Appendix D

HS2 Chesterfield Demand Analysis

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AECOM

Chesterfield HS2

Final

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Derbyshire County Council

Demand Analysis Report

Revision Record

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1 Introduction

1.1 Scope

AECOM has been commissioned by Derbyshire County Council (on behalf of Chesterfield Borough Council) to investigate the potential impacts of HS2 services calling at Chesterfield station. These have to be understood in the context of wider changes to existing services on the conventional network assumed to occur post HS2 Phase 2b. In addition to modelling this Core scenario, testing has been undertaken to model various additional combinations of HS2 services calling at Chesterfield that are currently proposed to pass through the station without stopping.

1.2 Methodology

MOIRA is a rail industry standard demand and revenue modelling tool used by the Train Operating Companies (TOCs). It calculates changes in Generalised Journey Time (GJT)[1] resulting from changes in the timetable and applies standard rail industry demand elasticities to these in order to ascertain proportional changes in demand. It allows the user to identify changes in rail demand on a flow by flow basis and also by groups of services. It is most appropriately utilised where GJT changes are up to circa +/-20%. For this reason HS2 Ltd has not used MOIRA to model the more 'transformational' impacts of HS2 where more significant changes in GJT are forecast to occur. For example, the change in GJT on the Chesterfield-London flow could be in the region of -25% once the HS2 service is introduced. However given the relatively high level of this study, MOIRA remains the best tool available to undertake this particular analysis. It will provide a broad indication of the likely scale of demand change.

A copy of MOIRA was kindly provided by Northern Rail to undertake the analysis. This particular version of the software includes a sufficient level of geographical detail to ensure that any relevant changes local to Chesterfield are identified within the analysis. The version of the software utilises a December 2016 version of the national rail timetable, and demand and revenue data for the year leading to September of the same year.

1.3 Data Sources

In order to define both the Core and Option scenarios, information was required on the likely service pattern at Chesterfield post the construction of Phase 2b of HS2. Data in terms of calling patterns and journey times for HS2 services has been sourced from the "HS2 Phase 2b Strategic Outline Business Case-Economic Case" document[2] (November 2016), with further details subsequently confirmed directly with HS2 Ltd.

As the introduction of services on HS2 Phase 2b will also impact upon existing services on the "classic" network, amendments to the base timetables in MOIRA will have to be considered. As part of the emerging business case for Phase 2b, HS2 Ltd have outlined their assumptions for changes to existing services used in the demand modelling for the new route. Details of these amended service patterns are published as part of "HS2 Phase Two Assumptions Report: PLANET Framework Model version 6.1c" (November 2016) document[3].

These assumptions have generally been utilised as the basis for the conventional services used in this study (described in Section 3.1). However in a few instances, alternative assumptions have been used. An example of this is where service patterns operated by the Northern franchise in the Chesterfield area have been amended since the award of the new franchise in April 2016. These changes were not reflected in the latest round of PLANET modelling by HS2 Ltd.

1.4 Modelling Assumptions

A number of assumptions have been made in order to produce the modelling outputs:

Demand data is at year to September 2016 values. No exogenous growth is considered.

[1] GJT is made up of in-vehicle time, service frequency penalty (ie wait time) and interchange penalty

[2] https://www.gov.uk/government/publications/hs2-phase-2b-economic-case

[3] https://www.gov.uk/government/publications/hs2-phase-2b-economic-case

- Services are coded as per the specifications set out by HS2 Ltd (see Sections 1.3 and 3.1). Services operate to a standard hour pattern with no peak time extra services.
- Modelled changes to timetables are limited to services operating to or through Chesterfield station. No changes were made to other areas of the network (e.g. southern part of Midland Main line, Sheffield-Manchester route).
- Weekday demand and timetable utilised in MOIRA with scale factors to all-week/all-year demand.
- Timings of retained existing services in the Core and Option stopping tests have been altered in some instances to accommodate even interval HS2 services and to retain a realistic timetable on the Chesterfield – Sheffield corridor.
- MOIRA does not take into account any potential fare based competition between conventional and HS2 services in the future, nor restrictions on the usage of HS2 services for certain flows. We have therefore assumed fares are the same between HS2 and conventional rail services.
- Demand between Chesterfield and the proposed HS2 stations at East Midlands Hub (Toton) and Old Oak Common were omitted due to the limitations of the MOIRA software. Whilst the overall impact on demand of this will be marginal, it should be borne in mind that there would be journeys made on the HS2 network to and via (ie; interchange) these stations that are not captured in this analysis.

