1. Strategic Case

1.1 Business Strategies and Spending Objectives

The East Coast Main Line (ECML) is part of the strategic rail network and plays a key role in enabling economic, environmental and community benefits at national, regional and local level. It serves a diverse set of markets for rail services including inter-regional, commuter, long distance and freight and is one of the two mainline railways connecting England and Scotland. A third of the UK population live within 20 minutes of an ECML station.

The Government has committed to a continued programme of investment in rail to meet projected increases in demand from passengers and freight[1]. The Transport Investment Strategy (July 2017)[2] identified four key priorities:

1. Create a transport network that works for users, wherever they live;
2. Improve productivity and rebalance growth across the UK;
3. Enhance our global competitiveness by making Britain a more attractive place to invest; and,
4. Support the creation of new housing.

Furthermore, the recent strategic vision for rail[3] set out specific objectives for the industry, namely:

1. A more reliable railway;
2. An expanded network;
3. A better deal for passengers;
4. A modern workforce; and,
5. A productive and innovative sector.

The ECML Enhancements Programme is aligned with these priorities and objectives, enabling links between London and new or underserved markets to rebalance growth and creating opportunities for freight that enhance Britain's attractiveness as an investable market. Improved connectivity and reduced journey times will contribute to enhanced productivity.

The Government has also committed to meeting carbon emission, greenhouse gas and air quality targets.[4] The ECML Enhancements Programme will facilitate an uplift in electric or bi-mode rolling stock along the route, allowing greater usage of overhead power. Reduced journey times will also allow greater competition with the air market for domestic journeys, such as London to Scotland.

The ECML Enhancements Programme (as defined in the Management Case) is designed to contribute to these commitments and objectives, principally through the following outputs:

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[1] National Infrastructure Delivery Plan 2016 -2021, Infrastructure and Projects Authority (reporting to HM Treasury and Cabinet Office) March 2016

[2] Transport Investment Strategy, https://www.gov.uk/government/speeches/transport-investment-strategy, July 2017

[3] https://www.gov.uk/government/publications/a-strategic-vision-for-rail/connecting-people-a-strategic-vision-for-rail

[4] The Government's first four Carbon Budgets have been set covering the period out to 2027. The Government is also committed to implementing the EU's 2030 Green House Gas (GHG) target of at least a 40% reduction in domestic EU GHG emissions through EU Emission Trading System (EU ETS).

- Long Distance High Speed (LDHS) seating capacity into London increased by 38% from approximately today's 2900 to 3950 seats per hour at peak times;
- An increase in capacity from 6 to 8 LDHS services between London King's Cross and Doncaster and from 5 to 6 LDHS services between Doncaster and Newcastle per hour;
- Maintain freight capacity for current and Freight Market Study[5] forecast demand, using diversionary routes as far as practicable; and,
- A reduction in journey times for the fastest LDHS services in each hour to 4 hours between London and Edinburgh and 2 hours between London and Leeds.

This will deliver step changes in service that will:

- Create new journey opportunities to and from London for LDHS services, serving new destinations such as Harrogate and Skipton, as well as an uplift in services to existing destinations including Leeds, Newcastle and Edinburgh;
- Improve passenger experience and fleet reliability through the introduction of new rolling stock across a number of franchises (including IEP); and,
- Create freight opportunities through the removal of constraints at the south end of the GN/GE route, which was upgraded in CP4.

The Programme consists of a number of infrastructure interventions along the line of route, which fall into three specific categories:

- IEP enabling works: These schemes are mostly delivered and consist of the works required in order to physically operate the government-procured IEP rolling stock when it is introduced from 2018, replacing the ageing ICEC fleet. This includes gauge clearance to ensure that the trains are compatible with the existing infrastructure, platform lengthening and depot connections.
- Power supply upgrades: A power supply upgrade at the south end of the route is already delivered. An additional intervention will provide an increase in the capacity of the power supply north of Doncaster, enabling LDHS and local services to operate in electric on the East Coast.
- Capacity enabling works: This consists of a number of schemes focusing on resolving known bottlenecks at locations along the line of route, delivering an increase in track capacity for LDHS services. This includes the grade separation of Werrington Junction, enabling an uplift in passenger and freight services on the route.

1.2 Drivers for change

The drivers for change represent the problems, issues and opportunities in the existing arrangements that resulted in the creation of an integrated ECML Enhancements Programme. In doing so they provide the rationale for the proposals for change.

1.2.1 Mixed traffic on constrained infrastructure

An important consideration for the ECML is the mix of different types of traffic that operate along the route. LDHS services, travelling at up to 125mph, share infrastructure with local stopping services and heavy freight trains. The interaction of these services causes constraints, with fast trains catching up with slower services. On the existing infrastructure this limits timetable flexibility.

[5] Network Rail Freight Market Study, 2013

Currently, the capacity for LDHS services south of Northallerton on the ECML is limited to six passenger trains per hour. This is due to two principal causes. First, the mix with London commuter traffic serving areas as far away as Peterborough and Cambridge consumes much of the available track capacity, particularly at peak times where there is higher demand for commuter services. The phased introduction of the Thameslink timetable from May 2018 will see a further uplift in these services, with some being diverted from King's Cross Station into the Thameslink core and to locations south of London.

Secondly, the number of LDHS services has historically been constrained by infrastructure pinch points. Some of these constraints are proposed to be addressed by the ECML Enhancements Programme, such as grade separation of Werrington Junction, but other constraints cannot be resolved at this time due to prohibitive costs, such as the two-track section over Welwyn Viaduct.

Similar constraints exist north of Northallerton, where the current two-track railway potentially stymies the introduction of new services alongside the existing passenger and freight services. To date this section has been assumed to have capacity for five passenger and two freight trains per hour. However, in addition to seeking infrastructure-led solutions, analysis and operational planning can provide alternative solutions. Notably in this area, the existing assumptions around freight utilisation and growth have been reassessed, thus allowing for a revision to these assumptions that results in a better mix of traffic without the need for large scale infrastructure interventions.

1.2.2 Boost economic growth and opportunity

The Intercity East Coast franchise is overwhelmingly driven by the inter-city long distance market. The provision of additional paths would allow the franchised operator to provide direct London services to new locations, such as Harrogate, as well as moving to a more frequent all-day service for existing markets such as Lincoln and Bradford, directly contributing to the Government's aim of boosting opportunities for economic growth and balancing the economy. By increasing capacity, there is the potential to exploit new stopping patterns that better connect regional centres along the line of route, providing further opportunities for accessing employment and education as well as improving productivity.

The latest ORR statistics (Passenger Rail Usage 2017-18 Q3, March 2018) demonstrate the continued increase in demand for long distance passenger services on ECML, even whilst demand in other sectors may be softening. Passenger kilometres on VTEC totalled 1.4bn in the quarter, up from 1.3bn in the same period a year earlier.

Analysis from the Economic Case has demonstrated that faster journey times on the London to Scotland services – in part facilitated by increased track capacity – can be expected to grow passenger revenue by taking a share of the domestic air market. The ECML's current limited track capacity and sub-optimal journey times can mean that air travel is more appealing than rail. This limits the potential of the franchise to grow revenues in these markets and thus limits the franchise premium to the Department and the associated passenger benefits. Additional paths provided by the ECML Enhancements Programme allow an increase in service levels and provide better journey times for high-value markets such as between London and Edinburgh. They will also optimise the use of the new Intercity Express Programme (IEP) train fleet that will be introduced from December 2018.

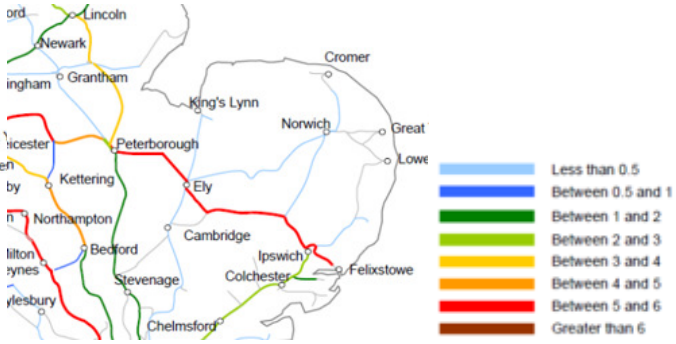
1.2.3 Opportunities for freight

Rail freight generates more than £1.6 billion a year in economic benefits for the United Kingdom including productivity gains for UK businesses, reduced road congestion and environmental benefits.[6] Freight growth across Great Britain is forecast to increase in terms of tonne kilometres by 2.9 per cent annually through to 2043; this compares to a growth of about 2.5 per cent per year since the mid-1990s. Currently, both Class 4 (up to 75mph) and Class 6 (up to 60mph) freight services operate along the ECML, utilising a range of locomotives and wagons. The slow speed of the heavier trains in particular is a constraint on capacity.

