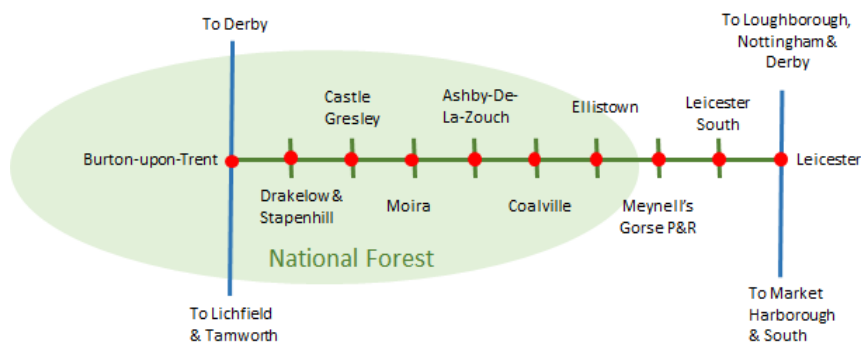
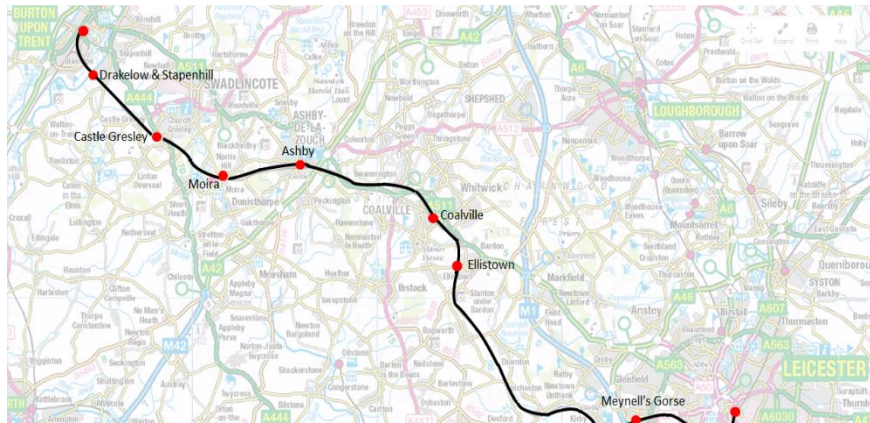


The Ivanhoe Line

Strategic Outline Business Case (SOBC)

May 2021



Submission by
The Campaign To Re-Open The Ivanhoe Line (CRIL)

RYRB5

Amendments

Version	Date	Who by	Detail
Draft a	8th January 2021	Douglas McLay Bruce Wakley	Initial issue for comment
Draft b	18th March 2021	Douglas McLay Bruce Wakley	Interim update for Rob Russell (Network Rail)
Draft c	7th April 2021	Douglas McLay Bruce Wakley	pre-Mark Beckett review version
Draft d	9th May 2021		Various revisions, especially to Commercial and Management Cases
Draft e	10th May 2021	Douglas McLay Bruce Wakley	Further edits, LVC and Derby Uni feedback added
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1r1	21 February 2022	Bruce Wakley	First redacted version
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1r3	9 th March 2022	Bruce Wakley	Third redacted version

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The SOBC has been produced with commercially sensitive data obtained under Non-Disclosure Agreements (NDAs) so cannot be widely published. This is a redacted version of the SOBC with the sensitive data removed, for general publication.

EXECUTIVE SUMMARY

Overview

The corridor that runs from Burton-on-Trent to Leicester through Staffordshire, Derbyshire and Leicestershire, suffers from high levels of deprivation exacerbated by the lack of good public transport links running from south east to north west. However, one positive feature of the area is that there is a fully operational freight railway running its full length - the Ivanhoe Line.

The proposal is that the Ivanhoe Line would be re-opened to passenger traffic to connect the substantial towns of Swadlincote, Ashby-de-la-Zouch and Coalville to Leicester and Burton, and then onwards to the national railway network. Although there are practical and financial issues to be overcome, in comparison with other schemes nationally, this is one of the easiest to implement due to the limited amount of infrastructure work required. The scheme also has widespread local political and community support.

The need for improved transport links

The area covered by the line is a prime candidate for investment to support levelling up for the following reasons:

- It includes Swadlincote and Coalville, both included in the list of the fifteen largest towns in the UK which do not enjoy a passenger train service.
- South Derbyshire and North West Leicestershire are both in the bottom 10% of the most deprived areas in the UK.
- Access to education and non-primary healthcare is constrained by poor public transport links.
- Many residents in the area need to travel to find and retain work. The heavily congested roads and very limited public transport makes such travel difficult.
- The significant levels of both industrial and residential development in the area have put additional pressure on the already overcrowded road network and a further 18,000 new houses are planned for the area without associated improvements in transport infrastructure

The Proposal

The proposal is to reinstate passenger services on the entire line from Burton to the Leicester mainline station, with six intermediate stations. The exact number and locations of the intermediate stations will be driven by the outcome of the next, more detailed, stage of development work. The practicalities of reopening of the Ivanhoe Line to passengers may dictate a phased introduction of services.

The connection to Leicester is dependent on the first phase of the already planned remodelling of Leicester station track work. This first phase is envisaged in Network Rail's Leicester Area Strategy Advice, which is currently subject to SOBC development. The reinstatement of the North Curve at Knighton could be delivered alongside a wider Leicester Area infrastructure project. The exact locations of some of the remaining stations will be subject to further work.

Taking this into account three options are proposed in this SOBC:

- **Option 1.**
A simplified, initial service between Burton and Leicester South with stations at Gresley, Ashby and Coalville (four new stations). This would enable connections to the national rail network at Burton. This option provides maximum connectivity for lowest cost and is expected to be the preferred initial option.
- **Option 2.**
An initial service between Burton and Leicester South with six new stations - adding Drakelow and Meynells Gorse to Option 1.
- **Option 3.**
The total scheme from Burton to Leicester station, giving mainline connections at both ends.

If options 1 or 2 are selected the additional capability could be added after the mainline at Leicester has been remodelled. The potential for a phased re-opening would allow an early delivery of benefits:

- Passenger services be running on the line by 2024.
- Trains running to Leicester South by 2024.
- Trains into Leicester on the mainline by 2030¹.

Recent development of Project Speed by Network Rail which enables rapid implementation of suitable rail network enhancements opens up the possibility of a Fast Track implementation of Option 1 of the Ivanhoe Line. For this to happen it would need to be the outcome of the SOBC evaluation.

Strategic Fit

The Ivanhoe Line project forms a logical part of the wider rail network development to enhance connectivity in the East Midlands, including:

- Midlands Connect's Rail Hub project intends to deliver additional services through Burton and Leicester.
- The development of Leicester Station as high quality gateway to the City and local jobs market, as promoted by Leicester City Council.
- The HS2 Eastern Leg and the development around East Midlands Hub at Toton.

The Ivanhoe Line proposal enhances connectivity east to west across the area bounded by these developments, enabling their benefits to be maximised and spread more widely.

Funding

Estimates of capital costs range from £■■■■m to £■■■■m depending on option. A primary source of capital funding for this work will be from the government's Restoring Your Railways Fund. However,

¹Dependent on the timing of Network Rail's Leicester Area project.

for the scheme to be approved, other sources of capital funding may be required to build stations and any associated access and car parking.

Our projections suggest that the final scheme should be able to meet operating costs from revenues. However, there may be some short-term operating cost subsidies required during the interim phases, when revenue will be limited with fewer stations being operational and through-services at Leicester not possible.

An innovative external blended funding plan is envisaged, similar to that successfully used on the recently announced Northumberland Line reopening. This will harness third party funding using Land Value Capture from landowners who will benefit from the restored passenger services increasing the value of new developments along the line.

Benefits

Once passenger services are operational, good quality public transport will once again be available to residents and businesses in the Burton-Leicester corridor with the following benefits:

- Significant reduction in journey times compared with cars and buses.
- For residents, especially those without cars, much better access to:
 - Acute, mental health, maternity and other specialised healthcare facilities.
 - Education opportunities such as Higher Education, apprenticeships, wider range of further education.
 - Wider range of better paid jobs.
 - Boost visitor numbers at tourist attractions (Conkers, Discovery Centre, Hicks lodge, Moira Furnace etc.)
- Despite significant economic growth in the area, road traffic levels will reduce, enabling:
 - Reduction in transport-related emissions and noise pollution.
 - Reduction in investment on road improvement schemes, enabling greater investment in sustainable transport measures (zero emission buses, cycling and walking routes and new rail stations).

Purpose of the SOBC

This Strategic Outline Business Case (SOBC) defines the transport problems in the Burton to Leicester corridor. The potential interventions are examined and the most appropriate intervention to resolve these problems is identified.

The aim of the SOBC is to gain permission and funding to proceed to the Development (OBC) stage or to embark on a Fast Track process. To examine the intervention in greater detail. The approach taken in this SOBC is proportionality; in practice this means that the transport problem is described in some detail and the best intervention identified. However, a detailed analysis has not been commissioned at this stage. Figures based on CRIL's own work using publicly available information is used to demonstrate the viability of the proposed intervention.

There are many variations of service patterns, stations, and types of stock which could be used in considering the proposed intervention. To retain proportionality these have not been examined in detail within the SOBC but will be carried out as part of the next stage

2. STRATEGIC CASE

The Transport Problem

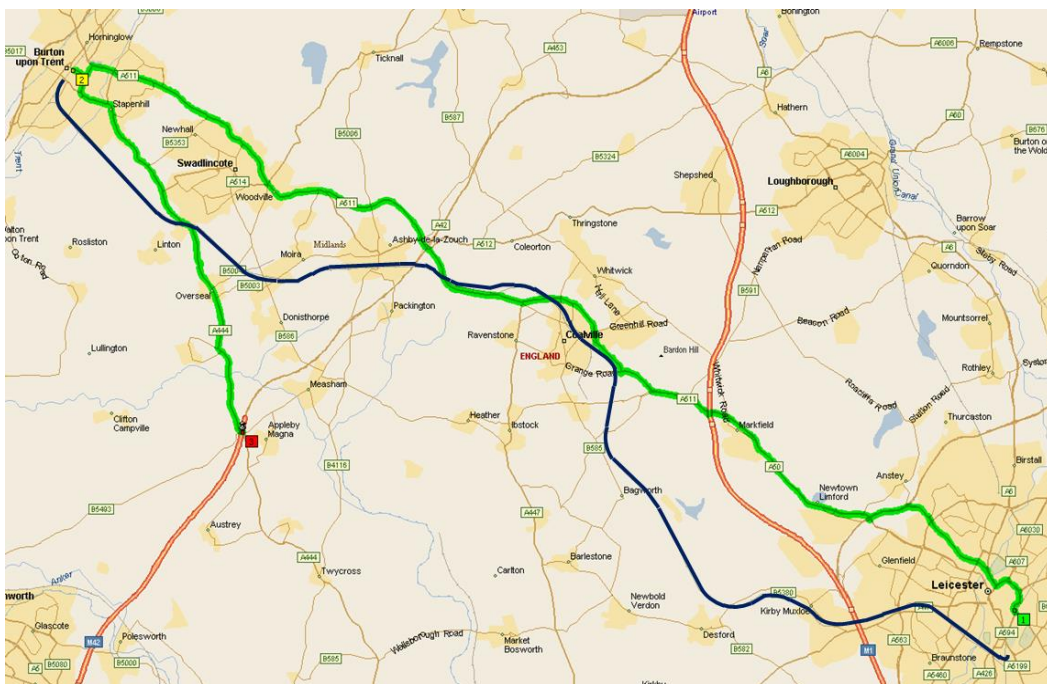
Introduction

The Ivanhoe Line corridor has a population of circa 275,000 people, not including the stations at Burton and Leicester and their populations within a 5km radius. It has developed significantly in the last thirty years, with large increases in both industrial/commercial developments and residential housing. Without a passenger railway the area relies on the largely under-developed road network for all its transport needs.

Communities and businesses along the Burton-Leicester corridor are served by the A511 primary road, as shown on Map 1 below. At the north end of the corridor the A444 primary road runs parallel to the railway line from Burton as far as Castle Gresley, which serves as a commuter feeder route from this area into Burton.

The East Midlands strategic road network focuses primarily on north-south journeys. East-west journeys along the corridor rely on primary roads which have seen little development, or a lengthy alternative route via the A50 and the M1. Whilst the A50 from the m1 J24 to Stoke has been heavily upgraded in the last 20-30 years, it has done little to relieve congestion on the A511 and A444.

The area faces economic, social and environmental challenges that are difficult to resolve without significant improvements to mobility and associated transport infrastructure.

