2016 current rail issues to be addressed by Crewe Town Council **4th August 2016**

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Background

Crewe Town Council has asked JRC to prepare a short piece of work concerning the current rail issues which need to be addressed by the Council. In practice, circumstances have caused this to be a fairly extensive piece of work, as events and Government positions have been evolving. The most urgent topics are:–

- Choices to be faced about Crewe Hub station location, and the key factors affecting that.
- The level of train services desired versus the services likely to be provided.
- What lobbying actions should the Town Council focus on to get the best outcome, on its own and in concert with other key stakeholders.

Each of these items has been researched and discussed below. There is a preliminary topic – an unavoidable item – about the general state of the HS project and about Network Rail. In summary, we are looking at outputs which have an immediate life of 20 years, now to the mid-2030s, ahead of any significant outputs which then can be ascribed entirely to an HS2 Phase 2 full scheme.

This ca. 20 year period is a long length of time to be seen as an interim state of affairs. Frankly the key challenge facing both Crewe Town Council and Cheshire East Council is to make the most of this period, and aim for the period beyond to be even more filled with opportunity. Nirvana will be a long wait, so make nirvana out of the next few years!

Current status of the HS2 project

The Phase 1 Hybrid Bill is navigating its way through Parliament, has concluded its Commons Stages, has received a 2nd reading in the Lords, and is now part way through the Lords Committee Stage which will run until at least November 2016. The Lords Committee received a large number of petitions against aspects of the scheme (827). HS2 Ltd chose to object to 414 of them (about 50%). It shows that HS2 is very keen to make progress and try to secure Royal Assent by the end of the year, however some of those objected-to petitions have been permitted. An end-of-year timescale may not be realistic.

The public timescale for progress with constructing and completing Phase 1 is certainly now looking optimistic. For example, there are huge complexities with construction of the HS2 part of Euston terminus and not all of these have been resolved yet. A range of dates from early 2027 (rather than December 2026) to some time in 2028 is now the smart money within informed circles.

This timetable also only addresses the HS2 Phase 1 and Phase 2a capacity requirements. Works at Euston are foreseen as continuing until 2033 (phase 2 full, if authorised), and to the far side of 2035, maybe 2037, for completing works at the 'classic' Euston terminus. The politics of a two-decade construction period in a dense part of Central London may yet prove to be considerable and cause other impacts on HS2.

The NAO continues to put the HS2 project at an 'amber-red' alert on costs and deliverability, in its latest progress assessment report of28 June 2016 on preparations for the project. The NAO headline is**:** "HS2 is a large, complex and ambitious programme which is facing cost and time pressures. The unrealistic timetable set for HS2 Ltd by the Department means they are not as ready to deliver as they hoped to be at this point. The Department now needs to get the project working to a timescale that is achievable." The total cost envelope set out by HS2 Ltd is not accepted by the NAO as encompassing all likely or foreseeable costs, and there are some unspoken fears that the visible gap is only the tip of an iceberg.

In parallel, several commentators and professionals are anticipating that, subject to quick decisions on the specification for Phase 2a to Crewe and early progress with a new Hybrid Bill for Phase 2a (which the Secretary of State has committed to), a December 2027 opening date might apply to both Phase 1 and Phase 2a.

As background to this possibility, there was a McLoughlin statement on 30 November 2015 while he was still Secretary of State: "Alongside my decision to take forward a route for the section of Phase Two from Fradley in the West Midlands to Crewe (Phase 2a), I have announced my intention to introduce a separate hybrid bill to expedite the process to enable construction of the Phase 2a section of HS2. A hybrid bill to set out the work, including where that work will take place and the land that will be required, will be introduced into Parliament in 2017 with the aim of obtaining statutory authority through Royal Assent in 2019. This will enable us to open the Phase 2a section in 2027, rather than 2033 as originally planned."

The new post-Brexit Secretary of State for Transport, Chris Grayling, is one whom RFG chairman Lord Berkeley has described as 'interested in making evidence-based decisions'. He has committed to continuing in principle with HS2 because of its capacity benefits. However the funding available might constrain initial outputs, as discussed below.

The new Mayor of London, Sadiq Khan, supports HS2 as a booster for the economy, but has said that the construction impacts on the Euston area must be addressed better. He and his Deputy Mayor for Transport (Val Shawcross) are exploring whether the HS2 project could *temporarily* be terminated at Old Oak Common for several years to allow the project impacts to be reduced in intensity. Transport for London has assessed the passenger distribution impacts for Crossrail etc, and concludes it would not be a 'show stopper' for some years.

Underlying all of this is a Cabinet Office review overseen by Sir Jeremy Heywood, the Cabinet Office Secretary, about HS2 project specification and cost risks. If there are problems, these lead to potential de-scoping in order for the project to stay within Treasury-approved spending limits. This work is not complete, meanwhile the NAO has raised some HS2 affordability and project risk alarm bells (see above), and about Network Rail project management (see below).

The Cabinet Office review is expected to culminate in decisions taken before and during the 2016 Autumn Spending Review. This will also combine with major spending decisions about the consequences of Brexit, where economic downsides may cause spending limitations ahead of any cash savings from exiting the European Union.

There is a classic national debate ongoing at present about 'reduce spending and be prudent' versus 'we must invest now for our nation's future'. There is general concern that loss of EU grants, whether for regional area investment and economic support or for infrastructure spend, will not be replaced in like-for -like volume by internal UK spending sources – that was definitely not the spending trend preceding the Brexit vote.

Projects and cash availability to 2024

There are emerging concerns about the stewardship of Sir David Higgins and Simon Kirby when they were running Network Rail, and this has read-across into the costings and general financial conduct of HS2. Following the NR cash crisis in 2015 – which continues with a major cash shortfall for year-on-year project spend – the National Audit Office is reviewing how NR has costed projects and the best ways forward in future years.

Great Western electrification is the test bed review. The NAO's work is continuing and a major report expected this Autumn. There are fears that final anticipated costs will be still higher than before, leading to further scaling back of enhancement (eg less electrification in Wales – also partly at risk from Brexit EU funding outcomes, see below). It implies no likely early take-up of electrification along the North Wales main line – relevant to Crewe.

Already there has been an explicit requirement for NR to use an improved costing system (RMM) which is already being inducted into NR at senior level through a specialist consultant (MBPC) whom JRC and Lord Berkeley know well. This will at last bring some financial reality into a system which has in reality been a series of unit rates estimates, additional of contingency risks, and quite often poor basic project management where NR had got into the habit of being able to put cost and timescale overruns onto the NR 'credit card' (the Regulated Asset Base).

There is no such 'credit card' flexibility now – NR is now under Treasury oversight and has to work on a 'cash available' basis. NR has a £1.8bn shortfall in capital spend until the end of CP5 (2014-19) even after much spend has been 'moved to the right' in timescale; for example it may have to sell assets

outright or long leases on properties. There is a £9.5bn capital overhang from CP5 passported into CP6 (2019-24), plus £2.5bn of revenue spend on maintenance and renewals passported similarly. Modern Railways (August 2016) has commented that "there will be very little headroom for further enhancements", in the context of a *total* £12.1bn enhancements in CP5, and £12.1bn for renewals. The forward permissible spend will largely be on maintenance and renewals.

There are knock-on effects, with some examples relevant to Crewe:

- NR doesn't even have cash to design a new 'classic' part of Euston terminus, let alone work out how a rebuild can be afford, when, with what project sequencing!
- Much work planned to maintain and enhance the national railway in the CP5 (2014-2019) is having to be shunted into CP6 (2019-2024) – see above – with inevitable knock-on effects on the scale of new works NR will be willing to commit to for CP6.
- NR is nevertheless having to plan in some detail for CP6 as the '***Initial Industry Advice***' (previously 'Initial Industry Plan') **must** be submitted to Government and to ORR in September 2016. That is still likely to be mainly on the old rough and ready costing system.
- This may need to be worked up in more detail before the Government is due to make its July 2017 High Level Output Statement about what it is prepared to buy from the rail industry in 2019-24. NR has also advised JRC on 22nd July 2016 that "we are still awaiting guidance", for example on what to include, what criteria and what level of ambition to show, following recent events post June 23rd (the Brexit vote).
- This will be an important decision making point as the 2015 NR Costing Review by Dame Colette Bowe has made it clear that the Government should not commit to any more enhancements until it was sure what it wanted and Network Rail had developed the scheme [to a level giving a degree of reassurance on outputs vs costs].
- There is a project timing issue, as Network Rail has previously intimated that it will take until the end of 2017 to reach valid conclusions on the shape and priorities for TransPennine electrification and capacity update – and indeed the NAO review of GW electrification implies a similar situation about solid knowledge on forward electrification costs.
- To see the end of 2016 as the possible decision date on the shape of HS2 'Phase 2 full' looks like another risk zone, with Phase 2 full possibly not being in true policy or output alignment with the other critical northern elements (eg, Trans-Pennine Electrification, HS3).
- **This at least points to Phase 2a to Crewe being a 'safe' element to focus on, allied to the Northern Powerhouse, and get the vision and project specifics right in a reasonable timescale.**
- It would demonstrate progress on infrastructure elements which are capable in the right circumstances of making a strong boost to the regional and national economy, and to regional and national connectivity. **Crewe Town Council and Cheshire East Council (CTC and CEC) have the ability to make a powerful play on this.**

In truth, neither HS2 Ltd nor Network Rail can each afford to do what they desire, nor might their underlying desires be wholly consistent with each other's. There is a potential lengthy gap, possibly to become lengthier, between Phase 2a and Phase 2 full. **A negative implication for Crewe is to having to 'soldier on' as the boundary station/zone between HS and classic rail territory for some years.**

The financial implication (leading to extra journey time) is that HS2 won't want to incur large scale junction renewal /replacement costs as a surrogate for NR's own budget, if the medium term were still to enable go-ahead for new HS lines/tunnels past Crewe. Meanwhile NR would

wish to receive urgent, separate funding to do some necessary track, junction, line speeds and station upgrades, so that there can be reasonably time-efficient and reliable HS journeys into the heart of the North West at Chester, Liverpool, the M6 corridor towns, Manchester and beyond, not least Scotland.

In addition, Crewe remains a critical element for the whole of the North West and Midlands regional networks, for passengers and freight. While HS2 represents the top value slice of long distance passenger travel on the WCML, the vast bulk of passenger and freight business remains dependent on a fully functioning Crewe as town catchment, railhead, 'classic' interchange and rail operational centre.

This starts to look like a situation about 'who blinks first, pays', and who wants to offload costs onto the other party! Neither attitude presages an optimum outcome for Crewe as a community, more a 'lash-up' for Phase 2a, which would be the worst of all worlds. That would remain until a further, later phase of Works were authorised for whatever HS2 Phase 2 full then amounted to – which might or might not be designed by then in close concert with HS3 thinking in mind.

This is not good news, at a tactical financing and project engagement level. Crewe would face major risks if such a blinkered position were to prevail, both in relation to the interim station location, and early development underpinning local economic growth, and access design for wider regional economic growth.

This points to timing of outcomes being another key issue. Early outcomes that are benefits within a two decade period, counting from now, will have substantial value and stimulate better the local and regional economy ahead of HS2 Phase 2 full. The benefits of not waiting for two decades for major change should be factored into decision making – a 20 year waiting period is not realistic, when year on year, and quinquennial results (and also government decision periods) are the current yardsticks for successful policies. We recommend ensuring Phase 2a is a wholly satisfactory scheme in its own right.

HS2 and national economic dependency on Network Rail and Crewe

The best attitude would be for the Government and other major players to accept that HS2 Phase 2a represents at least six years, maybe even a decade or two in operational terms (ie, two decades counting from now) of the best available high speed offering, and that economic growth should not be stultified by short-sighted limits on financial relationships and project specification between rail industry organisations. **This is the core position that Crewe and Cheshire East should be focused on.**

A phrase which comes to mind is that '*perfection is the enemy of the good*'. Two decades could represent untold economic gains in those preceding 20 years, themselves multiplying year on year. Crewe as a railway centre is worth over 4,260 passenger trains a week now, with a further 5½% (nearly 240) non stopping. It is also a significant freight operating centre in the national network.

The simplest and most basic question to answer, is how much development can be achieved affordably and in keeping with a long term economic expansion vision, within two decades. The example of London Docklands is salutary. No-one waited for Docklands Light Railway to be opened in 1987, after the announcement of go-ahead was made in 1982. With the area slated as

a Enterprise Zone with lighter planning controls, a Development Corporation and a rates holiday for some years, there was then sufficient stimulus to encourage businesses to locate in the defined EZ area, in anticipation of DLR opening. Unexpectedly this also stimulated the start of Canary Wharf. So the unforeseen can also happen.