2 Baseline

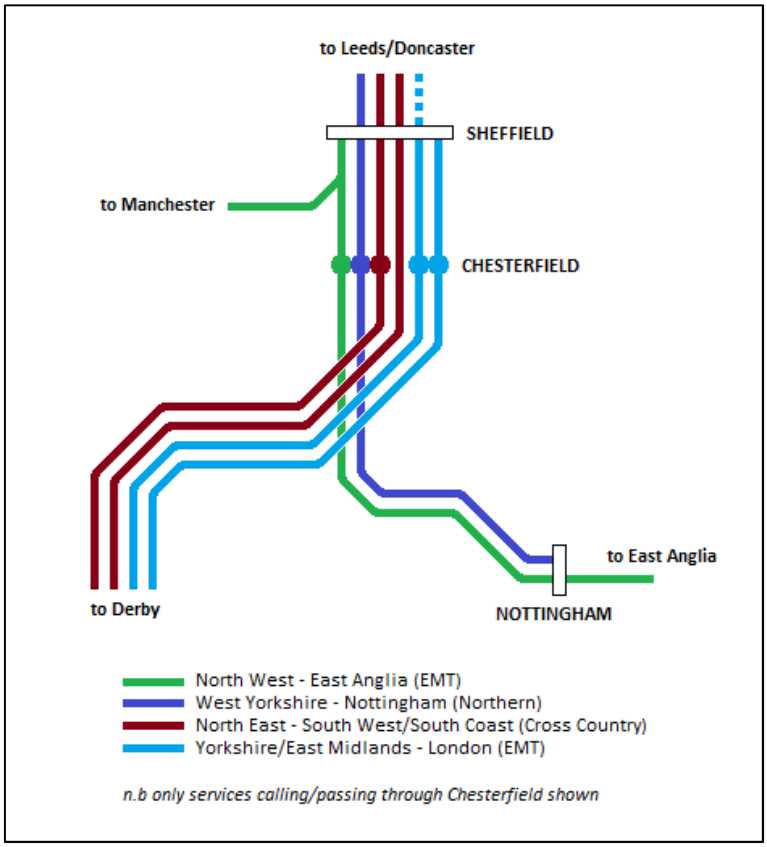
2.1 Current services at Chesterfield

Chesterfield station is currently served by services provided by three passenger Train Operating Companies (TOCs).

- East Midlands Trains operate services on two axis; from London St Pancras to Sheffield twice hourly (both calling at Chesterfield), and from the North West to East Anglia via Sheffield and Nottingham (hourly).
- Cross Country operate services between Scotland, the North East, and Yorkshire, to the West Midlands, South West and South Coast via Sheffield and Derby. Two trains pass through Chesterfield each hour, although generally only one calls throughout most of the day.
- Northern operate an hourly service between Leeds and Nottingham via Barnsley and Sheffield, calling also at Chesterfield.

Existing services in a standard hour are shown in Figure 1.

Figure 1: Existing Service Pattern



Therefore there are five trains calling at Chesterfield in a standard weekday off-peak hour, in each direction.

2.2 Current demand at Chesterfield

Table 1 presents the existing demand to and from Chesterfield by area (only flows with over 300 trips per annum considered). These constitute 99% of the demand at Chesterfield.

Table 1: Chesterfield Demand by Region

To/From	Single Jnys per annum	Share
Sheffield Area	583,000	33%
Greater London	260,000	15%
Rest of Yorkshire	204,000	12%
Derby Area	132,000	8%
North West England/North Wales	123,000	7%
Nottingham Area	109,000	6%
West Midlands	73,000	4%
Local Stations*	72,000	4%
Rest of East Midlands	70,000	4%
South East	37,000	2%
South West England/South Wales	22,000	1%
North East of England	14,000	1%
East of England	13,000	1%
Scotland	11,000	1%
Other journeys on flows with less than 300 trips per annum	18,000	1%
Total	1,741,000	100%

** Dronfield & Alfreton*

Notable is the dominance of short distance trips to and from the Sheffield area, comprising a third of total demand. Greater London and (rest of) Yorkshire trips make up over a further quarter of total demand. Nottingham, NW England/N. Wales, and Derby make up between 5% and 8% of demand.

Figure 2 shows the relative flows of demand between Chesterfield and key locations in North and Central England. Of key interest is the dominance of the short hop to Sheffield which, when considered with other flows heading north from Chesterfield accounts for circa 980,000 trips per annum. The significance of the flows southbound towards London and the South East via Derby and Leicester should also be noted.

