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De Chino,

Thank you for your letter of 22nd October which followed up the evidence which the Department for Transport submitted to the House of Lords Economic Affairs Committee inquiry into the economic case for High Speed 2. You asked for data concerning passenger demand and capacity on the West Coast Main Line.

- (1) The average (a) total number of passengers and (b) the total number of seats available in (i) standard class and (ii) first class for all trains leaving and arriving at Euston across the week, broken down by operator, destination and whether the train is peak or off peak**
- (2) The percentage of standing capacity used on each of the trains covered by Question 1, including a definition of standing capacity for each train**
- (3) Details of any plans to increase the seating and standing capacity of trains leaving and arriving at Euston in peak times**

In response to Question (1), Annex A provides information about the train capacity, number of passengers and the ratio of passengers to seats since 2008 and Annex B provides data on First and Standard Class carriages. This data demonstrates that the Department has invested in significant increases in capacity in recent years. However, this has only managed to keep pace with increases in demand and we are reaching the limit of what is possible with the existing infrastructure. To provide for long term demand we need the step change in capacity HS2 delivers.

Background

It is important that the data in Annex A is placed in the right context. The Department, Network Rail and train operators have spent considerable sums on the West Coast Main Line to increase capacity on the line over the last 20 years.

A major £9bn upgrade which lasted 10 years was completed in 2008. This provided 1,000 extra trains every week, reduced key long distance journey times by 20% and increased the number of long distance train paths increased from 7 to 11 per hour. In terms of the 9-carriage Pendolino trains using the line in 2008, an extra four trains would equal around 1,750 extra seats in the peak hour alone.

Capacity & demand since 2008 - Long distance services

For the long distance trains operating out of Euston, the capacity of the train shown in Annex A is the same as the number of seats.

The Department has continued to invest to increase capacity. For example, in 2012 the Department's contract with Virgin added four further 11-carriage Pendolino trains and lengthened 31 trains from 9 to 11 carriages, which provided longer trains on the busiest services. This increased the number of standard class seats on each train by almost 50%, from 320 to 470.

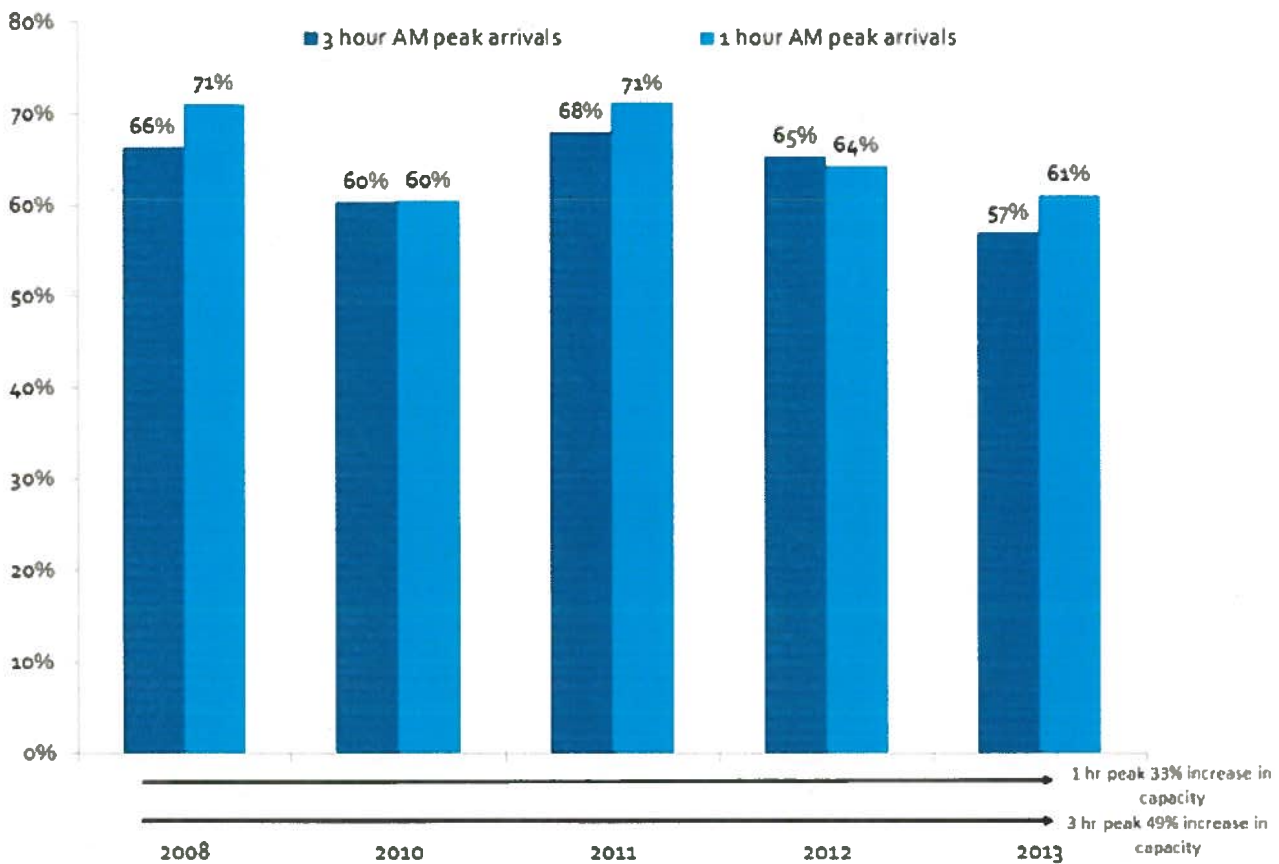
As a result, the number of long distance seats departing Euston in the AM peak hour has increased from 3,951 in 2008 to 5,244 in 2013 – an increase of 33%. Across the 3 hour peak capacity has increased by 49% from 10,200 to 15,224 seats.