Hence the key decision making for Crewe, in similar circumstances, is the local equivalent of whatever a development area boundary needs to be (smaller than the existing sub-regional zone), and the extent of stimulus that it needs. Given the geography of the local deprivation, the location of existing industries and the new national scope given by the existing railway station, it is logical to incorporate the whole of Crewe town in such a zone, along with whatever expansion zone is suitable to designate as an ambitious aggregation of jobs, housing, further and higher education, and leisure facilities during the next two decades.

Of the passenger trains calling at Crewe, there is a basic sequence of three intercity trains an hour to/from London, with hourly frequencies to/from Manchester, Liverpool and Chester/North Wales. Together with additional services calling at Crewe on occasional hours, the direct London service is 29% of all trains calling during a week. The bulk of other flows are inter-regional – 52% to/from the M6 corridor and Scotland, West Midlands, East Midlands, Wales – and 19% local regional trains. The London trains also serve other destinations in the opposite direction. So London & SE travel is perhaps 30% of all Crewe station usage, after weighting journey proportions. The bulk of travel is non-London.

South and Mid Wales' connectivity with the Northern Powerhouse depends heavily on services via Crewe. North Wales relies on Crewe for rail travel in most directions. Scotland via the West Coast Main Line is also dependent on Crewe, even if not all trains call. However sample links to the East Midlands and Yorkshire are poor – trains only go as far as Derby, not Nottingham nor Sheffield, for example. Journey times to Nottingham are about 120 minutes (55 miles as the crow flies), to Sheffield 80-100 minutes (45 miles), and to Leeds via Manchester 105-120 minutes (61 miles), all including interchange time, with average direct speeds generally slower than 30 mph.

Therefore for Crewe to achieve a rounded scale of economic growth stimulated by better railway connectivity, it is at least as important to improve the quality and speed of links in other directions as to/from London. That is the underlying principle behind HS3, in which Crewe should be gearing to play an important role. Crewe's economic growth case should not be solely predicated on changes with the HS offer.

Overall, until a Phase 2 full is delivered, the national and Northern economic outcomes will depend on HS2 delivery southwards, to achieve a national scale of linkage. But at Crewe and northwards, Network Rail is the key party for HS2 Phase 2a to succeed, and most probably for HS3 as well. This also has implications for the specification of HS2 Phase 2 full, which must take account of the various political and project urgencies around it, and with NR at the heart of defining affordable solutions that could have several decades of value throughout the Northern Powerhouse.

Crewe is also the north-western entry/exit wicket-keeper between the Midlands Engine and the Northern Powerhouse, and their transport entities, Midlands Connect and Transport for the North, both for potential through trains for HS3 destinations including west of Pennines main towns and cities, and for interchange and connections throughout both economic regions.

A discussion which includes reference to the current high level political objectives for rapid city to city accessibility in Northern England is included in this Part 3 article on HS2, written by JRC, along with a continuation of those developments in a Part 4 article. The direct parallels elsewhere in Northern England are noted in Part 4, in relation to HS2's July 2016 new announcement about changes to planned Sheffield city centre access which put Network Rail into pole position, as well as the explicit issues and opportunities with Phase 2a at Crewe and beyond. 'Part 4' goes on to consider the importance of Network Rail becoming a full and equal partner – along with an integrated funding pot – for HS2 accessibility throughout Northern England and elsewhere (Euston is another large problem area for the HS2 scheme.)

In summary, a 30 minute timing high speed regional metro between major centres is emerging as the high level policy for Northern England and for some Midlands city to city links. Schemes which prioritise and facilitate those that are likely to be given high weighting. Money (now in short supply) should in principle be spent only once on HS2 / HS3 / TP electrification and Trans-Pennine capacity, not two or three times over. Phase 2a should be part of this approach. The outcomes achieving with this spending should also focus on maximising returns and early effectiveness.

Fast trains taking, ideally, 30 minutes from Crewe to Preston, Liverpool and Manchester would be desirable, even with the existing lines. What service uplift and range of direct trains might be feasible towards the East Midlands and Yorkshire? Will a new layer of HS services be feasible between the West Midlands (Birmingham Curzon Street) and the Northern Powerhouse via Crewe with Phase 2a? **All these are questions which need answering, and it is for Crewe to pose the questions.**

Growth with realism? The scope for Crewe

Crewe Hub

HS2's interest in a Crewe station located near Basford appears to be driven by three factors:

- Simplicity of avoiding the existing complex rail junctions, ahead of which the eventual HS2 line to Manchester would tunnel under the WCML for the duration of the Crewe built-up area and minimise non-stop journey times.
- Apparent ease in opening up a link to the A500 for wider catchment access, including Stoke-on-Trent (which feels it has lost a potential HS2 Hub), and other towns.
- Lands near to Basford might also be more readily available for development than close to Crewe interchange, where some are already built up.

However the evidence further above is explicit, that the economic geography of Northern railways requires Crewe Hub primarily to be focused at or close to the existing station and interchange at Crewe, not at Basford. This is because, to be economically successful as a growth location, there will be more reliance on the existing railway network from all directions, than on HS2 from the south. HS2 Phase 2a will itself rely wholly on the existing network north of Crewe.

With HS2 as a total project being required to make £9bn cuts in costs already (potentially more if its allocated costs rise further), it will not be realistic to incur considerable additional costs on revising the existing railway alignments in the Crewe area to access Basford, as well as accommodate temporary or long term HS2 junction costs.

Two decades of economic development centred on or near the existing interchange, make it either sensible or inevitable that this becomes the hub for the long term as well. Train service patterns, the density of local population and its relative deprivation also makes the strengthening of links to other Northern and West Midlands economic hubs from the existing station far more worthwhile than focusing solely on the foreseeable interim HS2 service calling at a 'Basford' Hub.

That doesn't stop Crewe progressing as a High Speed Hub, with added benefits from being linked better to London. Crewe would be only 65 minutes or so from Euston, and less than 25 minutes from Birmingham and Manchester on an HS line. So the ambitions should not be constrained. In theory Crewe has the capacity to be THE principal growth point on the new HS2 corridor all the way between London and the North West, as nothing is being served intermediately on the HS2 main line between the London and Birmingham conurbations.

The specification for a Phase 2a station and tracks should be capable of expansion to Phase 2 full – this is likely to involve tunnelling for a HS bypass route – but if this led to further development growth beyond the second decade, this should then be just a step change for an already revitalised Crewe, providing of course that space had been enabled for that further period of expansion.

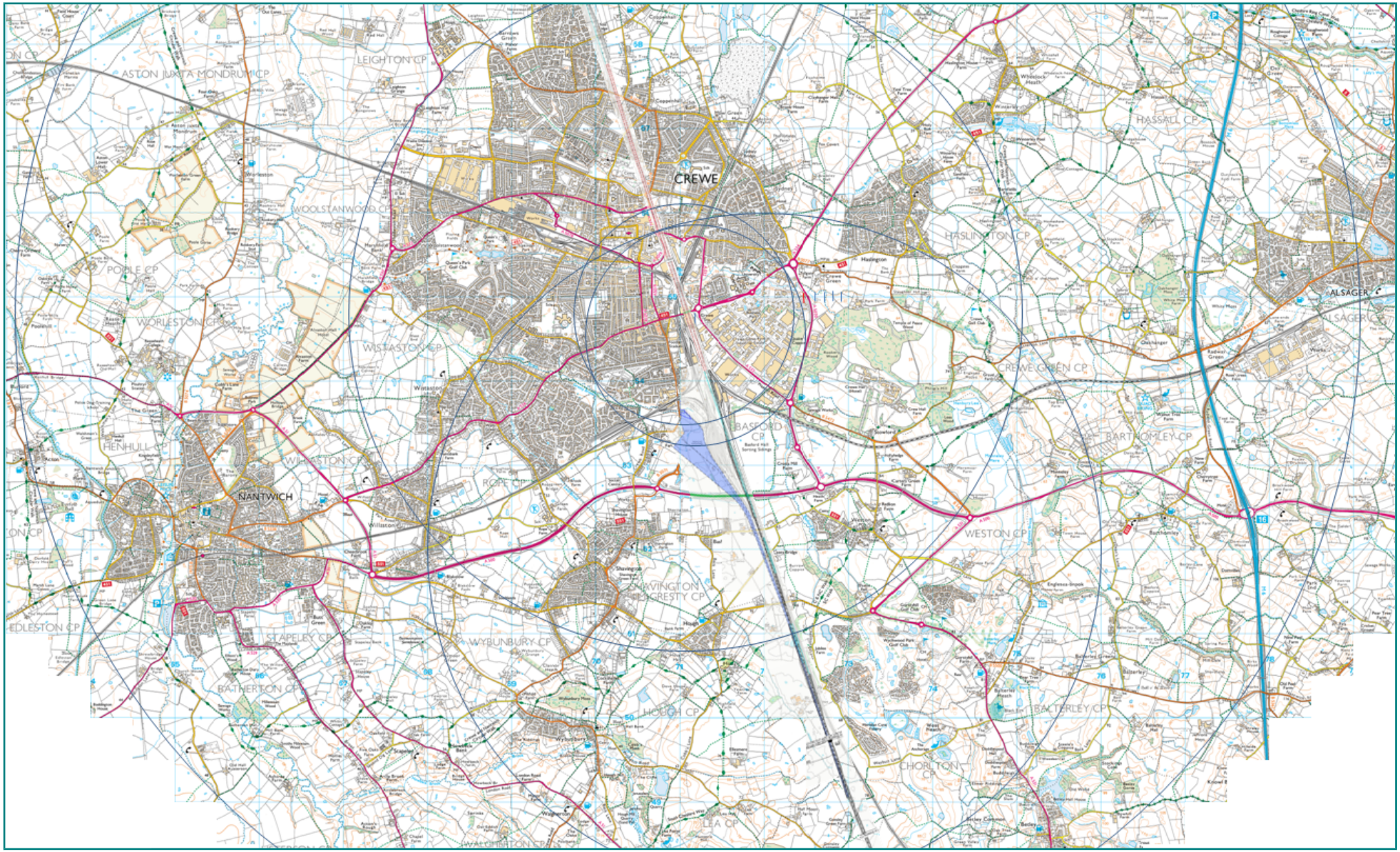
The basic High Speed service (see discussion below) might be 2 HS trains per hour to/from London, unless stopping patterns were changed with HS2 Phase 2a compared to HS2 Phase 1. For most of Crewe's residents, and most existing Crewe passengers, Basford would be a tail seeking to wag the dog, with less economic gain for the Crewe heartland, and with any Basford economic gains also difficult to reach and feel the benefits.

The map below is based on scaled down 1:25,000 mapping, and with HS2 overlaid, including Phase 2a and a longer term aim for HS2 Phase 2 Full. *A more detailed 34MB mapping file is available separately.* It shows the catchment within 1 mile (where high density development could be viable, based on Transport for London's experience) – and also a possible southern station entrance there. Other catchments shown are within 4 km/2½ miles, and 8 km/5 miles of Crewe interchange.

A Basford station centred somewhere near Casey Bridge – closer would be unlikely because of planned railway junctions, and it could be further south – would be 1½ km from the existing interchange and 2 km from the town centre. It would be further still from Bentley, Crewe works, Sandbach and other key locations.

HS2's proposed maintenance depot at Crewe (shown blue on the map) is in a location which might better be used for high density development, as can be observed from the catchment mapping. A depot location closer to Coppenhall Junction could be better for servicing HS2 Phase 2 full in the longer term, and possibly part of HS3. Phase 2a would be easily accessible through Crewe station.

It should be recognised that reliance on using the existing Crewe Interchange would in turn require better access by road, possibly by improving the approach road from the Crewe Green link. There would be scope with the existing Interchange designated as the Hub, to intensify development densities within 1 mile of the station.



Crewe and Basford station catchments. HS2 splits north of Hough, with through lines into tunnel and connecting spurs onto the existing WCML. Access to the proposed Crewe HS maintenance depot would be from south of Hough. The economic growth corridors of the A500 and the Crewe Green link are evident. The existing Crewe urban area, and its potential for high density developments, is better located around the existing Crewe interchange.

Scope for conventional rail service development

What has been excluded until now from most considerations about the Hub location and available rail service levels, is the scope for the existing Crewe Interchange also to stimulate new regional and inter-regional rail services, being part of the cause and consequence of the Hub. The strategic service gaps towards the East Midlands and Yorkshire have been observed already, requiring stronger links (also to/from Stoke-on-Trent). The economic mapping shows scope for:

- Improved Crewe-Manchester Airport services (at present hourly with limited evening services – an airport needs virtually 24/7 services to be attractive for staff shifts and for evening/early AM passenger flights).
- Several new regional catchment stations, eg an hourly Wrexham-Chester-Crewe feeder service, calling at a new railhead at Tarporley/Bunbury.
- A new Crewe-Alsager-Congleton-Macclesfield corridor – including trains otherwise terminating at Macclesfield from Manchester – via a chord west of Kidsgrove, which is possible to construct.
- Possible continuation to Middlewich and Northwich via Sandbach.

A second map is shown below at a regional level, in order to illustrate the possible options for rail service development.

