Greater Lincolnshire LEP Rail Study

Final Report January 2016

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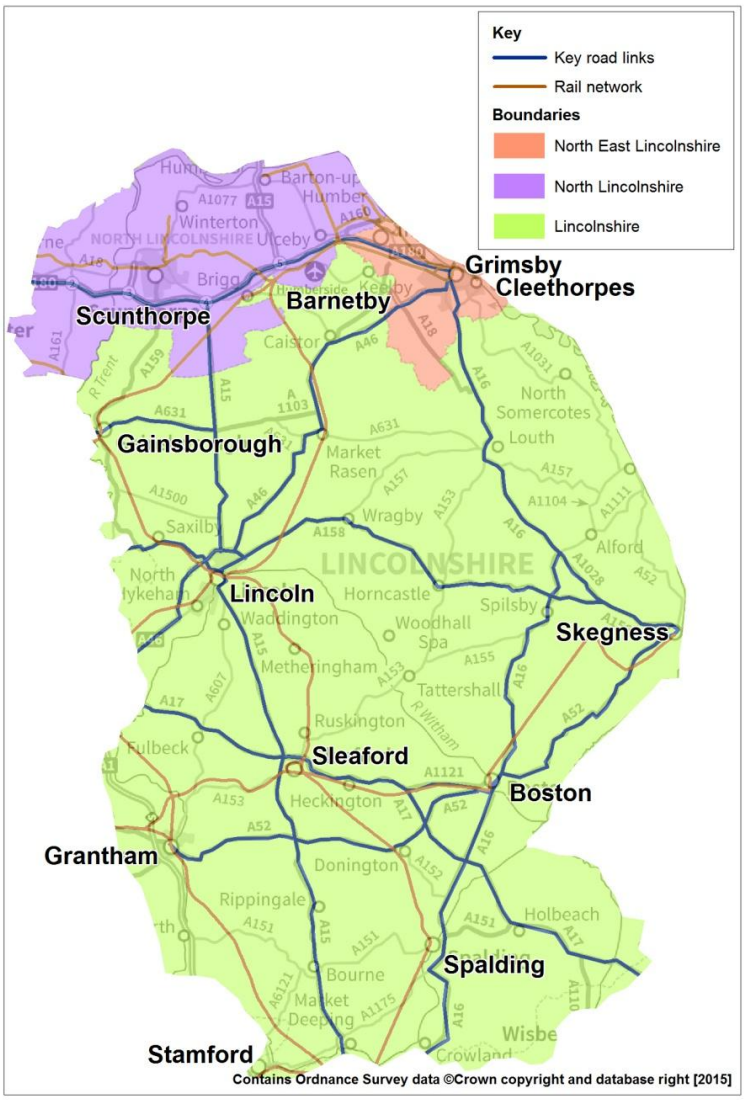
Contents

Tables and Figures

0 Executive Summary

0.1 *This report examines the role that rail plays in the Greater Lincolnshire Local Enterprise Partnership (LEP) area[1], the benefits to the economy that improvements to services might bring, and the types of service improvements that might deliver these benefits. We begin by applying an economic modelling framework that estimates the size of the benefits to be gained from improvements, before moving on to examine at a route level how services might be enhanced to deliver these benefits. From this a delivery framework has been developed for implementing the service changes identified.*

Figure 0.1 Greater Lincolnshire LEP Area – Main Rail and Road Links



[1] *An area covering the County of Lincolnshire and the Unitary Authorities of North Lincolnshire and North East Lincolnshire*

The Role of Rail in Greater Lincolnshire

0.2 *At the present time rail has a varied role across the Greater Lincolnshire area. Many services are characterised by their rural nature, and for historic and geographical reasons the Greater Lincolnshire network is comparatively isolated from the rest of the rail network.*

0.3 *The main city of Lincoln lacks the strategic service that might be expected for a city of its size, with a very limited service to London and no east – west services running beyond Nottingham. Whilst the service to London is to be substantially improved from 2019 there are presently no clear plans for the improvement of east-west services beyond Nottingham.*

0.4 *Over the last 20 years there have been relatively few changes to the rail network with almost no service enhancements or changes to rolling stock. Despite this, rail use across the county has grown, with an overall increase in patronage in excess of 60% and increases at main stations such as Lincoln of around 90%, showing that there is clearly a demand for services. However the stagnation of use in some places in recent years (such as Sleaford), and decline at other locations (such as Skegness), suggests that the existing service has reached the limit of its usefulness with a need to improve services further in order to help support the economy of the area. Despite this historic pattern of under investment the area has recently witnessed the £280million upgrade to the 'Joint Line[2] from Peterborough to Doncaster, which whilst it was designed and implemented in order to benefit freight traffic also provides potential benefits to local passenger services.*

Economic Impacts of Improving Services

0.5 *The results of our economic modelling indicated substantial benefits to the economy from improvements in rail services. Merely bringing existing services up to a level that Network Rail would define as a 'good' standard nationally could bring about a £34million increase in GDP per year. Improving them to the standard of the best equivalent services in the UK could be worth anywhere between £84m and £167million in extra GDP per year. To put this in context our modelling of the current rail service in the area places their value to the economy at around £161M per annum. The economic prize from enhancing the current level of service is therefore substantial.*

0.6 *These benefits are focussed on flows from the main centres such as Lincoln, Scunthorpe, Grimsby and Cleethorpes. This highlights the strategic importance of rail with the benefits of linkages to areas outside of Greater Lincolnshire being substantially greater than those for movements within the area.*

0.7 *While this implies that the improvement of strategic links is of greatest importance there is nevertheless a need to develop the rail network within Greater Lincolnshire to help develop labour markets and address environmental and social objectives. The improvements needed to services within Greater Lincolnshire are often comparatively minor and may in fact be easier to deliver than some of the more strategic services.*

0.8 *The modelling highlighted a particular need to improve links to the main centres in the East Midlands from Lincoln as well as to West and South Yorkshire, the former via Doncaster and the latter via the existing service to Sheffield.*

[2] So-called as it was a line that was jointly operated by the former Great Northern and Great Eastern railway companies.

Delivering These Aspirations

0.9 *Our analysis has shown that rail can play an important role in strengthening the economy across Greater Lincolnshire, supporting business, tourism and labour markets. However there is a need for further investment to fulfil its potential. To deliver the economic growth that the economic modelling indicates may be achievable will require a number of improvements which would be drawn from some or all of the following types of intervention:*

- *Development of strategic links - especially east-west links to the East Midlands, Yorkshire and the North West, but also south towards London.*
- *Infill service improvements - filling in gaps in timetables and improving Sunday services for example.*
- *Journey time reductions - increasing the often extremely low line speeds that prevail across the area.*
- *Transformational schemes – which would deliver fundamental changes to service patterns (but would also be very costly).*

0.10 *All of the above is in addition to the existing commitments to already committed improvements to infrastructure and services made by Network Rail and train operators, such as the introduction of more frequent Lincoln – London services. Throughout the report it is assumed that all of these existing commitments will be delivered.*

0.11 *The opportunity to deliver many of these service enhancements will come with the re-letting of the East Midlands Trains franchise in 2018. With consultation on the new franchise due to begin in July 2016 there is a window of opportunity for the local authorities and the LEP to develop their thinking on what they wish to see from it. Clearly more work is required to understand the operational and commercial impacts of changes, however many of the service enhancements could be delivered with a relatively limited increase in rolling stock provision in the area.*

0.12 *These enhancements could in turn be used to justify the case for further enhancements and ultimately contribute to the delivery of schemes that could transform the role that the rail network plays in supporting the Greater Lincolnshire economy.*

1 Introduction

1.1 In January 2015 JMP Consultants Ltd was commissioned by the Greater Lincolnshire Local Enterprise Partnership (LEP) to prepare a rail strategy for the rail network within the Greater Lincolnshire area. The area covered includes all rail services within the county of Lincolnshire and the unitary authorities of North Lincolnshire and North East Lincolnshire.

1.2 We have examined the linkages between the rail network and the economy of Greater Lincolnshire and modelled the economic benefits of developing the rail network within Greater Lincolnshire. Using these findings combined with information on the current level of service and usage on individual routes as well as information on planned improvements and remaining constraints we have identified a strategy for the development of services over the short, medium and long term.

INTRODUCTION TO THE GREATER LINCOLNSHIRE ECONOMY AND RAIL NETWORK

1.3 The economy of Greater Lincolnshire is dominated by a number of sectors, including agri-food, engineering and manufacturing, the visitor economy and port logistics and renewables. The Greater Lincolnshire area contributes over £16 billion annually to the national economy; however it is still one of the weakest performing areas in the country with a relatively low productivity and a low skilled, low wage economy.

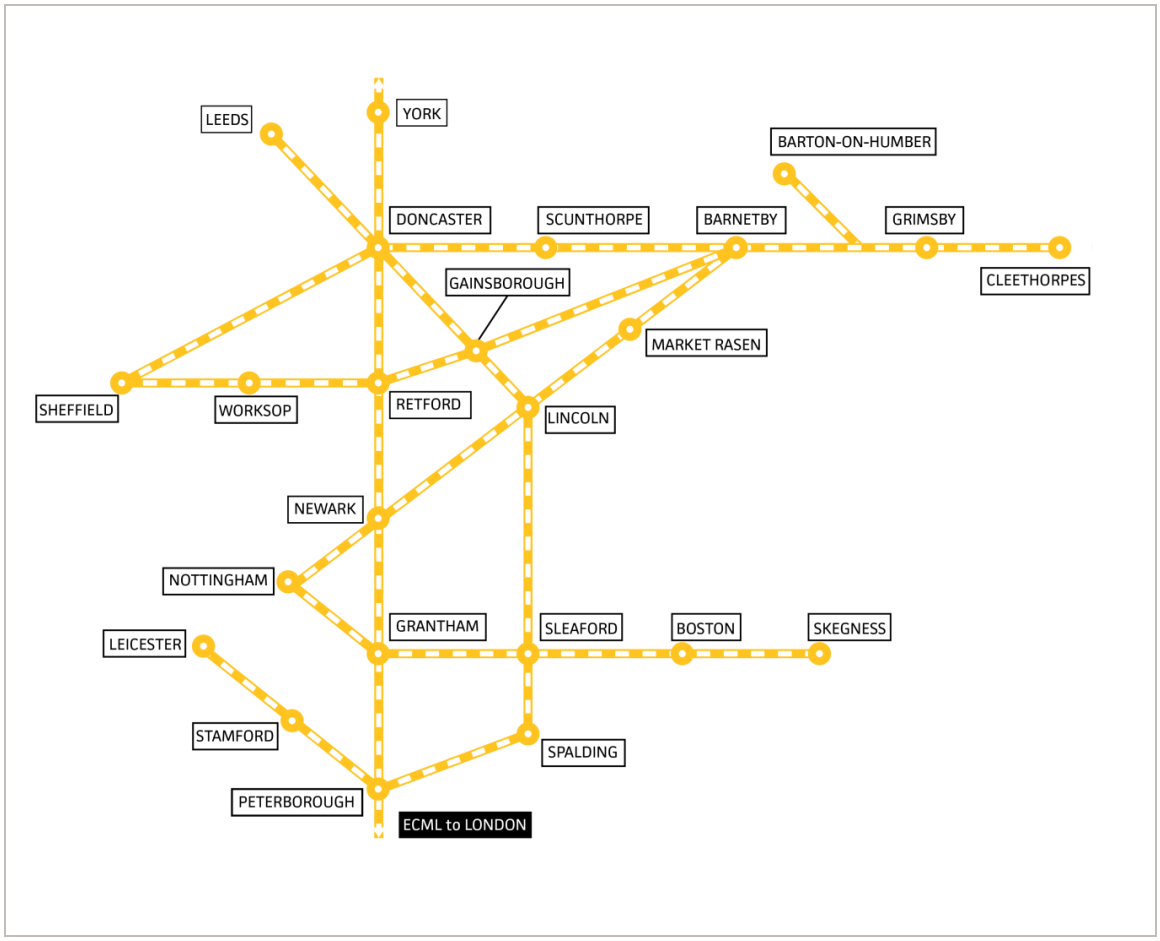
1.4 Through the Local Growth Deal the Greater Lincolnshire LEP has been successful in obtaining support for the development of the economy in the area with funding worth £111.2 million confirmed in July 2014. This investment from central government will bring forward £70 million of additional funding from local partners and the private sector.

1.5 Improved transport links and a strengthened rail service are expected to play a key role in maximising the benefits of this investment.

1.6 There are a number of routes that together form the rail network within Greater Lincolnshire. Reflecting the geography of the area the services provided cover a range of inter-urban and rural links. Long distance services within the heart of Greater Lincolnshire are sparser; however to the west side of the county the East Coast Mainline provides linkages that are of national, regional and sub-regional significance.

1.7 The majority of services within Greater Lincolnshire are delivered by East Midlands Trains (EMT), who operate a mixture of interurban and rural services across the county. To the north of the area Trans Pennine Express (TPE) and Northern are the main operators. The former operates the inter urban service from Cleethorpes to Manchester Airport, whilst Northern Rail have a presence in Lincoln from their Sheffield – Lincoln service and on the South Humber Bank from the stopping service between Sheffield and Scunthorpe. They also operate the Barton-on-Humber branch at the moment, although this will change to EMT from 2017. Virgin East Coast operate the vast majority of services on East Coast Mainline and have a limited presence at Lincoln with one train per day to and from London, though this is planned to increase over the life of the franchise.

Figure 1.1 The Greater Lincolnshire Rail Network



1.8 In addition to passenger operations, freight is of great significance to rail operations in Greater Lincolnshire. The main focus for this activity is on the South Humber Bank at the Port of Immingham. Immingham has historically dealt largely in bulk products, especially, coal, iron ore and petroleum products, all of which have been important markets for rail freight, and the port may expand further to develop into intermodal and container traffics, which would also be attractive for onward movement by rail freight.

1.9 The GN/GE Joint Line from Peterborough to Doncaster is, following its upgrade, developing as a major freight route with the aim of migrating all existing freight flows that use the ECML to this route, and accepting any new flows that develop.

1.10 Rail freight also has a strong presence in North Lincolnshire mainly related to the steelworks at Scunthorpe. Lincolnshire also plays a strategic role in rail freight movement with many north south services operating through the county along the upgraded joint line between Peterborough and Doncaster via Sleaford and Lincoln.

THE EAST MIDLANDS TRAINS FRANCHISE

1.11 The dominant operator of services in the Greater Lincolnshire area is East Midlands Trains. The operator provides the majority of local and regional services in the area and also operates longer distance services such as Lincoln – London via Nottingham and Liverpool – Norwich. The present franchise expires in March 2018 and consultation on the next franchise begins in July 2016. This will

present an important opportunity for stakeholders such as the three local authorities in Greater Lincolnshire and the Greater Lincolnshire LEP to present evidence on their vision for the development of the local rail network. This report sets out options for service development that might be pursued as part of the franchise renewal, although clearly there is a need to examine individual schemes and service options in more detail to understand their revenue and cost implications.

REPORT STRUCTURE

1.12 Following this introduction the report is split into two parts.

1.13 **Part A** describes the economy and the rail network of Greater Lincolnshire and considers what could be achieved in the future. It begins by examining in more detail the role that the rail network plays in Lincolnshire, and identifies some of the existing constraints it faces (Chapter 2). This is followed in Chapter 3 by a description of the economy of Greater Lincolnshire and how this relates to the rail network. Chapter 4 looks to the future and asks what the impact on the economy could be of improvements to the rail network. This chapter contains a description of our modelling of potential service improvements across Greater Lincolnshire which we have used to help identify areas for investment.

1.14 **Part B** is concerned with looking at these improvements and how they could be delivered to help realise these benefits. A series of chapters (5-9) examine individual routes - their usage, potential for development, any constraints that they have and the potential interventions that would help to deliver better services and grow the economy. This culminates in Chapter 10 with a vision for the development of rail services across Greater Lincolnshire. Chapter 11 summarises the findings of the report.

Part A: Rail and the Economy of Greater Lincolnshire – Now and What could be Achieved

2 Rail and its Role in Lincolnshire

FEATURES OF THE NETWORK IN LINCOLNSHIRE

2.1 The rail network in Greater Lincolnshire strongly reflects the geography of the area. The Greater Lincolnshire area is sparsely populated with a small number of larger settlements. The rail network links the majority of these locations, although there is significant variability in the quality of services. Many routes across the area can be characterised as rural. Whilst they perform an inter-urban function they also serve smaller settlements en route, and are characterised by comparatively low frequencies and long journey times. Whilst routes and services may in some areas be relatively indirect or slow the overall coverage is good with the only major gaps in the rail network being on the East Coast where no rail services exist between Skegness and Grimsby, leaving the towns of Horncastle, Mablethorpe and Louth isolated from the rail network.

2.2 The character of the area has tended to determine the types of service operated. The county misses out on being directly served by a north – south mainline, with the East Coast Mainline running to the west of the county. This has limited the scope for developing long distance connectivity in the area, with effectively no long distance services passing through the county (expect at Grantham). Furthermore, the need to cross the ECML has acted as a barrier to the development of better east – west links with the City of Lincoln particularly affected, with an interchange at Nottingham or Sheffield being a requirement for east – west trips, leaving the city isolated from its peers in the East and West Midlands and Yorkshire.

2.3 Services within Greater Lincolnshire tend to be characterised by slow journeys, not helped by poor service frequencies in a number of locations, making rail unattractive compared to road. A number of services do not follow standard service patterns, with for example the Lincoln – Grimsby route seeing eight trains each way per day spread over a 14 hour period but with gaps of approaching three hours at some periods, whilst the Lincoln – Sleaford route see trains operating at broadly hourly intervals but not following a standard series of departures times. It tends to only be those services that interact with other parts of the network that run at fixed minute past each hour, for example the Cleethorpes – Manchester Airport services.

2.4 This situation undermines a potentially very useful rail network that could help support the development of the area. The demographic geography of Greater Lincolnshire is such that the vast majority of the population live in a relatively small number of settlements. An analysis of data in Network Rail's Regional Market Study suggests that 81% of the population of the Greater Lincolnshire area lives within 5km of a railway station, approximately 1/3 of the population of the County of Lincolnshire live within or close to the urban area around Lincoln itself, there are therefore likely to be untapped potential markets for rail around the county.

2.5 A further feature of the rail network across the area is the pattern of stations. On a significant number of routes there are significant gaps between stations, reflecting the low population density across the area. This potentially provides the opportunity to operate fast services providing rapid links between the key settlements in the area. The comparative isolation of the Lincolnshire rail network from the rest of the rail network can also be used as a strength in planning services as it may be possible to plan an integrated

timetable to maximise connection opportunities at key nodes such as Lincoln and Sleaford, potentially following the principles of the Swiss Taktfahrplan[3].

2.6 A number of routes across the area have benefitted in recent years from the development of Community Rail Partnerships which have sought to promote routes and where possible develop services. However their efforts have in some ways been limited by a lack of available resource to effect the changes in service levels which would have a greater impact on the attractiveness of the routes.

DEMAND FOR SERVICES

2.7 Rail services have a varied role in Lincolnshire serving a range of functions. A number of services such as Cleethorpes – Manchester Airport and Lincoln – Nottingham perform a strategic function linking key settlements in the Greater Lincolnshire area with other parts of the UK. These services are used for a mixture of purposes such as business trips, personal and leisure trips by residents of Greater Lincolnshire and by tourists coming into the area either to the coastal destinations or to places such as Lincoln. The success of these services is arguably constrained by poor journey times and frequencies and a lack of connectivity beyond destinations immediately west of Greater Lincolnshire.

2.8 Other services across Greater Lincolnshire provide a mixed role dominated by leisure, education and personal business trips by local residents, the combination of journey times and frequencies of most services makes car more attractive for business journeys.

2.9 The rural nature of Greater Lincolnshire means that rail does not provide a commuting function in the way that it does elsewhere, particularly into large conurbations. However rail has an important role to play in providing access to jobs and education, especially for those without access to a car. Whilst most rail services will perform this role in some form, there are certain flows where this is more important, and over time may develop further. Specific data on commuting patterns from individual stations is not available however there are a number of flows where commuting is likely to form an important journey purpose, these include the following:

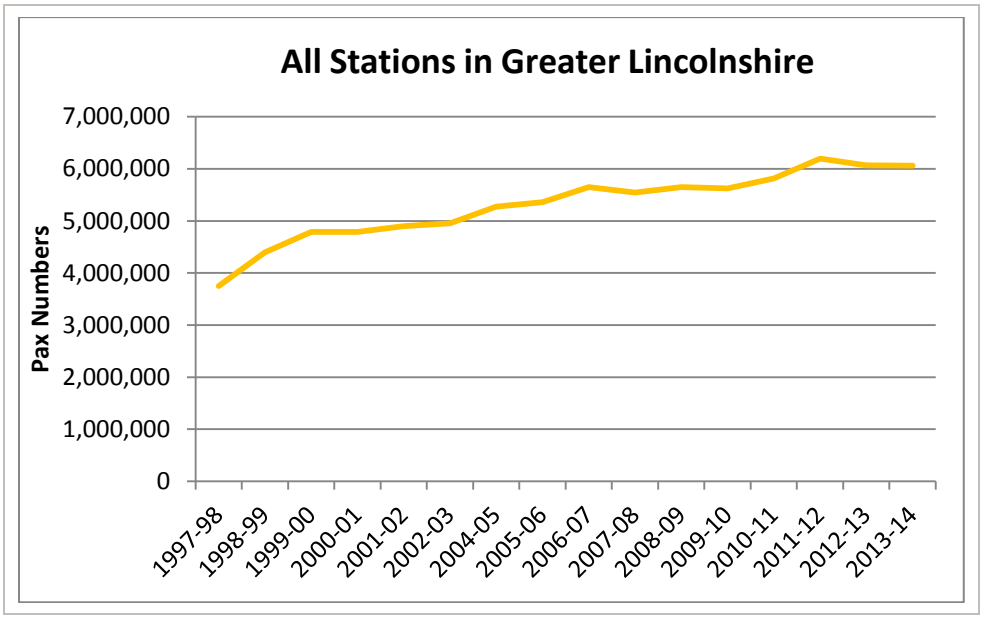
- Scunthorpe – Doncaster/Sheffield
- Stamford/Spalding – Peterborough (and London)
- Newark – Lincoln
- Sleaford – Lincoln
- Hykeham - Lincoln

2.10 Station usage data produced by the Office of Rail Regulation allows comparisons to be made of the pattern of demand on the rail network across Greater Lincolnshire. This data goes back as far as 1997-98, missing out only one year (2003-04) and therefore provides a valuable time series for comparing demand for stations.

2.11 The figure below presents the total station usage for all station in Greater Lincolnshire since 1997.

[3] Services on the Swiss railway network are integrated with each other and with other forms of public transport with a focus on minimising connection times rather than running faster services. Swiss Federal Railways have adapted their infrastructure such that journey times on main lines between hubs are multiples of 30 minutes so that on the hour or half-hour all trains stand in the main stations at the same time, minimising connection times.

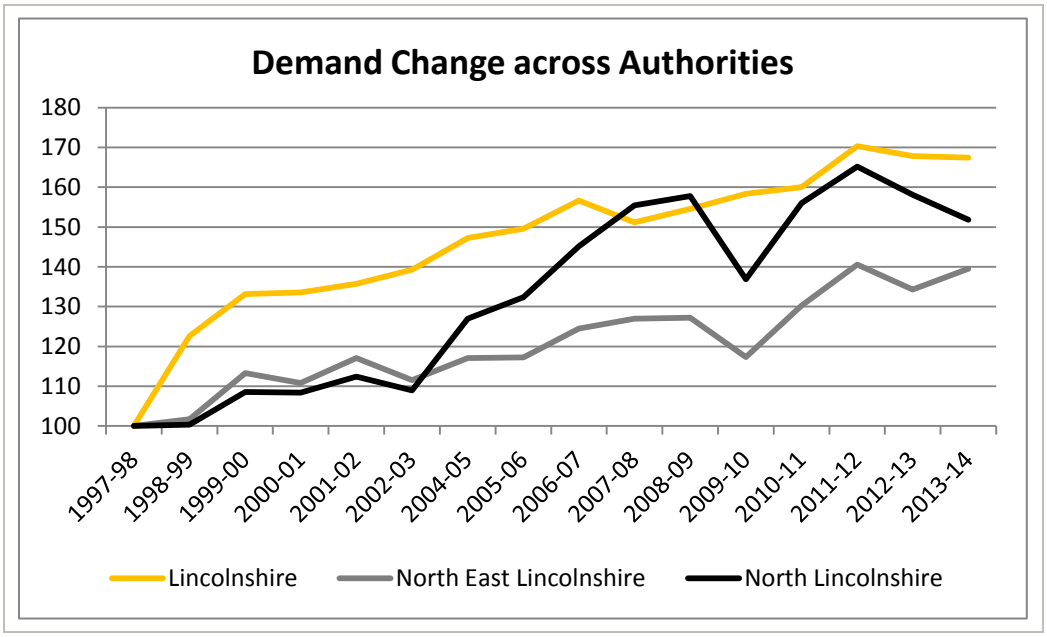
Figure 2.1 Station Usage since 1997/98



2.12 It can be seen that the growth in demand has been relatively steady and consistent over a long period, with an overall increase of 62% since 1997. This is despite there being relatively little change in the pattern of services, or quality of service offered. In some cases services have worsened with the loss of longer distance through services from Lincoln to points west of Nottingham for example. The only station which has enjoyed a significant improvement in service levels is Grantham which has benefitted from enhancements to the ECML service. The cause of the increase is likely to be linked to external issues such as changes in income over the long term, the cost of road travel and broader changes in individuals travel patterns that have driven changes in demand more generally across the whole UK rail network.

2.13 The figure below compares the level of demand for the three constituent local authorities which form Greater Lincolnshire. The results are indexed to 1997/98 to provide a more meaningful comparison.

Figure 2.2 Index of Demand Change Across the Three Authorities Since 1997/98



2.14 The pattern of demand is interesting as it shows the County of Lincolnshire having the highest level of growth over the period, with particularly strong growth in the late 1990s, perhaps due a combination of some service developments in the early years of the Central Trains franchise and the growth of services on the ECML. Demand appears to have levelled off in recent years with small declines in usage at larger stations such as Lincoln having an impact on the total usage.