Against such increases in capacity over a short period of time a decrease in the load factors is to be expected. However, as Figure 1 shows, although capacity increased 33% in the peak hour and 49% over the three hour peak, load factors in 2013 remained within 10 percentage points of the 2008 levels.

What the crowding data also does not show is that there are constraints on the number of destinations that can be served by the limited number of train paths. Virgin Trains has been working hard with stakeholders for some time to introduce a small number of additional services to Blackpool North and Shrewsbury from London Euston. Instead of introducing new services from London, as per the original application, the best we could do was to extend current services. Network Rail could not support Virgin's original application for additional train paths due to the capacity pressure on the line and the potential negative impact on reliability and performance. The revised services are expected to commence in December 2014 and are subject to final approval from the Office of Rail Regulation.

Figure 1: Load factors^{1,2} and capacity on long distance³ train service arriving at London Euston on a typical autumn weekday

Load factors^{1,2} on long distance³ train services arriving at London Euston on a typical autumn weekday



1 Includes standard and first class. Long distance capacities include the number of seats provided, suburban capacities also include standing allowances where appropriate.

2 Total capacity divided by total critical load

3 Virgin Trains services

4 2009 data is not available

Source: Department for Transport, Rail Statistics crowding data

Commuter trains

Annex A also sets out the historic loading for commuter trains. In this case, on London Midland and London Overground train services from and to Euston are aggregated together. We are not able to disaggregate this data further by passenger class, operator or service destinations because we have a franchise obligation with the train operating companies not to release the information as it is commercially sensitive.

Again, we have increased departure capacity from Euston since 2008 – this time by about 20% in both the peak hour and three hour AM peak. A significant amount of this will be from the introduction of new London Overground rolling stock that increased standing room on their trains at the expense of seats.

However, load factors remain close to their 2008 levels. The load factor is 91% in the one hour AM peak and 88% in the three hour peak (which is above 2008 levels for the three hour peak).

Figure 2 provides a response to Question (2). When considering the number of passengers standing, and the number of passengers in excess of capacity, we are able to disaggregate the data by train operating company. This clearly shows the differences in between London Midland Services and London Overground.

The capacity for commuter services does include a standing capacity where appropriate. Standing allowances can vary considerably between types of rolling stock but for modern commuter train sliding door stock it is typically around 35%. London Overground has a high percentage of passengers standing because its trains are designed to carry a high number of standing passengers and limited numbers of seats.