A positive basis for such initiatives is that Crewe is one of the busiest stations in the whole of the Northern Powerhouse, in terms of rides per head of population, at 20-30 rides per head per year (the whole of Cheshire East averages 21). The local and wider catchment populations are 'rail-minded' so demonstrate a high likelihood of travelling more by rail, with population, jobs and university expansion, and with improved rail corridors on offer, both HS2 and other flows. Crewe entry+exit represents 33% of the <u>total</u> passenger volume of all 22 stations in Cheshire East, well ahead of Macclesfield (18%) and Wilmslow (17%).

At 2.7m entry+exit passengers in 2014/15 *excluding interchange volume*, Crewe is busier than all stations in the North East except one (Newcastle upon Tyne), and all stations bar five in the North West, excluding those in Central Manchester and Liverpool. The other five are Bolton, Chester, Manchester Airport, Southport and Stockport. It is already a busy national interchange.

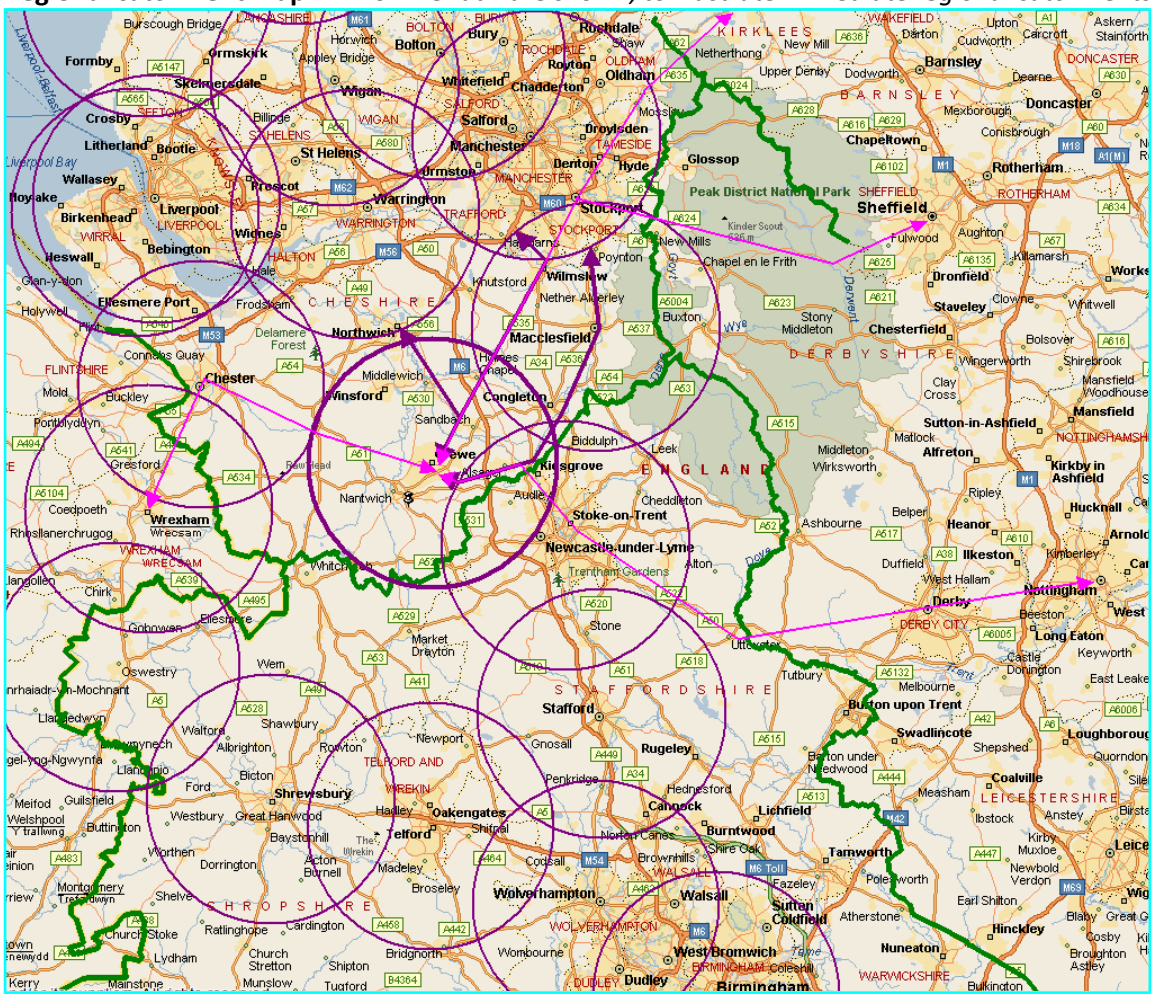
The negative issue shown on the second map is that Crewe is on the administrative border of the Northern Powerhouse, and indeed just over the administrative border from the West Midlands and not far from the East Midlands and Wales. The consequent risk is that Crewe might be seen as marginal territory, rather than the lynch-pin between neighbouring regions and a strong economic growth point in its own right. While HS2's desired Hub here is a benefit, the danger is that there is insufficient perception of the core opportunities arising with the existing services and with the potential for improvement for the benefit of all.

Crewe Town has the scope to establish a strong basis for future development and economic growth, based on the emergence of an HS2 Hub and focussing on outputs that have greatest value within the Northern Powerhouse, eg:

- Expansion of further and higher education.
- A highly accessible node to establish service businesses and regional HQ.
- Ability to provide a larger volume of commuter housing within easy reach of multiple workplaces across the North West and West Midlands.

- Effective base for expanding transport and industrial jobs, with a existing strong range of skillsets and growing demand for more.

Regional catchment map *10 mile radii are shown, to illustrate immediate regional catchments*



Intervention in future rail proposals – train service levels desired vs. provided

A summary table for the Spring 2015 passenger service volume is set out overleaf. Franchising dates are shown below. Network Rail also has its 5-yearly Control Periods. CP6 starts in April 2019.

- DfT franchising timetable:
    - Just concluded for Northern Rail and TransPennine, as part of the wider Rail North and Transport for the North (TfN) deals, and foreseen to run until at least the mid-2020s.
    - TfN ambitions now being assembled, with the intention of clearer outcomes, outputs and service inputs set out by 2017, for phased delivery during the 2020s.
    - New pre-qualification indicative franchise specifications for West Coast intercity and West Midland regional and inter-regional services, just published, and intended to provide service development and continuity until HS2 arrives in the mid-2020s.
- HS2 project dates, nominally December 2026 for Phase 1, 2027 for Phase 2a to Crewe, and 2033 for Phase 2 full. As noted above, Phase 1 and Phase 2a might be merged.

CREWE PASSENGER TRAINS																			
Service (and v.v.)	Operator	Direction	Intermediate call	Start/Finish	Total Arr & Dep (1-way calling) (x2 for A & D intermediate call)	Non-stop	Direction	Intermediate call	Start/Finish	Total Arr & Dep (1-way calling) (x2 for A & D intermediate call)	Non-stop	Total 2-way calling	Total 2-way calling WEEK	Non-stop trains WEEK	InterCity	InterCity NS	InterRegion	Regional
Traffic day not 00:00 to 24:00																		
Weekdays												Weekday						
London-Scotland (incl overnight)	VT/SR	NB	2	0	4	15	SB	2	0	4	15	8	56	193	8	30		
(London)-Birmingham-Scotland	VT	NB	14	1	29	0	SB	14	1	29	0	58	386	0	58			
London/Birmingham-North West	VT	NB	3.2	0	6.4	2	SB	3.2	0	6.4	1	12.8	95	17		3	12.8	
London-Manchester via Crewe	VT	NB	15.4	1	31.8	0	SB	15	0	30	0	61.8	412	0	61.8			
Birmingham-Manchester via Crewe	XC	NB	1	0	2	0	SB	3	0	6	0	8	48	0			8	
Crewe-Mcr.Airport-(Manchester)	NT	NB	0	13	13	0	SB	0	13	13	0	26	156	0				26
Crewe-intermediate-Manchester	AW/NT	NB	16 AW	20	20	0	SB	17 AW	20	20	0	40	254	0				40
London-Liverpool	VT	NB	16	0	32	2	SB	14	0	28	3	60	416	28	60	5		
Birmingham-Crewe-stops-Liverpool	LM	NB	29	3	61	0	SB	30	2	62	0	123	775	0			123	
London-Chester/North Wales	VT	NB	14	0	28	0	SB	13	0	26	0	54	338	0	54			
(WMids)-Crewe-Chester/N.Wales	AW/VT	NB	1	20	22	0	SB	2	23	27	0	49	335	0			49	
Cardiff-Shrewsbury-Crewe-Manchester	AW	NB	15	0	30	0	SB	13	2	28	0	58	379	0			58	
Cardiff-Shrewsbury-Crewe-N.Wales	AW	NB	2	0	4	0	SB	0	0	0	0	4	22	0			4	
<-Crewe-stopping-Shrewsbury->	AW	NB	2	9	13	0	SB	4	7	15	0	28	188	0				28
Crewe-Stoke-on-Trent-Derby	EM	NB	0	15	15	0	SB	0	15	15	0	30	195	0				30
Crewe-Stoke-on-Trent-Trent Valley	LM	NB	0	16	16	0	SB	0	15	15	0	31	210	0				31
												651.6	4265	238	241.8	38	254.8	155
Saturdays												Saturday						
London-Scotland (incl overnight)	VT/SR	NB	1	0	2	12	SB	1	0	2	13	4			4	25		
(London)-Birmingham-Scotland	VT	NB	12	1	25	0	SB	15	0	30	0	55			55			
London/Birmingham-North West	VT	NB	4	0	8	0	SB	2	0	4	1	12				1	12	
London-Manchester via Crewe	VT	NB	15	1	31	0	SB	15	0	30	0	61			61			
Birmingham-Manchester via Crewe	XC	NB	1	0	2	0	SB	1	0	2	0	4					4	
Crewe-Mcr.Airport-(Manchester)	NT	NB	0	14	14	0	SB	0	12	12	0	26						26
Crewe-intermediate-Manchester	AW/NT	NB	16 AW	18	18	0	SB	17 AW	19	19	0	37						37
London-Liverpool	VT	NB	14	0	28	2	SB	14	0	28	1	56			56	3		
Birmingham-Crewe-stops-Liverpool	LM	NB	27	3	57	0	SB	29	1	59	0	116					116	
London-Chester/North Wales	VT	NB	12	0	24	0	SB	10	0	20	0	44			44			
(WMids)-Crewe-Chester/N.Wales	AW/VT	NB	1	19	21	0	SB	1	23	25	0	46					46	
Cardiff-Shrewsbury-Crewe-Manchester	AW	NB	15	0	30	0	SB	13	1	27	0	57					57	
Cardiff-Shrewsbury-Crewe-N.Wales	AW	NB	0	0	0	0	SB	0	0	0	0	0					0	
<-Crewe-stopping-Shrewsbury->	AW	NB	2	9	13	0	SB	4	7	15	0	28						28
Crewe-Stoke-on-Trent-Derby	EM	NB	0	15	15	0	SB	0	15	15	0	30						30
Crewe-Stoke-on-Trent-Trent Valley	LM	NB	0	16	16	0	SB	0	15	15	0	31						31
												607			220	29	235	152
Sundays												Sunday						
London-Scotland (incl overnight)	VT/SR	NB	4	0	8	9	SB	2	0	4	9	12			12	18		
(London)-Birmingham-Scotland	VT	NB	11	0	22	0	SB	9	1	19	0	41			41			
London/Birmingham-North West	VT	NB	4	1	9	0	SB	5	0	10	1	19				1	19	
London-Manchester via Crewe	VT	NB	11	0	22	0	SB	10	0	20	0	42			42			
Birmingham-Manchester via Crewe	XC	NB	1	0	2	0	SB	1	0	2	0	4					4	
Crewe-Mcr.Airport-(Manchester)	NT	NB	0	0	0	0	SB	0	0	0	0	0						0
Crewe-intermediate-Manchester	AW/NT	NB	17 AW	8	8	0	SB	17 AW	9	9	0	17						17
London-Liverpool	VT	NB	15	0	30	0	SB	15	0	30	0	60			60	0		
Birmingham-Crewe-stops-Liverpool	LM	NB	11	0	22	0	SB	11	0	22	0	44					44	
London-Chester/North Wales	VT	NB	5	0	10	0	SB	7	0	14	0	24			24			
(WMids)-Crewe-Chester/N.Wales	AW/VT	NB	1	22	24	0	SB	1	18	20	0	44					44	
Cardiff-Shrewsbury-Crewe-Manchester	AW	NB	9	0	18	0	SB	7	0	14	0	32					32	
Cardiff-Shrewsbury-Crewe-N.Wales	AW	NB	1	0	2	0	SB	0	0	0	0	2					2	
<-Crewe-stopping-Shrewsbury->	AW	NB	4	0	8	0	SB	6	0	12	0	20						20
Crewe-Stoke-on-Trent-Derby	EM	NB	0	7	7	0	SB	0	8	8	0	15						15
Crewe-Stoke-on-Trent-Trent Valley	LM	NB	0	12	12	0	SB	0	12	12	0	24						24
												400			179	19	145	76
Summary totals for Crewe-intermediate-Manchester exclude through AW trains already counted as Marches Line service																		

Passenger service volumes at Crewe, Spring 2015. Of the passenger trains calling at Crewe, there is a basic sequence of three intercity trains an hour to/from London, with hourly frequencies to/from Manchester, Liverpool and Chester/North Wales. Together with additional services calling at Crewe on occasional hours, the direct London service is 29% of all trains calling during a week. The bulk of other flows are inter-regional – 52% to/from the M6 corridor and Scotland, West Midlands, East Midlands, Wales – and 19% local regional trains. The London trains also serve other destinations in the opposite direction. So London & SE travel is perhaps 30% of all Crewe usage, after weighting journey proportions, and the bulk of travel is non-London.