The ECML south of Peterborough, and the route between Peterborough and Doncaster via the GN/GE line, have the potential to accommodate an uplift in freight traffic. By 2043, traffic from the port at Felixstowe is expected to rise significantly, increasing utilisation of the GN/GE line to Lincoln and further north. Capacity released by the opening of HS2 Phase 2b in 2033 presents an opportunity for the ECML to accommodate further freight growth but future investment may be required to facilitate this. The maps below, which shows the ECML running through Stevenage, Peterborough and Grantham, summarise the 2013 Freight Market Study Central Case forecasts of daily freight demand over the next 30 years on the southern end of the route (in total freight train paths per hour):

2023/24 Forecast

2043/44 Forecast



The grade separation of Werrington Junction will allow the forecast near-term growth in freight traffic to access the GN/GE route to the north (via Lincoln) without conflicting with fast passenger services on the ECML, thus maximising the return on the Government's CP4 investment in upgrading the GN/GE route.

Between York and Newcastle, the ECML provides connections with the ports at Teesside, Sunderland, Tyneside and Blyth with a mix of heavier and lighter container freight traffic. The freight flows are greater between York and Northallerton where much of the freight connects from the east. Freight demand at the northern end of the ECML has been subject to fluctuation as a result of the decline of specific key markets, principally coal, over recent years but this is expected to be partially offset by an uplift in container traffic. The maps below summarise the 2013 Freight Market Study Central Case forecasts of daily freight demand over the next 30 years in the North-East of England (in total freight train paths per hour):

[6] Rail Freight Strategy, DfT, September 2016

2023/24 Forecast *2043/44 Forecast*

The conclusion of the analysis is that the current timetable provides broadly one freight path per hour between Northallerton and Newcastle and current evidence shows that no additional freight capacity will be required over that section of the ECML in the foreseeable future.

1.2.4 Environmental impact of operations

The Government has committed to meeting challenging targets for reducing carbon emissions and greenhouse gases and improving air quality. The Prime Minister confirmed on 20 September 2016 that the UK would implement measures to reduce UK emissions to enable ratification of the Paris Agreement. The aims of the Agreement (i.e. to limit the rise in global temperatures to well below 2°C, to pursue efforts to hold it to 1.5°C and to reach net zero carbon emissions in the second half of the century) are more ambitious than the basis of the UK's statutory target for 2050.[7] Accordingly, the UK will likely have to reduce emissions further than currently planned.

Although the ECML was electrified almost thirty years ago, franchised and open access operators continue to operate a significant number of diesel services on the route. These are required to serve those destinations off-route that are not currently wired (such as LDHS services north of Edinburgh or services that cross the Pennines) but this means that trains are emitting diesel fumes for a significant proportion of their journey whilst under the ECML wires. The railway industry can contribute towards achieving the environmental targets above through greater use of electric-powered rolling stock which is estimated to reduce carbon emissions by 20% to 30% per vehicle kilometre when compared to diesel rolling stock.[8] The Programme proposes to increase the traction power capacity on the ECML to enable bi-mode trains to operate in electric mode when under the wires.

1.2.5 Business needs

On the basis of these underpinning drivers for change, a number of strategic benefits are sought from the ECML Enhancements Programme. These are:

Removing infrastructure constraints

- Increased capacity at the south end of the route through remodelling of King's Cross Station and the removal of critical bottlenecks and conflicting moves, resulting in an increase of two LDHS trains per hour;

[7] https://www.gov.uk/government/speeches/theresa-mays-speech-to-the-un-general-assembly

[8] Study on further electrification of Britain's railway network, Railway Safety and Standards Board, 2007

- Making better use of capacity at the north end of route, better reflecting current freight utilisation and Freight Market Study forecast demand, allowing for an additional passenger path per hour north of York and to meet projected growth in peak demand at Newcastle; and
- Reduction in journey times between King's Cross and key cities on the route through the improved separation of fast and slow services and timetabling improvements made possible by new infrastructure and the improved performance characteristics of new rolling stock.

Boost economic growth and opportunity

- Improved access to employment and learning opportunities through the introduction of additional services;
- Improved connectivity through new and extended services;
- Increased front line railway employment opportunities as a result of an increase in services;
- Increased passenger revenue, through uplift in service provision and serving new markets, providing more competition with the domestic air market due to journey time improvements; and
- Improved journey experience for LDHS passengers through the introduction of new electric and bi-mode rolling stock that provides improved passenger comfort.

Opportunities for freight

- Improved connections to the GN/GE route, making use of this alternative route to Doncaster and the north more viable, and facilitating projected growth in these markets without conflicting with the ECML.

Environmental impact of operations

- Reduction in carbon and nitrous oxide omissions as a result of withdrawing diesel loco-hauled stock (HSTs) and DMUs from the route, allowing new electric and bi-mode services to utilise the overhead line electricity where it is available;
- Improved station environment for passengers through a reduction in diesel emissions at stations; and
- The replacement of the HST fleet introduces Controlled Emissions Toilets in place of discharge onto the track.

1.3 Potential scope

The options for delivery of the Programme are described in the following sections. The roles, resources and governance for the Programme are described in the Management Case.

1.3.1 Background to the ECML Programme

The genesis of the ECML Enhancements Programme was a set of disparate schemes set out at the time of the 2012 HLOS, intended to increase capacity, improve performance and reduce journey times whilst facilitating the introduction of new rolling stock. The Hendy Review in 2015 identified the funding pressures across the enhancements portfolio, leading to a re-phasing of the funding for the ECML enhancements across the remainder of CP5 and CP6. Following the Review, and the subsequent OBC that was approved by BICC in May 2015, these ECML schemes were

constituted as a single ECML Enhancements Programme. That Programme is the subject of this FBC, which identifies a number of options for delivery.

The totality of schemes within the Programme are at various stages of the project lifecycle, as shown in the table below:

Stage	Scheme	Status considerations
Feasibility	York North Throat	Paused pending FBC outcome
Commit to Develop	None	None
Commit to Design	Power Supply Upgrade 2 (Doncaster to Edinburgh) King's Cross Remodelling Freight Loops Werrington Junction Grade Separation Huntingdon-to-Woodwalton four-tracking Stevenage Turnback Automatic Power Change Over Balises	Re-phased to CP6 as part of the 2015 Hendy Review Renewals-led scheme – contribution for enhanced elements Paused pending FBC outcome Subject to ongoing TWAO submission None None None
Commit to Deliver	Peterborough Down Slow IEP Enabling works Automatic Selective Door Opening Balises	None Works will be delivered in time to facilitate IEP introduction in late 2018 None
Completed	Power Supply Upgrade 1 (London to Doncaster) Doncaster East Side Enhancements Some IEP Enabling works	Works will be delivered in time to facilitate IEP introduction in late 2018 None None

1.3.2 Potential scope - options appraisal

Overview of appraisal

This section sets out the various options for investment in the ECML Enhancements Programme, as tested in the Economic Case. It starts by setting out the Do Minimum option (Option 1), which takes account of works within the Programme that have already been, or are about to be, delivered or that are required to operate the new IEP rolling stock.

The Full Programme option (Option 2) is then described. This would deliver all of the proposed infrastructure schemes within the ECML Enhancements Programme. However, the latest forecasts have confirmed that the total cost would be in excess of the assumed CP6 budget for the Programme, with a remaining risk of further escalation. On that basis, this option is not recommended. It does, however, provide a helpful point of comparison with the "Full Programme" option that was recommended at OBC.