Figure 2: Peak passengers in excess of capacity (PiXC) and passengers standing at London Euston on a typical autumn weekday, 2013

	AM peak arrivals (07:00-09:59)			PM peak departures (16:00-18:59)		
	London Midland	London Overground	Virgin Trains	London Midland	London Overground	Virgin Trains
PiXC ¹	7%	0%	0%	8%	0%	0%
Passengers ² standing	21%	51%	0%	20%	45%	0%

1 The percentage of standard class passengers above the capacity on their service at the critical load point.
2 The percentage of standard class passengers above the number of standard class seats at the critical load point.

Source: <https://www.gov.uk/government/statistics/rail-passenger-numbers-and-crowding-on-weekdays-in-major-cities-in-england-and-wales-2013>

This shows that over the morning and afternoon peaks, London Midland services are carrying on average nearly one person over the capacity (including standing room) for every 10 passengers on the train. One in five people is standing. This is an average and London Midland services regularly feature in the top 10 most crowded services in the country.

The nature of the services provided by these carriers are different. London Overground run short, metro-style services that serve London and the suburbs. Please note, these services are not included in the BCR for HS2 and were not covered in the 2013 strategic case.

Virgin runs long distance intercity services. Standing is not a reasonable option on these services. With luggage a train can seem full even when there are seats available. While on average there are no passengers in excess of capacity during the peaks, certain trains, such as the first off-peak trains on a Friday evening, can be extremely full.

London Midland offers an inter-urban commuter service. These trains serve destinations between London and Birmingham. London Overground style standing coaches are not reasonable for such journeys.

Meeting Future Demand

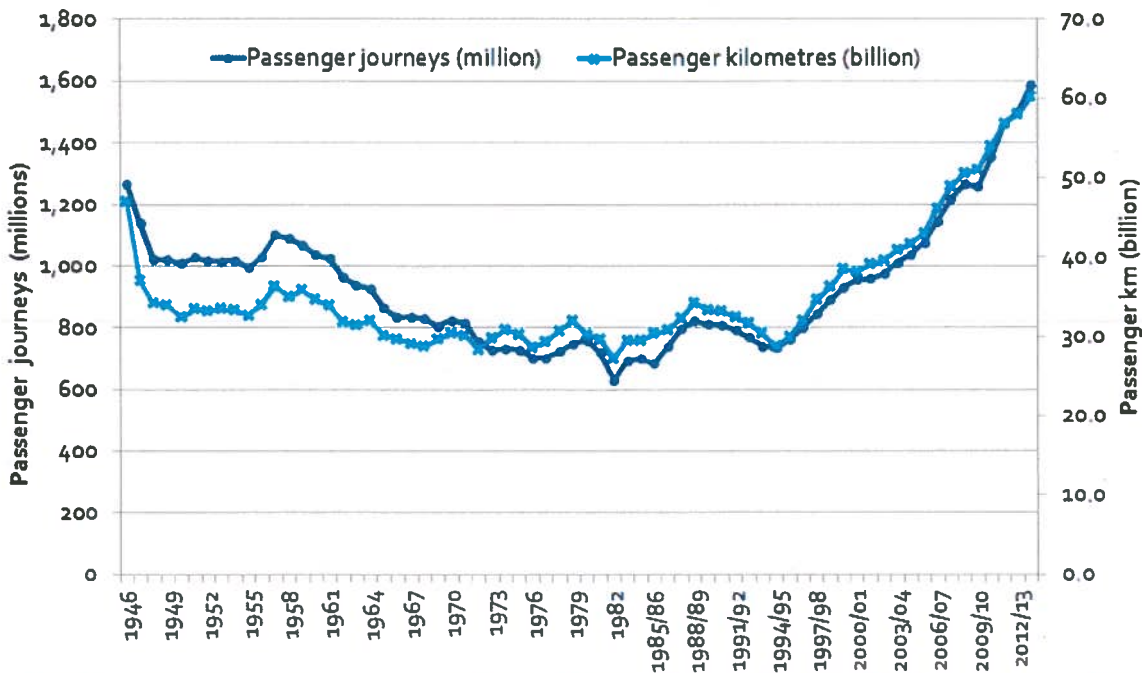
The recent statistics show that, on long distance services at least, a number of significant capacity increases have kept pace with short term demand. For London Midland services, passengers are already travelling on some of the busiest services in the country.

