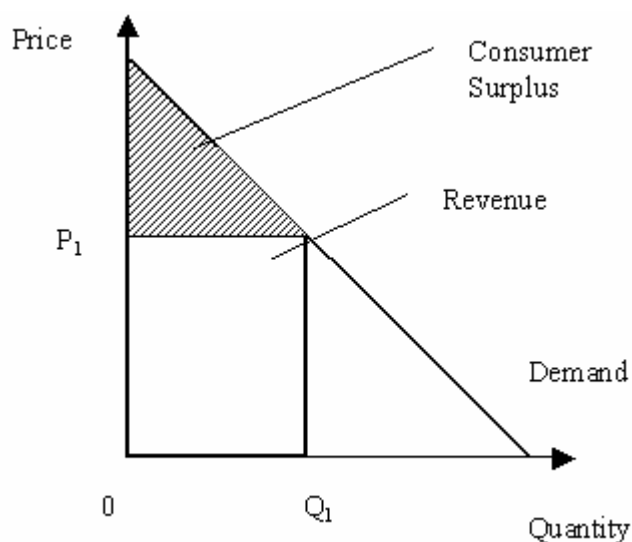


Figure 1 Consumer Surplus

Price discrimination is the concept of charging different groups of customers different prices depending on their willingness and/or ability to pay. The different charges made may or may not reflect an increased cost of supply. The effect of successful price discrimination will be for the firm to obtain some amount of consumer surplus.

There are three types of price discrimination: first, second and third degree. First degree is where each consumer is charged their marginal valuation, so all surplus is captured by the firm. In practice, this is extremely difficult to implement, as the firm requires perfect information on each consumer's marginal valuation of their good or service. Second degree is where bundles are offered, and consumers self-select between the bundles (this has little application to the rail industry). Third degree is where the market can be roughly segmented according to some characteristic of consumers. Resale in the second hand market must be impossible for third degree to be effective.

Through market segmentation, different types of customers are distinguished and grouped and then an assessment of each group's elasticity is conducted. Elasticity is a measure of the sensitivity of an individual or group to a change in price. If a group is sensitive to a change in price (for a good or service) then if the price is put up, demand will fall by a relatively larger amount in percentage terms. A group in this category has an elastic demand. Conversely, if the price can be increased with little or no effect on demand then the group displays an inelastic demand.

2.1 Application to the rail industry

Railway operators have traditionally segmented their market into business and leisure groups. Business users (generally) show an inelastic demand, whilst leisure users' demand is relatively elastic. Third degree discrimination is practised to charge different fares to each group for what is largely the same product. Typically, this is achieved through charging higher fares before 0930. This is a largely accepted measure and allows rail operators to extract some (though not all) of the consumer surplus.

2.2 Yield Management

An effective yield management fare structure will estimate the prices that each consumer will be prepared to pay and then charge each consumer the highest price at which they demand the service (Doganis, 2002). Thus, within the constraints of practicability, a yield management fare structure is a form of first degree price discrimination. A seat on a train or plane cannot be stored – once the train has departed, the potential revenue that the seat could generate is lost forever (unlike in a shop where a good that is not sold one day can be stored and sold the next). In usual operating circumstances, demand for that seat will increase as departure date and time approaches. Consequently, while there is low demand for a particular service (either because it is days or months before its departure, or because the service is operating at a quiet time of day), seats will be sold at the lowest price at which consumers demand the service, and as demand increases, so too will the price, until the final person to book the service pays the very highest price on the demand curve owing to their inelastic demand for the service. If the assumption is made that purchase time is perfectly correlated with willingness to pay, this pricing structure will extract almost all the consumer surplus.

This can be explained in terms of Figure 2, where the operator is assumed to be a monopolist and the marginal cost (the cost of supplying one more unit of capacity) for the operator is assumed to be constant up until the point that the train reaches its full capacity (point E). At this point the cost of providing for one extra passenger (one additional unit of capacity) would be great as it would require a second train set. Before price discrimination the operator would sell Q_m seats for P_m (as this is the profit maximising point), however after price discrimination, the operator will charge a fare of P_0 to the first customer (at this point price is equal to Marginal Cost), with each subsequent

customer being charged a slightly higher price up the demand curve to P_{max} , thus selling each seat at the maximum price each consumer demands the service. After discrimination, the demand curve will equal the marginal revenue curve and each passenger on this train will have paid a different fare for the same journey. If successful, the operator will extract the whole consumer surplus present in the monopoly case, which is represented by the area $P_{max}P_mB$. The operator will also obtain the area BCE , which represented a deadweight loss before discrimination. The total surplus for the operator after discrimination is therefore $P_{max}P_oE$, total revenue is $0P_{max}EQ_o$ and costs are $0P_oEQ_o$.