There are also the ambitions of Crewe and Cheshire East to take into account. The possibility of improved regional and inter-regional services has been set out above. Clearly, development of business cases would be required in order that those could proceed towards authorisation within franchising processes. A summary of revised outputs addressing those possible ambitions outputs is set out below, with new total weekly volumes to compare with the preceding table:

CREWE PASSENGER TRAINS - EXPANDED HUB AMBITION				
Service (and v.v.)	Operator	Crewe hub impact	Total 2-way	Non-stop
Traffic day not 00:00 to 24:00			calling WEEK	trains WEEK
Weekdays				
London-Scotland (incl overnight)	VT/SR	Hourly non-stop Glasgow/Edinburgh-London (some ? combine Carstairs), existing services to call at Crewe	442	330
(London)-Birmingham-Scotland	VT	Extra 2-hourly service sourced from Cardiff/West Midlands/East Midlands, combine at Crewe if needed	598	0
London/Birmingham-North West	VT	New services also 2-hourly, sourced as suitable from Wales/Midlands origins	307	17
London-Manchester via Crewe	VT	No change	412	0
Birmingham-Manchester via Crewe	XC	Additional hourly Midlands-Trans-Pennine destinations service	436	0
Crewe-Mcr.Airport-(Manchester)	NT	Hub regional service: Increase to half-hourly and with longer operating hours	672	0
Crewe-intermediate-Manchester	AW/NT	As now, better evening and weekend services	324	0
London-Liverpool	VT	As now, plus several extra trains	472	28
Birmingham-Crewe-stops-Liverpool	LM	As now	775	0
London-Chester/North Wales	VT	Longer operating hours	450	0
(WMids)-Crewe-Chester/N.Wales	AW/VT	Extra Hub regional service to Wrexham	583	0
Cardiff-Shrewsbury-Crewe-Manchester	AW	Extra Cardiff-NW/Scot trains already counted	379	0
Cardiff-Shrewsbury-Crewe-N.Wales	AW	As now	22	0
<-Crewe-stopping-Shrewsbury->	AW	Extra 2-hourly Shrewsbury-local stops-Crewe	310	0
Crewe-Stoke-on-Trent-Derby	EM	Extra E.Mids-NW/Scot trains already counted, allow longer hours for local trains	270	0
Crewe-Stoke-on-Trent-Trent Valley	LM	Extra trains through to Manchester International already counted	210	0
New Hub regional corridors	NT	New Hub regional Crewe-Northwich and Crewe-Macclesfield-(Manchester) services (may be through train)	496	0
		Also, with modifications, for Saturday and Sunday volumes	7158	375

Specified service levels

Pre-determined official ambitions are those stated in the various franchise documents. The agreed Northern Rail and TransPennine franchise service delivery is taken as a given. It does not substantially affect the service volume via Crewe, though it aims to improve the range and frequency of connections at the Manchester Hubs and expand their capacities.

Medium term Trans-Pennine access

Network Rail does not expect to be ready with its proposals for TransPennine electrification and any related HS3 thinking until the end of 2017.This will also dovetail with options to emerge from Transport for the North. TfN has set out the current processes on its website. Relevant headlines are set out below.

Transport for the North is already developing its agenda. Strategically it is important that TfN recognises the role of Crewe in the coming decades, as being a lynch pin in the economic and railway geography of the Northern Powerhouse, and the key node for other regions to access the Northern Powerhouse and v.v.

TfN: Thursday 07 July 2016
Mapping our plans for the future – we talk to Amy Harhoff, TfN's Head of Policy and Strategy, about her team's work

We asked Amy what she sees as the key priorities for TfN in terms of policy and strategy: "The next eighteen months is a key transition period for Transport for the North," she explained, "We'll be the first sub-national transport body of its kind in England by the end of 2017 and our team will be ensuring that our strategy, policy and programmes are well-developed using robust evidence."

"We need to ensure that TfN can drive the strategic transport agendas that will enable growth for the North. We'll be producing our integrated strategy over that period, it will bring forward new evidence, make the case for major transformational investments and, critically, it will be developed in partnership with a clear plan to involve business and civic leaders and ensure public buy-in. That will include an initial phase of public consultation, followed by a formal consultation once we get statutory status. Whilst we're developing this strategy we'll also be ensuring that TfN provides clear priorities into the current roads and rail investment processes."

"The Strategy and Policy Team needs to be, and is, very outcome focused," she told us, "We do have a lot of outputs: to deliver the Northern Transport Strategy, to form the organisation as a statutory body and to deliver key pieces of work like the Independent Economic Review but really our priority is turning all that research and analysis into meaningful policy to formulate TfN's targeted priorities, for schemes and investments that in turn create the right environment for business to prosper."

West Coast specification

DfT consultation on the new West Coast intercity specification was launched on 10th May 2016 (see particularly pp.18-21 about train services), and consultation closed on 2nd August (CTC has responded to it). In summary the DfT's processes and objectives are to:

- Start the process to select a rail company to operate and develop these services and stations from April 2018.
- Use this opportunity to look again at the rail services provided by the ICWC franchise, and ensure they meet the needs and aspirations of the people and areas they serve. "Our vision for the new franchise is to enable economic growth, support investment and make journeys better for passengers."
- Drive growth in passengers and develop the market for intercity travel between the cities served by the franchise ahead of the introduction of HS2, delivering a step change through reduced journey times, improved capacity, greater levels of performance, access to a wider range of fares to suit all markets offered through innovative fulfilment channels, and a more resilient operation.
- Work in partnership with the West Midlands franchise operator, Network Rail, HS2 Ltd, the Department for Transport and other relevant bodies to support the delivery of the HS2 works, particularly the rebuild of London Euston station.
- Deliver a new benchmark in customer satisfaction building on the high levels currently achieved. Improve the environment on board and at stations, in particular, ensure that any potential impact on the passenger during major planned construction works is minimised and managed.
- Build on investments made in the West Coast Main Line and ICWC franchise, to drive the delivery of the long-term benefits from this investment and value to the tax payer through a value for money proposition for ICWC as a flagship railway and laying the foundation for the operation of HS2.

None of this consultation explicitly changes the services currently offered by the West Coast franchise. However the consultation document opens up the scope for changes in stopping patterns and frequencies beyond the opening of HS2. Watford Junction is used as an example for this.

There is no reason why Crewe shouldn't also be argued as a Northern exemplar, and indeed as offering the potential for earlier changes to service patterns, with more selected stops, as a stimulant pre-HS2 for the start of Hub economic growth and related developments. Why should Crewe (and other locations) have to wait for HS2 to turn up in reality for things to start happening, instead of recognising and emulating the London Docklands example?

The OPDC area at Old Oak Common (London's HS2 suburban hub) isn't waiting for things to happen around it, but is gearing up now for area regeneration and attracting new economic activity, well ahead of 2026-27. There at least the Crossrail project is underway with certainty of dates, so that there is greater stimulus for initial development investments.

West Midlands specification

A new West Midlands and Chilterns Route Study was published by Network Rail in June 2016. The study considers the effect of the growth forecasts outlined in NR Market Studies for the periods to 2023 and to 2043. The purpose of the Route Study is to provide an evidence base that will present advice and choices to funders when considering rail industry investment in the short, medium and longer term.

A range of choices are identified which include train lengthening to meet demand to 2024, opportunities to maximise the benefits of HS2 in Birmingham and at Old Oak Common, as well as longer term options out to 2043. These options include train lengthening, infrastructure changes and the opportunities presented by the Digital Railway programme.

Up to 10 extra trains an hour are proposed for central Birmingham, largely by using the ex-GW Snow Hill lines more intensively and with new links to that railway from the LM system lines. This would also bring more regional trains closer to the HS2 station at Curzon Street, by calling at the adjoining Moor Street station.

This would not have a major effect on service levels on the corridors between the West Midlands and the North West. However there would be increased capacity on CrossCountry intercity services. An underlying part of the proposals is for better infrastructure to support a jointly specified and jointly managed West Midlands rail franchise (due to replace the current London Midland operation from October 2017).

It is anticipated that this franchise will include a distinct business unit for the West Midlands travel to work area and will form the first step towards a future, devolved West Midlands franchise. The West Midlands Combined Authority (WMCA) and 14 regional partner authorities are currently working with the Department for Transport on this proposition.

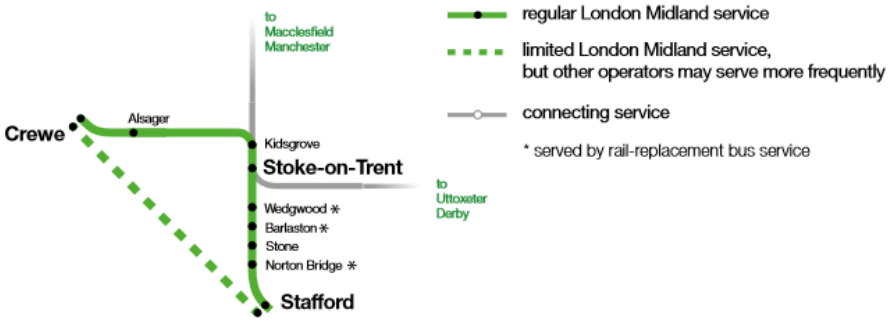
Crewe's opportunities towards the West Midlands

For Crewe, the reality is that it is probably too big a step initially to extend a West Midlands rail franchise to abut with that for the Northern Powerhouse (a comparable basis to the co-terminous Greater Manchester and West Yorkshire ITAs), although such a move would place Crewe in a stronger position for regional rail accessibility.

In the medium term, however, there might be a business case to provide a Madeley (A525) or Whitmore Parkway (A53) station on the Crewe-Stafford line, once line capacity pressures ease with HS2 Phase 2a. It would enable fast railhead access from the western Potteries and from poorly connected local towns such as Market Drayton.

The starting point for such a possibility was set out in the DfT's recent consultation on the West Midlands franchise, which ran from December 2015 to March 2016. This discussed whether LM regional services should run direct between Crewe and Stafford, rather than via Stoke-on-Trent:

5.17 London Midland currently provides an hourly service from London Euston to Crewe via Stoke-on-Trent. This provides the main service at stations between Nuneaton and Stafford including Atherstone, Tamworth, Lichfield Trent Valley and Rugeley Trent Valley. It also provides the local service between Stafford, Stoke-on-Trent and Crewe.



5.18 Since the Trent Valley part of the service was introduced in 2008, passenger numbers have grown significantly. There is an issue, however, that some of the stations between Stoke-on-Trent and Crewe have shorter platforms that can only cater for four carriages. This means trains either have to be limited to four carriages and often become crowded or they are longer but have to run directly from Stafford to Crewe, missing out Stone, Stoke-on-Trent, Kidsgrove and Alsager.

5.19 We would like people's views on whether the current service should continue to operate as it does now, or whether a direct route from Stafford to Crewe should be run at all times, providing a consistent timetable and allowing longer trains to operate. It is possible that this service could be provided by another operator through another franchise.

An Invitation To Tender (ITT) for the new West Midlands franchise was due to be issued in July 2016, but the consequences of Brexit and financial pressures have delayed the DfT process. One of the shortlisted three bidders, MTR, has also withdrawn from the bidding.

What could be another option with HS2 Phase 2a in 2027, is for HS2 to start to offer a higher speed inter-regional network between Birmingham Curzon Street, Crewe and Manchester/ Liverpool/Preston. This is discussed below.

Services to/from Wales

The other major passenger rail component for Crewe, excluding high speed lines, is the Welsh Government. This oversees the specification and award of the Wales and Borders franchise. Rail franchising will be fully devolved to the Welsh Government from 2017. It is currently gathering the views of rail interest groups on the specification for the next Wales and Border franchise. In 2017, Welsh Ministers will initiate the formal process for procuring the next franchise.