The charts below show the recent trends in rail demand. They show consistent growth in passenger demand over the last 20 years, with historic levels of demand. They also show recent trends and, despite fluctuations, year on year growth has remained positive.

We have no reason to believe that demand for rail is likely to slacken significantly in the future. From our demand modelling, the economic case assumes passenger demand grows at 2.2% per year. By contrast long distance rail demand has grown at an average rate of 4.9% a year for the last 18 years.

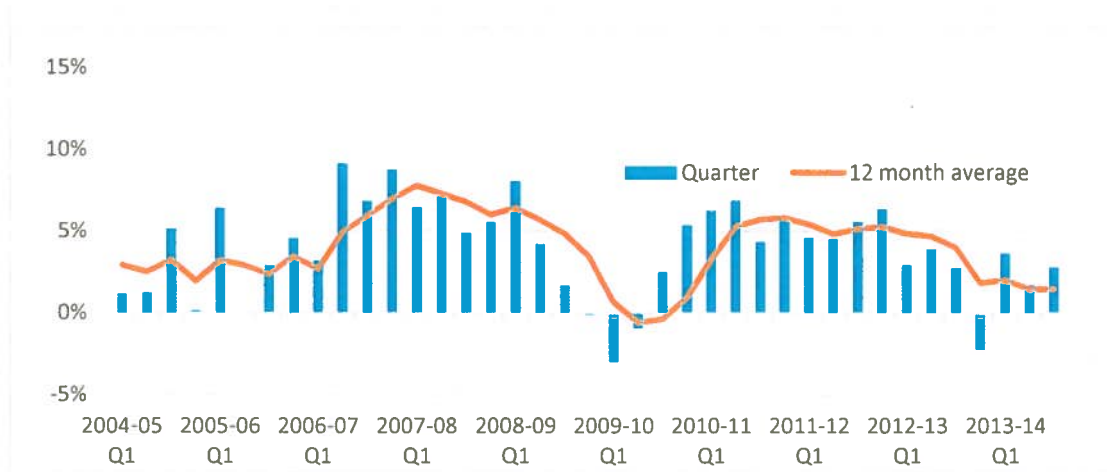
Our past projections have been conservative - in the 2007 'Delivering a sustainable railway: White Paper' we predicted demand 6% lower than actual growth by 2012/13. Had we predicted the economic downturn and accounted for it in our projections in 2007, the gap between predicted and actual demand would have been even larger.

