
Heathrow Hub rail mode share estimates

Our methodology takes a simple approach to producing an initial estimate of the size of mode share that might be expected by the introduction of Heathrow Hub, without the use of complex demand forecasting models. More complex models are able to account for considerably more factors than has been possible in this analysis, but would take significant time and resource to develop and calibrate.

Our modelling approach use existing mode choices to the airport, and assumes that these relationships (and decisions) continue in the future. To do this we have used the latest CAA surface access survey data, which provides a sample of 31,400 records representing 44m annual trips to Heathrow. We have simplified demand choices to three broad choices: car, coach/bus and rail, which we have done by amalgamating the specific 45 access mode options given in the CAA survey responses.

All absolute figures have been grown to 2030 values using forecasts provided by Aviation Economics (63% non-transfer airport growth to 2030).

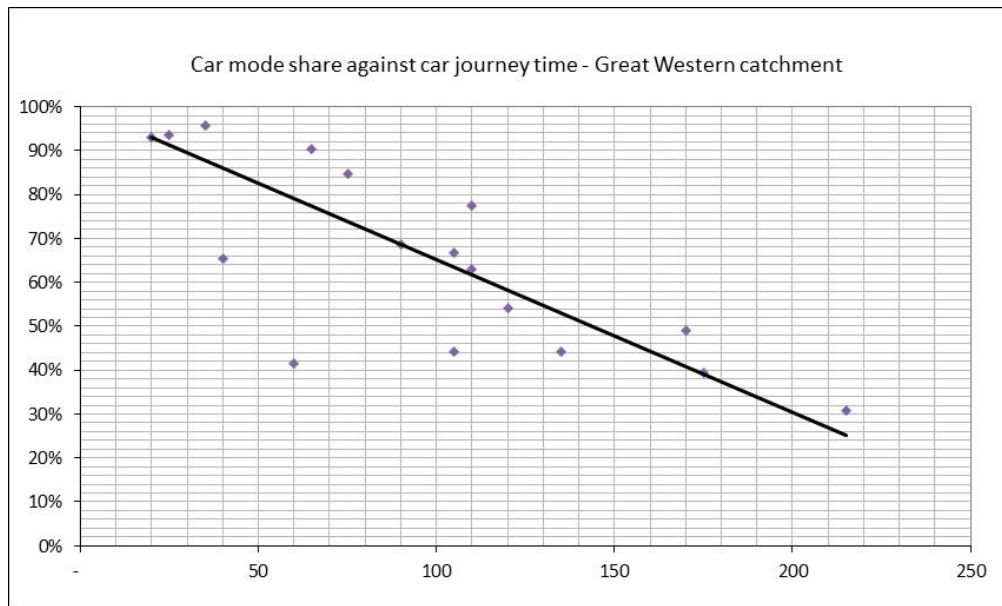
Our approach initially considered rail improvements to the airport from the west and south. These are addressed below.

Western and Southern catchments

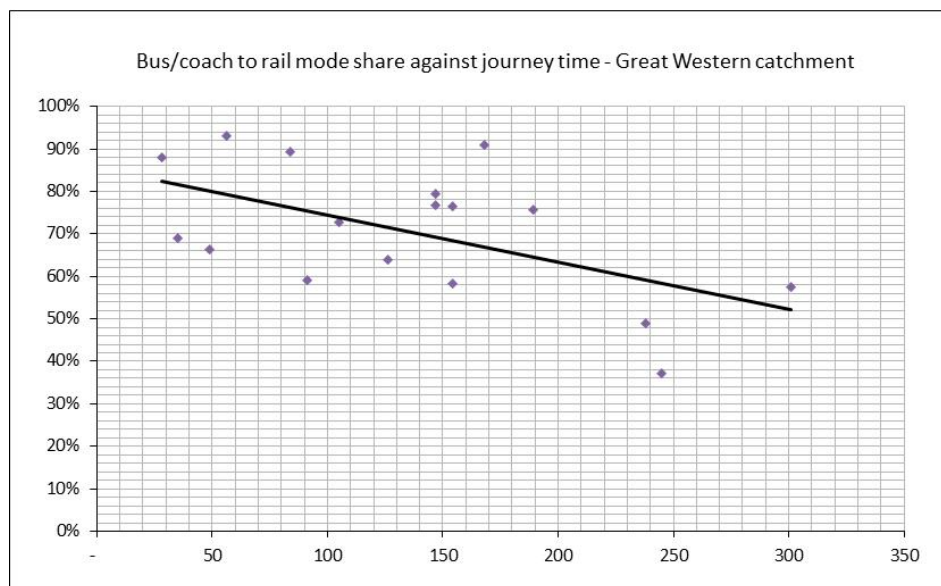
We took a subset of the CAA data with origins specifically in the Great Western and Southern airport catchments. We undertook some preliminary analysis to interrogate the data and inform how we might devise a simple, but reasonable approach.