Figure 2: Flow Diagram - Existing Demand

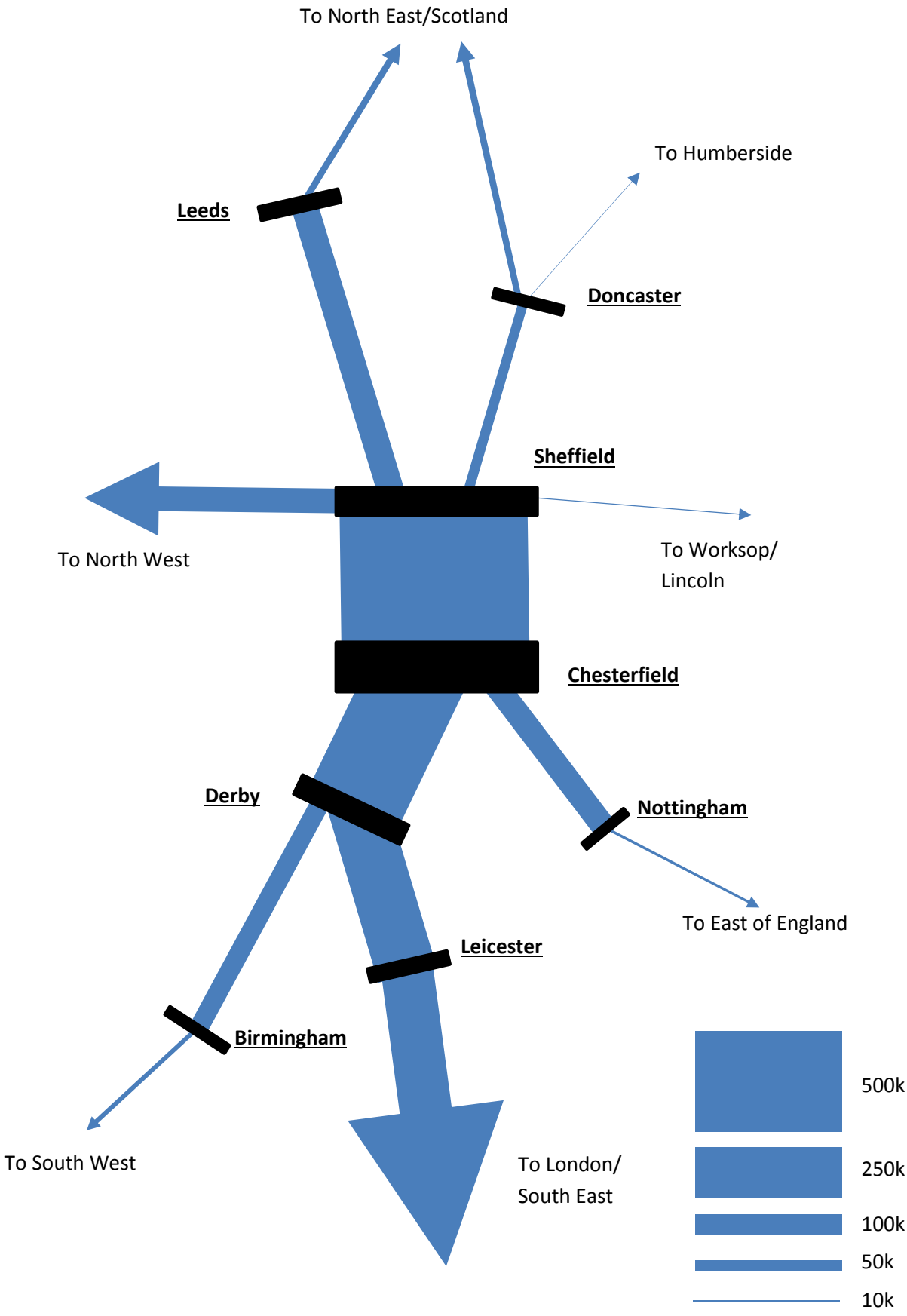


Table 2 shows the split between existing demand originating and terminating at Chesterfield.

Table 2: Chesterfield Demand as Origin/Destination

	From Chesterfield	To Chesterfield
Journeys per Annum	1,169,000	572,000
%	67%	33%

This shows that Chesterfield is primarily a generative station, being the starting location for two thirds of trips using the station. However, there are still a significant amount of attracted trips, reflecting the strength of local employment and also the utility of the station as a railhead for visitors to East Derbyshire, the Peak District and North Nottinghamshire.

Table **3** presents existing demand split by Train Operating Company (TOC).

Table 3: Chesterfield Demand by TOC

TOC	Journey Share
East Midlands	55%
Cross Country	30%
Northern	15%

Table 3 As the current majority operator at the station, as well as provider of services to London, East Midlands Trains accounts for 55% of demand to and from Chesterfield. Cross Country, operator of non-London long distance services (including trains to Leeds and Birmingham) accounts for a further 30% of trips. Northern, operator of an hourly Nottingham to Leeds service accounts for the remaining 15% of demand at Chesterfield.