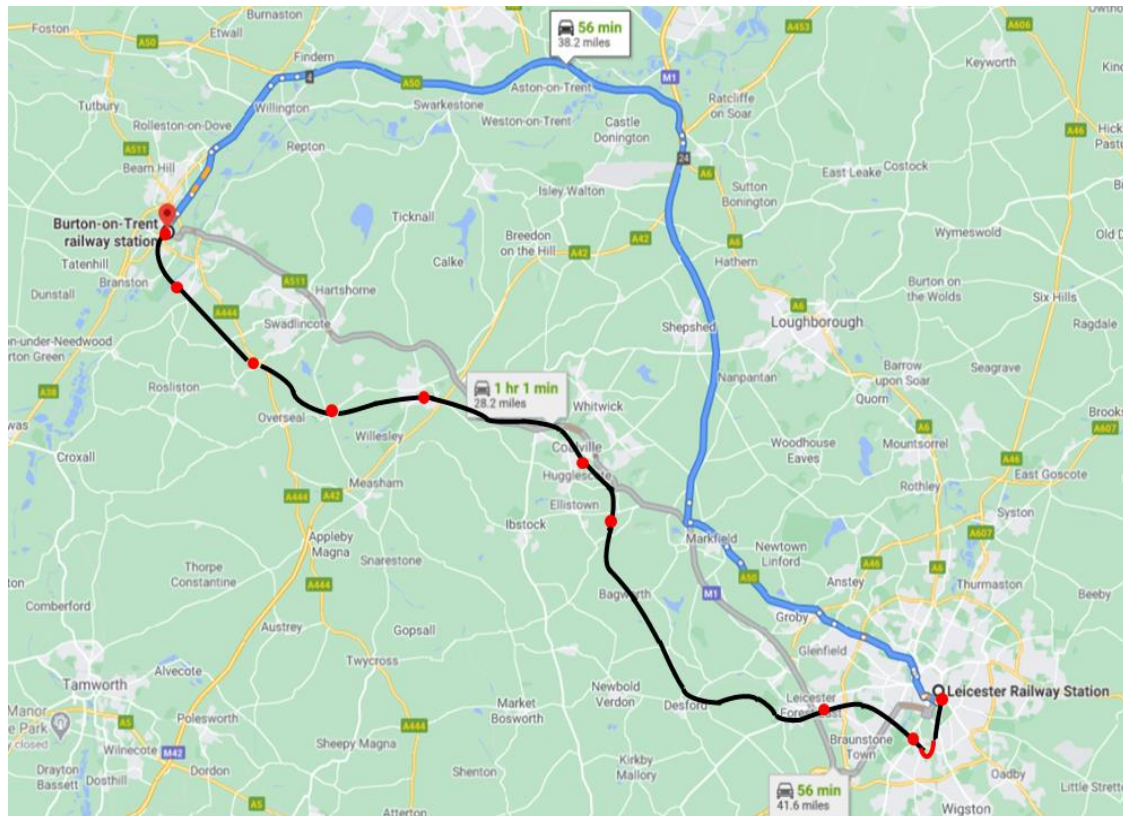


Map 1 - Major primary roads serving the area

Current transport issues

The following issues are associated with the local transport network and shown on Map 2:

- Road journeys are slow² and congested due to the outdated arterial primary roads being no longer fit for purpose. Journeys between Burton and Leicester take longer today than they did forty years ago, despite the provision of single carriageway bypasses for Ashby and Coalville in the intervening years.
- The only public transport options are very limited bus services that are subject to the same road congestion as cars.
- Traffic from the east into Burton is funnelled to the only two road bridges (A444 and A511) over the River Trent. These routes become very heavily congested, especially during peak hours.
- Similarly the A511/A50 route into Leicester is heavily congested with car-borne commuter traffic during peak hours.
- When using Google Maps to plot a route between Burton and Leicester it often chooses a route 10 miles longer via the A38-A50-M1 to avoid using the A511 because it is quicker, a clear illustration of the congestion the communities along the A511 are suffering from.



Map 2 - Major traffic flows to and from the corridor. The black line indicates the Ivanhoe Line.

²Leicester-Burton journeys average less than 30mph at peak times.

Future transport needs

In the years since the rail service between Burton and Leicester was withdrawn, the socioeconomic landscape has changed beyond recognition. There has been rapid housing growth on mainly brownfield land released from the coalfield closures, as can be seen in the population growth data in Table 2.1 below. The population growth rate in South Derbyshire is nearly three times that of the UK average, and the growth rate of North West Leicestershire is nearly twice the UK rate. Neither area has received matching infrastructure investment.

		Region	1991-2019 population growth rate
Tier 1 Authorities		United Kingdom	16.3%
		England	17.6%
		Derbyshire	12.5%
		Leicestershire	23.2%
		Staffordshire	11.1%
		Leicester	25.8%
		Blaby	22.4%
Districts		Hinckley and Bosworth	17.0%
		North West Leicestershire	27.9%
		South Derbyshire	47.6%
		East Staffordshire	22.3%

Table 2.1 - Population growth

Table 2.2³ below, shows that Swadlincote is the largest town, by population, outside an urban area in England, without a railway connection and Coalville is fourth largest, by the same definition.

Town	Population (2011 Census)	Closed	Urban Area
Dudley	79,379	1964	West Midlands Conurbation
Gosport	71,529	1953	South Hampshire
Newcastle-under-Lyme	75,082	1964	Stoke-on-Trent Built-up Area
Washington	67,085	1964	Wearside
Waterlooville	64,350	N/A	South Hampshire
Halesowen	58,135	1958	West Midlands conurbation
Leigh	52,855	1969	Greater Manchester Built-up Area
West Bridgford	45,509	N/A	Nottingham Urban Area
Swadlincote	45,000	1947	
Kingswood	40,734	N/A	Bristol Built-up Area
Skelmersdale	34,455	1963	Wigan Urban Area
Canvey	38,170	N/A	
Blyth	37,339	1964	
Dunstable	36,253	1965	Luton/Dunstable Urban Area
Coalville	34,575	1964	

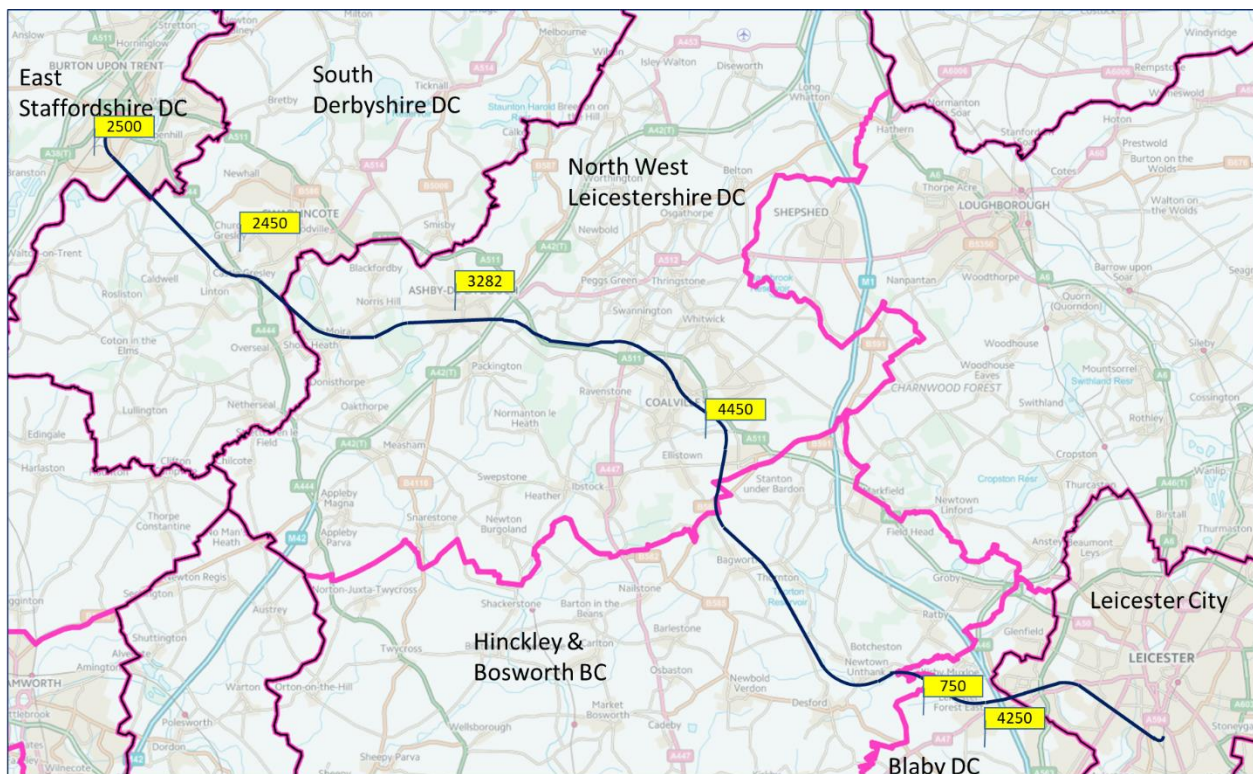
Table 2.2 - Towns without a rail connection, by population

³Extracted from Wikipedia at [List of largest towns in England without a railway station - Wikipedia](https://en.wikipedia.org/wiki/List_of_largest_towns_in_England_without_a_railway_station)

New Homes

There are in excess of 18,000 (and increasing) new homes currently planned in large housing developments within 5km of proposed stations in the area to help meet government targets (and more will be required to meet ongoing needs). These will generate significant new personal transport needs, which can only currently be met by the already overloaded road network. These developments can be seen in Map 3 below and include:

- 2500 homes in a new development at Drakelow on the west bank of the Trent, just outside Burton. If the occupants of these houses travel regularly to Burton or commute to other destinations via the A38, this will put significant new strains on the two already overloaded Trent crossings at Burton.
- 2450 new homes in the rest of South Derbyshire District Council area, again likely to increase commuting traffic over the Trent and on the A444 and A511.
- 7732 new homes in NW Leicestershire District Council area at Ashby de la Zouch and Hugglescote/Donington le Heath.
- 5000 new homes in the Blaby District Council area at Lubbesthorpe and Kirby Muxloe, with more expected.



Map 3 - Major housing developments along the line.

Social Mobility

The Burton to Leicester corridor runs through three counties, Leicester City and in five district councils, as can be seen in Map 3 above. The majority of the corridor runs through the old coalfields of North West Leicestershire and South Derbyshire. The closure of the coal mining industry led to the area needing regeneration and has fallen behind most other areas in terms of Social Mobility, particularly at the north end of the line, as can be seen in Table 2.3 below.

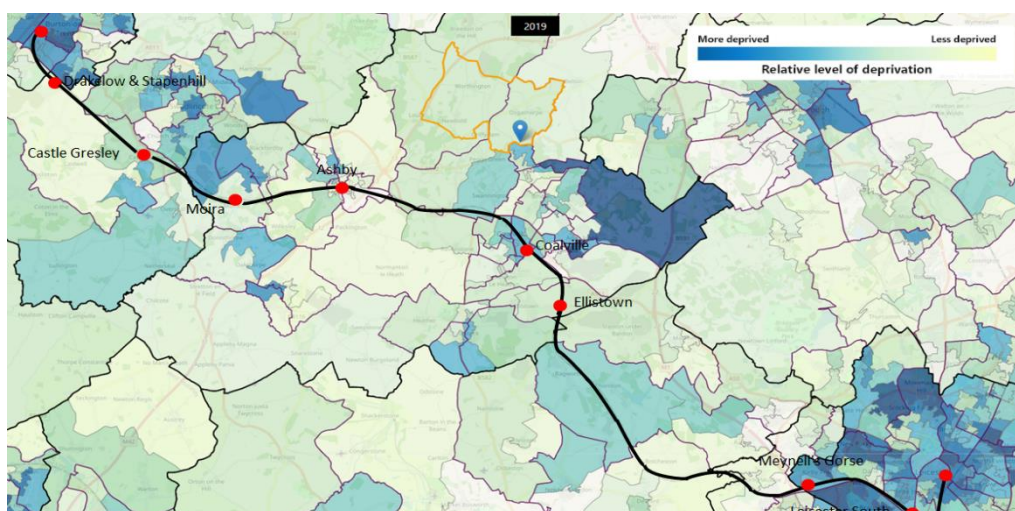
Tier 1 LA	Tier 2 LA	Social Mobility Index ranking out of 324 ⁴	Link to map of Indices of Multiple Deprivation by LA
Staffordshire	East Staffordshire DC	261	East Staffordshire
Derbyshire	South Derbyshire DC	304	South Derbyshire
Leicestershire	Northwest Leicestershire DC	231	Northwest Leicestershire
Leicestershire	Hinckley & Bosworth BC	184	Hinckley & Bosworth
Leicestershire	Blaby DC	100	Blaby
Leicester	Leicester City is a unitary authority	249	Leicester

Table 2.3 - Social Mobility by District Council

From a Social Mobility perspective the Midlands is a prime area for levelling-up. Of the forty Local Authorities in the East Midlands, twenty-one (52%) are in the bottom quartile. Of the twenty -one local authorities in the bottom quartile in the East Midlands, twelve are in the bottom 10%, the worst performance in the country. To some extent this is driven by national funding, with Leicestershire being the lowest funded county⁵ in the country.

As can be seen on map 3, the Districts Council areas are large. A more detailed view of need can be seen in the Indices of Multiple Deprivation 2019⁶ produced by the Ministry of Housing, Communities and Local Government (MHCLG). Links to the maps covering these measures are included in the Table 2.3 above.

Map 4 below shows the Indices of Multiple Deprivation covering the whole Ivanhoe line, along with the currently proposed station sites. As can be seen, the communities served by the north end of the line in particular (e.g. Swadlincote in South Derbyshire and Coalville in Northwest Leicestershire) are showing up as particularly deprived and Leicester is little better.



Map 4 - Map of Indices of Multiple Deprivation 2019

⁴Low is good, high is bad

⁵ See [Fair funding | Leicestershire County Council](#)

⁶ See [English indices of deprivation 2019 - GOV.UK \(www.gov.uk\)](#) and an explanation of their derivation at [IMD Infographic](#)

Increased social mobility facilitated by improved transport

Improved transport facilities through this area will offer a very effective way of raising the social mobility opportunities to residents of the area.

Employment

Securing regular employment is another step towards social mobility.