To avoid making the method overly complicated, we assumed that improving the rail time to the airport, effectively makes rail more competitive by the amount of time it saves compared to the current position. The graph below shows the relationship between overall car mode share for a location, and journey time to the airport. We have used the gradient of the best straight-line through these points to estimate the change in mode share that could be expected by an improvement in rail journey times. A change in journey time of 65 minutes (which is the typical journey time saving by rail offered by Heathrow Hub) corresponds to a car mode share change of 23%¹.

¹ Effectively we assume that a 65 minutes faster rail journey time, equates to an 'equivalent' increase in comparative car journey of 65 minutes



We have undertaken the same analysis for coach. This graph shows that a 65 minute reduction in rail time resulting from Heathrow hub would reduce coach/bus mode share as a proportion of total public transport (i.e. when coach/bus plus rail = 100%), by 7%.



You will see that the relationship between time from airport and coach mode share is not as strong as for car. There will be a variety of reasons for this, for example:

- Coach travel is significantly more attractive than is generally the case for major flows where rail and coach compete. Coach journey times are broadly equal to or faster than rail in many cases, and services are direct, avoiding interchange, a particularly major factor for airport journeys.
- Certain locations (such as Oxford) offer extremely well-developed coach/bus services and have established unusually high coach/bus mode shares. Coach/bus travel is often provided as part of organised travel plans (school trips, holiday tours etc.)

- Coach/bus is often the lowest cost option for budget travellers

We have not attempted to resolve this for the purposes of this study. However, the shallowness of the gradient reduces the transfer we assume from coach to rail, so should reflect effectively the lower sensitivity of the bus/coach market to rail improvements.

Using these calculated modes shares reductions to car and bus/coach following the introduction of Heathrow Hub, we recalculated the overall modes share proportions for each location, assuming that the mode share changes from car and bus/coach are captured by rail. So, although we are assuming the same modes share reductions for each location (i.e. 23% and 7% for car mode share reduction and 7% coach reduction for total PT mode share), these reductions are applied to the actual observed proportions from the CAA survey for each location.

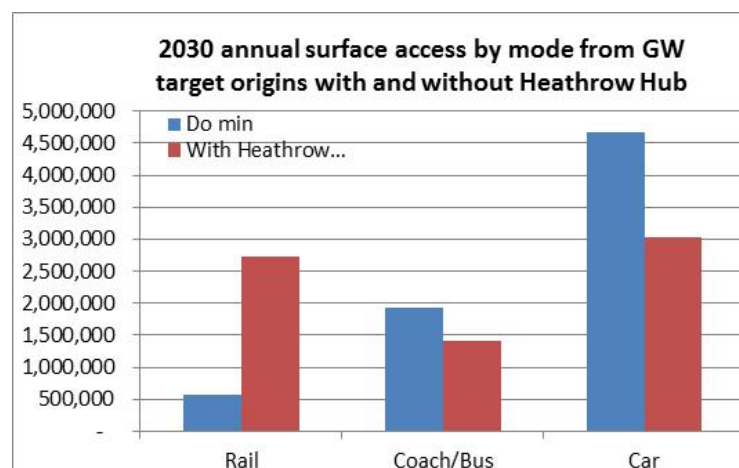
We believe that our assessment of mode shift to rail from locations on the Great Western corridor is inherently conservative. The use of public transport is relatively more attractive for journeys to Heathrow than for equivalent journeys other than to central London, but rail access is currently poor except from central London. In contrast, coach currently has an unusually high mode share (27% compared with 8% for rail) in this corridor, which strongly suggests that many air passengers choose the best public transport option for journeys to Heathrow in preference to driving. The strong market position of coach is also shown by the significantly higher fares charged by National Express for journeys to Heathrow compared with its fares to central London.