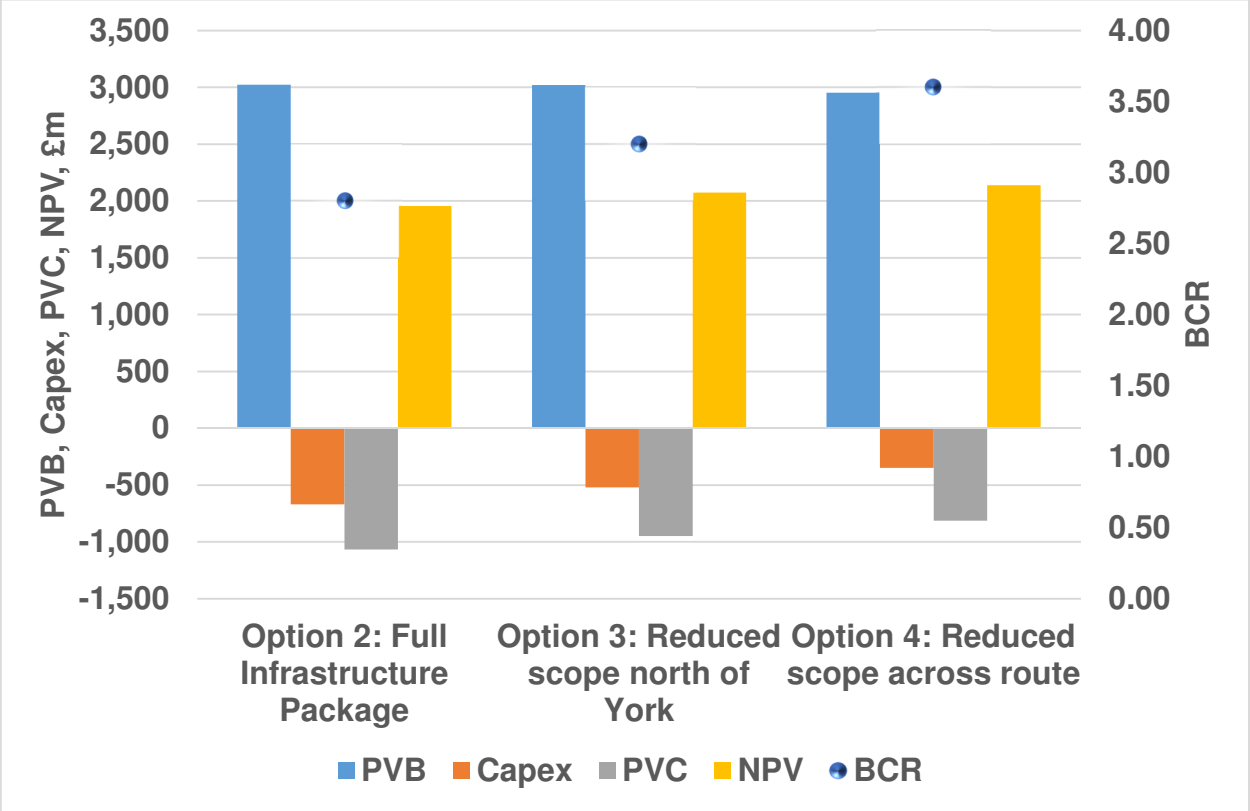
Taking these cost pressures into account, two descoped options for the ECML Enhancements Programme have been considered in this full business case (Options 3 and 4). These assess a reduced scope of infrastructure schemes and the benefits that they enable. The recommended option is Option 4, which reduces the scope of the full programme by removing the proposed freight loops, York North Throat and Huntingdon

to Woodwalton four-tracking schemes. The Programme outputs are still delivered in this option.

Although it is not the recommended option, a number of standard WebTAG sensitivities have been run on Option 3. This assumes that the four-tracking is in scope (for reasons outlined later in this Strategic Case). A sensitivity test has also examined the case for investment if we assume that the already-procured IEP fleet is not treated as a sunk cost. Due to the lack of certainty on potential capacity at Welwyn Viaduct, an additional test has been undertaken to understand the impact of removing two trains per hour in the evening peak in order to accommodate the uplift in LDHS services.

Finally, sensitivity tests have been undertaken to quantify the impact of the opening of HS2 Phase 2b on the case for investment. These sensitivities have been undertaken on Option 3 and are based on a set of assumptions around the optimum use of released capacity on the ECML following the opening of HS2 in 2033; a delay of three years to this date is also tested. This work deviates from the more simplistic approach taken at OBC to define a credible alternative use of capacity south of York, and has been undertaken through consultation with colleagues in HSR Group. This assumed specification has been endorsed by the One Railway Programme Board.

These options are outlined here with commentary however the headline analysis is shown below:



1.3.7.1 Train Service Specification 2021

The ORR has granted an uplift in access rights to franchised and non-franchised services from May 2021 on the assumption that the required infrastructure works will be delivered by this date. Those assumptions have informed our approach to this FBC, with

the “End State” defined as May 2021. As the timescales for the Werrington Grade Separation and Power Upgrade work, in particular, are developed further advice on options for timetable change in 2021 will be considered with Passenger Services but this is not expected to significantly affect the economic appraisal. This appraisal has been undertaken on the basis that services commence in May 2021. However, as this appraisal is over a 60 year period, it is unlikely that a short delay to infrastructure delivery would have a material impact on the BCR and so this scenario has not been subject to a specific sensitivity. It is possible that the HS2 tests would be more sensitive to any such delay, with a shortened appraisal period up to the point that HS2 Phase 2b opens in 2033.

As with the OBC in 2017, the timetable development undertaken for the FBC has demonstrated that the level of services contracted under a number of franchises, in addition to the Open Access services granted in May 2016, cannot be accommodated on the planned infrastructure based on the Network Rail evidence published to date.

This is specifically the case on the two-track section between Northallerton and Newcastle where there is a misalignment between the available track capacity and the level of services that have been contracted or have firm rights. Including FirstGroup’s Open Access services to Edinburgh, there is a commitment for up to eight passenger trains per hour (tph) on this section of the route by 2021. This is in addition to the existing average 1tph (freight) resulting in a total of 9tph. These commitments break down as follows:

- 3 x ICEC (Intercity East Coast franchise)
- 2 x CrossCountry
- 2 x TransPennine Express
- 1 x East Coast Trains (FirstGroup Open Access) (5 trains per day)
- 1 x freight

This exceeds the line capacity of 7tph today. For appraisal purposes it is assumed that the FirstGroup OA service can be timetabled five times per day. Therefore, one train per hour in the standard hourly pattern needs to be removed. As set out by RIB at the time of the OBC, this is a longer term economic and strategic decision for Passenger Services to take. However, as with the OBC, for the purposes of this economic appraisal it is assumed that only one TPE service runs north of York from May 2021. This is based on an assessment of which service provided the highest revenues, in addition to the fact that this service does not have firm rights from 2021. Passenger Services will determine which services to remove in due course. This decision will take account of wider strategic factors in addition to the economic evidence that has been presented, and further economic analysis has been requested by Passenger Services in order to inform this decision. Passenger Services have indicated that they are unable to take this decision prior to the completion of the ongoing CrossCountry franchise consultation in 2018.

At the time of the OBC, the section south of Peterborough, and in particular the two track section over Welwyn Viaduct, was also identified as a constrained section that had too many services committed from May 2021. The OBC therefore removed two Great Northern services per hour in the evening peak in order to accommodate the uplift in LDHS services. However, changes to Timetable Planning Rules to use two and a half minute planning headways over the Viaduct in certain cases during the evening peak mean that it may be possible for the full aspired quantum of 12 GTR and 8 LDHS

services to be accommodated. Therefore, this FBC models 20tph in the evening peak. However, recognising that this solution will be subject to more detailed investigation and industry consultation, as well as modelling to understand the performance implications, the FBC includes a sensitivity that removes two Great Northern services per hour in the evening peak in order to accommodate the LDHS uplift. Similar testing was undertaken at OBC stage.