Figure 3: passenger journeys and kilometres, 1946-2012/13



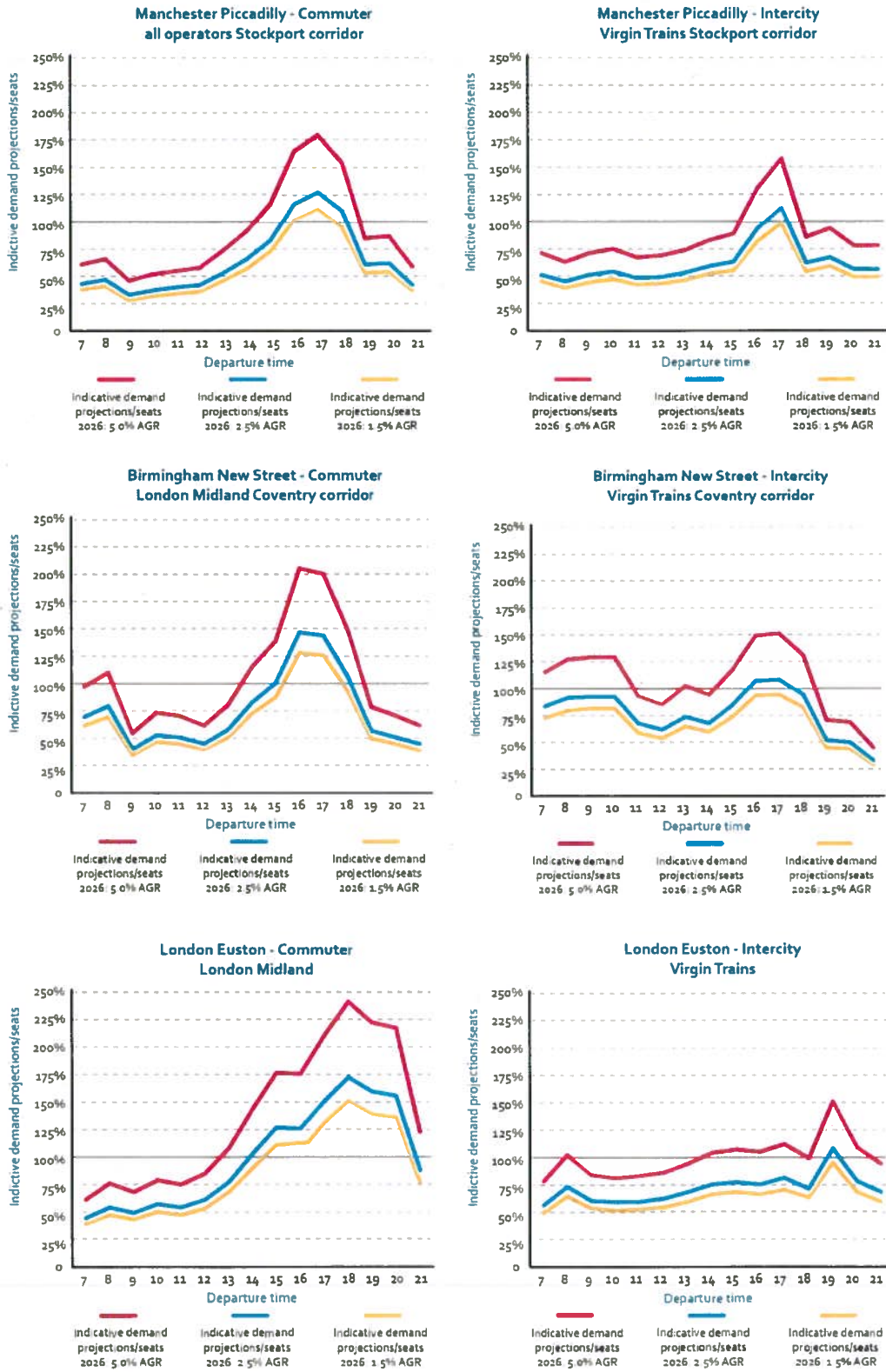
Source All journeys 1946-2012/13 Department for Transport, Transport Statistics Great Britain 2013, Table TSGBo601, All journeys 2013/14, and data for long distance operators Office of Rail Regulation and online archives of Strategic Rail Authority statistical publications
 Note: all journeys from 2009/10 include non-franchised services

Figure 4: Percentage change in passenger kilometres from year before: all franchised operators (long distance and commuter)



Looking to future demand, it is clear that we will have to provide more capacity if we want to continue to keep pace with even modest future demand. The charts below show analysis undertaken for the strategic case. They show indicative passenger to seat ratios of services in 2026 at different passenger growth rates if we did not increase the capacity of the network. Even allowing for standing room on London Midlands services, these levels of passengers to seats would result in serious levels of overcrowding and in practice would mean people being unable to get on trains.

Figure 5: indicative passenger demand to seat ratios



Committed improvements

The Department has some plans in place to increase capacity on both Virgin and London Midland trains during the current rail Control Period, which runs up to 2019.

In response to Question (3), in the recent Direct Award, Virgin trains committed to convert one first class coach in 21 Pendolino trains to standard class. This work is due to take place during 2015. This will increase Standard Class capacity by 5,500 seats per day, a net increase of 2,100 seats.

The Department for Transport is also investing £62 million in ten additional Class 350 4-car trains to run on the London Midland network and the upgrade of some of the existing Class 350 fleet to be capable of 110mph running. The new fleet was planned to come into service from December 2014, but some of the trains were introduced more than two months' early. The remaining trains are due to be introduced on London Midland's services ready for the new winter timetable in December. The higher speed will enable an additional hourly London peak train to operate, maximising use of the four tracks into Euston, and further peak trains will be lengthened from 8 to 12 carriages, the greatest length that can currently be accommodated. The train plan is still being finalised but we anticipate it will provide several thousand additional peak places into Euston, helping meet the requirement for capacity to satisfy the demand forecast in the 2012 rail investment strategy.