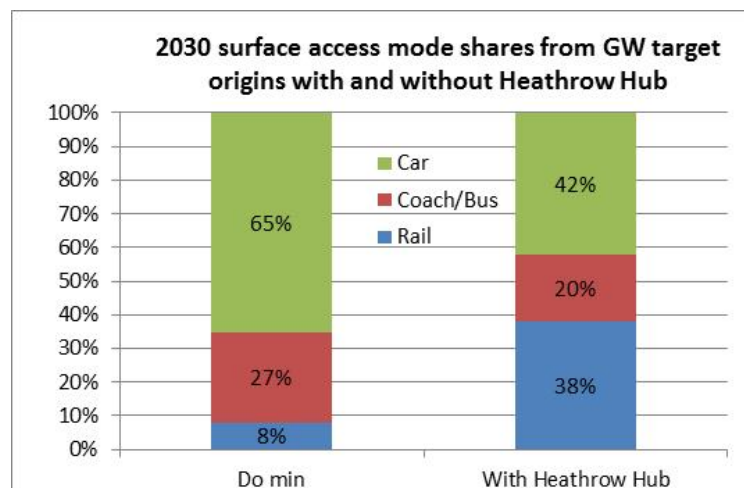
The transformation of rail access provided by Heathrow Hub will make rail the dominant public transport mode for the Great Western corridor, and we believe it is likely that the actual modal shift from both car and coach will be significantly higher than indicated by our analysis.

For locations south of the airport (Spelthorne, Hounslow, Richmond, Wandsworth, Runnymede and Woking) we have applied a similar method. However, the relationships from the observed data were not sufficiently robust to establish a reliable regression line (the immediate catchment for Southern access has fewer data points, the distances are far shorter, and some of the catchments cover wider London areas). For expediency we used the Great Western relationships, and applied these to the observed southern corridor catchments, assuming journey time savings of 50 minutes.

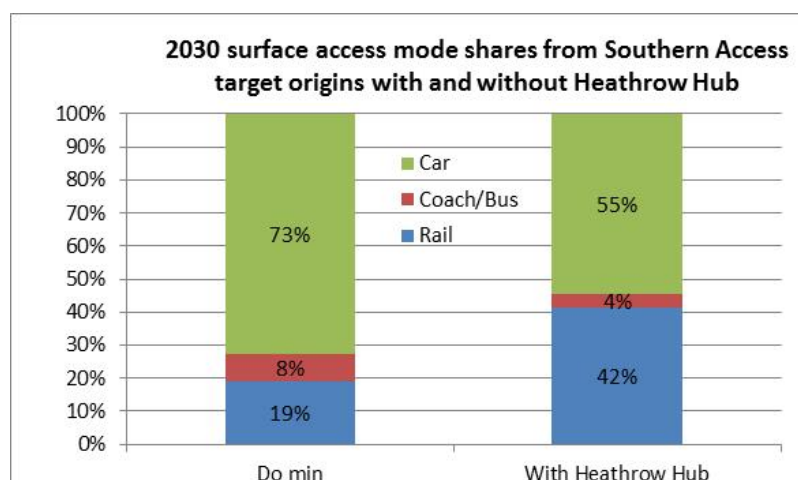
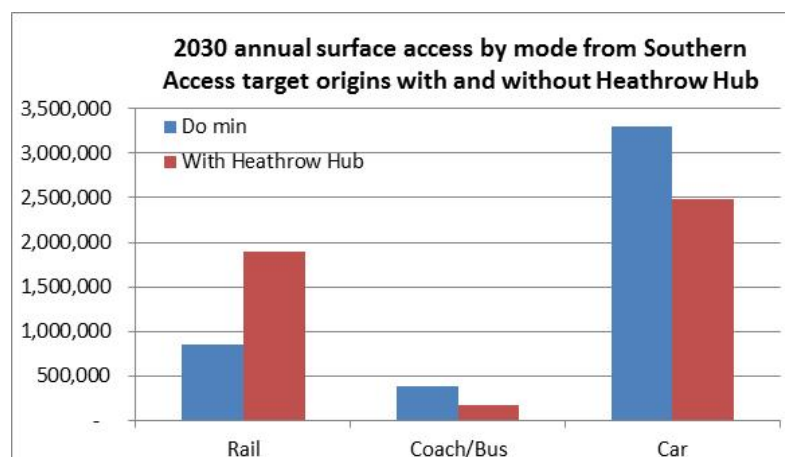
The results for these catchments are shown below.