The VTEC franchise includes a commitment to introduce a two-hourly service between London and Middlesbrough. This was an additional service proposed by VTEC at the time of their bid. Although the Programme will deliver sufficient Mainline capacity to implement the Middlesbrough service, from an operational perspective it can only be accommodated through the retention of six Intercity 225 electric sets in addition to the full IEP fleet. Given the forthcoming changes to the ICEC franchise, as well as the fact that the timescales for delivery of the infrastructure would leave them on-lease but unused for over a year, it has been assumed for the purposes of this appraisal that these sets will not be retained and that the Middlesbrough service is not introduced.

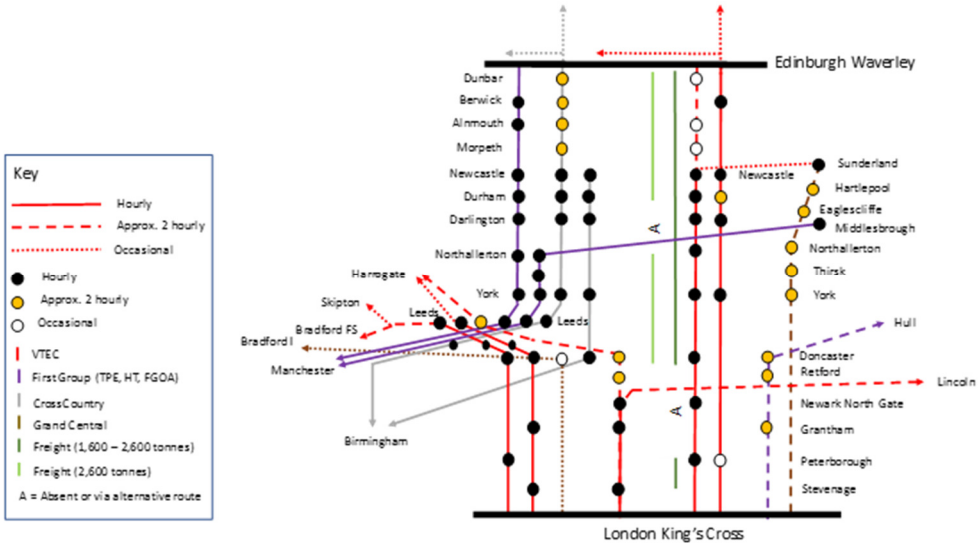
It will be for the next ICEC franchisee (the East Coast Partnership) to propose a way in which Middlesbrough services could be delivered. It is possible that, depending on the train formation chosen, the operation of services to Middlesbrough may require additional infrastructure at the station. The East Coast Partnership may provide the opportunity to deliver this.

1.3.7.2 Option 1: Do minimum

The Do Minimum option would mean not delivering any of the capacity enhancement schemes, except for those that have already been delivered at Doncaster station. It has been used to allow a comparative basis for the purposes of the business case.

As the IEP fleet has already been procured and the IEP enabling works largely delivered, Option 1 would seek to make the best use of this fleet to deliver some benefits to passengers. This would involve delivering extensions to existing services where possible (i.e. where no additional paths were required from London King's Cross), meaning some locations on the periphery of the ECML, such as Bradford and Lincoln, would receive an increase in direct services to London. The introduction of the IEP fleet could still deliver some journey time benefits, with journeys between London and Leeds and London and Edinburgh circa five and six minutes faster respectively.

The proposed train service specification for the Do Minimum is shown in the diagram below:



ECML Full Business Case "Do Minimum" Train Service Specification

However, in this option the full IEP fleet that has been procured for the ECML could not be utilised efficiently. By pairing 5-car sets to form 10-car sets, it is likely that almost all of the fleet could be employed but, without an increase in track capacity, the proposed uplift in services could not be implemented. This would result in excess capacity being provided on certain routes instead of optimising the use of individual 5-car sets to match the demand.

The Do Minimum scenario would still require some funding for the partial completion of the Power Supply Upgrade 2 works north of Doncaster, as Network Rail's modelling work suggests that this is needed for the TransPennine Route Upgrade and to provide resilience in the Doncaster area to meet today's timetable needs with electric traction. Half of the cost of PSU2 has therefore been including in the Do Minimum.

The proposed turnback facility at Stevenage has also been included in the Do Minimum. Due to capacity constraints arising from Thameslink services, a bus replacement service will be implemented between Stevenage and the Hertford Loop from December 2018. On completion, the turnback facility will allow the reinstatement of these services.

Although the IEP fleet would bring some ambience, journey time and capacity benefits to passengers, the Do Minimum offers very limited strategic fit with departmental objectives, and stakeholders' expectations for this route are that investment will be made to deliver a step change in the number of services that can be operated to new and existing markets.

The cost of Option 1 is between £210m - £310m (cash) in CP6.

This option is not recommended.

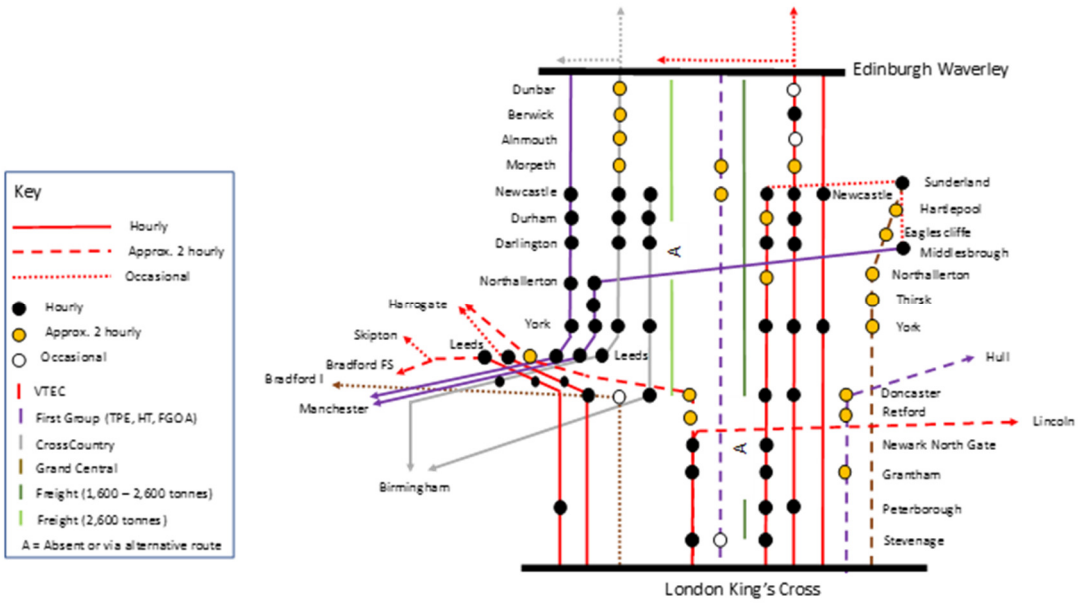
1.3.7.4 Option 2: Do Something (Deliver full infrastructure programme)

This option would deliver all of the schemes within the ECML Enhancements Programme to provide two additional LDHS paths between London and Doncaster as well as

infrastructure to provide an additional passenger path north of York alongside two freight paths.

This option would deliver all of the client outcomes described in this document but the total cost exceeds the CP6 funding assumption. Moreover, as demonstrated in Options 3 and 4 below, the full infrastructure package is not required to achieve the Programme outcomes.

The diagram below shows the service pattern that has been assumed to operate after delivery of the full scope and is the basis of the analysis for testing the investment case.



ECML Full Business Case Do-something Train Service Specification 2021

The cost of Option 2 is between £810m - £1,070m (cash) in CP6. This option has been assessed as **high value for money** with a BCR of 2.8 and an NPV of £1.96bn over the 60 year appraisal period.

However, the full scope is not affordable within the assumed CP6 budget for the Programme. On that basis, we are not recommending the delivery of the full programme.