2.15 North Lincolnshire has also seen a sharp increase in demand for services; almost wholly attributable to Scunthorpe in the period from 2004-05 to 2008-09. Demand changes here may be linked to increases in commuting to other areas, but could also be linked to the improved quality of the Trans Pennine Express services over this period, particularly due to the introduction of Class 185 trains from 2006.However there has been a period of decline in North Lincolnshire in recent years.

2.16 Growth in North East Lincolnshire has been more modest perhaps reflecting trends in coastal leisure trips on which the route to Cleethorpes has been reliant on historically. The area has seen few if any service changes since privatisation and journey times are such that rail is not used for commuting, where as in other areas rail commuting has grown significantly over the period. The two major dips in rail use in North and North East Lincolnshire in 2009-10 and 2012-13 are linked to engineering issues. The former was due to planned engineering work for 10 weeks on embankments during the summer of 2009 which will have had a seriously impact on the summer leisure market, whilst the second dip was caused by a major landslide at Hatfield Colliery at Doncaster which blocked the line for much of 2013. These major breaks in service especially during the summer season may in part explain the lower growth rates achieved in these areas.

2.17 In Chapter 4 the results of an economic modelling exercise are presented, looking at a number of key towns and cities in the Greater Lincolnshire area. The table below presents the total station usage at these locations in the year 2013-14 and shows the percentage change since 1997-98 and over the last ten years.

Table 2.1 Station Usage at Key Stations

Station	2013-14 Usage	% Change since 2002/03	% Change since 1997/98
Lincoln Central	1,585,386	30%	89%
Grantham	1,198,197	49%	97%
Grimsby Town	427,367	12%	29%
Scunthorpe	376,870	63%	86%
Stamford	324,813	45%	73%
Skegness	322,796	-28%	4%
Sleaford	301,349	0.1%	35%
Cleethorpes	277,724	55%	73%
Boston	206,994	-1%	55%
Spalding	171,960	2%	22%
Gainsborough	138,614	61%	151%
Barnetby	61,437	53%	99%

2.18 It can be seen that the results represents a very mixed picture. A number of stations have been very successful over the period with large increases in passenger numbers. The biggest *percentage* increase has been Gainsborough (Lea Road and Central stations combined), (151% since 1997-98 and a 61% in the last 10 years). Larger *absolute* increases in growth have been achieved at stations such Lincoln, Grantham and Scunthorpe, which have nearly doubled their passenger numbers. There are however a group of stations where demand has been comparatively static over the period and in some cases there has been a decline. The worst example of this is Skegness which over the last 10 years has seen a reduction in passenger numbers of 28% (although there has been a modest increase compared to 1997-98). The reasons for this are unclear but may be related to changes in demographics, holidaying patterns and issues of insufficient rail capacity in summer seasons which may deter passengers.

2.19 Growth over the last ten years at both Sleaford and Spalding has also been disappointing, in the case of Spalding this is surprising as the area is increasingly linked to Peterborough for its economic vitality, and the rail service should be well placed to serve this.

2.20 In both cases, it is possible that the existing service no longer meets users' needs, and deficiencies within it (discussed later), need resolving to stimulate demand further.

THE DEVOLUTION OPPORTUNITY

2.21 The governance of regional rail services across England is at an exciting juncture. Increasingly, control of services will be devolved from central government, and this has already been seen through the development of a partnership agreement between DfT and Rail North over the control of services operated by Northern and Trans Pennine Express. This agreement will bring increased control for local authorities over rail services via Rail North. Within the Greater Lincolnshire LEP area this covers services on the South Humber Bank and the Sheffield – Lincoln service.

2.22 Devolved control may well extend in some form to services presently operated by East Midlands Trains in the Lincolnshire area. An organisation known as Midlands Connect has been developed to deliver better transport links across the East and West Midlands. Lincolnshire County Council are a member of this organisation, and it is likely that it will have influence over the future development and direction of the East Midlands Trains, London Midlands and as pacts of the Cross Country franchise. Devolution would bring greater control over the specification of services, helping the local authorities and the LEP to use rail to meet their economic, social and environmental objectives.

3 Economic Drivers in Greater Lincolnshire

KEY ECONOMIC SECTORS

3.1 Greater Lincolnshire has a total population of approximately 1,040,650[4] and has a number of specific economic strengths. These include agri-food, manufacturing and engineering, tourism and the visitor economy. Future opportunities include ports, logistics and the associated growth of the low carbon energy sector. Greater Lincolnshire is already home to the busiest ports in the UK, including the largest UK port by tonnage, and the Humber Estuary is the focus of a growing low carbon sector worth £1.2 billion[5].

3.2 In total, the local economy is estimated to contribute over £16 billion annually to the national economy[6]. However, it is still one of the weakest performing areas in the country in terms of productivity, and retains a significant element that represents a low skilled, low wage economy.

3.3 The county's largest employers reflect the economic strengths of Greater Lincolnshire, and include[7]:

- Findus, one of Europe's largest frozen food and seafood companies, with operations in Grimsby under the Young's Seafood brand, which has a market leading position in branded seafood;
- Bakkavor, an international fresh prepared foods supplier with manufacturing operations in the UK, Europe, Asia and North America. In Greater Lincolnshire the company's operations are concentrated in and around Spalding, but it also has manufacturing facilities in Barton-on-Humber, Boston, and Bourne;
- Novartis UK is the UK affiliate of Swiss-based Novartis AG – one of the largest healthcare companies in the world – and operates a large pharma-chemicals manufacturing plant in Grimsby.
- Tata Steel operates a large integrated steel-works at Scunthorpe which manufactures approximately 3.2 million tonnes of steel per year;
- Siemens Industrial Turbomachinery Ltd. in Lincoln, part of the global Siemens group, is a major engineering business manufacturing industrial gas turbines.

3.4 In addition to these large employers, there are over 40,000 small and medium-sized businesses in the Greater Lincolnshire area[8].

Agri-food

3.5 Greater Lincolnshire is the nation's biggest arable and horticulture producer, has 25% of England's grade 1 agricultural land, produces 25% of the country's vegetables, and processes 70% of UK seafood[9]. In total, farming, manufacturing and food processing are worth an estimated £1 billion to the area's economy, and employs 35,000 people directly in agriculture or food production[10].

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[4] Census 2011

[5] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan, March 2014, pp8-9

[6] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan, March 2014, pp8-9

[7] UKTI, Local Investment Showcase, https://www.localinvestuk.com/

[8] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan, March 2014, pp8-9

[9] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan, March 2014, pp8-9

[10] UKTI, Local Investment Showcase, https://www.localinvestuk.com/

3.6 The agri-food sector, both in terms of produce and allied food manufacturing, is therefore one of the main focuses for growth across Greater Lincolnshire. The area is home to a number of major employers in food and agribusiness, including the highest concentration of food companies in the UK. This food manufacturing sector is supported by its rural hinterland across Greater Lincolnshire, and the impact of the sector on the economy is much wider than farming, fishing and food processing, with sectors as diverse as logistics, packaging materials, professional and businesses services all dependent on the food chain for much of their livelihood. Accounting for associated activities within the supply chain including farm equipment manufacturing, freezing, distribution, packaging and food importation, the number employed within the sector rises to 68,000 workers and the sector is estimated to generate a GVA of over £2.5bn[11].

Manufacturing and engineering

3.7 Greater Lincolnshire's manufacturing sector is worth £1.8 billion annually[12], with 15% of employees working in manufacturing[13]. The area has a proud heritage in manufacturing and engineering and, as home to the biggest Siemens plant in the UK[14] retains its core strength in power engineering. Tata Steel, one of the world's top 10 steel producers, is based in Scunthorpe, home to one of Europe's most competitive integrated steel plants. This plant supplies steel for construction and shipbuilding, through to rail track and wind turbines for the European mainland[15]. The growth of the offshore wind sector in Greater Lincolnshire and the Humber brings major potential in terms of steel demand from the supply chain and the development of complementary areas of expertise.

The visitor economy

3.8 Tourism is an important and growing element of the economy. Greater Lincolnshire attracts more than 17 million visitors per year, and is home to Butlins in Skegness, the 4th most popular tourist resort in the UK[16]. The visitor economy is worth more than £1 billion a year to Greater Lincolnshire and employs 39,000 people[17]. The Tourism and Hospitality Chamber, dedicated to the industry, has been set up and supported by the Lincolnshire Chamber of Commerce.

3.9 The area has a strong tradition of coastal tourism, and resorts such as Skegness and Cleethorpes have long attracted visitors to enjoy the seaside and all that this offers. Skegness has traditionally attracted many visitors from the Nottingham area and the wider East Midlands. Cleethorpes has particularly strong links with visitors from the urban communities of South Yorkshire and in particular Sheffield. The coastal resorts represent major destinations for both day trips and longer stays for these communities.

3.10 Tourism in Lincolnshire encompasses not only traditional tourism but also business visitors, culture and heritage, events and festivals. The county boasts heritage assets including the castle, cathedral and Brayford Waterfront in Lincoln; the Lincolnshire Wolds Area of Outstanding Natural Beauty; more than

[11] http://www.greaterlincolnshirelep.co.uk/growth/agri-food

[12] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan, March 2014, pp8-9

[13] UKTI, Local Investment Showcase, https://www.localinvestuk.com/

[14] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan, March 2014, pp8-9

[15] UKTI, Local Investment Showcase, https://www.localinvestuk.com/

[16] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan, March 2014, pp8-9

[17] http://www.businesslincolnshire.com/sectors/visitor-economy

120 sites of special scientific interest; more than 600 ancient monuments; as well as the coastal resorts from North East Lincolnshire to the Wash[18].

3.11 The city of Lincoln and its attractions represents a fundamental element of the area's tourism offer. 'Uphill' Lincoln, centred on the castle and cathedral, represents the key opportunity. The 800th anniversary of Magna Carta in 2015 is the potential catalyst for growth, and will place Lincoln firmly in the market place for overseas visitors as well as domestic markets.

3.12 In support of this core tourism offer, it is acknowledged that further investment is required to broaden and deepen the network of attractions, and the retail offer, across the area in order to extend the average length of stay, and to increase visitor expenditure.

Ports, logistics and renewable energy

3.13 Greater Lincolnshire's international ports are the busiest in the UK. Together, the Ports of Immingham and Grimsby handled approaching 63m tonnes in 2013 (UK Port Freight Statistics 2013). The ports and logistics sector will continue to underpin growth of agri-food, manufacturing and the low carbon economy, including offshore wind as well as generating opportunities for wider growth across the area.

3.14 The growth of the low carbon energy sector on the Humber Estuary has many synergies with the growth of the ports. Indeed, the new Able Marine Energy Park, situated within the Humber Renewable Energy Super Cluster, takes advantage of the area's natural assets – developable land, coastline and the UK's major port of Immingham & Grimsby. These assets are being harnessed to serve the growing opportunity for renewable energy in the area, including the development of offshore production[19].

3.15 The Marine Energy Park will see substantial quays built to accommodate the deployment of large industrial components to the North Sea and beyond. This development alone will create in excess of 11,000 jobs including over 4,000 direct jobs on the South Humber bank, helping establish the Humber Estuary at the heart of the largest offshore wind market in the world. As a consequence, Grimsby is also emerging as an important centre for the servicing and maintenance facilities of the offshore wind sector. Siemens, Dong, RES, Centrica, E.ON and Vestas from E.ON's base, operate maintenance vessels for the offshore wind industry from Grimsby Docks as well basing their offices on the dock. Humberside Airport also has strong links to the growing renewable energy sector. It is England's largest offshore helicopter logistics hub in terms of passengers carried to and from offshore facilities.

The Local Growth Deal and its impact on the Greater Lincolnshire economy

3.16 The Local Growth Deal with Government supports the growth of the economy in Greater Lincolnshire. The Greater Lincolnshire Growth Deal[20] aims to drive growth across the area, especially where there is existing sectoral strength (agri-food, manufacturing, and visitor economy) as well as sectors with growth potential (low carbon, ports and logistics, and health and care).

3.17 Specifically, the Greater Lincolnshire Local Enterprise Partnership secured £111.2m from the Government's Local Growth Fund to support economic growth in the area in the first wave of growth deals in July 2014. In Greater Lincolnshire this included £18.6m of new funding confirmed for 2015/16 and £21.2m for 2016/17 to 2021. This substantial investment from Government will bring forward at least £70m of additional investment from local partners and the private sector. Combined together this creates a total new investment package of £181.2m for the Greater Lincolnshire LEP.

[18] http://www.businesslincolnshire.com/sectors/visitor-economy

[19] UKTI, Local Investment Showcase, https://www.localinvestuk.com/

[20] Cabinet Office and Deputy Prime Minister's Office, Greater Lincolnshire Growth Deal, 7 July 2014 updated 29 January 2015, HMSO

3.18 In January 2015 the Greater Lincolnshire Local Enterprise Partnership agreed an expansion to its Growth Deal with the Government which will see an extra £14.8m invested in Greater Lincolnshire between 2016 and 2021. This is in addition to the £111.2m of funding committed by the Government identified above.

3.19 Over the lifetime of the Deal (2015-2021) the Local Enterprise Partnership estimates that up to 4000 new jobs could be created, 4000 new homes built and that it has the potential to generate £110m public and private investment.

THE IMPORTANCE OF RAIL TO THE GREATER LINCOLNSHIRE ECONOMY

3.20 The existing economic sectors of strength across Greater Lincolnshire: food manufacturing and agri-business, tourism and the visitor economy, and engineering and manufacturing; are all heavily reliant upon transport. The sectors with growth potential: low carbon, ports and logistics, and health and care; are all to a greater or lesser degree reliant upon transport too. All have some needs in which rail can play a role, though health and care is particularly reliant upon much more local transport networks, often provided through private transport such as the car. Ports and logistics, and the renewable energy sector often have very specific transport needs, particularly with regard to freight.

The Economic Benefits of Improved Railways

3.21 Transport investments such as those in railways can, and generally do, affect the economy. They can in particular affect the location and pattern of economic activity[21]. In very simplistic terms if a transport improvement reduces the time needed to make a particular journey, it is likely to facilitate economic development at either end of the journey.

3.22 There are a number of ways of looking at how rail investment can bring economic benefits. These include direct transport supply benefits including income from rail operations, such as fares and wages, and from access to wider distribution markets. There are direct demand benefits including improved accessibility, and time and cost savings. Transport user benefits are based largely on these time savings, but can also include congestion relief, frequency, safety, and reliability impacts[22].

3.23 There are also a number of indirect impacts at the microeconomic (sector) and macroeconomic (whole economy) levels. These include rent income, price of commodities, the attraction and accumulation of economic activities, increased competitiveness, and the growth of consumption.

3.24 In supporting regional economies, there is importance both in connecting cities and towns to each other, and of improving internal linkages within individual towns and cities. In the context of the northern regions of England, One North[23] deals with both in identifying how economies can benefit from improved transport links. Better connectivity means improved journey time reliability, better travel quality and shorter journeys that will widen and strengthen labour markets and improve business efficiency by:

- Stimulating business investment and innovation by supporting economies of scale and new ways of working;
- Achieving agglomeration economies by bringing firms and their employees closer to business rivals and partners;

[21] Department for Transport, Discussion Paper *Transport, Wider Economic Benefits, and Impacts on GDP*, 2005

[22] Department for Transport Webtag guidance

[23] One North, A proposition for an Interconnected North, July 2014

- Enabling firms to access a larger labour supply and providing wider employment opportunities for workers and those seeking work;
- Increasing competitiveness through access to new and larger markets with the benefits of increased labour market specialisation;
- Reducing trading costs and using more efficient logistics networks;
- Strengthening the existing comparative advantages of a place to do business.

3.25 These lessons hold for regional towns and cities across England and Wales.

Key Issue 1: Connecting places

3.26 Rail connects places. Increased connectivity increases the potential for trade, whether by improving freight connections or by improving the ease with which meetings can take place. This allows a reorganisation of economic activity between places, with firms, plants and offices moving to new – and now more efficient – locations. The changes arise because better connectivity improves both 'market access' and 'supplier access'[24].

3.27 When looking at transporting goods or services to market, for places that are quite similar, there will be trade and economic benefits, as "better connectivity will tend to increase trade volumes, bringing benefits of more choice for consumers and more intense competition between firms."[25]

3.28 Connectivity allows locations to gain scale in a particular range of activities, thereby gaining a comparative (and absolute) advantage in what they do, while buying in other goods or services from a similarly specialised and efficient source[26]. This aids specialisation and productivity. These economic gains are not accounted for in traditional cost-benefit analysis, but we can identify that economic benefits will be gained through investment in rail, whether through the saving of business time, which represents a productivity gain, whether it leads to extra productivity for an existing activity (reducing prices or improving the product), or to increased business in a new location. In this way rail investment can improve business to business connectivity; provides benefit by improving connectivity for retail, leisure and tourism; and reduces travel time and cost, thereby increasing economic benefit.

3.29 The importance of investing in rail in our growing regional economies is encapsulated in he Rail North vision and principles based around four high level objectives for the future of regional rail services:

- Better connectivity – faster, frequent, more punctual services;
- A transformation of quality – with the creation of a user friendly network, and the visible marketing coherence of London Underground;
- Capacity – adequate capacity both in terms of overcrowding on trains, and track capacity to accommodate movements;
- Cost Effectiveness – investment to ensure that as services grow the cost per passenger falls.

3.30 The Rail North vision is particularly important and relevant to the economies of the northern part of Lincolnshire, where economic connections to South Yorkshire and the rest of the north are strong. In the county of Lincolnshire, the economic geography means that connections to the English Midlands are of much greater priority although the principles for service development can still be applied to all regional

[24] Bridget Rosewell & Tony Venables for HS2 Ltd, *High Speed Rail, Transport Investment and Economic Impact*, 2013

[25] Bridget Rosewell & Tony Venables for HS2 Ltd, *High Speed Rail, Transport Investment and Economic Impact*, 2013

[26] Bridget Rosewell & Tony Venables for HS2 Ltd, *High Speed Rail, Transport Investment and Economic Impact*, 2013

services. Local authorities in both the West and East Midlands regions are collaborating to develop and deliver the Midlands Connect vision. This will enable authorities across the Midlands to reach a unified position on what strategic transport interventions are required to maximise the growth potential of the area, and more widely of the UK as a whole. The vision will encompass how the Midlands will make the most of the opportunities presented by HS2.

3.31 Rail connections within, to and from the Greater Lincolnshire area share common characteristics that will be addressed through investment around these sub-national visions, for both the Midlands, and the North.

3.32 Rail into, out of, and across the county is currently slow and frequencies are already low, and consequently rail provides poor centre to centre connectivity. This should translate to key policies that highlight those journeys where speeds are low, a common issue across Greater Lincolnshire, and could be improved significantly in markets with potential for growth. The perceived quality of rail services across Greater Lincolnshire, especially their speed, does act as a barrier to use, and is an issue for business of all types. The quality of rail services and the rolling stock in terms of passenger experience is also important, and a reputational issue for business in the area.

3.33 Business-to-business connections to London and important regional cities such as Birmingham, Nottingham, Leicester, and Sheffield, and to international links at Stansted, the London airports, and at Manchester Airport, are the links that businesses identify as the fundamental passenger services provided by the rail network. Over time as air services develop further links to Humberside and Robin Hood Airports will become more important. Again, there is split geography, links to Birmingham, Nottingham, and Leicester, together with Stansted, East Midlands, and the London airports are fundamental to the southern parts of the County. Manchester Airport, Sheffield, Leeds and York are more important in the northern parts of Lincolnshire.

Key Issue 2: Connections to the East Coast Main Line

3.34 Connectivity to London is crucial. Local rail services provide important connections to a range of destinations of importance to business, but also to connections with East Coast Main Line services at Peterborough, Grantham, Newark, Retford and Doncaster, providing onward connections to London, and to locations in Yorkshire and the far north.

3.35 The slow speed of local lines from most of Lincolnshire to these ‘rail-heads’, and the relative convenience of car travel in reaching stations with direct services to London and other destinations elsewhere on the East Coast Main Line, does mean that important businesses and their partners often drive to main line stations, rather than using local services. Stakeholders from key businesses identified that taxis, hire cars, and taking lifts from colleagues and family were all routinely used for trips to the East Coast Main Line stations in preference to using the local trains. The presence of high quality, secure, car parking was also cited as a reason to drive direct to East Coast Main Line stations.

Key Issue 3: Ports and Freight Connections

3.36 Freight services that serve the area’s chief manufacturing and energy industries by rail are vital to the area. If the potential for rail freight operations to contribute to meeting the needs of the growing economy is to be realised, the rail network needs to be developed. There is presently insufficient capacity to accommodate existing peak demand for freight. This network capability for growth in the freight market is something that could limit the effectiveness of the economy. However investment being delivered by Network Rail including the North Lincolnshire Re-signalling scheme and will deliver extra capacity whilst the South Humber Gauge Enhancement Scheme, being delivered in parallel with the re-signalling works will increase present the opportunity to development the movement of shipping containers by rail from the Port of Immingham.

3.37 Key businesses in the area understand the relationship between passenger and freight movements, and have strongly advocated the need for investment in the infrastructure to provide additional capacity on the network to ensure that freight and passengers can run side-by-side. There is a strong demand for additional freight capacity to support the growing port and manufacturing sectors, and a strong sense that investment in the infrastructure is required to provide this additional capacity, understanding that the needs of passenger services must also be met. Tata Steel, acknowledging its fundamental need for freight capacity, sums this up, and "is keen to see improvements for all rail users using services and would not wish to see any one group disadvantaged over another."

3.38 Investment is needed in strategic infrastructure projects to increase the capacity and competitiveness of the ports and logistics sector, including rail gauge improvements on the South Humber Line. The gauge enhancement scheme between Immingham and the East Coast Main Line at Doncaster to enhance the rail freight capacity of the South Humber Line, led and funded by North Lincolnshire Council and the Humber LEP is being delivered by Network Rail, and will help the growth in containerised freight to and from the Humber Ports.

3.39 Development of the Spalding Rail Freight Hub is another fundamental project. This investment in the infrastructure to facilitate the development of a 60 hectare rail freight interchange at Deeping Fen will further support growth of food processing activity in the southern part of the county. The investment will also help to promote intermodal shift and reduce carbon emissions. Much of this investment is likely to come from the private sector.

3.40 Much of the freight transport within the Agri-food sector is road based. This includes not just the transport of produce out of Greater Lincolnshire to markets across the UK, Europe and the world, but also includes incoming produce for processing within the area's strong food processing and manufacturing businesses. To support planned growth within the agri-food and associated sectors, the Greater Lincolnshire Local Enterprise Partnership has identified a number of necessary transport infrastructure investments[27]. The infrastructure required to support the long term growth of the sector includes development of the Ports of Immingham & Grimsby and Boston, and Humberside Airport's Perishables Hub.

3.41 Nevertheless the Joint Line, linking Peterborough to Sleaford and Lincoln via Spalding, is a potentially important link for freight in the agri-food and food processing and manufacturing sector in the south of the county. Network Rail has recently completed an investment of £280m to upgrade this line to allow for freight capacity to be improved, and to provide complementary relief to the East Coast Main Line.

Key Issue 5: Manufacturing and engineering

3.42 The Greater Lincolnshire Local Enterprise Partnership emphasises the need to continue to invest in business infrastructure to support the growth of the county's manufacturing and engineering sector[28], including major road improvements in Grantham, Spalding, Lincoln and the A160/A180; developing a wider range of scheduled services from Humberside Airport alongside enhanced surface access; and further investment in port infrastructure. Road freight remains the primary means of transporting the area's manufactured goods to market. For example, the Siemens turbines, of which 97% are for the export market, predominantly move by road as 'abnormal' loads due to their size, many via Immingham port.

[27] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan, March 2014

[28] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan, March 2014

3.43 The need for investment in rail services to improve national connections to support business travel, particularly Lincoln to London connections, has also been identified. Not only will this support engineering and manufacturing, but will help all business sectors across the area.

3.44 In specific instances the rail freight sector will be able to assist the manufacturing and engineering sectors, and where possible provision should be made to retain existing freight facilities and allow new ones to develop.

Key Issue 6: The visitor economy

3.45 Tourism is one of the most important growth sectors for the area. The Greater Lincolnshire Local Enterprise Partnership has identified that, in some parts of Greater Lincolnshire, the road and rail infrastructure remains a significant barrier to the growth of the visitor economy[29]. The Lincoln to London rail connection is a particular focus in terms of transport links, alongside improving the Nottingham to Lincoln service. In the north of the county, improved capacity and reduced journey times between Doncaster and Cleethorpes will support the growth of the visitor economy.

3.46 Improvement of the Lincoln to London connection is critical for growing the visitor market in Lincoln. This includes for overseas visitors as well as domestic tourism, but also provides complementary benefits for business visitors and the growing number of people engaged in the further and higher education sector. Lincoln University is climbing the UK league table, and the University has also partnered with Siemens to create a purpose built School of Engineering[30] helping to raise its profile to students, investors and the research community. Whilst access to London is important for the visitor economy, improvements in services to the west including those to Nottingham and Sheffield, as well as improved access to the north will also help grow the visitor economy.

3.47 Coastal tourism remains an influential part of the economy. Improved rail services that provide connections beyond the traditional markets of Nottingham and Leicester (for Skegness) and South Yorkshire (for Cleethorpes), such as direct services to and from Birmingham, will enable the tourism businesses along Lincolnshire's coast to grow.