Great Western catchment





Immediate Southern access catchment



Rest of the country and the London area

Without the availability of bespoke models, it has only been possible to undertake an indicative study of future mode share to the airport. There will be many substantial rail transport changes which will be taking place over the coming years, which are not currently available. This means that a method that is heavily based on existing choices (given in the survey information), rather than comprehensive models will have limitations. In the previous section, we have considered the two major schemes which directly form part of the Heathrow Hub proposal – namely, access on the GWML, and Southern access. The following schemes will also be in place in the future:

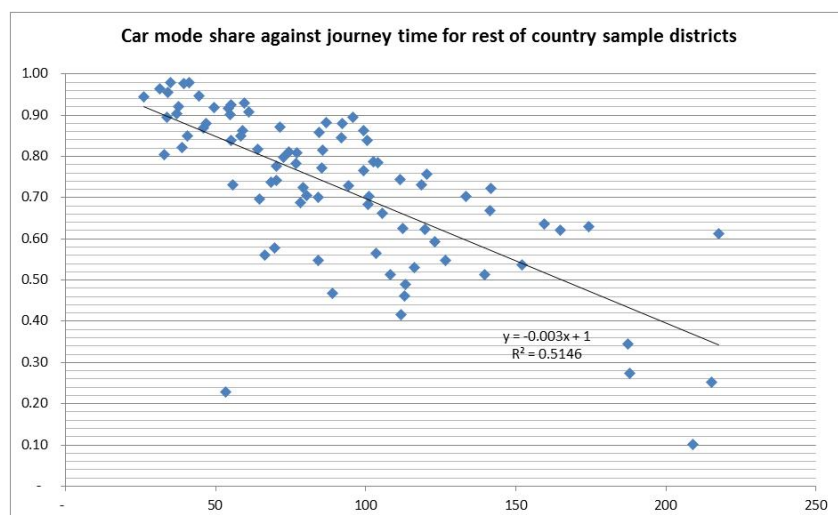
- Crossrail, including 4, or possibly more trains per hour to Heathrow (we propose 6/8 trains per hour)
- the Thameslink programme – which gives many people on the Thameslink corridor a one interchange option to Heathrow via Crossrail at Farringdon
- HS2 and Old Oak common interchange – giving very much faster access to and from the Midlands and the North, and
- A possible connection from the West Coast Main Line to Crossrail via Old Oak Common – offering catchments from the WCML a much better interchange access to Heathrow.

