The Northumberland Line

Outline Business Case

Northumberland County Council

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Quality information

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Introduction

The reintroduction of passenger services on the railway line between Ashington and Newcastle is a key priority of Northumberland County Council (NCC), to improve connectivity within, and beyond, the South East Northumberland Corridor area. The scheme is hereinafter known as the Northumberland Line, as illustrated in the figure below.

The Northumberland Line Extents

This document sets out the Outline Business Case (OBC) for the scheme and presents a compelling case for investment in the railway line, which will not only benefit the communities it serves, but the wider North East region. The OBC has been developed in accordance with Department for Transport (DfT) guidance on the Transport Business Case (January 2013) and is structured around five distinct Transport Cases as follows:

- The Strategic Case – demonstrates that the reopening of the line is needed;
- The Economic Case – demonstrates that the reopening of the line offers value for money;
- The Financial Case – demonstrates that the reopening of the line is affordable;
- The Commercial Case – demonstrates that the reopening of the line is commercially viable;
- The Management Case – demonstrates that the reopening of the line can be delivered.

The OBC has also been developed to take account of requirements for potential funding opportunities, with particular reference to the Rail Network Enhancements Pipeline (RNEP) and the current Transforming Cities Funding (TCF) opportunity for the North East Combined Authority region.

The Local Challenges and Opportunities

Northumberland County Council (NCC) is seeking to improve connectivity and accessibility in the South East Northumberland Corridor (SEN Corridor). Improving the links from towns such as Ashington and Blyth is of key importance to encouraging more sustainable access to the key regional economic centres across Tyne and Wear. This will assist in reversing the decline in the deprivation of these areas of South East Northumberland, which has been evident since the closure of the mining and shipbuilding industries over the last 30 year period. Enhancements to transport links within South East Northumberland will also be instrumental in stimulating economic investment within the region and will help to bring forward much needed delivery of housing allocations. Various options to improve transport links have been considered over a number of years, with reopening of the Northumberland Line being identified as the preferred option.

The Northumberland Line scheme is being developed at a time when the Government has made a commitment to provide substantial investment in developing the railway network. Schemes will be prioritised for investment if they meet at least one of four priority goals:

- Priority 1: Keeping people and goods moving smoothly and safely;
- Priority 2: Delivering the benefits from committed programmes and projects already underway;
- Priority 3: Offering more: new and better journeys and opportunities for the future;
- Priority 4: Changing the way the rail sector works for the better.

The Northumberland Line addresses all of these priorities to some degree, although there is clear evidence that, in particular, it will offer new and better journeys and opportunities for the future, by better connecting communities within, and beyond, the South East Northumberland area.

Those schemes seeking central Government funding should be developed in accordance with the RNEP process outlined below.

The Northumberland Line is currently at the 'Develop' stage, meaning that the scheme is moving towards a preferred option, although the potential operating model is still being discussed. NCC is seeking endorsement of this business case by DfT and a 'Decision to Design' the preferred option.

Whilst the Northumberland Line will continue to be developed through the RNEP process to identify funding for the full scheme, other opportunities are being identified to deliver those elements of the scheme which could be delivered more quickly through the planning process.

The North East Regional Transport Team has recently submitted a bid to the Transforming Cities Fund, which included the phase 1 of the Northumberland Line as one of the proposed schemes. The Northumberland Line scheme aligns well with the Transforming Cities objectives, providing a new transport link between residential areas on the edge of the Tyne and Wear city region with the urban core of Newcastle city centre. The scheme will provide new opportunities to residents of South East Northumberland to access employment, education and leisure opportunities, transforming the lives of the resident population, who have suffered both economically and socially since the decline in the mining and manufacturing issues at the end of the last century. This offers an unprecedented opportunity for funding to deliver the Northumberland Line scheme and bring forward the much needed investment in the South East Northumberland area.

The Scheme

The Northumberland Line scheme consists of the re-introduction of rail passenger services over an existing freight-only line in order to link key town and communities in the South East Northumberland corridor and the wider Tyne and Wear region.

The route utilises the East Coast Main Line for 6.8km to Benton North Junction, at which point the existing freight-only line diverges to run parallel with the Tyne and Wear Metro line as far as Northumberland Park, where it is envisaged that a new platform will be constructed to facilitate interchange between rail and Metro Services. The line of route then turns northwards towards Seaton Delaval, skirting the western edge of Blyth before arriving at Ashington. The distance from Benton North Junction to Ashington is 23.2km. There are freight-only connections off this line of route towards the Port of Blyth, Morpeth (for connections back onto the East Coast Main Line) and extensions beyond Ashington towards the Lynemouth Power Station.

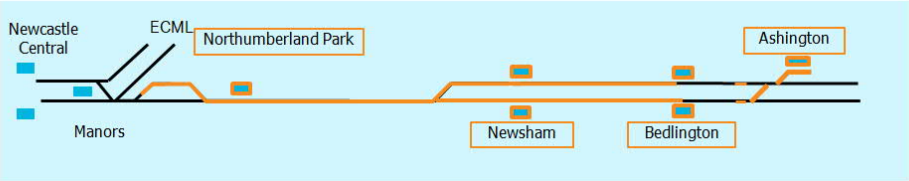
Stations are proposed at Northumberland Park (for connections with Metro services), Seaton Delaval, Newsham, Blyth Bebside, Bedlington and Ashington, The scheme will be developed such that a possible station at Seghill and a station at Woodhorn could be considered in the future.

The existing route is single track from Benton North Junction as far as Newsham, and then double track through to Ashington.

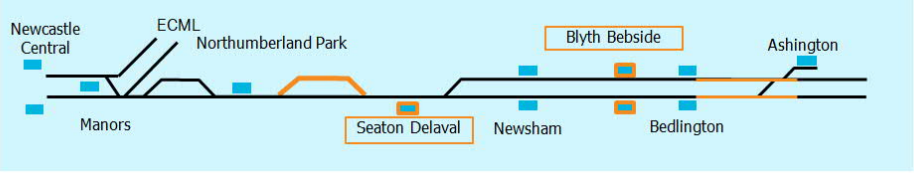
A phased approach to delivering the scheme has been considered in order to facilitate the identification of a solution that might be able to be delivered more quickly within TCF timescales. However, the ultimate goal will remain to deliver the full scheme, once funding is identified and the necessary statutory approvals have been received. As such, two phases have been identified, which are outlined in the following figure.

Infrastructure Phases

Phase 1: Initial hourly service
4 new stations; Line-speed increases Benton-Newsham; Double track extension south of Newsham; LX upgrades; Turnback facility at Ashington off Main Line; Junction improvements Bedlington North



Phase 2: Half-hourly service
Passing loop between Holywell LX and Seghill LX, new stations at Seaton Delaval and Blyth Bebside, line-speed increases north of Bedlington.



Given the timescales dictated by the Transforming Cities Fund, only infrastructure phase 1 would be deliverable through this fund, with funding from RNEP likely to be sought to deliver phase 2.

The Strategic Case

The Strategic Case sets out the case for intervention and how the investment will further the aims and objectives of NCC and other relevant stakeholders. It highlights that the key problems currently facing the area are ones of poor transport connectivity, with limited alternative modes of transport to the private car. This not only restricts the potential for residents of South East Northumberland to access employment, education and leisure opportunities in the wider North East region, it also reduces the attractiveness of South East Northumberland as an area in which to invest. As a result, the south east area of Northumberland has struggled to overcome social deprivation, which has been evident in the area since the closure of the mining industries in the late 1980's and early 1990's. The key problems identified in the Strategic Case are summarised below:

- Car Ownership: Car ownership in Northumberland is forecast to increase, particularly in South East Northumberland. This has a number of potential implications including increasing highway congestion, impacting on journey times and the commercial viability of bus-based public transport across the South East Northumberland region;
- Mode Share: Private motor car usage in Northumberland is higher than the national average and this contributes to congestion and air quality. Public transport usage in Northumberland is lower than the national average. Congestion on the strategic road network has already led to objections from Highways England to proposed developments in South East Northumberland that would increase pressure on the strategic road network;
- Commuter Trips: There is a significant outflow of commuters from Northumberland into Tyne and Wear. Congestion is already an issue on the strategic road network into Tyne and Wear and alternative modes of transport need to be provided to ensure the population of South East Northumberland can access key areas of employment by sustainable modes;
- Links of Economic Importance: Links into Tyne and Wear, particularly Newcastle, are vital for the economic prosperity of Northumberland. However, the bus journey times are uncompetitive compared to car journeys;
- Accessibility: Public transport options do not meet the needs of all residents of Northumberland. A lack of available services, long journey times and high public transport costs mean that public transport is not a viable option for many people;
- Environmental Issues: Air quality is a major concern for two of the authorities forming the North of Tyne Combined Mayoral Authority. Collectively, there is a need to reduce harmful vehicle emissions. The mitigation measures put in place to address air quality may impact on the current travel demands and mode choice to and from Northumberland.

The Strategic Case further highlights the impact of failure to invest in the reintroduction of passenger services on the Northumberland Line. For those that have access to a car, there will be an overreliance on private car travel into neighbouring authorities to access opportunities. Not only will this exacerbate local congestion issues, it will increase demand on the key radial routes into Tyne and Wear, which are already congested and are currently subject to a legal directive to implement measures to improve air quality.

Whilst traffic congestion is clearly an issue that must be addressed, perhaps what is of greater importance to the development of South East Northumberland and the wider region is the impact that poor transport connectivity will have on development opportunities in the region. NCC has failed to deliver on their housing aspirations in recent years and this is unlikely to improve without investment. A number of strategic employment sites, particularly Blyth Estuary, have been identified in South East Northumberland but the success of these sites will be dependent on good transport connections. Further appraisal of the potential impacts to the economy will be undertaken during the next stage of development of the scheme.

A number of policy documents have been reviewed within the Strategic Case to set out how the scheme aligns with local, regional and national policy objectives. There is an emphasis on improving sustainable transport connections, which will not only help facilitate economic growth but will also benefit the local environment through improvements to air quality. The Northumberland Line, as a new sustainable transport link into Tyne and Wear, aligns well with these policy objectives.

Public consultation undertaken as part of the OBC development has shown strong support for the scheme. A series of events were held across South East Northumberland and North Tyneside, where people had the opportunity to view the scheme proposals and provide feedback. The information was also available online with an online survey to be filled in. The responses received as part of this exercise have been overwhelmingly positive, with 96% of the nearly 1,000 respondents supportive of the scheme. A report has been prepared summarising the outputs of the public consultation exercise in more detail.

The final section of the Strategic Case summarises work that has been undertaken to date to identify options to address the challenges outlined in this report. It clearly demonstrates that a range of low, medium and high cost options were considered, before sifting and appraisal identified a heavy rail solution as the option to be developed further. The Institute of Public Policy Research (IPPR) has recently identified this heavy rail solution as a quick win for improving the transport network in the north of England.

The Commercial Case

The Commercial Case sets out how the Northumberland Line scheme is being developed against a backdrop of significant policy change in respect of the procurement, delivery and operation of rail enhancement projects. The project team is taking the opportunity afforded by this new environment to develop an innovative procurement and delivery structure, based on an efficient design, delivery and operational cost structure.

As part of the development of the Commercial Case for the Outline Business Case, further work has been undertaken to assess the relative benefits of the two core mechanisms of procuring passenger rail services; Franchise or Concession. These opportunities were identified in the Strategic Outline Business Case but have been further developed as part of the Outline Business Case through increased market engagement. The Commercial Case identifies the relative advantages and disadvantages of both options, but a preferred option has not been agreed at this stage. Several areas are identified in the Outline Business Case for further exploration during the next stage of the project, to ensure a preferred option can be reached. The advantages and disadvantages of both options are summarised in the following table.

	Advantages	Disadvantages
Franchise	• Mobilisation may be more straightforward, relying on the TOC's existing management structure and expertise that is already in place • Economies of Scale may materialise because much of the management overhead structure already exists	• A single tender action is unlikely to produce costs as low as a fully competitively tendered process • No opportunity to challenge or reduce existing industry operating practices, unit rates and operating costs • Limited opportunity for local input to specification and performance management • Limited opportunity to reduce delivery costs
Concession	• Start-up business has freedom to negotiate lower unit rates and more efficient operating practices • Greater potential fares integration leading to higher patronage figures • Higher economic benefits arising from higher patronage numbers (linked to better journey times and lower fares) • More local control and management of specification and performance outputs • More innovative rolling stock options may drive lower infrastructure costs	• Need to set up new structures to procure, manage and operate the Concession • A relatively small service operation may have a disproportionately high level of management overheads and overseeing structure compared to incremental addition to an existing Franchise • Market appetite for relatively small Concession may result in fewer bidders

The Commercial Case also concludes that the existing and new track and signalling infrastructure will remain part of the Network Rail Regulated Asset Base, although an option exists for the new stations to be 'owned' and operated by a third party.

The Economic Case

The development of options for the purposes of demand forecasting and economic appraisal has therefore focussed on the delivery of different service frequencies that the infrastructure phases and operating scenarios outlined above are able to support and are summarised in the table below:

Infra. Phase ID	Operating Scenario	Appraisal Option ID	Stations Served	Service Headways (peak/ofpk)	Ashington-Newcastle Journey Time	Freight Paths (does option facilitate 1 tph in both directions all day?)
IP1	Franchise	**T1**	4	40* / 60	32	no (paths restricted in both directions in the peak hour only)
	Concession	**A1**	4	40* / 60	30.5	
IP2	Franchise	**T2**	6	30 / 30	35	no (paths restricted in both directions in the peak hour only)
	Concession	A2	6	30 / 30	32.5	

* three services across a two-hour peak period – essentially a half-hourly service in the peak hour in the peak direction only

Options T2/A2 can be viewed as being the 'full scheme' that delivers a half-hourly service all day, serving all the anticipated stations in the corridor and achieving the fastest realistic journey time. It is estimated that the earliest that the full scheme could be delivered by would be 2025. Options T1/A1 could be considered to be an option that delivers a passenger service on the corridor within the shortest practical timescales, with an estimated delivery in 2023. In that context, Options T1/A1 become a strong candidate for the Transforming Cities Fund bid. The Franchise-based options are assumed to be operated by class 170 diesel rolling stock, whereas the Concession-based options are assumed to be operated by electric battery operated rolling stock based on some initial market testing undertaken to inform the OBC. Finally, the other key difference between the Franchise and Concession options is the treatment of fares, with the Franchise-based operation assuming standard Rail Settlement Plan fares in line with existing fares to/from Newcastle on existing rail corridors, whilst in the Concession-based options fares have been assumed to be set in line with the Tyne & Wear Metro fare zones, thus facilitating ticketing integration between Metro and Northumberland Line services.

A spreadsheet based mode choice model was developed to undertake the demand and revenue forecasting for the Northumberland Line scheme and to inform the economic appraisal. This model was developed in accordance with TAG guidance and is summarised in Appendix C of this OBC. It has been updated since the SOBC to reflect changes in TAG guidance and changes in the infrastructure options being considered.

The levels of demand now being forecast in the OBC are circa 15% to 20% higher than what was forecast in the SOBC, reflecting the modelling updates and changes to the service specification. Forecast revenue is slightly down (by 7%), mainly as a result of adjustments to the long-distance journey uplift factor. It is also worth noting that the modelling is now indicating that 45% of the rail demand is sourced from car and 18% from bus. Concession-based demand is 24% greater than the Franchise-based demand, reflecting the lower rail fares in the corridor and slightly faster journey times. However, Concession-based revenue is slightly lower than Franchise-based revenue by 2%, indicating that the extra demand generated by the lower fares is not quite compensating in revenue terms for the lower fares.