The appraisal of the full infrastructure package allows a like-for-like comparison to be made with the recommended option in the OBC. Overall, the increase in capital cost (as a result of significant AFC increases on some schemes) and reduced forecast revenues have resulted in the BCR being revised downwards from 10.5 (Very High) at OBC to 2.8 (High) at FBC. This is despite savings in operating expenditure resulting from changes to timetable assumptions and not retaining six Intercity 225 trains beyond 2020. The modelling shows that forecast revenue has reduced by approximately 20% from the OBC to the FBC, which is in part driven by lower background growth and updates to WebTAG that present a different view of real growth. The profile of revenues between TOCs has also changed significantly, with Open Access services abstracting considerably more revenue from franchised services than indicated at OBC. This is attributable to changes in the modelling suite, which are now deemed to give a more realistic assessment than at OBC, as well as the fact that Open Access operators are expected to benefit from improvements in journey times.

As part of the economic appraisal, Mott MacDonald undertook a sensitivity test whereby Grand Central services were artificially slowed down in the timetable. This test served to isolate the impact of the journey time improvements and showed a revenue swing of approximately [redacted] (2010 prices) over the appraisal period back to franchised operators, demonstrating how these improvements have served to abstract significant revenues.

This option is not recommended.

1.3.7.3 Option 3: Do Something (Reduced scope north of York)

Current cost forecasts for schemes within the Programme exceed the assumed CP6 funding. This was an issue raised as part of the OBC but has been exacerbated by the escalating cost of the freight loops between Northallerton and Newcastle, as well as for the four-tracking and grade separation schemes at the southern end of the route. Two options have been tested to reduce the Programme's scope and address the affordability challenge. The first of these options, Option 3, descopes infrastructure north of York, removing the proposed Freight Loops and York North Throat enhancement from the Programme.

Changes in freight utilisation and future forecasts of freight demand have led to the conclusion that the previous assumption of a need for two freight paths per hour north of Northallerton was in excess of what is required, with a need identified for no more than one freight path per hour. This change in assumption was endorsed by all stakeholders at the ECML Programme Board in January 2018. On that basis, it is possible for a sixth passenger path to be accommodated in each hour without the need to build the freight loops, albeit with a five minute journey penalty in the northbound direction for the Intercity East Coast slow stopping service between King's Cross and Newcastle. This means that the loops can be removed from scope whilst still delivering the Programme outputs. Network Services is starting to work with industry stakeholders and HSR Group to look at more strategic solutions in this location that could extend beyond the capability of the freight loops if a step change in capacity was sought in the future.

The proposed scheme at York North Throat is also removed in this option. Network Rail's analysis of this scheme has shown it to deliver no discernible contribution to the proposed outputs of the ECML Enhancements Programme. The circa [redacted] enhancement was estimated to achieve a reduction in delay minutes valued at just £46k per year.

The cost of Option 3 is between £680m - £890m (cash) in CP6. The NR estimate (P80 cost) is within the funding assumption for CP6 (£785m cash); however, taking into account the Reference Class Forecast (optimism bias) analysis, there is a risk that cost increases in delivery would create an affordability challenge.

Removing the Freight Loops and York North Throat schemes from the scope, and therefore the capital costs associated with them, results in a NPV of £2.1bn and BCR of 3.2. This is an improvement on Option 2 because the modest impact on passenger benefits and revenues is outweighed by the reduction in capital costs.

The value for money of the incremental spending required to deliver the option 2 over option 3 provides a demonstration of the value of the infrastructure north of York. The freight loops and York North Throat schemes would cost an additional [redacted] for very

little service benefit as a result of the revised freight assumptions. This means that the incremental cost of Option 2 above Option 3 is very poor value for money, with a BCR of almost zero (0.1).

Although Option 3 represents better value for money than Option 2, further opportunities to refine the scope of the Programme have been tested as Option 4. For the reasons outlined above, Option 3 still presents a significant affordability challenge and risks exceeding the assumed funding envelope for CP6. For that reason Option 3 is not recommended.

Option 3 is not recommended.

1.3.7.6 Option 4: Do Something (Reduced scope across whole route)

Recognising the potential to reduce cost pressures still further, Option 4 tests a further descoping of the infrastructure proposed in Option 3 by also removing the proposed four-tracking scheme between Huntingdon and Woodwalton (HW4T) from the Programme.

At the core of the viability of this option is whether the Programme outputs are still deliverable without significantly compromising the proposed journey time improvements or importing unacceptable levels of performance risk onto the network. The journey time savings between London and Edinburgh and Leeds are the same as Option 2, at 16 and 13 minutes faster than the Do Minimum respectively.

As with the freight assumptions at the north of the route, the potential to explore this option has resulted from a reassessment of freight utilisation and forecast demand which has allowed us to revise the assumed freight requirements from two to one train per hour over the section in question. Removal of HW4T from the Programme's scope would incur total southbound journey time extensions of three minutes spread across the two GTR services in each hour of the day plus one minute spread across two LDHS services in the morning peak only.

Although the journey time penalties are seemingly small enough to justify the removal of the scheme for little disbenefit, the economic appraisal also took account of the potential performance gains to be had from delivering the scheme. As detailed simulation modelling would have been impractical in the time available, performance data has been analysed to consider the amount of primary and reactionary delay that could be avoided by the scheme. By examining the root causes of delay, performance experts used qualitative judgment to determine what percentage of total delay could be avoided. This analysis found that the scheme could potentially deliver a 3.5 second reduction in Average Minutes Lateness per train. In other words, if HW4T is not delivered, then on average every southbound train will incur a delay of 3.5 seconds.

The cost of this option is between £590m - £780m in CP6. Option 4 has a BCR of 3.6, indicating high value for money. This is due to the significant reduction in infrastructure costs as a result of not delivering the HW4T scheme, which offsets the loss of franchise premium, whilst retaining most of the user benefits. The resultant NPV is £2.14bn. A comparison with Option 3 shows that the HW4T scheme has an incremental BCR of just 0.5, indicating that the scheme in isolation represents poor value for money.

However, given that the performance analysis undertaken as part of this appraisal was necessarily at a high level, there is the possibility that the performance impact of not delivering HW4T has been understated. NR's System Operator believes that there is a strong case for the scheme and a number of TOCs consider the performance analysis to

be incomplete. Therefore, neither Network Rail nor the TOCs currently support the removal of the scheme from the Programme scope.

Due to the affordability challenges across the portfolio, Option 4, as endorsed by the Rail Investment Board, is recommended to be taken forward as the lowest cost Do Something scenario. This will allow delivery of the Programme outputs. Due to the criticality of proceeding with the delivery of key elements of the Programme, it is important that a timely investment decision is taken now. However, Network Rail is preparing a document setting out their appraisal of the Huntingdon-to-Woodwalton four-tracking benefits and, if a robust and credible case for the scheme can be demonstrated, then authority will be sought from BICC to add the HW4T scheme to the endorsed scope of the Programme (i.e. Option 3 would become the recommended option).

It should be noted that there is a third party proposal to build a new station on the ECML close to a significant housing development at the former Alconbury airbase. The proposed station is within the limits of the proposed HW4T scheme and would have platforms on the Up and Down slow lines, making it dependent on the delivery of this scheme (which would provide the Up slow). However, the planning application for Alconbury was not contingent on a station being provided and the existing Huntingdon station is less than six miles away.

The commercial and economic case for a new station at Alconbury has yet to be proven at SOBC stage and the current proposal for approximately 5,000 homes would be unlikely to make the station commercially viable. However, the developers expect this number to grow to somewhere in the region of 10,000 homes alongside significant employment and educational facilities. The developers are aware that the HW4T scheme is not committed to date and the decision to remove it from the Programme would provide sufficient clarity to allow alternative options to be considered. The Department will continue to work with Homes England and the developers in exploring these options in the event that this option is taken forward.

Option 4 is recommended.

Sensitivity tests

A number of additional WebTAG sensitivities, such as variable demand growth or demand cap, have been undertaken as part of this appraisal. Although Option 4 is recommended, these sensitivities have been applied to Option 3. This presents a worst case scenario – sensitivities for Option 4 would be expected to show a slight improvement in BCRs due to lower capital expenditure – and will serve to support the case for any subsequent reinstatement of the HW4T scheme back into the Programme for the reasons described above.