Alternatives to HS2

Looking further forward, our investment plans will seek to complement HS2. However, we have done a considerable amount of work on the potential to increase capacity on the West Coast Mainline through upgrading the current network. We have published four reports on the subject, most recently 'HS2 Strategic Alternatives Final Report' published in October 2013¹. A summary of our work on strategic alternatives is also considered in Chapter 6 of the Strategic Case.

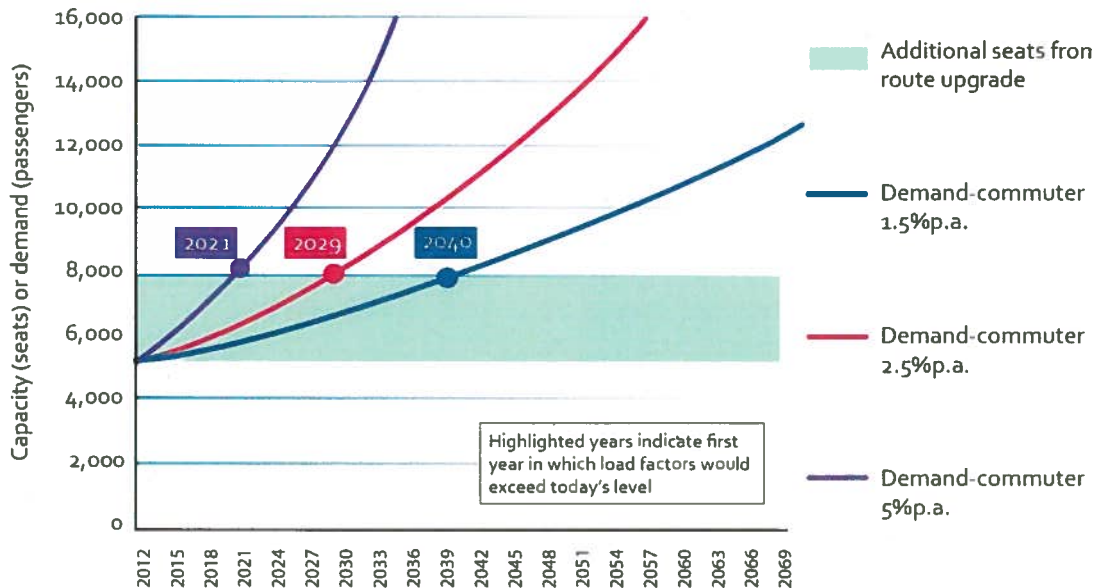
This considerable work in developing and modelling an optimised alternative to HS2 found that the best of the alternatives could only increase the total number of seats leaving Euston by 36% during the PM peak hour. After this there are no realistic alternatives to increase capacity further. To put this into context, between 2008 and 2013 we have increased the number of AM peak hour seats by 36% and PM peak hour seats by 29%.

Furthermore, the alternatives can only deliver up to 16 train paths an hour during the peak. That is one more intercity service, and two more commuter services (one of which London Midland intends to introduce shortly) than we currently have today. Again, after that, there is no realistic way to increase the number of services. This limits the capacity of the upgrade, but it limits future connectivity, particularly between the North of England and London. Services to places such as Milton Keynes could also be compromised due to restrictions in the current timetable means that services are limited.

¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/253456/hs2-strategic-alternatives.pdf

Analysis undertaken for the strategic case shows that, for both long distance and commuter services and under modest rates of rail growth, all of the additional capacity provided by strategic alternatives would be used up during the 2020's.