The OBC VfM results are presented in the table below, both for the Level 1 Initial BCRs and the level 2 Adjusted BCRS that incorporate the wider economic benefits. The values in brackets signify what the equivalent SOBC VfM results were.

Economic Appraisal VfM Results, 2010 prices

Option	Level 1 (Initial BCR)				Level 2 (Adjusted BCR)				
	PVB (£m)	PVC (£m)	NPV (£m)	BCR	WEB (£m)	PVB (£m)	PVC (£m)	NPV (£m)	BCR
T1	241.9 (185.4)	97.9 (81.2)	144.0 (104.2)	**2.47** **(2.28)**	42.4	284.3	97.9	186.4	**2.90**
A1	308.7	115.7	193.0	**2.67**	46.1	354.8	115.7	239.1	**3.07**
T2	361.3 (278.7)	94.6 (104.5)	266.7 (174.2)	**3.82** **(2.67)**	45.7	407.0	94.6	312.4	**4.30**
A2	470.8	114.2	356.6	**4.12**	50.4	521.2	114.2	407.0	**4.56**

The scheme's BCRs have improved as we move from the SOBC to the OBC. The key reasons for this are the increased benefits in line with the increase in demand alongside the fact that the capital costs for the scheme have remain largely unchanged or in the case of Phase 2 have slightly reduced.

Whilst the results appear to indicate that the Concession-based scenarios generate a better BCR than the Franchise-based scenarios, there is a note of caution when drawing this conclusion, based on; a/ the specification and cost base for these scenarios could be subject to change compared to what has been appraised in this OBC, and b/ evidence from sensitivity testing undertaken would appear to suggest that as demand increases there is a tipping point whereby the Franchise-based BCRs become higher than the Concession-based BCRs.

The Financial Case

At the RNEP 'Develop' Stage, which informs this OBC, a significant amount of engineering analysis has been undertaken, which has been reported in the Option Selection Report (Appendix E of this OBC). Cost estimates have been produced at a 'GRIP 3 equivalent[1]' level. A Quantitative Cost Risk Assessment (QCRA) has been developed to model the level of risk value that should be applied to the GRIP 3 cost estimate for the OBC. The anticipated final cost (AFC) is presented in the following table and compared to the previous AFC presented in the SOBC.

	Phase 1	Phase 2
OBC ANTICIPATED FINAL COST	**£124,983,989**	**£161,917,576**
Comparison with SOBC		
SOBC AFC @ 4Q2018:	*£117,216,519*	*£169,414,324*
SOBC AFC @ 3Q2019 (Assumed construction price inflation @ 3/4 x 3.2% = 2.4%):	*£120,029,715*	*£173,480,268*
Change (OBC-SOBC) in £GBP @ 3Q2019	*£4,954,273*	*-£11,562,691*
Change (OBC-SOBC)/SOBC @ 3Q2019 in %	*+4.1%*	*-6.7%*

The overall picture is one of remarkably little change since SOBC, which was at 4Q18 pricing and the OBC estimate, which was at 3Q19 pricing. The comparison of total costs at SOBC shows a 4.1% increase in Phase 1, and this is dominated by the changes in Permanent Way costs. Additional Permanent Way cost increases come from the need to upgrade significantly more track than anticipated.

[1] The cost estimates are based on a design commensurate with Network Rail GRIP stage 3. Essentially, this is not a Network Rail project, and therefore GRIP is not being followed. However, the design has been developed to that level and enough to inform the costs to at least that level of accuracy.

Further Phase 1 increases come from stations and signalling, although these are partially offset by savings in level crossings and utility diversions, as well as a reduction in overhead allowances following further assessment. The OBC Phase 2 has been compared with SOBC Phases 2-4 combined and shows a reduction of £11.6m or 6.7% at 3Q2019 prices. This is a result of reduced scope in signalling, operational power, and the removal of need for significant earthworks after Phase 1. Risk and overheads have fallen as the relocation of the passing loop has assisted the efficiency of construction.

Renewals costs have been updated from the SOBC, with further analysis undertaken to link the incremental costs associated with the renewal of the scheme's additional infrastructure over the scheme life with the initial capital cost elements. In addition, mobilisation costs have been revisited since the SOBC from both the perspective of a Franchise operator and a Concession operator.

Two different sets of operating costs have been determined for the OBC, representing either the Franchise-based operation (Options T1/T2) or the Concession-based operation (Options A1/A2). The development of the Franchise-based operating costs for the scheme has been undertaken 'bottom-up' through the application of core operating cost rates sourced either from Northern Rail or from data available on the Network Rail website (as per the SOBC, but re-visited and re-viewed by Northern). The Concession-based operating costs have been determined via some initial market testing with the rail industry, where a service specification has been agreed in line with the defined options and a costed proposal has been received. The following table summarises the operating costs.

Annual Operating Costs (2018 prices)

Option	SOBC	OBC
T1	£3.8m	£4.2m
A1	-	£4.6m
T2	£5.6m	£6.1m
A2	-	£6.7m

Operating costs have increased by circa 10% compared to the SOBC, reflecting additional capacity that has been included in the OBC to cater for peak demand (a peak strengthening unit). As it stands, the Concession-based operating costs are circa 8% to 10% higher than the Franchise-based operating costs. At this stage, however, it would be premature to assume that this would remain the case as the scheme is further developed and the Concession-based approach is refined via more detailed and thorough market testing.

The scheme's financial appraisal has focused on the estimated impacts at three different levels:

- at the 'UK plc' level, by comparing total incremental rail revenue to total incremental operating costs;
- at the Northern Franchise level, by comparing the estimated incremental revenue to the Northern Franchise with the estimated scheme operating costs (which are assumed to fall to the franchise); and
- at the Concession level, by comparing the estimated incremental revenue to the Concession with the estimated scheme operating costs (which are assumed to fall to the Concession).

The following table summarises the financial appraisal in years 2 and 10 of the scheme, indicating whether the scheme generates an operating surplus or requires additional subsidy.

Financial Appraisal (2018 prices)

Option	UK plc		Northern Franchise		Concession Operator	
	Year 2	Year 10	Year 2	Year 10	Year 2	Year 10
T1	£0.5m	£2.4m	-£1.5m	-£0.5m		
A1	£0.2m	£2.3m			-£2.3m	-£1.4m
T2	£1.3m	£4.4m	-£1.9m	-£0.3m		
A2	£0.8m	£4.1m			-£3.3m	-£1.9m

A negative value indicates a requirement for additional subsidy

At the UK plc level, the scheme is forecast to generate a revenue surplus. At the Northern Franchise level, the scheme is expected to require a subsidy that declines over time to less than £0.5m per annum by year 5. The Concession operator will also require subsidy, but to a greater level than the Northern Franchise. There are several reasons for this:

- The Concession operator receives marginally less revenue than the franchise operator due to the lower fares and the fact that whilst these lower fares do attract additional demand, it is not enough to offset the impact of the lower fares;
- The Concession operator's operating costs are circa 8% to 10% higher than the Franchise-based operating costs. At this stage, however, it would be premature to assume that this would remain the case as the scheme is further developed and the Concession-based approach is refined via more detailed and thorough market testing.
- The Concession operator does not have the benefit of additional revenue elsewhere on the rail network like Northern does.

Northumberland County Council has already committed significant funding from its capital programme to help design and develop the scheme. In the period 2020-2023, a further £29.6 million has been identified. Additional funding opportunities for the Northumberland Line still need to be identified to cover the shortfall in funding from NCC's commitment. One avenue being pursued is the Transforming Cities Fund. The North East business case for Transforming Cities Funding was delivered in November 2019, with decisions on funding expected in March 2020. Any funding awarded to the Northumberland Line scheme would need to be spent by 2022/2023. This aligns with the phased approach to delivery, with infrastructure phase 1 deliverable within this programme. Northumberland County Council is however committed to delivering both phases of the scheme and work is currently ongoing to identify alternative sources of funding from the private sector from those businesses that will benefit from the reopening of the Northumberland Line to passenger services. Initial discussions have been positive with further discussions planned as the scheme develops. The RNEP process is a further area for potential scheme funding to deliver phase 2 of the scheme. Given the Northumberland Line scheme has now been accepted into the RNEP pipeline, this is a funding route that is being explored.

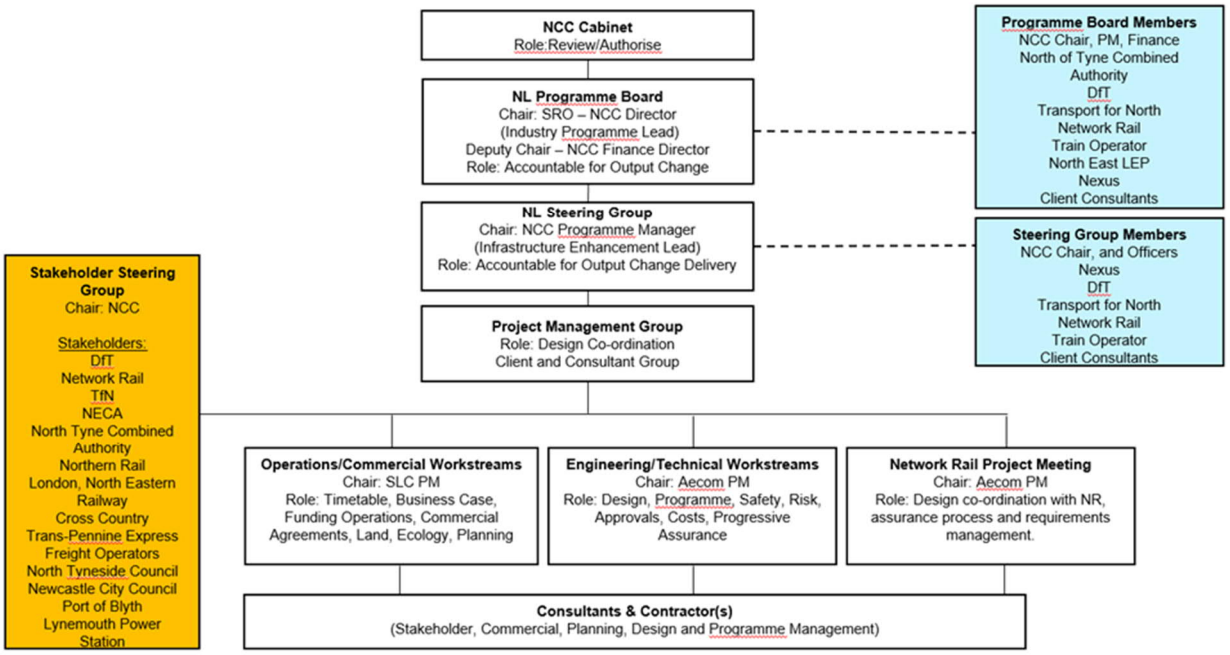
Alongside the capital costs of the scheme, NCC recognises the need to cover the revenue support for the scheme in the initial years of operation, something which will be considered by the council's Cabinet in February 2020.

The Management Case

The Northumberland Line scheme is supported by all three local authorities that make up the North of Tyne Combined Mayoral Authority. It has also been identified as a priority in the Strategic Economic Plan for the North East. This high level support for the scheme will assist in progressing the scheme through to construction.

A project specific governance structure for the Northumberland Line scheme is already in place. This is made up of a steering group, who meet monthly, and a programme board. The key representatives in the structure are presented in the diagram below.

Project Governance Structure



NCC will continue to promote the scheme through the 'design' stages of the project. The Design Phase of the project is planned to run from March 2020 to April 2021 for the Outline Design of both Phases, procurement of Phase 1 Principal Designer and Contractor and achievement of Planning Consent. At the end of this period an updated OBC is proposed to be submitted reflecting post procurement costs for the project and any scope changes arising from Outline Design and the Planning Process. Between February 2021 and August 2021 Detailed Design work is planned to take place with Full Business Case being submitted in September 2021 enabling a Decision to Deliver to be made in November 2021 and Construction works to commence at that point. Early activities in advance of the DfT Decisions to Design and Deliver are proposed to be funded 'at risk' by NCC in order to de-risk critical path activities in the programme and enable immediate starts on the Design and Deliver Phases.

The anticipated first part of the Design Phase (third party costs are subject to confirmation) is in the region of £10million including all survey & design works, planning & consents, project management, programme management, business case and stakeholder management through to April 2021 (post Phase 1 contractor procurement). DfT is asked to contribute £5million of this on the basis of match funding from NCC, where the NCC funding is to be front-loaded in order to expedite the project.

The programme for the scheme has been developed to account for potential funding opportunities, including the Transforming Cities Fund opportunity for the North East region. As such, a phased approach to delivery of the scheme is proposed, with the programme split into two phases. The rationale behind the programming is to deliver those elements of the scheme which could be delivered through using existing planning powers first, with Phase 2 proposals, developed in parallel but over a longer period. This will allow Phase 1 of the scheme to be operational during 2023, which is within the funding window of the Transforming Cities Fund. The full scheme is programmed to be completed by early 2025.

There are a number of dependencies to the project, which will have the potential to impact on delivery to programme. These include the freight strategy, land requirements, highway issues, level crossings, Network Rail renewals programme, capacity on the ECML/Newcastle Central and the number of structures along the line. Work is currently ongoing to understand the risks associated with these project dependencies and develop mitigation measures as necessary.

The concepts of benefits realisation and monitoring and evaluation are introduced in the Management Case with initial proposals developed. These plans will be developed further as part of the 'design' phase of the project and in full consultation with DfT.

1. Introduction

1.1 Overview

This document sets out the Outline Business Case (OBC) for the proposed re-introduction of passenger services on the railway line between Ashington and Newcastle; the line will be hereinafter known as the Northumberland Line[2]. The purpose of this OBC is to present a compelling case for investment in the railway line, which will not only benefit the communities it serves, but the wider North East region.

The business case has been prepared in accordance with the Department for Transport (DfT) guidance on the Transport Business Case (January 2013) and is therefore structured around five distinct transport cases as follows:

- Strategic case – demonstrates that the reopening of the line is needed;
- Commercial case – demonstrates that the reopening of the line is commercially viable;
- Economic case – demonstrates that the reopening of the line offers value for money;
- Financial case – demonstrates that the reopening of the line is affordable;
- Management case – demonstrates that the reopening of the line can be delivered.

In light of the recent release of government documentation outlining a new approach to the way it enhances the railway, this business case has also been aligned to the requirements of the Rail Network Enhancements Pipeline (RNEP) guidance.

1.2 Background

Northumberland County Council (NCC) is seeking to improve connectivity and accessibility in the South East Northumberland Corridor (SEN Corridor). Improving the links from towns such as Ashington and Blyth is of key importance to encouraging more sustainable access to the key regional economic centres in Tyne and Wear. This will assist in reversing the decline in the deprivation of these areas of South East Northumberland, which has been evident since the closure of the mining and shipbuilding industries over the last 30 year period. Enhancements to transport links within South East Northumberland will also be instrumental in stimulating economic investment within the region and will help to bring forward much needed delivery of housing allocations. Various options to improve transport links have been considered over a number of years, with reopening of the Northumberland Line being identified as the preferred option.

The scheme was first considered in 1996 when NCC, and its partners, commissioned a study to investigate travel demand in the SEN Corridor in order to assess the need for major improvements in public transport.

Three options were originally considered as follows:

- the re-introduction of passenger rail services on existing freight rail lines between Ashington and Newcastle;
- the extension of the Tyne & Wear Metro system or the introduction of other light rail systems into South East Northumberland; and
- improving the existing bus services through priority measures or bus guidance routes.