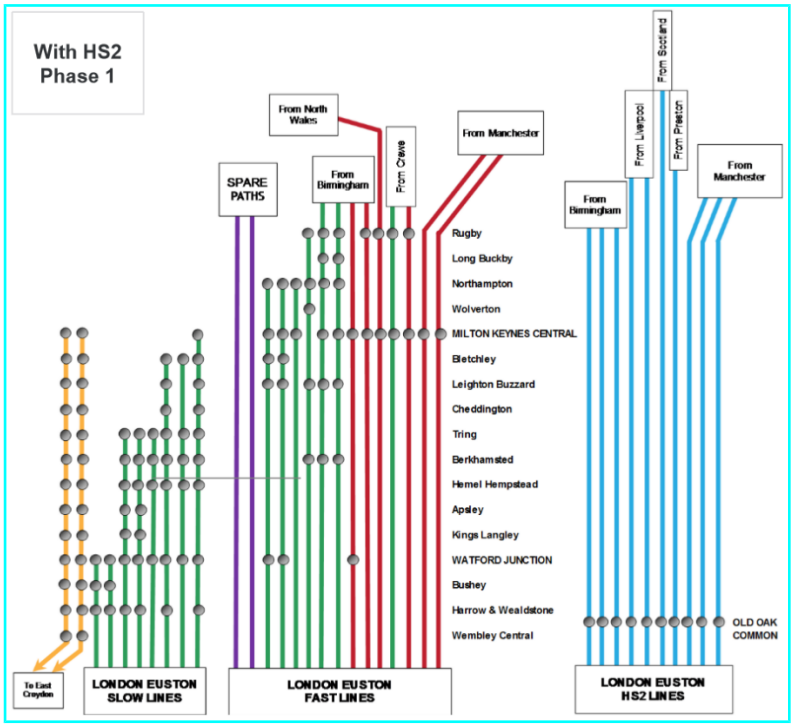
HS2 Phase 1 / Phase 2a / Phase 2 full

This brings us to HS2 and its sequential proposals. The initial game-changer is Phase 1, which is the planned HS line from Euston to Central Birmingham, and to Handsacre near Lichfield to

rejoin the WCML. This line is notionally planned to open in December 2026, although the recent NAO report referenced above casts serious doubt on this date. Sometime in 2027, possibly allied with the intended opening to Crewe that year, might be more pragmatic.

In terms of services, HS2 Phase 1 represents a simple translation of West Coast intercity services onto HS tracks – essentially, they are West Coast Main Line tracks 5 and 6. There won't be any more trains per hour. Apart from the stark reduction in journey times between major cities, the main change is foreseen as adjustments to the service pattern on the existing WCML 'classic' network – so back to the fundamental point that Crewe like other places will continue to depend hugely on the classic railway and its future services.

An outline service structure for Phase 1 was set out in 2013 by HS2 Ltd, and republished by the DfT in its November 2015 technical demand updates for HS2 and WCML, so gave that implicit support. The service diagram is set out below, unfortunately it cuts detailed service information short at Rugby.



This does **not** imply a simple transposition between WCML intercity and HS2, which might otherwise suggest that of the 3 current Manchester intercities, 2 would continue to run via Stoke on Trent and Macclesfield and serve those centres, and 1 continue to run via Crewe and serve that.

The HS Phase 2a Financial Case document says **(with our emphasis)**:

2.12 The Phase One train service specification assumes that of the three services per hour each way between London and Manchester, two are routed via Crewe **(but do not stop)** and so in Phase 2a use the extended high speed line. One is routed via Stoke **(again without stopping)** and does not therefore utilise the faster journey speeds on offer with the extended high speed line in Phase 2a.

2.13 Our analysis demonstrates that if all three HS2 services from Manchester were routed via Crewe then this would lead to an extra £148 million of benefits and £114 million of revenue gain. When the third service is re-routed via Crewe

there is an increased chance of possible congestion on the line between Crewe and Manchester, and more detailed work is required to fully understand the impacts. On a conservative basis, we have therefore assumed in our latest cost estimate an additional infrastructure cost of £200 million (£147m, Net Present Value) to facilitate this routing.

The consequence is that none of the 3 HS tph to/from Manchester would call at Crewe. For HS services, Crewe would therefore rely on other trains, which could only be those to/from Liverpool and/or the North West, as Chester/North Wales intercity trains explicitly continue to use the existing WCML. It should be noted further, that with the risk of increasing congestion on the present Crewe-Manchester railway if 3 non-stop HS services were routed that way, this could also severely constrain the ability to run better regional or inter-regional services via Crewe on this main corridor – which could be counter to regional economic growth objectives and a variety of new and improved services capable of benefiting Crewe and Cheshire East.

There appear to be 2 HS tph from Liverpool – it is unclear if these are to continue as 2 tph only in peaks, and 1 offpeak? **At present, only 1 of those currently calls at Crewe. An hourly Preston HS service is also shown.** At present this starts in the North West at Preston or Lancaster, but doesn't run in offpeak periods on the WCML. It generally calls at Crewe at present. It is assumed that most Glasgow-London trains, as now, wouldn't call at Crewe. **Commentary below by HS2 Ltd makes it clear that the basic 'reference case' for Phase 2a intends calls at Crewe only by an hourly Liverpool train and an hourly North West train.**

The rationale for the proposed post-HS2 2 tph conventional fast train service to Manchester is now clear – to provide a service to Stoke on Trent, etc, while a second Crewe-London train might also be to replace a London-Manchester via Crewe or other intercity service.

This points to a constrained HS service at Crewe, **only 2 tph**, and at best two replacement conventional services for other intercity stops at Crewe that might be removed on accelerated trains. It is assumed that all other routes and services on non-HS corridors would be maintained, based on current ambitions for future services.

HS2 Ltd has also explicitly stated in its Phase 2a Commercial Case that (with our emphasis):

1.7 The 2013 Strategic Case set out a proposed train service pattern that would run once Phase One opens in 2026. This assumes that six trains per hour run through Crewe **(with two services stopping there)** and one train per hour runs through Stoke-on-Trent (without stopping). For the purposes of modelling, we have assumed that this service pattern continues to run once Phase 2a opens in 2027. When the rest of Phase Two opens in 2033, we have assumed that the Phase Two train service pattern will run across the network, as set out in the 2013 Strategic Case.

1.8 We are continuing to work on developing the best service pattern for Crewe and the wider North West. We have modelled a number of alternative service patterns as part of the economic analysis (set out in more detail in the Economic Case and Strategic Case for Phase 2a). In addition, both consultation responses and Sir David Higgins have recommended that HS2 serve a new high speed hub station at Crewe. The Government supports the vision for a Crewe Hub, and intends to make further announcements on the way forward in 2016. We are working with Network Rail and local stakeholders to understand how best to develop options which are affordable and deliver value for money."

So this emphasises that Crewe should in baseline terms not expect a higher HS service frequency than 2 tph, although there might be scope to vary the specification in conjunction with broader-based economic analyses and as a result of a strong case set out for the Crewe Hub and a new high speed station there.

There are two, related final points about Phase 2a. The commercial case says on page 10 that:

Rolling Stock	Provision for additional rolling stock is not necessary within Phase 2a of the programme	£ 0

If no trains are planned to be ordered, it is also possible to infer that the proposed Phase 2 full HS regional services between Birmingham Curzon Street and Manchester would not operate during Phase 2a.

This situation would be reinforced if line capacity between Crewe and Manchester were under pressure, because all non-stop HS trains between Manchester and London might be routed via Crewe. A Birmingham-Manchester Phase 2a HS service could only be worthwhile if it operated via Crewe. Yet such a service could give a significant regional advantage to Crewe and a Hub development there.

It might still be possible to start a regional HS hub service in Phase 2a between Birmingham Curzon Street and Liverpool and/or the North West, but only if there were a commercial case and if trains were ordered. Capacity for any Birmingham-Crewe-Manchester HS regional service would depend on not all Manchester-London HS trains running via Crewe.

A better business case for more HS stops at Crewe

The HS2 Phase 2a Economic Case notes that growth in demand has been capped in modelling at 2037 volumes. The modelling is consistent with previous HS2 work, notably the 2013 Economic Case for HS2. This of course will limit the forecast benefits for the general Phase 2a extension, and for specific proposals such as additional services at Crewe. HS2 says this:

1.17 It is considered however, that this application of a demand cap is conservative as it is applied only four years after the full "Y" network is assumed to open. There is no evidence to suggest that demand will stop growing within this timescale and demand growth on our rail network has been strong over the preceding twenty years. Our demand forecasts could also be viewed as conservative given that they only assume 2.2 per cent demand growth each year across the rail network whereas as noted above, historic demand growth has been far stronger.

Other factors not valued in the Economic Case are (from Figure 2):

Regeneration: Land use change is not considered within our modelling. Benefits from regenerating areas of the country most affected by the benefits of HS2 regeneration.
Movements to More Productive Jobs: Land use change is not considered within our modelling. The increase in productivity identified as resulting from jobs relocating into higher productivity areas.
Foreign Direct Investment: The connectivity benefits arising from HS2 may lead to firms overseas being more attracted to invest in the UK.
Freight: HS2 may result in additional capacity available for rail freight. The potential benefits resulting from this have been considered but have not been quantified in the economic case.

The Economic Case goes on to set out a partial case for 2 additional hourly HS stops at Crewe, one a Manchester train and the other a Glasgow train. The costs incurred in accommodating these stops need to be assessed, for a business case to be established:

1.50 As well as altering the route of the high speed trains another option may be to alter their stopping pattern to make services accessible to more people. For example, additional stops could be made at Crewe to exploit its strong rail connectivity with the surrounding area. Additional stops at Crewe have been modelled on two HS2 services, one which terminates at Manchester and another terminating at Glasgow. The table below presents the change in benefits resulting from this train service specification. It demonstrates that stopping two additional high speed trains at Crewe increases net transport benefits by £278 million and revenues by £251 million. A BCR for this train service specification cannot be calculated. This is because if further trains stopped at Crewe this may require additional investment in infrastructure, such as a new station or new platforms, and the scale of these costs have not yet been assessed.

Figure 13: Change in benefits from increasing stops at Crewe

£2011 Prices, PV	'Reference Case'	Crewe Additional Stops	Difference
Transport User Benefits	£1,978m	£2,280m	£302m
Other Benefits	£5m	£5m	£0m
Loss of Indirect Taxes	-£117m	-£141m	-£24m
Net Transport Benefit	£1,866m	£2,144m	£278m
Revenues	£1,376m	£1,627m	£251m

The HS2 Phase 2a Strategic Case also shows that Crewe is a key railhead already, and can be a strong railhead also for HS services:

3.9 …By connecting to the WCML at Crewe, Phase 2a is also able to take advantage of the existing rail connectivity at Crewe. We have looked at the possible benefits of maximising this connectivity by stopping more trains at Crewe, and this set out in more detail in Section 5…

Accelerating to Crewe connects HS2 with the wider North West
4.18 Crewe is already well connected to the local and national UK rail network. It is a significant rail hub where the main trunk of the WCML and four regional rail lines converge, acting as a gateway to the North West, and giving Crewe 360 degree rail connectivity to major destinations including Liverpool and Scotland; Manchester; Stoke-on-Trent; Birmingham and London; Shrewsbury and South Wales; and Chester and North Wales. Freight typically requires more flexibility in the timetable in order to ensure that services can respond to the changing demand requirements – such as a large container ship docking at a port – that are a feature of the freight market. This makes Crewe a strategically important location on the rail network, for both passenger services and freight.

4.19 In a typical off-peak hour there are 20 departures from Crewe to destinations elsewhere in the North West, Scotland, and North and South Wales. Crewe Station draws its demand from a wide catchment, including other local stations such as Chester and Stoke-on-Trent. Over the past decade, the number of passengers using Crewe Station has grown, with 3.7 million passengers using the station in 2013/2014 compared to 2.7 million in 2004/05. [*NB: THIS INCLUDES INTERCHANGE NUMBERS.*] In addition, in 2013/14 a third of passengers were interchanging between rail services at Crewe. When interchange is ranked as a percentage of overall station usage, Crewe is amongst the top ten UK stations for the proportion of station users who are inter-changing between trains. Passenger numbers at Crewe are forecast to

continue to grow, and HS2 Limited forecast that with Phase Two of HS2 as consulted, 6.3 million passengers [*INCL INTERCHANGE?*] could be using Crewe Station in 2036.

4.20 By building HS2 to Crewe by 2027, people travelling to and from the North West, from places including Chester, North Wales, Stoke-on-Trent and Shrewsbury will also have the option to join faster services to London, and those travelling further afield who currently pass through or change trains at Crewe on their way to or from London will have the option of using high speed services for part of their journey. As a result, accelerating the part of Phase Two to Crewe means that there is the potential for people to benefit from greater improvements to journey times much earlier than originally planned.

