

Profit incentives from coach/rail and rail/rail overlaps

Introduction

1. This appendix discusses the possible profit incentives available to NEG as the owner of coach and rail operations in the Greater Anglia area. More specifically it looks at the incentives arising from the merger situation being investigated, namely the overlaps arising from the common ownership of (a) NEL and the Anglia and Great Eastern parts of the Greater Anglia franchise and (b) c2c and the Great Eastern part of the Greater Anglia franchise.¹
2. In relation to (a), coach services could be reduced or coach fares increased, with the lost revenue from passengers switching away from coach being more than offset by the additional rail fares from those overlapping passengers who switch to rail, lower coach operating costs and in the case of increased fares the increase in revenue from passengers remaining with the coach. In relation to (b), rail fares could be increased on one of the rail franchises, with the lost revenue from passengers switching away from that franchise being more than offset by the additional rail revenue from those overlapping passengers who switch to the other rail franchise and the higher fares from the non-switching rail passengers. This paper attempts to simulate the possible profit outcomes from these strategies in the six overlapping coach routes in the Greater Anglia area,² as well as outcomes arising from increasing rail fares in the Southend–London route. The simulations include up-to-date estimates on switching behaviour and the variability of costs, which are outlined below.

How coach/rail and rail/rail substitution may be profitable

3. The profitability of transferring passengers from coach to rail or from rail to rail arises from the common ownership of rail and coach routes on specific flows. An independent coach operator may be discouraged from increasing its prices for the fear of losing passengers to alternative forms of transport. However, if the coach operator also owned the competing rail franchise, then increasing coach fares could be profitable so long as a significant portion of passengers who switch do so to rail rather than other transport alternatives. Accordingly, for this strategy to be profitable a significant portion of coach (or rail) passengers will have to view the overlapping rail service as a viable substitute.
4. Coach operations have a high proportion of costs that are variable or semi-variable. Rail operations, on the other hand, have largely fixed costs. The Passenger Service Requirement (PSR) for c2c and Central Trains, and the Service Level Commitment for Greater Anglia, effectively determines the mileage to be operated and imposes performance penalties for failing to run the required service. There are no such service level requirements for coach operations, and NEL has the ability to vary the contracted mileage with its coach franchisees [§]. Combined with the different characteristics of running a coach service, this means that costs can be reduced by a discretionary lowering of service levels. Thus cost savings could be achieved if lower

¹The overlaps arising from the common ownership of Central Trains and the Greater Anglia franchise are not considered for reasons discussed in paragraphs 7.4 to 7.9 of the report.

²As per Table 2 of the report.

coach services lead to fewer coach passengers but extra train passengers generally add little to train costs.