The study recommended the re-introduction of rail services on the line between Ashington and Newcastle as it was the most justifiable in terms of overall cost and benefit, and also provided good transport integration opportunities. Further review since 1996 (including a major scheme bid in July 2002) continued to find this option the most viable.

[2] Previously this scheme has been referred to as the Ashington Blyth & Tyne Line (ABT)

In May 2019, NCC submitted the Strategic Outline Business Case (SOBC) for the scheme, which informed the 'Decision to Develop' in line with RNEP guidance. The DfT's Autumn 2019 Schemes Update confirmed that the Northumberland Line scheme had passed the Decision to Develop. In addition, the SOBC has informed the Transforming Cities Fund (TCF) bid being prepared by North East Regional Transport Team, for which the Northumberland Line scheme is an integral part of the package of transport enhancements contained in that bid.

The submission of this Outline Business Case (OBC) is intended to inform the 'Decision to Design', in line with RNEP guidance.

1.3 Proposed Scheme

The Northumberland Line passenger reopening scheme design uses, with the exception of a 4 mile length of the East Coast Main Line, an existing freight only line. At present, with the exception of Manors and Newcastle Central, the scheme is considering the use of 6 new stations as follows and illustrated in Figure 1.1 overleaf.

- Ashington;
- Bedlington;
- Blyth Bebside;
- Newsham;
- Seaton Delaval;
- Northumberland Park (existing Metro station requiring new rail platforms).

The scheme is seeking to achieve competitive journey times between Ashington and Newcastle of less than 40 minutes depending on line speed enhancements and calling patterns. An allowance for maintaining freight paths is also being included in the proposals. The options considered are discussed in greater detail in Chapter 4 of this report, the Economic Case.

1.4 Proposed Benefits

By creating an enhanced rail infrastructure that will improve transport opportunities to and from South East Northumberland, the Northumberland Line scheme will deliver the following benefits:

- Provide a real incentive for potential employers to relocate to the area;
- Provide vital infrastructure to deliver the Council's aspirations for population and economic growth as identified within the emerging Northumberland Local Plan;
- Enhance connectivity within and beyond Northumberland to provide wider opportunities for local residents;
- Increase opportunities for developing employment in the wider Tyne and Wear area by providing improved access to labour supply;
- Deliver significant growth in sectors such as the National Renewable Energy Centre (NaREC), offshore oil and gas, renewables, engineering and for the Port of Blyth itself.

Figure 1-1: The Northumberland Line

1.5 Rail Network Enhancement Pipeline (RNEP)

The Government has embarked on a record programme of modernisation of the railway network to meet the surge in railway demand since privatisation. Alongside investment in maintenance and renewals, a commitment has been made to provide substantial investment in further developing the railway network.

RNEP sets out the new government process for delivering railway enhancements for those schemes seeking central Government funding. It will see a move away from rigid five year cycles to a rolling programme of investment. Investment will be focussed on railway enhancements that deliver real benefits for passengers, freight users and the economy.

The RNEP process is based around five stages of activity separated by formal decision points. The first three stages are characterised by increasing levels of detail and understanding; 'Determine', 'Develop' and 'Design'. The latter two stages of 'Deliver' and 'Deploy' are focussed on building and operating the enhancement and ensuring the benefits of the scheme are realised. Schemes can enter the pipeline at any point, subject to their level of development when seeking the funding from central Government.

The Northumberland Line is currently at the 'Develop' stage, meaning that a range of potential enhancements have been considered and this business case outlines how these have been developed and evaluated so that a preferred way forward is identified. NCC is seeking endorsement of this business case by DfT and a 'Decision to Design' the scheme further. The RNEP process is outlined below.

Figure 1-2: RNEP Process

In order for the Northumberland Line scheme to achieve a 'Decision to Design', this business case must demonstrate that the scheme will meet one or more of the following priorities for rail, established by government:

- Priority 1: Keeping people and goods moving smoothly and safely;
- Priority 2: Delivering the benefits from committed programmes and projects already underway;
- Priority 3: Offering more: new and better journeys and opportunities for the future;
- Priority 4: Changing the way the rail sector works for the better.

The objectives of the Northumberland Line, which are set out in the Strategic Case, clearly demonstrate that the scheme aligns with Priority 3 above, 'new and better journeys and opportunities for the future'. However, this OBC also recognises the importance of addressing all four priorities where it is appropriate to do so, in line with the RNEP guidance. On that basis, the table overleaf shows where further evidence can be found in this OBC, demonstrating how the Northumberland Line scheme aligns with RNEP priorities[3].

As part of this OBC, the plan for the 'design' stage has been clearly set out in Section 6.13 of the Management Case. This section outlines the tasks that would need to be undertaken and the cost associated with undertaking these tasks. As part of this section, there is a request to DfT for a 50% contribution to this 'design' stage.

[3] Table 3.2 in the Commercial Case also illustrates how the scheme aligns with the DfT Priorities for Rail.

Table 1-1: RNEP Criteria

		To enter the Design stage		
	What will be assessed?	**Proposal of outputs**	**Essential**	**Location of evidence within this Outline Business Case**
	Business case	**Outline Business Case**		
	Delivery plan	**Detailed**		
Priority 1: Keeping people and goods moving safely and smoothly	1.1 How will the construction and operation of the enhanced asset integrate with the rest of the network?	Perform timetable assessment. Demonstrate that the proposed asset maintenance regime can be supported by the network.	Y	The Option Selection Report (Appendix E) contains sections that address how the scheme will be delivered and how it will be operated, with particular reference to the operation of the existing railway. Timetable assessment analysis has been undertaken and discussed in Section 4 in the OSR.
	1.2 How will the scheme provide an acceptable level of reliability and performance?	Quantify the scheme design impact on network performance.	Y	This is a standalone scheme with interactions at the southern end on the ECML and at Newcastle station. Timetable assessment analysis has been undertaken and discussed in Section 4 in the OSR.
	1.3 How will the change in passeners numbers on other parts of the network be mitigated?	Quantify the impact on existing stations and routes, with and without proposed mitigations.	Y	The scheme primarily serves a new catchment area with limited extraction from existing rail services. Where there is extraction, this is quantified in the Economic Appraisal Report (Appendix C). This also sets out the levels of additional demand on the wider existing network.
	1.4 How will the scheme enhance the safety of the rail network?	Indicate how the scheme outputs contribute to the safe construction and operation of the scheme.	Y	Safety is a key thread throughout the OSR (Appendix E). Section 9 of the OSR focuses on safety in design.
	1.5 Does the scheme adhere to the necessary regulatory and planning requirements?	Evidence compliance/support for the planning and regulatory requirements.	Y	Section 8 of the option selection report covers environment and consents. A detailed land and consents strategy is included as an appendix to the OSR.
Priority 2: Delivering the benefits from programmes and projects already committed	2.1 Will the MLP scheme outputs be dependent on any Government committed schemes?	Integrate MLP scheme programme with committed schemes. Demonstrate approval from scheme authority.	Y	The scheme is not dependent on outputs from other committed schemes.
	2.2 How does the scheme impact other government committed schemes?	Quantify scheme impact on interfacing enhancements and validate mitigation.	Y	Section 2.9 of the Business Case sets out project interdependencies with other committed schemes and how this will be managed.
Priority 3: New and better journeys and opportunities for the future	3.1 What passenger benefits are introduced by the enhancement?	Identify the scheme outputs which produce passenger benefits and demonstrate traceability.	Y	Section 2.12 of the Business Case discusses measures of success. This clearly sets out the benefits that must be realised to achieve the objectives of the scheme. It also sets out how the benefit will be measured and the timescale for doing so.
	3.2 What is the local demand for the scheme benefits?	Evidence the demand and quantify the individual contributions to enhancement costs.	Y	The Economic Case summarises the demand and revenue forecasts for each of the options under consideration. Further detail is contained in the Economic Appraisal Report (Appendix C).
	3.3 What wider economic opportunities are addressed by the scheme?	Quantify the value of opportunities exploited by scheme.	N	An Economic Narrative has been produced to support the OBC (Appendix K). This justifies the inclusion of Wider Economic Benefits that have contributed to a Level 2 Value for Money quantification. Details of how the Wider Economic Benefits have been generated are outlined in the Economic Appraisal Report (Appendix C).
Priority 4: Changing the way the rail sector works for the better	4.1 How will the scheme be delivered to introduce efficiency?	Quantify the impact of innovation and efficiencies and justify any cost to their implementation. Demonstrate how risks (if any) are being managed.	Y	The Commercial Case establishes different commercial operating models that are being considered for this scheme. The Economic Case sets out how these have been translated into options and presents the appraisal of these options. The Management Case sets out the core scheme risks.
	4.2 How will the scheme increase UK supply chain efficiency and productivity?	Quantify the impact of increasing supply chain efficiency and productivity and justify any costs to their implementation. Demonstrate how risks (if any) are being managed.	N	Early Contractor Involvement has been procured to inform the OBC and this is discussed in the OSR (Appendix E). The Commercial Case discusses relevant delivery models.
	4.3 How will the scheme support the development of novel technologies and techniques?	Identify novel technologies and techniques in the design and delivery plans of the scheme.	N	The Commercail Case discusses approaches to delivery of the scheme (infrastructure and operations), which will be further developed during the Design stage of the scheme.

1.6 Document Structure

Following this introductory chapter, this OBC has been prepared with the following structure:

- Chapter 2 – Strategic Case: A summary of the need for the scheme, including an overview of the current issues, future challenges and study specific objectives. It is these objectives that will be used to appraise the success of the scheme;
- Chapter 3 – Commercial Case: A summary of the commercial viability of the scheme and discussion around possible routes to procurement, including delivery options that might be available;
- Chapter 4 – Economic Case: Outlines the options appraised and the emerging value for money of each option;
- Chapter 5 – Financial Case: A summary of the financial case for the scheme including details on the costs of the scheme and how these costs have been derived;
- Chapter 6 – Management Case: A summary of the proposed governance structure for the scheme delivery, risk management, stakeholder management and proposals for monitoring and evaluation. This chapter of the OBC also sets out a clear plan of action (with anticipated costs) needed to progress the scheme through the 'Design' stage of scheme development.

There are also a series of supporting appendices that present the detail that sits behind the core Transport Cases.

2. Strategic Case

The Strategic Case sets out the case for intervention and how the investment will further the aims and objectives of Northumberland County Council and other relevant stakeholders. It clearly identifies accessibility by public transport as a key problem in South East Northumberland, which is impacting on the regeneration of the area and the wider North of Tyne region. A range of different options have been considered, with a heavy rail solution identified as the right solution to improve connectivity within and beyond South East Northumberland.

2.1 Introduction

This section of the business case presents the Strategic Case for the reopening of the Northumberland Line in South East Northumberland to passenger services. It includes a review of the existing transport networks and demonstrates that there are major problems in South East Northumberland with sustainable transport connectivity to employment, leisure and education opportunities. For a number of decades, poor sustainable transport connectivity has compounded problems of social deprivation and slow economic growth, which have been inherent in South East Northumberland since the decline of the mining and manufacturing industries in the 1980s. The lack of take up by developers of many available sites for employment and housing in the past indicates at least some level of market failure. This cannot be solely attributed to the lack of passenger services on the Northumberland Line, although it is widely accepted that good sustainable transport provision can stimulate economic prosperity, create jobs, increase gross value added (GVA) and increase land value adjacent to rail lines/stations.

Significant changes have taken place recently which look to change the economic landscape in the North East, with the agreement of Northumberland County Council, North Tyneside Council and Newcastle City Council to form the North of Tyne Combined Mayoral Authority (NoTCMA). Plans are emerging with excellent opportunities going forward to address the historical challenges facing the local economy, at the heart of which is a vision for enhancing social and economic prosperity and increasing the wellbeing of its communities. The aim is to build upon the North of Tyne area's significant economic, education and cultural assets and increase the contribution to both the North East and national economies, improve the area's productivity through enhanced business growth, innovation, skills and infrastructure.

This Strategic Case draws on information and studies that concern the Northumberland economy. It focuses primarily on the south eastern part of the county, setting the scene for why transport intervention is required and conversely, the impact of there being no intervention. Much of the information supporting the need for the scheme is recent, sourced from an evidence base generated as part of the Northumberland Local Plan, and similar plans for neighbouring authorities. Together, these identify policies and land allocations for the areas future prosperity (next twenty years and beyond). In addition, other studies have been undertaken by Northumberland County Council as part of an initial evidence base for the scheme.

The Strategic Case demonstrates the need for the scheme, to ensure that the current problems on the highway and public transport network do not jeopardise future development plans and ambitions of the NoTCMA and those of Northumberland County Council. The scheme also supports wider national and regional strategies, such as the Industrial Strategy and those of Transport for the North (TfN). It also provides the context and rationale behind the substantial benefits that the scheme is expected to deliver. The economic benefits are discussed in greater detail in Chapter 4 of this report, the Economic Case.

The reopening of the Northumberland Line to passenger services has been investigated and continually developed over a number of years. It has been a key transport priority for Northumberland County Council and remains so with the advent of the NoTCMA. The North East Combined Authority (NECA) also acknowledges the benefits this rail scheme would bring to the wider region, and as a consequence it is retained as a priority transport scheme in the refresh of the North East Local Enterprise Partnership (LEP) - Strategic Economic Plan 2017 and was submitted as a scheme within the regional Transforming Cities Fund bid.

The scheme will fully support Government's objectives for economic growth and tackling air pollution generated by transport. National, regional and local policies act as drivers for change, and are summarised in Section 2.5.

The Department for Transport's guidance document, 'The Transport Business Case: Strategic Case', sets out the requirements for the Strategic Case. Table 2.1 shows where the information covering these areas can be found in this document.

Table 2-1: Strategic Case Requirements

Sub-Section	DfT Requirements	OBC Requirement	Location in the Document
Business Strategy	Context of business case and strategic aims and responsibilities of organisations involved	Updated	Section 2.2
The Case for Intervention: Problem Identified	Describe the problem and evidence base which justifies intervention	Updated	Section 2.3
The Case for Intervention: Impact of Doing Nothing	What is the impact of doing nothing?	Updated	Section 2.4
The Case for Intervention: External and Internal Drivers of Change	What is driving the need to change	Optional	Section 2.5
Objectives	Measurable, achievable, realistic and time bound objectives	Updated	Section 2.6
Options	Set out all potential interventions and shortlist	Completed	Section 2.7
Scope	What is to be delivered and what is out of scope	Updated	Section 2.8
Interdependencies	Internal/external factors upon which the successful delivery of the project is dependent	Completed	Section 2.9
Constraints	High level internal/external constraints e.g. technology, environmental etc.	Completed	Section 2.10
Stakeholders	Outline contribution of stakeholders and any potential conflicts	Completed	Section 2.11
Measures for Success	What constitutes successful delivery	Updated	Section 2.12

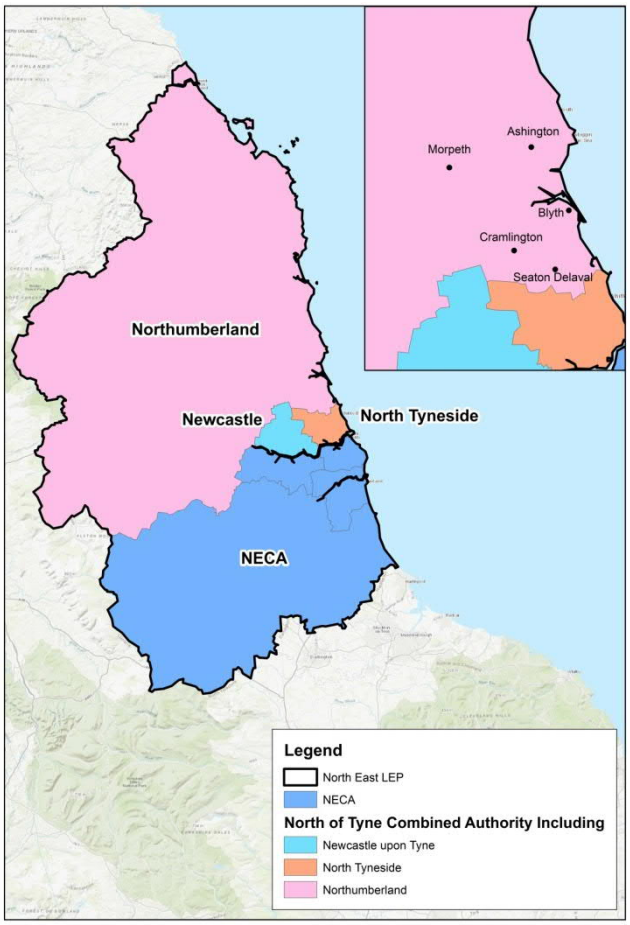
2.2 Business Strategy

The reopening of the Northumberland Line to passenger services is being promoted by Northumberland County Council, as part of, and with the full support of, the NoTCMA, established as a recent devolution deal with Government. This has been a long term ambition for Northumberland County Council and development of the scheme has continued over a number of years, mindful of potential funding opportunities and the lengthy process involved for the reintroduction of passenger services, with multiple stakeholders involved. The scheme aligns well with the strategic aims of Northumberland County Council and will help to deliver the vision set out in the corporate plan, which focuses on making Northumberland a county which residents regard as a great place to live, and in which residents can access the things they enjoy, whilst having the opportunity to learn and thrive.