INVESTMENT IN TRANSPORT THROUGH THE GROWTH DEAL

3.48 One of the main objectives of the Strategic Economic Plan[31] is "enhancing transport connectivity, reducing congestion and enabling major sites for housing and employment". Growth Deal investments that will deliver direct benefits to transport links in Greater Lincolnshire include:

- Grantham Southern Relief Road – a relief road, bridge and connections that will enable housing and employment land to be developed, reduce traffic congestion in the town centre and on the A52 and instances of rail bridge strikes and resultant delays on the East Coast mainline;
- Lincoln Central Transport Hub – a new bus station, pedestrian footbridge and car park, integrated with the train station and connecting to the Science and Innovation Park, improving rail, bus, pedestrian and cycle linkages across the city and beyond;
- 'Go Skegness' - Skegness Sustainable Transport – interconnected sustainable transport improvements including multi-modal improvements to enhance junctions, remove pinch points and

[29] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan

[30] UKTI, Local Investment Showcase, https://www.localinvestuk.com/

[31] Greater Lincolnshire Local Enterprise Partnership, Strategic Economic Plan, March 2014

improve facilities for pedestrians and cyclists; a seasonal park and ride site; and real time passenger information.

3.49 Within the Growth Deal the following commitments are already being delivered:

- The Local Enterprise Partnership and partners to take a more proactive role in consultation on long-term rail planning and franchise specification; and to provide a co-ordinating role between constituent local authorities;
- The Department for Transport to work with the Greater Lincolnshire Local Enterprise Partnership (and D2N2 LEP in Nottinghamshire and Derbyshire) to help achieve the objective of increased service frequency between Lincoln and Nottingham via Newark. If local funding is provided to operate incremental rail services for three years and services prove successful, the Department for Transport commits to considering funding service levels thereafter;
- From the Department for Transport and Network Rail to more proactive engagement of the Local Enterprise Partnership in the long-term rail planning process (e.g. Route Studies) and in rail franchise specification through targeted local engagement of the Local Enterprise Partnership as part of an enhanced consultation process. The Department for Transport also commits to encourage bidders for franchises to identify and take into account the priorities of Local Enterprise Partnerships and other key local stakeholders as part of the franchising process, and will also encourage Train Operating Companies to continue with, and enhance where possible, their engagement with LEPs as key local stakeholders.

3.50 As part of the Humber Local Growth Deal[32] in the South Humber, or northern part of Greater Lincolnshire, there is commitment to invest in rail gauge enhancement from Immingham to Doncaster to allow the use of the rail route by larger shipping containers. The investment will help to develop intermodal traffic and container traffic to and from the South Humber Ports. This investment will, in itself, open up opportunities for more freight demand on the South Humber Bank. The physical capability to handle standard sized containers will drive demand up for intermodal container traffic, placing even more emphasis on the importance of addressing capacity issues on the lines in northern Lincolnshire.

[32] Cabinet Office and Deputy Prime Minister's Office, Humber Growth Deal, 7 July 2014 updated 29 January 2015, HMSO

4 Modelling the Economic Potential of Rail

4.1 To further understand the potential benefits of rail services to the economy of Greater Lincolnshire we have modelled the wider economic benefits of developing rail services to and from the area. The intention of this modelling is to identify the value of improving rail links, to identify those sections of route where the greatest benefit would be generated by improvements and also those sections of route where the level of service is poorest and therefore needs to be improved.

4.2 The improvement of rail (or any transport) services between two locations can bring wider economic benefits to the economy. The scale of these benefits is linked to the journey time and cost between the two locations, and the size and composition of the economies. The benefits of this are known as the economics of agglomeration and reflect the fact that good transport links allow businesses to interact with each other more effectively, increasing productivity and promoting increased competition.

4.3 At their broadest level, agglomeration economies occur when individuals benefit from being "near" to other individuals, and exist when the spatial concentration of economic activity gives rise to increasing returns in production. Transport and communications play a crucial role because, in most contexts, speed and low costs in transportation and communication provide a direct substitute for physical proximity[33].

4.4 Recent research[34] has identified where improved rail connectivity between places of different size may provide economic benefits. The obvious example in UK terms is the difference between London and provincial cities where better connectivity will enable the smaller centre to become "a more attractive location; it starts off with lower wages and rents, and improved connectivity means that it will get better access to London's large market and large base of suppliers".

4.5 However it is also widely acknowledged that the economy of the UK as a whole is relatively unbalanced with the economy in London and the South East being too dominant. As part of the rebalancing of the economy improved connectivity between towns and cities across the Midlands and North is of considerable importance.

APPROACH

4.6 JMP has modelled the potential wider economic benefits of providing an improved rail service from a selection of the key settlements in Greater Lincolnshire to a range of destinations both in and out of the area. This work was based on a model specified by Network Rail within its series of Market Studies in 2013, and which has been adapted by JMP to include the impact of different sectors of the economy on the scale of the benefits. The importance of this segmentation by economic sector has been highlighted in research on agglomeration and the connectedness of locations - "there is some evidence that suggests that the strength of these relationships changes by economic sector, with some sectors likely to benefit more from concentration of activity than others"[35].

[33] Daniel Graham & Patricia Melo, *Advice on the Assessment of Wider Economic Impacts: a report for HS2,* March 2010

[34] Bridget Rosewell (Volterra Partners) and Tony Venables (University of Oxford) *High Speed Rail, Transport Investment and Economic Impact,* 2013

[35] Daniel Graham & Patricia Melo, March 2010, op cit

4.7 The data incorporated into the modelling to define economic sectors was taken from Department for Transport WebTAG guidance on wider impacts (WebTAG Unit A2-1). The four sectors of the economy defined within the modelling are:

- Construction
- Manufacturing
- Consumer Services
- Producer Services

4.8 While the first two sectors are relatively self explanatory the components of the last two perhaps requires further definition, provided in the table below:

Table 4.1 Definition of Consumer & Producer Services Segments

Consumer Services	Producer Services
Motor Trade	Financial
Wholesale	Insurance
Retail	Auxiliary/Financial
Hotels/Restaurants	Machinery Renting
Land Transport	Computer Services
Water Transport	Research & Development
Travel Support	Other business services
Post Telecom	

4.9 Utilising the model described above it has been possible to generate estimated impacts for service improvements to the range of modelled destinations.

SETTLEMENTS AND SERVICES

Settlements Modelled

4.10 To carry out this modelling a range of origins and destinations were identified, both within Greater Lincolnshire and further afield. As the area covered was very large not all of the locations within Lincolnshire were linked to all of the destination locations. In addition it was decided not to model all origin destination pairs that are wholly within Greater Lincolnshire, with the exception of Lincoln. The rationale for this is that for a number of these movements rail is unlikely to ever be a significant factor in users, especially business users, travel decisions as the geography of the rail network and road networks tends to favour road movements. Instead the focus is largely on longer distance movements, particularly with larger regional centres, as it these markets that rail is likely to be strongest in.

4.11 The table on the following page identifies the station pairs that were modelled as part of this work.

Table 4.2 Station Pairs Assessed Within Wider Economic Modelling

	Lincoln	Cleethorpes/ Grimsby	Barnetby	Scunthorpe	Grantham	Stamford	Skegness	Boston	Spalding	Gainsborough	Sleaford
Birmingham	✓				✓	✓	✓	✓	✓		✓
Cambridge					✓	✓					
Derby	✓				✓		✓	✓			✓
Doncaster	✓	✓	✓	✓	✓					✓	
Grantham	✓						✓	✓			✓
Leeds/Wakefield	✓	✓	✓	✓	✓				✓	✓	
Leicester	✓					✓	✓	✓	✓		✓
Lincoln		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
London	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Manchester	✓	✓	✓	✓	✓					✓	
Nottingham	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Peterborough	✓		✓		✓	✓	✓	✓	✓		✓
Scunthorpe	✓		✓								
Sheffield	✓	✓	✓	✓	✓		✓	✓		✓	✓
York	✓		✓		✓				✓	✓	
Stansted Airport					✓	✓					

4.12 With one exception the locations assessed represent the top 10 largest settlements within Lincolnshire. The exception to this was Barnetby, which whilst a relatively small settlement within its own right has a unusual catchment area composing much of the industrialised area around the Port of Immingham & Grimsby as well as Humberside Airport, and the associated businesses based there.

4.13 The stations outside of Greater Lincolnshire generally represent a mixture of locations across the Midlands and the North plus London. The exception to this is Cambridge and Stansted Airport which have been included due to their proximity to Stamford and the direct service that they receive. The choice of which stations are linked to which in large part reflects the railway geography and economic linkages of the area - the south of the area tending to face more towards the East and West Midlands, whilst the north of the area has closer ties with Yorkshire and the North West. There are some exceptions to this pattern, particularly where the East Coast Mainline facilitates fast direct links. For this reason linkages such as Spalding and Stamford towards West Yorkshire have been considered because of the high quality service to the north from Peterborough.

4.14 It should be noted that as the economic data that forms an input to the model is presented at a local authority level it has been necessary to make adjustments to the data for settlements that form only a small part of their local authority area, or where more than one station from a local authority area is included in the model. The general approach to this has been to weight areas by population with the exception of Barnetby.

4.15 In developing the model it became clear that for many station pairs route choice is an issue. For example it is possible to travel from Lincoln to Peterborough either directly via Sleaford on a slower East Midlands Trains service, or alternatively via Newark on an East Midlands Trains service and Virgin East Coast services. To account for this issue those station pairs where route choice was a major issue had all reasonable routes assessed and the results were then weighted to reflect the likelihood of the use of the different routes based on the their respective journey times.

Service Levels

4.16 As there were a large range of service options to model across the area a standard approach was taken to the service levels modelled. These followed Network Rail definitions of service level as defined within their series of Market Studies produced in 2013. These define what would represent a *"good current*" and "*best current*" levels of service. Within the two service categories are sub categories of service dependent upon whether the service is long or short distance. Within this report these are referred to as "Intercity" and "interurban".

4.17 The table below sets out definitions of the service levels used for "good current" and "best current".

Table 4.3 Definition of Service Levels

Service Type	Good Current		Best Current	
	Average Speed (mph)	Frequency (trains per hour)	Average Speed (mph)	Frequency (trains per hour)
Intercity	80	1	100	2
Inter-Urban	45	1	60	2

4.18 It can be seen that the service levels defined as "good current" are in general terms relatively modest with comparatively low average speeds and a service of only one train per hour in each direction. Arguably existing services should as a minimum be close to or around this level of service. The "best current" level of service involves a step up in service levels and should probably be thought of as aspirational in most cases, although it is acknowledged that any journey that involves travelling substantial distances on the ECML is already likely to be close to this level of service.

4.19 The approach set out above allows an assessment of all services using a common standard to understand how far existing services are away from delivering what might be thought of as a minimum level of service. To understand specific station pairs in more detail an assessment was carried out for both direct services (without any interchanges) and the existing situation (inclusive of any interchanges that are required at the present time).

4.20 Two further tests were carried out looking at the potential benefits of a fixed percentage reduction in journey times[36] of 10% and 20%. The aim of this being to understand what the benefits of improved services might be outside of the constraints of the service definitions identified above.

RESULTS

4.21 The results are presented in two sections, the first looks at the benefit to individual towns and cities of improving linkages, including an assessment of the links that would benefit most from improvements.

[36] Technically the test was on 10% and 20% reductions in 'generalised cost' which is a combination of journey times and fares,

The second examines the cumulative benefits on particular sections of route. This latter approach is particularly relevant for understanding the case for intervention on individual sections of route.

4.22 The benefits are presented in terms of the forecast change in agglomeration benefits (measured as changes in GDP) compared to the existing level of service.

THE VALUE OF THE EXISTING RAIL NETWORK

4.23 Before examining the impact of improvements to the rail network on the economy of Lincolnshire it is useful to look at an estimate of the existing value of rail services in the area, to provide some context to the results that follow. Using the model it is estimated that the existing value of the rail network across the whole of Greater Lincolnshire is around **£161million per annum**. Whilst this represents around 1% of the total value of the economy of the Greater Lincolnshire LEP area, (around £16bn), it should be considered that rail has a disproportionately strong impact on high value parts of the economy, and therefore targeted improvements could bring significant benefits.

RESULTS BY STATION

4.24 Table 4.4 looks at the impact of introducing a "good current" level of service to all routes (with and without the introduction of direct services where none presently exist). Table 4.5 looks at the impact of "best current" levels of service, again with and without interchange, whilst Table 4.6 looks at the impact of a blanket reduction in generalised cost of 10% and 20%.

Table 4.4 Agglomeration Benefits of a "Good Current" level of service (£ 000 GDP)

Location	Good Current Service	
	With Existing Interchange	Direct Services
Barnetby	£1,717	£4,799
Boston	£3,045	£8,750
Gainsborough	£910	£3,195
Grantham	£7,152	£8,449
Grimsby	£6,248	£15,014
Lincoln	£6,967	£21,599
Scunthorpe	£2,446	£13,702
Skegness	£1,523	£4,616
Sleaford	£1,833	£4,916
Spalding	£2,037	£8,442
Stamford	£935	£5,065
Total	**£34,819**	**£98,550**

4.25 For the **good current** level of service the two largest settlements (Lincoln and Grimsby/Cleethorpes) show the greatest absolute level of benefit from service improvements. The difference between results where existing interchanges are maintained, and those where direct services are developed to all locations are stark. The greatest change is at Scunthorpe where benefits increase by a factor of five, whilst other smaller locations show significant changes, for example Stamford and Gainsborough.

4.26 In all three of these cases the services that presently operate only serve a limited number of destinations directly, and whilst these services are of a high quality, for example Stamford has a direct service to Leicester and Birmingham to the west and Cambridge and Stansted Airport to the east, they do not provide a broad range of connectivity, with interchange required for many destinations. Part of the reason for this will also be linked to the lack of direct services to London. At present, of all the stations assessed, only Grantham has an all day service to London, and this is perhaps reflected in the low differential between the with interchange and direct service results. Grantham in general is better connected to areas outside Greater Lincolnshire than other settlements including Lincoln, with direct services to Nottingham, Liverpool, Norwich, Edinburgh, Leeds and London, and intermediate points.

4.27 The significant difference between the 'with' and 'without' interchange results for Lincoln also serves to illustrate the relatively poor level of service that Lincoln currently receives, and its lack of direct connectivity. Direct services from the city of Lincoln, outside of Lincolnshire do not go much beyond its immediate neighbours to the east with an hourly service to Nottingham and Leicester, and a hourly service to Sheffield via Worksop, both of which suffer poor journey times. **This would indicate that there are significant gains to be had from improving services from Lincoln and increasing the range of locations which are served directly**.

Table 4.5 Agglomeration Benefits of a "Best Current" Level of Service (£ 000 GDP)

Location	Best Current Service	
	With Existing Interchange	Direct Services
Barnetby	£4,498	£9,218
Boston	£6,052	£12,671
Gainsborough	£2,036	£5,002
Grantham	£13,645	£15,594
Grimsby	£12,495	£26,879
Lincoln	£17,471	£34,832
Scunthorpe	£11,888	£27,603
Skegness	£2,834	£6,657
Sleaford	£3,849	£7,776
Spalding	£5,165	£12,883
Stamford	£3,419	£8,504
Total	**£83,357**	**£167,623**

4.28 The results for the **best current** level of service tend to reiterate the points made above about the good current level of service. However it is interesting to note that the results for the best current level of service whilst maintaining existing interchanges, provides similar results to the good current level of service with all locations served directly. **This indicates that there is scope to maximise the potential benefits of service improvements through a mixture of more direct services on key flows, supplemented by improvements in journey times or frequency on feeder routes**. A further point to note is that the differential between interchange and no interchange for best current is much lower than for the good current situation.

4.29 The significant potential of the rail network can be seen with improvements across the network bringing an increase in the GDP attributable to the passenger rail network of between 22% and 104% relative to the existing situation.

4.30 The table below looking at percentage changes in Generalised Cost is interesting as it maps closely to the results presented above and therefore shows the level of service change required from the present service to obtain a given level of benefits. For example it can be seen that a 10% improvement in generalised cost would bring a result analogous to a good current level of service with no new direct services. To deliver a best current level of service with existing interchange would represent a 20% reduction in generalised costs. Assuming that fares remain unchanged, the mechanism for delivering these changes are limited to changes to journey times, frequency and the need to interchange.

4.31 Of these tools direct services are the most powerful, typically bringing a 20% reduction in generalised cost at a stroke, but these are also the hardest to introduce, and will not be suitable or possible in all cases.

Table 4.6 Agglomeration Benefits of a Generalised Cost Reduction (£ 000 GDP)

Location	Generalised Cost Reduction	
	10% Reduction	20% Reduction
Barnetby	£1,476	£4,325
Boston	£2,257	£5,646
Gainsborough	£786	£2,170
Grantham	£5,307	£11,774
Grimsby	£3,987	£9,571
Lincoln	£7,937	£18,254
Scunthorpe	£7,233	£17,163
Skegness	£503	£1,900
Sleaford	£1,771	£3,875
Spalding	£2,761	£6,326
Stamford	£2,146	£4,850
Total	**£36,170**	**£85,858**

Station Pairs

4.32 An alternative way of looking at the results is to assess them by individual pairs of stations. Given the number of pairs involved it is not possible to look at all of them. There is therefore a focus on the areas which generate the greatest benefits:

- Access from Lincolnshire stations to city of Lincoln
- All Lincolnshire stations to London
- Strategic Links from Lincoln
- Links from the South Humber Bank

4.33 These four groups will address some of the key flows within the area which will provide a basis for understanding the potential for investment. The results presented in this section are for the good current and best current options.

Greater Lincolnshire Towns to Lincoln

4.34 The table below presents the results for improvements between Lincolnshire stations and the city of Lincoln.

Table 4.7 Agglomeration Benefits from Greater Lincolnshire Towns to Lincoln (£ 000 GDP)

	Good Current		Best Current	
	With existing interchange	Direct Service	With existing interchange	Direct Service
Barnetby	£129	£129	£225	£225
Boston	£34	£117	£74	£207
Gainsborough	£55	£102	£55	£102
Grantham	£114	£230	£175	£359
Grimsby/Cleethorpes	£301	£301	£603	£603
Scunthorpe	£231	£436	£371	£666
Skegness	£22	£54	£46	£86
Sleaford	£60	£128	£60	£128
Spalding	£53	£134	£53	£134
Stamford	£11	£42	£32	£64
Total	**£1,001**	**£1,975**	**£1,392**	**£2,574**

4.35 When compared to the aggregate results presented in the previous sections the GDP benefits from service improvements for flows to Lincoln from elsewhere in Greater Lincolnshire are very limited. This largely reflects the small size of the majority of these locations. The key exceptions are Grantham, Grimsby/Cleethorpes and Scunthorpe. In the case of the latter two size is the main issue, with these being the second and third largest settlements in the area. In the case of Grantham it is likely to be a combination of size and the characteristics of the economy. Being located on the ECML with strong links to London it is likely that Grantham has a more service based economy than other parts of Lincolnshire. The introduction of a best current level of service would approximately double the existing value of the service, whilst even a good current service would increase the value by around 50%.

4.36 The result for improvements between **Grimsby/Cleethorpes and Lincoln** is perhaps the most interesting, as it suggests that **this linkage would benefit the most from improvement**, which is intuitive as these are the two largest conurbations in Lincolnshire, and yet the rail link between the two is one of the poorest in Lincolnshire with a less than two hourly service.

4.37 It will be noted that there are two particularly poor results, in Skegness and Stamford. In the case of Skegness the journey is very indirect by rail, and the economy is comparatively small. In practise it is likely that this journey will always be more attractive by road for business users, as the route is shorter meaning that the railway would have to see a very large improvement in journey times to be a lot more attractive. Stamford is in a similar situation being very distant from Lincoln, and served via indirect routes either via Peterborough and Newark or Peterborough and Sleaford. In practise the geography of the area would tend to indicate that the economy of Stamford will not be linked to Lincoln, instead facing Peterborough and Leicester. This does not indicate that rail is unimportant for these areas, instead it suggests that the focus of rail should be on the development of longer distance journeys.

Lincoln & Greater Lincolnshire to London

4.38 The table below examines the agglomeration impact of improving services to London. In comparing these results with others it needs to be understood that values for London are always very high due to the size and density of the area, and also the very large number of high value jobs within the capital.

Table 4.8 Agglomeration Benefits from Lincoln & Greater Lincolnshire to London (£ 000 GDP)

	Good Current		Best Current	
	With existing interchange	Direct Service	With existing interchange	Direct Service
Barnetby	£172	£1,955	£602	£3,917
Boston	£1,709	£5,812	£3,583	£8,136
Gainsborough	£179	£1,776	£527	£2,620
Grantham	£4,148	£4,148	£8,374	£8,374
Grimsby/Cleethorpes	£773	£5,387	£1,673	£11,321
Lincoln	£935	£10,407	£4,981	£15,394
Scunthorpe	-£54	£8,368	£3,195	£14,908
Skegness	£632	£2,765	£1,406	£4,041
Sleaford	£1,189	£3,522	£2,248	£5,136
Spalding	£1,063	£5,947	£3,120	£8,811
Stamford	£406	£3,213	£1,578	£4,786
Total	**£11,154**	**£53,304**	**£31,290**	**£87,445**

4.39 The table clearly illustrates the importance of London and that significant agglomeration benefits can be derived from improving services to London. However some locations appear to already have a “good current” level of service (via interchange), Scunthorpe in particular is already in this position along with Barnetby and Stamford. .

4.40 **For Lincoln the scale of the increase from developing direct services to London is significant** - benefits of up to £10M per annum can be seen from a good current direct service, approximately doubling the estimated value of the existing service. Similar value can also be seen from Scunthorpe, along with slightly lower values from Grimsby, reflecting the greater distance involved. Many of the benefits for Lincoln will be realised as part of the new Virgin East Coast franchise which will increase the number of direct services to London from Lincoln

4.41 It can also be seen that, relative to their size, many of the towns in the south of Lincolnshire perform well, reflecting their proximity to London. Both Spalding and Stamford perform well when direct services are modelled, and both of these towns are only a short distance north of Peterborough, which itself has an excellent service to London.

4.42 The results of this table would suggest that there is scope to investigate developing services to and from London, particularly from Lincoln and the South Humber Bank areas, but also from the south of the area especially Sleaford and Spalding.

City of Lincoln Strategic Links

4.43 As Lincoln is the largest settlement in the study area, and is also at the centre of Lincolnshire’s rail network it is important to examine the strategic links from the area. As has been identified above Lincoln would benefit from improvements to services to London, however there may also be benefits from

improvements to services elsewhere notably the Midlands and North. The table below presents the benefits of service improvements to a range of destinations.

Table 4.9 Agglomeration Benefits of Strategic Links from Lincoln (£ 000 GDP)

	Good Current		Best Current	
	With existing interchange	Direct Service	With existing interchange	Direct Service
Birmingham	£160	£1,186	£917	£2,618
Derby	£163	£508	£388	£1,001
Doncaster	£499	£752	£1,054	£1,329
Leeds	£147	£1,539	£961	£2,674
Leicester	£719	£719	£1,166	£1,166
Manchester	£510	£1,408	£982	£2,186
Nottingham	£861	£861	£1,725	£1,725
Peterborough	£348	£519	£717	£871
Sheffield	£1,956	£1,956	£2,925	£2,925
Wakefield	£67	£665	£409	£1,048
York	£69	£339	£272	£624
Total	**£5,499**	**£10,453**	**£11,517**	**£18,168**

4.44 The table above demonstrates that there is significant potential from investing in services around Lincoln. The most significant result is that for improving links to Sheffield which generates the largest GDP uplift across all service levels. It might have been expected that Nottingham would perform best as this is usually seen as Lincoln's closest neighbour, however in comparative terms the service to Nottingham is better than that to Sheffield therefore there is less absolute benefit in improving the service. This is well illustrated when it is considered that moving to a good current level of service to Sheffield would more than double the benefits of the existing service. Furthermore the economy of Sheffield is significantly larger than Nottingham. As will be shown later there are other benefits in improving services to Nottingham linked to the cumulative benefits of improving services towards Birmingham.

4.45 It can also be seen that there are significant benefits from improving links to the north with Doncaster, Wakefield, Leeds and York collectively representing a significant group of benefits. This again is a function of the very poor existing linkages to these locations, and the size of the economies in these locations. From the table it is interesting to note the good range of towns and cities across the Midlands and Yorkshire that Lincoln could be better connected to.

4.46 **The results would therefore suggest that improving rail links from Lincoln to the North and the Midlands could make a useful contribution to developing the economy of the area**.

The South Humber Bank

4.47 The South Humber Bank, which in this work includes Grimsby, Cleethorpes, Scunthorpe, and as a proxy for the industry around Immingham and Humberside Airport, Barnetby, represents a significant part of the economy of the Greater Lincolnshire area. As these settlements are located in the north of the county the selection of locations is weighted towards Yorkshire rather than the Midlands. The following tables present the results for the three stations.

Table 4.10 Agglomeration Benefits of Strategic Links from Grimsby/Cleethorpes (£ 000 GDP)

	Good Current		Best Current	
	With existing interchange	Direct Service	With existing interchange	Direct Service
Doncaster	£354	£354	£956	£956
Leeds	£427	£2,269	£1,775	£3,904
Manchester	£2,359	£2,359	£3,122	£3,122
Nottingham	£591	£1,546	£1,160	£2,133
Peterborough	£121	£511	£319	£960
Sheffield	£1,112	£1,112	£2,026	£2,026
Wakefield	£309	£1,080	£904	£1,630
York	£198	£394	£557	£824
Total	**£5,474**	**£9,627**	**£10,822**	**£15,558**

Table 4.11 Agglomeration Benefits of Strategic Links from Barnetby (£ 000 GDP)

	Good Current		Best Current	
	With existing interchange	Direct Service	With existing interchange	Direct Service
Doncaster	£105	£105	£343	£343
Grimsby	£135	£135	£296	£296
Leeds	£261	£847	£727	£1,289
Lincoln	£129	£129	£224	£224
Manchester	£227	£227	£622	£622
Nottingham	£169	£419	£371	£644
Peterborough	-£22	£98	£72	£234
Scunthorpe	£147	£147	£301	£301
Sheffield	£259	£259	£563	£563
Wakefield	£124	£322	£262	£530
York	£7	£152	£108	£250
Total	**£1,545**	**£2,843**	**£3,896**	**£5,301**

Table 4.12 Agglomeration Benefits of Strategic Links from Scunthorpe (£ 000)

	Good Current		Best Current	
	With existing interchange	Direct Service	With existing interchange	Direct Service
Doncaster	£434	£434	£1,348	£1,348
Grimsby	£428	£428	£829	£829
Leeds	-£222	£1,462	£945	£3,176
Manchester	£1,009	£1,009	£2,284	£2,284
Sheffield	£1,049	£1,049	£2,732	£2,732
Wakefield	-£86	£618	£334	£1,605
York	-£113	£329	£218	£718
Total	**£2,500**	**£5,333**	**£8,693**	**£12,695**

4.48 It can be seen from the tables that there are **potentially large benefits available from developing services from the South Humber Bank.** This is partly due to the relatively slow service that presently operates, which if speeded up would help develop existing links. The second issue is the lack of other direct services with service being limited to the Cleethorpes – Manchester Airport service and the Grimsby – Lincoln – Newark service. The negative values for some destinations from Scunthorpe and Barnetby indicate that existing services are already better than the modelled service presented here. As with Lincoln it is clear that improving links towards Yorkshire especially Leeds would be beneficial, whilst there is still scope for improving services to Manchester.