3 HS2 Option Specification

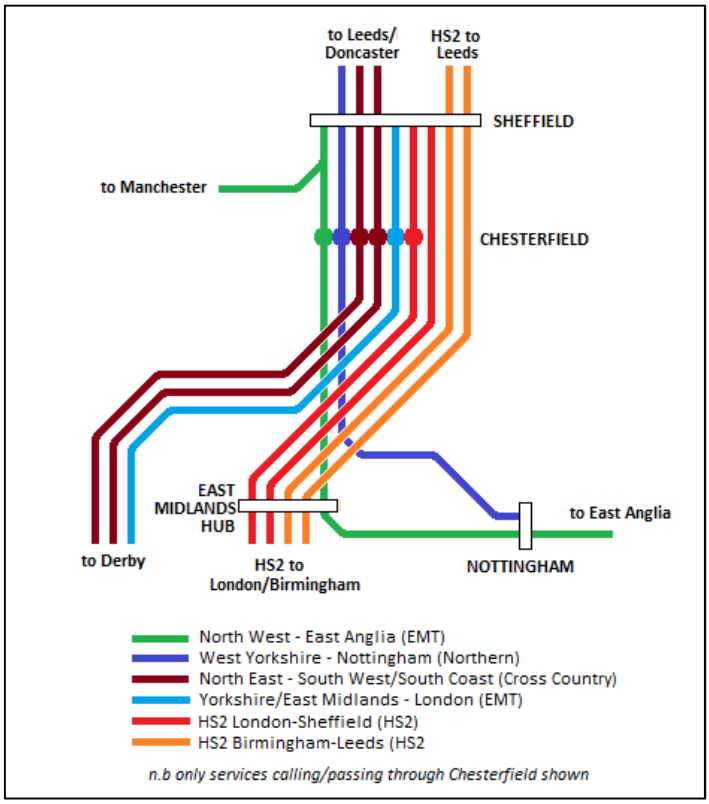
3.1 HS2 Core Scenario

The Core Scenario in a post HS2 Phase 2b environment contains a number of assumptions made about services both via the high speed and conventional networks. Sources for these are discussed in Section 1.3. Details of these are outlined as follows:

- Four HS2 services pass through Chesterfield each hour in each direction. These consist of two London to Sheffield services (which divide from Leeds services at East Midlands Hub) and two Birmingham to Leeds via Sheffield services. Of these, one of the London-Sheffield services each hour calls at Chesterfield.
- One conventional London-Sheffield service per hour via Derby, Leicester and the Midland Main Line. This calls at Chesterfield.
- One North West-East Anglia via Sheffield and Nottingham service per hour. In the Core Scenario, this service is diverted via the East Midlands Hub to provide interchange with HS2 services, incurring a journey time penalty as a result. This service calls at Chesterfield.
- One Bradford to Nottingham service via Leeds and Sheffield per hour. In the Core scenario, this train replaces the existing Leeds-Nottingham via Barnsley and Sheffield service, as planned to be undertaken by the new Northern franchise. As such, this differs from the assumptions made in the HS2 PFM 6.1 document. This train calls at Chesterfield.
- Two Cross Country services each hour, one from Edinburgh to Plymouth (via Leeds), and one from Reading to York (via Doncaster). In the Core scenario, both these trains call at Chesterfield.

Figure **3** shows the Core service pattern as modelled at Chesterfield.

Figure 3: Core Service Pattern



Four HS2 services are now shown as passing through Chesterfield (with one calling) between Sheffield and the new East Midlands Hub station at Toton. One Midland Mainline service between Sheffield and London is removed, with the North West to East Anglia service diverted via the East Midlands Hub. In total, six trains per hour are shown as calling at Chesterfield in the Core HS2 scenario.

3.2 Alternative HS2 Scenarios at Chesterfield

Five alternative calling patterns for HS2 services (Options 1-5) passing through Chesterfield were then considered, stopping different combinations of services in order to ascertain the relative benefits of each.

Table 4: HS2 stopping pattern at Chesterfield by option

HS2 Services	Core	Option 1	Option 2	Option 3	Option 4	Option 5
London-Sheffield 1	x	x	x	x	x	x
London-Sheffield 2		x		x		x
Birmingham-Leeds 1			x		x	x
Birmingham-Leeds 2				x	x	x
HS2 calls per hour	1	2	2	3	3	4