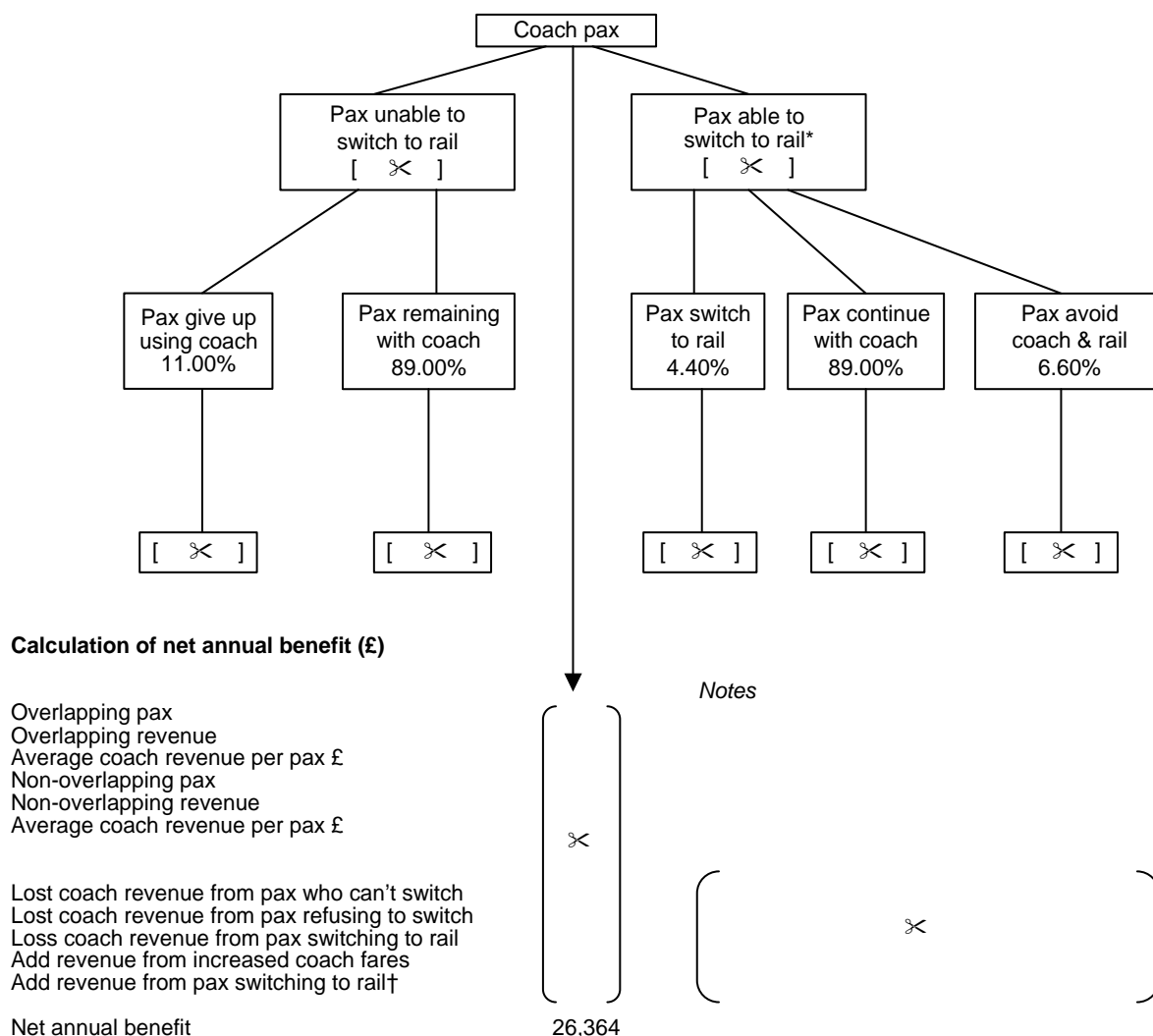
Illustrative examples—coach/rail overlaps

Increasing coach fares

5. Figure 1 illustrates the possible outcome from increasing coach fares from one of the main overlapping coach routes (490). The Norwich–London coach route generates for NEL about £[£] in revenue from about [£] passengers. Figures from NEG suggest that the majority of these passengers (about [£] per cent) are overlapping passengers, ie are able to use the Greater Anglia rail service to get to their destination. A price increase would cause some passengers to cease using its coach services and of these, some would switch to rail and some to another form of transport or not travel at all. This loss of revenue, however, is offset by the higher fares paid by the passengers who continue to use the coach service, as well as the rail revenue from passengers who switch to rail. Accordingly the net benefit or loss is dependent on the price elasticity of demand, as well as the willingness of switching passengers to use rail as an alternative to coach.

FIGURE 1

Norwich–London: 10 per cent coach fare increase



Source: CC calculations from NEG data.

*This represents % of overall route passengers which are overlap passengers.

†Average rail revenue per passenger on all overlapping sections = £ [£].

6. Figure 1 shows that when assuming a price elasticity of -1.1 ,³ a 10 per cent price increase could generate a net benefit of up to £26,364 a year. The calculations show that much of the benefit arises from the higher coach fare revenue from passengers who do not switch, but also a significant portion coming from the extra rail revenue from passengers that do. It assumes that of those passengers that switch, 40 per cent⁴ will use rail and 60 per cent will use alternative sources of transport.⁵ However, it may be possible that less than 40 per cent would switch to rail, which would materially affect the profit outcome.

³Professor Wardman, M. *Report on the Review of Rail and Coach Elasticities*—Institute of Transport Studies (ITS), Leeds (August 2004).

⁴Obtained from a range of diversion ratio estimates from Professor Wardman, M. *Report on the Review of Rail and Coach Elasticities*—Institute of Transport Studies (ITS), Leeds (August 2004).

⁵Including the option of not travelling at all.