Figure 6: commuter demand and route capacity achievable through upgrading the existing West Coast Mainline



HS2

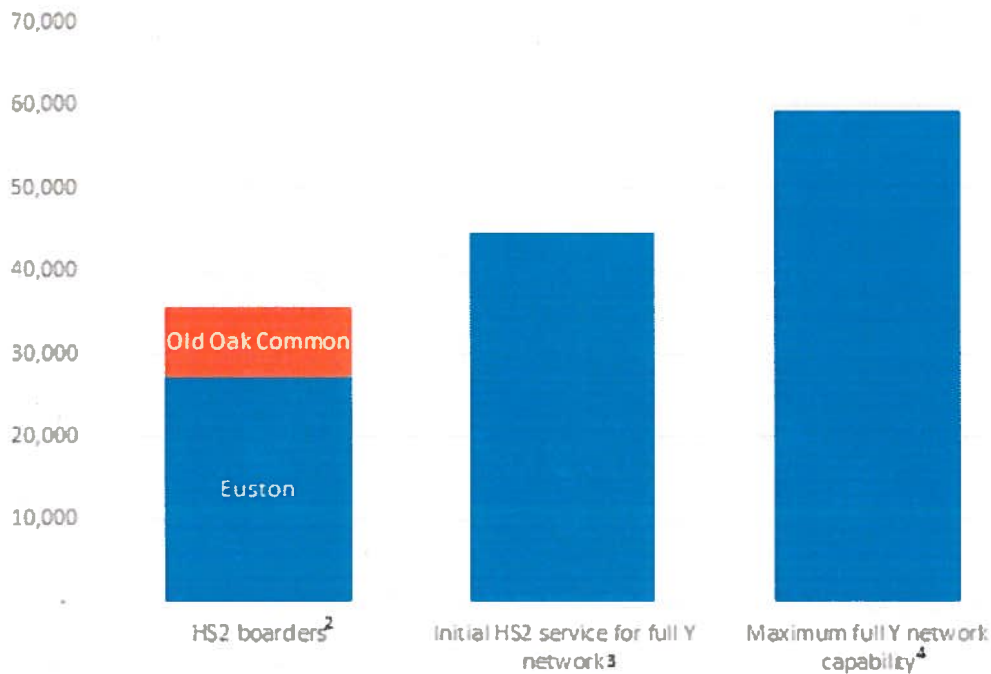
By contrast, HS2 will ultimately triple the seats available compared to today's capacity and allow up to 30 train paths out of Euston during peak hours, compared to 13 paths available in 2009. It will free up capacity on the existing network for new services that cannot be run today because of timetabling compromises.

We do not plan to use the full capacity of the network from the first day of operation. The initial service specification for the full HS2 network would provide 44,550 seats in the three hour peak PM period which could increase to a maximum full network capability of 59,400.

We are confident that there will be sufficient demand for HS2, and demand that would overwhelm the alternatives. The detailed modelling that we undertook as part of the economic case and financial case for suggests that HS2 will have enough passengers to be profitable as a franchise from the start of operations. The model shows an all-day loading factor (taking account of the extra capacity provided) of 41%, which is very close to the average 2013 all day loading factor of Virgin services of 43% today.

The chart below shows the number of passengers forecast to board HS2 at Euston and Old Oak Common during the PM peak period (16:00-19:00) in 2036 compared to the number of HS2 seats. This chart shows that there will be a sufficient capacity to meet demand and that there is scope for HS2 to increase capacity further post 2036.

Figure 7: 3 hour peak¹ PM departures departing London on HS2 in 2036



¹Peak hour is the 16:00-19:00 period

²Source of HS2 boarders data is the Environmental Statement: Traffic & Transport Part 4 London Assessment

³The initial HS2 service for the full network is based on 5x 200m and 11x400m trains per hour from London

⁴The maximum full network capability is based on 18x 400m trains per hour from London

I trust this information meets your requirements insofar as we are able to given the constraints of commercial sensitivity. I look forward to seeing you on 9th December.

y-e
Patrick

THE RT. HON. PATRICK McLOUGHLIN

Annex A

Figure 8: Total peak and off-peak capacity¹ and critical loads² on train services arriving at and departing from London Euston on a typical autumn weekday: 2007 to 2013