Stopping more trains at Crewe

4.21 The 'reference case' in our economic analysis assumes the Phase One service pattern, where two trains per hour stop at Crewe and go on to serve destinations across the wider North West including Liverpool. An additional three high speed trains per hour travel through Crewe on the way to Manchester or Scotland, and a single classic compatible service travels via Crewe on the WCML from Handsacre to Liverpool. However none of these services are assumed to stop at Crewe. Advice from Sir David Higgins, and responses to the consultation, suggested that there was the potential for more benefits to be delivered from stopping more trains at Crewe to further improve connectivity across the North West.

4.22 We have explored the benefits of stopping four trains per hour at Crewe rather than two as in the Phase One service specification. Our modelling showed that stopping these extra trains could deliver an additional £302 million in benefits and £251 million in revenue. This is set out in more detail in Section 5 [see Annex for details of Section 5].

4.23 While further work, including on costs and funding, must be completed before decisions can be taken on whether to proceed, the Government supports the vision for a Crewe Hub. The Government intends to make further announcements on the scheme later in 2016, and any Crewe Hub scheme will be subject to public consultation. Such a proposal will need to be affordable, offer value for money, and bring benefits to Crewe town and the entire region including Cheshire, Warrington, Stoke-on-Trent and Staffordshire.

Regeneration of the Crewe and the region

4.24 HS2 will drive growth by acting as a catalyst for major regeneration and development schemes, delivering better connectivity and providing opportunities for the UK's businesses and workforce. It will generate economic opportunities and development beyond the direct impacts of building a new railway.

4.25 **The recently formed Northern Gateway Partnership, a collaboration of seven local authorities across Cheshire and Staffordshire, and the Cheshire and Warrington and Stoke-on-Trent and Staffordshire Local Enterprise Partnerships, has set out their aspirations for economic growth in the region, to capitalise on the opportunities and investment that they believe will be generated by HS2. Cheshire East Council have also set out their vision for regenerating the sub-region in response to consultation, which they believe is exceptionally well placed to deliver a boost to economic connectivity, enable high value development and regeneration and provide employment, skills and business opportunities directly linked to HS2 investment. Their long term vision is for a town and a region which is a nationally significant**

economic centre; one of the leading advanced engineering and manufacturing centres in England; and a sought-after place not only in Cheshire but the UK as a whole.

Network Rail outputs

The final ingredient for service aspirations and planning is Network Rail's own thinking about future required line capacities in the region, and potential changes in Network Rail's organisation to ensure effective delivery of railway modernisation. The latest NR organisational update, the Network Rail Transformation Plan was published on 29th July 2016. It presses forward the importance of Route-based management structures, along with ORR regulatory oversight. It also sets out a series of priorities for getting Network Rail 'back on track', able to deliver greater reliability and higher capacity across the national network.

It includes discussion of higher capacity through the 'Digital Railway', and the possibility of creating a 'Northern Route' management to help drive forward TfL, TransPennine and HS3 projects:

Digital Railway: *WHAT WE WILL DO*
– Autumn 2016, leadership review of the DR Programme.
– Autumn 2016, identification of key geographical areas where digital railway can have the greatest impact to deliver capacity and performance benefits.
– By December 2016 initial costed options for these targeted, regional digital railway deployments to solve critical issues on the network.
Northern Route:
One of the Shaw recommendations was the possibility of a new Northern route. We have asked Michael Holden, former chief executive of Directly Operated Railways, to conduct a review into Network Rail's structure and its alignment with its multiple customers and stakeholders. As part of his work we have spoken to key stakeholders to understand how we can best support their needs. It is clear that no single option meets all stakeholder needs. Any changes must be focused on delivering passenger benefits. We are developing options which the Board will consider in autumn 2016.

Liaison with Network Rail will be an important task for Crewe and Cheshire East during Autumn 2016, to ensure that the present and future railway is fit for purpose and funded. It must maximise the scope for a fully effective range of services on all routes radiating from Crewe, to underpin the economic growth objectives of Crewe Hub and its nationally important interchange.

- The present line speed limits within Crewe allow 80 mph for non-stop trains on the main NW tracks. Beyond that, speeds are mostly 90-125 mph towards Preston, up to 100 mph towards Runcorn but slower on to Liverpool, and 90-110 mph towards Stockport but slower on to Manchester. Effective intercity times are present are Crewe to Liverpool about 36 minutes (1 intermediate stop), Preston about 41 minutes (2 intermediate stops), and Manchester about 33 minutes (2 intermediate stops).
- **The scale of line upgrades which might be feasible are relevant for Crewe's economic future. Upgrades which support faster interim HS services during Phase 2a, and also faster inter-region and regional services , could achieve good business cases. Upgrades which also add capacity could be better still.**
- Two decades to the mid 2030s includes three rail infrastructure Control Periods (CP6 2019-24, CP7 2024-29 and CP8 2029-34), during which time the principal lines in the North West should not be subject to a form of 'planning blight' waiting for the final version of HS2 Phase 2 full.
- In respect of HS2, it is clear from the evidence above that there is no guarantee that the high speed train service to/from London will be improved before the mid 2030s, and plenty of evidence that the Crewe HS service could be a low frequency, albeit those trains would offer fast journey times.

Shaping the future for Crewe Hub and Cheshire East – lobbying priorities

Defining the Hub, Interchange and growth elements

Crewe Town Council and Cheshire East must set out their vision of how the Crewe Hub and Interchange must work as a single entity in future – to separate these two functions physically would ensure *sub-optimal* outcomes for transport connectivity, accessibility and economic growth. Agglomeration works when the essential elements are next to each other, not when they are disparate.

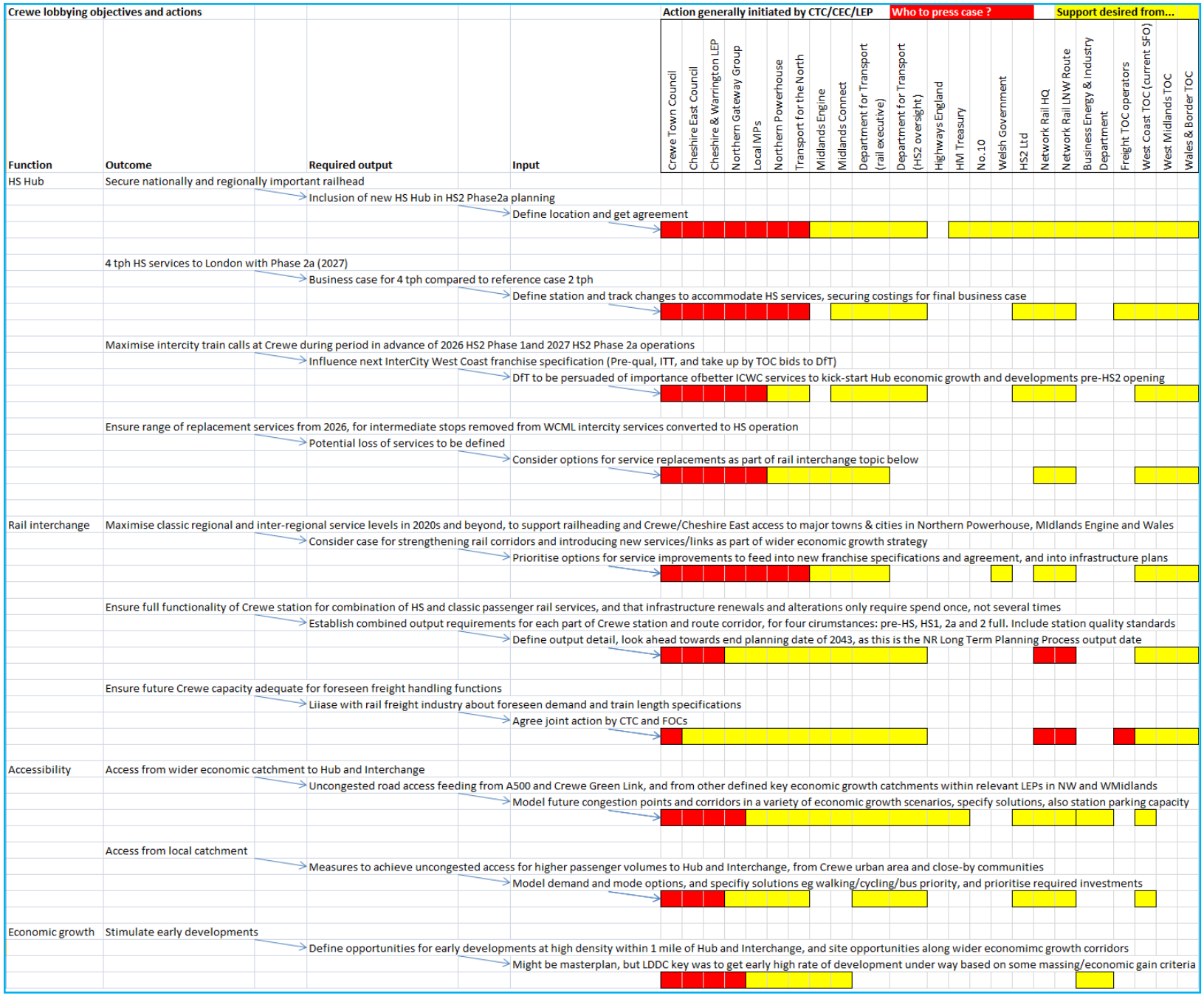
A lot clearly hangs on a few factors:

- Definition of Hub location, where the finances and logistics of the next two decades points clearly to a station at or very close to the existing station.
- Understanding the infrastructure costs to inform the business case for more frequent HS2 services calling at Crewe.
- Start service development pre-HS2 to kick-start local and regional economic growth within the Northern Powerhouse - additional intercity calls as well as a review of regional and inter-regional service levels and connectivity, and preparedness to substitute other trains for those intercity stops removed when HS2 services start up.
- Full operational functionality, and passenger facilities and appropriate quality at the Hub and Interchange.
- Adequate facilities for freight services into future decades.
- Address the accessibility of the Hub and Interchange, both from the wider economic catchment and from the main urban area and its surrounds.
- Initiate early developments which achieve significant early massing and growth outcomes.

An outline table is set out overleaf, which defines for these factors the desired *outcomes*, the principal *outputs* to achieve those outcomes, and the required *inputs* which are the building blocks to achieve the outputs. Alongside those, there is a guide to which organisations should be pressing on each topic, and the audiences who should be informed and supportive, and may in turn need to 'own' and lead on some of the outputs. No specific timescales are attached to these proposed objectives and actions, but clearly there are processes in train. Some context for timings of actions is set out below. JRC would be pleased to assist this briefing and lobbying process.

HS2 and Phase 2a

The present Phase 1 parliamentary Bill is trying to achieve Royal Assent by the end of 2016, though it might run into 2017. A Phase 2a Bill is expected at some time in 2017. As a Government-backed Hybrid Bill, it might be introduced at any period during 2017, possibly once decisions have been taken about the final definition of Crewe Hub station and any necessary on-network (ie, on-Network Rail lands) construction that could influence the line of the railway, works, and impact mitigation required to be shown in the parliamentary plans. Consultation on impact and mitigation proposals would also require to be completed. A full suite of HS2 planning documents is listed here, compiled by the Government.