A new governance model for transport has been created operating across the North East as a pragmatic solution to provide the flexibility to meet the area's unique circumstances. This requires arrangements that will enable the North and South of Tyne areas to pursue their own diverse policy objectives while continuing to work together on transport delivery and as part of the North East Local Enterprise Partnership (LEP), so that the whole area will operate more efficiently and effectively in the shared pursuit of greater productivity and economic growth.

Figure 2.1 illustrates the new governance boundaries within the North East LEP area. On the amendment of the existing boundaries of North East Combined Authority (NECA) and the establishment of the North of Tyne Combined Mayoral Authority, each combined authority has become the Local Transport Authority for its respective area under the Transport Act 2000.

Figure 2-1: Governance Boundaries in the North East LEP Area



As the North East moves forward, the seven councils will maintain their shared commitment to creating the conditions for economic growth and working collaboratively across the wider North East geography where it makes sense to do so on areas of common interest. Effective engagement with the North East LEP and the wider business community is also critical to delivering the ambitions for the area. The North East LEP arrangements have delivered a significant number of development and growth projects which have begun to transform the North East area, and provide an effective framework to manage and commission the multi-million-pound investment programmes designed to improve and support the North East's economy. The seven authorities formerly of NECA have agreed to continue to work closely with and through the North East LEP in delivery of the Strategic Economic Plan.

The Northumberland Line scheme is one of the key transport schemes in the plan which will benefit the North East through enhanced sustainable transport connectivity. It is widely acknowledged that economic growth and productivity can only be achieved with adequate infrastructure in place. The scheme will also contribute to some priority objectives in the area, particularly around improving air quality on the key corridors in Tyne and Wear, which is currently subject to scrutiny as part of a European Directive.

Whilst the governance structure has changed significantly over the last 18 months in the North East, development work has continued on the scheme. A transportation study has been undertaken to review existing transport provision serving Northumberland and its neighbouring authorities, a Stage 2 – Feasibility Study as part of the GRIP process has been completed and an economic assessment of the benefits of reopening the line to passenger services is complete. An appraisal of a long list of possible interventions has been undertaken, which resulted in the Northumberland Line scheme emerging as the preferred intervention. These studies have defined the scope and identified potential constraints, and also whether the outputs can be delivered economically and in line with current network proposals/strategy.

Northumberland County Council sees a real opportunity to progress the scheme in line with the government's new approach for rail enhancements - Rail Network Enhancements Pipeline (RNEP), alongside Network Rail's 'Open for Business' initiative; the scheme has now been accepted into the RNEP pipeline. NCC welcomes the fact that it moves the investment in enhancements away from rigid five year cycles and clearly seeks to support enhancements to the capability of the railway, by adding capacity as one of its four priority considerations for scheme progression. In addition to making railways safer and more reliable, the guidance clearly supports some of the main objectives of the Northumberland Line, to offer new opportunities for citizens and businesses and to unlock much needed housing and economic growth.

The government has identified four priorities for investment and action that contribute to achieving the goals set out in the Strategic Vision for Rail:

- Keeping people and goods moving smoothly and safely;
- Delivering the benefits from committed programmes and projects already underway;
- Offering more: new and better journeys and opportunities for the future;
- Changing the way the rail sector works for the better.

We consider that the Northumberland Line proposition contributes across all these key government priorities, and in particular strongly aligns with one of these, namely: **Offering More: New and Better journeys and opportunities for the future**.

"Enhancements that meet this priority will support outcomes that drive new industrial, economic and housing growth. This may be, for example, by reopening old lines to support communities; expanding the network to support new towns and villages; connecting centres of employment and commerce; or creating new corridors for economic growth to rebalance the economy" (RNEP: A New Approach for Rail Enhancements, DfT March 2018)

This OBC will demonstrate how the Northumberland Line scheme aligns with this priority for rail, alongside the other three priorities defined by government[4].

Network Rail has recently designated the Northumberland Line scheme as an "Open for Business" scheme. This essentially opens up the scheme for potential third party delivery as a 'contestable project'. Contestable projects are funded projects that can be delivered by parties other than Network Rail, where it is safe to do so. This allows Network Rail's role therefore to be more 'hands-off' across certain aspects of delivery.

Section 2.3 demonstrates the need for the scheme and highlights why the Northumberland Line can deliver on this priority, meeting many of the outcomes expected by RNEP.

2.3 The Case for Intervention: The Problem Identified

This section of the Strategic Case sets out the need for the scheme. A sustainable transport solution directly serving the South East Northumberland area, would provide a step change in connectivity within the area, making many of the emerging employment opportunities in Blyth and Ashington more accessible. It will also provide a sustainable transport option by rail to the greatest concentration of jobs, retail and leisure opportunities in Tyne and Wear, and Newcastle in particular, as the regional capital for commerce and business. Such opportunities do not exist locally to the residents of South East Northumberland, and as a consequence, the area exhibits many of the attributes of deprivation, including unemployment, poor health and low education achievements, associated with social exclusion The socio-economic characteristics are presented here, illustrating significant differences within Northumberland and also between South East Northumberland, the main area of interest and the rest of the North East and UK. There are likely to be many complex reasons behind this difference, but this section considers the lack of good transport provision and infrastructure as one of those. For many, this will define whether they work, undertake education or training, or can access leisure and retail facilities outside of their area, where much greater opportunities exist.

[4] Table 3.2 in the Commercial Case also illustrates how the scheme aligns with the DfT Priorities for Rail.

A review of the key drivers for change is given in the Section 2.5, but it is clear on reviewing these that providing good transport infrastructure is essential for growth; it links people to jobs and places of growth, links business to business and goods to the market place. In South East Northumberland, evidence suggests transport provision is not working or fit for purpose for everyone. The North of Tyne Combined Mayoral Authority has bold aspirations for the economy, and this vision is also shared by the North East LEP. Central government's new flagship Industrial Strategy should be the cornerstone of future development in the North East, given its proud industrial heritage. This can only be realised with the right infrastructure in place to deliver it.

2.3.1 Market Failure

South East Northumberland displays signs of market failure and the Northumberland Line will, in some part, aim to address this. Government guidance (HM Treasury Green Book) describes market failure as a situation "where the market has not and cannot itself be expected to deliver an efficient outcome; the intervention that is contemplated will seek to redress this".

Evidence suggests market failure is a reality in South East Northumberland. Evidence includes employment rates lower than other areas in the North East, high levels of social deprivation and the need for better public transport to access opportunities outside of the immediate area of interest. Importantly, there are development sites for housing and employment that are slow coming forward, due to a lack of interest of the UK business community, with insufficient inward investment to raise living standards. This comes at a time when the North East economy is showing strong signs of economic recovery after the recession, with new and better jobs being created. However, this success does not seem to be apparent universally and certainly not in South East Northumberland.

Giving people better access to jobs and other opportunities will help overcome this market failure. Moreover, it will give developers the confidence to invest in the area and build houses with the likelihood of land uplift values.

The varying landscape of demand for employment land and housing alone demonstrates that market failure is not consistent across Northumberland. It is certainly not consistent with other development sites in Tyne and Wear which are showing good signs of economic activity and job creation. It is reported later the impact the North East LEP Strategic Economic Plan has had since its first publication in March 2014. If the requirement for employment land remains static in South East Northumberland, then this places greater demand for better transport provision to reach these other opportunities in neighbouring authorities.

The Northumberland Draft Local Plan highlights the issue around market failure as follows:

- The South East of the county has experienced consistent under delivery of housing in recent years compared to the housing allocations in existing Local Plans. Some large housing sites have stalled and sites on previously developed land have proven unviable.
- This area faces particular challenges; social and environmental deprivation arising from unemployment and poverty continue to frustrate the ability of communities to emerge from the post-industrial, coal mining legacy into sustained and sustainable growth. The closures of the RioTinto Alcan smelter at Lynemouth and Northumberland Foods in Amble have also had an impact upon the communities and supply chains locally.

The Northumberland Line scheme will address issues of market failure through de-risking vacant or derelict land to create development opportunities through access to key sites identified in the Northumberland Local Plan for South East Northumberland.

2.3.2 Poor Access to Opportunities in Tyne and Wear

Market failure manifests itself in the form of lack of development and opportunity in Northumberland for local residents. However, there are many opportunities outside of South East Northumberland that residents are not taking up, evident by levels of unemployment and the concentration of social deprivation in the area. This calls into question whether transport provision is adequate to access these opportunities, especially for those non car owners. We investigate later in this section, the public transport provision to key employment sites, but it is clear they are not competitive journey times to those by car.

Figures 2.2 and 2.3 illustrate some of the development sites currently benefiting from development and the creation of jobs. Many would be directly served in central Newcastle by the Northumberland Line. Even Cobalt could be easily accessed by a station at Northumberland Park and discussions with representatives from Cobalt have confirmed they think the Northumberland Line scheme will offer a real travel alternative to the private car. However, residents of South East Northumberland currently struggle to access these opportunities. Further information on the opportunities residents are missing out on is summarised in the following table.

Table 2-2: Opportunities for South East Northumberland Residents

Site	Description
Science Central	Science Central is one of the largest mixed use development sites in the country, occupying 24 acres in Newcastle city centre. The site has been recently rebranded to Newcastle Helix and is being developed in partnership with Legal and General, Newcastle Council and Newcastle University. The site has already created 1,000 jobs and is expected to provide 4,000 jobs once fully built out in addition to 450 homes. Legal and General already have a 12 storey office block and in 2016 invested £65 million for another 8-storey office block. The construction of laboratories is expected to add another 270 jobs to the city's life sciences sector.
Stephenson Quarter	The Stephenson Quarter is a mixed use development in its second phase located behind Newcastle Station. Stephenson Quarter will provide space for start-up digital businesses, public squares, luxury flats, a boutique hotel and a technical school. Stephenson Quarter already provides 900 jobs equivalent to £45m per annum and will provided 3,000 jobs worth £150m per annum upon completion.
Quorum Business Park	Quorum and Balliol Business Park in North Tyneside host a wide range of businesses in grade-A accommodation. Including major employers such as Engie, Tesco Bank, Balfour Beatty, Greggs, Convergys, Fabricon, British Engines, Insure the Box and Sitel. They also host an annual jobs fair, which offers more than 1,000 opportunities with a wide range of positions. The park is already more than 60% occupied and has attracted 13 new occupiers in 4 years and provides more than 5,000 jobs. Recently Cofely, British Engines and NCFE have relocated 84 staff and added 500 jobs.
Cobalt	Cobalt Business Park is one of the largest developments in the UK with 2 million square feet of grade-A office space. The site is continuing to grow with six major occupiers, including G4S, Accenture and IBM taking either second buildings or additional floors. Cobalt is now 83% occupied and is home to almost 13,000 employees. Recently Siemens, Utilitywise and Hewlett Packard moved 200 employees to the site and added 860 additional jobs.
Team Valley	Team valley is one of the largest industrial estates in Europe with 700 business and 25,000 employees across a range of premises. It is located close to the urban core and has good access via public transport and the A1(M). Team valley enjoys ongoing investment in facilities and development such as Dukesway Central and a £70million upgrade to the A1(M)in 2016. There is also 22,700m² of new development planned from 2017 to 2019.
The Urban Core	The Urban Core is a combination of Newcastle city centre and Gateshead town centre which function symbiotically due to their proximity. The Urban Core provides a large number of employment opportunities in the region. New manufacturing sites are planned on the north bank of the Tyne to maintain the leading position of the area in offshore engineering. The digital sector is now worth more than £1 billion accounting for 44,000 employees. The North-East Futures University Technology College and National Innovation Centre for Data are set to open in in 2018 and 2019 respectively. £3.5 million in European funding has been secured to deliver the North of Tyne Community Led Development strategy. Invest Newcastle has secured 12 new investment projects and 9 business expansions which has created 565 new jobs and safeguarded 438.
Baltic Quays	Baltic Quays is a £7.8m mixed-use emerging technology centre over 14 hectares expected to provide 4,000 jobs. Gateshead Council has pledged to invest £307m over 5 years in the site supporting digital and technology companies. The quarter is already a destination of choice for innovation clusters, high growth businesses and leading edge

Site	Description
	institutions including Northern Design Centre, PROTO: The Emerging Technology Centre, Northumbria University's Innovate Campus and Gateshead College's £35m Baltic Campus.
East Pilgrim Street	The East Pilgrim Street development is split into two adjacent sites. The North site is focused on retail and acts as an extension of the high street. The South site contains a mix of leisure, offices and residential development. Overall East Pilgrim Street is expected to provide 3,000 jobs.
The Metro Centre	The Metro Centre was once Europe's largest retail centre when it opened and currently hosts 330 stores in a wide variety of sectors. The shopping centre is a large employer and contributes a significant amount of the 10% of the local economy attributed to retail. The Metro Centre continues to attract investment and received £34m from 2011 to 2016.

However, importantly, it is expected that the Northumberland Line will help accelerate development in Blyth and Ashington through providing easier access to these sites and an increased labour pool to take up the job opportunities. This will be particularly important for sites such as Energy Central and Blyth Estuary, identified as an innovation hub, which will be dependent on specialist skill sets from employees outside of the South East Northumberland area.