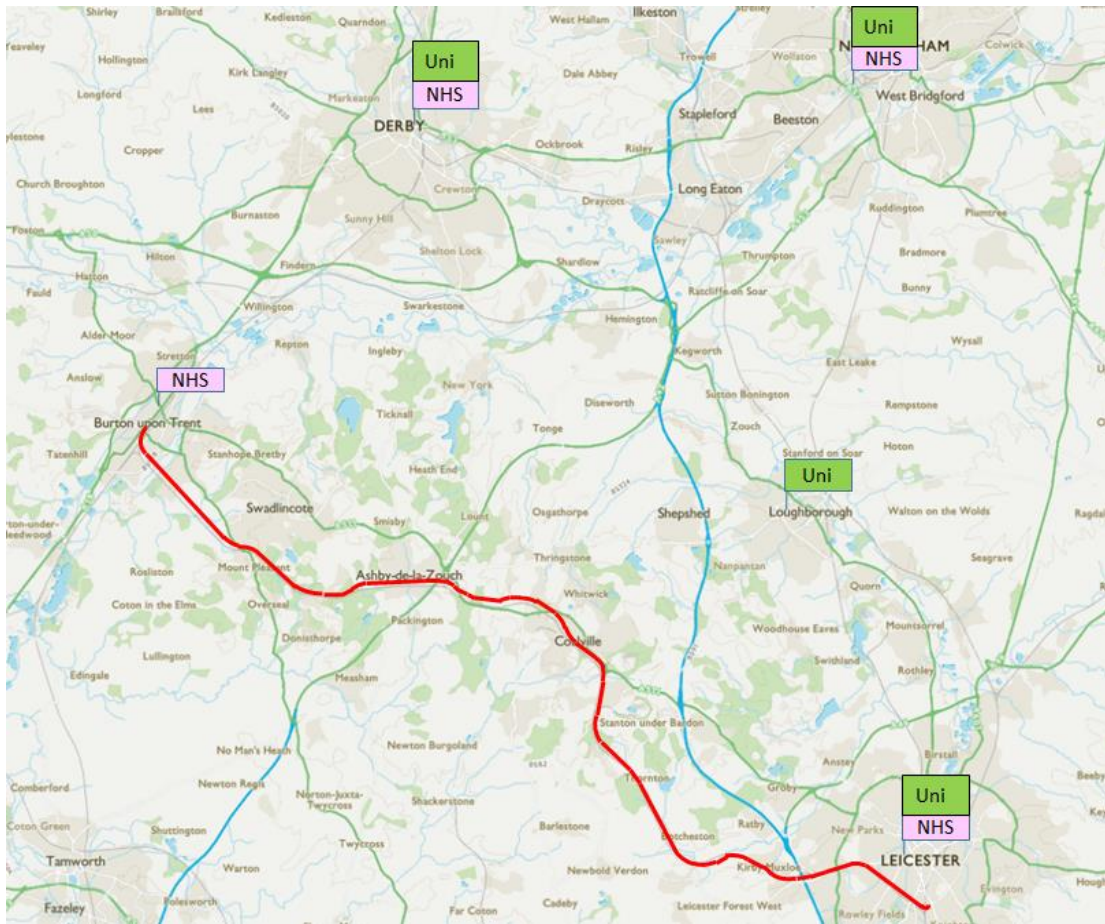
- People who don't have access to the daily use of a car, or who find commuting every day on congested primary roads unacceptable, need better transport services to access better paid or more fulfilling jobs outside the local area, e.g. at Loughborough or the forthcoming East Midlands Airport Gateway and Industrial Cluster (EMAGIC) .
- Equally workers from areas outside the corridor will be able to take advantage of the opportunities offered by employers who can't fill posts from the local population. Local employers (e.g. Amazon, who already run buses to get workers from Leicester to their Coalville fulfilment centre)) list access to a wider resource pool as a key benefit of the line reopening to passengers.

Education

Commuting to further and higher education establishments from home is very difficult without having daily access to a car. Being unable to carry out higher education study without living away from home is a significant barrier to certain socio-economic groups - impeding social mobility in the area. Reopening the line would open up access to universities and colleges at Derby, Leicester and ultimately Loughborough and even Nottingham.

Healthcare

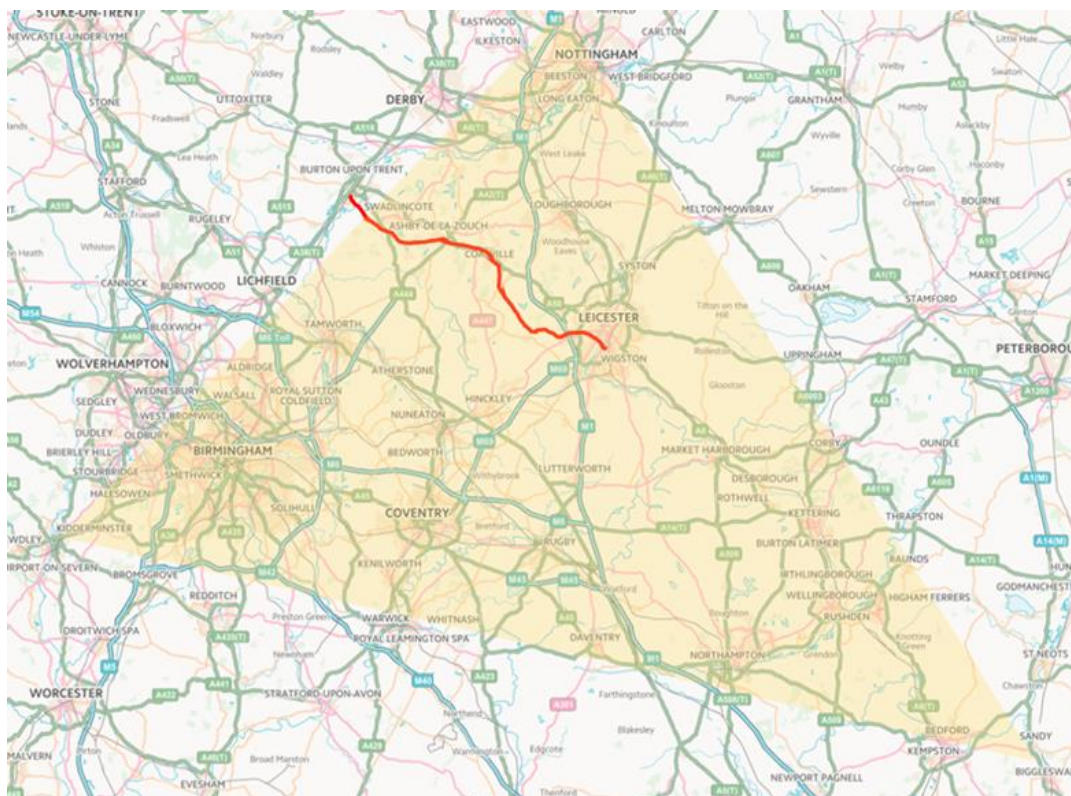
Communities along the Burton-Leicester corridor have very limited healthcare provision, beyond those services provided by primary care. Access to acute hospital based services and other specialised services (diagnostics, mental health, maternity and orthopaedic etc.) can only be had by travelling to Burton, Derby or Leicester. As already described this is currently very difficult without having a car. The results are barriers to healthcare for some residents and heavier demands on the Patient Transport Services. These difficulties are compounded when considering the needs of visitors to patients who are admitted to hospitals. The proposed station at Leicester South would provide easy access to Leicester Royal Infirmary.



Map 5 - Location of Healthcare and Higher Education facilities that serve the corridor, remote from communities along the line.

Industrial development

Following the closure of the coalfields, brownfield land has been released which has also attracted a lot of industrial and commercial development, particularly in hi-tech and logistics industries. This is because of the corridor's strategic location in the logistics golden triangle, being within 4 hours journey time to 90% of the UK population, see Map 6 below with the Ivanhoe Line marked in red. This logistics traffic is all road based, adding to the congestion.



Map 6 - the Logistics “Golden triangle” with the Ivanhoe Line marked in red

Further industrial development along the line is forecast to generate an additional 11,522 jobs⁷, putting further pressure on the existing infrastructure. With the pre-Covid unemployment rates⁸ being quite low (see Table 2.4 below) this implies a lot of inward commuting, even with the current level of housebuilding.

Local Authority	Claimants	Rate (%)
East Staffordshire	1,735	2.4
South Derbyshire	1,140	1.7
North West Leicestershire	1,050	1.7
Hinckley and Bosworth	1,420	2.1

Table 2.4 - Pre-Covid unemployment rates along the line

It should also be noted that the newly proposed East Midlands Freeport, accessible by rail at East Midlands Parkway is forecast to create 60,000 jobs, increasing job and commuting opportunities for communities along the line, as well as the potential for increased rail freight.

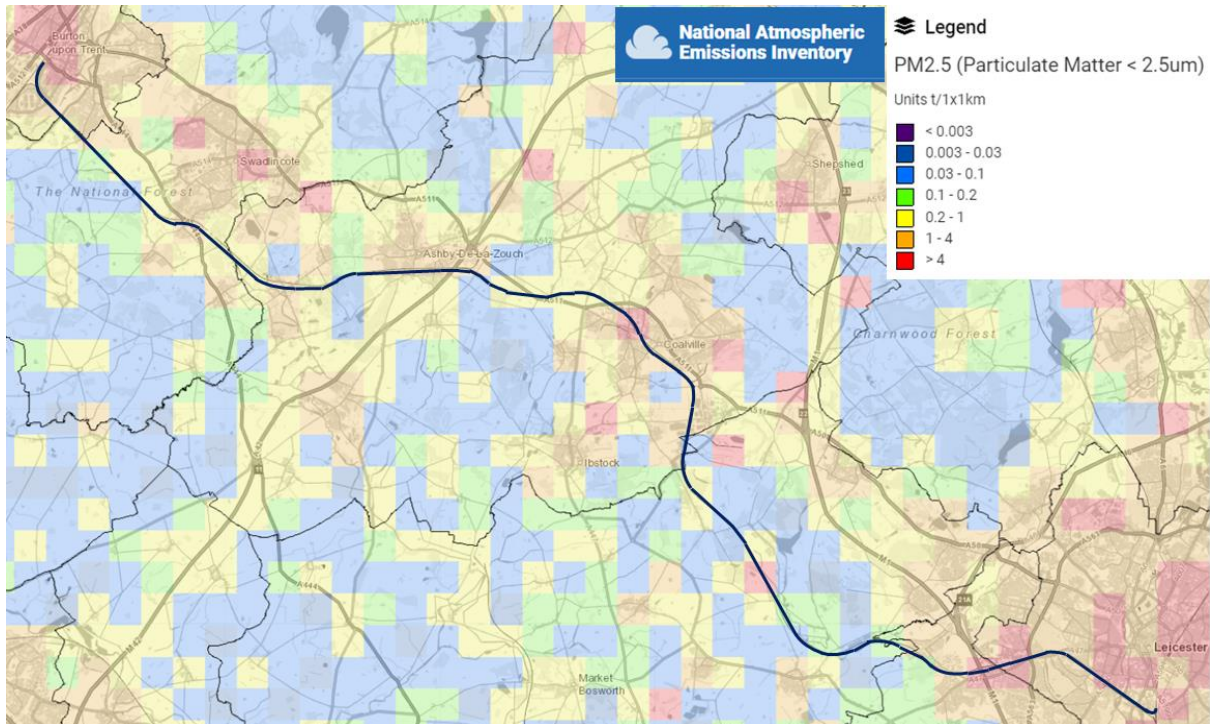
⁷According to analysis by South Derbyshire DC (Richard Groves: 3,422 jobs) and North West Leicestershire DC (Barrie Walford: 8,100 jobs).

⁸Downloaded from

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/unemployment/datasets/claimantcountbyunitaryandlocalauthorityexperimental/current>

Environmental

The corridor suffers from high levels of air pollution, particularly at the north west end. This is caused by the high levels of congestion on the primary roads contributed to by the heavy use of cars for passenger transport and the numbers of freight lorries. See Map 6 below for levels of PM2.5 pollution along the corridor which clearly shows high pollution levels at communities in the area, particularly at the north end. The arterial road, the A511, needs congestion relief⁹ to help mitigate current congestion levels, yet it is clear that feeding this demand with more road building is not a long-term solution as traffic levels keep rising as capacity is added and further logistics businesses move into new industrial units.



Car dependency

The lack of public transport translates into elevated car and van ownership, as can be seen in Table 2.5 below, based on 2011¹⁰ census data.

Comparing the level of car and van ownership in Local Authority areas that the Ivanhoe Line serves with comparable areas served by the Robin Hood Line, the differences are clear. The percentage of households without a car in the cells highlighted. If we also compare the corridor's Local Authorities with the whole East Midlands, the level of elevated car and van ownership is still higher in the corridor. If the level of car or van ownership in just two of the local authorities along the line was reduced to those along the Robin Hood line there would be over 22,000 less cars or vans in the area or if dropped to the level for the whole of the East Midlands the number would be over

⁹See county council plans at [A511 Growth Corridor Scheme | Leicestershire County Council](#)

¹⁰Extracted from [QS416EW \(Car or van availability\) - Nomis - Official Labour Market Statistics \(nomisweb.co.uk\)](#)

6,000. Not only would this imply less car or van usage it would reduce the embedded carbon associated with the initial purchase of cars and vans.

The conclusion is that a working rail service would likely reduce car and van ownership, leading to a reduced environmental impact caused by cars and vans.

	Ivanhoe Line LAs		Robin Hood Line LAs		East Mids
	NWLDC	SDDC	Ashfield	Mansfield	
Zero cars or vans in household	15.6%	13.5%	23.7%	25.2%	22.1%
1 car or van in household	39.9%	40.9%	44.3%	43.1%	42.5%
2 cars or vans in household	33.7%	35.2%	25.4%	24.9%	27.4%
3 cars or vans in household	7.9%	7.7%	5.0%	5.3%	6.0%
4 or more cars or vans in household	2.9%	2.7%	1.6%	1.5%	2.0%
Overall average of cars or vans per household	1.44	1.46	1.17	1.15	1.24

Table 2.5 - Car ownership levels in Districts along the line compared

Car use for commuting journeys in the East Midlands as a percentage of all commuting journeys is the highest of all regions in Great Britain, as detailed in Table 2.6¹¹ below. As can also be seen rail commuting journeys in the East Midlands as a percentage of commuting journeys are joint lowest in Great Britain.