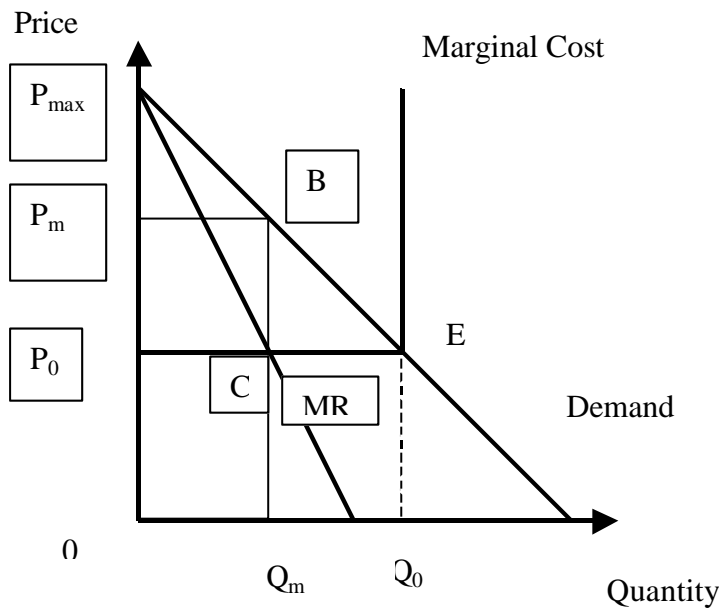


Figure 2 First degree Price Discrimination compared to monopoly.

In practice, it would not be possible to successfully extract the entire consumer surplus, as further to the assumption that time is perfectly correlated with willingness to pay, the operator would need perfect information on the shape of the demand curve. Furthermore there is asymmetry of information, with operators unable to know exactly how much a consumer is prepared to pay for the seat. There is also a transaction cost: making estimates, and providing the back office functions to support the charging of each consumer a different fare costs money. Nevertheless, yield management fare structures can enable the operator to obtain an increased amount of consumer surplus.

This system has been thoroughly tested in other transport sectors (most notably by low-cost airlines such as Ryanair and Easyjet). However is this model suitable for rail services? This research presents some findings on current and prospective off-peak rail users' perspectives of yield managed fare structures.

3. LITERATURE

The advantages of a yield managed fare structure in the airline industry have been shown (e.g., Hanlon, 1994; Belobaba and Wilson, 1997; Doganis, 2002). It is government policy to foster modal shift from relatively more polluting forms of transport such as private car and aviation to more sustainable modes such as cycling, rail and other public transport (e.g., Defra, 2006; Scottish Executive, 2006a). Research by the consumer watchdog for the rail industry - Passenger Focus (2007) has shown 81% of rail users to be 'very' or 'fairly' satisfied with their overall journey. However, it also shows that value for money for price of ticket is low at 43% overall and 55% for longer distance operators, with this figure showing no improvement over the previous year.

In an interview with *Rail* (2007), Chris Gibb, Managing Director of Virgin CrossCountry states "yield management of fares is all about charging the right fare for the right journey." However, while acknowledging the benefits of discounted advance purchase tickets for those who are able to plan their journeys and take advantage of them, Passenger Focus (2006) states that they "remain committed to an affordable walk-up railway for those who cannot [book in advance]".

In a study of rail fares, the House of Commons Transport Committee (2006a) states:

"...Cheap advance purchase fares are a sensible way to fill up off-peak seats that would otherwise not be sold, but this must never be to the detriment of affordable walk-on fares. The latter must once again become the mainstay of rail travel if the railways are going to compete with the motorcar and be affordable to the general public for routine journeys. The Government needs to develop the regulatory framework to ensure a sound and passenger-friendly balance between off-peak bargains and user-friendly and affordable services every day of the week."

The committee also indicate that rail fares must become more user friendly in order to achieve government targets on modal shift. Furthermore they state that the rail industry is not like the no-frills airline sector, and should not aim to imitate them in terms of booking systems and pricing structures.

In its response to this report, the government acknowledges the wider objectives of encouraging modal shift towards rail:

"The Department for Transport knows the importance that passengers place on the availability of flexible walk-up fares. Turn-up-and-go train travel provides the flexibility which people need when they make a range of journeys" (House of Commons Transport Committee, 2006b).

The Department for Transport also indicates that rail fare policy will remain under review. In Scotland, Scottish Ministers are currently reviewing rail fares

policy. One of the objectives of the new policy will be to maximise opportunities to encourage modal shift to rail (Scottish Executive, 2006b).

The literature shows support for modal shift towards rail, and a consensus that advance purchase fares have a role to play, however there appears to have been less research undertaken into the flexibility of such fares, and the significance of this factor in achieving the desired modal shift.

4. THE RESEARCH PROJECT

4.1 Methodology

The research project aims to investigate the attractiveness of yield managed fare structures to current and prospective rail users, and consider whether more flexible off-peak tickets would encourage a modal shift towards rail. Evidence was gathered through a self-completion questionnaire involving both quantitative and qualitative responses. Data from a randomly selected sample of off-peak rail users and non-users in Loughborough, and a small secondary sample in Edinburgh were collected.

Respondents' sensitivity to buying advance purchase tickets was investigated using scenario tests. A hypothetical leisure journey situation was presented, with some suggestions of possible reasons and the condition given that exact travel plans were to be finalised. The first scenario included some yield management style variable fares which rose as the departure date approached. These fares included a condition that a specific departure time must be booked and not subsequently altered. The cheapest ticket in the second scenario remained a constant fare, with the condition that travel date must be specified, however any off-peak service could be used without the requirement to book a specific departure time. In both scenarios, these tickets required to be purchased before 1800 on the eve of travel. The choices of a higher, fully flexible ticket or waiting and paying on day of travel were given in both scenarios. Respondents were asked to indicate which choice they would make if the date of departure was one week away, and the choice they would make if the date was two days away for each of the two scenarios.

Conditions under which respondents were likely to consider making greater use of off-peak rail services were studied using the Likert five-point agreement scale.

Some illustrative examples of advance purchase fares were researched, with availability sourced from fares manuals and respective operators' websites.