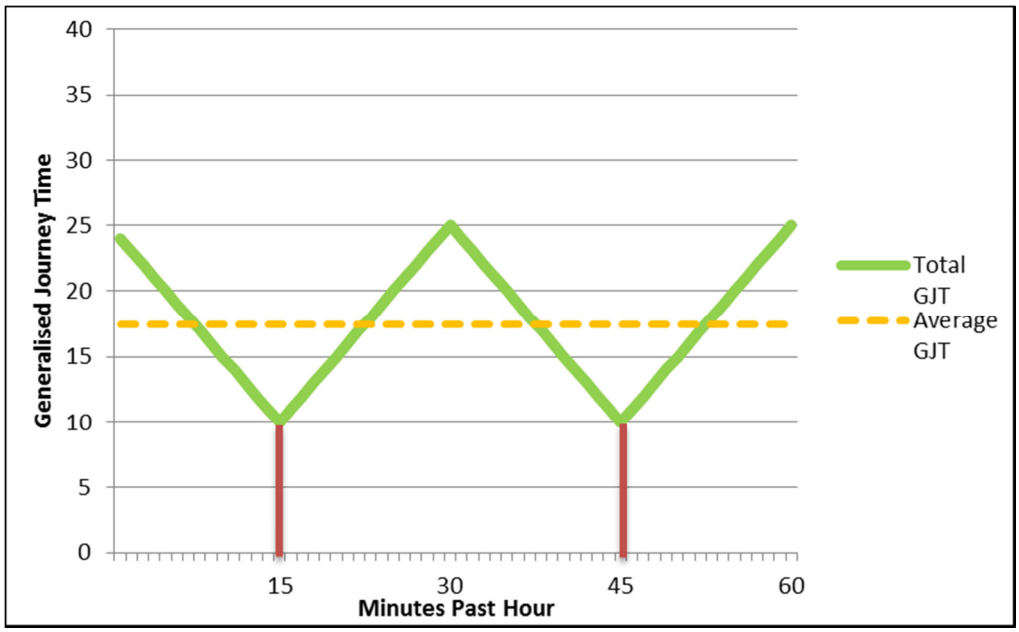
3.3 Timetabling Approach

For the purposes of superimposing an HS2 timetable at Chesterfield suitable for coding into MOIRA, we have adopted a principle for spacing out trains which is outlined below.

MOIRA calculates changes in demand based upon changes in GJT between an origin and destination. Aside from the impact of actual in vehicle time, the effect of the modelled timetable on users' desired departure and arrival times at origin and destination are taken into account. This "displacement" value reflects the amount of time that passengers would have to travel either earlier or later as a result of the timetable not matching their desired arrival or departure time. MOIRA undertakes this calculation using a "rooftop" model (so called due to the outputs resembling a series of pitched rooftops).

Figure 4 shows a simplified example of a rooftop model for two evenly spaced trains per hour between an origin and destination.

Figure 4: Rooftop Model (Evenly Spaced Trains)

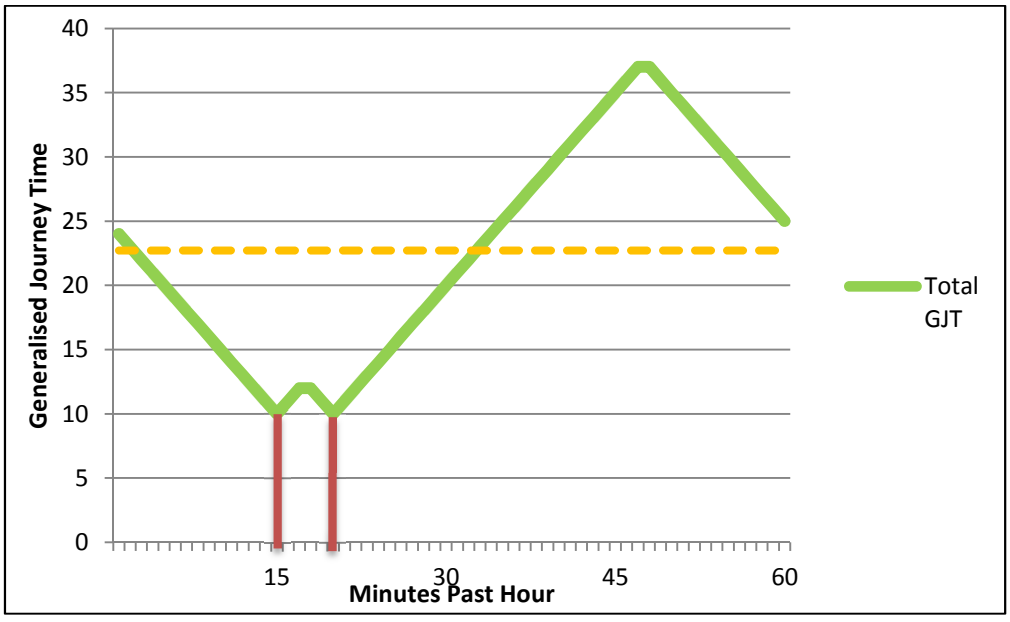


Trains depart at 15 and 45 minutes past the hour. The red vertical lines represent the generalised journey time taken on board each service from origin to destination. Demand for travel in this example is considered to be consistent across the hour. The pitched green lines show the additional displacement time incurred by passengers as a result of them having to amend their arrival/departure times as a result of the timetable.

Trains depart at 15 and 45 minutes past the hour. The red vertical lines represent the generalised journey time taken on board each service from origin to destination. Demand for travel in this example is considered to be consistent across the hour. The pitched green lines show the additional displacement time incurred by passengers as a result of them having to amend their arrival/departure times as a result of the timetable.

Figure 5 shows the impact of grouping the two trains per hour instead to operate 5 minutes apart.