RESULTS BY ROUTE SECTION

4.49 Having examined the results of the modelling by route section it is useful to examine the aggregate results by route section. This provides evidence on the cumulative benefits that might be derived from improvements to a section of line. For example the section of line from Lincoln to Peterborough will be important for a broad range of trips including to London and the Midlands, and therefore the benefits of improvements may be higher than a section of route where either the level of service is already high, or the number of origin destination pairs using the line is low.

4.50 The table below summarises the result for key sections of line across the Lincolnshire.

Table 4.13 Agglomeration benefits by route section (£ 000 GDP)

	Good Current		Best Current	
	With existing interchange	Direct Service	With existing interchange	Direct Service
Lincoln - Newark	£3,668	£20,932	£10,994	£34,656
Newark – Nottingham	£2,748	£5,422	£5,815	£9,583
Lincoln – Sleaford	£565	£908	£1,173	£1,486
Lincoln – Barnetby	£1,729	£6,495	£3,414	£11,837
Lincoln – Gainsborough	£2,963	£6,375	£6,041	£10,533
Gainsborough – Doncaster	£855	£2,115	£2,182	£3,000
Gainsborough – Retford	£2,783	£5,644	£5,440	£9,269
Retford – Sheffield	£2,561	£3,610	£4,463	£5,671
Doncaster - Scunthorpe	£8,379	£26,636	£24,673	£50,957
Scunthorpe - Barnetby	£6,937	£13,939	£14,745	£25,314
Barnetby – Grimsby	£7,273	£16,172	£14,467	£29,075
Sleaford - Grantham	£5,573	£16,152	£11,075	£23,816
Grantham – Nottingham	£3,740	£7,064	£6,838	£11,179
Sleaford – Boston	£4,569	£13,367	£8,886	£19,329
Boston – Skegness	£1,523	£4,616	£2,834	£6,657
Sleaford – Spalding	£492	£813	£1,040	£1,280
Spalding – Peterborough	£2,647	£10,339	£6,204	£15,426
Peterborough – Stamford	£678	£4,026	£2,363	£6,258
Stamford - Leicester	£590	£2,222	£1,818	£4,061
London – Peterborough	£11,154	£53,304	£31,289	£87,445
Peterborough – Grantham	£9,652	£44,972	£27,129	£75,920
Grantham – Newark	£4,749	£34,207	£16,175	£58,436
Newark – Retford	£2,244	£15,751	£7,870	£28,495
Retford - Doncaster	£2,056	£14,704	£7,370	£27,183

4.51 It can be seen that the routes with the greatest level of benefit accruing to them tend to be those on the East Coast Mainline. This is unsurprising as the ECML supports a lot of the links and in particular acts as a funnel for trips to and from London which generate the greatest level of benefits. Away from the ECML the sections with the greatest set of benefits is Scunthorpe – Doncaster which also acts as the main conduit to and from Scunthorpe, Grimsby and Cleethorpes. Following this is the link from Lincoln to Newark, again not unexpected as Newark is a trunk route to and from Lincoln and there are potentially significant benefits from upgrading it.

4.52 At the other end of the scale is the section from Lincoln to Sleaford which performs quite poorly. This is in large part linked to the routing of many trips via the ECML rather than the Joint Line due to the poor service on this route. The route does however perform an important function in terms of connectivity within Lincolnshire. The section from Gainsborough to Doncaster appears to only have limited benefits,

however this is because the present service is so poor that many journey planners route trips via Retford or Sheffield, and therefore the benefits of connectivity to these locations is shared between the three potential routes. Were the service to be improved on the direct line to Doncaster the benefits could be allocated to it. The same would apply to Sleaford – Lincoln if the route received significant service improvements, although the case would be more difficult to make due to the quality of service on the ECML.

4.53 It can be seen that the route from Skegness does not perform well, reflecting both the size of Skegness, but also its physical isolation from the rest of the county, and the characteristics of its economy. In contrast the section from Spalding to Peterborough produces very positive results due in part to the poor existing service but also the potential that exists from Spalding's location relative to Peterborough and London.

4.54 The following figures illustrate the impact on the routes of a good current (with interchange) level of service and a best current (with interchange) level of service.

Figure 4.1 Route Benefits of Good Current (with interchange) Level of Service

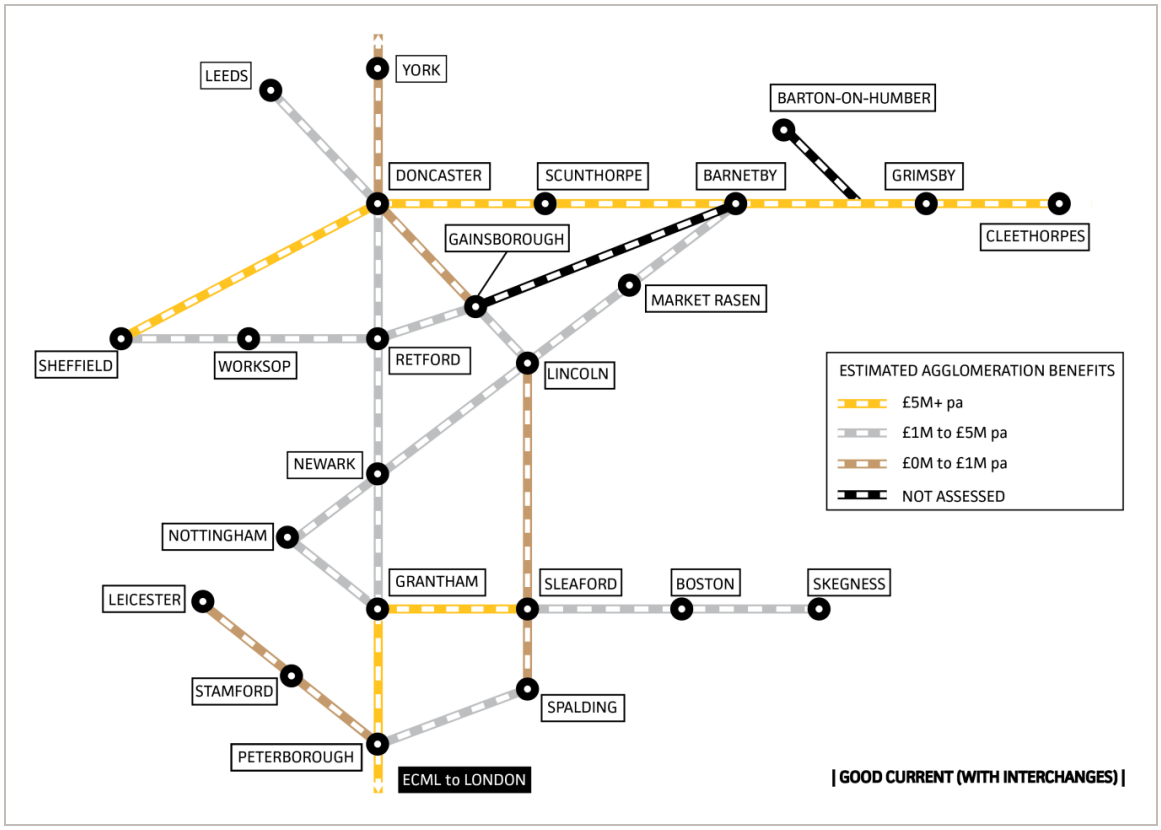
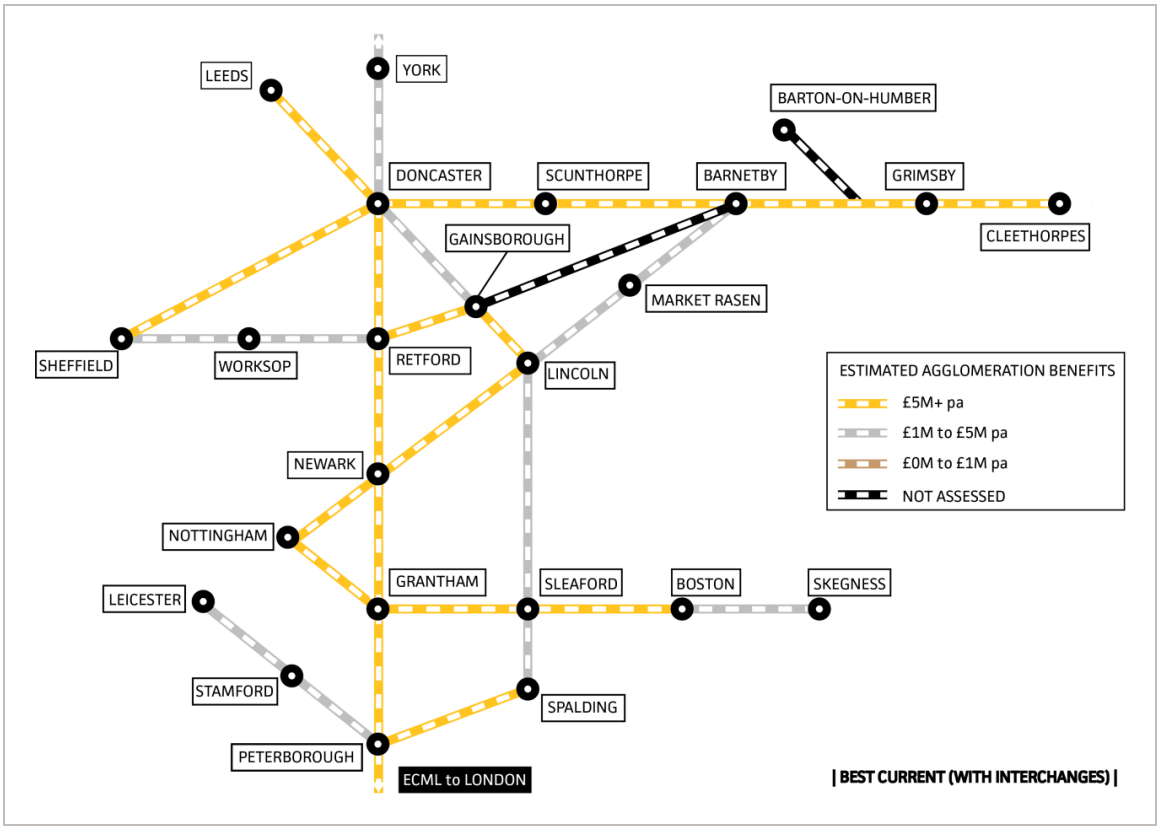


Figure 4.2 Route Benefits of Best Current (with interchange) Level of Service



SUMMARY OF THE ECONOMIC BENEFITS

4.55 It has been shown from the modelling that there is the potential to generate significant agglomeration benefits from improvements to rail services across Lincolnshire. Inevitably the largest benefits arise through improvements to services to London, however it has also been shown that there are large benefits from improvement to other major centres across the Midlands and North. In particular it is clear that there are large benefits from improvements to services to and from Lincoln and the stations on the South Humber Bank. It is especially clear that the poor links between Lincoln and Yorkshire have the potential for large improvements.

4.56 It has been shown that for certain pairs of stations the benefits of service improvements would more than double the economic benefits that the services generate. A good example of this is the route from Lincoln to Sheffield.

4.57 Inevitably the smaller settlements within Greater Lincolnshire do not generate such large benefits, however the there is still scope for improving such services, and these settlements may benefit from investment elsewhere in the network.

4.58 In Part B and the following chapters we look at what the existing network delivers and what potential options exist for developing services to help to deliver the economic benefits forecast here. This begins in Chapter 5 by looking at long distance connectivity before moving onto services in different areas of Lincolnshire.

Part B: Delivering the Necessary Rail Improvements

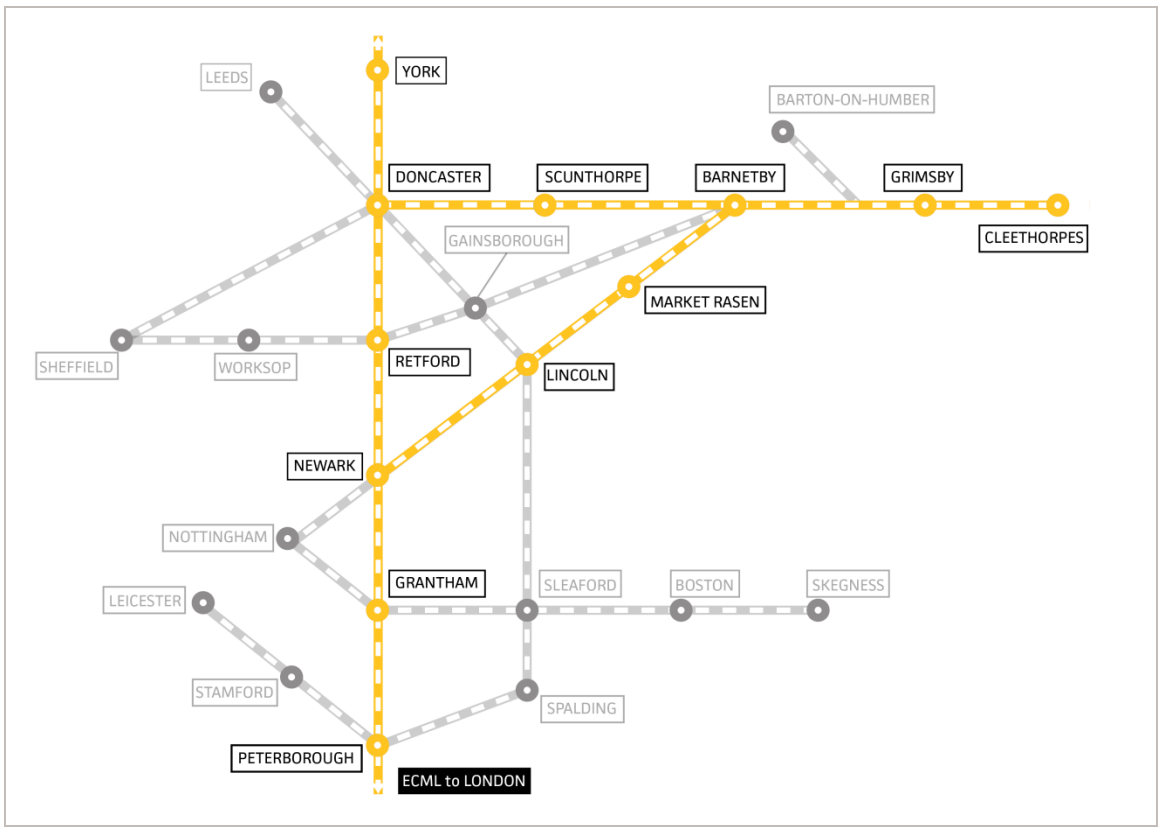
5 Long Distance Connectivity

5.1 Long distance rail connectivity from Greater Lincolnshire is generally poorer than in other parts of the country, with services tending to be characterised by a mixture of inter urban and rural services. As we noted earlier the reason for this is that Lincolnshire is not directly served by any of the key radial mainlines meaning that it does not benefit from passing services. The exception being Grantham which is located on the ECML and has a high quality service to London, Leeds, York, Newcastle and Edinburgh.

5.2 Instead of direct long distance services, passengers to and from Greater Lincolnshire have had to connect onto long distance services either at East Coast stations, at Doncaster, Retford, Newark, Grantham and Peterborough, or for other links made connections at Sheffield, Nottingham or Leicester. This lack of direct connectivity has tended to isolate services in Greater Lincolnshire from the rest of the rail network, and has contributed to lengthy journey times, making rail journeys to Greater Lincolnshire unattractive to potential passengers.

5.3 The following sections describe the existing situation and aspirations for the development of services in the future in more detail.

Figure 5.1 Lincolnshire: Existing and Potential Long Distance Rail Services



LINCOLN – LONDON

5.4 For many years Lincoln was one of the largest cities in the country without a direct service to London. This was resolved, initially by East Midlands Trains in 2008 who introduced a direct service operating via Newark Castle and Nottingham to London St Pancras. From April 2011 this service was joined by a direct East Coast service operating from Lincoln to London Kings Cross via Newark and Peterborough. Both of these services operate only once per day in each direction, however the East Coast service is much the faster of the two with a journey time of 2 hours 4 minutes compared to the 2 hours 51 minutes of the St Pancras service. Indeed the East Midlands service provides more value in giving direct connectivity to Leicester, Bedford and Luton than it does in providing connectivity to London as the service leaves 15 minutes ahead of the East Coast service and arrives 30 minutes after it.

5.5 A long held aspiration has been for the development of all day direct services from Lincoln to London, indeed this formed part of franchise commitment for the ill fated National Express East Coast franchise. For various operational reasons it was not possible to fulfil this commitment, leading instead to the introduction of the daily service described above.

5.6 However the new Virgin East Coast franchise, launched in February 2015 promises to deliver a new service of seven trains per day from London to Lincoln and six trains from Lincoln to London, although the service won't be introduced until May 2019. This will approximate to a two hourly service frequency, but will bring a significant improvement by introducing direct service with a journey time of around two hours as opposed to the varying journey times that presently range from two hours 6 minutes to two hours 54 minutes, all requiring a change of trains and some requiring interchange on foot between Newark Castle and Northgate stations. This service will address key markets and be particularly attractive to business users and tourists visiting Lincoln. However there are aspirations for further improvements, and work carried out by JMP for the East Coast Mainline Authorities (ECMA) consortium identified that whilst service levels should ideally be introduced at a two hourly frequency, they should ultimately be increased to an hourly frequency and journey times should be driven down. This would represent a step change in service levels from Lincoln to London, although this aspiration may have to wait until after the present franchise to be fulfilled.

5.7 To deliver reduced journey times may require work not just on the ECML between Newark and Lincoln to raise line speeds to maximise the benefits of improved services.

SOUTH HUMBER BANK – LONDON

5.8 One of the key service aspirations for North East Lincolnshire Council is the development of direct long distance services to London. The area is now the largest centre of population within the catchment of the East Coast Mainline without either an existing service or a commitment to developing a new service to London.

5.9 Conditional outputs developed by JMP for the ECMA Consortium in 2014 identified a desired service level of every two hours from Cleethorpes to London serving Grimsby and Scunthorpe. This has been backed up further by work in this report that identifies that if a direct service to London could be operated the combined benefits to Cleethorpes, Grimsby, Barnetby and Scunthorpe would be between £15.5M and £30.11M per year. Such a service could also help support the development of passenger flights from Humberside Airport, by increasing the catchment area of the airport.

5.10 As the new Virgin East Coast franchise did not identify Cleethorpes within the service improvements that they will deliver as part of the franchise it would seem that direct services from the South Humber Bank would have be delivered either as part of the next East Coast franchise, or alternatively by an Open Access Operator.

5.11 In terms of open access operators a number of proposals have been made, the most recent being Alliance Rail who have submitted a Track Access Application to the Office of Rail and Road (ORR) to

operate four services per day in each direction between Cleethorpes and London King's Cross, calling at Grimsby Town, Habrough, Scunthorpe and Doncaster. At the time of this report (October 2015) the application had yet to be determined.

Delivering a South Humber – London Service

5.12 One of the issues relating to operating a Cleethorpes – London service is the routing of the service. There are two options, the first being to operate via Barnetby, Scunthorpe and Doncaster, and the second being to operate via Barnetby, Lincoln and Newark.

5.13 The former option has the benefit of including Scunthorpe but would involve developing an entirely new service. Operating via Newark and Lincoln would theoretically allow the service to be developed as an extension of the already committed London – Lincoln service, bringing with it the additional benefit of an improved service from Grimsby to Lincoln and Newark.

5.14 Carrying out a comparison of journey times between London and Cleethorpes via the two different routes shows very little difference between them with a potential journey time via Lincoln of 2 hours 57 minutes and Doncaster of 2 hours 53 minutes.

5.15 With so little difference between the journey times the next factor to contribute to the route choice would be the commercial impact of the service and the resource requirements to operate the service. A high level assessment would suggest that operating a service via Lincoln might only require one additional train, over and above the committed service from London to Lincoln, whilst operating the service via Scunthorpe would require two additional trains, doubling the operating costs.

5.16 Nevertheless there may some operational factors that would suggest that routing the service via Scunthorpe would be more appropriate. At the present time a new fleet of Class 800 SET trains is on order for Virgin Trains East Coast. These will be maintained at a new depot at Doncaster, rather than the present depot used by Virgin Trains East Coast at Leeds Neville Hill. Locating the depot at Doncaster will have a positive impact on the operating costs of services as the level of empty running to and from the depot at the beginning and end of the day will be reduced.

5.17 A good example of this is the present situation with the London – Lincoln service which spends more time running empty to the depot at Leeds than it does travelling from London to Lincoln. With a depot at Doncaster access to Cleethorpes would be much quicker than with a depot at Leeds.

5.18 A further benefit of the SET programme is the introduction of a mixed fleet of nine and five car trains. The five car trains will allow 'portion working' to be introduced where two trains are coupled together and divide en-route to allow two destinations to be served. Virgin Trains East Coast already plans to operate portions for services to destinations in West Yorkshire such as Bradford and Harrogate. In the longer term it would be possible to extend this so that portion working could be used to provide the South Humber Bank with a direct service to London by coupling and dividing services at Doncaster. This would suggest that there may be more operational advantages to operating via Scunthorpe.

5.19 In commercial terms there might also be more advantages to operating via Scunthorpe. Operation via Lincoln would only see calls at Cleethorpes, Grimsby Barnetby and potentially Market Rasen. Operation via Doncaster would allow calls at Scunthorpe which is a substantial market on the South Humber Bank. The new service would also offer an uplift in frequency between Cleethorpes and Doncaster which would generate more intermediate traffic along this section of the route.

5.20 Overall it would seem that in the medium term there are more advantages to developing the aspirations for South Humber Bank to London services via Scunthorpe rather than via Lincoln, allowing the committed service between London and Lincoln to develop independently. This would maximise the connectivity and economic benefits to the area, and may also bring operational and commercial advantages to the train operator.

THE EAST COAST MAINLINE

5.21 Whilst the East Coast Mainline (ECML) only serves one station within Lincolnshire directly it is of greater importance to long distance rail travel within Lincolnshire. Stations at Doncaster, Retford, Newark, Grantham and Doncaster act as interchanges for feeder services to and from the Greater Lincolnshire area.

5.22 However the ECML also acts as a constraint to developing services within Lincolnshire. This is particularly the case at Newark where the ECML crosses the Lincoln – Nottingham line at grade. This is a major capacity constraint, the impact of which is felt on both routes, but due to the higher traffic levels on the ECML tends to constrain service development more on the Lincoln – Nottingham line. A further constraint exists at Peterborough where services from Sleaford and Spalding have to share capacity with the ECML for around 3 miles between Werrington Junction and Peterborough station.

5.23 Capacity issues around Peterborough are to be improved during Control Period 5 with the development of a 'dive-under' scheme for Werrington Junction north of Peterborough which will allow freight services from East Anglia to access the Great Northern Great Eastern Joint Line towards Spalding without crossing the ECML at grade. Work on this scheme is currently planned to begin in 2018 with completion planned in Autumn 2020.

5.24 Virgin East Coast has promised a range of service improvements including changes to service patterns and the introduction of new rolling stock. Aside from the improvements to the direct Lincoln service there are no other significant changes to service levels at the stations between Doncaster and Peterborough but the development of more frequent and direct services to Bradford, Harrogate, Huddersfield, Middlesbrough and Sunderland will help to improve connectivity more broadly.

5.25 During Control Period 5 (CP5) which runs from 2014 to 2019 Network Rail has a fund of £240M to spend on ECML capacity improvements. As its name implies this fund will deliver increases in capacity at key locations along the route. This has the potential to not just increase capacity for long distance services but also for other services using the route. It is unclear at the present time which schemes will be delivered as part of this fund, however the following are under consideration:

Options Under Consideration

- **Capacity increase between Huntingdon and Peterborough**
- **Peterborough station improvements**
- **Grade separation of the flat crossing at Newark**
- **Capacity improvements at Doncaster and Darlington stations**
- **Increases in capacity between Ferryhill and Newcastle and Doncaster and Wakefield**

5.26 Given the size of the fund it is unlikely that all of these schemes will be delivered within CP5, although it is clear that there are a number of schemes which would impact on rail services in Lincolnshire. In the longer term such capacity increases may help to deliver improved long distance service within Lincolnshire, such as the Cleethorpes – London service described above and could be prioritised for delivery in Control Period 6 (2019-2024).

SUMMARY

5.27 Lincolnshire is at present comparatively poorly served by long distance services, with the area being reliant in interchange into long distance services at various points on the ECML. However matters seem

set to improve in coming years with a fresh commitment to operating a two hourly service between Lincoln and London.