Figure 2-2: Key Employment Sites in Tyne and Wear

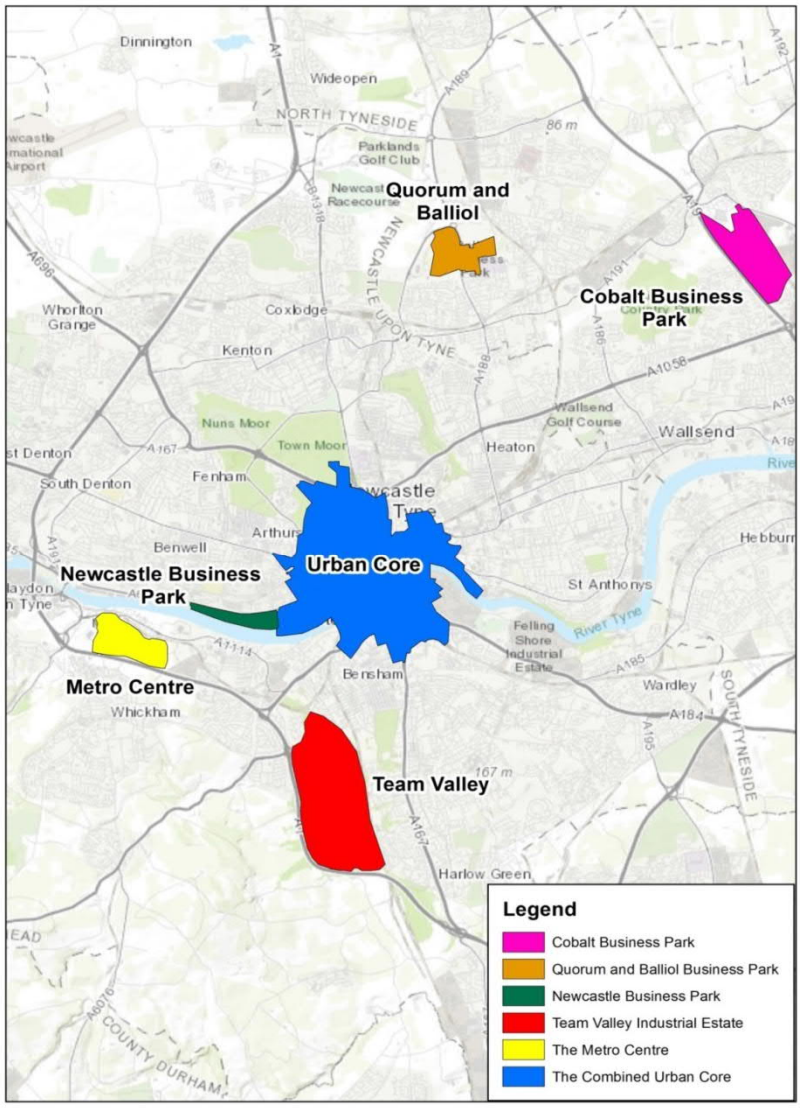
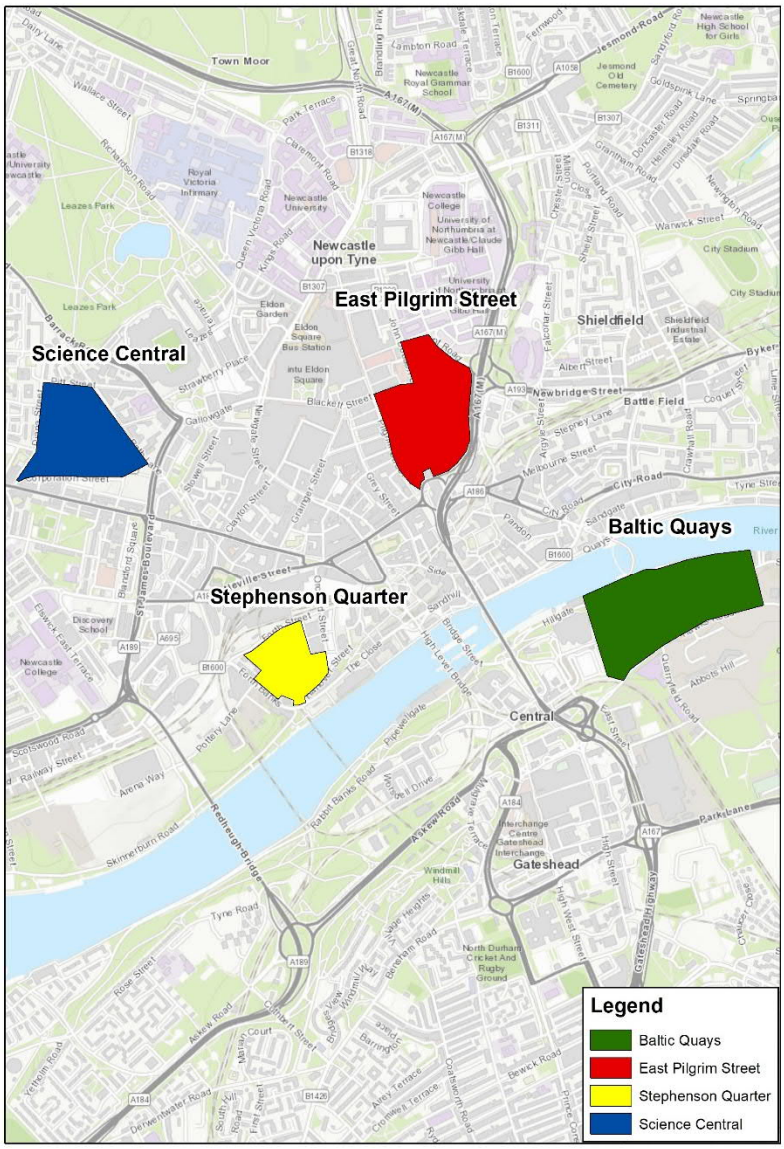


Figure 2-3: Employment Opportunities in Newcastle and Gateshead



2.3.3 Key Characteristics of Northumberland

Northumberland is the largest unitary authority by geographic coverage with the greatest area of Green Belt of any Local Planning Authority. It is the most sparsely populated Authority in England with only 63 people per square kilometre. Home to around 316,000 people, Northumberland remains mostly rural, with its largest settlements having no more than 40,000 residents. The south east of the County is the most densely populated, with the three largest towns, Blyth, Cramlington and Ashington. These act as main employment centres, drawing from a wider area than just South East Northumberland. They also provide a significant range of services in their respective centres and offer assets such as Northumberland College and large scale leisure facilities that have a wider reach.

The remainder of this section looks in more detail around the socio-economic and transport characteristics, challenges and opportunities which set the scene in more detail for the scheme.

2.3.4 Socio-Economic Characteristics

Historically, the North East region has had a declining population, but that changed between the 2001 and 2011 Census. However, there is variation in these figures shown for South East Northumberland, (Blyth Valley & Wansbeck, the former districts of South East Northumberland), which represent parliamentary constituencies in the study area, compared to regional and national growth. This is illustrated in Table 2.3. The population of Northumberland is also ageing and the significance of this demographic change makes it a major policy issue for the prosperity and resilience of Northumberland communities: between 2016 and 2036 evidence presented for the Local Plan forecasts a significant increase in those over 65 (by almost half), with those over 80 years of age doubling in number. Conversely, the core working age population of 20 to 64 year olds is projected to decrease by over 12%. There are a number of reasons which could account for this, such as poor housing provision and poor accessibility to jobs, key services and facilities. It is not just population levels which will have an impact on transport demand; a higher percentage of younger or older people will mean more reliance on public transport.

Due to these demographic patterns, and the Office for National Statistics forecasts, it is predicted that without positive policy intervention, the County's population will increase by only 1.8% to 2036. By contrast, the UK population is projected to increase by 5.5% in just the first ten years of this period.

If this does occur, projections show that it would result in a significant reduction in working age population and a subsequent reduction in the number of working people in Northumberland. In which case, there could be a reduction in the ability of Northumberland to provide a labour force to existing or potential employers who want to locate in the County, leading to growth stagnating and further market failure.

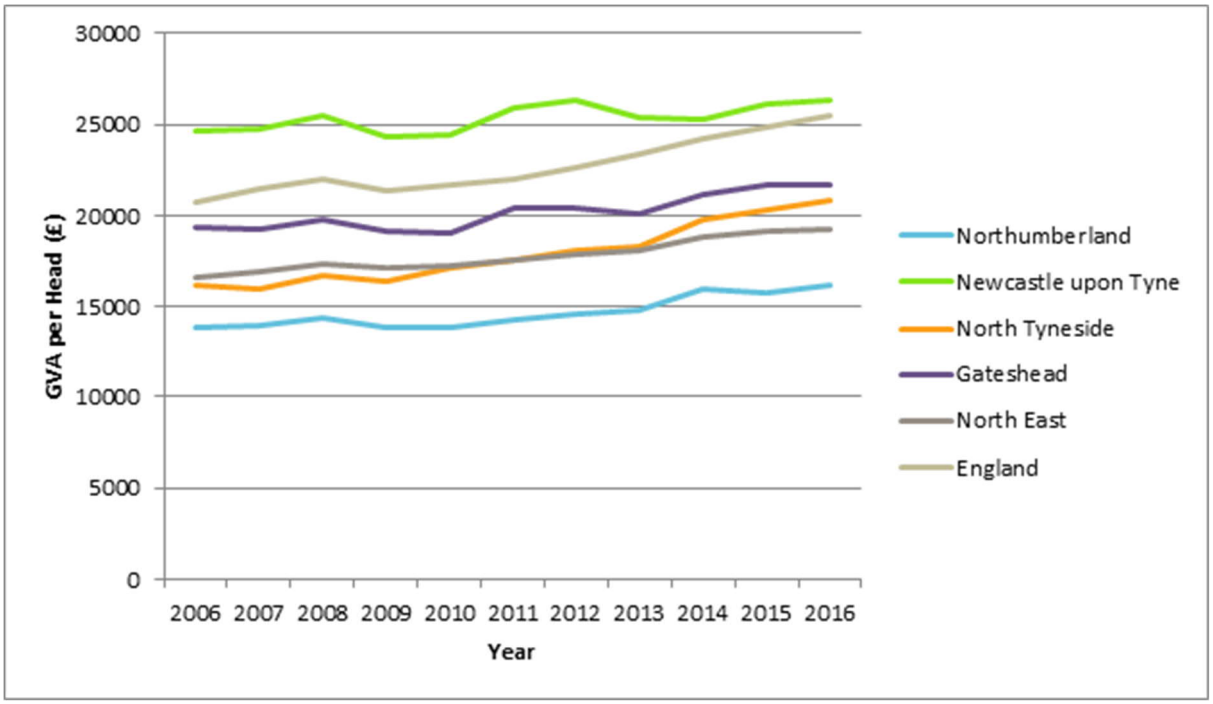
Table 2-3: Census Data, Resident Population Growth

Area	2001 Population	2011 Population	Growth
Blyth Valley	81,265	82,174	1.12%
Wansbeck	61,138	62,354	1.99%
Northumberland	307,190	316,028	2.88%
North East	2,515,442	2,596,886	3.24%
England and Wales	52,041,916	56,075,912	7.75%

Northumberland makes a major contribution to regional and national prosperity. It is home to major globally competitive and connected companies. Northumberland is at the heart of the northern economy, sitting between the competitive city economies of Newcastle and Edinburgh, with good links to national and international markets via Newcastle Airport, the strategic road and rail network and the Port of Blyth and the region's other sea ports. There is increasingly good digital connectivity, which includes rural parts of the County.

The Northumberland economy has grown steadily in recent years. However, Gross Value Added (GVA), which is an economic measure of the value of goods and services produced in an area, is lower than both the North East Local Enterprise Partnership (North East LEP) area and national rate of growth. This can be explained by low productivity, which points to the need to improve the quality of jobs and skills in Northumberland, and attract new business in higher value sectors. Figure 2.4 illustrates GVA for Northumberland in comparison with other areas.

Figure 2-4: GVA comparisons between Northumberland and other areas (Source: ONS 2017)



The structure of the County's economy has undergone substantial change over the past 30 years. There has been a downsizing of the agricultural workforce and the complete departure of deep coal mining. The economy now has a broader base which incorporates manufacturing and certain service sectors. There is particular reliance on the public sector although as elsewhere, this sector has been reducing over the past 10 years. Significantly, there has been a decline in manufacturing employment, including some of the newer sectors that replaced mining and heavy industry, reflecting national trends. Unlike past periods of change, there has not been a parallel growth in high value service sector employment, although there is potential for strong growth.

Northumberland has relatively healthy levels of economic activity and employment, with both being greater than the regional rate, (although slightly below the national rate) in 2017. The Northumberland unemployment rate in 2017 was also lower than the regional average, at 5.0% and this has continued to fall. However, these levels vary significantly across the County. The Local Plan therefore, needs to support a quantitative increase in the number of jobs in the County, in order to provide suitable job opportunities for people to move into employment, alongside support for skills initiatives to enable the County's current labour force to meet the requirements of businesses. Good transport infrastructure can stimulate development and growth, but it can also connect people to existing opportunities.

The spatial distribution of areas of high unemployment and economic inactivity shows that whilst there are rural pockets, the issues are most acute in the south east, pointing to the need to provide opportunities accessible to this population; unemployment in Wansbeck in the 2011 Census was 9.5% compared to 4.1% in Tynedale, which has an existing railway line with good connections into Tyne and Wear. It is the south east that will best be served by the Northumberland Line for passenger services, affording greater access to employment opportunities. Northumberland's economy is intrinsically linked to the economies of neighbouring areas, Tyneside in particular. The 2011 Census showed a net outflow of commuters from Northumberland of over 23,000 people – mostly between Northumberland and Tyneside.

Whilst GVA is a useful measure of the economic wealth of an area, it is a work based measure of production and as such, is distorted by those employees who commute between regions. As a further analysis, average weekly earnings have been analysed to show the relative wealth of both the area and the residents of South East Northumberland.

Table 2-4: Average Weekly Earnings (£) 2013 (Annual Survey of Hours and Earnings)

Location	Resident Earnings (£)	Workplace Earnings (£)
England	520.7	520.5
North East	472.3	470.2
Northumberland	479.4	437.9
Blyth Valley	468.0	439.7
Wansbeck	447.9	482.5

The data above shows that the average workplace earnings in Northumberland in 2013 were below the regional and national average. The average wage of a resident of Northumberland however, was above the regional average and supports the theory that residents are out-commuting into other areas for work, and higher paid employment.

Within the south east area of Northumberland, Wansbeck has an average weekly resident wage which is much lower than the regional and national averages. However, the average weekly wage for the workplace in Wansbeck is higher than that of Northumberland and the regional average. This suggests that those jobs which are available in Wansbeck are not being taken up by local residents, potentially due to a lack of available skills within the area. Although the desire is to ensure local residents have sufficient skills to access local employment opportunities, there is clearly a need to ensure suitable transport links exist to allow in-commuting to South East Northumberland to address any shortfall in the local labour pool.

It is acknowledged that having a decent home is fundamental to the health and wellbeing of everyone living in Northumberland. The Local Plan objectives include extending housing choice across Northumberland by delivering homes for existing and future communities and to support the Northumberland economy, alongside providing well-designed and affordable homes to meet the diverse needs of an ageing population. Where these houses are located, will place demands for travel across all transportation networks.

The Government's new standardised approach for robustly establishing each local authority's 'Local Housing Need' over an initial 10-year period, has been applied in Northumberland. This is based upon the latest official population and household projections (updated every two years) which take account of trend-based and predicted natural change in birth and death rates as well as UK internal and international migration patterns. The methodology also factors in an adjustment for affordability to reflect 'market signals' based on the ratio of workplace-based median house prices to median earnings (updated annually). The standardised formula suggests that, once factoring in affordability, Northumberland currently has an annual average 'Local Housing Need' of +717pa for an initial 10-year period 2016-2026.

Guidance also requires local plans to prepare to be aspirational and positive. For the 20 year Plan period, an ambitious preferred jobs-led growth scenario is being taken forward, which dictates 17,700 net additional dwellings would be required at an average of 885 per annum.