Region of residence	Commuting mode of transport %ages							Employment ('000s)
	Car	Motorcycle	Bicycle	Bus / coach	All rail	Walk	Other modes	
North East	76	*	1	8	3	9	1	1,207
North West	76	-	2	6	5	9	1	3,542
Yorkshire and The Humber	74	*	3	8	3	11	1	2,571
East Midlands	81	*	3	4	2	9		2,412
West Midlands	78	1	2	7	5	7	1	2,828
East of England	73	*	3	3	11	8	1	3,130
London	27	1	5	13	44	9	1	4,757
South East	71	1	3	3	11	10	1	4,690
South West	77	1	4	4	2	11	1	2,818
England	67	1	3	7	12	9	1	27,956
Wales	80	*	2	5	2	10	1	1,481
Scotland	70	*	2	9	5	11	2	2,671
Great Britain	68	1	3	7	11	9	1	32,108

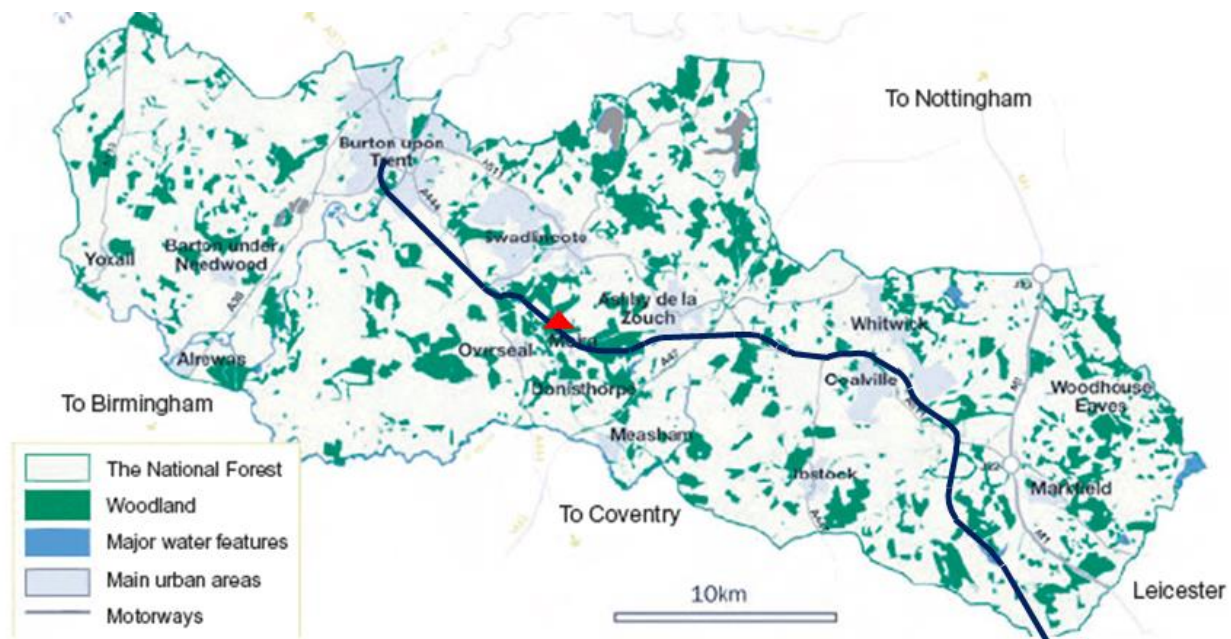
Table 2.6 - How commuting journeys are made

Tourism

The National Forest is situated in the Burton to Leicester corridor, as can be seen in Map 7 below.

¹¹ Data extracted from [Modal comparisons \(TSGB01\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/modal-comparisons)

The centre for tourism is the “Conkers” site at Moira, adjacent to the proposed station, see the red triangle below. There are other attractions nearby in a growing set of destinations for staycations.



Map 7 – The National Forest

A STEAM¹² query, run by the National Forest Operations Director, looking at an area within two radius miles of the proposed Moira station returned the annual data shown in Table 2.7 below.

Measure	Volume
Visitor Numbers	806,000
Visitor Days	873,000
Economic Impact	£36.9m
No of Jobs Supported (FTE)	421
Average spend per visitor	£45.73
Average length of stay	1.08 days

Table 2.7 - Annual National Forest visitor data

The National Forest as a whole has seen steady growth in visitor numbers, as detailed in Table 2.8 below.

Measure	2015-2019	2010-2014	2005-2009
Visitor Numbers	9.121 m	7.794m	7.809m
Visitor Days	10.25m	8.796m	8.551m
Economic impacts (inflation linked)	£471.50m	£416.39m	£385.80m
No of jobs supported (FTE)	5363	4803	4368

Table 2.8 - National Forest visitor growth

With further attractions being added there is a clear upward trend. The National Forest estimate a 5% uplift in visitor numbers should the Ivanhoe Line reopen. As a conservative estimate, this

¹² See [Global Tourism Solutions \(UK\) Ltd | Tourism Research | UK](#)

equates to circa £2m of economic impact. By comparison, at Abbotsford (Sir Walter Scott's home) one year after the Borders Railway reopened, visitor numbers increased from 80,000 pa to 200,000¹³ pa, an increase of 150%.

Objectives of potential transport interventions

To address the socio-economic problems described, the following objectives of transport interventions have been identified:

- Significant reduction in current passenger journey times within the corridor.
- Improve access to key educational and healthcare services, employment opportunities and quality retail, especially for those people with no car.
- Reduction of road traffic.
- Reduction of pollution levels.
- Increased tourism in the National Forest.
- Simplified access to the National Rail network.

Potential Transport interventions for improvement

Three potential transport interventions have been considered to address the transport problems highlighted:

- **Road improvements.** Improve primary network by creating a dual carriageway from Burton to Leicester.
- **Improve bus services.** Create more frequent express and stopping bus services from early morning to late evening.
- **The introduction of a rail service integrated with local bus services and cycleways** to enable easy access to the nearest station.

The potential journey times for each option are illustrated in Table 2.9 below.

Journey Leg	By train, with line Improvements ¹	By bus, with service Improvements ²	By car, with road improvements ³
Burton - Ashby	17	45	27
Ashby - Coalville	4.30	22	12
Coalville - Leicester	20	64	31
Total (Minutes)	41	131	61

¹Network Rail Ivanhoe RYR CA Draft Report v0.4

² Arriva service no. 29/29A

³ Car journey off peak (Google Maps 17:03:21) **Peak journey times significantly longer**

Table 2.9 - Journey times compared

A more detailed study of journey times to town centres can be seen in table 2.10 below. Whilst the percentage of users able to travel by car to the nearest town centre is roughly equivalent to the East Midlands average, the percentage of users able to access a town centre in 15 mins by public transport in 15 minutes is well below average. Whilst some of this may be due to geography, it is

¹³ Information supplied by Simon Walton, chair of the Border Railway campaign group.

also an indicator of poor public transport provision, a factor influencing poor social mobility scores and car dependency.

		% users within 15 minutes of town centres by PT/walk	% users within 30 minutes of town centres by PT/walk	Travel time in minutes to nearest town centre by car	Number of town centres by car within 30 minutes	% users within 15 minutes of town centres by car
District	South Derbyshire	13	61	16	4	52
	North West Leicestershire	20	79	13	4	71
	Hinckley and Bosworth	15	65	15	6	55
	Blaby	10	59	14	8	55
County	Derbyshire	26	83	13	6	70
	Leicestershire	21	74	13	6	66
	Nottinghamshire	33	91	12	7	78
	East Midlands Averages	25	79	13	6	67

Table 2.10- Percentage of users able to access town centres in time periods by Public Transport

A light rail intervention was also considered, but was discounted following advice from an expert panel facilitated by Network Rail. More details are in Annex A, but the lack of support from Leicester City Council for a light rail option is seen as key.

Potential Benefits Balanced Scorecard

A comparison of the benefits of each potential intervention is summarised in Table 2.11 below. The effectiveness of each intervention is rated from 1 to 3 - 1 being the most effective.

Benefit rating (1 high)	Rail	Bus	Car
Journey Times	1	3	2
Congestion	1	3	3
Commuting	2	3	2
Construction disruption	1	1	3
Socio economic improvement	1	2	2
Speed of implementation	2	1	3
Environmental	1	3	3
Totals	9	16	18

Table 2.11 - Transport options balanced scorecard

It is clear that rail intervention is the most effective course considered. This comparison is described in more detail at Annex B.

Scope and Constraints of Rail Intervention

Scope.

The scope of the intervention is limited to the provision of a regular passenger train service from early morning to late evening between Burton and Leicester mainline stations and includes:

- Services to the towns of Swadlincote, Ashby-de-la-Zouch and Coalville, and to three smaller communities, plus a new station at Leicester South.
- Passenger access to the national railway network at Burton and Leicester.

- Adaptation and improvement of local bus services and cycleways to work in harmony with the new rail service and extend the benefits to surrounding areas without direct access to a station¹⁴.

Constraints

The key railway constraints are:

- Access to Leicester - a new junction involving property acquisition and demolition is required, and the line into Leicester is close to capacity.
- Access to Burton, where it is important that the level of interaction with existing services is minimised or removed altogether.
- The existence of very limited freight movements on the Ivanhoe Line needs to be considered.
- The line currently has significant sections of single track, which constrain capacity.
- The number of level crossings on the line is a potential constraint unless risk mitigation measures are undertaken.

Freight

The line is currently open for freight only, serving the quarries at Bardon. Once the line is upgraded it is possible that it may attract additional freight traffic, as already proposed in the Leicester Area Strategic Advice 2020¹⁵ document. However, there are implications for the line capacity, as described below.

Network Rail Capacity Analysis

CRIL has commissioned a Capacity Analysis report from Network Rail which shows that line capacity will limit the passenger services that can be implemented. However, the report concluded that an hourly service could be introduced with some additional infrastructure in the Leicester South area, on top of the services already proposed in the Leicester Area Strategic Advice 2020 document. This matches the hourly Coalville-Leicester bus service but is half the frequency of Coalville-Burton bus services, but see previous comments on bus-rail integration.

Access to Leicester station is dependent on the proposed Leicester Area infrastructure works being implemented with either passive provision for the Knighton North Junction or an extension of its scope to include it.

The proposals include a design which does not place any constraints on services on either the Birmingham to Derby mainline or the Ivanhoe Line.

¹⁴ Discussions with local bus operators in support of this approach have already started.

¹⁵ See [Leicester Area Strategic Advice 2020 \(networkrail.co.uk\)](https://www.networkrail.co.uk/leicester-area-strategic-advice-2020).

Summary

- The communities in the Burton to Leicester corridor would benefit greatly from the regeneration that the line would bring.
- The corridor includes some of the most socially deprived areas in England.
- The corridor is subject to high levels of residential and industrial development with associated pollution.
- In the absence of practical public transport, the corridor is a highly car-dependent area.
- The burgeoning National Forest tourism sector will further boost road traffic without viable alternatives.
- The temporary benefits arising from previous road improvement schemes have been negated by increased traffic levels.
- A rail-based transport intervention supported by feeder bus services and cycleways would be the most effective way to deliver the step-change required.

3. ECONOMIC CASE

The financial estimates prepared for this SOBC are budgetary. The process towards the approval of a Full Business Case or a Fast Track process is at an early stage. Before a full estimate of the costs and benefits can be made there are very many unknowns to be researched and key decisions about the details of the scheme to be made.

There are three Options under consideration:

- **Option 1**
A simplified initial opening Burton to Leicester South with stations at Gresley, Ashby and Coalville (four new stations).
- **Option 2**
An initial opening between Burton and Leicester South with six new stations.
- **Option3**
The full scheme.

Three budgetary estimates have been prepared for each option:

- Capital Expenditure (CapEx)
- Operational Expenditure (OpEx)
- Revenue Income

Capital Cost Assumptions

The following assumptions, supported by the results of the Network Rail Capacity Analysis, have been made in considering CapEx:

- The permanent way, level crossings and signalling will be upgraded to enable a passenger service with trains running up to 60 miles per hour.
- The north curve at Knighton junction will be restored as part of the full scheme (option 3) to enable trains to run directly into Leicester station.
- There will be one new passing loop installed on the single track section at the new Leicester South Station.
- Up to an initial six intermediate stations will be opened between Burton and Leicester.
- All new stations will be unmanned and built to the same low-cost, no-frills design.
- The track upgrades on the Midland Main Line (MML) in the Leicester area, recommended in the Network Rail Leicester Area Strategic Advice document¹⁶, are funded separately.
- Service pattern and rolling stock are adopted as outlined in Annex E.
- The introduction of services will be phased to allow early implementation, with the connection to Leicester main line and additional stations being added later.
- Finance from a mix of government and private funding will cover capital and transitional operating costs whilst revenues build to make the line self-sustaining.

¹⁶ See [Leicester Area Strategic Advice 2020 \(networkrail.co.uk\)](https://www.networkrail.co.uk/leicester-area-strategic-advice-2020)

Benefits

The benefits offered by this scheme include:

- The transport service benefits described in the Strategic Case above.
- Wider Economic Impacts (WEI). Detailed modelling of the WEI is not proportionate at the SOBC stage, however the nature of the expected benefits is also outlined in the Strategic Case above.
- See Annex F for a report by Derby University on environmental benefits.
- New commercial opportunities could be created around new railway stations, e.g. cafes, bike hire businesses etc.

Disbenefits

Disbenefits include:

- The existing bus services may suffer, but some are already under-utilised. As detailed in the recently published Williams-Shapps review¹⁷ railway stations will increasingly be seen as public transport hubs, with integrated ticketing, which should open up new commercial bus opportunities in compensation and increase station catchment areas.
- Some road disruption at level crossings may be experienced.
- Noise, for those living adjacent to the line.