5.28 There are however two clear aspirations for further service improvements and these are as follows:

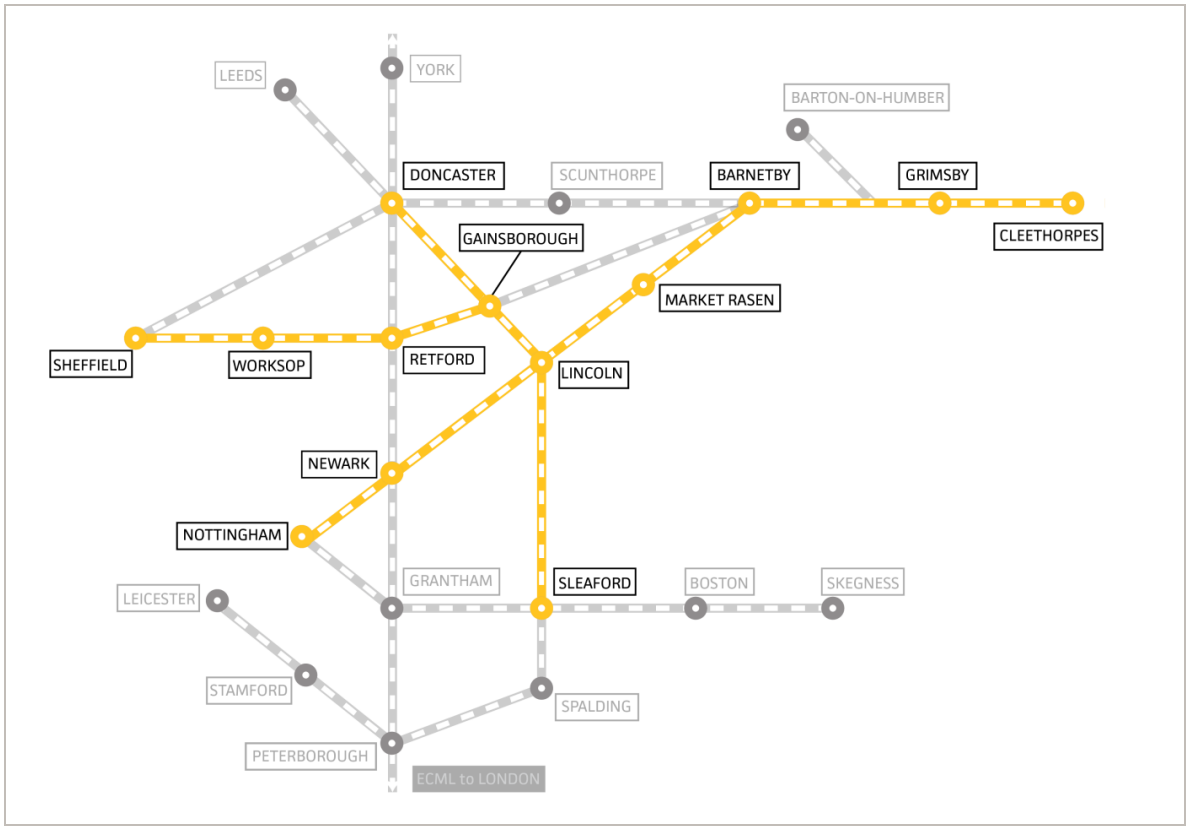
- Introduction of a Cleethorpes – London service
- Further increase in the frequency of Lincoln – London services to hourly

5.29 Clearly the development of these services will be in large part dependent on the success of the proposed Lincoln service, which would encourage the development of further services, and also increases in capacity on the East Coast Mainline.

6 Lincoln Radial Routes

6.1 The City of Lincoln is the largest settlement in the county of Lincolnshire and unsurprisingly is at the centre of the rail network in the area. The city is served by four routes. Two of these act as strategic links into and out of the county, to the East Midlands, and to South Yorkshire, whilst the other two provide important links within the county, to Grimsby in the North East of the area and Sleaford to the south.

Figure 6.1 Lincolnshire: Lincoln Radial Routes



6.2 Passenger services to Lincoln are entirely operated by East Midlands Trains, with the exception of the Sheffield – Lincoln service which is operated by Northern Rail and the daily East Coast service to London King's Cross. Service patterns have remained largely unaltered across the area for many years, with service levels broadly comparable to the situation at the time of privatisation in the mid 1990's. However over this time demand has grown significantly, using ORR Station Usage figures trips from Lincoln Central have increased by 89% since 1997/98 and by 30% since 2002/03. Whilst this is encouraging it is however significantly lower than the national levels of growth which using the same approach indicate that passenger number have risen 116% since 1997/98 and 70% since 2002/03. This gap between Lincoln and the rest of the rail network reflects the lack of service development in the area.

6.3 A further common feature of the routes described here has been the lack of change in the rolling stock fleet in use. Both East Midlands Trains and Northern Rail are using the same fleets on services around Lincoln that were in use 20 years ago. The majority of East Midlands services are formed of Class 153 or Class 156 Sprinter trains, the former being only one coach trains. Services operated by Northern are formed of either Class 142/144 Pacer trains or Class 150 Sprinters. These trains do not meet modern passenger expectations, and Northern rolling stock in particular suffers from being of a very low quality.

6.4 The following sections describe the situation on each route and identify potential service enhancements.

LINCOLN – NEWARK/NOTTINGHAM

6.5 The route from Lincoln to Newark and Nottingham is the most important route from Lincoln both in terms of passenger numbers and the potential economic benefits accruing from improvements. Service on the route provide direct links to both the East Coast Mainline at Newark, and the East and West Midlands either directly (to Nottingham and Leicester) or via interchange to Derby and Birmingham. Despite its importance to Lincoln and Lincolnshire the route is one of the most operationally constrained due largely to the flat crossing of the East Coast Mainline immediately north of Newark Northgate station. This combined with the mixture of passenger and freight services on the route has historically limited the scope for developing services.

Existing Services & Usage

6.6 The route is served by two groups of passenger services. The first of these is the service that operates from Lincoln to Leicester. The service operates at a broadly hourly frequency throughout the day but with some notable gaps including a two hour gap in the evening between 1835 and 2035 and a 70 minute gap during the day from 1230 to 1340. The service is relatively unusual by modern standards in that it does not run at set minutes past each hour, with services typically departing Lincoln between 30 and 40 minutes past each hour. This is a commercial disadvantage as it makes the service pattern difficult to remember for users, and also impacts on potential interchanges at other stations.

6.7 The journey time from Lincoln to Nottingham is around 1 hour and 1 hour 40 minutes to Leicester. Whilst providing a strategic link the service also acts as a local service calling at a number of smaller stations, including Hykeham, Swinderby and Collingham between Lincoln and Newark and up to seven stations between Newark and Nottingham. The stopping pattern varies significantly with some services operating fast, whilst others call at all stations. East of Newark stops are shared with the Lincoln – Newark Northgate service. It is the variations in the stopping pattern that contribute to the fluctuations in departure times from Lincoln.

6.8 The second service operating on the route is that from Lincoln to Newark Northgate. This service operates 13 services from 0526 to 1925 each day; the main rationale for the service is to provide connections on East Coast Mainline services at Newark Northgate, and as such many of the services operate non-stop with a journey time of 26 minutes. Like the Nottingham service the timing of train is somewhat sporadic with a gap in the afternoon service of two and a half hours, and a number of gaps of over an hour. Seven of the services originate at Grimsby providing a connection from the north east of the area into East Coast services at Newark.

6.9 The Sunday service on the route is very poor with the first train from Nottingham to Lincoln not departing until 1633 and the Newark – Lincoln shuttle operating at a variable frequency from the 1105 departure from Lincoln.

6.10 Overall it can be seen that the combined pattern of services has the potential to provide a good link between Lincoln, Newark and Nottingham, however the anomalies within the timetable dilute the benefits of the services operated.

6.11 The table below presents information from the 2013 Network Rail Regional Market Study on usage of services between Lincoln and Newark, looking at all stations within Lincolnshire and key stations outside Lincolnshire. The information is partial as it only covers flows into Lincoln and Nottingham stations and not intermediate flows.

Table 6.1 Journeys per year Lincoln – Newark – Nottingham Route (Source: Network Rail)

	Total Station Usage (2012)	Lincoln	Nottingham
Lincoln	1,655,000	N/A	172,000
Hykeham	35,000	9,000	8,000
Swinderby	17,000	6,000	1,000
Newark	1,422,000	223,000	216,000
Nottingham	6,437,000	174,000	N/A

6.12 Interestingly the table shows that the most significant flows on the route are those from Newark to and from both Lincoln and Nottingham. In part this is likely to be related to interchanges at Newark onto the East Coast Mainline, but also reflects the proximity of Newark to both cities and potentially commuter markets from Newark to the two cities. This compares to the flows of around 170,000 trips per annum between Lincoln and Nottingham, which might be expected to be higher given the size of the cites. This would indicate that the long journey times and irregular service pattern are deterring potential users and weakening rail's competitive position.

6.13 The final major issue with the route is the lack of longer distance services using the route. At present all services operate through to Leicester, however there are no direct links further afield to Derby and Birmingham, both of which are important regional centres. Such services existed until as recently as 2003, but have over time been removed, not helped by changes to franchise geography which has isolated Birmingham from Lincoln.

Upcoming Service Changes

6.14 However from the May 2015 timetable change a number of service improvements will be put in place. The main change is the introduction of a new hourly service from Nottingham to Newark Castle, this will improve frequency within Nottinghamshire but will also allow a change in the stopping pattern of services from Lincoln to Nottingham, as services will no longer have to serve (except at peak times) intermediate stations between Newark and Nottingham. This in turn will allow a change in the stopping pattern of services between Lincoln and Newark, Hykeham for example receives an hourly service all day to Nottingham and Lincoln. The Lincoln – Newark service will remain largely in its present form providing a fast link to and from Newark Northgate for connections on the ECML.

6.15 The improvements above will address some but not all of the issues with the present service. The key constraints are discussed in more detail below.

The Constraints to Service Development

6.16 There are two infrastructure constraints that limit the potential for significantly improving services on the Lincoln – Newark – Nottingham line. The first of these is the maximum permitted line speed. At the present time there are extensive sections of route where a 50mph speed restriction is in place. It is unclear if the limiting factor is related to signalling issues or track quality; however the speed limit would need to be raised to bring significant changes to journey times. The table below compares the existing average speeds and journey times with potential journey times with increased line speeds for Lincoln – Nottingham journeys, a distance of 33.75 miles.

Table 6.2 Comparison of potential journey times Lincoln - Nottingham

	Existing Service (Best)	50 mph Ave	60 mph Ave	70 mph Ave
Average Speed	39	50	60	70
Journey Time	52	41	34	29

6.17 It can be seen that moving to average speeds of 50 or 60 miles per hour makes a significant difference to journey times and with the limited number of stops that the service makes this would be readily possible if the line speed of the route permits it. It should also be considered that in the economic modelling presented earlier in the report the average speed for a "good current" level of service was only 45mph, whilst a best current service was 60mph. Given the limited number of stops and comparatively forgiving infrastructure that is relatively straight and flat such targets should be achievable.

6.18 Resignalling is planned for much of the route in the next few years and it is possible that this will provide the opportunity to address many of the line speed issues.

6.19 The second major infrastructure constraint, which is more difficult to address is the Newark Flat Crossing. This is a now almost unique arrangement in the UK where different routes cross on the level. The flat crossing is a major planning constraint and as traffic on the East Coast Mainline has grown significantly in recent years is now a major constraint to the development of services from Lincoln to Nottingham. The greater volume of both trains and passengers on the ECML has meant that the ECML has always taken precedence over the Lincoln – Nottingham line in planning services.

6.20 Resolving the issues presented by the flat crossing is not easy, and although schemes have been proposed in the past there is no scheme being pursued at the present time. The delivery of such a scheme would require a very significant investment to deliver a flyover paralleling the A46 and crossing both ECML and the River Trent to the south west, the construction of such a flyover and its associated earthworks would be extremely costly, the business case for delivering it would have to be driven by the need to improve services on the ECML as much as a desire to improve services from Lincoln to Nottingham.

6.21 The earliest that such a scheme could be delivered would be during Control Period 6 from 2019 to 2024, however in reality the development of such a scheme could be blighted by uncertainty over the development of HS2 and its resulting impact on services on the ECML after completion.

6.22 There is however a strong case for addressing the existing constraints to improving services, especially journey times based around the modelling work presented earlier in this report. This demonstrated that if a "best current" level of service could be delivered to the route there would be around £11M of agglomeration benefits accruing to the Greater Lincolnshire economy every year. This would be increased further if more direct services were operated to locations such as Birmingham, with an absolute maximum of around £34M of benefits each year.

Future Services

6.23 Looking at the issues surrounding the present service and the role that the route plays as a strategic link into and out of Lincoln there are a range of service changes that would deliver improvements. The main requirements would be to reduce journey times and increase direct connectivity. The following options would address this:

Options for improvement

- **Development of "best current" journey times, with an average speed of 60 mph between Nottingham and Lincoln**
- **Extension of Birmingham – Nottingham services operated by Cross Country to Lincoln providing direct services to Nottingham, Derby and Birmingham, either replacing or complementing the existing service**
- **Examining the scope of a regular pattern of departure times, ideally spreading out departures from Lincoln to Newark Castle and Newark Northgate into half hourly intervals.**
- **Reduction of the Lincoln – Newark shuttle to a two hourly frequency on commencement of two hourly London – Lincoln service.**
- **Operation of all day Sunday service from Lincoln to Nottingham**

6.24 Given the strategic nature of the route this list of service improvements may seem comparatively modest; however in combination they would represent a step change in the level of service on the route, and a significant improvement in the level of connectivity on the route. The development of a direct service to Birmingham with a journey time of 1 hour 54 minutes would be a significant improvement on the present best case situation of a journey time of 2 hours 14 minutes with an interchange at Nottingham. Without detailed modelling work it is not clear if the route could sustain a half hourly service from Nottingham to Lincoln, and a Lincoln – Newark shuttle service, however if it could it would allow the Birmingham service to operate fast calling at Newark Castle only.

6.25 The resource implications of these improvements would not necessarily be severe as the reduction in the Newark – Lincoln shuttle service after the improvement in direct services to London would release a train whilst the Birmingham service would be an extension of an existing service from Birmingham to Nottingham limiting the need for additional rolling stock. Finally the significant reduction in journey times proposed, an 18 minute reduction on the existing best service, may have implications for rolling stock utilisation as trains could be worked more intensely on a faster railway.

Summary

6.26 The Lincoln – Nottingham route is the City of Lincoln's strategic connection to the East and West Midlands, however the service on the route has been neglected for a long time with a considerable reduction in direct services by historic standards. There are two major constraints on the route, but the resolution of one of these (line speeds) would make a significant difference to the attractiveness of services, and could act as a catalyst for further improvements.

6.27 A number of service changes have been identified that would potentially increase the usage of the route and bring wider benefits to Greater Lincolnshire as a whole as identified in the economic modelling work.

LINCOLN – SHEFFIELD/DONCASTER

6.28 The line from Lincoln towards Sheffield and Doncaster is the second strategic route from Lincoln, providing direct links to South Yorkshire and the wider Yorkshire and the North East area. Like the route to Nottingham described above the route between Lincoln and Sheffield has become something of a Cinderella service.

6.29 The service towards Sheffield is the better of the two operating at an hourly frequency throughout the day. However all services are stopping services calling at both stations within Lincolnshire and Saxilby

and Gainsborough, but also all stations west of Retford as the service provides an urban link from Worksop to Sheffield. Services often operate through to Doncaster via Sheffield largely for reasons of operational convenience but also to provide a direct link to the Meadowhall shopping centre. The journey time to Doncaster is however very unattractive at around two hours. Service on this route are operated by Northern Rail, with operations centred on Sheffield. The rolling stock used is of very poor quality with Pacer trains often being used, making their only appearance within the County of Lincolnshire. The average speed for the 48.5 mile journey is 35 mph, slightly worse than that for the route from Lincoln to Nottingham, although more stops are made.

6.30 The service provides connectivity with ECML services at Retford, which enjoys a broadly hourly service to London through a combination of East Coast and Hull Trains services, however return services from London are poorer with services tending to cluster, being followed by a long gap. The range of destinations to the north is also limited with services terminating at either York or Hull. Only Saxilby and Gainsborough passengers would be likely to use Retford for interchange purposes as better connections with the ECML can be made at Newark from Lincoln.

6.31 The second service is that from Lincoln to Doncaster operated by East Midlands Trains. The frequency of this service is only five trains per day in each direction with all northbound services originating at either Sleaford or Peterborough but with all southbound services terminating at Lincoln. As well as having a very poor frequency the timing of services is such that they are quite inconvenient for users. There are no services in either direction timed to allow use by commuters whilst two of the services operate within an hour of each other in the evening, with departures from Doncaster at 1934 and 2033, the former of these following a five hour gap from 1427.

6.32 This poor service frequency lets down a service which has the potential to provide the quickest access to Lincoln to and from Yorkshire and the North East. Although the average speed is only 41mph, despite only having two intermediate stops on a 36 mile journey, the route offers the most direct and quickest service. A journey time from Leeds to Lincoln of 1 hour 40 minutes with only one interchange compares to a journey time of 1 hour 45 minutes via Newark, requiring two changes, or 2 hours 27 minutes via Sheffield. The route lacks any intermediate stops between Doncaster and Gainsborough. However there have been proposals to build a station at Robin Hood Airport, which would require an improved service to operate.

6.33 The Sunday service on the route is especially poor with a service of only four trains in each direction at a two hour frequency, which do not begin until a 1515 departure from Lincoln. There is no service between Lincoln and Doncaster on Sundays.

6.34 The table below presents information from the Network Rail Regional Market study on usage between key stations on the routes and also the total usage of that station, to put the demand flows in context.

Table 6.3 Journeys per Year: Lincoln – Sheffield/Doncaster

	ORR Station Usage	Lincoln	Sheffield
Lincoln	1,655,000	N/A	57,000
Saxilby	59,000	45,000	3,000
Gainsborough	154,000	90,000	5,000
Retford	406,000	38,000	25,000
Worksop	464,000	17,000	157,000
Kiveton Bridge	66,000	9,000	41,000
Sheffield	8,424,000	57,000	N/A
Doncaster	3,884,000	20,000	N/A

6.35 It can be very clearly seen that there is dividing line in the Sheffield service with Retford and points east facing towards Lincoln, while Worksop and points west face towards the Sheffield catchment. Given the very poor service from Doncaster to Lincoln it is interesting to note that Doncaster can generate 20,000 trips per annum in contrast to the 57,000 that Sheffield generates with an hourly service operating all day.

6.36 The study suggests that the total number of trips from the two routes into Lincoln is around 135,000 trips per annum. This compares with 446,000 trips per year on the route from Nottingham to Newark. The economic modelling work also identified both links, but especially that to Sheffield, as being of importance to Lincoln, with economic benefits comparable to those for improvements to Nottingham.

Constraints to Development

6.37 The greatest infrastructure constraint to developing services on the route is the comparatively low line speed. Whilst the line speeds vary there are few sections where speeds exceed 60mph. This limits the competitiveness of rail against other modes and limits the demand for services.

6.38 There are relatively few limits on capacity for services in the areas, although the use of the route between Lincoln and Doncaster as a strategic freight route is a potential planning constraint.

Planned Service Improvements

6.39 The trains service requirements for the Sheffield – Lincoln service specifies a number of improvements to services during the next franchise from 2016. From the 2019 timetable change it is planned to increase service frequencies between Sheffield and Retford, giving a half hourly off peak service. However only Worksop and Retford stations are planned to receive this service level. This indicates that a fast service would be introduced, removing stops at intermediate stations in South Yorkshire. Although not specified it would seem logical for the fast service to be the service that operates to Lincoln. The removal of the intermediate stops west of Worksop would reduce journey times to and from Sheffield by around 10 minutes.

6.40 The TSR also improves Sunday services by bringing forward the existing first departure from Sheffield to 0900 and operating an hourly service thereafter until 2100. This represents a substantial improvement on the existing level of service.

Further Improvements to Services

6.41 Whilst the service improvements outlined above will bring an improvement over the existing service offered there is some way to go before the routes deliver on their strategic potential.

6.42 The most pressing case for improvement is on the Lincoln – Doncaster service. This route has the potential to provide improved links from Lincoln and Gainsborough to the north via interchange at Doncaster. With targeted journey time reductions and a significant increase in service frequency the route could bring a significant improvement in connectivity even with interchanges to other services at Doncaster. This would help provide better links for both business and leisure users and make Lincoln a more attractive place to access for residents of the West and South Yorkshire conurbation. In the short term a two hourly service should be introduced ultimately increasing to an hourly service.

6.43 Providing a direct service beyond Doncaster is more challenging with no obvious service for an improved Doncaster – Lincoln service to be integrated with. Improvements to the Doncaster – Lincoln service will in large part hinge on the development of a station at Robin Hood Doncaster Sheffield Airport, which would help to generate more passengers on the route.

6.44 The proposals to improve journey times by reducing stops as part of the next Northern franchise on the Lincoln – Sheffield route presents the opportunity to upgrade the service. In other parts of the franchise a “Northern Regional” service has been identified for longer distance more strategic routes that are not

covered by the Trans Pennine Express. This service level involves the use of new or enhanced rolling stock and would act to improve the attractiveness of the service between Lincoln and Sheffield, making it more attractive for business and tourist use.

6.45 The following identifies the potential improvements to services on the two routes:

Options for improvements

- **Opening of station at Robin Hood Doncaster Sheffield Airport**
- **Development of a two hourly Lincoln – Doncaster services, increasing to hourly**
- **Introduction of Sunday services between Doncaster and Lincoln**
- **Improvements to line speeds throughout**

Summary

6.46 The route north from Lincoln to Sheffield and Doncaster has the potential to be developed to play a more important role in the development of services in Lincolnshire, especially as the economic modelling identified benefits from improving services to Sheffield. Some improvements to services are already planned but there is scope for further improvements through changes to line speeds and the transformation of service levels. In the long term this could include the development of through services to the North West.

LINCOLN – SLEAFORD

6.47 The route from Lincoln to Sleaford provides an important link between Lincoln and South Lincolnshire. Services on the line operate at a broadly hourly frequency throughout the day although there are a number of gaps particularly in the afternoon where there is 80 minute gap between departures followed by a 70 minute gap.

6.48 Whilst a number of services, mainly in the morning and evenings shuttle between Lincoln and Sleaford the majority of services operate to and from Peterborough, with a number of the northbound services operating through to Doncaster. The route only has two intermediate stations at Metheringham and Ruskington. Like many routes in Lincolnshire journey times are disappointing with an average speed of only 40mph for a journey of 21 miles with only two intermediate stations.

6.49 The two intermediate stations perform well given the size of the population served, Ruskington has a population of 5,169 but generates 92,000 trips per annum whilst Metheringham has a population 3,384 but generates 110,000 trips per annum.

6.50 Interchange with other services is available at both Lincoln and Sleaford, with services interchange for Grantham and Skegness available at Sleaford.

6.51 The table below sets out the key flows to Lincoln on the route based on information in the 2013 Network Rail Regional Market Study.

Table 6.4 Journeys per year Sleaford - Lincoln

	ORR Station Usage	Journeys to Lincoln
Metheringham	110,000	84,000
Ruskington	92,000	61,000
Sleaford	337,000	136,000
Spalding	173,000	15,000
Peterborough	4,208,000	31,000

6.52 It can be seen that there are very strong links between Sleaford and Lincoln but that demand from stations south of Sleaford towards Lincoln is significantly lower, suggesting a clear division in the catchment for services at Sleaford.

Scope for Developing Services

6.53 Given the rural nature of the area the justification for significant improvements to services is relatively limited. However the route would benefit from the introduction of a regular hourly all day service, removing the present gaps in the service, this could be supplemented by the development of selected peak services into Lincoln to improve the frequency of service making rail more attractive and providing greater access to opportunities.

6.54 Journey times on the route could also be improved, taking advantage of line speed increases introduced as part of the Joint Line upgrade. This has increased the predominant line speed on the route from 55 mph to 75 mph. Although detailed modelling would be required to confirm the level of change the implied 30% uplift in speed could reduce journey times between Sleaford and Lincoln by up to 10 minutes, a substantial reduction that would make journeys by rail more competitive than car.

6.55 If as described above services between Lincoln and Doncaster were improved these could be linked into an improved Lincoln – Sleaford service in both directions all day to improve the range of connectivity available across Lincolnshire.

6.56 The line would also benefit from the introduction of a year round Sunday service.

LINCOLN – GRIMSBY

6.57 The route from Lincoln to Grimsby provides a potentially important but underutilised service, currently eight services per day operate at an approximately two hourly frequency, although there are a number of larger gaps. For example in the afternoon and evening, services depart from Grimsby at 15:45,18:28 and 21:45. The economic modelling identified this route as the most important internal route within Lincolnshire.

6.58 At the present time all but one service from Lincoln originates at Newark Northgate and all southbound services terminate there, providing connectivity with East Coast Mainline services. The first and last southbound services of the day start from Cleethorpes, whilst the last northbound evening service terminates there. This lack of a direct all day service to Cleethorpes prevents the development of a potential tourism market for trips by rail from Lincoln to Cleethorpes.

6.59 There are only a few intermediate stops, at Market Rasen, Barnetby and Habrough. The services provides the only rail link to and from Market Rasen, and also provides links that could be developed at Barnetby which acts as a railhead for the growing Humberside Airport.

6.60 Historically the route played an important role in linking Grimsby with London, both via interchange at Newark and also via direct services. However over time the stagnation of journey times on the route via

Lincoln and the improvement in journey times and frequency on the ECML, coupled to the more frequent Trans Pennine service via Scunthorpe has made the route via Doncaster more attractive for London trips.

6.61 As discussed above it is possible in the longer term that delivering a Grimsby – London service may be more effectively achieved through extending Lincoln – London services which would route services via Barnetby and Market Rasen. This could help to provide a useful boost to service frequency were an all day service to be developed. This is however a longer term options that could only be considered for delivery beyond the scope of the existing Virgin Train East Coast franchise.

6.62 The average speed of the service is higher than other services in Lincolnshire at 47 miles per hour; however there is scope for further improvement given the lack of intermediate stops especially between Barnetby and Lincoln. The line speed is presently 75mph for most of the route between Wrawby Junction (Barnetby) and Lincoln, with short sections at lower speeds mainly around Market Rasen. However between Barnetby and Grimsby the line speed is only 60mph limiting the journey time improvements that can be achieved.