4.2 Summary of samples

Data was collected over nine randomly allotted time slots at Loughborough railway station in December 2006 and January 2007 and received 102 responses. The sample shows an over representation of people aged 18-26 when compared to Charnwood Borough as a whole, although with a term time

population of 14,560, Loughborough University students represent 9.5% of the Borough as a whole (Guardian, 2006). There are slightly more males than females, car ownership is lower than the national average, 23% have at least one child under the age of 18 and almost all have access to the internet for personal use.

The small secondary sample, collected at two offices in central Edinburgh received 31 responses and is used to compare to the main sample. The age groups are more equally spread, with the gender split being slightly more females than males. Car ownership is close to the national average, 29% have at least one child under the age of 18, and 94% have access to the internet.

The analysis presented in this paper focuses on three areas: respondents' sensitivity to booking inflexible advance purchase tickets, the attractiveness of yield management pricing structures to the user, and attitudes towards modal shift from private car or aviation to rail. Some illustrative examples of advance purchase fares are then presented.

4.3 Findings on Advance Purchase fare options

Figure 3 shows respondents' choices of ticket from the scenario tests. When booking one week in advance, 28% of respondents chose to buy the cheapest inflexible advance purchase ticket. However when some limited flexibility of travel time was offered, this proportion increased to 63%.

When selecting choices two days in advance, 42% of respondents selected the cheapest inflexible ticket although the price had increased by £15. However, when offered some limited flexibility, this proportion increased to 70%. In this scenario there was no increase in the price of the cheapest ticket between one week in advance and two days in advance. Two thirds of respondents indicated that they felt more comfortable planning a rail journey under the conditions of the second scenario.

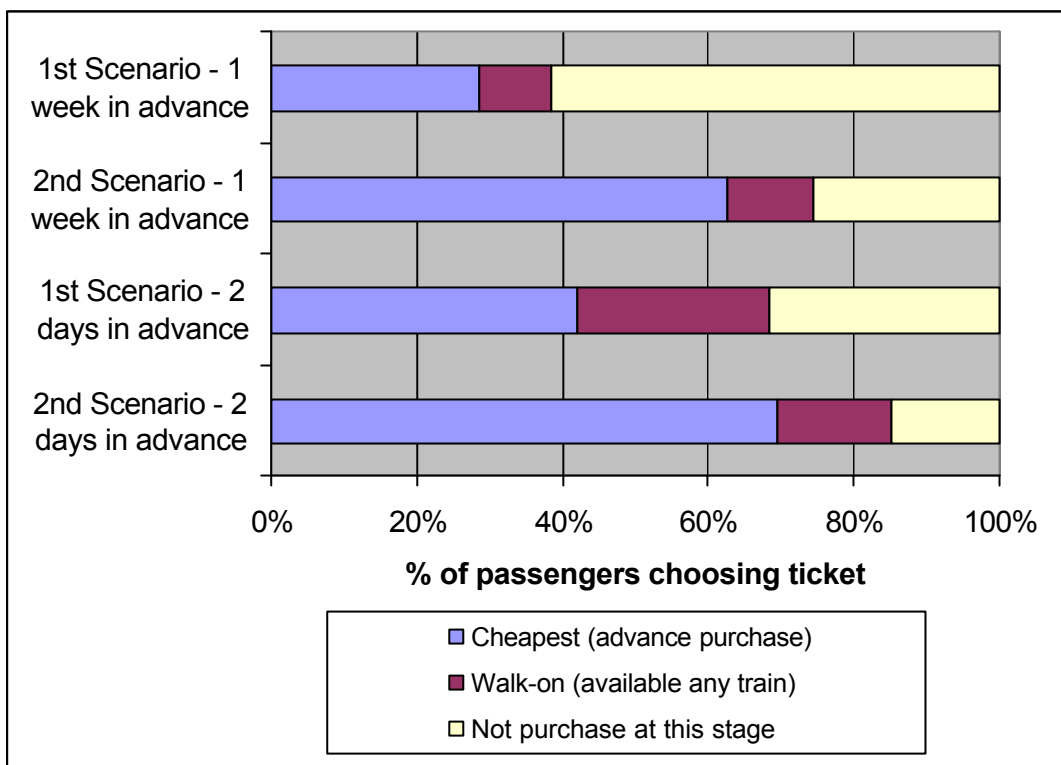


Figure 3 Respondents' choices in Scenario Tests

The secondary sample in Edinburgh showed a broadly similar pattern, although a greater proportion chose the option to wait and pay on the day.

About 60% of respondents indicated that they did not feel comfortable booking tickets through yield management style ticket systems. Reasons given for this include: fairness, pressure to purchase, budgeting difficulties and lack of transparency. A further 2% suggested that it should be known when the fares would rise, whilst 9% reported they were happy booking tickets using the system. Some respondents drew comparisons to airlines, and indicated that one of the key advantages of rail services is that they do not (mostly) use a yield management fare structure.

This was explored further with respondents asked whether they preferred constant fares that allowed some flexibility, or variable fares that did not, but offered the opportunity of receiving discounts. In Loughborough, 82% of respondents and in Edinburgh 71% indicated that they preferred constant fares. Some of the reasons given by respondents for their preference of constant fares are shown in Table 1.