New houses and associated population growth will inevitably create new demand for public transport provision. Better public transport provision, especially rail based, can act as a catalyst for housing development. It is also common for land values to increase with good rail provision, which would be welcomed in Northumberland, to further invest in services and facilities for the benefit of local communities. Work has progressed to establish the best locations for stations, taking into account potential future demand and the possibility of land value uplift, which could be used to help finance the scheme.

The index of multiple deprivation gives further information on the social portrait of an area and can be used to rank all local authorities in England. Authorities are ranked based on the average super output areas measure (which is the population weighted average of the combined scores for the SOAs in a district). The IMD also ranks every small area (LSOA) in England from 1 (most deprived area) to 32,844 (least deprived area). SOAs are measured on seven different categories and an overall score calculated, including:

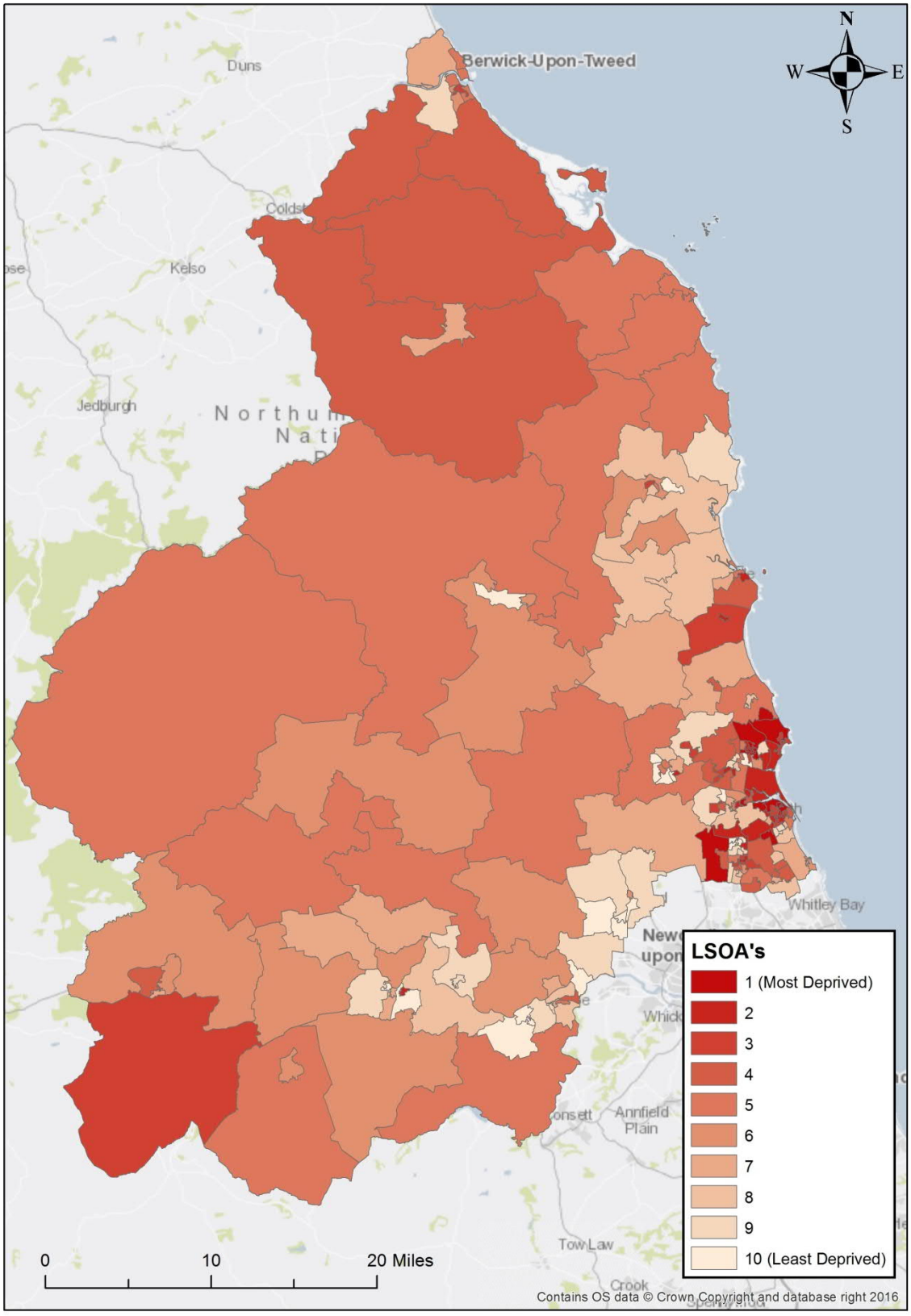
- Income;
- Employment;
- Health deprivation and disability;
- Education, skills and training;
- Barriers to housing and services;
- Crime; and
- Living environment.

Table 2-5 shows some of the key social statistics for Northumberland, which contribute to IMD scores. The data demonstrates that South East Northumberland is performing poorly against some of these social indicators, particularly when compare to the national figures. Figure 2.5 shows the overall IMD map for Northumberland, highlighting the concentration of the most deprived areas in the south east area of the County.

Table 2-5: Social Statistics for Northumberland

Factor	Base	Blyth Valley	Wansbeck	Northumberland	North East	England	Source
People not in good health	Resident Population (%)	7.1	8.3	6.3	7.4	5.5	2011 Census
People with limiting long term illness	Resident Population (%)	21.1	23.4	20.7	21.6	17.6	2011 Census
Average weekly wage by residents (FT)	Resident Population	N/A	N/A	487.1	492.2	544.7	Annual Survey of Hours and Earnings 2016
Mortality rates	Per 100,000 population	N/A	N/A	1016	1128	986.6	Death Registration 2015
Population living in the 20% most deprived SOAs	Resident Population (%)	22.6	39.7	16.4	N/A	N/A	IMD 2015
Residents claiming Job Seekers Allowance	Claimants	N/A	N/A	2.1	2.3	1.3	Claimant Count 2016
Residents claiming Incapacity Benefit	Claimants	N/A	N/A	6.4	8	6.2	Claimant Count 2016
Residents claiming Disability Living Allowance	Claimants	N/A	N/A	1	1.1	0.9	Claimant Count 2016
Residents with no qualifications	Working age population (%)	16.6	18.8	14.9	17.8	14.8	2011 Census
Residents with qualifications at degree level or above	Working age population (%)	20.7	19.9	27.3	24.3	29.8	2011 Census
Population living in local authority or other social housing rented properties	Working age population (%)	22.9	22.5	18.7	23	17.7	2011 Census

Figure 2-5: IMD Map for Northumberland 2015



Evidence shows that health and wellbeing, and quality of life, are linked to a range of social, economic and environmental factors. Development, through its location and design, has the ability to positively influence health and wellbeing. It can improve access to community facilities, healthy housing, healthcare facilities, local employment opportunities, open space, healthy food, and encourage active lifestyles. Development is much needed in South East Northumberland, but so too is better accessibility to other opportunities in neighbouring areas which will improve health and wellbeing.

In 2011, 14.9% of the working age population of Northumberland were recorded as having no qualifications. This is comparable to the national average, and 2.9% lower than the regional average for the North East. Within Northumberland however, the figures varies considerably, with 11.1% of the working age residents of Tynedale having no qualifications compared to 18.8% of the working age population of Wansbeck. In fact, it is those areas of South East Northumberland which have already been identified as socially deprived, which have the highest proportion of the working age population without qualifications. Much of this can be attributed to the loss of heavy industry in the area which led to a decline in the number of skilled jobs. It is however, a self-perpetuating cycle with many children growing up in an unemployed household being distracted from education by the social problems that unemployment often causes.

Table 2-6: Qualifications in Northumberland for Working Age Population, 2011 Census

District	No Qualifications	Degree or Higher
Blyth Valley	16.6%	20.7%
Castle Morpeth	12.2%	36.4%
Wansbeck	18.8%	19.9%
Northumberland	14.9%	27.3%
North East	17.8%	24.3%
England	14.8%	29.8%

2.3.5 A Transport Portrait

The long distance transport movements in Northumberland are reasonably well served. The main trunk road network, which runs through the county, consists of the A1, running north to south from Edinburgh to London, and the A69, which runs east to west from Newcastle through to Carlisle. The East Coast Main Line railway also serves the area with regular passenger services between London and Scotland. A local service also uses this line, with regular connections between the communities of Morpeth, Cramlington and Newcastle. To the west of the county, the Tyne Valley Line provides frequent services to Newcastle, as well as providing a connection further west into Carlisle. However, addressing the socio-economic problems already discussed, highlights a real need for better provision for shorter trips to work, retail and leisure opportunities. As yet, there is no rail passenger service for the most densely populated urban settlements in South East Northumberland, such as Ashington and Blyth. These communities rely on a network of bus services for connections within Northumberland and beyond to Tyne and Wear which are just not competitive in comparison to car based trips, due to long journey times and perceived issues of poor journey quality This is a real problem which will intensify with the forecast population growth, increased car ownership and lack of local opportunities in South East Northumberland for jobs, retail and leisure activities.

Car ownership will be an influential factor in determining the choice of travel destinations, the frequency of journeys and the mode of travel chosen, for any trip purpose. Ownership levels, established from the 2011 Census, vary across Northumberland, as illustrated in Figure 2.6.

Figure 2-6: Households that do not own a car (Census 2011)

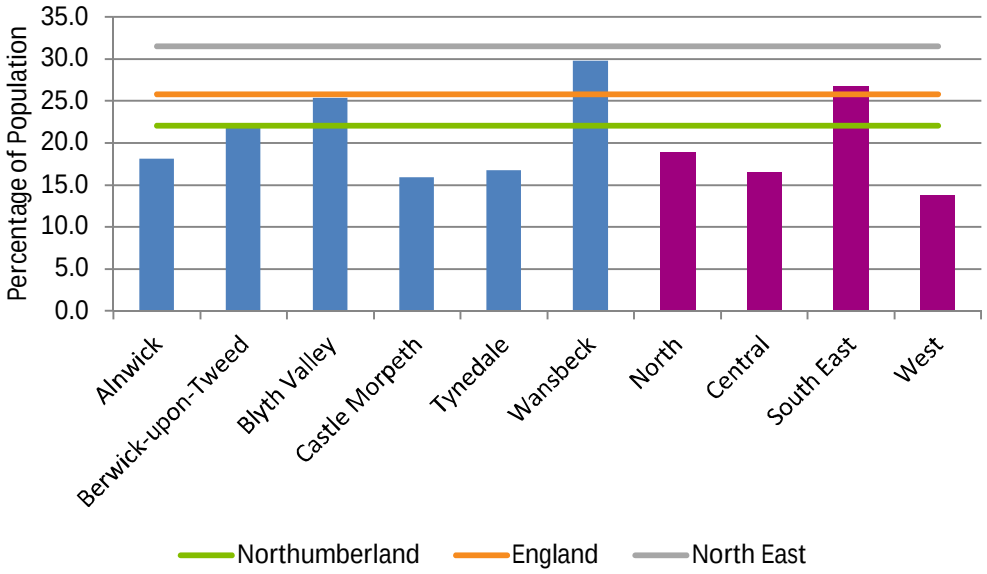


Figure 2.6 shows that in 2011, the percentage of Northumberland households that did not own a car was lower than the national average. However, there were districts within the region where car ownership levels were low, namely Blyth Valley and Wansbeck. Across Northumberland, car ownership is lowest in the urban south east area, which would be directly served by the Northumberland Line passenger services.

Car ownership levels are often an indicator of deprivation in an area. It is therefore no surprise that car ownership levels are lowest in the most deprived areas of Northumberland. However, with an increase in wealth within these areas as a consequence of economic growth, local developments and new or higher paid jobs, there could be aspirations for people to own a car. Whilst congestion may not be such an issue for most areas of Northumberland at present, increasing car ownership levels could lead to it being a concern in the future, particularly on the key routes into Tyne and Wear, which do suffer from congestion. The projected car ownership levels for the 15 year period to 2031 are reported in Table 2.7.

Table 2-7: Future Projections for Car Ownership (TEMPro 7)

Area	2016-2031				
	No Car	1 Car	2 Cars	3+ Cars	Total Cars
Blyth Valley	-9.4%	9.1%	19%	20.8%	15.4%
Wansbeck	-9.6%	11.8%	21.8%	24.6%	18.2%
Northumberland	-8.7%	9.7%	18.6%	21.7%	16.2%
North East	-9.3%	10.6%	20.9%	25.3%	17.6%
Great Britain	-1.5%	13.5%	21.3%	23.1%	18.9%

Any increase in car ownership will increase traffic congestion and impact negatively on air quality. The challenge therefore lies in encouraging new car owners to continue making use of alternative modes of travel, even for certain journeys, in order to manage transport demands and reduce carbon emissions.

The Northumberland Line will provide a much enhanced public transport offer in terms of quality and journey times for those living in South East Northumberland (Blyth and Wansbeck), which should be able to provide a more competitive alternative to the car to a greater number of employment and education opportunities within South East Northumberland, Tyne & Wear and further afield.

The A189 is the major commuter route into Tyne and Wear for communities in South East Northumberland, including Blyth and Ashington. The road is dual carriageway between Newcastle and Ashington and runs largely parallel to the Northumberland Line. There are a number of bottlenecks on the route where it intersects key radial routes into urban areas. One of the most critical intersections is the junction with the A19 at Moor Farm. Over the years, a number of small scale low cost traffic measures have been implemented to improve the flow of traffic and increase capacity. However, it is in need of more major intervention to overcome the congestion it currently suffers. Between 2007 -2017, growth on the major roads in the North East was 6.8% (DfT National Traffic Survey). Highways England is currently looking at possible interventions as part of the Road Investment Strategy (RIS2). Without further provision, congestion will worsen given previous and forecast growth levels. Other routes are available into Tyne and Wear, however, they incur longer distances and travel times. With Highways England already objecting to a number of proposed developments that would use the A19 Moor Farm junction, now more than ever, investment is needed in alternative transport modes to alleviate this bottleneck on the transport network and bring about growth across South East Northumberland.

The two main passenger railways running through Northumberland are the East Coast Main Line and the Tyne Valley Line. The former runs north to south connecting Tyne and Wear with Scotland, with the latter running east to west between Tyne and Wear and Carlisle. The third line is the Northumberland Line, which is currently a freight only link connecting South East Northumberland with Tyne and Wear.

London North Eastern Railway (LNER), TransPennine and Cross Country trains provide fast and frequent services to Scotland, the Midlands, Yorkshire, the North West and London using the East Coast line through Northumberland. The key stations in Northumberland that are served by trains on the East Coast line are Berwick-upon-Tweed, Alnmouth and Morpeth. Morpeth is a popular station, with 418,000 passengers departing/arriving during 2017/18. Since December 2019 Morpeth now has a core half-hourly service to Newcastle (although there are gaps in some hours when only one train operates), made up of the local service operated by Northern calling at Cramlington and Manors, which typically takes 25 minutes, and the recently introduced TransPennine service that is non-stop between Morpeth and Newcastle taking 14 minutes. In the peak periods some of the East Coast and CrossCountry services call additionally at Morpeth, thus offering a fast (typically 15 mins) peak service to/from Newcastle, which starts to be more competitive in terms of journey time than car, and makes commuting by train an attractive offer.

Patronage from Morpeth demonstrates that the train services are popular – certainly in terms of the peak periods; as they do provide fast journey times into the heart of Newcastle, in addition to longer distance trips to other UK cities. Unfortunately, the high population densities around Blyth and Ashington are not readily served by this passenger rail provision, disadvantaging the resident population here accessing similar opportunities and services.