6.63 The table below presents the level of usage on the route based on the Network Rail Regional Market Study.

Table 6.5 Journey per Year Lincoln – Grimsby

	ORR Station Usage	Lincoln	Grimsby
Cleethorpes	265,000	6,000	37,000
Grimsby	447,000	39,000	N/A
Habrough	33,000	5,000	11,000
Barnetby	69,000	10,000	7,000
Market Rasen	59,000	40,000	2,000
Lincoln	1,655,000	N/A	39,000

6.64 The table above includes some movements that are shared with other services in Northern Lincolnshire, however the largest flow is clearly that between Market Rasen and Lincoln, followed by movements between Grimsby and Lincoln. Given the relatively poor service on the route and low population of Market Rasen (3,230) the number of trips from Market Rasen is reasonable. However given the size of Grimsby and Lincoln it might be expected that number of trips between them would be higher. The level of trip making from Barnetby towards Lincoln is also quite high given the poor service and that economically Barnetby faces towards Scunthorpe and Grimsby rather than Lincoln.

Potential Service Developments

6.65 Although journey times could be improved further the main issue with the present Lincoln – Grimsby service is the poor service frequency. There are a number of ways that this could be addressed. The first options relates to the introduction of the two hourly Lincoln – London service from May 2019. This service will reduce the need for the Newark – Lincoln shuttle allowing to it to operate on a two hourly basis rather than its present approximately hourly pattern. This in turn could release a train to increase service frequencies between Lincoln and Grimsby, as a minimum delivering a clockface two hourly service and extending to Cleethorpes.

6.66 In the longer term an hourly service should be worked towards. This could be delivered in one of two ways, firstly as a direct development of the existing service, or alternatively through the extension of Lincoln – London services to start at Grimsby. These could be overlaid on the existing timetable to provide an hourly service, which would provide an improvement in connectivity and an uplift in service

quality through the introduction of IEP trains. However delivery of such an option is only likely to be possible beyond the end of the existing Virgin Train East Coast franchise, and after some initial improvements have been made to the service.

6.67 Across all routes in the area there is a need to develop the case for increasing line speeds to reduce journey times. This is likely to be an ongoing incremental process taking advantage of re-signalling works and track maintenance and renewals work to deliver enhancements in a cost effective manner.

6.68 The potential improvements to the route are therefore:

Potential improvements

- **Introduce a two hourly all day service with all services extended to Cleethorpes**
- **Work towards the introduction of an hourly service either through development of the existing service or through the extension of Lincoln – London service to Grimsby.**
- **Work to increase line speeds to improve journey times, especially between Barnetby and Cleethorpes**

SUMMARY

6.69 There are four routes radiating from Lincoln that are of both local and strategic importance to Lincoln and Lincolnshire. The four routes provide varying levels of service however all are characterised by a need for further improvements to services to realise the potential benefits of the rail network to Lincolnshire as a whole.

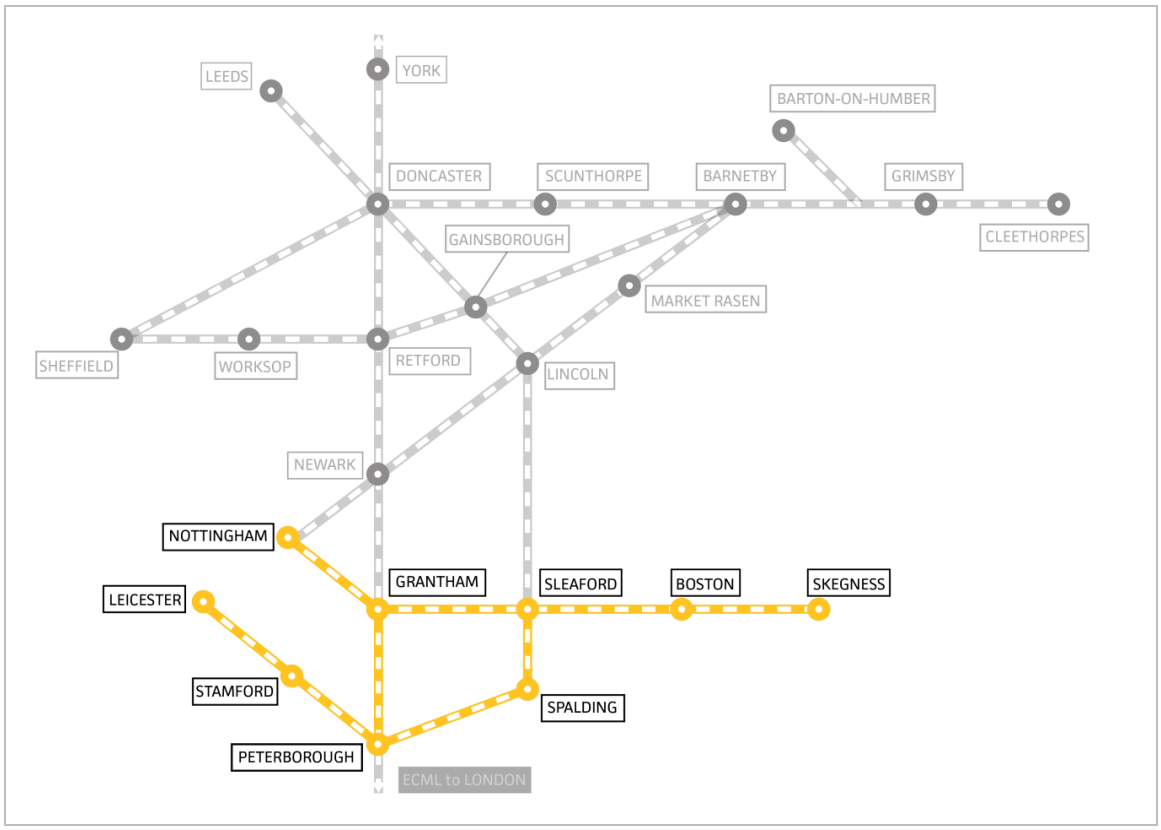
6.70 Across all of the routes the outstanding feature is the relatively low average speeds given the combination of straight routes, a lack of gradients and the infrequent stops that services make. Some of these issues are being addressed - for example line speeds have been increased between Sleaford and Lincoln as part of the Joint Line upgrade. However, there is a need to develop more strategic links to other parts of the country, with direct services largely being limited to the nearest major settlements outside of Lincolnshire for example Sheffield and Nottingham. Such links would help deliver the economic benefits estimated in the previous chapters. Finally the frequency of services across all four routes is often variable with a need in two cases for substantial improvements (Lincoln – Doncaster and Lincoln – Grimsby), an on other routes for more minor improvements. Again some progress is already being made with an upgrade to Lincoln – Nottingham services from the May 2015 timetable change, and improved services from Lincoln to Sheffield specified as part of the next Northern Rail franchise.

6.71 The benefits of investment may however be significant with three of the four routes being identified as of importance in the economic modelling. Clearly however more work is required on the detail of service improvements, including liaison with TOCs and Network Rail.

7 South Lincolnshire & East Midlands

7.1 In the south of Lincolnshire there are a group of routes which serve a number of towns providing links between Grantham, Skegness, Spalding, Peterborough and Stamford. These routes, with one exception run on an east-west axis providing links to the East and West Midlands and also to East Anglia. There is only one through service towards Lincoln with services tending to be isolated from Lincoln and the north of the county.

Figure 7.1 Lincolnshire: South Lincolnshire & East Midlands Routes



7.2 Like the rest of the county services have tended to be relatively static in recent years, with frequency and journey times remaining constant, and rolling stock remaining largely unchanged since privatisation. The services described are all operated by East Midlands Trains at the present time with the exception of the service from Birmingham to Stansted which is operated by Cross Country.

NOTTINGHAM – GRANTHAM – SKEGNESS

7.3 The route from Nottingham to Skegness via Grantham provides a link from a number of larger settlements in South Lincolnshire to the East Midlands. The service operates over a distance of 80 miles and serves the towns of Grantham, Sleaford, Boston and Skegness in Lincolnshire, as well as a number of smaller settlements. East of Sleaford the route has historically been dependent on tourism traffic to Skegness which in turn helps to support the use the route for other purposes. Tourism traffic is still of importance today with overcrowding of service being an issue in summer months.

7.4 The service operates at an hourly frequency on weekdays, with journey times varying between 1 hour 55 minutes and 2 hours 15 minutes. The variation in journey times is largely related to the stopping pattern of services especially west of Grantham, where the Nottingham – Skegness service acts as a local stopping service, of which only Bingham has a regular service. East of Grantham stopping patterns are also variable with10 intermediate stations between Grantham and Skegness, however no train stops at all stations and only Sleaford, Heckington, Boston and Wainfleet receiving stops from all services. A number of the smaller stations have only very infrequent services with Rauceby and Ancaster receiving only four calls in each directions and Thorpe Culvert and Havenhouse only receiving two trains in each direction. This illustrates the role that the service plays in providing a service of social importance to rural communities.

7.5 The Sunday service on the route varies by season. During summer there are eight services in each direction between Nottingham and Skegness, however in winter this is reduced to four trains in each direction, with the first arrival in Skegness not until 1400. This seasonal variation clearly illustrates the importance of tourism to the route.

7.6 Services make a detour to serve Grantham which also involves the train reversing and adds around 15 minutes to journey times compared to the direct route. However this additional journey time is offset by the additional connectivity that stops at Grantham brings, providing interchange for London, East Anglia, as well as Yorkshire, the North East and Scotland. This does however have a substantial impact on journey times from Lincolnshire to the East Midlands. Sleaford in particular suffers. Without the diversion via Grantham Sleaford would be within around 50 minutes of Nottingham, however journey times via Grantham are a minimum of 65 minutes.

7.7 Average speed on the route are not high, the table below presents average speeds over a number of sections; these can vary further depending on the stopping pattern of services.

Table 7.1 Average Speeds: Nottingham – Skegness Route

Route Section	Average Speed (mph)
Nottingham – Skegness	36
Grantham – Sleaford	42
Grantham – Skegness	38
Sleaford – Skegness	45

7.8 It can be seen that the overall average speed of 36 mph is very poor; the fastest section is Sleaford – Skegness reflecting the relative lack of stops for most services over this section.

7.9 Partial information is available on the usage of the route, with the 2013 Network Rail Regional Market Study containing information on flows to Nottingham from all stations excluding Skegness.

Table 7.2 Total Journeys to Nottingham and total station usage

Origin Station	ORR Station Usage	Journeys to Nottingham
Boston	216,000	31,000
Hubberts Bridge	1,000	0
Swineshead	2,000	0
Heckington	65,000	4,000
Sleaford	337,000	19,000
Rauceby	2,000	0
Ancaster	4,000	1,000
Grantham	1,120,000	178,000

7.10 Unsurprisingly Grantham, Sleaford and Boston provide the vast majority of demand on the route. It is interesting to note that trips from Sleaford to Nottingham are relatively limited compared to the number to and from Lincoln, around 100,000 per annum. The total number of trips from Grantham to Nottingham is very large, although some of these trips may be interchange trips from the East Coast Mainline. Grantham is however located in a very convenient position for residents to commute to Nottingham.

7.11 The route has an active Community Rail Partnership which aims to promote and develop the route and in turn increase demand.

Infrastructure Constraints

7.12 There are two main infrastructure constraints on the route from Nottingham to Skegness. The first of these are two single track sections of line east of Sleaford, one running from Sleaford to Heckington and one from Hubberts Bridge to Sibsey. At the present time the length of these single track sections and the level of service provided does not present any serious constraints to operation, however if service levels were increased above hourly the single track sections might present a timetabling problem.

7.13 The second, more pressing constraint is the low line speeds that are prevalent along the route. The table below summarises the predominant line speeds between Nottingham and Skegness.

Table 7.3 Predominant line speeds Nottingham - Skegness

Route Section	Line Speed (mph)
Nottingham – Grantham	60-75
Grantham – Sleaford	50
Sleaford – Boston	60
Boston - Skegness	50-60

7.14 It can be seen that line speeds on the route are generally low, with the section from Sleaford to Grantham being especially poor. It is known that there have been issues with the permanent way east of Sleaford, with heavier locomotive hauled trains banned from the route for a period due to concerns over track quality. This would suggest that the existing infrastructure would need substantial investment to bring substantial improvements to journey times.

7.15 As the lowest line speeds are at the west end of the route between Grantham and Sleaford, and this section will have the greatest number of passengers using it, there would be a case for using any available budget for investment on improving journey times on this section, before working eastwards towards Skegness. This approach would also be justified by the economic modelling presented earlier

that shows that substantial benefits would be gained from improving the section of route from Sleaford to Grantham, with still useful, but lower benefits from the eastern section of the route.

Service Developments

7.16 The greatest scope for improving services on the route is by reducing journey times on the route. Based on the population and number of settlements east of Grantham the case for increases in service frequencies, which would add substantially to the cost base of the route, is likely to be poor. The exception to this is during the summer season when severe overcrowding occurs on some services. This may justify an increase in service frequencies to deliver extra capacity, although the current policy of operating longer trains at weekends also helps. Historically Skegness received trains from a variety of destinations in the summer season, especially South Yorkshire and the West Midlands. It may be worth examining the case for such services particularly from Sheffield which might be the easiest for East Midlands Trains to deliver. The operation of such services on Sundays would be beneficial to both the resort and make use of rolling stock that is spare on Sundays.

7.17 The only case for changes in weekday services may be around developing a dedicated service between Grantham and Nottingham for intermediate stations, as is currently being introduced between Nottingham and Newark Castle. Such a service would relieve the Nottingham – Skegness service of intermediate stops between Nottingham and Grantham allowing some journey time reductions especially at peak times, whilst also improving services between Grantham and Nottingham. An alternative to this would be to try and timetable the two existing services between Grantham and Peterborough to provide a more even split in departures times and remove the existing bunching which sees two services depart in 15 minutes followed by a 45 minute gap which afflicts services in both directions. Due to the difficulties in planning the Liverpool – Norwich services, the Nottingham – Skegness service would seem the most likely to be retimed to deliver this improvement.

7.18 There is also a need to develop an all year round all Sunday service to and from Skegness.

SLEAFORD – PETERBOROUGH

7.19 The Sleaford – Peterborough is the southern part of the Great Northern Great Eastern Joint Line which runs from Peterborough to Doncaster and has recently been heavily upgraded to allow freight traffic to be diverted from the East Coast Mainline.

7.20 The passenger service on the route is broadly hourly on weekdays with most services operating direct from Peterborough to Lincoln. However there are a number of issues with the service provided. The first relates to services in the mornings and evenings, with no service leaving Sleaford for Peterborough before 0834 making commuting trips via this route impossible. Instead two services depart from Spalding for Peterborough at 0700 and 0800. This gap in services is reflected in the evening with the last through service from Peterborough to Sleaford departing at 1625. Services from Peterborough are in general poor after this time with departures from Peterborough to Spalding at 1732, 1836 and 2030.

7.21 The alternative option of travelling from Sleaford to Peterborough via Grantham is both slower and involves an interchange. The historic reason for this lack of early morning and evening services has been the times that the signal boxes on the route were open. However as part of the upgrade of the route for the diversion of freight trains the numerous mechanical signal boxes have been abolished and replaced by control from Lincoln Signalling Control Centre which is open continuously. This therefore removes one of the main barriers to service development on the route.

7.22 Weekend services are also very poor on the route. There is no Sunday service, and there are substantial gaps in the service on Saturdays with for example a 2 hour 20 minute gap in departures from 0932 to 1149, and a further gap from 1242 to 1510. These gaps reduce the potential use of the service for leisure travellers at weekends.

7.23 Journey times on the route, as elsewhere in Lincolnshire are poor. Despite there being only one intermediate station, at Spalding, average speeds over the 35.5 mile route are only 40mph. However as part of the upgrade of the joint line, line speeds have been increased to 75mph giving scope for journey time reductions. Indeed from the May 2015 timetable change there appear to be some improvements to journey times with up to 6 minutes removed from the Peterborough – Sleaford journey time.

7.24 Little information is available about flows of traffic on the route. However based on the service pattern the largest flow is likely to be Spalding to Peterborough. The service that Spalding receives is surprisingly poor. The town has a population of over 30,000 but as described above receives only an hourly service to Peterborough and Lincoln with very poor evening services and no Sunday service and large gaps in the Saturday service. There is a case for improvements to services to Peterborough to allow the town to take full advantage of the high quality links available to London and East Anglia. The situation at Spalding contrasts with Stamford, discussed below, which receives an hourly service to Peterborough, Cambridge, Stansted, Leicester and Birmingham, and usage that is approaching double that at Spalding, despite have a population of only 20,000.

Service Improvements

7.25 Whilst there have been historic constraints to developing services on this route linked to the opening hours of signal boxes, and low line speeds, many of these constraints have now been removed following the upgrade of the joint line. The only significant constraint remaining is capacity around Peterborough where there may be some pathing constraints between Werrington Junction and Peterborough station, as well as platforming issues at Peterborough station, although the development of a grade separated dive under at Werrington Junction may help resolve these issues.

7.26 There is a long standing aspiration for the development of a station at Littleworth between Spalding and Peterborough. Such a station could act as a Park & Ride to Peterborough for settlements south of Spalding. More work is required to examine the viability of such a station .If there was suitable demand, then such a station might contribute revenue to the route as a whole helping to improve the financial performance of the route.

7.27 The main service improvements that the route would benefit from are:

Potential Improvements

- **Journey time reductions by taking advantage of recent signalling and track upgrades.**
- **Scheme that encourage more commuting by rail to Peterborough, such as a new station at Littleworth if a feasibility study showed that this was viable.**
- **Clockface hourly service between Sleaford and Peterborough, retaining through links to Lincoln where possible, operating Monday to Saturday, and providing an early morning and late evening services.**
- **Development of a two hourly Sunday service ideally building to a hourly service.**

NOTTINGHAM – GRANTHAM – PETERBOROUGH – NORWICH

7.28 The route from Nottingham to Norwich via Grantham and Peterborough is served as part of a much longer route from Liverpool to Norwich. The service only crosses into Lincolnshire at Grantham, but is an important cross country link. Service are operated by East Midlands Trains and are typically operated by heavily refurbished Class 158 trains which provide a relatively high standard of travel compared to other rolling stock in use in Lincolnshire.

7.29 It serves both a local and strategic function by providing important strategic links for Grantham to Liverpool, Manchester, Sheffield, and Norwich. It also provides a local function by providing a service from Grantham to Nottingham. It shares this function with the Skegness – Nottingham service described above however the value of the service is not maximised with departures from Grantham to Nottingham and vice versa tending to be clustered. For example there are two services in 15 minutes from Grantham to Nottingham followed by a 45 minute gap.

7.30 The route is known to have overcrowding problems. Historically these have been worst west of Nottingham, but in recent years the service has been strengthened from two to four car trains west of Nottingham. East of Nottingham the majority of services are two car and do suffer from overcrowding.

Potential Improvements

7.31 Over almost the full length of the route the service is paralleled by other services which limit the scope for improving service frequencies, however there may be scope for journey time improvements to the service at a number of locations. The most relevant to Grantham would be improvements to journey times between Peterborough and Nottingham. Between Peterborough and Grantham this would require the use of different rolling stock with a higher maximum speed, than the 90 mph the Class 158s can achieve, as the East Coast Mainline already operates at 125mph. This would actually bring wider benefits to the planning of the ECML as the Liverpool – Norwich service represents a planning constraint as it is the slowest passenger service in operation on the section between Doncaster and Peterborough.

7.32 Between Grantham and Nottingham increases in line speeds would be required to deliver a faster service. The existing speeds are poor with an average of 40mph for the section from Grantham to Nottingham, despite the lack of intermediate stops. If line speeds on this sections could be increased this would benefit both the Norwich – Liverpool and Skegness – Nottingham service.

BIRMINGHAM – LEICESTER – STAMFORD – STANSTED AIRPORT

7.33 The Birmingham – Stansted Airport service operated by Cross Country trains skirts through the southern edge of Lincolnshire, serving the town of Stamford. The service operates at an hourly frequency and provides an important strategic regional link from the West Midlands to the East of England.

7.34 Services on the route are operated by 100mph capable Class 170 trains which provide a relatively high standard of passenger accommodation. However services on the route can be overcrowded at times with the service being used by a mixture of local and long distance passengers.

7.35 The rail journey time is competitive with car between Peterborough and Leicester with a journey time of 56 minutes compared to a car journey time of over an hour. This in spite of the route being relatively indirect, diverting via Melton Mowbray to access Leicester. The rail journey time from Stamford to Peterborough, at 14 minutes is also significantly faster than car, which has a journey time of around 30 minutes. These strong competitive features of rail are however diluted by the frequency of the service, which at hourly, makes rail less attractive.

Potential Improvements

7.36 The main improvement needed to the Birmingham – Stansted service is an increase in capacity to reduce overcrowding. This could be delivered through cascades of rolling stock following electrification of other routes in coming years.

7.37 The other main issue is the frequency of services between Peterborough and Leicester. The development of a half hourly service would make the route significantly more attractive, especially for shorter trips between Stamford and Peterborough. The easiest way of delivering such a service would be to extend the existing Birmingham – Leicester service, also operated by Cross Country through to Peterborough. An alternative option that would expand the level of direct connectivity on the route would

be to extend the existing two hourly service from Ipswich to Peterborough, operated by the Greater Anglia franchise to Leicester giving a direct link from Suffolk to the East Midlands. This service would require increasing to an hourly service to give a full half hourly service from Peterborough to Leicester.

SUMMARY

7.38 There are four routes of differing character in the south of Lincolnshire. Two of these routes provide important links across Lincolnshire providing services to towns such as Boston, Skegness, Sleaford and Spalding. These routes are characterised by low speeds, and variable frequencies making the routes less attractive.

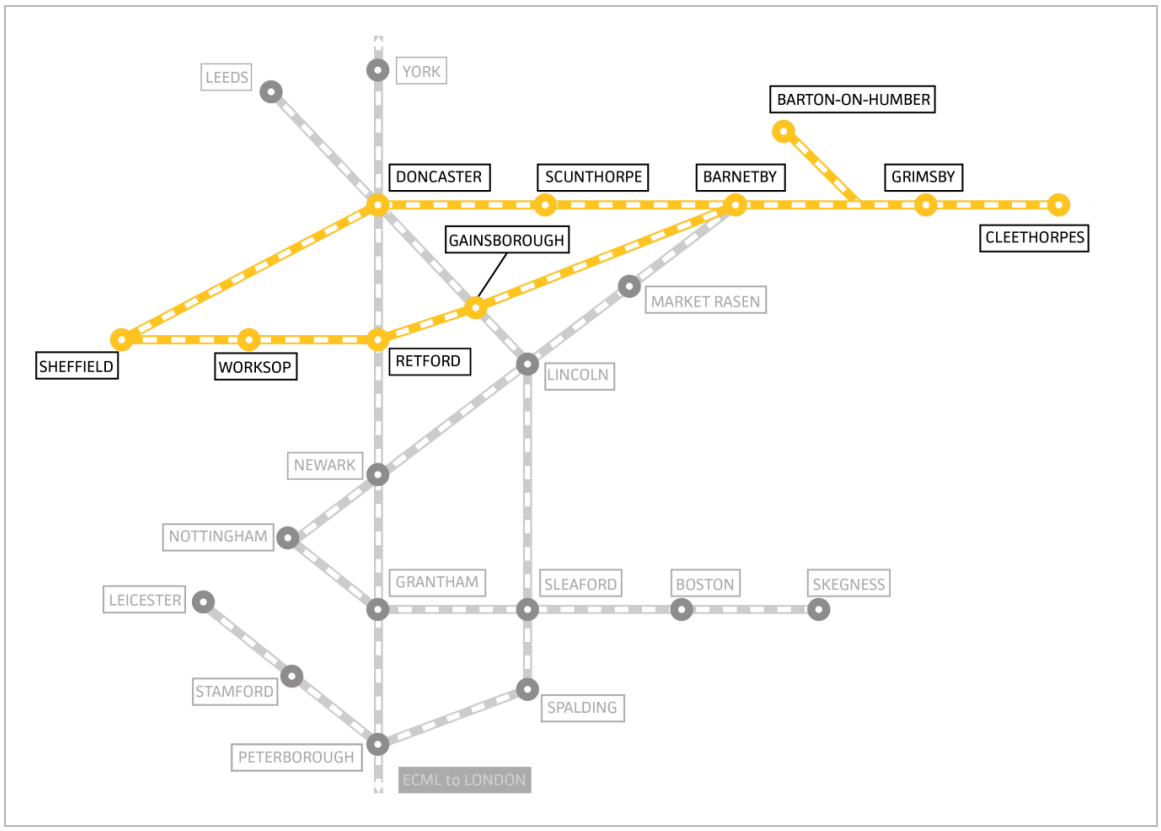
7.39 The other two routes provide a contrast, being part of longer distance strategic services which although not fast by the standards of long distance services, provide a high level of connectivity to a wide variety of locations. However the penalty for the good links is overcrowding as a single service attempts to provide both local and strategic functions.

7.40 Whilst there is scope for improving all of the services in this group of routes, the most pressing issues relate to the Nottingham – Skegness and Sleaford – Peterborough routes, especially the latter, which requires changes to both frequencies and journey times to provide a more attractive service to users.

8 Northern Lincolnshire

8.1 The rail network in Northern Lincolnshire serves the major towns of Scunthorpe, Grimsby and Cleethorpes, as well as Barnetby for Humberside Airport, and Barton-on-Humber. The rail network in the area is relatively isolated from the rest of the Lincolnshire rail network being operationally focussed on Yorkshire rather than the East Midlands. The only link to the rest of Lincolnshire being via the Grimsby - Lincoln service, discussed in Chapter 6. Although there are only two main service groups the service in the area are provided by two operators, Northern and Trans Pennine Express.

Figure 8.1 Lincolnshire: Northern Lincolnshire Routes



8.2 Service levels in the area have, like much of Lincolnshire, been static for many years, with the structure of the timetable dating back to privatisation. The main change has been investment as part of the Trans Pennine Express franchise which has brought modern Class 185 Desiro trains to the area.

SOUTH HUMBER MAINLINE

8.3 The South Humber Mainline runs from Doncaster to Cleethorpes through Scunthorpe, Barnetby and Grimsby. Whilst the route is principally a freight route linking the Port of Immingham & Grimsby with the Yorkshire area and providing a link to the ECML at Doncaster, the line is also the main passenger route from North East and North Lincolnshire to the rest of the national rail network. Services on the route are characterised by comparatively low frequencies and poor journey times.