Capital Expenditure (CapEx)

Three budgetary CapEx estimates for each option are given in Table 3.1 below. These are:

- A.** Lowest estimate assessed as Rail Method of Measurement Volume Methodology (RMOMVT)
B. Most likely estimate, including an uplift of 40% as used on the HS2a estimates (HS2 - 40%)
C. Highest estimate, including an optimisation bias uplift of 66.4% (OB -66.6%)

	A Lowest	B Most likely	C Highest	Notes
Option 1 - Leicester South to Burton - 4 new stations				
Option 2 -Leicester South to Burton - 6 new stations				
Option 3 - Leicester London Road to Burton - 6 new stations				

Table 3.1 - CapEx estimates for the different options

Each estimate is the total capital cost of each option, calculated using recognised quantity survey processes and industry-standard unit costs. They include risk allowances and Network Rail offsets for the capital work expenditure commitments for CPs 6 and 7, relevant to the upgrading of the line to enable passenger services to run based on figures provided by Network Rail. These will require further refinement at the next stage. Proposals for funding are described in the Financial Case.

Annex C explains in more detail how these estimates have been derived.

¹⁷ See section 39 on page 71 of [Great British Railways: The Williams-Shapps Plan for Rail \(web version\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/671111/Great_British_Railways_The_Williams-Shapps_Plan_for_Rail_web_version.pdf) ([publishing.service.gov.uk](https://www.publishing.service.gov.uk))

Operational Costs (OpEx) and Revenue

To avoid the need for ongoing subsidies, revenue costs need to cover operating costs. Table 3.2 below details the OpEx and revenue generation for four new stations (Castle Gresley, Ashby, Coalville and Leicester South), with additional entries for more stations up to the full complement described in the CapEx estimate section. The sequencing of station opening is not considered here.

For each group of stations there are estimates of minimum and max revenue and OpEx based on comparable services and rolling stock¹⁸. As can be seen, with an initial hourly service maximising connectivity the revenues should cover the operating costs (highlighted cells).

	Costs and revenues in £m pa								
	Hourly Service				Blended service ¹⁹				
Stations	Min revenue	Max revenue	Min OpEx	Max OpEx	Min revenue	Max revenue	Min OpEx	Max OpEx	Population connected
Gresley, Ashby, Coalville, Leicester South	■	■	■	■	■	■	■	■	149,529
+ Meynell's Gorse	■	■	■	■	■	■	■	■	199,440
+ Drakelow	■	■	■	■	■	■	■	■	231,023
+ Moira	■	■	■	■	■	■	■	■	240,976
+ Ellistown	■	■	■	■	■	■	■	■	265,393
Ultimate, terminating at Leicester station	■	■	■	■	■	■	■	■	

Table 3.2 - OpEx and Revenue forecasts along with populations connected

The following points should be noted:

- OpEx costs are without the application of any optimisation bias.
- Revenue figures are derived from station revenue data supplied by East Midlands Railways under an NDA along with catchment area data.
- The Network Rail capacity study indicated that the line will only support 6 stations if the service terminates at Burton and Leicester.
- Through-services at either end are possible and likely to generate additional revenues, but have not been considered for this analysis.
- The revenue modelling covered 8 stations, the absolute maximum foreseen (up to 6 have been costed in the capex modelling) and with them included the run time on the line is circa 53 minutes, which makes for a viable service, *but only if running through Leicester*.
- Revenue includes car parking revenue.
- Only 10% of the population in catchment at Leicester South has been used.
- 60% of the population at Meynell's Gorse has been considered due to the proximity of Leicester station.
- Access charge and associated supplements of the OpEx costs are estimates.

¹⁸ Maximum figures are for 2-car Class 156. Minimum figures are for 2-car Class 170.

¹⁹ A blended service refers to 2 tph during peak hours and 1 tph during the off-peak and at weekends.

- As additional stations are created revenues increase faster than costs because costs are largely linked to miles travelled by rolling stock, not new stations.
- When a new Meynell's Gorse station is created, a half hourly peak service could be justified, based on current demand forecasts.
- No attempt has been made to cost the time benefit of faster rail journeys over road journeys.

Annex D explains in more detail how the revenue estimates have been prepared.

Annex E explains in more detail how the OpEx costs have been prepared.

Economic Summary

The calculation of Benefits to Costs Ratios (BCR) and a Transport Analysis Guidance (TAG) assessment is not proportionate in this RYR SOBC stage. However to provide an indication of the financial viability of each option, budgetary figures based on an initial hourly service are shown in Table 3.3 below:

	Option 1		Option 2		Option 3	
	Min	Max	Min	Max	Min	Max
CapEx estimate	████	████	████	████	████	████
OpEx estimate	████	████	████	████	████	████
Revenue estimate	████	████	████	████	████	████
Operating balance	████	████	████	████	████	████

Table 3.3 – Economic summary

All three options should be viable without subsidy, although the position during the initial transition period will need further study. Quantification and monetisation of the economic benefits at the next stage will enable a Benefit Cost Ratio to be calculated along with more detailed modelling of the economic case.

4. FINANCIAL CASE

The financial case establishes the budget finance and funding considerations using the estimates of cost and benefits previously discussed.

Costs

Capital Costs (CapEx) and Operating Costs (OpEx) have been considered in the Economic Case above, which established that steady-state revenue is likely to exceed OpEx. The profile of fare revenue growth depends on the sequence and timing of station opening and in the interim, a funding model will be needed, potentially involving NGO and LVC funds. It is expected that financial steady-state will be achieved after four years of the full service being operational.

CapEx costs may be met from a variety of sources, and whilst the scheme is being considered as part of the Restoring Your Railway initiative, it is expected that the scheme has a higher chance of success with the substantial backing from a third party or parties.

Revenue

Whilst fares create the greatest revenue, there is potential for additional income from associated activities such as rent from shared use of station buildings, and railway stations are an ideal location for meeting venues.

Funding

As OpEx is expected to be less than revenue, this section outlines potential sources of additional funding for Capex only, and how they may become engaged in the project.

Local Funding

- Authorities will be encouraged to raise contributions to the cost of local stations, car parking and other facilities in their S106 conditions for future development where there is a 'lawful' case, in planning terms, for such a contribution to be secured.
- Additional funding may be gained from the Community Infrastructure Levy²⁰ (CIL), where a council has published a schedule of charges for their area.
- Local Growth Funds²¹ such as the Midlands Engine.
- Diverted road improvement funds, where planned spending on road improvements to address congestion on the A511 could be diverted for use on a more long-term sustainable rail option.
- Whilst still embryonic, the project could also be able to apply for funding from the government's levelling up fund²².

²⁰ See [Community Infrastructure Levy - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/policies/community-infrastructure-levy)

²¹ See [Midlands Engine to roar ahead with ambitious new strategy - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/policies/midlands-engine)

²² See [Levelling Up Fund: prospectus - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/policies/levelling-up-fund)

Land Value Capture

[REDACTED]

This Land Value Capture (LVC) would be an important and viable methodology to be incorporated into the scheme's funding and finance plan. It is neither a tax nor a levy but is based upon the principle that land and property close to improved transport facilities experience a measurable increase in value above that of property in less well served areas. It does not impact on the independence of local planning permission decisions.

[REDACTED]

[REDACTED]

Spending profile

The implementation work is likely to be phased (details in the Commercial Case below) and the spending profile will be affected by this. A blended funding approach will be used with a mix of public and private funding to cover the costs of capital works, implementation and commissioning and shortfall of revenues whilst traffic levels build.

An illustrative example of the blended funding approach is shown in Fig 1 below, which attempts to detail the spending profile of different funding types:

- High up-front CapEx
- Revenues building over time
- OpEx starting as a large cost as services get underway.
- LVC contribution to OpEx costs declining as revenues build.

²³ See [Home - E-Rail \(e-rail.co.uk\)](https://www.e-rail.co.uk) and their involvement in the [Ashington line reopening](#).

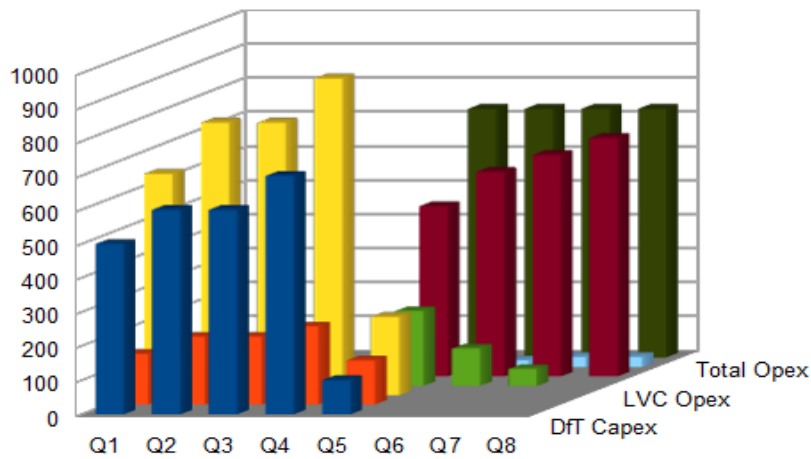


Fig 1: Illustration of blended funding for a two year stage showing transition from CapEx to OpEx expenditure

The detailed work to support implementation phasing decisions will be carried out as part of the next stage. The full spending profile forecast will then be prepared.

5. COMMERCIAL CASE

Introduction

In this section we outline how the proposal will be implemented moving forward from the SOBC stage. Whilst similar schemes would normally be sponsored by a single Tier 1 Local Authority, as the Ivanhoe Line passes through four Tier 1 and five Tier 2 council areas, this becomes problematic.

Role of CRIL

CRIL was formed as a Community Interest Company (regulated by Companies House) to speak with one voice on behalf of all the communities along the line, and to lead the RYR submission on behalf of all the Local Authorities.

The campaign has been wholeheartedly supported by the five local MPs through whose constituencies the line runs, and by all the tier 1 and Tier 2 local authorities. These councils have all contributed to a cash fund held by CRIL to finance feasibility studies. CRIL have prepared this SOBC with support from study contracts let to Network Rail, the University of Derby, Mark Beckett Consulting and E-Rail, match funded by the DfT and managed by CRIL.

Development Stage

CRIL is not an appropriate organisation for placing and managing the substantial contracts and external suppliers required to deliver the OBC or Fast Track process.

Leicestershire County Council, having the largest share of the line running through the county, have agreed to be the lead Local Authority, on the understanding that their costs will be covered. This leadership has been agreed with all four tier one councils involved. Whilst the DfT have agreed to fund the next stage, the extent of that funding will need to be agreed prior to commencement of the next stage.

There are three options for future development activity:

- To contract with Network Rail to undertake this work.
- To procure a specialist rail consultancy to undertake the work, with Network Rail providing “third party” advice under an Asset Protection Agreement.
- To adopt a Fast Track process using Network Rail’s emerging Project Speed methodology to expedite the development of urgently required rail schemes. This option could be the appropriate to enable the politically required timeframes for Restoring Your Railways projects to be met.

There are important dependencies between Ivanhoe and other schemes already being developed by Network Rail on behalf of others. These include the Leicester Area Infrastructure development (interface between Knighton Junction and Leicester), and the Midlands Rail Hub projects at Burton-upon-Trent. Network Rail has already undertaken an initial capacity analysis on the Ivanhoe proposal, building on the work it did on the Leicester CMSP in 2020. The project will involve upgrades to a range of Network Rail assets, including track, signalling and structures. For these reasons there is a strong case for Network Rail to undertake the work on behalf of Leicestershire County Council and the wider client group under a Development Agreement.

However, there are advantages in putting the development to the market. It would potentially result in a less expensive and quicker outcome, meeting the aspiration of parties for faster delivery.

The selection of a partner will need more discussion between CRIL and the DfT.

The development stage using the traditional business case process should result in a Single Option Report and Outline Business Case.

Design Stage

Whilst learning from any lessons from the Development Stage, a similar approach will be used to prepare the FBC to meet the Department for Transport's requirements for approval to proceed.

Fast Track Process

A Fast Track process would be led by Network Rail and is expected to consist of a single intermediate stage delivering a case to proceed to construction document, combining the functions of the OBC and FBC.

Implementation

Network Rail is at present the most suitable organisation to carry out the implementation in line with the specifications contained in the FBC or its Fast Track equivalent. Subject to approval from the DfT, Network Rail would manage the complete implementation programme, coordinating the inputs from other organisations as required under an Implementation Agreement. The procurement route for appointing a delivery contractor or contractors would be for discussion and agreement between the client group and Network Rail, but the work could, for example, be let through its existing framework contracts. This is explored in more detail in the Management Case below.

Operation

Consultation has been held with Network Rail and East Midlands Railways about the operation of the line when reopened to passenger traffic. It is proposed that Network Rail owns and operates the infrastructure, and a train operating company would run the trains and manage the stations. The most likely candidate for this is East Midlands Railway, although ultimately this is a matter for the DfT who would have to enact the change to the contract with the operator.

Phasing

To open the railway to passengers from Burton to Leicester requires the major track alterations already anticipated on the main line at Leicester and the restoration of the north curve at Knighton to be complete. This could cause considerable delays to the completion of the line.

By contrast, access to Burton station is relatively straightforward and as the railway is double tracked to Ashby, it would be possible to restore passenger services at the northern end of the line much more quickly, enabling earlier delivery of benefits from the line whilst ensuring that the whole line will be reopened as soon as the alterations in the Leicester area have been completed.

The need for some of the proposed stations is clear, and their locations identified. However, others need further work to demonstrate their viability, which may only be visible once the line is open to passengers.