Northumberland has an extensive bus network served by a number of bus operators. Arriva is the main operator serving South East Northumberland, and is an essential service for commuter and retail/leisure trips into Newcastle and North Tyneside, with limited alternatives for those without access to a car. However, bus services compare very poorly against car trips for journey times. Table 2.8 illustrates some journey times to significant employment, retail and leisure sites in Tyne and Wear. The distance is that recorded for the quickest journey time by car. Journey times by bus are often double those of car trips, with the probable exception of the express bus between Ashington and Newcastle city centre. Whilst services are direct between South East Northumberland and North Tyneside and Newcastle, anyone wanting to travel further afield will be required to interchange.

Table 2-8: Journey Times to Key Employment Sites (AM Peak)

Origin	Destination	Bus Time (mins)	Car Time (mins)	Distance (miles)
Blyth (Central)	Newcastle city centre	65	30	14.8
Blyth (Central)	Team Valley	90	40	22.6
Blyth (Central)	Metrocentre	85	35	18.9
Blyth (Central)	Cobalt Business Park	46	18	9.1
Ashington (Central)	Newcastle city centre	64	35	18.3
Ashington (Central)	Team Valley	88	40	26.2
Ashington (Central)	Metrocentre	94	35	22.5
Ashington (Central)	Cobalt Business Park	72	20	14.7

Source Google maps/traveline (highway journey times represent quickest routes but journey times are variable)

Based on journey times and the lack of available train services, car seems the obvious mode of choice to those key business and retail destinations. Where the highway capacity does not permit the provision of bus priority measures, highway congestion will have a further detrimental impact on the operation of bus services. Not only will it increase the operational cost of public transport in the area, which in turn is likely to be passed onto passengers, it will lead to unreliable journey times which will see buses being viewed as an even less favourable mode of transport than it currently is.

Analysis has already been conducted on changes in commuting patterns between 1981 and 2011. Analysis on data shows that there has been an increase in the percentage of the population commuting out of Northumberland for work from 23% in 1981, to 27% in 1991, 33% in 2001 and 37% in 2011. The increase has been observed in all districts and is likely attributable to a decline in traditional industries within Northumberland, alongside an increased willingness to travel. It also reflects the potential market failure of development and job creation within Northumberland and the need for intervention to reverse some of these trends.

Table 2.9 reports the origin/destination flows from destinations in SE Northumberland to workplace locations. These numbers clearly demonstrate the importance of Newcastle and North Tyneside as destinations for commuter trips. There are journeys in the opposite direction for work purposes, which reflects businesses can attract people from outside the immediate catchment area to South East Northumberland.

Table 2-9: Origin- Destination flows (2011 Journey to Work Data)

Origin/ Destination	Alnwick	Berwick-upon-Tweed	Blyth Valley	Castle Morpeth	Tynedale	Wansbeck	Gateshead	Newcastle	North Tyneside	South Tyneside	Sunderland
Blyth Valley	245	199	12,142	2,054	341	1,949	1,289	6,576	5,755	316	594
Wansbeck	312	78	3,138	3,524	317	9,167	745	3,146	2,027	173	331
Gateshead	73	18	744	909	1,508	340					
Newcastle	164	84	1,662	2,279	1,260	826					
North Tyneside	247	89	2,964	1,649	416	891					

Tyne and Wear has always been the key destination for commuters from Northumberland, although the 2011 Census data has demonstrated a decrease in those commuting to Tyne and Wear as a destination. In 1981, 89% of out commuters had a destination in Tyne and Wear; by 2001 this had decreased to 84% and by 2011 this had reduced further to 83%. It is likely that an increase in car ownership levels will have impacted on this figure with more people now having the ability to travel to a wider variety of destinations to work.

Despite the reduction in the importance of Tyne and Wear as a destination for out commuters, it still remains by far the principal destination from Northumberland. It is therefore important that a good and efficient highway and public transport network between Northumberland and Tyne and Wear is provided. The rail service will relieve traffic on this congested route, reducing congestion and journey times for both car and bus users.

Table 2.10 shows the split of modes of all journey to work trips that originate in Northumberland, the North East and England extracted from the Census data 2011.

The most dominant mode of transport for trips originating from Northumberland is the car, with 65% of commuter trips made by this method where the person being surveyed is the driver. This is higher than the national and regional figures, although this is to be expected in rural areas where distances to work are likely to be longer and public transport is not often commercially viable, offering a much reduced service than more urban areas. This is more pronounced in the Blyth and Wansbeck areas of South East Northumberland, not served by passenger rail services.

Public transport usage in the county is low, with only 5% of commuters travelling by bus and 1% of commuters by train. This is much lower than the national figures of 7.5% of commuters travelling by bus and 5% of commuters travelling by train. This could be reflective of the rural nature of the county and the dispersed population settlements, making the provision of public transport more difficult in these areas. However, it is also clearly impacted by the lack of passenger rail infrastructure to some of the most populated areas in South East Northumberland, where it must be noted that bus usage is actually higher than the County average (reflecting the propensity for travel in this area and reliance on the bus as the only alternative to the car).

Non-motorised forms of transport account for 13% of all journeys to work from Northumberland; this is split between walking, at 11.5%, and cycling, at 1.5%. It is recognised that these forms of transport will only be suitable for journeys to work that are short distances. In Blyth Valley, however, this is lower, which may reflect the lack of job opportunities in that area.

Table 2-10: 2011 Census, Mode Share for Journey to Work Trips

Mode	Blyth Valley	Wansbeck	Northumberland	North East	England
Work mainly at or from home	3.0%	3.2%	6.3%	3.7%	5.4%
Underground, metro, light rail, tram	0.8%	0.3%	0.5%	2.5%	4.1%
Train	0.8%	0.6%	1.3%	1.2%	5.3%
Bus, minibus or coach	7.6%	6.8%	5.2%	9.3%	7.5%
Taxi	0.6%	0.4%	0.4%	0.8%	0.5%
Motorcycle, scooter or moped	0.6%	0.5%	0.5%	0.4%	0.8%
Driving a car or van	67.5%	66.7%	65.4%	61.7%	57.0%
Passenger in a car or van	7.6%	7.7%	6.5%	7.0%	5.0%
Bicycle	2.1%	1.6%	1.5%	1.8%	3.0%
On foot	8.5%	11.2%	11.5%	10.6%	10.7%
Other method of travel to work	0.8%	0.8%	1.0%	0.9%	0.7%

Accessibility analysis has been undertaken to further illustrate some of the problems with the transport network, which currently serves South East Northumberland. In the morning peak period, 7.30 – 9.30am, accessibility analysis shows that urban areas of South East Northumberland can access Newcastle city centre in up to a 40 minute drive time; it is however noted that the journey time in the peak hour can be much higher than this with significant congestion on the key radial approaches into Tyne and Wear. This is in contrast to public transport (bus) journey times for South East Northumberland, with journey times from Ashington to Newcastle taking more than 60 minutes. Similar accessibility analysis to other key destinations such as the Accident and Emergency hospital at Cramlington, and Kirkley Hall, which provides land based education and training, also show major differences between car and bus journey times. Public transport needs are currently not being adequately met for residents of Northumberland in general. The provision is possibly most disappointing for Ashington and Blyth that are nearest to the main centres of retail, leisure and jobs in Newcastle, Gateshead and North Tyneside. Here, uncompetitive public transport journey times compared to car, and high public transport costs mean it is not a viable option for many.

Figure 2-7: Accessibility by car to Newcastle city centre

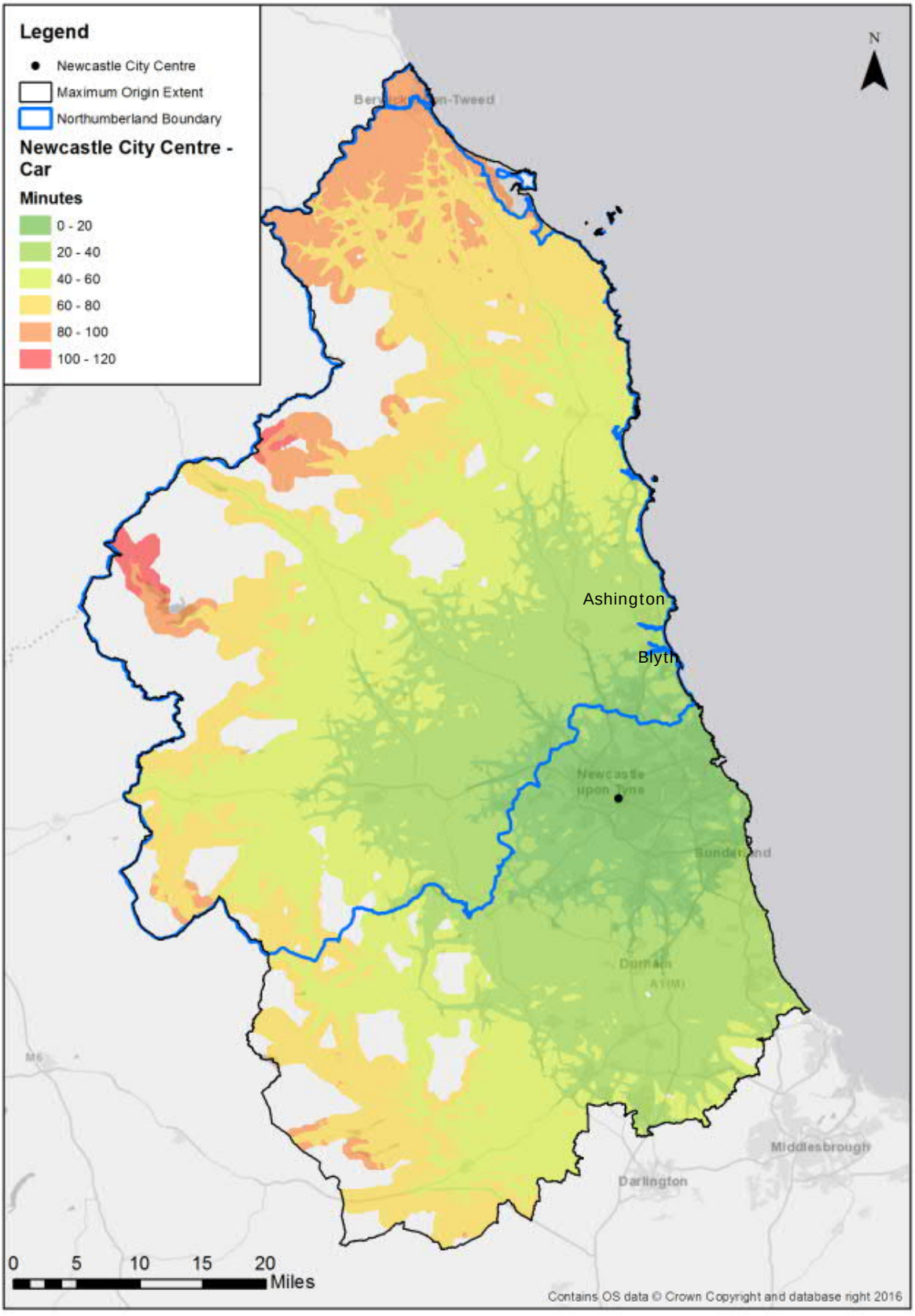
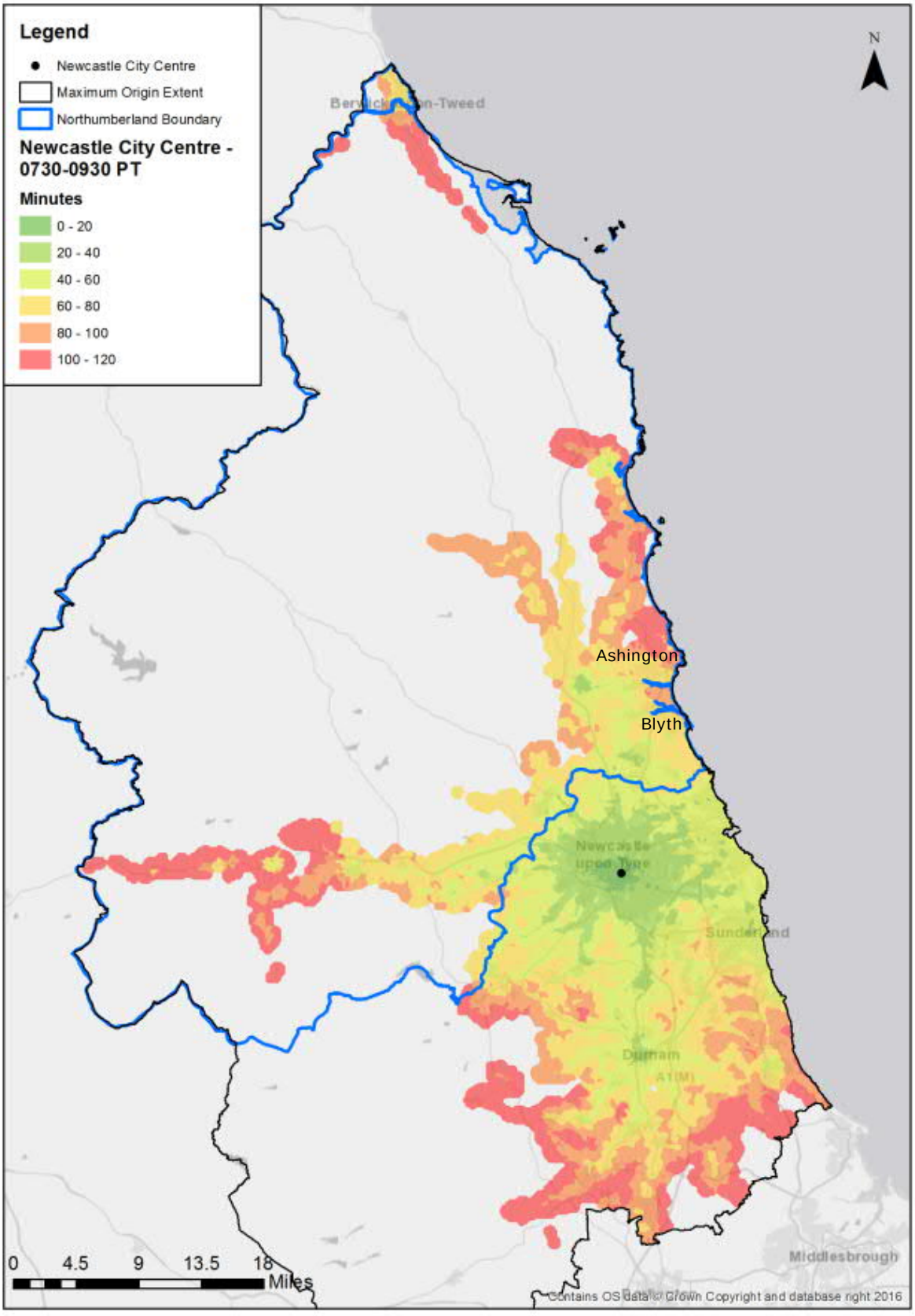