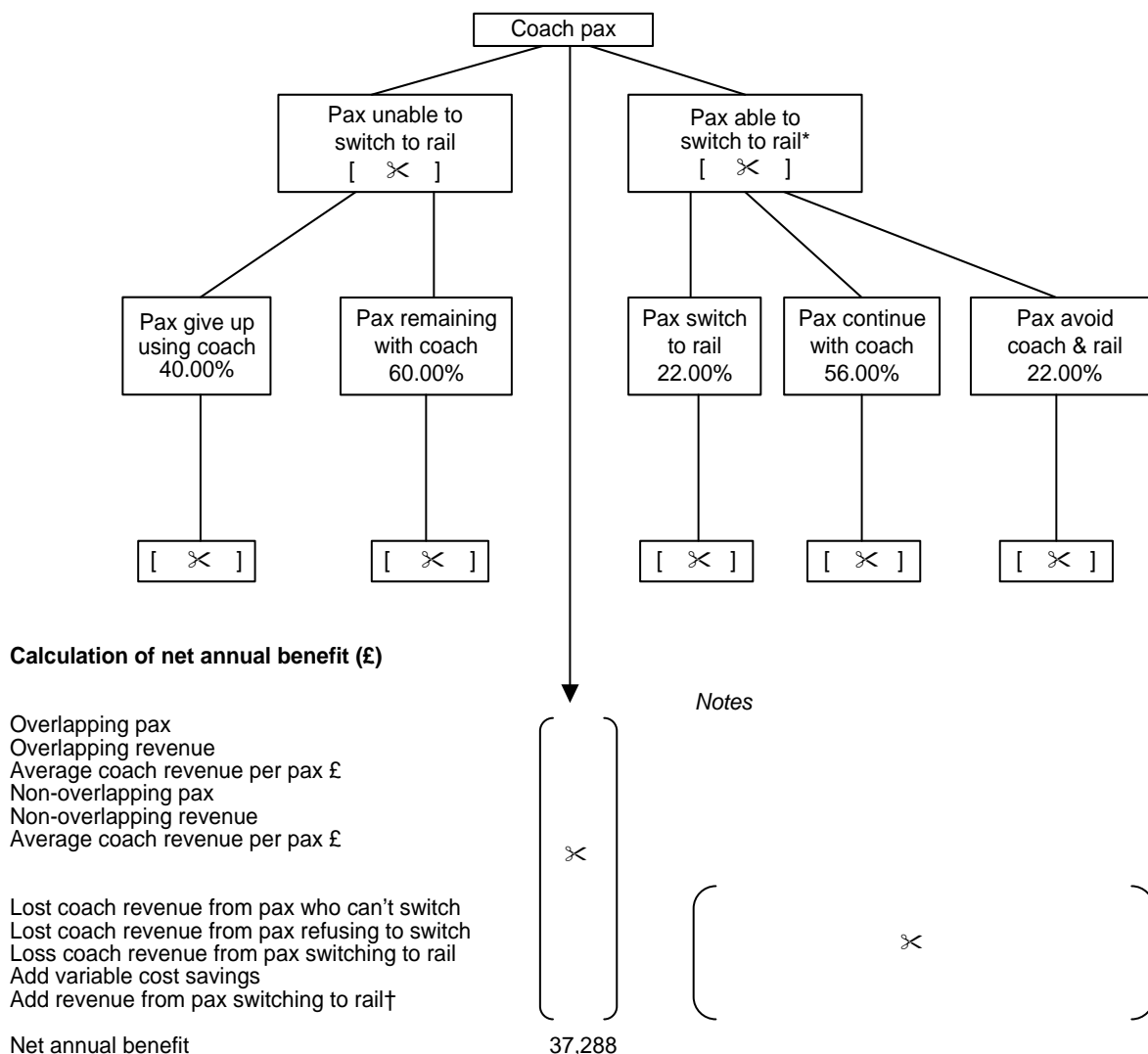
7. When calculating the extra rail revenue gained, the forecast number of switching passengers is multiplied by the average rail revenue per passenger for all overlapping flows, which should be a reasonable proxy for the likely rail fare that switching passengers are likely to pay. The revenue per passenger is generally higher for rail than on coach (as in Figure 1).