8.4 There are two contrasting passenger services operating on this route. The first is operated by TPE and is an hourly service running from Cleethorpes to Manchester Airport, running via Doncaster and

Sheffield. All services call at Grimsby, Barnetby and Scunthorpe with selected services also calling at Habrough and certain peak services calling at intermediate stations between Scunthorpe and Doncaster. Typical journey times from Cleethorpes to Doncaster are around one hour 12 minutes, with the journey to Manchester Airport taking 3 hours.

8.5 The route is however of economic importance to the development of the area. Work conducted by JMP Consultants in 2014 to look at the value of the existing service estimated that the direct service from Cleethorpes to Manchester Airport in its current form is worth around £68M per annum to the local economy. Reducing journey times by around 10 minutes between Cleethorpes and Doncaster was found to bring an additional £5M per annum benefit.

8.6 The second passenger service is that from Scunthorpe to Sheffield operated by Northern. This service runs hourly throughout the day and calls at all intermediate stations. This gives a journey time of one hour 20 minutes from Scunthorpe to Sheffield and 40 minutes from Scunthorpe to Doncaster, 10 minutes longer than the TPE service. Eastbound the two services in combination leave Sheffield at 30 minute intervals; however the westbound service from Scunthorpe operates with two trains in 11 minutes followed by a 49 minute gap. In effect this makes the service from Scunthorpe to Sheffield hourly as few passengers will be likely to use the stopping service with a longer journey time when a faster service operates so closely ahead of it.

8.7 Track capacity on the route is high to accommodate freight traffic, although between Grimsby and Cleethorpes, where only passenger services operate, the route is reduced to single track. Signalling on the route is mixed although there are a significant number of manual signal boxes especially in the Barnetby area which will be abolished in late 2015 as part of the North Lincolnshire Re-signalling Scheme.

8.8 Line speeds are not high with a ruling speed of 55 mph, which is the cause of the significant journey times to Doncaster from Cleethorpes. An improvement in line speeds would bring considerable benefits to the operation of the passenger service, and would also bring some benefits to freight traffic, as container trains and other types of train, when running empty, can operate at up to 75 mph.

8.9 As the route is served by services operating on a single corridor, connections with other routes are important, especially at Doncaster. At the present time the timetable is arranged such that there are unattractively long connection times at Doncaster for Leeds and York, limiting the attractiveness of travel by rail to these destinations and potentially impacting on the economy.

8.10 The Network Rail Regional Market Study (2013) provides evidence on the usage of the existing services based on data for 2012. This includes information on trips to Sheffield and to Grimsby.

Table 8.1 Passenger Flows and Station Usage: South Humber Mainline

Station	ORR Station Usage	Sheffield	Grimsby
Doncaster	3,884,000	N/A	21,000
Crowle	34,000	2,000	2,000
Althorpe	9,000	0	0
Scunthorpe	395,000	39,000	34,000
Barnetby	69,000	5,000	7,000
Habrough	33,000	1,000	11,000
Grimsby Town	447,000	31,000	N/A
Cleethorpes	265,000	34,000	37,000

8.11 The table shows some interesting patterns of demand, for example it is interesting to note that Grimsby and Cleethorpes each generate nearly as many trips to Sheffield as Scunthorpe despite Scunthorpe being much closer to Sheffield and having two trains per hour. In both cases car has a very similar journey time to rail, however at Scunthorpe frequency may be of more importance and the existing pattern of services is such that the frequency is essentially hourly due to the clustering of services. The station at Barnetby has an important role to play in providing interchange to Humberside Airport, a role that may develop further as the Airport grows. This is hinted at by the comparatively high proportion of trips to Sheffield relative to Grimsby.

8.12 As Grimsby and Scunthorpe have similar populations and Grimsby is further from the urban centres of South Yorkshire it is possible that Scunthorpe is underperforming as it has fewer users than Grimsby Town, indicating there may be the potential for growth.

8.13 In the short term it may be beneficial to develop the Cleethorpes – Manchester Airport service as a branded Airport service, as it serves both Manchester Airport and Humberside Airport. This would be useful for developing greater awareness of Humberside Airport and sustainable access to it, benefitting both the rail operator through increased use of rail to access the Airport, and the Airport through increased patronage. However to deliver this there is a need to improve linkages between the Airport and Barnetby station. At the present time the bus link from Humberside Airport to Hull misses out Barnetby entirely, apart from one service per day in each direction, meaning that there is no direct bus link. Therefore a taxi trip is required for the final part of the journey. As demand for the Airport increases it would appropriate to examine the case for a dedicated bus service connecting into and out of rail services at Barnetby. This accompanied by improvements to passenger facilities at Barnetby would serve to increase the attractiveness of using rail to access the Airport. In the longer term there are aspirations for the development of a station closer to the Airport. This however would be dependent on future growth of the Airport.

Developing Services

8.14 There are a number of potential options for developing services on the South Humber Mainline. Both services on the route are affected by the refranchising of both Northern and Trans Pennine Express from 2016; however the service specifications for the route do not indicate any substantial changes to the existing service pattern. The main improvements to services can be summarised as follows:

Potential Improvements

- **Reduction in journey times between Doncaster and Cleethorpes**
- **Restructure of the existing timetable to provide a half hourly service from Scunthorpe to Doncaster**
- **Introduction of a half hourly Cleethorpes – Manchester service**
- **Ensuring there is sufficient capacity in summer for seasonal trips to Cleethorpes**

8.15 It is likely that reductions in journey times will be delivered during Control Period 5 as part of renewals to both the signalling on the route and track renewals. Indeed steps towards re-signalling are already taking place with an upgrade planned over the 2015-16 between Scunthorpe and Ulceby Junction. As described above a journey time reduction of 10 minutes along the length of the route would bring benefits of around £5M per annum.

8.16 Redrafting the timetable to provide a half hourly service from Scunthorpe to Doncaster may be possible if additional services were terminated at Doncaster rather than operating to Sheffield, as many of the timetabling constraints, especially crossing the East Coast Mainline at Doncaster would be removed. Whilst ideally services would continue to Sheffield, termination at Doncaster may not have a severe

impact on demand as the vast majority of existing passengers would use the Trans Pennine Express service rather than the Northern Rail service as the former is quicker and heading southbound departs from Scunthorpe only 10 minutes ahead of the stopping service. Work by JMP Consultants in 2014 suggested that the benefits of a half hourly service from Scunthorpe might be as high as £1.7M per annum.

8.17 In the medium to long term the development of a half hourly service between Cleethorpes and Manchester would be beneficial. Modelling carried out by JMP Consultants in 2014 suggested that there would be benefits of up to £4.6M per annum to the economies of North Lincolnshire and North East Lincolnshire from such a change. Delivering such service would however be resource intensive, and would raise capacity issues particularly between Sheffield and Manchester as other services compete for available capacity. It may therefore be necessary to deliver such a service in an incremental way with a half hourly service between Cleethorpes and Doncaster being developed first, followed by incremental steps westwards. An alternative option of operating a service from the South Humber Mainline to other locations is unlikely to be viable due to a lack of capacity on routes northwards from Doncaster to Leeds and York.

8.18 Delivering sufficient capacity to the route in summer is a difficult issue with rolling stock resources being very tightly controlled. Releasing additional trains to operate to Cleethorpes in the summer season would mean removing a train from use elsewhere on the network which given broader overcrowding issues on the Trans Pennine network may not be feasible. A potential alternative solution to delivering extra capacity might be for Northern Rail to operate seasonal services for example during the school summer holidays on the route via Brigg. This option is described in more detail in the section covering that route.

8.19 In the long term it may desirable to increase service frequencies between Scunthorpe and Doncaster to try and improve connectivity from the town to other locations. Operating direct services from Scunthorpe beyond Doncaster is operationally difficult, however a high frequency service, with a lower journey time would make best use of the excellent connectivity that Doncaster already has.

CONNECTIVITY TO WEST YORKSHIRE & THE NORTH

8.20 As described above the South Humber Bank has direct services to Sheffield and Manchester, however connectivity to West Yorkshire, York and the north is poorer, with interchange at Doncaster required. This is a limiting factor as the need to interchange introduces a potential source of unreliability to journeys whilst connection times impact on the frequency of journey opportunities.

8.21 As timetables are seldom planned around connections journey times can be very variable with times varying by direction. A good example of this is the present service between Scunthorpe and Leeds where the journey to Leeds takes 1 hour 29 minutes and according to journey planners can only take place on an hourly basis, whilst in the return direction there are two opportunities to travel each hour with journey times between 1 hour 17 minutes and 1 hour 32 minutes. In practise shorter journeys to Leeds are possible by using an unadvertised connection at Doncaster. The situation for Barnetby, Grimsby and Cleethorpes is worse with only an hourly service making connections at Doncaster and relatively high connection times at Doncaster.

8.22 The scope for making significant changes to the timetable is limited with the development of direct services to the north from the South Humber Bank unlikely due to capacity issues on the ECML and also the need to reverse at Doncaster which would involve a number of conflicting movements at an already constrained location. The only options for direct services would be to utilise the Doncaster North Chord that provides a direct link from the South Humber Mainline to West Yorkshire via routes which are used for freight traffic, or alternatively using the Doncaster avoiding line to run from Hatfield & Stainforth to Adwick on the Doncaster – Leeds line. These routes are however relatively low speed and avoiding Doncaster would present a commercial risk for services.

8.23 It is possible that a peak service could be developed to operate direct from Scunthorpe to Leeds via Hatfield & Stainforth, Adwick Junction and Wakefield Westgate. Such a service would test the viability of such services and would present opportunities for commuting and business trips, journey times would be around one hour.

8.24 The most viable option for improvement is likely to be a focus on improved connections at Doncaster. Ideally steps could be taken to ensure that the timetable is reflective, in that journey times and frequencies are consistent in both directions as far as possible. Additionally the planning of services on the East Coast Mainline should take more account of the need for viable connections. The next opportunity to address this lies in the development of the next major East Coast Mainline timetable change in 2019 when Virgin Trains East Coast increase service levels. Retiming the Doncaster – Scunthorpe stopping service would also address this issue.

Potential Improvements

- **Peak direct services from Scunthorpe to Leeds via Adwick and avoiding Doncaster**
- **Improved connections at Doncaster for West Yorkshire and the north**

CLEETHORPES – BARTON-ON-HUMBER

8.25 The Cleethorpes – Barton-on-Humber service is presently a very isolated part of the Northern Rail network. The service provides a local stopping service to a number of smaller station on the South Humber Mainline as well as the stations on the branch itself. From Barton-on-Humber interchange is possible with bus services across the Humber Bridge to Hull. The route is one of two in Greater Lincolnshire that has a Community Rail Partnership (CRP) in place and the route plays an important role in providing accessibility between Barton-on-Humber and Grimsby/Cleethorpes for those without access to a car.

8.26 The existing weekday service on the line comprises a two hourly service calling at all stations from Cleethorpes to Barton-on-Humber operated by Northern. The service makes full use of the one train allocated to it making an increase in service levels difficult without a significant increase in resources and costs. The average speed of the service is very low at around 30mph. For journeys to and from Hull via the bus connection the total journey takes around one hour 25 minutes from Grimsby to Hull compared to a journey of 50 minutes by car. The reason for this journey time difference is a mixture of low line speeds and the high density of stops in the service. A competing bus service operated by Stagecoach, while slightly slower operates at an hourly frequency adds as a further detraction from the attractiveness of the line for connections to Hull, although this service does not serve the same intermediate settlements.

8.27 A further complication is the timing of the connecting “Fast Cat” service to Hull, from Barton-on-Humber. Whilst connections from Hull are typically around 10 minutes the times of connections to Hull vary, with typically a 17 minute wait but at some times of the day a wait of half an hour, the latter occurring in the morning peak period. Such gaps and variability detract from using the route as a through link as well as issues relating to the unreliability of connections between the two services.

8.28 The operation of the service is complicated by the isolation of the service from all other services operated by Northern. The services are crewed, under subcontract, by TPE staff based at Cleethorpes. Trains are provided by a solitary Doncaster – Grimsby service operated by Northern each day which swaps over the train that works the Barton branch. This situation is likely to change from 2017 when the Barton–on-Humber branch may be transferred from Northern to East Midlands Trains. At this point the service may become operationally more integrated with the Grimsby – Lincoln service.

Potential Service Improvements

8.29 There are a number of options for developing service on the Barton-on-Humber branch, some of these are incremental changes whilst others would involve significant expenditure. The following changes could be made to the service.

Potential Improvements

- Improved connections at Habrough with TPE services
- Introduction of improved all year round Sunday service
- Introduction of hourly service
- Improved connections with Humber Fast Cat

8.30 At the present time it is possible to make connections with TPE services at Habrough, however this typically requires either a 25 minute or 30 minute wait in each direction. Ideally this connection time would be lower to reduce journey times. However it would be important to ensure that the if the connection were reduced in one direction through the retiming of a service this did not in turn increase the journey time for services in the other direction.

8.31 Improved Sunday services could be introduced at a relatively limited cost subject to the completion of resignalling works that would reduce the cost of operating the service.

8.32 The introduction of an hourly service to the route would make the service a more viable alternative to car for local trips on the line. The cost of achieving this would be large as an additional train would have to be leased, however it would address the existing poor service frequency on the route. Such a service, operating at the same minutes past each hour throughout the day would make the service more attractive for through trips to Hull, if coupled with improved integration with the Humber "Fast Cat" bus timetable.

CLEETHORPES – BRIGG – SHEFFIELD

8.33 The Cleethorpes – Brigg – Sheffield service, operated by Northern Rail, presently only operates three times per day in each direction on Saturdays only as a 'Parliamentary Service' required to prevent closure proceedings taking place. The service provided represents the only service to use the stations at Gainsborough Central, Kirton Lindsey and Brigg. The service on this route has been in place for over 20 years, after weekday services were withdrawn by Regional Railways in a round of cuts during 1992. The journey time from Sheffield to Cleethorpes via Brigg is slower than the route via Scunthorpe but serves the stations at Retford and Worksop.

8.34 The routes present role is dominated by freight traffic, providing a route from Immingham to the East Midlands and South Yorkshire that does not require an at grade crossing of the ECML, as is required on either of the alternative routes via Newark or Doncaster. The route also has an important function as a diversionary route for both passenger and freight traffic when the South Humber Mainline is closed. The route was used extensively for this purpose during 2013 after a major landslide at Hatfield closed the South Humber mainline. The friends of the Brigg and Lincoln Lines hold aspiration for the development of a service operating six days per week.

8.35 The case for developing further passenger services on the route is complex. The journey time from Sheffield to Cleethorpes is a little over two hours. Therefore to introduce even a two hourly service would require as a minimum two and potentially three additional trains, which would be a significant expense, for a service that would largely duplicate the existing Sheffield – Cleethorpes via Doncaster service.

8.36 One potential role for the route may be to develop its role as a tourist route, for accessing Cleethorpes. The present service from Sheffield to Cleethorpes suffers from overcrowding in summer months. It is possible that weekday services could be developed during the summer months via Brigg to provide increased capacity and give Worksop and Retford a direct link to Cleethorpes. The resourcing of such a service would have to be achieved by utilising rolling stock that is spare in the off peak period in the Sheffield area. Whilst this may not be possible at the present time looking to the future increased capacity within the new Northern Rail franchise may provide some scope for delivering such a service.

Summary

8.37 The routes that serve Northern Lincolnshire are in many ways separate from other routes in Lincolnshire, tending to face towards South Yorkshire rather than the Midlands. However they do share similar characteristics with the rest of Lincolnshire with service frequencies being comparatively low and journey times also being low. The area does enjoy a strategic link to and from Manchester Airport, which is of a high quality, and there are plans in place to reduce journey times through changes to signalling and track.

9 The Role of Freight

9.1 The rail network in Greater Lincolnshire, especially Northern Lincolnshire plays an important role in the UK rail freight network. Much of the area has benefitted from major investment in infrastructure to improve services such as the recent upgrade to the GN/GE Joint Line. The rail network also serves Immingham, the largest port by tonnage in the UK, which has for many years focussed on the shipment of bulk products. There are also a number of flows that are generated locally within Greater Lincolnshire.

9.2 Whilst in many areas of the country passenger and freight movements have conflicted with each other when planning the use of scarce capacity, rail freight has enjoyed a symbiotic relationship with passenger services in Greater Lincolnshire where the strength of freight services have historically helped to support the continuance of passenger services. At the present time investment in the networks infrastructure primarily for freight traffic, most notably through the upgrade of the GN/GE Joint Line, also potentially benefits passenger traffic for example through increased line speeds.

THE NORTH LINCOLNSHIRE PORTS

9.3 The largest single generator of freight traffic in Greater Lincolnshire is the Port of Immingham & Grimsby on the South Bank of the Humber Estuary. This port was developed largely by the Great Central Railway in the early years of the twentieth century, and as such has always been very rail focussed.

9.4 Immingham is the largest Port in Britain by tonnage moved, and much of this is moved by rail, indeed 25% of the UK's rail freight uses the route to and from the South Humber Ports. The port has specialised in the import of coal and iron ore in recent years, the latter for the steelworks at Scunthorpe. The port also supplies a number of oil refineries and chemical works in the area around it, which in turn generate their own rail freight movements, although the movement of petroleum products has declined in recent decades as pipelines have replaced rail for bulk movements.

9.5 The movement of coal traffic is likely to decline in coming years as the number of coal fired power stations declines, at the present time the port serves power stations at Cottam, Ratcliffe, Eggborough, Drax, Rugeley. Coal traffic is however being replaced with biomass traffic with a flow having already been developed from Immingham to Drax Power Station.

9.6 There are a small number of finished steel flows to and from Immingham from destinations as diverse as Scunthorpe, Wolverhampton and Llanwern.

9.7 Oil flows from Immingham originate at either the Humber or Lindsey refineries, close to the Immingham port complex. Although services have been in decline for a number of years, a diverse range of destinations are served including Jarrow, Rectory (near Nottingham), Preston Docks, Kingsbury (near Tamworth), Colnbrook (near Heathrow), and Westerleigh (near Bristol).

9.8 All freight traffic from Immingham uses the South Humber Mainline as far as Barnetby, this is the busiest section of the rail network in the UK for freight traffic. At Immingham traffic take one of three routes towards Scunthorpe, Brigg or Lincoln. Much of the traffic towards Scunthorpe is coal or iron ore traffic, the route towards Brigg is also dominated by coal and biomass traffic, whilst the line to Lincoln is a mixture of coal traffic for Radcliffe Power Station and oil traffic heading towards the Midlands and beyond.

9.9 Looking to the future rail freight around Immingham will benefit from two investments taking place simultaneously. The first is the re-signalling of the route from Scunthorpe to Immingham which will deliver additional capacity, and potentially contribute to line speed improvements. This £80M scheme will transfer control from a large number of annual signal boxes to Network Rail's new control centre in York.

9.10 The second investment funded and led by North Lincolnshire Council and the Humber LEP is gauge enhancement of the route from Doncaster to Immingham which will allow the development of container traffic from Immingham which uses larger 9' 6" containers. This will help the port to maintain its competitiveness as a container and intermodal traffic becomes more important and bulk products decline.

FREIGHT TRAFFIC GENERATED IN GREATER LINCOLNSHIRE

9.11 Rail freight traffic is generated from a small number of locations within Greater Lincolnshire. The largest of these is the steelworks at Scunthorpe which in addition to the flows of raw materials arriving from Immingham also generates a number of flows of finished products, and transhipments between other steelworks in the UK. At the present time there are flows to Aldwarke (Rotherham), Goole Docks, Lackenby (Teesside), and Wolverhampton. The frequency of these flows varies depending on commercial requirements with some flows operating on a daily basis and others on a "as required" basis.

9.12 Other flows in the Scunthorpe area include the movement of refuge for landfill from the Greater Manchester area to a site near Scunthorpe at Roxby Gullet.

9.13 Within Lincolnshire itself the only regular flow of traffic serving the area is a flow of imported steel that operates from Boston Docks to Washwood Heath (Birmingham).

9.14 As part of the Local Growth Fund there are plans to develop a 60 hectare Rail Freight Hub at Deeping Fen near Spalding to support the growth of food processing activity in the area.

FLOWS PASSING THROUGH LINCOLNSHIRE

9.15 In addition to the freight flows that originate at Immingham that pass through Lincolnshire there are a number of other flows that pass through the county. The most important of these are flows on the GN/GE Joint Line between Peterborough and Doncaster via Sleaford and Lincoln that has recently enjoyed a £280M upgrade. The rationale for this improvement is the need to remove freight traffic from the East Coast mainline between Peterborough and Doncaster to provide capacity for additional passenger services. To achieve this the Joint Line route has been resignalled to facilitate all week opening, and has seen substantial track upgrades to increase the ruling line speed to 75mph, fast enough to allow the operation of container trains at their maximum permissible speed.

9.16 Although the upgraded route has only recently been completed a number of services have already been diverted including a number of heavy freight trains as well as some container trains running from Felixstowe to the north of England. These flows may well increase over time as daytime freight paths on the ECML become less attractive as passenger services are enhanced and freight paths become slower. The proposed scheme to provide grade separation at Werrington Junction (north of Peterborough) will further enhance the attractiveness of the Joint Line to freight operators as existing issues with conflicting movements at Peterborough to access the Joint Line will be removed, where presently freight travelling from East Anglia has to cross the ECML on the level which is time consuming and absorbs available capacity for passenger and freight traffic alike.

SUMMARY

9.17 Overall freight traffic is of critical importance to the rail network in Greater Lincolnshire and is growing through the diversion of more services away from the ECML. In the north of the Greater Lincolnshire area rail freight also provides an important support to the local economy through the steelworks at Scunthorpe and the Port of Immingham. Whilst rail freight traffic is entirely commercial there has been, and continues to be, significant investment in infrastructure to support its development.

10 Developing the Network

10.1 The preceding chapters described the existing situation on rail routes in Greater Lincolnshire and identified the economic benefits that could be gained from developing these routes further. This chapter sets out an approach for delivering schemes that would help the rail network deliver its full potential to the economy of Greater Lincolnshire - fulfilling its role in business, commuter and leisure markets and providing a sustainable transport system.

10.2 The following sections group the interventions into categories and provide indicative costs for them, culminating in a list of schemes for development. It is important to note the level of inter linkage between schemes as these may support different options for the strategy in future years. Many of the enhancements will support the delivery of the benefits identified in the economic modelling chapters of this report but in identifying priorities for delivery we have taken recognition of any tradeoffs between the benefits a scheme brings and the feasibility of its delivery.

NETWORK WIDE IMPROVMENTS

10.3 In addition to the route specific improvements identified in the preceding chapter there are a number of network wide improvements that could be applied across the rail network in Greater Lincolnshire. These are described below.

Timetabling

10.4 As we have already described the rail network within Greater Lincolnshire is comparatively isolated from the rest of the national rail network. Whilst this isolation creates some issues around developing services, it also presents an opportunity. To try and develop a more cohesive network at minimum cost a timetable could be developed that maximises the connectivity between services. Both Lincoln and Sleaford are hubs in the Greater Lincolnshire network and a timetable could be developed that maximises the opportunities for connections by ensuring that services on all routes converge at the same time, allowing interchange between all services before departing again. These could feed into strategic services such as those to Nottingham and London.

10.5 The development of such a timetable would contribute to reducing journey times across Greater Lincolnshire, helping increase use of services, and making rail more attractive for tourism visitors. At Lincoln such a plan could potentially be integrated with the planned Transport Hub so that key bus services to other parts of Greater Lincolnshire not served by rail could be integrated into the timetable.

10.6 Even allowing for the freestanding nature of the Greater Lincolnshire rail network implementing such a timetable may take time especially where incremental changes are needed to introduce new services to fill gaps in the existing timetable, for example between Lincoln and Sleaford. The East Midlands Trains franchise renewal process presents the opportunity to explore this issue further.

Rolling Stock

10.7 Much of the existing rolling stock used across Lincolnshire by all operators is now approaching 25 years old. The main exceptions to this are the Class 185 trains used by Trans Pennine Express on the Manchester – Cleethorpes service.

10.8 Rolling stock operated by Northern Rail is going to be subject to significant change in the coming years after the franchise is re-let, including a commitment to withdraw all Pacer trains by 2020. There are however no plans at the present time for changes to the East Midlands Train fleet. This fleet is largely composed of older British Rail built Sprinter trains. Whilst the operator has been successful at

refurbishing this fleet, particularly the Class 158 units, there is an ongoing issue about the suitability of many of these trains, especially the Class 153 and 156 vehicles, for the needs of modern passengers. These latter classes are used on a number of the more strategic longer distance services such as Lincoln – Nottingham and Skegness – Nottingham. Looking to the future there is a need to operate more suitable stock with better passenger amenities, such as air conditioning, wi-fi and power sockets, at the very least on longer distance services.

10.9 The refranchising of East Midlands Trains in 2017 presents the opportunity to address these issues. The outcome of the Northern Rail franchise which presents a commitment to ordering 120 carriages that are capable of operation on non electrified lines may provide an indication of the scope for rolling stock renewal in the next East Midlands Trains franchise and would provide a basis for lobbying for new trains in the next franchise.

Line Speeds

10.10 To provide improved journey times across the network there is a need to work with Network Rail and train operators on the issue of line speeds. Whilst it would be desirable for line speeds to be improved as soon as possible the volume of work required and the need to deliver it in a cost effective manner means that that the work would probably be delivered over several years. The most appropriate approach to prioritising work in a cost effective way is to work with Network Rail to ensure that:

- When re-signalling works take place the spacing of signals is planned to provide passive provision for higher line speeds
- When track renewal work takes place the opportunity is taken to carry out work to increase line speeds.

10.11 The approach set out would deliver a progressive series of enhancements that would collectively make useful inroads to journey times. It will also help to deliver outcomes in a cost effective manner, the approach has been taken elsewhere for example in the delivery of the South Humber Gauge Enhancement Scheme where some works have been planned to take place as part of broader maintenance and renewals work, and disruptive works have been planned to take place at the same time as other disruptive works such as the North Lincolnshire re-signalling scheme. Delivery of line speed enhancements is something that would fall outside the scope of franchise renewal, however the franchise renewal consultation process would present a useful forum to explore the issue further.