Selection of Respondents' comments on Constant and Variable fares	
Broad category	Response
Budgetary concerns	<i>"Can compare and budget; more likely to travel on spur of the moment."</i> (Respondent 39, Age 36-45, Female)
Fairness	<i>"Flexibility is important - and I want to know that I'm not paying more than everyone else on the same train."</i> (Respondent 111, Age 46-55, Male)

Pressure to purchase	<i>"I don't wish to feel pressure from a train company to specify my plans."</i> (Respondent 98, Age 36-45, Female)
Expectation	<i>"I just prefer to know the price. I wouldn't go to Marks and Spencer if their prices constantly changed."</i> (Respondent 102, Age 46-55, Male)
	<i>"The train companies should be there to suit the people - not the other way round."</i> (Respondent 95, Age 27-35, Male)
Comparison to car travel	<i>"People with cars are not going to be keen to trade their freedom for a fixed departure time."</i> (Respondent 112, Age 36-45, Male)
Integrated transport	<i>"Public transport is often late and can be unpredictable. If I was getting a bus to the station and missed a train, I wouldn't want to pay extra to travel on a different train."</i> (Respondent 8, Age 18-26, Female)

Table 1 Selection of Respondents' comments on Constant and Variable Fares

4.4 Premium for walk-on travel

Respondents were asked whether walk-on travel should command a premium over an advance purchase fare and 71% and 62% of respondents in Loughborough and Edinburgh respectively indicated it would be acceptable to pay a modest premium of about 10%-20%. Support for a premium of greater than 20% falls away sharply.

4.5 Attitudes towards environmental issues

Figures 4 and 5 show the strength of agreement with five statements concerning rail travel and the environment for each sample. The mean level of agreement is shown for each statement (the lower the value, the stronger the agreement).