In all tests the case for investment remained sound, with BCRs ranging from 2.1 (Low Growth scenario) to 6 (High Growth scenario). The findings of these tests are reported in full in the Economic Case. The results of these tests are shown below:

	NPV (£m) PV	BCR
Option 3	**2072**	**3.2**
HS2	**408**	**1.5**
IEP costs not sunk	**1749**	**2.4**

	NPV (£m) PV	BCR
High growth	**3571**	**5**
Low Growth	**869**	**1.9**
2026 Cap	**1544**	**2.5**
2046 Cap	**2469**	**3.8**
High VoT	**2432**	**3.6**
Low VoT	**1683**	**2.8**

As with the OBC, a sensitivity was run that assumed that the IEP rolling stock procurement costs are incremental costs and therefore includes them in the appraisal. The incremental costs are for the fraction of the IEP fleet which is required to resource the additional services which is estimated to be six 9-car units. Inclusion of these additional costs reduces the BCR to around 2.7. Therefore, despite the increase in cost, the Value for Money would remain high.

In order to reflect the uncertainty over the number of trains that could be accommodated over Welwyn Viaduct, and the work that will need to continue on scoping this opportunity, a further sensitivity was run limiting the number of services over the viaduct in the afternoon peak to 18tph by removing two GTR services. The results show that the BCR for Option 3 reduces from 3.2 to 2.9.

The HS2 sensitivity tests are discussed in detail at Section 1.5 below.

1.3.7.8 Strategic Fit of Options

		Option 1 - Do minimum	Option 2 – Do something (Deliver the full ECML Enhancement Programme)	Option 3 – Reduced scope north of York (remove freight loops and York North Throat)	Option 4 – Reduced scope across route (Option 3 without HW4T)
Affordability	*AFC of programme scope within assumed funding envelope for CP6*			AFC is affordable but allows no headroom to accommodate Reference Class Forecasting (see Financial Case)	
Transport Investment Strategy priorities	*Create a transport network that works for users, wherever they live*				
	Improve productivity and rebalance growth across the UK				
	Enhance our global competitiveness by making Britain a more attractive place to invest				
	Support the creation of new housing				
ECML EP Objectives	*Increase capacity into and out of Kings Cross to 8 LDHS tph*				
	Achieve journey times for the fastest LDHS services in each hour of 4 hours from London to Edinburgh and 2 hours from London to Leeds				
	Improve passenger experience and fleet reliability through introduction of new rolling stock across a number of franchises				
	Create new journey opportunities to and from London, as well as between regional centres in the north of England and Scotland				
	Remove constraints at the south end of the GN/GE route				

Figure 1 Strategic fit of options (RAG ratings are a result of objective assessment as to strategic fit)

1.4 Benefits and risks

1.4.1 Benefits

The full list of benefits for the ECML Enhancements Programme can be found in the ECML Benefits Management Strategy and Benefits Register. The inter-dependencies between the benefits and benefit enablers have been captured in the ECML Benefits Map. The Benefits Map identifies the relationship between the infrastructure outputs, the benefits and the strategic objectives and is part of the Management Case.

1.4.2 Risks

The current high level risks to the Programme are:

- Infrastructure outputs cannot be delivered within available funds; and,
- Infrastructure cannot be delivered in time for the introduction of new services.

A more detailed analysis of the risks to the ECML Enhancements Programme is provided in the Management Case.

The Economic Case outlines a sensitivity test where demand is capped at ten years as opposed to the standard twenty years to understand the sensitivity of the economic case to reduced demand forecasts. Variations in growth have also been tested.

1.5 Strategic constraints and dependencies

Thameslink

The Thameslink Programme is nearing completion, with new services due to be introduced in May 2018, building incrementally up to 24 trains per hour through the core section of London from December 2019. This will result in a radically different structure for suburban services at the southern end of the ECML, including services through the Thameslink Core to destinations south of London. December 2019 will mark the culmination of a significant timetabling exercise. Inevitably the interaction of services means that there will be an impact on LDHS services on the ECML, particularly with the uplift in services proposed by the ECML Enhancements Programme.

Historically, Welwyn Viaduct represents a particular pinch point on the ECML. For the purposes of this appraisal we have assumed that 20tph can be accommodated through changes to Timetable Planning Rules. However, should this not be possible, then it is likely that two GTR services would need to be removed in the afternoon peak hours.

As the ECML timetable is developed for May 2021, detailed work will be required in order to address the choices between performance, frequency and capacity more widely when combining an uplift in LDHS services with the Thameslink services that are already present.

IEP

From 2018, the Intercity Express Programme will deliver a step change in passenger capacity (approx. 840 additional peak time seats into London) and the passenger experience on the ECML. The existing HST and IC225 stock in operation on LDHS services are between 25 and 40 years old and in need of replacement. IEP will deliver a fleet of modern electric and bi-mode trains, allowing the operator to raise service levels

and serve new destinations. The fleet has been procured by the DfT and the Programme is therefore centrally managed by the Major Projects Directorate within the Department. Works to enable the IEP fleet to operate on the ECML are being delivered as part of the CP5 enhancements programme, thus necessitating a close alignment between Network Services and Major Projects.

IEP has its own standalone business case and therefore sits outside of the scope of the ECML Enhancements Programme business case. However, the latter will be delivered in such a way as to maximise the potential and opportunities of the new fleet.

High Speed Two (HS2)

The High Speed 2 Phase 2b route assumes a junction on to the East Coast south of York at Church Fenton with up to three HS services per hour to Newcastle planned to use the East Coast from this junction from 2033. HS2 will provide a direct connection between London Euston and Leeds and HS2 Edinburgh services will be routed via the West Coast Main Line.

The expectation is that from 2033, the London to Leeds market will primarily be served by HS2 services. These services are expected to reduce journey times between the two cities to 79 minutes and increase seating capacity by 60 per cent. The HS2 network would also halve journey times between Birmingham and Leeds.

It is also assumed that from 2033, the London to Newcastle market will be served predominantly by HS2 services operating on the classic ECML north of York. However, without additional infrastructure, the section of the ECML between Northallerton and Newcastle will be limited to a maximum of six passenger paths per hour alongside a single freight path.

As the IEP fleet is subject to a 27.5 year lease, with leasing costs committed regardless of usage, the HS2 sensitivity included an evaluation of the anticipated fleet utilisation in a post-HS2 scenario. This analysis shows that approximately one third of the IEP fleet could not be used on the route once HS2 Phase 2b opens. However, assuming all 5-car sets were paired to create 10-car sets, then the eight LDHS paths between London King's Cross and Doncaster provided by the infrastructure works would enable the full IEP fleet to be operated.

HS2 Sensitivity

In order to understand the impact of HS2 on the case for investment in the ECML Enhancements Programme, DfT's Network Services and High Speed Rail Group have collaborated to define an indicative train service specification for 2033, when Phase 2b will be introduced. This specification makes an assumption as to how the released capacity on the existing ECML could be used and therefore provides an alternative service specification for use as part of an HS2 sensitivity. This specification can be found in Annex C.

The specification will now form the basis of the "Do Minimum" service specification for the HS2 Phase 2b Business Case. These assumptions are notwithstanding any potential additional capacity released as a result of (currently unfunded) infrastructure works in CP6 and CP7 as per the East Coast Route Study and long term planning process.

The approach taken to appraising HS2, whereby delivery of Phase 2b is taken as a sensitivity as opposed to forming part of the central case, is consistent with the approach taken across the Department and is in line with WebTAG guidance. This approach – for

all Business Cases rather than the ECML in isolation – has been agreed at an Analytical level within the Department and endorsement will be sought from the One Railway Programme Board in June 2018.

The HS2 sensitivity test on Option 3 reduces the BCR for the ECML Enhancements Programme to 1.5, representing medium value for money. The reduction in BCR is due to the abstractive effect of HS2 serving key markets on the current ECML route, principally Leeds, Edinburgh and Newcastle. This has a significant impact on both user benefits (primarily time savings) and franchised revenues. The modelling assumes that HS2 and non-HS2 fares would be identical but if HS2 prices were higher, it would be expected to reduce abstraction from the conventional network and improve the BCR of the Programme.

A second sensitivity test has modelled a three year delay to the completion of Phase 2b. This would increase the ECML Enhancements Programme BCR to 1.7.