Crewe lobbying objectives and actions
Action generally initiated by CTC/CEC/LEP
Who to press case ?
Support desired from...
Function
Outcome
Required output
Input
Crewe Town Council
Cheshire East Council
Cheshire & Warrington LEP
Northern Gateway Group
Local MPs
Northern Powerhouse
Transport for the North
Midlands Engine
Midlands Connect
Department for Transport (rail executive)
Department for Transport (HS2 oversight)
Highways England
HM Treasury
No.10
Welsh Government
HS2 Ltd
Network Rail HQ
Network Rail LNW Route
Business Energy & Industry Department
Freight TOC operators
West Coast TOC (current SFO)
West Midlands TOC
Wales & Border TOC
HS Hub
Secure nationally and regionally important railhead
Inclusion of new HS Hub in HS2 Phase2a planning
Define location and get agreement
4 tph HS services to London with Phase 2a (2027)
Business case for 4 tph compared to reference case 2 tph
Define station and track changes to accommodate HS services, securing costings for final business case
Maximise intercity train calls at Crewe during period in advance of 2026 HS2 Phase 1and 2027 HS2 Phase 2a operations
Influence next InterCity West Coast franchise specification (Pre-qual, ITT, and take up by TOC bids to DfT)
DfT to be persuaded of importance ofbetter ICWC services to kick-start Hub economic growth and developments pre-HS2 opening
Ensure range of replacement services from 2026, for intermediate stops removed from WCML intercity services converted to HS operation
Potential loss of services to be defined
Consider options for service replacements as part of rail interchange topic below
Rail interchange
Maximise classic regional and inter-regional service levels in 2020s and beyond, to support railheading and Crewe/Cheshire East access to major towns & cities in Northern Powerhouse, MIdlands Engine and Wales
Consider case for strengthening rail corridors and introducing new services/links as part of wider economic growth strategy
Prioritise options for service improvements to feed into new franchise specifications and agreement, and into infrastructure plans
Ensure full functionality of Crewe station for combination of HS and classic passenger rail services, and that infrastructure renewals and alterations only require spend once, not several times
Establish combined output requirements for each part of Crewe station and route corridor, for four cirumstances: pre-HS, HS1, 2a and 2 full. Include station quality standards
Define output detail, look ahead towards end planning date of 2043, as this is the NR Long Term Planning Process output date
Ensure future Crewe capacity adequate for foreseen freight handling functions
Liiase with rail freight industry about foreseen demand and train length specifications
Agree joint action by CTC and FOCs
Accessibility
Access from wider economic catchment to Hub and Interchange
Uncongested road access feeding from A500 and Crewe Green Link, and from other defined key economic growth catchments within relevant LEPs in NW and WMidlands
Model future congestion points and corridors in a variety of economic growth scenarios, specify solutions, also station parking capacity
Access from local catchment
Measures to achieve uncongested access for higher passenger volumes to Hub and Interchange, from Crewe urban area and close-by communities
Model demand and mode options, and specifiy solutions eg walking/cycling/bus priority, and prioritise required investments
Economic growth
Stimulate early developments
Define opportunities for early developments at high density within 1 mile of Hub and Interchange, and site opportunities along wider economimc growth corridors
Might be masterplan, but LDDC key was to get early high rate of development under way based on some massing/economic gain criteria

Accordingly, the decisions on a Hub location and the business case and on-network requirements are on the critical path, and discussions involving CTC and CEC must be undertaken this late summer and Autumn. {These may already be underway.] In its Phase 2a Commercial Case, HS2 says:

> 2.3 There are some actions that we have been able to take early. In November 2015 HS2 Limited procured suppliers under Professional Service Contracts (PSCs) to develop an understanding of the land requirements, the geological requirements, railway systems, and environmental issues that will shape the design of the route and infrastructure requirements. This will support the work needed to finalise the design and environmental statements in 2016 to enable the deposit of a hybrid bill.
>
> 2.4 There will also be a number of further outputs needed, between the OBC and FBC, in order to achieve Royal Assent.
>
> 2.5 A full list of outputs will be developed as the project evolves from the development stage following the deposit of the bill, however, the outputs at this stage are expected to be:
>
> a. Bill Scheme Design
> b. Environmental Statements
> c. Undertakings and Assurances
> d. Third Party Agreements
> e. Funding Programme
> f. A Procurement Strategy for the Delivery Phase
> g. An Operating Concept - a high level proposal on how the line is likely to operate, including options for a regulatory regime (which is likely to follow Phase One)

HS2 Ltd has stated that the Phase 2a Outline Business Case is due in 2017 as well as what is included in the Hybrid Bill. On a slower timescale, the Phase 2a Final Business Case is due in 2019). Crewe Town Council, Cheshire East and other parties may need to submit evidence to Parliamentary committees during the Bill stages (2017-19).

HS2 has further stated (Commercial Case, para 4.34) that , as part of the HS2 Gateway policies, "we are encouraging local partners to identify how they can maximise the impact of HS2 as a significant opportunity to secure private sector investment, including from overseas, into regeneration and growth projects across the country. In the Spending Review the Chancellor announced growth funding for the East Midlands LEP. He also confirmed funding for other Phase Two stations as decisions are taken."

The reporting chain between HS2, the DfT and Ministers is set out in the HS2 Management Case (Figure 2, page 10). CTC and CEC need to have this in mind – ultimately HS2 Ltd is a delivery organisation sponsored by Government, and variations to costs and outputs – and outcomes – will need to be scrutinised by DfT. Significant funding, timescale and policy matters will be referred upwards for review and decision. Much more detail is set out in the Management Case.

The ministerial significance of Crewe Hub and related HS2 service proposals should also be borne in mind at a Cabinet and Government economic management scale. The new post-Brexit government led by Theresa May has just established a relevant Cabinet committee, as covered in a recent news report:

The newly-created **Economy and Industrial Strategy Committee** will look at addressing long-term productivity growth, encouraging innovation and focusing on the industries and technologies that could give the UK a competitive advantage.

Prime Minister Theresa May has chaired the first meeting of a new cabinet committee focused on building an economy "that works for everyone".

It will look at developing a "strong" industrial strategy, encouraging innovation, boosting productivity and creating opportunities for the young.

Mrs May said that to take advantage of "opportunities" presented by Brexit "we need to have our whole economy firing".

Speaking ahead of the meeting in Downing Street, Mrs May said she wanted her government to "build an economy that works for everyone, not just the privileged few" - a pledge she made in her first speech as prime minister.

She added: "That is why we need a proper industrial strategy that focuses on improving productivity, rewarding hardworking people with higher wages and creating more opportunities for young people so that, whatever their background, they go as far as their talents will take them.

"We also need a plan to drive growth up and down the country - from rural areas to our great cities."

The full list of attendees at Tuesday's committee included:

- **Prime Minister Theresa May**
- **Chancellor of the Exchequer Philip Hammond**
- **Business, Energy and Industrial Strategy Secretary Greg Clark**
- Work and Pensions Secretary Damian Green
- Health Secretary Jeremy Hunt
- Environment, Food and Rural Affairs Secretary Andrea Leadsom
- Culture, Media and Sport Secretary Karen Bradley
- International Trade Secretary Liam Fox
- Education Secretary Justine Greening
- Defence Secretary Michael Fallon
- **Communities and Local Government Secretary Sajid Javid**
- **Transport Secretary Chris Grayling.**

Finally it should be observed that there is a rail project group reviewing Crewe's functionality and that of the relevant onwards main lines, so far as those may impact on HS2 operability – not least the option to route all 3 Manchester trains non-stop through Crewe tracks during Phase 2a, if possible without requiring much or any additional infrastructure on Network Rail's tracks:

5.24 HS2 Limited has previously explored with DfT's Rail Executive and Network Rail how the performance risks could be mitigated through train service planning – the "without infrastructure" solution. There are a number of choices that could be made about services that serve Crewe and this will be the subject of detailed work to inform an Outline Business Case for Phase 2A. This work will be overseen by a Project Development Group that has already been created and contains representatives from HS2 Limited, DfT Rail Executive, DfT Passenger Services, DfT High Speed Rail Group and Network Rail.

Franchise outputs

Passenger services, their stopping patterns and their frequencies are normally for the Department for Transport (or the Welsh Government) and wider stakeholder interests to propose, the Department/Welsh Government to specify as franchise sponsors, and for TOC bidders to price in their delivery costs and risks. There is a clear role there for CTC and CEC to provide inputs to future franchising, and to influence variations to existing services.

The next relevant service groups for re-franchising are InterCity West Coast, West Midlands and Wales & Borders, as identified above. This is really the bulk of passenger services to and via Crewe It will be important for CTC and CEC to input proposals – an early stage is the best time to influence, before the franchise options have been narrowed down - and to help influence thinking as those franchises are recast. Dialogue with the Department/Welsh Government's franchise managers, and with current and potential or short-listed TOC operators, will be required.

CTC and CEC will need to provide a clear evidence base for any changes to service levels, so that the merits of different options for service patterns can be evaluated by the franchise sponsors.

Network Rail and conditional outputs

Railway service levels and their capacity and reliability implications are also for Network Rail to consider and price, as the net impact on railway infrastructure and operational costs can be considerable and strongly influence the likelihood or not of specific projects proceeding, and their timescales if major works have to be undertaken. It is also clear, as discussed and shown above, that HS2 capacity requirements on the existing NR lines will be considerable in HS2 Phases 1 and 2a. **It is therefore vital that CTC and CEC have in-depth and effective working relations with Network Rail At Route and HQ level.**

Pragmatically, in the case of Crewe, proposals *must* start to be developed in outline for regional spend partially in CP6 and partially in CP7 (2024-29). The crux for the Phase 2a project will be:

On the railway elements

- Defining the locations of interfaces between NR and HS2.
- Which of those to include in the HS2 Phase 2a Bill, and who bears which costs where within the whole Crewe area.
- This will significantly affect each organisation's bottom line.
- In parallel, which Network Rail elements to prioritise in enhanced capacity and service development, which achieve baseline reductions in HS train times between major city centres.
- **If in practice a Phase 2 full is some years later, and money is not plentiful, then making something like the existing or close-by station more operable for classic-compatible HS trains – and maximising the through running and interchange capabilities around the other existing route approaches – is likely to be cheaper and hit more targets across the entire suite of rail operations than a green field station and new interchange build.**
- This is in terms of scale of additional construction and whole life costs and revenues, service reliability and performance across many TOCs and freight operators, and system capacity.
- **Summarising, applying a 'value for all services' attitude should be more productive at Crewe for the rail network and the nation as a whole, during Phase 2a, than a value exercise focused**

solely on HS2's priority. HS2's further added value would come with Phase 2 full, when new bypass tunnels would be built (and could be justified partly by not having invested in a half-way house during Phase 2a). A study to reinforce these arguments might be helpful.

- Meanwhile, options of using the existing bypass tunnels and adapting them for HS non-stop trains, or of rationalising the existing fast line trackage through the station and the junctions beyond, should be reviewed so that more streamlined operations can be facilitated without so many train crossing conflicts.
- This may imply designs for several flyovers or flyunders. The area between Basford and the existing Crewe is potentially a good location for pre-sorting HS and classic flows for the various northern onwards routes.

On the economic growth elements

- CTC and CEC will need a clear phased plan which takes advantage of the emerging railway infrastructure. There are already defined as part of a broadly defined 'Northern Gateway Development Zone'. The local sub-set of this may need to focus quickly on its potential and the early opportunities for outputs.
- The conundrum of what railway infrastructure exists to start with, alongside what new elements are realistic to plan for during the two decades to the mid-2030s, is the key to resolving the **location** of new core development. The line of argument above points to somewhere in and around the existing stations, because HS2 may nominally have choices (though not without HS2 Phase 2 full happening quickly…), but it is most unlikely that the existing railway and its funders will have the luxury of choices – they will largely have to use what there is already.
- However it's isn't necessary for the location of the railway infrastructure to determine the new economic growth's **scope, shape and functions**, as these will be derived from Crewe's general positioning within the wider NW economic territory and with its projected journey times to key economic catchments, eg London, Birmingham, Manchester, Liverpool and the wide range of national and regional catchments. That general positioning will help to format the quantum of practicable change and growth.
- Crewe would be only 65 minutes or so from Euston assuming 2 intermediate stops), 55 minutes if non-stop, and less than 25 minutes from Birmingham Curzon Street (Phase 2a if services were operated that way) and Manchester (Phase 2 full).
- So the ambitions should not be constrained – in theory Crewe has the capacity to be THE principal growth on the new HS2 corridor.
- The specification for a Phase 2a station and tracks should be capable of being expanded to Phase 2 full – this is likely to involve tunnelling for a HS bypass route – but in terms developing beyond the second decade, this should then be just a step change for the revitalised Crewe – providing that space has been enabled for that further stage of expansion.

Other key issues to discuss are:

- Capacity at Crewe and on the onwards lines towards HS2 NW and Scottish destinations will require improvement if journey times are to be minimised with HS lines ceasing at Crewe so some years.
- For a rounded economic growth case, other rail corridors via Crewe should also be improved as part of the CP6 and CP7 opportunities. A key element may be to improve the segregation of tracks to reduce conflicting crossing movements. Eg, should Marches-Manchester trains be routed via the existing tunnel lines, with platforms on those, in order to reduce train crossing conflicts at the northern end of Crewe station?

- Simplification of the current Crewe junctions could be a key element in making the business case for additional HS stops at the existing station, and also assist Network Rail by minimising the complexity and costs of track, junction and signalling renewals for the existing network – a project which is required in any event during the 2020s.

Annex: HS2 Phase 2a Strategic Case Section 5

Modelling the benefits of Phase 2a, including potential better HS service at Crewe

5.1 As part of the Strategic Outline Business Case (SOBC), HS2 Limited have carried out an economic appraisal of Phase 2a. This sets out the expected costs, benefits and revenues for the scheme, both as an increment to Phase One, and as part of a full Phase Two. This chapter outlines the main findings of this work – a more detailed set of results and an explanation of the assumptions and modelling is included in the Economic Case.

Phase 2a offers value for money on its own and as part of the full "Y" network
5.2 The Economic Case shows that accelerating the delivery of Phase 2a has a positive financial impact, meaning that on a Net Present Value (NPV) basis costs are less than the income generated. As set out in the Economic Case, delivering Phase 2a in 2027 would generate additional revenues of £346 million compared to a relatively modest increase in cost due to acceleration (around £25 million NPV).