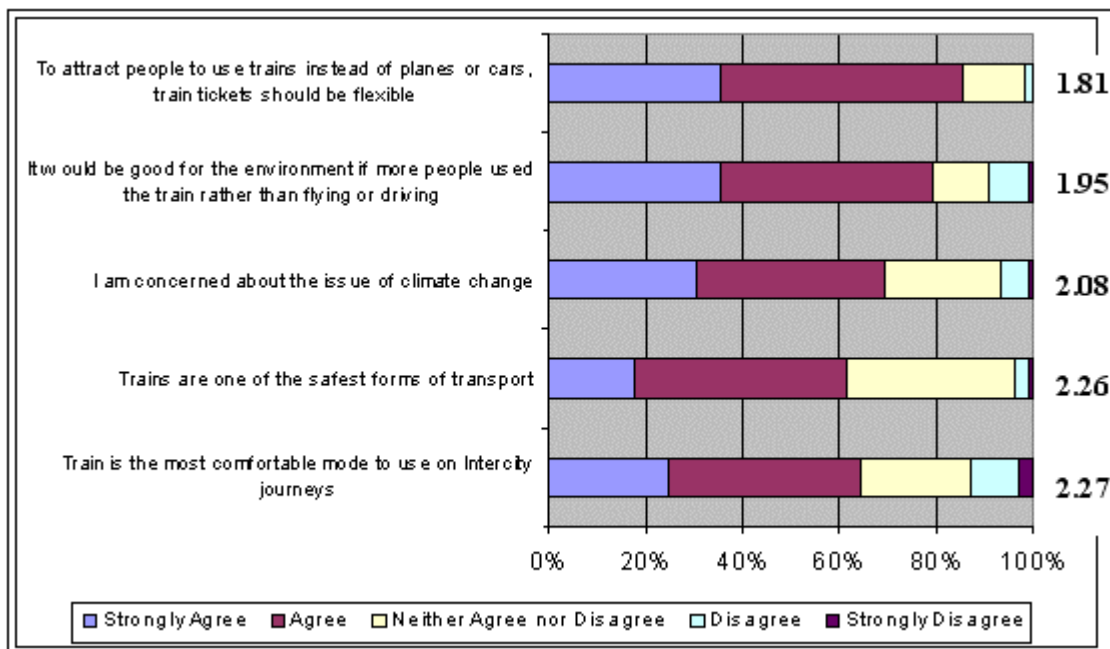


Figure 4 Loughborough sample showing levels of agreement

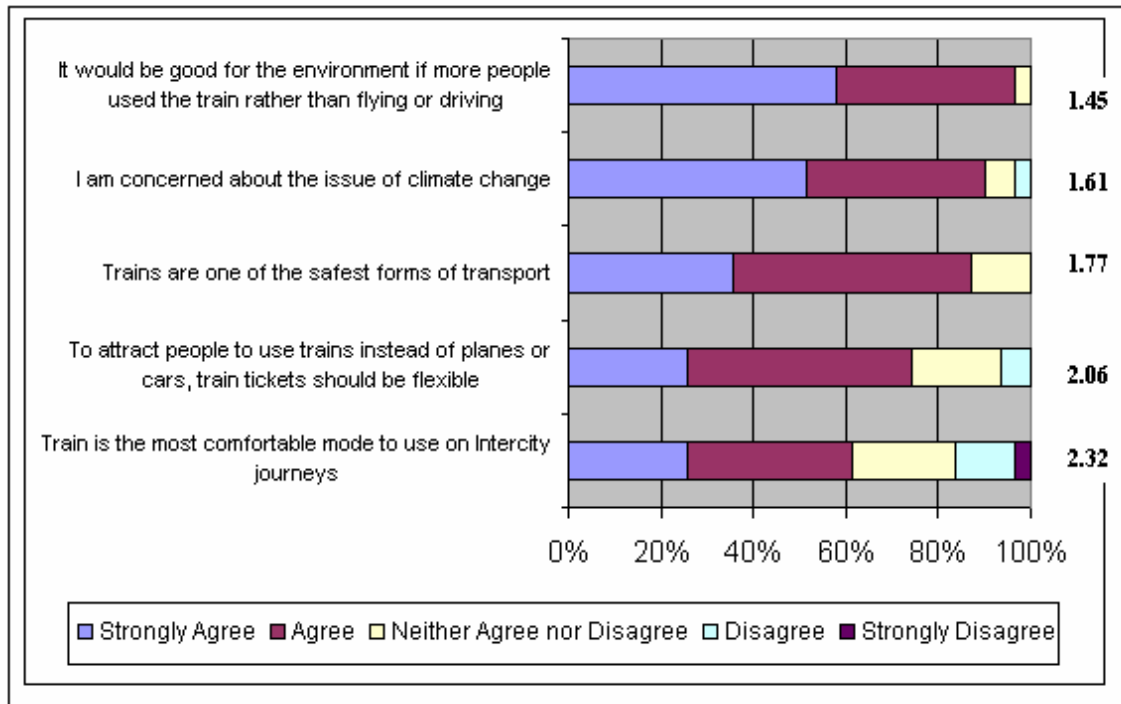


Figure 5 Edinburgh sample showing levels of agreement

The results in Figures 4 and 5 show that there is a very strong agreement with the statement *I am concerned about the issue of climate change*, and a similarly strong agreement with the statement that *It would be good for the environment if more people used the train rather than flying or driving*. The statement *To attract people to use trains instead of flying or driving, train tickets should be flexible* resulted in a very high level of agreement with 85% of respondents agreeing.

This result suggests that more flexible off-peak train tickets could lead to patronage growth for the rail industry. The strong agreements with the two former statements suggest that there is a high level of concern over environmental issues (and certainly over climate change in particular) and that there is a desire for modal shift from less sustainable forms of transport such as car and aeroplane to rail. There is a general satisfaction with the comfort and safety levels of rail services

4.6 Barriers to achieving modal shift

Further results are shown in Figures 6 and 7. It is immediately clear that respondents consider that rail fares are confusing. Also, 86% of respondents agree that they would be concerned if there was a substantial increase in the price of walk-on tickets.