The approach we have taken for the rest of the country is as follows:

- We have taken a sample of districts from the rest of the country (85 districts – accounting for two thirds of the total ‘rest of country’ demand to the airport)
- Each district has been assigned a single railway station (representing the largest rail demand from that district – using ORR station entry and exit data)
- Each district has then been assigned to a rail route, via which demand would access Heathrow. We have given each location a journey time saving associated with this route, in line with the rail improvements which will be available to Heathrow in the future, as follows:

Route	Journey time saving
Clapham Junction (via Southern Access)	17 mins
Great Eastern (via Crossrail)	31 mins
HS2 (via OOC)	79 mins
Thameslink corridors (via Crossrail at Farringdon)	19 mins
WCML (via OOC)	24 mins
Woking (via Southern Access)	30 mins

- We have then applied a similar approach to estimating the change in mode share to rail as we have done for the GW and immediate Southern access areas. That is – assuming the saving in journey time will effectively change the competitive position from car to rail. The graph to show the relationship between car mode share and journey time is shown below. As you can see, the relationship is fairly strong, which offers reassurance to the reasonableness of the method.



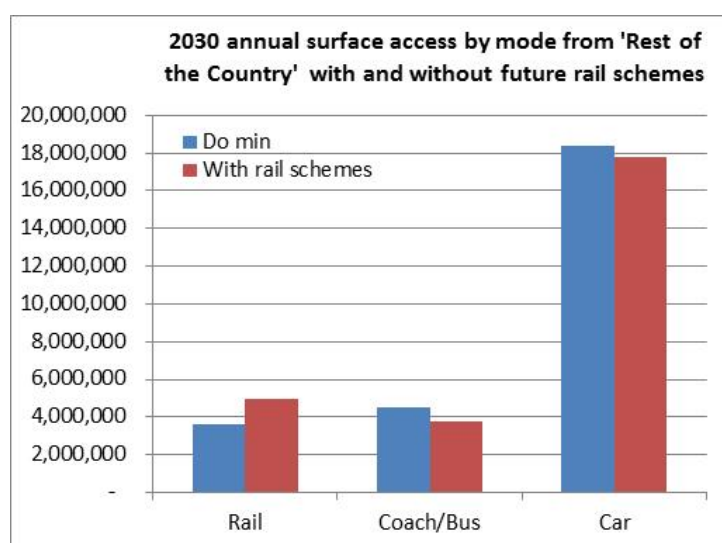
As before, we have applied the calculated mode share gain to the actual mode share of the existing districts. This increases rail demand (from car) by around 50% from these areas.

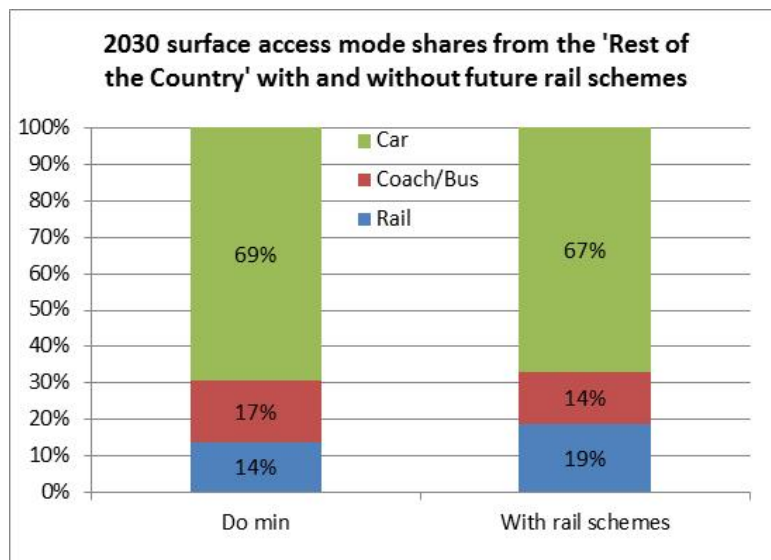
Transfer to rail from coach/bus has proved rather more problematic. As we noted before, passengers choosing coach/bus are more complex, and likely to be less time sensitive and more price sensitive. We have not been able to examine these complexities in any detail in this study. Instead, we have made a very rough adjustment of mode switch to rail from coach using the following method:

- The current 'average' journey time for rail to Heathrow from our 'ROC' districts is longer than coach, and current mode share from coach is 17% compared to 11% for rail. With rail journey time improvements, the journey time is around the same as for coach. We have therefore assumed that the equivalent modes shares would be the same for coach and rail. This transfers around 20% of coach demand to rail in the future.