Reducing coach services

8. Figure 2 illustrates the possible outcome from reducing the 490 coach service. NEG stated that most of the overlapping coach services operated only between one and five coaches a day each way. Accordingly reducing service frequencies would have a disproportionately adverse impact on coach revenues. Reducing frequency by even one equates to a 20 to 50 per cent reduction. NEG argued that this would cause an even greater reduction in passenger demand as travelling times would be less convenient for passengers and there would also be adverse consequences with regard to connections with other NEL services. The calculation below assumes a reduction of five to three services a day of the London–Norwich route, with all diverting passengers split (as in Figure 1) between those switching to rail (40 per cent) and those switching to other forms of transport including those who would not travel at all (60 per cent). At this split, the loss of revenue from lost passengers is more than offset by the variable cost savings and from the extra rail revenue from passengers that switch to rail. As with Figure 1, this calculation is sensitive to the degree to which overlapping coach passengers see rail as a viable alternative. For example, if less than a sizeable minority (10 per cent) of these deserting passengers switch to rail, then the withdrawal of the service becomes unprofitable.

FIGURE 2

Norwich–London: coach frequency decrease



Source: CC calculations from NEG data.

*This represents % of overall route passengers which are overlap passengers.

†Average rail revenue per passenger on all overlapping sections = £ [£].

- Both figures illustrate the extent to which the ownership of the rail franchise makes a difference to the profit outcome of a strategy involving coach fare increases or coach service reductions. In both cases, the rail revenue from switching passengers turns each strategy into a profitable one, and this is typically the case when higher elasticities (about -1.0) are used. Table 1 summarizes the profit outcomes for all the overlapping coach routes in the Greater Anglia area arising from a 10 per cent coach fare increase, assuming an elasticity of -1.1 and a diversion ratio of 0.4, ie 40 per cent of passengers who cease using coach divert to rail and 60 per cent use an alternative form of transport or not travel at all.

TABLE 1 Extra profits arising from a 10 per cent fares increase—assuming price elasticity of -1.1

Coach service number	Route	Flow/route ratio of passengers %	Extra rail revenue from switching passengers £	Extra revenue from higher coach fares* £	Total extra profits £
495/6	Cromer–London	[✂]	
481	Ipswich–London				
484	Clacton–London				
490	Norwich–London				
497	Great Yarmouth–London				
Total					

Source: CC calculations from NEG data.

*Includes loss of revenue from switching passengers.

- Four of the six routes show increases in profits, and it is on these routes (481, 484, 490 and 497) that the overlapping flows account for a significant part of the total route. On the remaining routes, the merger makes a small difference to the profit outcomes as the overlapping flows account for a small part of the overall route.
- Table 2 summarizes the profit outcomes arising from the withdrawal of coach services. For service 490, however, rather than a complete withdrawal, only a 40 per cent reduction in frequency was modelled (from five to three services a day). The two largest of the listed coach services are making positive contributions to group costs, so it is expected that withdrawing the services without the ownership of the rail franchise would result in a reduction in profits (£152,930 for all routes). With the rail revenue arising from switching passengers, the withdrawal of services becomes profitable for the routes 490 and 497, and for routes 481, 484 and 495/6 profitability increases significantly. These six routes show that the rail revenue could make a material difference to incentives where the overlap percentage is significant.

TABLE 2 Extra profits arising from withdrawing coach services

Coach service number	Route	Flow/route ratio of passengers %	Extra rail revenue from switching passengers £	Variable cost savings less lost coach revenue £	Total extra profits £
495/6	Cromer–London	[✂]	
481	Ipswich–London				
484	Clacton–London				
490	Norwich–London*				
497	Great Yarmouth–London				
Total					

Source: CC calculations from NEG data.

*Assumes only a reduction from five to three services a day rather than a total withdrawal.

- NEG argued that the 40 per cent diversion ratio used in the original calculations was not appropriate and suggested a figure of 14 per cent instead. It referred to the NEG/Central trains report of 1997, which quoted cross-price elasticity between coach and rail of 0.14. NEG added that by using this figure it would not be profitable to increase coach fares on any of the overlapping routes as shown in Table 3, which also uses an elasticity figure of -1.1.

TABLE 3 Calculations of extra profits arising from:

Coach service number	Route	Withdrawing services (£)			Fare increases (£)		
		Extra rail revenue from switching passengers	Variable cost savings less lost coach revenue	Total extra profits	Extra rail revenue from switching passengers	Extra revenue from higher coach fares	Total extra profits
495/6	Cromer–London	202,137	-152,930	49,207	31,083	-41,706	-10,623
481	Ipswich–London						
484	Clacton–London						
490	Norwich–London*						
497	Great Yarmouth–London						

Assumptions

Diversion ratio 14%, network revenues retained and revenue risk = 100%.

Source: CC calculations from NEG data.

*Reduction in services from five to three a day.