It is therefore proposed that the next stage will evaluate phasing the opening of the line in the light of these factors. The following approaches will be examined:

- Rolling out from Burton towards Leicester South in two or three steps.
- Adding other stations as traffic demand and funding dictate.
- The final phase connects into Leicester main railway station.

These phases would need to be adjusted should Option 2 or Option 3 be selected for authorisation.

Fast Track Process

A Fast Track process would be suitable for the development of an option 1 build which is in essence a shovel ready project. It would roll out the Burton to Leicester South section of the line, using Network Rail's recently developed fast track laying methodologies.

6. MANAGEMENT CASE

The Management Case describes in outline how any part of the work will be seen through to delivery according to specification, on time and to budget.

Key Delivery Partners

The Local Authority Partners, Network Rail and CRIL have been meeting regularly to oversee the early stages of the project. As complexity increased, a Project Board will be required, comprising:

- Leicestershire County Council (acting as the contracting body/sponsor)
- Leicester City Council
- Derbyshire County Council
- Staffordshire County Council
- CRIL
- Network Rail
- Midlands Connect
- DfT
- East Midlands Railway

Whilst terms of reference are yet to be developed, key roles of the Board will be:

- Oversight, direction, support and member body leadership on the development of proposals and plans associated with the project.
- Endorsement of the client requirements/scope for the project.
- Monitoring progress and consideration of design, funding and business case for the project.
- Develop a combined strategy for the delivery of the project.
- Alignment of interests to secure success of the project.
- Oversight of programme and risk management.
- Ensure that the critical success factors for the stations are achieved.

The roles of the key parties are envisaged to be as follows:

Leicestershire County Council or Network Rail – contracting party, acting in the role of client/sponsor.

DfT – ultimately responsible for approving the business case, providing funding and enacting changes to franchise (or equivalent replacement operating contract).

Network Rail – owner of the infrastructure assets created or amended. Potentially responsible for the development and delivery of the project.

Midlands Connect, as the Sub-National Transport Body for the Midlands, is responsible for strategic rail development. Their role will be to ensure that the project is aligned and included in its strategy.

CRIL, as the public campaign group which established the scheme as part of the Restoring Your Railways Project, provided local leadership to galvanise local support for the scheme and wrote this SOBC. Its role will be to ensure that the project is progressed appropriately.

Key Dependencies, Interfaces and Risks

The Leicester Area Strategic Advice recommended that in order to accommodate new and additional passenger services, and additional freight traffic, the line between Wigston South Junction and Leicester station should be quadrupled. The implementation of a new junction, proposed under option 3, at Knighton would be a direct interface with Network Rail's proposed Leicester scheme.

There are proposals for Burton-on-Trent to undertake infrastructure work supporting additional Midlands Rail Hub West Midlands Rail Executive services between Birmingham, Derby and Nottingham. West Midlands Rail Executive are proposing the extension of the Birmingham Cross City Line to Burton, terminating in a new bay platform. Signalling and track work at Burton could interface with these requirements. Table 6.1 below illustrates the key high-level risks currently identified for the project.

Description	Prob	Impact	RAG	Mitigation
Delays in getting into Leicester station or the scheme is not delivered	M	L		Terminate services at Leicester South station. Revenue impact can be reduced with linking bus services.
Revenue forecasts are based on pre-Covid data and may not recover post-Covid, threatening viability of the line reopening	M	M		For OBC stage when passenger numbers will be clearer.
Leicestershire CC have only agreed to act as lead local authority if their costs are covered. Without funding there is no agreement.	M	H		CRIL to broker an agreement to fund this work, either by the DfT or by contributions from the other councils.
Land acquisition costs to buy back the Knighton Curve track bed land are based on a desktop study and not necessarily reusing the old track bed.	M	M		To be worked at OBC stage. Not required for early staging
Costs of station land acquisition, access and carpark construction. Current figure is based on a desktop study.	M	M		To be worked at OBC stage
Level crossing risk mitigation measures increase cost of scheme	M	M		To be worked at OBC stage
Additional costs to facilitate station feeder bus services and cycleways	L	L		
Unforeseen changes of scope	M	M		
LVC yields no additional funding	L	M		
Other 3 rd party funding options yield nothing	M	M		
Abstraction of current bus revenues	M	L		As detailed in the recent Williams-Shapps review, rail stations should form a hub for future public transport provision with new commercial opportunities.
Stabling capex may be required	M	L		To be reviewed once TOC and rolling stock agreed.

Table 6.1 Key high-level risks

The Risk Management Process will comply with Network Rail's GRIP/PACE standard, the Common Safety Method (CSM) required by UK Law and Highways Design Standards and processes.

During the Develop stage a detailed Risk Register will be established covering overall project risks. This will include a process of hazard identification and preliminary system definition to establish whether the project represents a 'significant' risk in respect of CSM in conjunction with Network Rail.

The Project Board will review the identified risks at each meeting, based on project updates from the functional team leaders (i.e. engineering, planning, property, finance, economic, legal) to ensure risks are being identified and mitigated and to make a qualitative assessment of the effect on the programme risk exposure.

Periodically the project will be subject to a Quantified Cost Risk Assessment (QCRA) and Quantified Schedule Risk Assessment (QSRA). These will be carried out during the Develop stage based on the scope of the emerging preferred option and again during the Design stage based on the Outline Design.

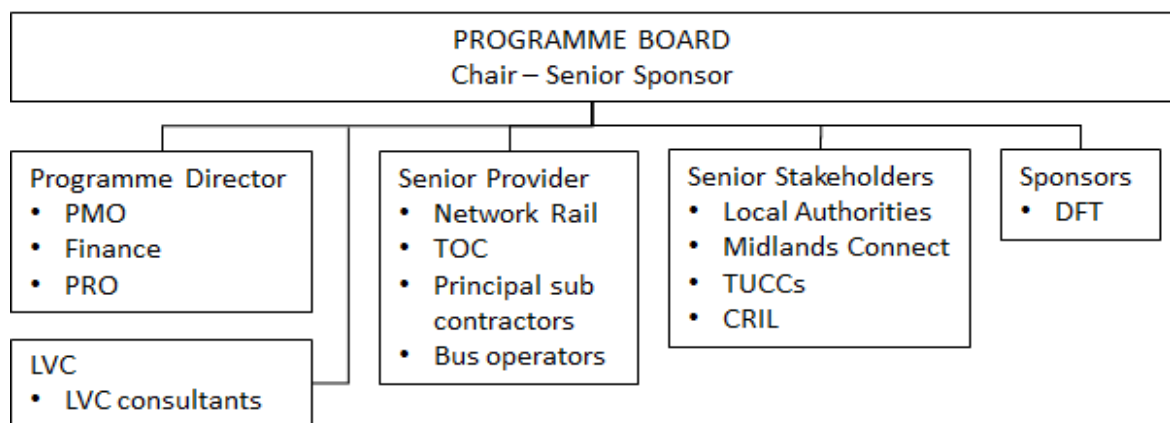
Programme – Traditional Approach

Development Phase

The successful consultants, or Network Rail, depending on the decision outlined in the Commercial Case, will agree a delivery plan for the OBC under the direction of the Contracting Local Authority and the Project Board. The key activities will include:

- Requirements capture, through a Client Requirements Document
- Asset condition, ground condition and topological surveys
- Engineering constraints and feasibility report, including more accurate capital costs
- Economic appraisal, including demand forecasting
- Funding plan, including the mix of Central Government (RYR fund), local funding, LVC funding and 3rd Party funding
- Land and property strategy
- Project Management Plan and detailed programme
- Risk matrix
- Single Option Report
- Outline Business Case document
- Other product requirements of the PACE process

See programme board structure below.



Managing Costs and Milestones

The traditional process outlined in the Commercial and Management Cases is based on the RNEP stages, which are designed to ensure progressive assurance of a project throughout its lifecycle. There is mapping onto the PACE stages which have more detailed requirements. The governance structure, through a Project Board, will enable the appropriate level of project control at each stage of the project.

Fast Track Process

The Fast track process would combine the development and design stages of the traditional process using Network Rail Project Speed methodologies. The governance structure would be similar to that used in the traditional process by the formation of a Project Board.

Developing the way forward to the next stage

It is not proportionate at the SOBC stage to present a formally worked up programme plan. However, to give an indication of the earliest probable delivery date using the Fast Track process is shown in Table 6.2 below. This serves as a checklist to gauge progress towards Implementation authorisation and consequently delivery of the scheme:

Milestone	Start	Complete	Comments
SOBC	July 20	May 21	This paper
SOBC evaluation, Fast Track process design and contract award to NR	June 21	Sept 21	
Fast Track Development and design and Authority to Proceed to Implementation	Sept 21	May 22	
Implementation	May 22	June 24	- Based on Okehampton scheme timescales - First train running June 24

Table 6.2 - High level programme time-scales

Areas Needing Further Study at the next stage (OBC or Fast Track)

There are particular areas where the scope of the proposal needs to be determined as part of the next stage in order to get to a Single Option. Table 6.3. below highlights the key areas.

Title	Background
Through services opportunity	Revenue forecasts are based on Burton-Leicester services only but there could be an opportunity to create through services to increase revenue, e.g. through Burton to Derby and through Leicester to join up with the Ivanhoe phase 1 service running up to Loughborough and beyond.
Stabling	Stabling at Derby Etches Park has been assumed, but there is a lack of space so either capacity needs adding or an alternative stabling location developed, e.g. NEMESIS at Burton. Stabling location likely to depend upon TOC running services on the line.
Station sites	All station sites are proposals that have been made to enable revenue forecasts to be produced. Validating these proposals needs to be a function of the OBC stage.

Title	Background
Station volumes	OpEx and revenue modelling for up to 8 stations has been completed. The Network Rail capacity report states the maximum number of stations that can be supported is 6, but with a run time of ~53 minutes an hourly service to 8 stations and running through Leicester (see 1 above) looks possible and needs to be studied as an option at the OBC stage.
Phasing	A key item for development will be how the project is phased, with staged opening.
Car parks	The maintenance and operation of car parks will be subject to further investigation/negotiation, with precise arrangements likely to vary by location.
Bus service abstraction	The extent to which existing bus services will be impacted and how the effect on subsidies will be offset by new bus service opportunities will need further study.

Table 6.3 - Areas needing further study

Immediate next steps

The following next steps are envisaged:

Traditional Process

- Establishment of the Project Board.
- Agreement on the procurement route for the development stage.
- Developing a specification for the development stage which can then be priced (competitively or by Network Rail).
- Confirmation whether Leicestershire CC or Network Rail will act as lead sponsor/promoter.

Fast Track Process

- Establishment of the Project Board.
- Agreement on the Fast Track Process design
- Developing a specification and funding of the Fast Track stage
- Award of Fast Track process contract to Network Rail;

Annex A - Light Rail

The possibility of using a Light Rail solution was investigated. There were two potential solutions under consideration:

1. A light rail solution running throughout the length of the line using the existing railway.
2. Accessing Leicester by running a light rail route into the City Bus station area, diverging from the Ivanhoe line route in the vicinity of Meynells Gorse.

CRIL consulted a panel of Light Rail experts assembled by Simon Coultard, Network Rail's Light Rail lead. The panel included subject matter experts who were working on the Nottingham and Coventry Light Rail projects. One of these was familiar with the Ivanhoe Line.

The first option was universally agreed to have few advantages, and many disadvantages. The construction cost savings often provided by light rail are not applicable because:

- The existing track bed and much of the track work already exists
- The need to continue to run freight on the line means that cheaper light rail track could not be used
- The relatively long distances would make the construction of an overhead traction power supply system expensive. Although autonomous trams are being developed their performance and range is as yet unproven.

Although a map study showed that a light rail route from Meynell's Gorse to Leicester City bus station could be available, this second option was not practical as the intervention offered must meet the initial need to provide a service into Leicester. The main reasons were:

- Leicester City Council have not identified a need for this provision.
- The light rail system would take a lot longer to implement than the restoration of services on the Ivanhoe Line.
- A light rail system using overhead electric traction would be more expensive than upgrading the Ivanhoe Line
- An autonomous battery powered ultra light system would be an inappropriate choice before results from the Coventry pilot are available.
- The service would involve passengers from the Ivanhoe Line changing at Meynells Gorse, and not being able to travel to destinations on the National Rail network beyond Leicester.

It was however noted that the provision of this style of service in addition to the National Rail service from Burton to Leicester could be considered at a later date if Leicester City Council identified a need and when Ultra Light Rail is proven.

Annex B - Potential benefits balanced scorecard

Journey Times

The potential journey times for each option are illustrated in Table B.1 below.

Journey Leg	Rail¹	Bus²	Car³
Burton - Ashby	17	45	27
Ashby - Coalville	4.30	22	12
Coalville - Leicester	20	64	31
Total (Minutes)	41	131	61

1Network Rail Ivanhoe RYR CA Draft Report v0.4

2 Arriva service no. 29/29A

3 Car journey off peak (Google Maps 17:03:21)

Peak journey times significantly longer

Table B.1 - Journey time analysis

In order to assess the potential benefits offered by each potential intervention under consideration in a manner proportionate to the SOBC stage, each potential benefit was rated as being low (3), medium (2) or high (1). The benefits rated are:

- Journey time - Impact on reducing journey times along the route.
- Congestion - The reduction of road congestion.
- Commuting - The attractiveness to commuters for their daily travel to work.
- Construction disruption - The disruption on existing transport services caused by construction work.
- Socio economic improvement - The impact on social economic disadvantage.
- Speed of implementation - Length of time until benefits are realised.
- Environmental - The reduction in all types of pollution in the Burton to Leicester corridor.

It should be noted this scoring is a rating not a ranking.

A comparison of the benefits of each potential intervention is summarised in Table B.2 below.