Electrification

10.12 At the present time no part of the rail network in Greater Lincolnshire is electrified (apart from the ECML). Historically this has not been a major issue, as much of the rest of the network in the East Midlands and Yorkshire is also not electrified. Looking to the future however the lack of electrification may limit the ability to develop services. A good example of this is the Lincoln – London service, which when introduced at a two hourly frequency from 2019 will utilise bi-mode IEP trains which will operate as an electric train from London to Newark and a diesel train to Lincoln. However were the service to be increased further to hourly it is likely that the operator would need the route to be electrified as there may be insufficient bi-mode trains to operate an hourly service. Furthermore bi-mode trains are unlikely to have the acceleration in diesel mode that they will have in electric mode and there could therefore be timetabling benefits from electrification.

10.13 Other benefits of electrification include lower operating costs, reducing the need for subsidy of services, and greater reliability. Electrification of other parts of the network would threaten the development of new services and the retention of existing strategic links. For example if the route from Manchester to Sheffield were electrified then there would be an implied threat to the future of the Manchester – Cleethorpes service, as the business case for electrification between Manchester and Sheffield would hinge on the conversion of as many services as possible to electric traction. A similar situation would

apply to the future development of services from Lincoln to Birmingham if the Birmingham – Derby route were electrified.

10.14 There is therefore a need to investigate the case for electrification of routes into Greater Lincolnshire. Many of the routes will be difficult to justify due to their comparatively sparse service. Equally those routes would not be impacted by electrification elsewhere to the same extent. The two main routes that might justify electrification would be the Nottingham – Lincoln route which with a relatively high density of services could present a positive case. The second route is that from Doncaster to Cleethorpes. The case for this would be more complex with a relatively low frequency service operating over a long distance. It is likely that electrification of this route would in large part be dependent on the use of electric traction by freight operators. Additionally there may be a case for electrification of the GN/GE Joint line in the long term if the benefits to freight traffic were included within the assessment, this point also applies to the Doncaster – Cleethorpes route.

10.15 The *Northern Sparks* report completed in Spring 2015 identified the route from Doncaster to Cleethorpes as a 'Tier 3 Scheme', which meant it would be towards the end of a rolling programme of electrification. Whilst it would be sensible to leave electrification of the route until after other key routes including Doncaster – Sheffield - Manchester are completed, the low score achieved by the Doncaster – Cleethorpes route was based on the route being electrified in isolation from other routes, and consequently the benefits were limited. Had it been treated as an incremental extension, following the electrification of the Hope Valley line the case may well have been different, especially as the renewed commitment to direct South Humber – Manchester services in the latest TPE franchise specification means that the full benefits of electrification from Sheffield to Manchester could not be realised without electrifying Cleethorpes – Doncaster.

10.16 It is possible that over time the costs of electrification may fall, whilst the operational benefits will increase as more of the network is electrified and the operating costs of diesel services increase. In the case of Greater Lincolnshire the case is helped by the comparatively simple nature of electrification across the area with relatively few tunnels or over bridges to complicate the engineering.

Interchanges and Ticketing

10.17 Whilst the rail network serves many of the key settlements across the Greater Lincolnshire area there are a number of areas of the county that are not rail served and there is the opportunity to develop a series of bus rail interchanges to maximise the benefits of both bus and rail services. A good example of this is the scheme presently being developed for a Transport Hub in the centre of Lincoln combining bus and rail facilities. The development of a series of similar hubs at key locations across the Greater Lincolnshire area would act to improve integration between modes and introduce a broader range of journey opportunities. The benefits could be maximised if timetables between services were integrated, building on the ideas described above. This would be especially useful for providing north south links in the east of the county for example between Skegness and Cleethorpes via Mablethorpe.

10.18 Looking to the future an integrated approach to smart ticketing might further serve to make travelling by public transport more attractive. Smart ticketing could provide combined rail and bus tickets across the whole area. This could build on work carried out elsewhere in the country for example through the introduction of *MCard* smart ticketing in West Yorkshire and "*The Key*" on services operated by Southern Railway and Brighton & Hove buses. More locally East Midlands Trains already have a Smartcard system in use at stations on the Midland Mainline. This system could be extended further to include Lincolnshire. This latter issue could be pursued as part of the next East Midlands Trains franchise.

10.19 In areas covered by the Northern Rail franchise the "*Smart in the North*" programme being developed by Rail North and DfT will seek to deliver smart ticketing during the next franchise, starting April 2016.

Stations

10.20 The Greater Lincolnshire area has a wide variety of stations with a varying quality of facilities. Over time there is a need to maintain and develop these facilities to meet passengers' expectations. Within the specification of the new Northern Franchise is a requirement to develop a Social and Commercial Development Plan, part of which seeks to develop redundant or underutilised buildings for use for either community or commercial purposes. Such an approach could logically be extended to include stations managed as part of the East Midlands Trains franchise when that is re-franchised. Such investment would not just act as a catalyst for improvements benefiting both passengers and rail operators alike, but would also help support the adjacent local communities. An approach like this would be especially applicable across Greater Lincolnshire where there are many rural stations particularly if linked to the development of smaller transport hubs providing integration into local bus services.

10.21 The Greater Lincolnshire LEP should seek an identified fund for stations in Greater Lincolnshire as part of the next EMT franchise to ensure that stations receive appropriate levels of investment. This could be supported by developer contributions in areas where housing or employment development is taking place close to the stations.

Community Rail Fund

10.22 Two of the routes in Greater Lincolnshire benefit from the existence of Community Rail Partnerships (CRPs) that have helped the routes to develop. CRPs play an important role on the routes they serve in terms of promoting lines and developing local initiatives, as well as lobbying operators for improvements to services.

10.23 Whilst they have achieved a lot they have been constrained by the relatively limited funding available. An initiative in the Northern franchise specification has been to provide an increased fund of £0.5M per annum for CRPs. A similar initiative as part of the next East Midlands Trains franchise would help to develop the activities of CRP's further, and would provide a budget for the grass roots promotion of any service enhancements that are implemented. There is a need therefore to lobby for the inclusion of such fund at the consultation stage of the franchising process.

COMMITTED & DELIVERED SCHEMES

10.24 There are already a number of schemes and improvements that have either already been delivered or are in the process of delivery. It is useful to summarise these to clearly identify what improvements are coming forward.

Table 10.1 Committed Schemes

Schemes
↗ Lincoln – London two Hourly service (from 2019)
↗ Peterborough – Doncaster GN/GE Joint Line Upgrade including higher line speeds, resignalling and extended opening hours.
↗ Scunthorpe – Immingham resignalling scheme, bringing increased capacity and line speed improvements
↗ South Humber Gauge enhancement – gauge clearance Doncaster - Immingham to accommodate 9' 6" containers
↗ Lincoln – Newark – Nottingham service enhancements (implemented from May 2015)
↗ Lincoln – Sheffield journey time reductions as part of new Northern franchise
↗ Replacement of Pacer trains and major refurbishment of other rolling stock operated by Northern by 2020.
↗ Transfer of Barton-on-Humber branch to East Midlands Trains from 2017
↗ Dive under at Werrington Junction to open in Autumn 2020

10.25 By recent standards the railways in the Greater Lincolnshire area are receiving relatively high levels of investment. A number of the schemes identified above will work towards addressing existing issues with passenger services and contribute towards realising their potential economic benefits. This especially applies to the delivery of improvements in services between Lincoln and Nottingham, Lincoln and London and the improvements to services between Lincoln and Sheffield.

10.26 These improvements should be seen as important stepping stones towards delivering further larger improvements that would realise the full benefits identified within Section 4 of this report. The introduction of these schemes will demonstrate the benefits of improvements and provide greater confidence about the case for further investment in the medium to long term.

INCREMENTAL IMPROVEMENT SCHEMES

10.27 There is a range of incremental improvements that could be delivered relatively quickly, often but not always as part of a new franchise agreement. These schemes largely relate to small scale changes to stations and timetables, and could therefore be requested from franchise bidders or alternatively be negotiated with the existing operator. The consultation process that will precede the refranchising of the East Midlands Trains franchise would present an opportunity to take these improvements forward.

10.28 The table below presents a group of incremental schemes, and provides indicative costs for their implementation. These costs have been estimated at a high level from previous work where JMP has looked at similar schemes.

10.29 All of these improvements are of a similar level of priority as they all make contributions to improving the quality of the rail network. The recent Invitation to Tender for the Northern franchise would tend to indicate that all of these improvements could well fall within the remit of new franchises - this certainly applies to Sunday services where the new Northern Rail timetable specification requires franchise bidders to make substantial improvements.

10.30 In addition to funding requirements the table below also identifies any other factors that may be a constraint to introducing the scheme.

Table 10.2 Potential Incremental Improvement Schemes

Improvement	Indicative Cost	Notes/Other Constraints
All year round and all day Sunday services including on routes that presently have no Sunday service	£500k-£1M pa	Assumes no addition rolling stock needed, additional costs are crew, fuel and variable track access charge. Costs sensitive to service level specified
Upgrade Lincoln – Sheffield to "Northern Regional" service	£500k pa	Additional leasing costs of using new trains on hourly Sheffield – Lincoln service requiring three 2 car trains. Service already likely to be sped up as part of new Northern franchise
Improvements to stations and introduction of a Community Rail Development Fund	£100k per annum	Develop a fund from train operators (as specified in the Northern franchise) to support community rail. The estimate here is based on the two CRPs in Greater Lincolnshire, plus an allowance for other stations and initiatives
Journey time improvements on the Joint Line taking advantage of line speed improvements	Nil	Partially delivered as part of May 2015 timetable change which may have some timetabling implications
Improved Scunthorpe – Doncaster timetable to better utilise frequency	Nil	This is subject to pathing issues especially around Doncaster where the existing service crosses the ECML
Improved connections between Barton-on-Humber branch and TPE Services at Habrough	Nil	Subject to timetabling issues, this should be lobbied for as part of any forthcoming timetable recasts.

10.31 It can be seen that three of the schemes have no additional costs associated with them, being issues where lobbying may be required to ensure that the best use is made of any opportunities that arises as a result of the introduction of new timetables. The other three options all have costs associated with them, the most substantial relating to the introduction of more Sunday services. The level of costs for Sunday services would be very sensitive to the exact specification of services.

10.32 More certainty surrounds the upgrading of the Lincoln – Sheffield service to a "Northern Regional" service. This would build on the implied commitment to speed up Lincoln – Sheffield services in the new Northern Rail franchise. The additional costs associated with this would involve the allocation of higher quality rolling stock to the route, potentially some of the new build of trains that are committed as part of the next franchise, or heavily refurbished trains.

10.33 The level of funding for a Community Rail fund is based, pro rata, on the commitment made in the Northern Rail franchise ITT, but with an additional allowance for the routes in Lincolnshire that have Community Rail characteristics but have not been classified as such.

10.34 It should be remembered that all of the options presented here will increase revenue and therefore the *net* costs of support will be lower than shown in these tables.

SERVICE CHANGES WITHIN EXISTING INFRASTRUCTURE

10.35 There are a further group of service changes that could be delivered without major changes to infrastructure. These are mainly service enhancements, and would be dependent on the availability of additional rolling stock, but some include minor infrastructure changes. The availability of rolling stock is only likely to be forthcoming as part of the next franchise agreement, largely related to the East Midlands Trains franchise, although potentially also the Cross Country franchise.

10.36 As with the previous group of schemes JMP has prepared indicative costs based on experience from other similar projects. However it is possible that if a number of service enhancements are delivered together the total costs might reduce as operational cost efficiencies can sometimes be generated when several new services are introduced - for example through more efficient rostering of rolling stock and train crew.

10.37 The enhancements are presented in two groups. The first examines those that could be prioritised as part of the East Midlands Trains franchise renewal, and which are estimated to deliver a high economic impact based on the modelling results presented in chapter 4. The second group have been identified as priorities not linked directly to the EMT franchise. These are presented in order of importance for development.

10.38 These schemes would be likely to require both a detailed operational and commercial assessment to validate them and to better understand the costs and revenues associated with them. The table presents indicative costs and notes any constraints associated with delivery.

Table 10.3 Potential Service Improvements Linked to East Midlands Trains Franchise

Improvement	Indicative Cost	Notes/Constraints
Development of hourly Lincoln – Birmingham service operated either by Cross Country or EMT. Depending on the commercial case this service may be additional to the existing service	£3M per annum	This assumes than an additional service is operated rather than amalgamating two services. £3M is based on a requirement for up to three additional trains to operate the service.
Clockface Half hourly Lincoln – Newark service	Nil	Plan on the basis on re-timetabling without additional resources. New Lincoln – London service may assist with this by providing a two hourly Newark Northgate – Lincoln service
Extension of Newark – Grimsby service to Cleethorpes and introduction of two hourly service, rising to hourly. Also introduce journey time improvements subject to infrastructure improvements	£1M per annum	Cost based on continued use of Class 153 units and introduction of two hourly service. This may be assisted by any Lincoln – Newark service resources released through replacement by Lincoln – London services
Two hourly clockface Lincoln – Doncaster service, operating all day, rising to hourly if RHADs station opened	£1M per annum	Cost based on continued use of Class 153 units, and the introduction of a two hourly service.
All day hourly service between Sleaford and Lincoln	£0.5M per annum	Costs based on additional movement costs, but assumes that there is no need to lease additional rolling stock
Hourly Sleaford – Peterborough service operating all day with potential for peak additional services between Spalding and Peterborough	£0.5M per annum	Costs based on additional movement costs, but assumes that there is no need to lease additional rolling stock
Development of an integrated timetable maximising connectivity across Lincolnshire, thorough interchange at key nodes such as Lincoln and Sleaford	Nil	It is assumed that there will be no additional costs associated with this proposal; additional services specified above would provide sufficient resource to deliver this.

10.39 The costs presented are all revenue costs which, as a minimum, would require a pump priming initiative to fund them until additional revenue from passengers was sufficient to support services.

10.40 It can be seen that the improvement with the highest priority, introducing direct services from Lincoln to Birmingham, also has the highest costs associated with it due to the need to lease and operate additional trains for the service. However such a service would also be likely to generate the greatest level of demand, helping offset the costs, not just between Lincoln and the West Midlands, but also by improving the service offer between Lincoln and Nottingham.

10.41 The other options which would increase operating costs would bring a step change in service levels on a number of routes and help to make these services more attractive. The options with no cost associated with them would add value to the other initiatives by enhancing the attractiveness of the services.

Table 10.4 Service Improvements outside scope of next EMT franchise

Improvement	Indicative Cost	Notes/Constraints
Delivery of all existing commitments	N/A	Ensure that all existing commitments by TOCs and Network Rail to 2020 are delivered
Development of Cleethorpes – Scunthorpe – London service	£5M per annum	This is based on the marginal operating and lease costs for the service whilst off the ECML. i.e. Doncaster - Cleethorpes
Increase frequency to half hourly Doncaster - Cleethorpes	£3M per annum	Based on the assumption that three additional trains would be required to operate a Doncaster – Cleethorpes service
Half hourly Peterborough – Leicester service either by extending existing Birmingham – Leicester service, or extending Ipswich – Peterborough service	£2M per annum	Assumes that two additional train would be required to operate the service
Continued management of seasonal capacity constraints on services to Skegness and Cleethorpes.	£0.25M	Based on marginal operating costs of lengthened services in summer or limited additional service operating, assuming that no additional trains needed to be leased
Enhanced rolling stock with improved passenger accommodation and capacity for Liverpool – Norwich and Birmingham – Stansted Airport services	£5M per annum	Based on upgrade of existing fleet and increase in train length from 3 to 4 car for Stansted services and 2 to 3 car for Norwich services. Benefits accrue mostly to areas outside Greater Lincolnshire
Development of half hourly stopping service between Scunthorpe and Doncaster in addition to TPE service	£1M per annum	This assumes that one train is required to operate the service. There may be a potential commercial conflict with introducing a half hourly service to Cleethorpes
Investigation of Grantham – Nottingham stopping service, initially at peak times potentially operating all day.	£0.5M	Assumes the lease of a Class 153 with the service only operating at peak times.

10.42 It can be seen that the range of service improvements identified here generally have higher costs associated with them than the previous group of schemes, although the costs would be offset by increases in revenue lowering any requirement for support. However the absolute costs involved and the significant impact on capacity of these services would tend to suggest that these are more long term aspirations. The main exceptions to this are;

- The improvements in the quality of rolling stock and increased capacity on Norwich – Liverpool and Stansted Airport – Birmingham services which are needed to help the service develop, and;
- The development of a South Humber Bank – London service which would have significant economic benefits for the area, although realistically it is unlikely that such a service could be delivered before the end of the existing Virgin Trains East Coast franchise.

TRANSFORMATIONAL SCHEMES

10.43 There are a small number of schemes that could deliver a significant change in capacity and capability of the infrastructure. Some of these schemes have been assessed in the past, and some are still being considered by Network Rail. These schemes can be generally characterised as “big ticket” items, and in the Lincolnshire context are often linked to improvements that benefit the ECML as their primary justification but which would also bring benefits to Lincolnshire by unlocking opportunities for service development.

10.44 There are also a number of smaller schemes which would be locally transformational, either by reducing journey times of existing services or by improving connectivity to the rail network through new stations. The costs for some of these schemes are very high level and have been identified based on the costs of similar schemes elsewhere in the country.

Table 10.5 Potential Transformational Schemes

Schemes	Indicative Cost[37]	Notes/Constraints
Grade separation of Newark Flat Crossing – increasing ECML capacity but also removing planning constraints on the Nottingham – Lincoln line	Circa £100M	This scheme is complex and is likely to be driven by the needs of the ECML timetable rather than the Lincoln – Nottingham route.
Significant line speed enhancements on key routes, notably Lincoln – Nottingham, Doncaster – Cleethorpes and Sheffield – Lincoln to reduce journey times	£0.25M per mile	Resignalling of routes is likely to be a prerequisite for this work due to the need to alter signal positions. Upgrade works could be phased as part of planned track renewal. Targeting core sections would yield the greatest benefit.
Line speed increases Nottingham – Grantham – Sleaford – Skegness	£0.25M per mile	Resignalling of routes is likely to be a prerequisite for this work due to the need to alter signal positions. Upgrade works could be phased as part of planned track renewal. Targeting Grantham – Sleaford would yield the most benefit initially.
Electrification of Nottingham – Lincoln and Doncaster – Cleethorpes	Circa £150M	This is dependent on linked routes such as Manchester – Sheffield – Doncaster being electrified. The benefits to freight traffic would also form part of the case.
Development of stations at Littleworth and Robin Hood Doncaster Sheffield Airport	£8M capital cost each	Subject to development of business case and impact of external factors such as local population growth and air passenger growth at RHADS.

10.45 Clearly the transformational schemes set out above represent major investments and would require significant planning. The timescales are not clear for the schemes but none could be delivered before Control Period 6 (2019-2024). It is possible that the introduction of the incremental enhancements and other service changes would help to pave the way for some of these transformational schemes by developing the rail market in Greater Lincolnshire. However it is likely that in the case of Newark Flat Crossing, it is the development of the East Coast Mainline that will determine if these enhancements are progressed.

10.46 The opening of new stations is dependent on both the local justification for a station, for example population growth and supporting development, but also the level of service that operates which would determine the attractiveness of a station to potential passengers. Both new stations identified here are on routes where there is scope for improvement.

10.47 The introduction of line speed increases which have been identified throughout this report as a necessity for improving and growing rail services across Greater Lincolnshire is something that would have to be phased over time. Given that line speed is in part determined by signal spacing and associated braking distances there is a need to consider the progress of Network Rail's national re-signalling programme when planning line speed enhancements. In addition the most effective way to implement line speed

[37] Indicative costs based on comparisons with other similar previous schemes

improvements would be to carry out track works as part of any planned renewals that are taking place in order to improve cost effectiveness.

10.48 In all cases the schemes and service enhancements presented here would require more detailed discussions with TOC's and Network Rail before proceeding further.

PRIORITIES FOR DELIVERY

10.49 Having identified a range of schemes and service improvements it is possible to identify a list of priorities for investment that should represent the key targets for developing services. These are options which are considered to deliver the most economic benefits but which are also realistic objectives for delivery in coming years. Most of them are focussed on the renewal of the East Midlands Trains franchise renewal which presents the next major opportunity to improve services. The following schemes have been identified:

- Development of a direct service between Lincoln and Birmingham, either by amalgamating the Lincoln – Nottingham and Nottingham – Birmingham service or by introducing a new service (subject to business cases).
- Frequency enhancements across the EMT Lincolnshire network to fill anomalous gaps in services, and provide a minimum of a two hourly service on routes that do not currently achieve this (Lincoln – Doncaster and Lincoln – Grimsby) and a minimum of an hourly service on other routes (Lincoln – Sleaford – Peterborough, Nottingham – Skegness and Lincoln – Nottingham).
- Linked to the above, introduce regular clockface departures ultimately working towards the development of an integrated timetable to maximise connectivity across the network
- Improve Sunday services by providing year round services on routes that do not presently have Sunday services and enhance Sunday services on other routes.
- Develop the case for a South Humber Bank – London service and for improvements in connectivity from the South Humber bank to other key centres across the north.

10.50 Linked to the priorities above that could be delivered by the new EMT franchise, there should also be a priority to work with Network Rail and train operators on the issue of line speeds. Whilst it would desirable for line speeds to be improved as soon as possible the volume of work required and the need to deliver it in a cost effective manner means that that is likely to be an ongoing programme over several years. The most appropriate approach to prioritising work in a cost effective way is to work with Network Rail to ensure that:

- When re-signalling works take place the spacing of signals is planned to provide passive provision for higher line speeds.
- When track renewal work takes place the opportunity is taken to carry out work to increase line speeds.

10.51 The priorities set out above, if delivered, would represent a significant improvement in the quality of services offered by the rail network across Greater Lincolnshire and would provide a basis for longer term investment.

11 Conclusions

11.1 This report has sought to examine the role that rail plays in the Greater Lincolnshire area, the benefits to the economy that improvements to services might bring and the types of service improvements that might deliver these benefits.

11.2 This has been carried out by applying an economic modelling framework that looks at the size of the benefits to be gained from improvements, before moving on to examine at a route level how services might be enhanced in order to deliver these benefits. From this a delivery framework has been developed for implementing service changes identified.

THE ROLE OF RAIL IN LINCOLNSHIRE

11.3 At the present time rail has a varied role across the Greater Lincolnshire area. Many services are characterised by their rural nature, and for historic and geographical reasons the Lincolnshire network is comparatively isolated from the rest of the rail network.

11.4 The main city of Lincoln lacks the strategic service that might be expected for a city of its size, with a very limited service to London and no east – west services running beyond Nottingham. Whilst the service to London is to be substantially improved from 2019 there are presently no clear plans for the improvement of services beyond Nottingham.

11.5 Over the last 20 years there have been relatively few changes to the rail network, with almost no service enhancements or changes to rolling stock. Despite this rail use across the county has grown, with an increase in overall usage of in excess of 60% and increases at main stations such as Lincoln of around 90%, showing that there is demand for services. However the stagnation of use in some places in recent years (such as Sleaford), and decline at other locations (such as Skegness), suggests that the existing service has reached the limit of its usefulness with a need to improve services further, to help develop the rail network and to support the economy of the area.

ECONOMIC IMPACTS OF IMPROVING SERVICES

11.6 The economy of Greater Lincolnshire is one that is not dominated by the types of businesses such as financial or professional services that are heavily dependent on agglomeration with other businesses. Nevertheless the results indicated substantial benefits to the economy from improvements in services. Inevitably these benefits were focussed on flows from the main centres such as Lincoln, Scunthorpe, Grimsby and Cleethorpes. The results highlighted the strategic importance of rail with the benefits of linkages to areas outside of Lincolnshire being substantially greater than those for movements within Lincolnshire.

11.7 This implies that the improvement of *strategic links* is of greatest importance. However there is also a need to develop the rail network within Greater Lincolnshire to help develop labour markets and address environmental and social objectives. The improvements needed to services within Greater Lincolnshire are often comparatively minor and may in fact be easier to deliver than some of the more strategic services.

11.8 Modelling work indicated that the wider economic benefits delivered by the rail services in the area are worth around £161M per annum. The modelling highlighted a particular need to improve links to the main centres in the East Midlands from Lincoln as well as West and South Yorkshire, the former via Doncaster and the latter via the existing service to Sheffield. It was shown that in certain cases, for example Lincoln – Sheffield, even comparatively modest improvements in services levels would potentially double the wider economic benefits relative to the existing services.

DELIVERING ASPIRATIONS

11.9 Rail can play an important role in strengthening the economy across Greater Lincolnshire, supporting business, tourism and labour markets. However there is a need for further investment to fulfil its potential. To deliver the growth that the economic modelling indicated maybe possible requires a number of improvements which can be summarised as:

- Development of strategic links - to London/Nottingham/Birmingham/Sheffield and, via interchange, Leeds.
- Infill service improvements - filling in gaps in timetables, improved Sunday services etc.
- Journey time reductions - increasing the sometimes extremely low line speeds that prevail across the area.
- Transformational schemes – those that would deliver fundamental changes to service patterns, but would also be very costly

11.10 Clearly more work is required to understand the operational and commercial impacts of changes, however many of the service enhancements could be delivered with a relatively limited increase in rolling stock provision in the area.

11.11 These enhancements could in turn be used to justify the case for further enhancements and ultimately contribute to the delivery of transformational schemes.

THE EAST MIDLANDS TRAINS FRANCHISE

11.12 As has been highlighted throughout this report the East Midlands Trains franchise is the main operator of services across Lincolnshire. The franchise has recently received an extension and the next franchise will now start in March 2018. Consultation on the next franchise will begin in July 2016, which will present the opportunity for the local authorities and Greater Lincolnshire LEP to identify aspirations and opportunities for service development. The renewal of the franchise represents the biggest single opportunity to influence the development of services over the next decade, and represents a sensible point at which to lobby for enhancements which should be within the gift of the potential franchisees, whilst raising the profile of, and setting out the case for, longer term improvements.

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