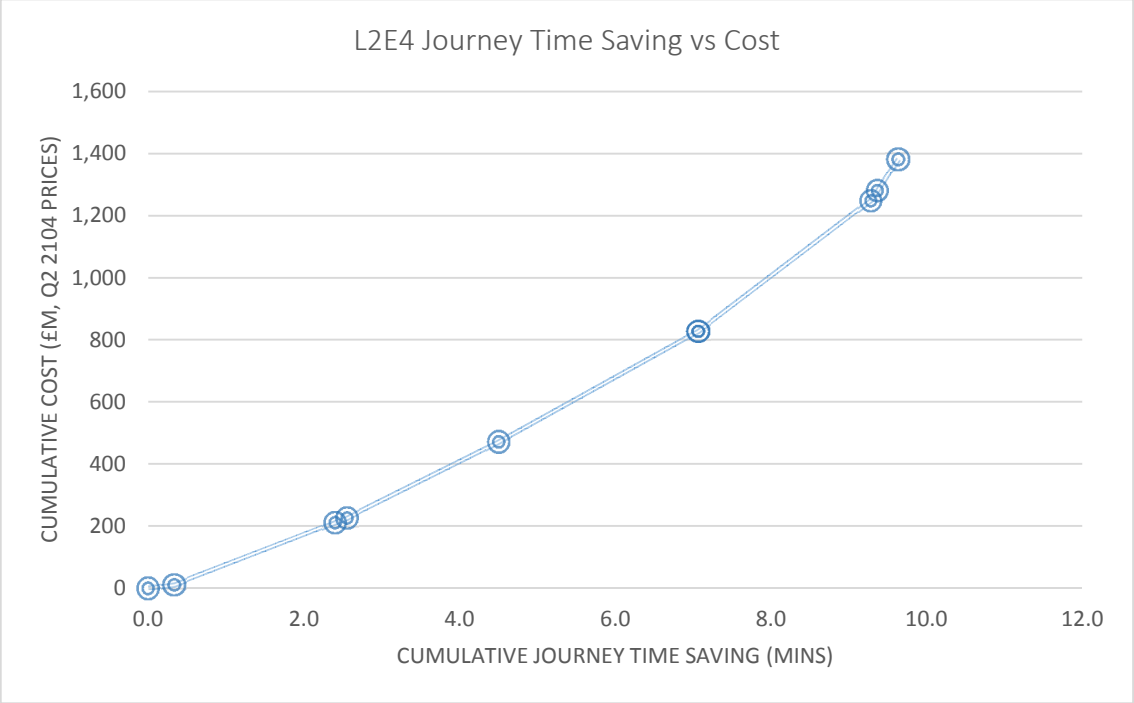
Infrastructure costs for PSU2 were reduced in the sensitivity test by approximately [redacted] to reflect the fact that HS2 will share the benefits from the power upgrades in the north when Phase 2b opens. It should be noted that the revenue impacts in this sensitivity test are partly due to Open Access assumptions but it is difficult to model or predict what the Open Access reaction to HS2 would be in reality.

Without the additional track capacity provided by the ECML Enhancements Programme, approximately one third of the IEP fleet could not be used on the route once HS2 Phase 2b opens. However, assuming all 5-car sets were paired to create 10-car sets, then the eight LDHS paths between London King's Cross and Doncaster provided by the infrastructure works would enable the full IEP fleet to be operated.

Strategic Alternatives to HS2 Phase 2b

There are no strategic rail alternatives to HS2 Phase 2b that could deliver comparable journey time benefits between London and Leeds. However, preliminary analysis suggests that timetabling constraints imposed by the HS2 network could lead to Newcastle services incurring significant pathing time north of Northallerton. If confirmed, this would erode the anticipated journey time benefits of the HS2 services and could lead to a decision to continue to serve the London to Newcastle market via the ECML.

In that event, consideration could be given to reducing journey times on the ECML. A study, known as 'L2E4', was completed by Arup in 2014. This assessed the interventions required to enable the line speed on sections of the route to be increased from 125mph to 140mph, the maximum design speed of the IEP trains. The scope of the enhancements would be significant, and highly disruptive, but could reduce the journey time between London and Newcastle by an estimated ten minutes. The graph below shows the estimated cumulative cost of the identified interventions against the journey time saved:



The upgrades proposed for delivery through the ECML Enhancements Programme are primarily intended to increase capacity. The headline journey time improvements will be achieved by the improved acceleration performance of the IEP trains and by using the additional track capacity to introduce fast non-stopping services. If taken forward, the L2E4 interventions would build upon the ECML Enhancements Programme to improve line speeds, complementing the investment in additional capacity.

TransPennine Route Upgrade

The TransPennine Route Upgrade is a proposed CP6 programme of improvements to services across the north of England. Upgrades to the existing route between Manchester and York, via Leeds, will deliver faster, more capacious and more frequent services, as well as improving connections between key towns and cities.

The ECML Enhancements Programme has a critical interface with the TransPennine Route Upgrade, particularly in respect of power upgrades between Doncaster and York, where the programmes are jointly funding elements of PSU2.

Northern Powerhouse Rail

Northern Powerhouse Rail (NPR) is the Government's and Transport for the North's joint ambition to dramatically improve journey times and frequencies between the major cities of the North of England; identified as Hull, Leeds, Liverpool, Manchester, Newcastle and Sheffield as well as Manchester Airport. This ambition looks beyond the necessary investment in the existing network to deliver a potential step-change in rail connectivity. As stated in Transport for the North's Strategic Transport Plan (January 2018), NPR will deliver an economic transformation in the north by bringing major population centres closer together.

Focusing specifically on the ECML, proposals being developed between Leeds and Newcastle include major upgrades of the route, using the HS2 junction at Church Fenton to access the mainline south of York. Work to date has focused primarily on meeting or significantly moving towards the specified journey time and frequency Conditional

Outputs. The immediate task is to further develop detailed options to support the inclusion of other significant economic centres, such as York, Darlington and Durham within network proposals.

Due to the early levels of maturity for these proposals, the exact requirements of NPR have not been incorporated within this FBC. However, it is assumed that NPR will be complementary – and incremental to – the proposed infrastructure investment in the ECML. The Strategic Outline Business Case (SOBC) for NPR is expected to be submitted in December 2018.

Digital Railway

Digital Railway is composed of two separate elements in relation to ECML.

In the short term, £5m has been allocated from the National Productivity Improvement Fund to develop proposals for a limited Digital Railway intervention to provide an increase in line capacity on the Moorgate branch.

In the longer term, proposals for the rollout of specific ECML Digital Railway schemes will continue to be developed whilst the Enhancements Programme is being delivered. Train control assets at the south end of the ECML are nearing the end of their working life. As well as considering a conventional renewal of these assets, Network Rail are developing a separate SOBC for renewing them with a digital signalling solution. This work is still in the early development phase and an SOBC will be presented to BICC in mid 2018, seeking funding to engage the supply chain and identify potential long term partners for the delivery of this work.

As with HS2, the interdependency between Digital Railway and the Enhancements Programme has been recognised such that – notwithstanding more localised schemes that may be delivered in the short term - the “Do Something” for the East Coast Enhancements Programme FBC will form the “Do Minimum” for the Digital Railway Business Case.

1.6 Key Stakeholders’ Requirements

Public and current and future passengers

Plans for the ECML infrastructure enhancements have been well publicised in recent years and have done much to inform expectations for improvements on the ECML. In addition, the IEP Programme, reinforced by the letting of franchises and the release of details about proposed service changes, has created a certain level of expectation about the step-change expected on the ECML in the coming years.

The ECML Route Study was published in draft for consultation in December 2017. This was produced by NR’s System Operator Strategy & Planning [LNE & EM] team and takes a long term view to 2043 and presents a series of options for potential future enhancements in order to meet specific pinch-points or overcome known constraints. It also sets out potential work packages to support transformational growth.

Train operators

The DfT has entered into franchise agreements with a number of TOCs over the course of CP5, including VTEC, TPE, Northern and GTR. Within each agreement there are a number of expectations, aspirations and commitments regarding upgrades to the ECML, the extent of which vary according to TOCs. In some cases, the assumptions that have been made have resulted in the ordering of new train fleets. These TOCs are seeking

clarity about what the ECML Enhancements Programme will provide, and when, in order to fully develop their operational plans for delivering benefits to passengers.