Figure 5: Rooftop Model (Unevenly Spaced Trains)

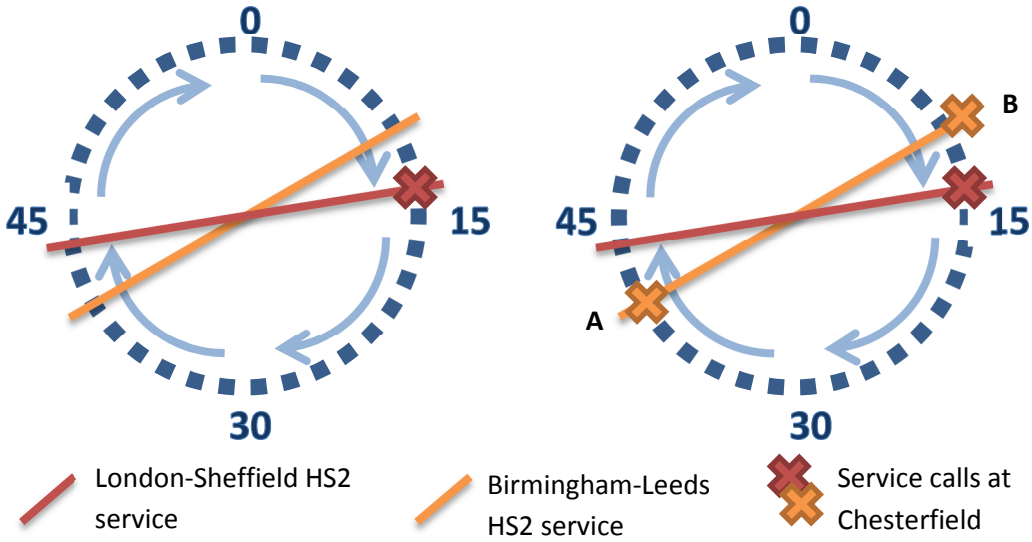


Because of the way in which the rooftop model operates, a timetable with trains spread out unevenly results in a higher average GJT than one where trains are evenly distributed. For this reason, when testing the various HS2 service options, care has been taken to ensure that additional trains are slotted in to the timetable in an incremental fashion designed to maximise the benefits attributable to each service.

For the above reason, it is likely that each pair of half hourly HS2 services (London-Sheffield and Birmingham-Leeds) will operate as close to 30 minutes apart from each other in order to best serve its core markets. In addition, the assumption has been made that the two sets of HS2 services will be 'flighted'[4] through Chesterfield in order to make best use of existing rail capacity.

Figure **6** shows an example of the standard hour clockface for HS2 services modelled as passing through or calling at Chesterfield.

Figure 6: Standard Hour HS2 services at Chesterfield (example)



The left hand diagram shows the Core HS2 scenario with 1 London-Sheffield train calling each hour. The right hand diagram shows variants on Option 2 (1x London-Sheffield, 1x Birmingham-Leeds). In order to maximise the spread of additional services, the stop on the Birmingham service marked A was used in the modelling rather than that marked B. This ensures additional services at near half hourly intervals, rather than grouped together in a short time period.

[4] On a mixed traffic railway, which this is through Chesterfield, it is good practice to attempt to operate trains of a similar operational characteristic close to each other wherever possible in order to minimise the impact on the available infrastructure capacity.

4 Results

4.1 Core HS2 Scenario – Impacts at Chesterfield

The Core test introduces the hourly London-Sheffield HS2 service calling at Chesterfield, as well as amending existing services on the conventional network as outlined in Section 3.1. Table 5 shows the ten most significant increases in annual journeys to and from Chesterfield.

Table 5: Top 10 Increases in Demand at Chesterfield

	Destination	Annual Jnys	% change
1	London Stations	+133,200	+52%
2	Meadowhall	+23,500	+30%
3	Leeds	+7,700	+9%
4	York	+7,400	+19%
5	Sheffield	+4,900	+1%
6	Birmingham Stations	+4,400	+9%
7	Doncaster	+2,900	+17%
8	Rotherham Central	+2,600	+28%
9	Birmingham International	+2,500	+49%
10	Manchester Stations	+2,500	+3%

The most significant change in absolute demand is between Chesterfield and London. The introduction of a considerably faster journey to the capital via the new hourly HS2 service is forecast to grow the number of trips to/from the capital by over 50%. Other significant improvements in demand are seen to Meadowhall[5], Leeds, and York. This is a result of the introduction of Chesterfield calls on both Cross Country services to these destinations.

Trips to Sheffield only see a marginal improvement, despite the introduction of a sixth hourly service between the city and Chesterfield. This is the result of the additional Cross Country service being marginally slower between Sheffield and Chesterfield than the Midland Mainline service it replaces in the base timetable (consistent with current observed timings). In addition, the combined effect on average GJT of the additional Cross Country and HS2 trains is only marginally better than the removed MML service as a result of the spacing of trains in the timetable.

Table 6: Top 10 Decreases in Demand at Chesterfield

	Destination	Annual Jnys	% change
1	Derby	-12,700	-5%
2	Leicester	-8,500	-11%
3	Alfreton	-1,400	-2%
4	Barnsley	-1,300	-3%
5	Dronfield	-1,000	-0%
6	Luton	-900	-2%
7	Kettering	-600	-3%
8	Nuneaton	-500	-6%
9	Glasgow Stations	-400	-8%
10	Manchester Airport	-400	-1%

[5] Both Cross Country services are modelled as calling at Meadowhall as per HS2 Ltd assumptions

Decreases in demand at Chesterfield are mostly as a result of the removal of one of the services via the Midland Mainline between Sheffield and London and the subsequent reduction in direct connectivity between Chesterfield and destinations such as Leicester and Luton. The removal of this existing MML service via Derby, however, has, in the Core HS2 scenario, been replaced by an additional all day call on the hourly Cross Country service between Yorkshire and Reading. However, some of these services already call at Chesterfield in the peak in the existing timetable. This means that the net impact is a reduction in the number of trains between Chesterfield and Derby in the Core HS2 scenario. Other changes are minimal and are as a result of minor retiming of services or connections to accommodate HS2 services through Chesterfield.