Benefit rating (1 high)	Rail	Bus	Car
Journey Times	1	3	2
Congestion	1	3	3
Commuting	2	3	2
Construction disruption	1	1	3
Socio economic improvement	1	2	2
Speed of implementation	2	1	3
Environmental	1	3	3
Totals	9	16	18

Table B.2 - Benefit analysis

Annex C - CapEx costs

Assumptions

The following assumptions have been used in the preparation of the Economic Case.

- The permanent way, level crossings and signalling will be upgraded to enable a passenger service with trains running up to 60 miles per hour.
- The North curve at Knighton junction will be restored as part of the full scheme to enable trains to run directly into Leicester station.
- There will be one new passing loop installed on the single track section at the new Leicester South Station.
- Up to an initial six intermediate stations between Burton and Leicester.
- All new stations are unmanned and as far as possible built to the same low cost, no frills design.
- The track upgrades on the MML in the Leicester area recommended in the Network Rail Leicester Area Strategic Advice document²⁴ are funded separately.
- Service pattern and rolling stock as outlined in Annex E.
- The introduction of services will be phased to allow early implementation, with the connection to Leicester main line additional stations being added later.
- A package blending government funding with private third party funding to cover capital and transitional operating costs whilst traffic revenues build to make the line self-sustaining.

The full estimate for our CapEx figures is included an associated spreadsheet (CRIL CapEx Estimates.xls)

²⁴ See [Leicester Area Strategic Advice 2020 \(networkrail.co.uk\)](https://www.networkrail.co.uk/leicester-area-strategic-advice-2020)

Annex D - Revenue Forecasting

Introduction

Forecast revenue is in the range £4.05m to £8.36m per annum, depending the roll-out of services, based on passenger fares and car parking. The lowest revenue is associated with an initial service that maximises connectivity for the minimum number of new stations (option 1). The maximum revenue arises from all possible foreseen stations and services running through to Leicester. Note that the revenue forecast assumes a service running Burton to Leicester only, despite through-services being possible at both ends and being capable of generating additional revenue.

This Annex explains how that forecast has been derived along with limitations and opportunities for further development.

Topography

The Ivanhoe Line runs from Burton-on-Trent to Leicester, in a south-east direction. It runs parallel to the A511 primary road (what was called the A50 prior to the opening of the M1 j24-Stoke dual carriageway).

At the Burton end the River Trent forms a natural barrier to transport where there are only two road bridges over the river. This leads to congestion between what are in effect suburbs of Burton (Stapenhill and Winhill) and the town centre.

In recent years the area at northern end of the line has seen an influx of people from the West Midlands, taking advantage of lower house prices. This has driven up congestion levels due to commuting.

The northern section of the line between Coalville and Burton is more heavily developed, both by industry and for housing, whereas the southern section of the line between Coalville and Leicester is less heavily developed, with the line running through more open country. These differences are reflected in the proposed station sites below.

Proposed station sites

To enable revenue to be estimated station sites need to be proposed. For the revenue model eight stations have been suggested, as below, although the stations at Moira and Ellistown could be provided later, at a cost of tourism revenue and sponsorship opportunities. A rationale for each station follows.

Stapenhill & Drakelow

This station site has been reserved by South Derbyshire DC (SDDC) to serve Stapenhill and the new housing development at Drakelow of 2,500 houses on the site of the old coal fired power station. This station should provide some relief to the congestion on the road bridges over the Trent and a link to onward public transport to commuters to the West Midlands.

Castle Gresley

This station serves not only Castle Gresley but the conurbation of Swadlincote, Upper & Lower Midway, Woodville and Newhall, which together form the ninth largest town in England without a rail connection and the largest town outside a conurbation. A station site has been reserved by SDDC.

Moir

This station sits in the heart of the National Forest tourism attractions of Conkers, Moira Furnace and Hicks Lodge and is reliant on tourism to justify its inclusion. A station site has been suggested in collaboration with the National Forest Operations Director. North West Leicestershire District Council (NWLDC) have yet to confirm a site.

Ashby-de-la-Zouch

This spa town sits on the A511/A52(M42 nearer Birmingham) junction. As such it is a busy transport hub subject to industrial and housing development. It has a good retail centre and an English Heritage castle. NWLDC has yet to propose a station site so for analysis purposes, a site adjacent to the old station has been used, as the old station now being in private hands and part of the original station grounds are built on. For rail passengers wanting to walk and cycle to the station this site looks a good choice, but for people wanting to drive to the station, an edge of town site away from the traffic would look a better choice.

Coalville

This town sits midway between Burton and Leicester and was the heart of the North West Leicestershire coalfield. The closure of the coalfields has led to large areas of brownfield land being released for redevelopment. The town is spreading out to envelop Whitwick, Hugglescote, Swannington, Greenhill, Snibston and Donington le Heath. It is already the 15th largest town in England without a rail connection and 4th largest outside a conurbation. A housing development of 4,450 houses planned at Hugglescote will in effect join Ellistown to Coalville. NWLDC has yet to confirm a station site but a site just to the south of the original station site has been used for analysis, given it is served by an existing footbridge and car park.

Ellistown

The proposed station site is adjacent to the Interlink Business Park between Bardon and Ellistown where there used to be a set of sidings called Cliffhill that served the nearby Cliffe Hill Quarry. This inward investment, including companies like Amazon and Eddie Stobart has led to a lot of inward commuting and pressure to build more houses. The 4,450 houses mentioned above will be bordered by the line and the proposed station site that has yet to be agreed by NWLDC. This station will also serve Bagworth village. With Interlink Business Park employers bussing people into their site we anticipate a strong road-rail migration arising from this station as well as sponsorship opportunities.

Meynell's Gorse

This is an existing Park & Ride site on the outskirts of Leicester that abuts the line and will form a natural road-rail migration point for commuters into Leicester, as well as Leicester (and potentially

Blaby and Hinckley & Bosworth) residents commuting to places of employment further up the line. There are also nearby industrial developments so this station will also serve as a commuting end point. Whilst not confirmed with Leicester City Council there are no issues foreseen.

Leicester South

This site is adjacent to the Leicester City Football Club (aka the King Power Stadium) to the north, and a large British Gas site with the National Gas Museum, to the south. The Leicester Tigers rugby ground is a short walk up the A426 as is one of Leicester College campuses and numerous places of employment and leisure. As well as match day transport demand from attending hospitality suites is expected. If, as expected, delays in accessing Leicester station are encountered, due to delays in recreating the northbound curve at Knighton or in getting paths into Leicester station, this station can serve as a temporary terminus to trains coming into Leicester from Burton. The bus services already serving the stadium will need reinforcing.

Station sites discounted

A balance between station sites to enlarge catchment and the speed of journeys needs to be struck. The following original station sites have been discounted:

- **Swannington**, which can be served from Coalville.
- **Bagworth**, which doesn't have a large enough catchment and can be served from the Ellistown station mentioned above.
- **Desford**, where the line runs to the north of the village but the industrial complex to the south of the village with its 2,000 employees is over two miles from the station. Once the line is open the need for this station can be reassessed. There is already pressure to provide it with the local MP taking soundings, but without a commitment to providing transport links it looks hard to justify initially and may be better served by a parkway station at Merrylees.
- **Kirby Muxloe**, where the use of the nearby Meynell's Gorse station is proposed. The later addition of a Kirby Muxloe station, once the demand has been established, is a possibility.

Fare Forecasting Approach

New stations

The overall approach to fare revenue forecasting is one of comparing catchment areas and fare revenues on comparable stations and lines with the Ivanhoe line. To this end data has been obtained from several sources:

1. Postcode Address File (PAF). A listing of every address in the country from the Post Office. Processed, this gives us the number of residences for every postcode.
2. Open Codepoint from the Ordnance Survey. This file provides a grid reference for every postcode.
3. Fare and footfall data from East Midland Railways for the comparable stations and lines we have identified. This data is extracted in a complex process and is subject to an NDA, so cannot be shared widely.

Using the first two data sources it is possible to calculate the population in radial catchment of a potential station site, using a population per residence figure of 1.9 (from South Derbyshire DC).

The radial distance used is 5km (but it should be noted that this distance could be increased through the provision of bus services), which is too far to walk, an easy cycle and probably too small for car drivers, so something of a compromise. Where stations are closer than 10km this would lead to double counting, so the populations in catchment have been reduced by a factor to account for this issue, albeit on the assumption that population density is even across the radial catchment area.

This approach to populations in catchment has been applied in our analysis to all the proposed stations on the Ivanhoe line as well as all the stations analysed on the comparable lines.

The comparable lines analysed are:

1. Nottingham-Worksop, aka the Robin Hood line.
2. Nottingham-Newark.
3. Nottingham-Grantham, part of the Poacher Line.
4. Newark-Lincoln.
5. Derby-Matlock.

For each line the revenue per head of population in catchment has been calculated using the data sources above. The first three lines above have remarkably similar revenue per head of population served and have been used to forecast the Ivanhoe line fare revenue. The other two lines have considerably higher revenue per head of population served, mainly due to the presence of outliers, potentially due to the presence of long distance commuters that are not thought to arise on the Ivanhoe line, so have not been used.

In addition to the above, future house building sites along the Ivanhoe line have been identified from council local plans and added to the demand, which given the explosive growth along the Ivanhoe line needs to be factored in.

When studying comparable lines and stations it is apparent that stations in the middle of a route generate a higher revenue per head of population in catchment than stations towards the end of the route. An attempt has been made to apply compensating factors to mirror this affect in the revenue model.

End-end revenue

Revenue for Leicester-Burton passengers has also been added, based on the lowest end-end revenue from the five lines analysed.

Tourism

The Ivanhoe Line runs through most of the National Forest, a developing tourism destination. Working with the National Forest Operations Director a STEAM²⁵ report has been run to establish current visitor numbers. Past visitor numbers have also been used to establish growth rates, which have averaged 17% over the two previous 5-year periods. The visitor attractions centre on Conkers, next to the proposed Moira station, so tourism passenger demand has been assessed against this station only, but there are other tourism destinations on the line, e.g. Ashby-De-La-

²⁵ See [STEAM model | Tourism Research | UK | Global Tourism Solutions \(UK\) Ltd](#)

Zouch is a spa town with an English Heritage castle that have not been included, so the tourism demand may be understated.

The National Forest estimate a 5% increase in tourism as a result of the Moira station being reopened, which combined with the average revenue per passenger at Moira plus the expected growth rate, assuming a 2024 service resumption date and linear growth based on the two previous 5-year periods enables a forecast to be made. As noted in the Economic Case, a year after the Borders Railway reopened, Abbotsford, the former home of Sir Walter Scott, saw a 250% increase in visitors which along with the pressure on staycations makes 5% look a conservative estimate. It should be noted that further visitor attractions are being added, so this trend looks set to continue.

It is therefore reasonable to assume that if the area were more accessible by public transport a wider range of attractions would be built, especially for weekend visitors. These new attractions will be developed as they become commercially viable. When this happens tourism growth rates grow at a much greater rate. This type of growth would particularly benefit local entrepreneurs in the bed and breakfast, hospitality and outdoor adventure sectors, e.g. bike hire.

Sporting venues

The proposed Leicester South station not only serves the surrounding population and industrial premises but also Leicester City Football Club and Leicester Tigers Rugby Union club. Whilst there is obvious demand on match days, when “football specials” are an opportunity, both grounds also house extensive hospitality suites, as follows:

- LCFC – eight suites with an average size of 116 delegates.
- Tigers – 34 suites capable of housing up to 1000 delegates.

An attempt has been made to forecast both match day passenger demand and delegate attendance demand at both these stadiums.

Car Parking

Car parking revenue forecasting is based on an expected car park size, based on catchment area, weekday and weekend occupancies and a daily cost of £3. These calculations are highly speculative and will in reality be affected by multiple local factors.

Limitations and Opportunities

The revenue forecast has been produced from a desktop analysis, without full involvement of councils along the line. To some extent it is theoretical in that, with mainline connections at both ends of the line, there are obvious through route opportunities that provide access to employment and education, with rail access to four major universities (Derby, Leicester, De Montfort and Loughborough) from stations along the line becoming possible. Assessing student commuting demand has not been attempted.

A comparison of employment commuters between the Ivanhoe Line and the Robin Hood Line (Nottingham-Worksop) has been attempted using NOMIS data. This is highly approximate as employment data within radial distances of stations is not available in NOMIS, so the lowest level of analysis area has been used. The analysis revealed similar results, with the expected differences

in employment type and the skewing of the results due to the inclusion of the Queens Medical Centre in Nottingham affecting the number of employees working in health. No great conclusions were drawn from this analysis other than the comparisons between the lines are reasonably valid, from an employment point of view.

The line is already open for freight, albeit at low speed due to the state of the line. Once upgraded the line may well attract more freight traffic, especially as the line runs through the so-called “logistics golden triangle”. Long term this can only increase as the pressure on carbon emissions increases. However, no revenue from additional freight traffic has been included in the model.

The opening of the line to passengers will result in large journey time reductions. For the SOBC there has been no attempt to cost the benefit of these time reductions, a factor that will need picking up at the next stage.

Revenue Models

To produce revenue forecasts six Excel models have been produced, covering between four and eight stations and the final service through to Leicester. The expectation is that the initial service will involve the four stations of Castle Gresley, Ashby, Coalville and Leicester South, which maximises population connectivity for the minimum number of stations. Publishing all the models in this document is inappropriate but a copy of the Excel workbook is available on request. Note that some of the underlying data was supplied under an NDA from EMR, and cannot be circulated widely.

Summary

Whilst the revenue model may look optimistic, given the exclusion of several potential revenue streams and the conservative use of comparable station data it is felt that the revenue forecast should be exceeded in practice.