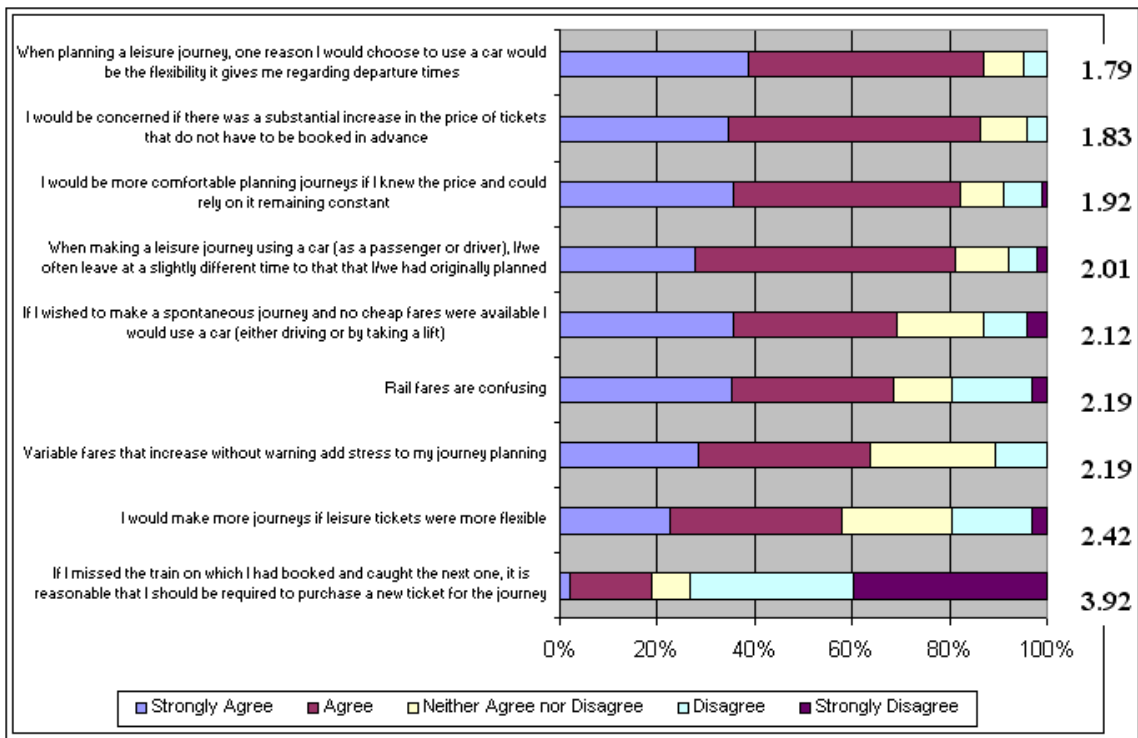


Figure 6 Loughborough sample showing levels of agreement

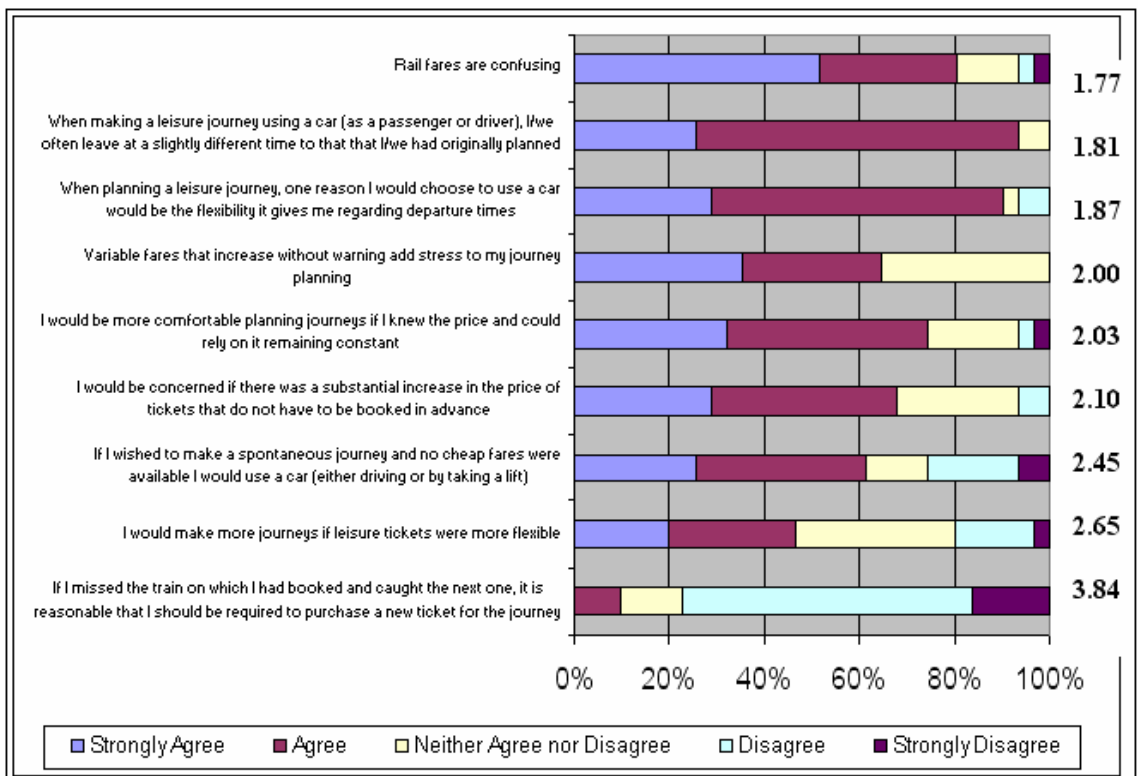


Figure 7 Edinburgh sample showing levels of agreement

For both samples, just less than 90% of respondents agreed with the statement *When planning a leisure journey, one reason I would choose to use*

a car would be the flexibility it gives me regarding departure times. This statement generated one of the highest levels of agreement of all.

Through the statement *When making a leisure journey using a car (as a passenger or driver), I/we often leave at a slightly different time to that that I/we had originally planned,* and with 81% (Loughborough) and 94% (Edinburgh) of the sample agreeing, it can be shown that the flexibility offered by using a car is not only valued, but is actually used to 'slightly' vary departure times 'often'.

Data was collected on the number of times respondents had used low cost airlines, with 70% and 65% having used them at least once in Loughborough and Edinburgh respectively.

There is strong disagreement with the statement *If I missed the train on which I had booked and caught the next one, it is reasonable that I should be required to purchase a new ticket for the journey.*

There is further evidence to show dissatisfaction with the prospect of having to book train tickets in advance to obtain discounted tickets using yield management fare structures with agreements with the statements: *Variable fares that increase without warning add stress to my journey planning; I would be more comfortable planning journeys if I knew the price and could rely on it remaining constant and I would make more journeys if leisure tickets were more flexible.*

The results show a desire amongst the respondents to make more journeys by rail when offered flexible ticketing, as well as a desire for a modal shift from less sustainable forms of transport such as car and aeroplane, although a large proportion of the sample have used low cost airlines at least once.

4.7 Illustrative examples

Walk-on fares are available for travel between any two stations in the United Kingdom. The cheapest advance purchase tickets are generally advertised as point-to-point (for example "Derby to Edinburgh from £15"). However when connections to the intercity station are required, the cheap fare may no longer be shown as available, or unexpected routeings may provide availability of cheaper fares. The following two examples illustrate these points.

The availability of fares from Derby and Loughborough to Edinburgh was checked on 25 February 2007 for travel on 15 March 2007. The Loughborough passenger's journey involves a 17 mile, 20 minute connection from Loughborough to Derby, and then travel on the same intercity train to Edinburgh as the Derby passenger. The Loughborough customer is being asked for 29 pence per mile (23 pence per mile more than the Derby passenger) for travel on the same train.

Date		Journey	First leg		Second leg		Miles	Single Price (cheapest)
Of check	Of travel		Depart	Arrive	Depart	Arrive		
25/2/07	15/3/07	Derby-Edinburgh	1142	1615	-	-	255	£15
25/2/07	15/3/07	Loughborough-Edinburgh	1034	1056	1142	1615	273	£78

Table 2 Example fares for intercity journeys¹

The walk-on single fare from Loughborough to Derby is £4.50. Purchasing separate tickets would cost £19.50, however knowledge of train fares is required and time must be spent searching for available fares. The additional £58.50 allows travel on any train and does not require advance booking.