13. Lowering the diversion ratio to 14 per cent eliminates all the profitable outcomes for two routes in the case of withdrawing services, and for all routes in the case of fare increases. At this level of diversion, NEG would have limited scope to profitably increase fares.
14. The suitability, however, of deriving diversion ratios from cross-elasticity figures depends on the relative market shares of coach and rail, and may not reflect the willingness of coach passengers to switch to rail, as it only reflects the increase in rail demand from an increase in coach price. Taking into account the relative market shares of coach and rail leisure travel in the relevant reference area at the time of the 1997 Central Trains report (23.7 per cent coach and 76.3 per cent rail), and using an own-price elasticity of -1.1, the cross-price elasticity of 0.14 translates to a diversion ratio of 0.41⁶ (41 per cent). ITS stated that the survey of coach users on the flows of interest in the Greater Anglia area indicated an even greater propensity to switch to rail, and as much as 53 per cent.
15. The existence of revenue risk may be an important factor in determining the viability of coach/rail substitution. The SRA stated that revenue risk on rail would most likely be shared between the franchisee and the SRA through a cap-and-collar mechanism. This sharing arrangement could reduce the incentive for NEG to encourage passengers to switch to rail beyond the cap as some incremental revenue would be shared with the SRA if it exceeded its target submitted in its franchise bid. But NEG is entitled to retain all incremental revenue if revenue exceeds the target by a narrow band. Therefore NEG could be entitled to exceed its target somewhat and keep most of the excess.
16. NEG argued, however, that it was unlikely to receive 100 per cent of additional rail revenue from coach passengers diverting to rail. It added that the amount of this extra revenue retained would range from 50 to 100 per cent depending on the degree to which NEG achieved its forecasts. Given the equal likelihood to overshoot as well as undershoot its forecast, it may be appropriate to assume, for the purposes of the calculations, that only 75 per cent of extra revenue is retained by NEG. Table 4 accordingly shows the outcomes of using this figure, as well as assuming a 40 per cent diversion ratio discussed above.

⁶0.14 / (1.1 * 23.7% / 76.3%).

TABLE 4 Calculations of extra profits arising from:

Coach service number	Route	Withdrawing services (£)			Fare increases (£)		
		Extra rail revenue from switching passengers	Variable cost savings less lost coach revenue	Total extra profits	Extra rail revenue from switching passengers	Extra revenue from higher coach fares	Total extra profits
495/6	Cromer–London	433,150	-152,930	280,220	66,607	-41,706	24,901
481	Ipswich–London						
484	Clacton–London						
490	Norwich–London*						
497	Great Yarmouth–London						

Assumptions

Diversion ratio 40%, network revenues retained and revenue risk = 75%.

Source: CC calculations from NEG data.

*Reduction in services from five to three a day.

- Table 4 shows that reducing the revenue risk to 75 per cent and increasing the diversion ratio back to 40 per cent makes some difference to the profit outcomes. Withdrawing services becomes profitable for all except the 490 coach service, and increasing fares remains profitable for all except the 495/6 coach service.
- NEG argued that many of its services were marginally profitable, and their continued operation was due to the contribution they made to the NEL network. By withdrawing or reducing these services, network revenues could be lost, which could make any strategy of shifting passengers to rail unprofitable. The above calculations do not take into account the potential loss of such revenue. If passengers switch to rail from coach (following an increase in fares or reduction in services), then a portion of this additional coach revenue could be lost, as switching passengers would no longer have a direct link to connecting coach services.
- Using annual network revenues supplied by NEG, a portion of these revenues was then deemed lost in proportion to the percentage of switching passengers relative to total route passengers. Table 5 reworks the calculations from Table 4 but includes the loss of 90 per cent of network revenues (net of 10 per cent commission).

TABLE 5 Calculations of extra profits arising from:

Coach service number	Route	Withdrawing services (£)			Fare increases (£)		
		Extra rail revenue from switching passengers	Variable cost savings less lost coach revenue	Total extra profits	Extra rail revenue from switching passengers	Extra revenue from higher coach fares	Total extra profits
495/6	Cromer–London	433,150	-1,026,402	-593,252	66,607	-155,548	-88,941
481	Ipswich–London						
484	Clacton–London						
490	Norwich–London*						
497	Great Yarmouth–London						

Assumptions

Diversion ratio 40%, network revenues lost and revenue risk = 75%.

Source: CC calculations from NEG data.

*Reduction in services from five to three a day.