	2008			2009			2010			2011			2012			2013		
	Total capacity	Total critical load	Load to Capacity %	Total capacity	Total critical load	Load to Capacity %	Total capacity	Total critical load	Load to Capacity %	Total capacity	Total critical load	Load to Capacity %	Total capacity	Total critical load	Load to Capacity %	Total capacity	Total critical load	Load to Capacity %
Long distance: 3 hour AM peak arrivals	10,200	6,761	66	..	..	..	12,438	7,510	60	12,255	8,327	68	12,255	8,000	65	15,224	8,867	57
1 hour AM peak arrivals	3,851	2,809	71	..	..	..	4,902	2,983	60	4,902	3,487	71	4,902	3,149	64	5,244	3,199	61
Off-peak arrivals ⁶	36,403	18,747	51	..	..	..	49,879	19,613	39	49,313	21,413	43	49,398	22,536	46	58,846	23,420	40
All day arrivals	46,803	25,508	55	..	..	..	62,117	27,123	44	61,568	29,740	48	61,641	30,536	50	74,070	32,887	43
3 hour PM peak departures	11,517	7,031	61	..	..	..	14,011	7,065	51	14,109	8,062	57	14,011	7,881	57	16,508	8,256	50
1 hour PM peak departures	4,390	2,371	54	..	..	..	4,902	2,591	53	4,902	2,952	60	4,902	2,886	59	5,688	2,920	51
Off-peak departures ⁷	34,544	17,867	52	..	..	..	48,106	20,012	42	48,069	22,152	46	48,090	23,595	49	58,712	24,431	42
All day departures	46,061	24,898	54	..	..	..	62,117	27,097	44	62,178	30,214	49	62,080	31,555	51	75,220	32,887	43
Suburban ^{4,5} 3 hour AM peak arrivals	19,326	16,373	85	20,616	15,996	78	23,289	15,827	68	23,067	17,839	77	22,581	17,091	76	23,082	20,243	88
1 hour AM peak arrivals	9,280	8,777	95	10,557	8,729	83	11,028	8,291	75	11,037	8,861	78	11,071	8,558	77	11,083	10,073	91
Off-peak arrivals ⁶	..	..	..	..	..	..	..	..	..	83,039	18,201	20	85,650	18,716	20	87,130	21,548	32
All day arrivals	..	..	..	..	..	..	..	..	..	88,106	36,040	42	88,231	35,807	41	90,222	41,701	46
3 hour PM peak departures	20,007	13,314	67	21,065	15,894	74	22,892	16,346	71	22,511	17,034	76	22,858	16,860	73	23,733	19,030	80
1 hour PM peak departures	7,891	5,143	65	8,789	6,021	69	8,732	5,964	68	8,729	6,544	75	8,726	6,361	73	8,763	7,124	81
Off-peak departures ⁷	..	..	..	..	..	..	..	..	..	82,030	20,683	33	82,678	21,834	35	84,339	23,924	37
All day departures	..	..	..	..	..	..	..	..	..	84,541	38,317	45	85,536	38,294	45	88,072	42,854	49

Where data are not available this is denoted by ..

- 1 Includes standard and first class. Long distance capacities include the number of seats provided; suburban capacities also include standing allowances where appropriate.
- 2 Includes standard and first class.
- 3 Virgin Trains services.
- 4 Siterlink (2007): London Midland and London Overground services from 2008.
- 5 Figures for 2007 and 2008 are based on only one manual count per service.
- 6 All services outside the 3 hour AM peak.
- 7 All services outside the 3 hour PM peak.

Notes and definitions for passenger numbers and crowding statistics (<https://www.gov.uk/government/publications/rail-statistics-qt>)

Source: Passenger counts; Department for Transport and Transport for London

Annex B

Figure 9: Seats and standing capacity on Virgin trains at Euston

Class of vehicle	Number of vehicles and unit configuration	Seats	Capacity of units		
			Standing **	Total	Standard class
390	35x11 car	589	147	736	444
390	21x9 car	439 (467)#	109 (116)#	548 (583)#	294 (368)#
221*	20x5 car	254	63	317	228
57	5 locomotives	N/A	N/A	N/A	N/A

* In addition, two driving cab ends are held in storage at Central Rivers Depot

** Standing capacity is assumed to be 25% of seating capacity.

Revised capacity following completion of the Coach G conversion works.

Figure 10: Seats and standing capacity on London Midland trains at Euston

Unit	Number of sets	Standard seats	First seats	Fleet size
321/4	4	271	28	7
350/1	4	206	24	30
350/2	4	246	24	37
350/3	4	214	24	10