For the same journey of Loughborough to Edinburgh, the availability of fares was checked on 25 February 2007 for travel on 17 April 2007. The cheapest advertised single fare for the direct routeing (via Derby) is £47. However, if individual fares are checked for Loughborough-London and London-Edinburgh, they are found to be £6 and £12.50 respectively. Tickets for both routeings require advance purchase. Thus for a journey routeing that takes only 40 minutes longer and involves travelling 100 miles in the wrong direction, it offers a saving of £28.50.

Date		Journey	Depart	Arrive	Travelling via	Miles	Price (cheapest)
Of check	Of travel						
25/2/07	17/4/07	Loughborough-Edinburgh	1134	1715	Derby	273	£47 ¹
25/2/07	17/4/07	Loughborough-Edinburgh	1145	1805	London	504	£18.50 ²

Table 3 Example fares for alternative routeings

In both examples, to take advantage of the cheapest fare, customers require knowledge of train fares above the level that a member of the public may reasonably expect to possess.

East Midlands Airport is only seven miles from Loughborough and offers low cost flights to Edinburgh. If a prospective customer was considering switching to rail, it is unlikely that the options to obtain the cheapest fares would be immediately apparent. Should this customer book one of the more expensive options shown in each example and later discover that a saving of £58.50 or £28.50 could be made in each respective example, they are likely to feel unfairly treated.

4.8 Missing a booked train

Where a customer misses a train on which they were booked with an advance purchase ticket, most operators require that a new ticket be purchased for travel on the next train. The following example shows the cost of purchasing a new ticket on the routes and times used in the previous two examples.

Journey and date	Depart	Price of advance purchase fare	Next available departure	Price to travel if booked departure is missed	Notes & cheapest available ticket type	Total price paid for train journey
Derby-Edinburgh (15/3/07)	1142	£15	1214	£72.50	Open Single	£87.50
Loughborough-Edinburgh (17/4/07)	1134	£47	1234	£41	Open Single – This Apex ticket allows upgrade to cheapest walk-on ticket on payment of the difference + £10	£88
Loughborough-Edinburgh (17/4/07)	1145	£18.50	1234	£78	Open Single - The next available departure on the direct routing via Derby is shown	£96.50
London-Edinburgh (17/4/07)	1330	£12.50	1400	£97.20	Saver Single – This journey is the 2nd leg of the Loughborough-Edinburgh via London example	£109.70

Table 4 Cost to travel when booked train has been missed³

All the examples in Table 4 involve catching the next off-peak train. Should the next departure be a peak service, the cost of a new ticket could be greater than for those shown. Where journeys are made using a combination of advance purchase tickets, no guarantee is made that booked tickets will be honoured in the event of disruption to the train service. Thus, in the above examples, where combinations of advance purchase tickets for Loughborough-Edinburgh (either via Derby or London) are shown, the cost of missing a connection en-route could also be great.

5. DISCUSSION

5.1 Trend towards offering less flexible off-peak tickets

Some operators are making it more difficult to use the flexible Saver ticket by altering the definitions of peak and off-peak. For instance the Saver is only valid between 1000-1400 for Monday to Friday travel on direct services from King's Cross-Edinburgh (on Fridays there is an extra late service on which Savers are valid). This includes only seven services each day, thus the earliest a customer could arrive in Edinburgh using a Saver ticket is after lunch at 1424. More customers are being forced either into buying the Advance Purchase tickets and trade in all the flexibility or face paying peak charges. The advantages to rail operators of demand management and increased revenues are clear (and to government in the form of increased premium or decreased subsidy for franchises), however with reference to this situation, the House of Commons Transport Committee (2006a) state, "...the passenger would be the loser in both circumstances".

As peak charges are not regulated as Savers are, these fares can be raised to whatever level the operator decides. Therefore, whilst some customers are able to travel much more cheaply than ever before, those who are unable to obtain any of the quota of cheap tickets, unable to risk being restricted to only one departure time, or are unable to book in advance, face higher, and (possibly) increasing fares where the use of Savers is not permitted.

Almost all operators have discontinued sales of the SuperSaver, a flexible ticket which provided a further discount from the Saver ticket for off-peak travel. This leads to the conclusion that under the yield management style fare structure, whilst some customers are lucky enough to obtain cheap travel at times which suit them, many others have only turned to using the advance purchase tickets as using flexible off-peak tickets has become increasingly difficult. The results of the scenario tests suggest that many people would rather retain some degree of flexibility even if this involves paying a higher fare than the lowest 'headline' fares.

There is no suggestion that any operator is considering making their services 'bookings only'. Currently operators make only a proportion of seats on each departure available to advance purchase customers (the proportion is not made public). However, with increasing numbers of operators offering advance purchase tickets and simultaneously applying more severe restrictions to the use of the Saver, this research is relevant to highlight customers' concerns over the trend towards offering less flexible off-peak ticketing.

5.2 Missing a train

The results show that people consider the requirement that an entirely new ticket should be purchased in the event of missing their train is unreasonable. Table 4 shows how much it would cost to travel on the next available departure for some example journeys. These sums would be payable even if the booked departure was missed by just a few seconds. The sums would appear to be out of proportion to the failure (of missing the booked train). After missing a train, customers will already see a negative side of train travel (even if it wasn't the train operator's fault that the train was missed). Requiring them to pay a sum many times the cost of their original ticket as well would exacerbate the negative image and is unlikely to attract that customer to use rail services again in the future.