The total uplift in demand at Chesterfield as a result of modelling the services in the Core HS2 scenario is +10%.

4.2 Alternative HS2 Scenarios at Chesterfield – 2 HS2 trains per hour

Table 7 presents the incremental change in annual demand to/from Chesterfield compared to the Core HS2 scenario. There are no decreases in demand on any flows to/from Chesterfield as the changes undertaken are purely additive in terms of benefits.

Table 7: Top 10 Increases in Demand at Chesterfield (Options 1/2 compared to Core HS2 scenario)

	Option 1 **2xEuston-Sheffield,** **0xBirmingham-Leeds**		**Option 2** **1xEuston-Sheffield,** **1xBirmingham-Leeds**	
	Destination	**Annual Jnys**	**Destination**	**Annual Jnys**
1	Sheffield	+67,800	Sheffield	+101,100
2	London Stations	+27,900	Leeds	+22,000
3	Manchester Stations	+500	Birmingham Stations	+15,100
4	Manchester Airport	+400	Manchester Airport	+500
5	Barnsley	+300	Manchester Stations	+500
6	Doncaster	+300	Wolverhampton	+500
7	Meadowhall	+300	Huddersfield	+300
8	Chapeltown	+200	Nuneaton	+200
9	Wombwell	+100	Bradford	+200
10	Dore	+100	Barnsley	+200
	TOTAL	**+145,100**	**TOTAL**	**+219,300**
	TOTAL (without Sheffield-Chesterfield)	**+31,600**	**TOTAL (without Sheffield-Chesterfield)**	**+44,000**

When considering adding a further HS2 service stop at Chesterfield above that specified in the Core HS2 scenario, the choice is between the second hourly London-Sheffield service and one of the two Leeds-Birmingham trains. Modelling in MOIRA tends to suggest that the better performing option is improving the links to Leeds (+22,000 trips) and Birmingham (+15,100 trips) by stopping one of the Birmingham-Leeds trains, rather than the additional London service.

Of note is the difference in demand generated between Chesterfield and Sheffield in each option. This is due to the sensitivity of this relatively large (c.580,000 journeys per annum) market segment in terms of GJT. Moving a train marginally within the timetable can generate significant impacts due to the rooftop model, and subsequently calculated demand growth. The Birmingham service chosen to stop at Chesterfield in Option 2 leads to a better overall reduction in GJT for the flow than the additional London service. It is worth noting however that Option 2 still performs better than Option 1 even when the Chesterfield-Sheffield flow is removed from consideration.

4.3 Alternative HS2 Scebnarios at Chesterfield – 3 HS2 trains per hour

Table 8 presents the incremental change in annual demand to/from Chesterfield when adding a third train compared to the best performing two HS2 trains per hour option (Option 2). There are no decreases in demand on any flows to/from Chesterfield.

Table 8: Top 10 Increases in Demand at Chesterfield (Options 3/4 compared to Option 2)

	Option 3 2xEuston-Sheffield, 1xBirmingham-Leeds		**Option 4 1xEuston-Sheffield, 2xBirmingham-Leeds**	
	Destination	**Annual Jnys**	**Destination**	**Annual Jnys**
1	Sheffield	+36,800	Sheffield	+37,100
2	London Stations	+27,900	Leeds	+13,600
3	Manchester Stations	+300	Birmingham Stations	+7,700
4	Meadowhall	+300	Meadowhall	+400
5	Doncaster	+200	Bradford	+300
6	Barnsley	+100	Huddersfield	+300
7	Chapeltown	+100	Nuneaton	+200
8	Manchester Airport	+100	Wolverhampton	+200
9	Milton Keynes	+100	Southampton	+100
10	Ealing Broadway	+100	Scarborough	+100
	TOTAL	**+66,800**	**TOTAL**	**+61,700**
	TOTAL (without Sheffield-Chesterfield)	**+30,000**	**TOTAL (without Sheffield-Chesterfield)**	**+24,600**

Overall there is little difference in which option may be preferable between a second Euston-Sheffield HS2 service, or a second Birmingham-Leeds HS2 service calling at Chesterfield. Of note is that both options generate demand uplifts between 60-70,000 trips per annum, of which 55-60% is Chesterfield-Sheffield demand. Overall, however, Option 3 generates marginally greater increased demand than Option 4 (both when considering Sheffield-Chesterfield trips and omitting them from the analysis).