In the case of the ICEC franchise, the East Coast Partnership is intended to be in operation from 2020 as a successor to VTEC; therefore, clarity on the outputs of the ECML Enhancements Programme will be crucial in specifying and tendering this competition.

Politicians

As one of the marquee Main Line railways in the UK, the ECML is often the subject of political focus and discussion. This has been proven in recent years through PQs in both the House of Lords and House of Commons, as well as specific meetings between Ministers and key stakeholders in relation to the route. It is therefore important that this FBC provides clarity with respect to the delivery of the ECML Enhancements Programme.

The route geography, extending into Scotland, also requires that consideration is given to the interface with Transport Scotland and as such they have been engaged within the Programme's governance.

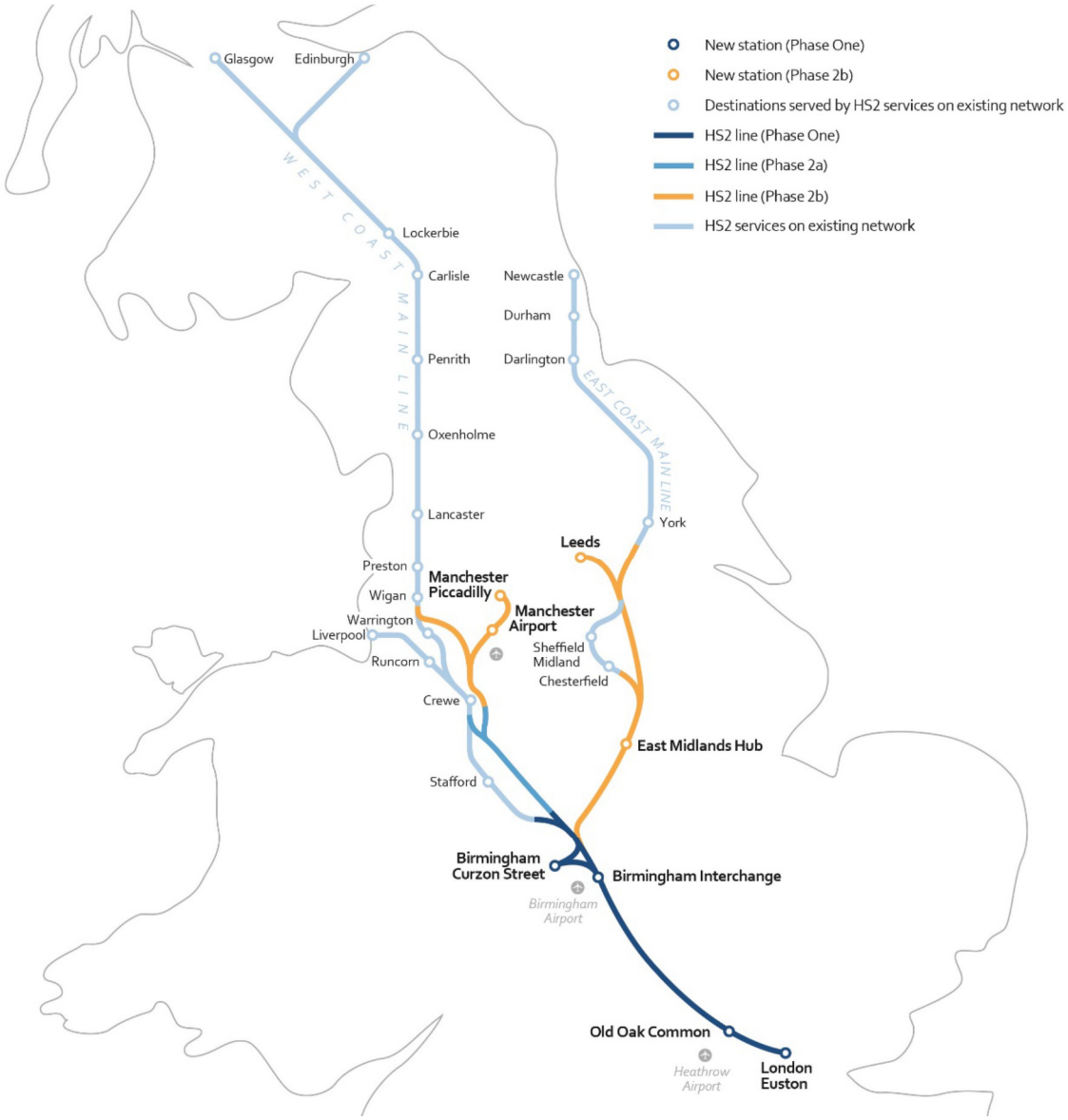
Residents living near the line

In terms of the infrastructure proposals, opportunities for formal consultation have to date been given on a scheme-by-scheme basis, as and when required. The Werrington Grade Separation and Huntingdon to Woodwalton schemes are subject to Transport and Works Act Order applications and, as such, have required a degree of formal consultation at an early stage of their development.

Annex A


EAST COAST MAIN LINE ENHANCEMENTS PROGRAMME
INVERNESS
ABERDEEN
EDINBURGH WAVERLEY
NEWCASTLE
NORTHALLERTON
YORK
DONCASTER
WERRINGTON
PETERBOROUGH
LONDON KING'S CROSS
Power Supply Upgrade Phase 2 (Doncaster - Edinburgh Waverley)
Northallerton – Newcastle Freight Loops
York Area Capacity
Doncaster Station Area Enhancements
Werrington Grade Separation
Peterborough Down Slow Line Speed Upgrade
Huntingdon – Woodwalton Four Tracking
Power Supply Upgrade Phase 1 (Wood Green – Bawtry)
Stevenage Turn-back
King's Cross Remodelling
KEY
Enhancements & Renewals
Stations
High-speed services from London King's Cross
Main Roads
Northallerton – Newcastle Freight Loops

Annex B


New station (Phase One)
New station (Phase 2b)
Destinations served by HS2 services on existing network
HS2 line (Phase One)
HS2 line (Phase 2a)
HS2 line (Phase 2b)
HS2 services on existing network
Glasgow
Edinburgh
WEST COAST MAIN LINE
Lockerbie
Carlisle
Penrith
Oxenholme
Lancaster
Preston
Wigan
Warrington
Liverpool
Runcorn
Crewe
Stafford
Newcastle
Durham
Darlington
EAST COAST MAIN LINE
York
Leeds
Manchester Piccadilly
Manchester Airport
Sheffield Midland
Chesterfield
East Midlands Hub
Birmingham Curzon Street
Birmingham Interchange
Birmingham Airport
Old Oak Common
Heathrow Airport
London Euston

Annex C: HS2 Released Capacity Specification

The following specification was used for the purposes of appraising the HS2 sensitivity:

Path	TOC	Calling pattern	Rationale
1	ICEC	Peterborough, Doncaster, Wakefield, Leeds (Skipton/Harrogate)	Protects intermediate station connectivity to/from King's Cross and Leeds
2	ICEC	Peterborough, Doncaster, York, Darlington, Durham, Newcastle, Alnmouth, Berwick, Edinburgh	Protects intermediate station connectivity to/from King's Cross and north of York
3	ICEC	Stevenage, Grantham, Newark, Lincoln	Protects intermediate station connectivity to/from King's Cross. Improved connectivity to/from Lincoln, building on 2021 timetable
4	ICEC	Peterborough, Grantham, Newark, Doncaster, York, Northallerton, Middlesbrough	Protects intermediate station connectivity to/from King's Cross. Improved connectivity to/from Middlesbrough
5	ICEC	Stevenage, Grantham, Newark, Retford, Doncaster, Hull	Protects intermediate station connectivity to/from King's Cross. Improved connectivity to/from Hull
6	Open Access	Open Access	Broadly as now
7	ICEC	Peterborough, Doncaster, York	Additional fast Peterborough (commuter) service and fast Doncaster/York service. Doncaster may not be an attractive journey via HS2.
8	ICEC	Peterborough, Grantham, Nottingham	Additional fast Peterborough, Grantham and potentially Stamford, commuter service. Additional London - Nottingham capacity to complement HS2.