5.3 Rail fare confusion

The examples of advance purchase fares in Tables 2-3 may help to explain why 71% of respondents consider train fares to be confusing. These tables show how some rebooking of tickets en-route or unusual routings can save money. Furthermore, there is evidence that customers would prefer a structure of fares that does not involve unpredictable price increases as departure date and time approaches (even if this involves paying a slightly higher fare).

5.4 Premium for walk-on travel

Support for a modest premium for walk-on travel should be weighed against the 86% of people who agreed that they would be concerned if there was a substantial increase in the price of walk-on tickets. The results suggest that support for a 10%-20% premium for walk-on travel would come alongside the introduction of a cheap off-peak advance purchase fare that did not rise unpredictably as departure date and time approached, and allowed some limited flexibility over departure times.

5.5 Modal shift from car to rail

The results show that one of the reasons people choose to use a car for leisure journeys is the flexibility it offers regarding departure times. This flexibility is 'often' used to 'slightly' vary departure times. Furthermore respondents agree that attracting people to use trains rather than driving or flying can be achieved by offering more flexible tickets. Evidence from the scenario tests demonstrated an unwillingness to book a departure time specific ticket for a leisure journey a week, or even two days in advance (despite the offer of a substantial discount), however when some limited flexibility over departure times was offered, the number of people willing to purchase increased both at seven and two days in advance. Together, these results suggest that enticing car users to rail services requires the availability of a cheaper range of tickets that allow some limited flexibility over departure times.

5.6 Modal shift from air to rail

Yield management techniques allow airline operators to increase their revenues (Doganis, 2002). It is therefore sensible for rail operators to consider using similar principles on the railway. However the evidence from this research suggests that people place different expectations on air and rail operators. Just less than three quarters of people who took part in this research have used a low cost airline at least once, however 61% stated they held concerns over the application of yield management principles to rail services, and a further 30% were unsure. Furthermore, with 82% of respondents stating they would prefer a fare structure that does not involve fares which rise unpredictably, little enthusiasm for the structure (despite the discounts available) has been identified.

5.7 Limitation of using time to segment the market

The theory of obtaining the consumer surplus (Section 2) is based on customers' willingness and ability to pay. Belobaba and Wilson (1997) state "The revenue gains come from forcing consumers to pay fares closer to their willingness to pay". Ability to book in advance is the measure used to segment the market. This is to assume that people who have the ability and/or willingness to pay are unable to book in advance, whilst people who

have no ability nor/or willingness to pay are able to plan their travel (up to) weeks in advance.

There may be cases where businesses are able to forecast their train travel requirements and book cheap tickets, whilst people who have limited funds may have no possibility of (or inclination to) planning travel in advance. In this situation, the consumer surplus will not be obtained as those with the ability and willingness to pay the higher fares have been given access to the lower fares. This scenario will result in a market failure, as well as encouraging leisure travellers making spontaneous journeys to seek other modes.

5.8 Government Policy

With wider government policy aimed at achieving a modal shift towards more sustainable transport modes (Defra, 2006; Scottish Executive, 2006), and the government acknowledging the importance that passengers place on the availability of flexible walk-on tickets (House of Commons Transport Committee 2006b), the results of this research suggest that offering the cheapest tickets with a limited increase in flexibility could result in the desired modal shift. Government also indicate that rail fares will remain under review. Private sector operators naturally only wish to achieve modal shift in order to increase their revenues and not for the wider reasons of alleviating environmental degradation, however if offering off-peak tickets with increased flexibility could lead to revenue growth, then this would represent a mutually advantageous strategy.

This approach would be consistent with government's objective of striking a good deal for the taxpayer (DfT, 2007), as achieving modal shift would produce wider societal benefits.

6. CONCLUSIONS

The results show a concern for the well being of the environment and clear support for a societal modal shift to take place from less sustainable forms of transport such as car and aeroplane to more environmentally sustainable modes.

The findings suggest that offering the cheapest off-peak tickets with less onerous restrictions governing departure times, and a structure in which fares do not rise unpredictably as the departure date approaches would lead to an increase in off-peak rail travel. This must be achieved alongside simplifying the fare structure, so that fewer people consider train fares to be confusing and without a substantial increase in walk-on fares, although a modest premium for this service would be accepted.

The results from the survey show that people often use the advantage of being able to vary their departure time slightly when travelling by car. Although rail travel has inherent difficulties in matching this advantage equally, it would seem that the ability to travel on a service half an hour later (for example) than the one originally booked would go a long way to attaining

this objective. Given that the results suggest that this could lead to a modal shift from off-peak car to rail, it could prove a successful strategy for the rail industry to attract more off-peak car users to fill vacant seats on trains.

It has been indicated that respondents wish to see a modal shift from aeroplane to rail. The results also show that yield management pricing structures are considered to be user unfriendly to a degree. It is therefore concluded that if an advance purchase ticket were to offer a cheap fare together with limited flexibility, the rail industry's competitive advantage over low cost airlines would be increased and modal shift could take place.

It is accepted that yield management style fare structures have some advantages of increasing custom on lightly used services, and reaching demand management objectives. The opportunity for revenue growth through first degree price discrimination has also been shown. However, this research has suggested that there may be an improved formula for growth in the off-peak market by selling tickets with limited flexibility rather than train specific ones. This could lead to an increase in the number of people who are prepared to make a modal shift from car and short-haul aviation to rail for off-peak journeys and increase the perception of value for money of train tickets.

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¹Prices sourced from Virgin Trains. Available online: www.virgintrains.co.uk . [Accessed 25 February 2007].

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