4.4 Alternative HS2 Scenarios at Chesterfield – 4 HS2 trains per hour

Table 9 presents the incremental change in annual demand to/from Chesterfield when adding a forth train compared to the best performing three HS2 trains per hour option (Option 3). There are no decreases in demand on any flows to/from Chesterfield.

Table 9: Top 10 Increases in Demand at Chesterfield (Option 5 compared to Option 3)

	Option 5 2xEuston-Sheffield, 2xBirmingham-Leeds	
	Destination	**Annual Jnys**
1	Sheffield	+38,300
2	Leeds	+13,600
3	Birmingham Stations	+7,700
4	Meadowhall	+400
5	Bradford	+300
6	Huddersfield	+300
7	Nuneaton	+200
8	Wolverhampton	+200
9	Southampton	+100
10	Scarborough	+100
	TOTAL	**+62,800**
	TOTAL (without Sheffield-Chesterfield)	**+24,600**

Option 5 demonstrates a further total incremental benefit of around 60,000 journeys per annum, of which 60% is related to the Sheffield-Chesterfield flow.

5 Conclusions and Summary

AECOM was commissioned by Derbyshire County Council (on behalf of Chesterfield Borough Council) to investigate the potential impacts of HS2 services calling at Chesterfield station. MOIRA software was used to model the impact of the Core HS2 scenario of one London to Sheffield HS2 service calling each hour in addition to a package of amended existing services on the conventional network. Following on from this, a series of tests was undertaken stopping further HS2 services which in the Core HS2 scenario are planned to pass through Chesterfield non-stop.

The effect on Chesterfield demand in the Core HS2 scenario is most markedly observed on flows to and from London as a result of the considerable speeding up of these journeys. Overall, demand increases at the station by 10%.

Options 1 and 2 added in either a further call at Chesterfield on the other London-Sheffield HS2 service, or a Leeds-Birmingham HS2 train. This showed that, incrementally over the Core HS2 scenario, it would be more beneficial to introduce new transformative fast services to Birmingham and Leeds than it would be to further strengthen HS2 links to London that exist in the Core HS2 scenario.

Options 3 and 4 tested the incremental benefit of adding in a third call by HS2 services at Chesterfield, based on the best performing of the two HS2 trains per hour options (Option 2, 1xLondon-Sheffield + 1xLeeds-Birmingham). Here there was little difference separating the options in terms of benefits.

Option 5 modelled the impacts of stopping all four HS2 services each hour at Chesterfield. Incremental benefits were of a similar magnitude to that seen with the step change from 2 to 3 trains per hour.

Table 10 summarises the impact of HS2 services calling at Chesterfield.

Table 10: HS2 Demand Impact at Chesterfield Station

Scenario	Number of HS2 Services Calling at Chesterfield	Annual Demand at Chesterfield ('000s)	Increase in Demand (compared to Today)		Proportion of Demand Using HS2
			Absolute ('000s)	Percentage (%)	
Today	0	1,741	-	-	-
Core HS2 Scenario	1	1,915	+174	+10%	30%
Option 1	2	2,014	+273	+16%	49%
Option 2	2	2,060	+319	+18%	37%
Option 3	3	2,134	+393	+23%	54%
Option 4	3	2,135	+394	+23%	46%
Option 5	4	2,214	+473	+27%	60%

Today's demand sourced from MOIRA October 2015 to September 2016

Total demand at Chesterfield is forecast to increase by between 10% and 27% as a result of the introduction of between one and four hourly HS2 services. Of note in terms of the proportion of demand using HS2 services is the significant percentage of trips using the single hourly HS2 service in the Core HS2 scenario. This is due to the fact that the HS2 London service immediately abstracts the full amount of existing London demand currently travelling by conventional services on the Midland Mainline (in addition to generating 52% more trips). The proportion of total demand utilising HS2 services increases as the number of services increases. Options 1 and 3 (one additional incremental London HS2 service) are shown to have a greater proportion of demand using HS2 than Options 2 and 4 (one additional incremental Leeds/Birmingham service). This is as a result of the differing nature of the key flows involved. Improvements to HS2 services to London results in further demand being focussed onto those particular high speed services. This is compared to adding HS2 services on the Birmingham and Leeds flows which tend to improve demand across the wider rail offer (both HS2+conventional).

Of note in the wider results is the high proportion of benefits which are allocated to the short distance Sheffield to Chesterfield flow. This is logical given the large existing market and sensitivity to small changes in GJT. Whilst we believe that the timetable as modelled in both the Core HS2 and Option scenarios is reasonable and valid based on the information available at this stage, some degree of caution regarding the Sheffield-Chesterfield results should be noted as demand is very sensitive to timetabling assumptions.

Finally, whilst no position has been taken by HS2 Ltd on the status of short distance flows using their services in the future, there is precedent for restricting access to these passengers from existing high speed services in order to protect space for longer distance higher yielding passengers (e.g. between Watford Junction and Euston). Therefore much of the modelled demand between Chesterfield and Sheffield could be subject to pricing designed to deter these types of travellers, or actual restrictions on utilising HS2 trains to make this journey.

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