20. Table 5 shows that the loss of network revenues eliminates the scope for NEG to profitably increase its coach fares or reduce coach services on all routes. The loss of these revenues could be avoided if NEG targeted fare increases to non-network passengers only, which usually accounts for a substantial majority (about [X] per cent) of total coach passengers. NEG argued that its systems did not allow such targeting, as prices were calculated by simply adding each individual leg of a journey, with no facility available to discount a particular leg. It is worth noting that reducing the 490 service from five to three remains an unprofitable strategy (and slightly profitable in the case of increasing 490 fares) even if the loss of net revenues was excluded from the analysis. NEG mentioned the possibility of withdrawing the 481 and 484 routes, due to their low usage and loss-making status.

Increasing rail fares

21. The above commentary has so far dealt with the coach to rail substitution, ie NEG's incentives to rationalize its coach services and encourage coach passengers on to its rail services. However, incentives may exist for NEG to increase rail fares on overlapping routes to encourage rail passengers on to its coach network. Table 6 shows the difference between coach and rail fares for the Norwich–London route.

TABLE 6 London–Norwich fares (return)

	£	
	<i>Rail</i>	<i>Coach</i>
Standard	64.00	
Saver/economy	32.60	20.50
Super		
Saver/APEX	19.00	17.00

Source: NEG.

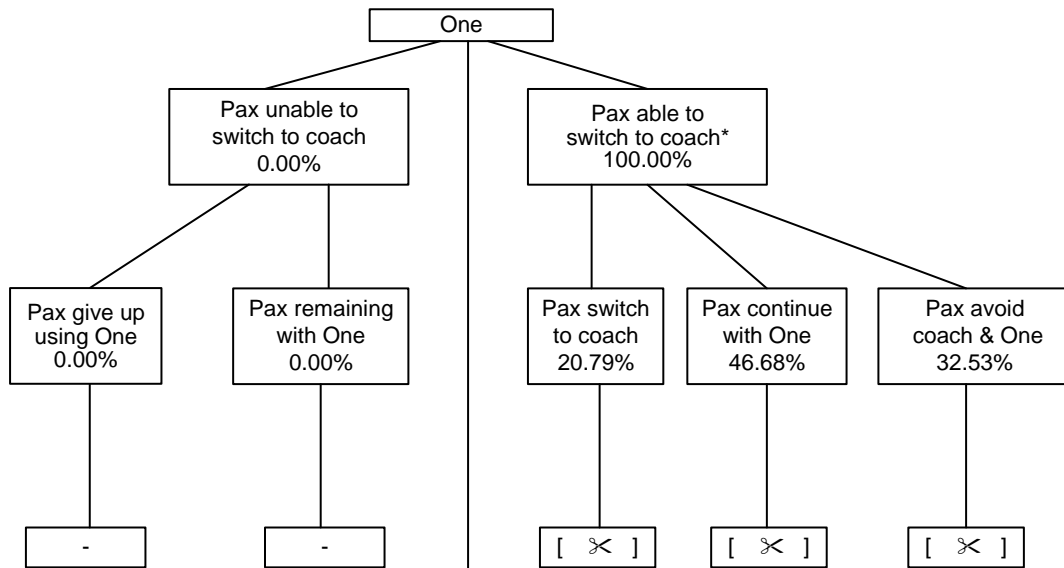
22. The gap between the rail and coach Saver/Economy fares is relatively high (59 per cent). The APEX rail fare, however, is only 12 per cent more expensive than its coach equivalent, and this reflects the fact that APEX rail fares were introduced as a result of coach competition. The common ownership of overlapping rail and coach services could encourage NEG to remove the £19 APEX rail fare and force passengers to either buy the £32.60 saver fare, or purchase the £17 coach fare. The calculations below attempt to simulate the effect on profits were NEL to do so on the 490 Norwich–London route, taking into account own-price rail elasticities and diversions ratios specific to the Norwich route.⁷
23. Based on figures supplied by NEG, the Norwich–London rail route earns about £[X] million in revenue on advanced purchase fares a year. If the average fare is about £19 (as per Table [X]), the annual number of passengers from these is about [X]. Removing these fares and forcing passengers to pay the £32.70 fare equates to a 72 per cent increase. ITS estimated, from relevant literature, that the own-price elasticity of rail leisure travel for the Norwich route was about –1.36. Accordingly a 73 per cent fare increase would reduce rail demand for discount tickets by at least 53 per cent on that route. This equates to a loss of about [X] passengers. Of these, ITS suggested that only 39 per cent would switch to coach. The coach revenue from these switching passengers and the higher rail fares would not be enough to offset the

⁷Professor Wardman, M (2004) *Report on the Review of Rail and Coach Elasticities*. Institute for Transport Studies (ITS), University of Leeds.

losses arising from passengers that switch to other forms of transport, as shown in Figure 3.