Finally, for the Rest of the Country, we assume that equivalent changes will take place for other parts of the country, which were not part of the 'Rest of the Country' analysis.

'Rest of Country' results

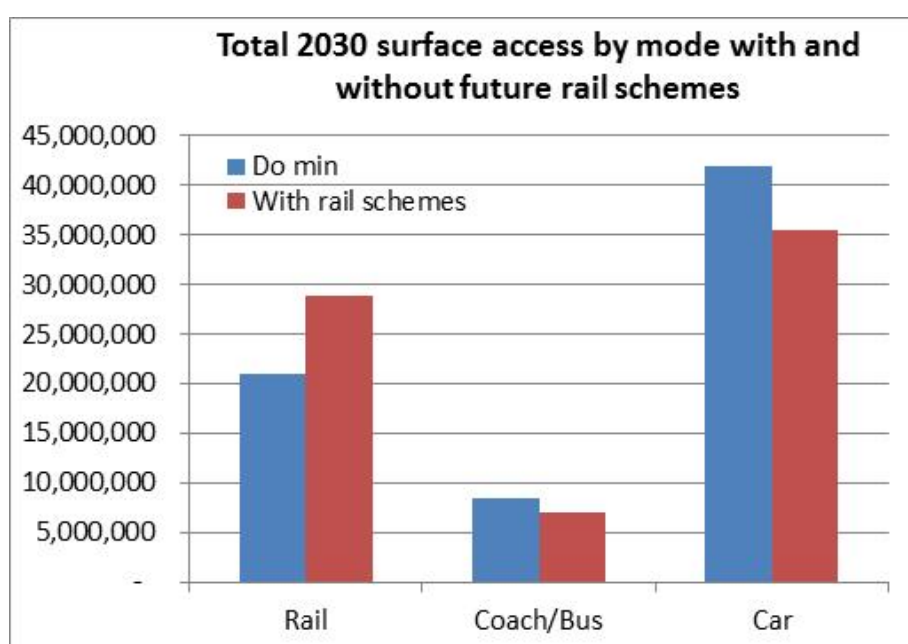


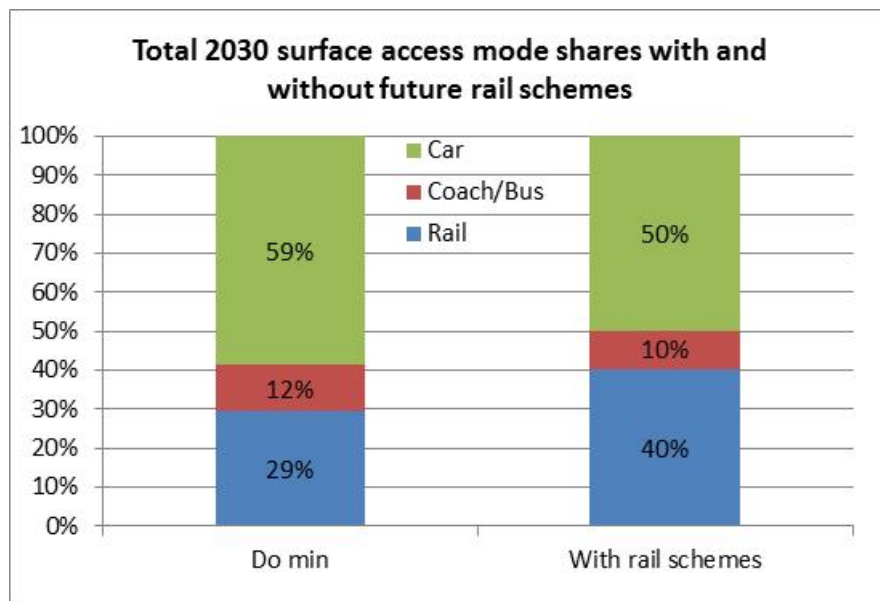


London area

The Greater London area is, and will remain in the future, by far the largest catchment for Heathrow. However, it has not been possible to estimate the changes in demand to and from the airport from the capital with the resources we have available at this time. Furthermore, TfL have advised us that they are unable to isolate the impact of Crossrail on rail demand to Heathrow from other assumed changes. However, Crossrail and other transport developments will make a significant improvement to access to the airport in the future. Proposed improvements Heathrow Hub is making to Southern Access to Heathrow will also improve rail accessibility from the south – as will the Thameslink programme to stations within the London area which will benefit from the Crossrail interchange at Farringdon. We have made a working assumption of a mode share change of 10% from car to rail from the Greater London area.