Annex E - Operating Costs

Operating costs are affected by three key input parameters:

- 1. Stations.** Eight stations are the ideal ultimate number of stations but it is recognised that opening the line with all in place is expensive and unlikely. The expectation is that the line will open with four “core” stations of Castle Gresley, Ashby, Coalville and Leicester South, with the latter forming a terminus while the Knighton Curve is reinstated and the track and platform works detailed in the Leicester Area Strategic Advice document are completed, to enable access to Leicester station. The core stations provide an East-West Midlands link and connect the key towns along the route.
- 2. Service pattern.** Two basic service patterns have been analysed, an hourly service and a blended service of 30 minute peak and hourly off-peak service. The initial line opening is expected to feature an hourly service only with a blended service being the ultimate objective once demand has been established. The hourly service would start at 0600 at Burton and finish back at Burton at 2300. The blended service would add half hourly services from 0630-0930 and 1630-1830, to address expected commuter demand. It should be noted that the Network Rail capacity report stated that an hourly service to all eight stations terminating at Leicester is not possible, however if the service pattern involved running through Leicester to Loughborough calling at the Ivanhoe Line phase 1 stations an eight station service should be possible. The existing Ivanhoe phase 1 service is hourly which would match the initial service we are expecting to provide. The additional peak time services forecast in the blended service could call at less stations, if it has to terminate at Leicester, in order to alleviate Network Rail concerns. Carrying on through Leicester would actually help relieve the platform congestion issue at Leicester.
- 3. Rolling stock.** Two types of diesel rolling stock have been analysed, Type 158 (as used extensively by East Midlands Trans and Type 170, as used extensively by Cross Country Trains. A battery powered service using Vivarail Class 230 rolling stock is possible but will need a detailed system design creating and will need to be the subject of a separate study.

The operating costs summary can be seen below in Table E1. below with the initially expected hourly service to core station costs being highlighted.

Service Pattern		Hourly		Blended	
Rolling stock		Type 158	Type 170	Type 158	Type 170
Stations	Core stations: Gresley, Ashby, Coalville, Leicester South				
	+ Meynell's Gorse				
	+ Drakelow				
	+ Moira				
	+ Ellistown				
	Ultimate, terminating at Leicester station				

Table E1

The operating costs forecast has been produced based on the following input parameters:

- **Stabling at Derby.** This is an assumption based on Derby being the preferred East Midlands Railways stabling and crew staffing location. Another TOC, e.g. Cross Country Trains may well prefer a different stabling location like Leicester, given this is a Cross Country train crew

staffing point. Alternative stabling locations will need exploring at a later stage as stabling capacity at Derby looks to be limited, NEMESIS at Burton being one option to be explored.

- **18 train crews**, for the blended service and 10 train crews for the hourly service, a driver and a guard for each train, running without a guard assumed to be not possible and given the unstaffed nature of the new station proposals a significant revenue leak risk.
- **Stations**, as detailed in Annex D, albeit with only the core stations being served initially.

To produce the OpEx forecasts, four tables in Excel have been produced to cover the combinations of terminating at Leicester South, terminating at Leicester and the hourly and blended service pattern options. An Excel copy is available on request.

Electrically delivered service

From an environmental benefit perspective (air pollution and noise pollution) an electrically delivered service is obviously preferable and would help address feedback from some residents living next to the line concerning noise pollution. Overhead electrification is unlikely in the near future and would have visual impact. Hydrogen powered trains in the UK are in their infancy (albeit being actively developed by Porterbrook and Alstom), but a battery powered service is possible, with the Vivarail Class 230²⁶, the converted and upgraded former London Underground D78 rolling stock about to be deployed on the Isle of Wight. Other battery powered options are expected to become available.

A three-car Class 230 train is roughly equivalent to a two-vehicle Class 156 or 170 train. With a 10-minute charge being enough to take a train 100 miles and the purely Ivanhoe Line service being 31 miles each way, a battery delivered service is potentially an option. To achieve the high charging rates required a set of batteries in a container are trickle charged in an ISO container adjacent to the station while not in use, then quickly discharged to charge a train. The rate at which the recharging batteries can be recharged/recycled will dictate how many recharging stations are required, along with the availability of the required grid connection. These batteries can also supply EVs in the station car park.

To cost this option at the OBC stage it is suggested that Vivarail are engaged to design a whole system solution, covering CapEx and OpEx costs, that will need to include:

- The Ivanhoe Line topology of stations, lines, running speeds and gradients.
- Any through service options, e.g. running through Leicester to Loughborough.
- Most intense service pattern.

Given the complexity of the ensuing operating costs an operating cost model for this option has not been prepared for the SOBC. With battery technology the subject of intense development and cost reduction it is likely cost models will need to be based on an in-service date and associated capacities at that time.

As with EVs, there is a high up-front CapEx cost but lower running costs, both from a fuelling and a maintenance perspective. Vivarail estimate a payback period of six years. Added to these benefits will be the wider economic impact of reduced pollution and with a potential better passenger experience, higher patronage. If carbon taxes become a future legislation regime the payback period would shorten.

²⁶See Country spec at [Class 230 Design Configuration - Vivarail](#)

Negative considerations are:

- A lack of flexibility, where it would take a system solution approach to ensure the right charging infrastructure is in place and short notice use on other lines/services would not be possible. A small, dedicated, fleet would also need to be made available.
- Short notice changes in service pattern that drive a review of charging points and capacity would not be possible, and involve additional CapEx.
- The need for stabling functionality that enables battery changes (e.g. concrete pad alongside the line to enable fork lift access) that may not be available at conventional stabling locations.
- The need for different financial models to address the CapEx costs.
- The need for a coupling convertor (available), because the couplings differ from those in use on the main network, in case of the need to move a train in the event of a breakdown.

Annex F - Environmental Benefit

Derby University have been engaged to look at the environmental benefits of reopening the line to passengers. The objective of this engagement is to develop best practice in assessing the environmental benefits of reopening the line along with a transportable methodology that can be used on other railway line reopenings. A more complete report, with an accompanying tool, will be made available shortly and Derby Uni will be bidding for additional funding to carry on developing this work stream.

Their initial report follows.

The Sustainability Case

Introduction

Our research indicates that there is limited conventional guidance with respect to developing a business case for a railway that is truly sustainable. Railways are always ever going to be enablers, the characteristics, benefits and effectiveness of which cannot be replicated by alternative transport modes.

In order to design and capture the sustainable value of our proposed investment we will apply a 'Measures that Matter' policy to influence our future planning and investment process. The Measures that Matter framework has been designed to have sustainability at its core and includes the necessary requirement to balance the three Social, Economic and Environmental dimensions with the Railway investment playing a key part to impact all three. For example, investment in just one dimension would have a detrimental impact in the other two.

Railway Sustainability Investment Framework

The framework articulates the planned and continuously enabling sustainability factors of the railway investment. Sustainability strategies will be outlined further and managed as ongoing programmes on an annual basis and captures, for example:

- Positive Societal impact- enabling travel for education, improving diversity, employment opportunities, and connecting friends and families, boosting the welfare of communities across the network, improving the health and wellbeing of travellers by supporting active travel.
- Positive Environmental Impact – enabling policies that will switch from the conventional 'take-make-waste' practices to optimising what's already available, for example adopting brown field site policies, incentivising the actively displacing of less sustainable transport modes by moving traffic off roads to rail within the community, making the rail system the transport mode of choice.
- Positive Economic Impact – enabling a viable network of stakeholders that have a vested interest in the operation of the railway being a going concern. This includes engaging with businesses in securing their employee pool by getting them to work, encouraging 'micro-freight' opportunities, exploiting the timetable, shifting logistics from road to rail by exploiting the potential local reach of the urban rail network.

We propose to adopt this framework as an additional and continuous value for money assurance mechanism due to the realisation that the rail transport sector is in a state of flux. This is due to the effectiveness of railway franchise operating models coming to an end, changes arising from outcome of The Williams Report, the impact of future revenue models from the recent pandemic, changes in the Green Book seeking to target more sustainable longer term value as well as considering the 'levelling-up' Government initiative.

Our framework requires adopting a systems approach to create 'sustainability opportunities' or 'networks' where the railway will play a key enabler in supporting these opportunities in the short, medium and longer term. These opportunities will become programmes involving internal and stakeholders that will need to play a key role in creating value. As an example, the railway will be seen as a key enabler to provide opportunities for education, enabling those in and around the local station communities to travel to education centres. Investment and travel subsidies would be sought for student travel from the relevant stakeholders who would benefit from the growth in student population. This mapping would have a balanced impact on social, economic and environmental dimensions. Other sustainability opportunities include for example reducing the burden on local Health Services through the introduction of Active Travel, justifying the demand for changes to local highway infrastructure, subsidies for travel from local employers to enable access to a wider employee skills base.

Our Measures that Matter framework also includes other enablers such as the requirement to adopt Circular Economic practices. Each rail asset intervention would be assessed in terms of its 'Circular Economic Readiness' to determine which asset interventions are the most viable and sustainable. A good example of adopting this approach is that investment would look more favourably at using repurposed rollingstock that has had its remaining life extended rather than the need to invest in new.

The main objective of this approach is to adopt sustainability at the core of all CRIL investments, making visible the social, economic and environmental impact the railway has and the enabling value the railway creates to wider stakeholder community.

Annex G - Leicester Area Strategic Advice

Network Rail have prepared a Leicester Area Strategic Advice document²⁷ to recommend changes in the track layout in the Leicester area. This work has arisen to meet several demands:

- More frequent services to Birmingham.
- A direct Coventry service (currently needs a change at Nuneaton with extended journey time).
- A direct Leeds service.
- More freight capacity on the critical Felixstowe-Nuneaton (aka F2N) route.
- The remodelling of Leicester station to meet Leicester City Council plans.

Whilst the aspiration to reopen the Ivanhoe Line to passengers is noted, it has not been factored into the designs presented in the document.

The Leicester Area Strategic Advice document has identified the need to double the running lines (i.e. 4-track) from south of Knighton through to the north side of Leicester station. The document includes a track design for this work.

A Capacity Analysis has been commissioned by CRIL to assess the network's capacity to support the additional passenger traffic required by CRIL's proposal to restore passenger services on the Ivanhoe Line. This analysis has identified that the proposed extra running lines through Leicester will allow access to Leicester Station from the Ivanhoe line via the restored North Curve. However the currently proposed configuration will require a minor alteration to the new crossover south of Leicester to free the paths required by services on the Ivanhoe Line.

The Network Rail capacity analysis team who carried out the analysis for CRIL are also doing the design work for the new layout, and have noted the need to incorporate this change into the design moving forward. Early indications are that this can be achieved without issue.

²⁷ See [Leicester Area Strategic Advice 2020 \(networkrail.co.uk\)](https://www.networkrail.co.uk/leicester-area-strategic-advice-2020)

Annex H - Shovel Readiness

This Annex describes in more detail the status of the various elements of the scheme which impact on its Shovel Readiness

Land. All the land needed to upgrade the line and build the stations is owned by Network Rail, with the exception of the North Curve at Knighton. However the land is owned by Leicester City Council who have confirmed it could be made available and given an indication of the cost of clearing it. This is allowed for in the CapEx estimates.

Track. The track required exists and is in service, with the exception of the short length required to restore the North Curve mentioned above. The track and signalling will require to be upgraded and a passing loop installed at Leicester South station.

Burton Station. The bay platform needed to terminate trains at Burton Station exists and needs refurbishing. The bay platform connects to the Ivanhoe line. A short length of bi directional running and a crossover are required on the Ivanhoe line.

Access to live railway to carry out works. Existing traffic levels are very light on the Ivanhoe Line, and almost non-existent at weekends and at night. Engineers' possession of the railway to carry out upgrades should be fairly straight forward.

Annex J - Programme Assumptions, Risks & Issues

Any programme of the magnitude of the restoration of passenger services on the Ivanhoe Line is going to have to manage some issues. These will need to be monitored carefully during both the business case and construction phases, and any risks that arise from these issues managed accordingly.

Assumptions

The following assumptions are made in this SOBC which will need to be tested in the OBC stage:

- There will be one new passing loop installed on the single track section at the new Leicester South Station.
- Up to eight intermediate stations between Burton and Leicester.
- The North curve at Knighton will be restored using the old alignment.
- The track upgrades on the MML in the Leicester area recommended in the Network Rail Strategic Advice document and minor alterations to the current track layouts go ahead and are funded separately.
- Service pattern and rolling stock are as outlined in Annex E.
- Whilst station buildings, platforms etc. are to be included in the scheme, site access, car parking and bike storage facilities are to be provided in coordination with local authorities.

Scheme Risks

The scheme itself described in this SOBC has risks associated with its implementation. These will need further examination at the OBC stage and mitigation measures recommended. Risks identified are listed below

- Disruption to freight services currently running on the line.
- The Network Rail Capacity Analysis carried out indicates that the proposed intervention can be timetabled on the line. There is a risk that changes to circumstances may impact on timetabling of services.
- Current passenger demand volumes used in this SOBC may change as travel patterns change post Covid-19
- All 9 local authorities on the line do not continue to support the scheme.

Scheme Issues

The following issue has been identified and will need to be researched further and resolutions adopted at the OBC stage.

- Stabling for the trains running on the line need to be identified with the TOC operating the services when that, and the type of stock to be used, is known. It is possible that suitable stabling may incur CapEx costs and impact on OpEx costs.

Annex L – Supporters

The supporters of this reopening proposal include:

MPs

- Andrew Bridgen, Northwest Leicestershire– lead sponsor
- Heather Wheeler, South Derbyshire
- Kate Griffiths, Burton
- Luke Evans, Hinckley & Bosworth
- Jon Ashworth, Leicester South

Councils

Tier 1

- Derbyshire
- Leicester City
- Leicestershire
- Staffordshire

Tier 2

- Blaby DC
- East Staffordshire
- Hinckley & Bosworth BC
- Northwest Leicestershire
- South Derbyshire

TOCs

East Midlands Railways support the line reopening and have expressed an interest in running services on it.

A more complete list of supporters is being compiled, for later submission.