5.3 Viewed as a "stand-alone" scheme (incremental addition to Phase One assuming a purely hypothetical scenario where the rest of Phase Two is not built by 2033), Phase 2a demonstrates value for money and generates over £2 billion in benefits. The Phase 2a Economic Case "Reference Case" which follows the same methodology as the HS2 2013 Economic Case shows Phase 2a has a Benefit-Cost Ratio (BCR) of 1.6 (including Wider Economic Impacts). However, construction inflation since 2011 has been higher than background inflation and may continue. This was recognised in the Spending Review and slightly reduces the BCR to 1.3, as discussed in paragraph 5.14. The BCR will be updated to take account of this and other changes to methodology in the Outline Business Case for Phase 2a in 2017.

5.4 Our economic appraisal was based around the working assumption that Phase 2a will operate the same Train Service Specification (TSS) as Phase One, as previously set out in the 2013 HS2 consultation.

Phase 2a maintains high value for money for the full "Y" network
5.5 Since the last Economic Case we have undertaken a number of updates in the modelling, a combination of updates to our demand forecasts and updates reflecting the changes in the rail network. We have also updated the costs. The central case BCR for the full "Y" network has been recalculated as part of our consideration of Phase 2a. On a comparable basis to the 2013 Economic Case the BCR would have increased. However, construction inflation since 2011 has been higher than background inflation and may continue. This was recognised in the Spending Review and will have a slight negative impact on the BCR, bringing it back to a BCR of 2.2, compared to the 2013 BCR of 2.3. The BCR will be updated to take account of this and other changes in methodology in the Strategic Outline Business Case for the rest of Phase Two next year.

Phase 2a: how it meets our objectives

5.6 Phase 2a meets the strategic objectives we set for the scheme. The preferred option improves journey times and connectivity north of Birmingham. Accelerating the delivery of the section of Phase Two between Fradley and Crewe delivers journey time savings of 13 minutes in addition to journey time savings already delivered by Phase One.

5.7 Once Phase 2a opens, people will be able to travel to Crewe from London in 55 minutes. Liverpool, Preston and Warrington will all benefit from 13 minutes of journey time savings, while journeys from London to Manchester would also be faster than under Phase One.

5.8 By building this section of Phase Two earlier than planned, the preferred option delivers benefits to Northern cities sooner than previously envisaged for Phase Two. Although not one of our objectives, acceleration also delivers revenues earlier than envisaged for Phase Two.

Wider economic impacts

5.9 Delivering the HS2 route between the West Midlands and Crewe delivers wider economic impacts of £366 million while the full "Y" network generates wider economic impacts of £14.2 billion. Some of these wider economic impacts will come from businesses being more accessible to one another leading to greater interaction between them (agglomeration benefits) as well as offering improved accessibility to labour markets, and affecting the overall level of labour supply.

5.10 Improving connectivity through faster, more frequent and more reliable train services could help support knowledge intensive sectors, which particularly benefit from improved connectivity. And it would also enable businesses to reduce costs by moving people and goods more quickly, easily and reliably. These could all help to improve productivity and help stimulate the economy in the North West.

What could change the Benefit Cost Ratio for HS2: sensitivity tests

5.11 To better understand the robustness of the economic case, we have assessed it using a range of different scenarios, and found that the economic case remains strong. These scenarios included a range of different assumptions about economic growth, growth in demand for rail travel, and the valuation of time savings. A summary of their effect on the 2013 compatible BCR is outlined below, and more detail is provided in the Economic Case.

Long term demand

5.12 Our approach to forecasting demand remains as set out in the 2013 Economic Case. Our reference case assumes that demand is capped in 2037, preventing benefits and revenue from increasing as a result of additional passenger demand after this point. However, if the predicted level of demand was increased and capped in 2044 (11 years after the full Phase Two opening), the standalone BCR for Phase 2a rises by around 0.2, while the BCR for the full "Y" network rises by around 1.3 (both compared to the reference case).

Values of time

5.13 To ensure that the values we use continue to reflect the most up-to-date evidence, we have recently published the outputs from a major research project into how people value a range of benefits, such as quicker journey times, improved reliability and reduced crowding. While further work and consultation needs to be done before fully implementing the findings into our economic analysis, our initial estimates suggest that adopting the key recommendations of the study would increase the BCR of the full "Y" network rising by 0.1 (compared to the reference case).

Construction inflation

5.14 The reference case in the Economic Case assumes construction costs increase over time in line with general price inflation (i.e. the "GDP deflator"). This is in line with the work that was carried out in the 2013 Economic Case. However, we recognise that since 2011 construction inflation (and growth in other project-specific costs) has been higher than background inflation, and that this may continue over the next five years. As a result, we have included a sensitivity test in which construction cost inflation reflects more recent historic trends, and applied this to the years up to 2020/21. This is consistent with the approach which was taken in the 2015 Spending Review, and has the effect of decreasing the BCR for Phase 2a by 0.3 and the full "Y" BCR by 0.3.

Optimism bias

5.15 The reference case in the Economic Case assumes an optimism bias (OB) factor of 40 per cent. This approach is consistent with Green Book Supplementary Guidance on OB and reflects a detailed, bottom-up attribution of different assets to different risk categories.

5.16 Department of Transport's appraisal guidance (WebTAG) provides its own advice on OB for conventional rail schemes which requires an OB of between 66 per cent and 40 per cent to be applied to costs, depending on the project stage. The "greenfield" nature of a large share of HS2 Phase 2 construction makes it rather different from investments on the existing rail network. This, together with the fact that HS2 costs are estimated on a different basis from Network Rail projects, means that it is appropriate for HS2 to follow the Green Book Supplementary guidance. However, in order to assess the impact of a higher OB, we have also included a sensitivity which assumes that OB is 50 per cent. In this scenario, the full "Y" BCR would decrease by 0.1 and the Phase 2a incremental BCR would also decrease by 0.1 (compared to the reference case).

Other factors

5.17 In addition to these sensitivity tests, there are a number of reasons to believe that our assessment is conservative. For example, we do not assume any land use change resulting from the improvements in connectivity of Phase 2a or from the full "Y" network, which may make businesses alter their location decisions and could lead to further benefits from regeneration and people moving to more productive jobs. Potential opportunities also exist to improve the train service specification operating on the HS2 route to Crewe (set out below), and these could improve the BCR for the incremental Phase 2a case.

Optimising the Phase 2a train service pattern could deliver further benefits

5.18 When carrying out economic modelling, it is necessary to make a number of assumptions, particularly about the train service pattern that will run in the future. We believe that the assumptions used in our reference case have resulted in a conservative estimate of the benefits delivered by Phase 2a. As a result we have also modelled a number of alternative scenarios.

Reference case

5.19 Our reference case assumes the same service pattern and routing as Phase One runs for six years until the rest of Phase Two is operational. Then it assumes that the Phase Two TSS is operated – as set out in the 2013 SOBC. This reference case assumes that two out of three London to Manchester services are routed via Crewe (but do not stop at Crewe) and use the additional HS2 infrastructure delivered by Phase 2a. The third Manchester service is routed through Stoke-on-Trent (but does not call there) and so does not get any journey time reduction compared to Phase One.

Alternative scenarios

5.20 We have also looked at two alternatives to the reference case. In both scenarios, we have assumed that the rest of Phase Two is not built after 2033. These show that there is the potential for further benefits to be delivered from the Phase 2a scheme over the main ones presented in this Economic Case.

5.21 The first alternative looks at the benefits of routing all three London to Manchester services via Crewe, so that they all take advantage of the journey time improvements offered by Phase 2a. When this third service is re-routed via Crewe, a pathing "penalty" is included to take account of possible congestion on the line between Crewe and Manchester. As a result we assume that all three services save nine minutes of journey time to Manchester over Phase One (rather than the 13 minutes assumed in the reference case). This analysis also allowed for additional infrastructure costs of up to £200 million to facilitate this routing. This routing approach adds £148 million net transport benefits and £114 million revenue to the Phase 2a benefits. Running three services through Manchester *[think this means through* Crewe *(JR)]* could also help to relieve a possible platforming constraint at Euston that might arise if one service continues to run via Stoke-on-Trent (but does not stop).

5.22 The second alternative looks at the benefits of stopping more trains at Crewe station. In the reference case, two trains an hour are assumed to stop at Crewe, and then carry on to Liverpool, Wigan, Warrington and Preston. In consultation, some stakeholders have made the case for more services to call at Crewe to deliver even more benefits to the region. To investigate this, the economic appraisal includes a sensitivity test of stopping four trains per hour at Crewe rather than two trains per hour. Over the appraisal period, this alternative delivers net transport benefits of £278 million and a further £251 million in revenues. At this stage of analysis infrastructure costs to allow those stops has not been estimated, so a BCR has not been calculated.

Interactions with Euston Station

5.23 As discussed above, the differential in journey times between trains that travel via Crewe to Manchester and those that travel via Stoke-on-Trent may create a platforming issue at Euston. To mitigate any platforming issue and to maximise the journey time benefits of the route between Fradley and Crewe, HS2 Limited has considered two different ways of mitigating the risk to performance on the National Rail and HS2 networks. There are two families of solution: "with infrastructure" and "without infrastructure".

5.24 HS2 Limited has previously explored with DfT's Rail Executive and Network Rail how the performance risks could be mitigated through train service planning – the "without infrastructure" solution. There are a number of choices that could be made about services that serve Crewe and this will be the subject of detailed work to inform an Outline Business Case for Phase 2A. This work will be overseen by a Project Development Group that has already been created and contains representatives from HS2 Limited, DfT Rail Executive, DfT Passenger Services, DfT High Speed Rail Group and Network Rail.

5.25 HS2 Limited has also explored mitigating the pressure at Euston between 2027 and 2033 by routing all three Manchester services via Crewe. This was modelled as one of the alternatives in the Phase 2a Economic Case (see above). However running an additional service through Crewe for the intervening six years may create capacity constraints in the Crewe area, which may

require additional infrastructure to alleviate. HS2 Limited carried out some high level work with its consultants and Network Rail to identify whether there were small scale interventions that could be made to the Network Rail network to mitigate any such congestion impacts at Crewe. Following this work, HS2 Limited has identified an infrastructure pot of £200 million that it believes it is prudent to make provision for at this time until the more detailed work can be carried out. This £200 million includes £150 million for works in the Crewe area and a further £50 million for the route north of Crewe. Although the preference is to find a solution which does not require further infrastructure, at this time the company believes that it is prudent to include this £200 million in the Phase 2a estimate.

Interface and opportunities with development at Crewe Station

5.26 As noted above, Crewe is already a major hub connecting to destinations including Chester, North Wales, Stoke-on-Trent and Shrewsbury. The potential advantages of creating a new high speed hub at Crewe were recognised by David Higgins in his 2014 report, where he recommended that the line should be extended to a new transport hub at Crewe, and that this should be delivered by 2027.

5.27 The proposal put forward in this strategic case does not include an assessment of the benefits and costs of a new Crewe Hub. We are working with Network Rail, HS2 Limited and local stakeholders to consider the costs of different options at Crewe, which would give the flexibility to stop significantly more HS2 services. We are working towards a preferred approach in 2016, and any station development will need to be affordable and offer value for money. While no decisions on Crewe Hub have been taken we have designed Phase 2a in a way which seeks to be flexible with potential options for a Crewe Hub. Phase 2a will work with a Crewe Hub station at any of what look to be the front-runner sites, although the location of a Crewe Hub and the associated HS2 alignment in the Crewe area to serve this may require some refinements to be made to the technical design of the northern end of Phase 2a.

Interface and opportunities with Phase One

5.28 There are potential benefits and efficiency savings to be made from building straight on from Phase One, through integrating construction and procurement.

5.29 For example, we are pursuing the potential efficiency savings from integrated construction, and the forthcoming Pre-Qualification Questionnaires (PQQs) for Phase One Civils are designed to facilitate this. The Major Civils Works Contracts PQQ includes an option which would allow successful firms to bid for a further £1.8 billion – £3.3 billion (2015 prices) of work to build a section of Phase Two north of Birmingham. The provisions would support the delivery of Phase 2a by providing the option to award one or more further packages for civils works through a mini-competition among the successful bidders, providing they are performing well under their existing package contracts. HS2 Limited would not be obliged to exercise this option and could elect to procure works separately if that were judged to be more efficient.

Next steps

5.30 The analysis presented in this section will continue to be refined as the project moves through the business case development stage. We are aware of a number of areas where more work will be required, and our focus for the next stage of analytical work will be:

●● a fuller analysis of the impact of stopping more trains at Crewe including information on the costs and impacts

●● further refine our understanding of the impacts of running all three Manchester HS2 services via Crewe as part of Phase 2a, include the impact on congestion on the line between Crewe and Manchester
●● further optimising the service pattern for Crewe and the wider North West, including exploring how Stoke-on-Trent might be served (see section 6)
●● continuing to fully explore options for a Crewe Hub, and how best to maximise connectivity and regeneration potential at Crewe
●● continuing to look at how to maximise efficiencies with the rest of the "Y" network, and to learn the lessons from international best practice and apply them to Phase 2a.