Overall results





Employee surface access

We have not been able to assess the detailed mode share of employees to the airport. However, we note that our proposals offer substantial rail access improvements to Heathrow. We are confident that our rail proposal, in conjunction with other employee initiatives, many of which are proposed by HAL, would offer very strong employee public transport access to the airport.

Cordon charging at Heathrow

The prospect of charging for private cars to access the airport has been discussed as a mechanism for managing private transport access to the airport, and generating revenue to fund more sustainable airport solutions is being considered.

We have undertaken an initial estimate of the impacts of a £5 cordon charge, using our Great Western catchment data, which indicates 4% mode transfer from car to rail. Further work would be required to test this estimate, but we consider a 4% mode shift to be a reasonable indication of the scale of change that might be expected from cordon charging.

All absolute figures have been grown to 2030 values using air passenger forecasts provided by Aviation Economics.

Summary of results

2012 figures								
						Bus-Coach		
Area	Bus-Coach	Car	Rail	Grand Total		Coach	Car	Rail
Greater London area	974,347	9,501,295	9,740,561	20,216,203		5%	47%	48%
Great Western area	1,175,369	2,860,385	368,033	4,403,787		27%	65%	8%
Southern Access area	255,651	2,024,234	530,160	2,810,046		9%	72%	19%
Rest of Country	2,773,085	11,284,866	2,219,519	16,277,470		17%	69%	14%
Grand Total	5,178,452	25,670,781	12,858,273	43,707,506		12%	59%	29%
2030 figures - no schemes		Growth to 2035			163%			
						Bus-Coach		
Area	Bus-Coach	Car	Rail	Grand Total		Coach	Car	Rail
Greater London area	1,588,185	15,487,112	15,877,114	32,952,410		5%	47%	48%
Great Western area	1,915,852	4,662,427	599,894	7,178,173		27%	65%	8%
Southern Access area	416,711	3,299,502	864,161	4,580,375		9%	72%	19%
Rest of Country	4,520,128	18,394,332	3,617,816	26,532,276		17%	69%	14%
Grand Total	8,440,876	41,843,373	20,958,985	71,243,234		12%	59%	29%
2030 figures with rail schemes - no adjustment for Greater London area								
						Bus-Coach		
Area	Bus-Coach	Car	Rail	Grand Total		Coach	Car	Rail
Greater London area	1,588,185	15,487,112	15,877,114	32,952,410		5%	47%	48%
Great Western area	1,428,457	3,022,011	2,727,706	7,178,173		20%	42%	38%
Southern Access area	174,054	2,505,465	1,900,855	4,580,375		4%	55%	42%
Rest of Country	3,781,030	17,778,724	4,972,522	26,532,276		14%	67%	19%
Grand Total	6,971,726	38,793,311	25,478,197	71,243,234		10%	54%	36%
2030 figures with rail schemes including adjustment for Crossrail for GLA							10%	to CR
						Bus-Coach		
Area	Bus-Coach	Car	Rail	Grand Total		Coach	Car	Rail
Greater London area	1,588,185	12,191,870	19,172,355	32,952,410		5%	37%	58%
Great Western area	1,428,457	3,022,011	2,727,706	7,178,173		20%	42%	38%
Southern Access area	174,054	2,505,465	1,900,855	4,580,375		4%	55%	42%
Rest of Country	3,781,030	17,778,724	4,972,522	26,532,276		14%	67%	19%
Grand Total	6,971,726	35,498,070	28,773,438	71,243,234		10%	50%	40%