FIGURE 3

London–Norwich: advanced purchase fare increase



Calculation of net annual benefit (£)

Total One pax using Advanced purchase fares†
 Total One revenue from Advanced purchase fares†
 Average Advanced purchase revenue per pax £†

Lost One rail revenue from pax who can't switch
 Lost One rail revenue from pax refusing to switch
 Lost One rail revenue from pax switching to coach

Extra coach costs
 Add revenue from increased one fares
 Add revenue from pax switching to coach‡

Net annual benefit

⌈
 X
 ⌋
 -14,225

Notes

⌈
 X
 ⌋

Source: CC calculations from NEG data.

*This represents % of overall route passengers which are overlap passengers.

†London to Norwich only

‡Average NEG economy Apex revenue per passenger on all overlapping sections =£[X].

24. The above calculation suggests that at an elasticity of -1.36 , raising leisure fares on the London–Norwich rail route would be unprofitable. The above calculation ignores the extra costs that would be incurred servicing the extra coach passengers, which would add to the reduction in profits.

Rail/rail overlaps

25. Profit incentives could also arise from rail on rail overlaps, which exist in two areas of the Greater Anglia area, namely routes triangulated by Norwich, Peterborough and Cambridge, as well as the route between Southend and London. In terms of taking advantage of these overlaps, there are likely to be greater incentives for increasing

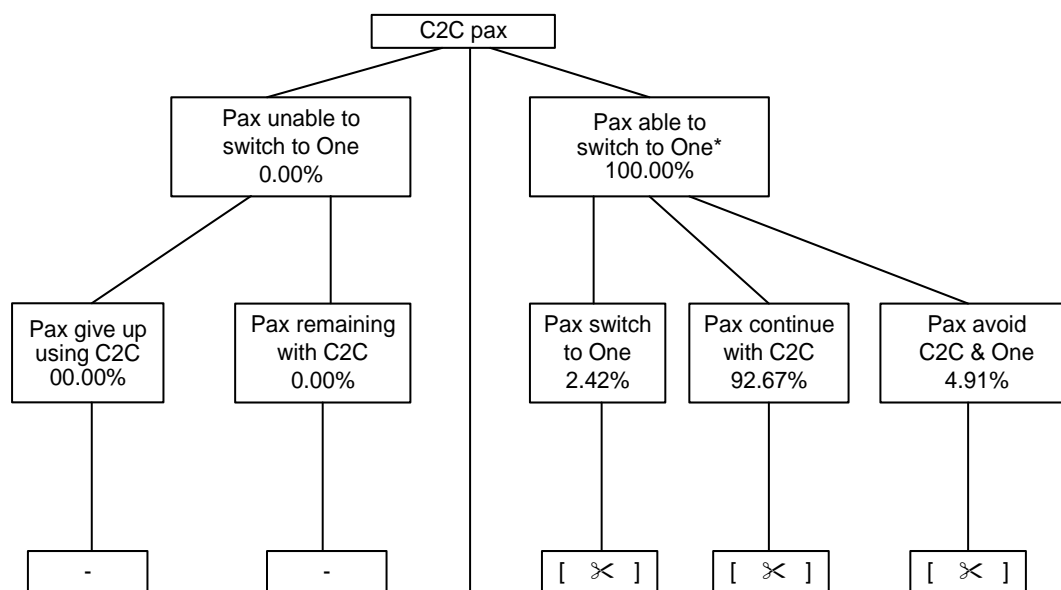
fares rather than reducing services. Service quality and standards are regulated by the SRA by way of incentive and disincentive mechanisms applying to revenues. NEG has argued that c2c is operating at only 1 per cent above its minimum service frequency; thus the scope for any service reductions is limited. It added that service withdrawals are effectively precluded by the franchise agreements and more specifically by the PSR for c2c and the Service Level Commitment for Greater Anglia. In terms of fares, however, a sizeable portion of revenue (about [X] per cent for c2c and One Anglia) is unregulated. The SRA has told us that the market for the standard open return (interavailable walk-on tickets which are valid for travel in both peak and off-peak times) tickets to Southend from London, and cheap day return tickets are essentially unregulated meaning that One Anglia and c2c are free to price these tickets according to their own marketing plans.⁸ Also, because fare regulation works by applying a cap on the total value of fares baskets, there may be increases in individual fares that are greater than the permitted increase in the basket as a whole.

26. All the fares on the overlapping flows in the Peterborough/Norwich/Cambridge triangle are interavailable and are set by one operator, namely Central Trains, except in the case of Cambridge–Ely, which is set by Great Northern. NEG argued that there was no price competition between rail operators on these overlapping flows. The OFT acknowledged that it seemed unlikely that there would be substantial concerns on these overlap flows.
27. Figure 4 illustrates the possible outcome from increasing fares on c2c services on the main overlapping flow of London–Southend. Given the different geographical course of the two routes, NEG argued that only a small proportion of route revenue (mainly for the complete London–Southend journey) should be considered as relating to potentially competing overlaps. The OFT stated that while there were no direct point-to-point overlaps between London and Southend given that that line takes different routes, the two lines are still the closest rail alternatives for the population living between the two lines. The widest distance between the two adjacent lines along their routes is about 5 miles. A third party stated that limited competition may exist for passengers who could use either Billericay/Wickford (Greater Anglia) or Laindon/Basildon (c2c), and Rayleigh (Greater Anglia) or Benfleet (c2c) stations, given that passengers live between the two routes.
28. Figure 4 only considers the Southend–London flow, and only the passenger and revenue figures arising from non-regulated cheap day return tickets. c2c generates about £[X] from the sale of unregulated fares on the Southend–London flow, which accounts for a small percentage of all revenues for c2c. Accordingly, we estimated that this would be generated from about [X] (at £9.70 per fare). The corresponding cheap day return fare for Great Eastern is £10.20.

⁸The SRA did add, however, that these tickets could be significantly constrained by Travelcard pricing.

FIGURE 4

Southend–London: rail fare increase



Calculation of net annual benefit (£)

Overlapping pax from unregulated fares
 Overlapping C2C unregulated revenue
 Average revenue per pax £

[£ X]
 9.70

Notes

Lost C2C revenue from pax who can't switch
 Lost C2C revenue from pax refusing to switch
 Loss C2C revenue from pax switching to One
 Add revenue from increased C2C fares
 Add revenue from pax switching to One†

[£ X]

[£ X]
 @£9.70
 @£9.70
 @£9.70 @ 0.1
 @£10.20

Net annual benefit

10,831

Source: CC calculations from NEG data.

*This represents % of overall route passengers which are overlap passengers.

†Average One revenue per passenger on all overlapping sections = £ [X].

29. At a price elasticity of -0.733 ,⁹ a 10 per cent fare rise would result in a 7.33 per cent reduction in the number of passengers. If 33 per cent¹⁰ of these passengers switch to Great Eastern and half avoid both train operators, there would still be an increase in profits of £10,831 for NEG, which equates to less than 1 per cent of total c2c turnover. It is worth noting that this price rise would be profitable regardless of the merger, as over half (£ [X]) of the extra profits arise from the extra revenue arising from passengers switching to Great Eastern. There would be adverse profit outcomes if higher own-fare elasticities were used. Professor Wardman suggested an own-price elasticity for Southend leisure rail travel of -1.63 . At this level of elasticity the extra revenue from higher fares would be more than offset by the loss of revenue from switching passengers, and accordingly there would be a reduction in profits.

⁹Batley, R. (2004) *Report on Southend-London Route Choice Study*, Institute for Transport Study, University of Leeds.

¹⁰Professor Wardman, M. (2004) *Report on the Review of Rail and Coach Elasticities*. Institute for Transport Studies (ITS), University of Leeds.

30. There are several factors that may counteract the incentives to increase unregulated fares. First, unregulated fares would mainly cover journeys on non-peak times, ie periods where c2c would have spare capacity. Given that virtually all costs on rail operations are fixed, there would be an incentive to increase demand at these times, and thus make off-peak fares as attractive as possible. Also unregulated fares (such as cheap day return) are, to some extent, constrained by regulated fares and Travelcard pricing.
31. According to strategy documents supplied by NEG,¹¹ [✂].

¹¹Londonlines 3 Year Strategic Plan 2005 to 2007 and One Strategic Plan 2005 to 2007.