Figure 2-8: Accessibility by public transport to Newcastle city centre



2.3.6 Environmental Portrait

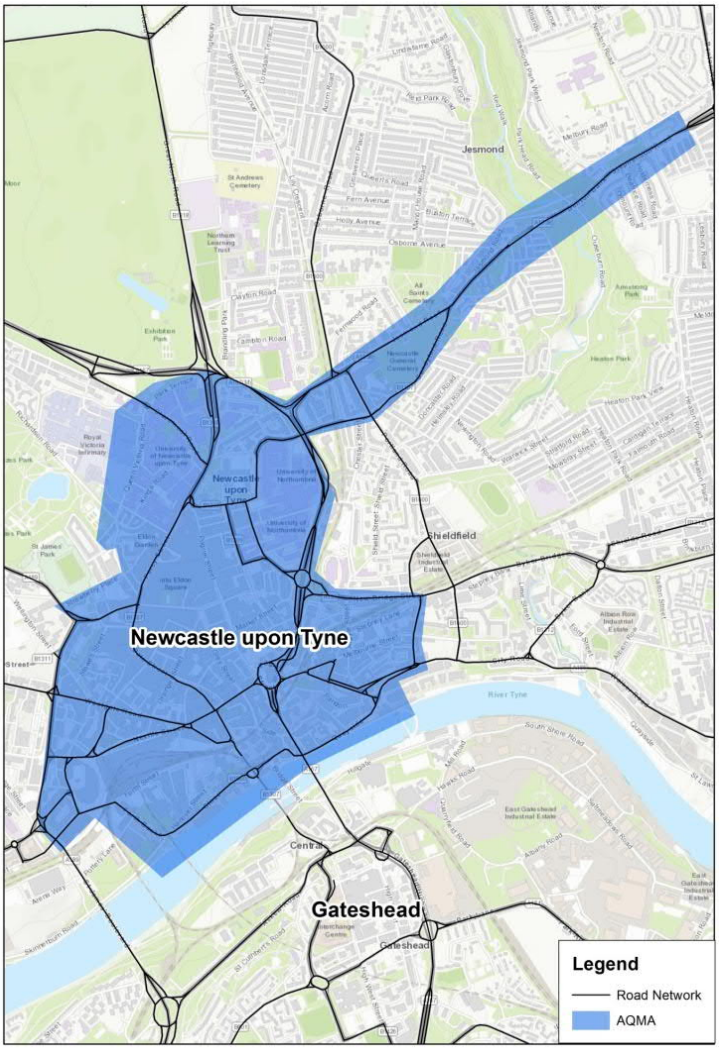
Poor air quality, caused by harmful pollutants, can have a significant negative impact on public health and biodiversity, and lead to the production of greenhouse gases. Air quality in Northumberland is generally good and there are currently no designated air quality management areas (AQMAs) in the County. However, problems could arise in the future from developments that may generate significant levels of traffic, introduce a new source of air pollution or expose people to existing sources of air pollution.

Unlike Northumberland however, the three nearest authorities are subject to a legal direction (Environmental Act 1995 (Feasibility Study for Nitrogen Dioxide Compliance) Air Quality Direction 2017) from the Secretary of State for Defra. They are currently undertaking a feasibility study (business case) to identify the option that will deliver compliance with legal limits for NO2 in the area for which authorities are responsible, in the shortest possible time.

We have already established that travel from South East Northumberland to neighbouring authorities for employment, leisure and retail is high. Future traffic growth will compound the problem, creating increased congestion and longer queues at existing traffic bottlenecks, unless actions are taken to address the problem.

The AQMA for Newcastle Gateshead is illustrated in Figure 2.9. The A1 is not included, as it is part of the Strategic Road Network, managed by Highways England who will be accountable to address the exceedance levels on their networks.

Figure 2-9: Air Quality Management Area for Newcastle



It is not confirmed at this time what measures will be adopted to deal with the problem of air quality and NO2 emissions. A package of measures is being proposed , which includes charging some vehicles to enter the city centre of Newcastle, changes to some key junction of the A167 Central Motorway and a reduction in capacity on the Tyne Bridge. Whichever solution is put in place will impact on the travel demands from Northumberland, as the likelihood is that those journeys through Newcastle, Gateshead and North Tyneside for whatever trip purpose, will be affected.

The Northumberland Line will alleviate some of the road-based problems faced by other authorities forming the North of Tyne Combined Mayoral Authority. To reach many important commuting destinations, Newcastle city centre, Team Valley, and Washington may necessitate trips through the designated AQMA. These trips in the future could be more time-consuming and/or more costly, subject to the measures put in place to address the NO2 exceedance levels. This will further disadvantage car users from South East Northumberland.

2.3.7 Summary of Transport Challenges

Due to the size of Northumberland, and the fact it is predominantly rural in nature, it is not surprising that there are many transport challenges. The North of Tyne Combined Mayoral Authority has set out plans in the Devolution Deal to overcome some of these challenges with technology solutions, such as high speed 5G broadband connectivity for many across the area. However, there is also the realisation that better transport infrastructure has a major role to play, in particular, sustainable transport provision. The challenges identified are, as follows:

Car Ownership: Car ownership in Northumberland is forecast to increase, particularly in South East Northumberland. This has a number of potential implications including increasing highway congestion, impacting on journey times and the commercial viability of bus-based public transport across the South East Northumberland region.

Mode Share: Private motor car usage in Northumberland is higher than the national average. This could contribute to congestion and air quality. Public transport usage in Northumberland is lower than the national average. Congestion on the strategic road network has already led to objections from Highways England to proposed developments in South East Northumberland that would increase pressure on the strategic road network.

Commuter Trips: There is a significant outflow of commuters from Northumberland into Tyne and Wear. Congestion is already an issue on the strategic road network into Tyne and Wear and alternative modes of transport need to be provided to ensure the population of South East Northumberland can access key areas of employment by sustainable modes.

Links of Economic Importance: Links into Tyne and Wear, particularly Newcastle, are vital for the economic prosperity of Northumberland. However, the bus journey times are uncompetitive compared to car journeys.

Accessibility: Public transport options do not meet the needs of all residents of Northumberland. A lack of available services, long journey times and high public transport costs mean that public transport is not a viable option for many people.

Environmental Issues: Air quality is a major concern for two of the authorities forming the North of Tyne Combined Mayoral Authority. Collectively, there is a need to reduce harmful vehicles emissions. The mitigation measures put in place to address air quality, may impact on the current travel demands and mode choice to and from Northumberland.

Section 2.3 has identified that better public transport provision is required to resolve many of the socio-economic issues currently prevalent in South East Northumberland. Access to opportunities is vital to all residents, for jobs, retail and leisure. Without this, market failure is likely to continue. The impact of `Doing Nothing' is discussed in Section 2.4.

2.4 The Case for Intervention: Impact of the Doing Nothing

Section 2.3 demonstrated that there is a clear case for the scheme in terms of addressing the identified problems across South East Northumberland. More so, if national, regional and local policies are going to be realised, the economy of the North East is supported to enable growth, and the productivity gap between there and other parts of the country, especially the South East, is going to narrow.

There is evidence that the North East is making good progress since the recession. Since the launch of the Strategic Economic Plan by the North East LEP, there have been notable successes:

- Between 2014 and 2016, there has been an increase of 53,700 new jobs in the North East economy, against a target of 100,000 by 2024;
- 33,900 (63%) of these are `better jobs` set against a target of 60% of new jobs falling into this category. `Better' being defined as a job in the top 3 Standard Occupation Classifications (SOC) categories – managers, directors, senior officials, professionals and associate professional or technical occupations;

- Enterprise zone status in some areas have been agreed;
- The North East Investment Fund is supporting new and existing businesses, with £55m loans fully committed by January 2017; and
- At November 2016, three quarters of the £559.5M ERDF allocation was committed, the second highest rate in the country.

However, like the much publicised discrepancy between the economies of the North and South in the UK, Section 2.3 demonstrated that there are significant differences between the economies across a much smaller area. In Northumberland, there is a stark contrast between rural and urban areas, for example, in terms of income and accessibility to opportunities, leisure and service facilities. The contrast is most alarming between areas of high deprivation and very affluent areas across the wider North East LEP area. Without investment and intervention, this gap will inevitably grow, leaving the most unfortunate and disadvantaged in the area, vulnerable to all the chronic symptoms of deprivation.

The most notable areas for growth are the development on which construction is underway, jobs being created and further demand being stimulated. These include Science Central, Stephenson Quarter and East Pilgrim Street in Newcastle. At Cobalt in North Tyneside, a jobs fair in May 2018 advertised 1,000 jobs available on site. All encouraging news for the North East, but not so for those in South East Northumberland disadvantaged by public transport accessibility, congested roads leading there and few options other than car for realistic commute times to work.

2.4.1 Congestion

The main radial routes into Tyne and Wear are already known to be congested. On the strategic road network, the major junction at the A19/A189 Moor Farm experiences delay daily in the morning and afternoon peak periods, so much so, that Highways England recorded five objections to planning applications, which would further exacerbate the problems. The B1318 Great North Road, which is the key corridor from South East Northumberland into Newcastle, is also congested, which has a material impact on journey times and journey time reliability, particularly for buses. For economic growth, this cannot be allowed to continue.

Further congestion is experienced in certain locations in both Ashington and Blyth. The congestion issues already evident will be magnified in the future with car ownership and traffic levels forecast to grow. This is inevitable in the absence of suitable public transport availability. This will impact on the economic growth potential of the south east area, carbon emissions and the quality of life of the resident population. In the longer term, job creation and new housing within the localised areas of South East Northumberland will negate the need to commute to Newcastle and potentially relieve some of these issues, but until that time, if trends continue for commuting trips out of the area towards Newcastle, congestion will only worsen.

2.4.2 Bus Based Public Transport

If growth forecasts are correct, greater car ownership and worsening congestion will increase bus journey times. Inevitably, the reliability of bus services will also deteriorate. This will impact on accessibility to jobs and services, from a poor position currently. This may further compound the growth in car ownership, as bus users seek more reliable alternatives. At worst, bus operators could withdraw services which are not financially viable, putting further pressure on the public purse to pay for secured services to allow much needed services, for those not in a position to own a car.

Table 2.11 illustrates the decrease in bus patronage in Tyne and Wear over a number of years, which includes services between South East Northumberland and Tyne and Wear. Over the 8-year period to 2017/18, there has been a decrease in patronage of 16%. If this trend is to continue, without any alternative public transport provision, the overall percentage of trips by public transport will reduce.

Table 2-11: Bus Patronage Figures

Year	Passengers	Percentage Change Year on Yea	Change from 2009/2010
2009/10	142,885,240		
2010/11	141,237,000	-1.15%	-1.15%
2011/12	139,077,000	-1.53%	-2.67%
2012/13	139,576,178	0.36%	-2.32%
2013/14	134,976,857	-3.30%	-5.53%
2014/15	132,719,965	-1.67%	-7.11%
2015/16	128,393,008	-3.26%	-10.14%
2016/17	128,696,205	0.24%	-9.93%
2017/18	119,849,459	-6.87%	-16.12%

2.4.3 Potential Loss of Development/Growth/Jobs

For economies to be successful, it is essential that transport systems are in place to allow people to move easily, with good transport connections to link workers to businesses and businesses to other businesses. Transport is fundamental to achieve that. Without the scheme, it may prevent the area from realising the benefit of housing development across the county of 17,700 houses up to 2036 (forecast in the Housing and Economic Growth Options Findings Report, June 2018, as part of the Local Plan development). Construction work alone will suffer if house building is constrained, and, with that, GVA will remain behind other areas.

Blyth Estuary is identified as both a current and future important economic centre. The importance of Blyth to the energy coasts has recently been reinforced by the announcement that it had been successful in obtaining a decommissioning licence from the Environment Agency. This will see a 2.3ha site, scheduled to be ready for use in 2018, used to manage up to 50,000t of offshore energy materials a year, as the port aims to focus on small-to-medium sized projects. It is essential that congested transport connections between Blyth and the wider region do not hamper this exciting opportunity for new employment.

2.4.4 National, Regional and Local Government Expectations

Since the recession, great emphasis has been placed on economic recovery. Transport for the North, the North of Tyne Combined Mayoral Authority and the North East LEP, all have economic growth, prosperity and improved wellbeing for all at the heart of their agendas. Acknowledging the fact that these can only be achieved with good infrastructure, not delivering would be deemed a failure at all levels of governance.

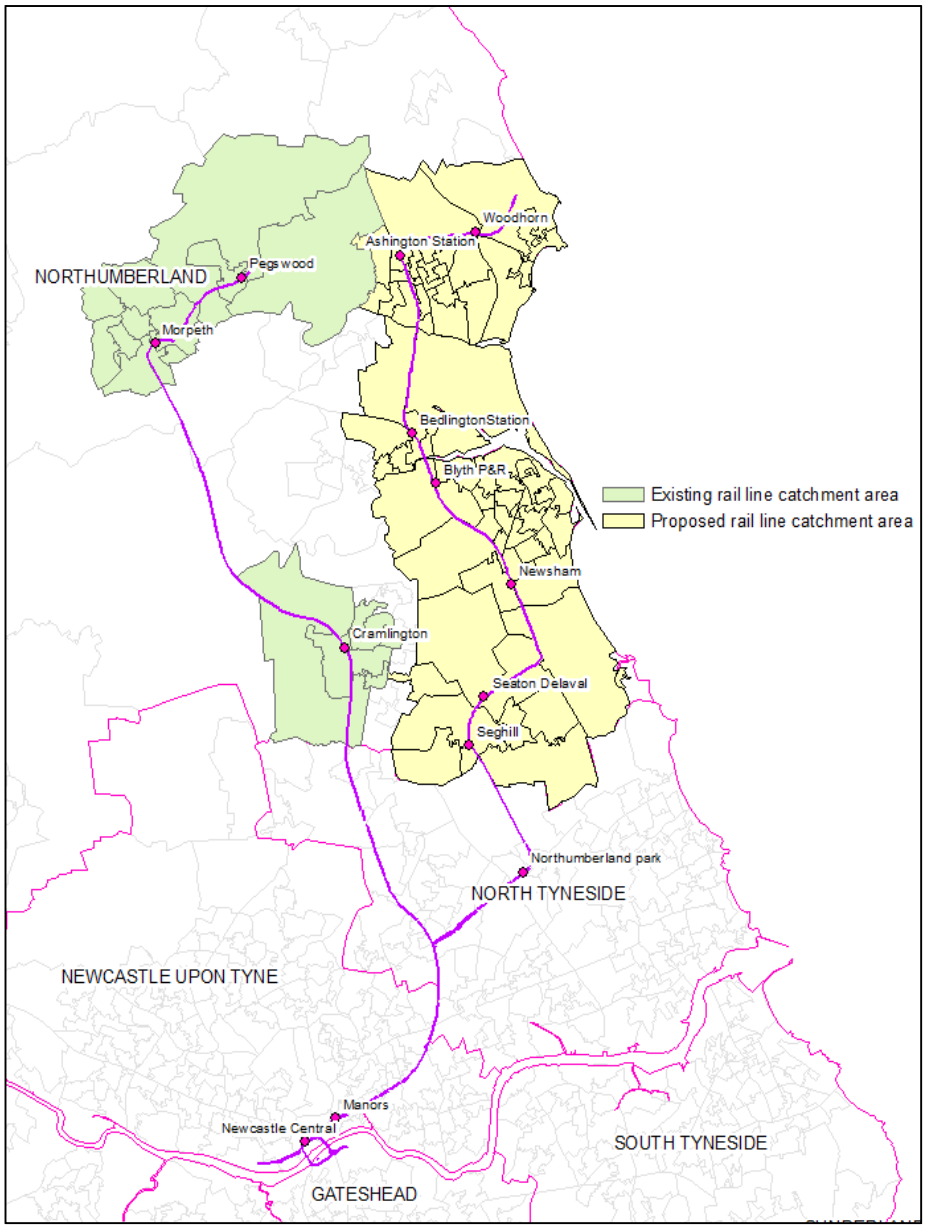
2.4.5 Quantifying the Impacts of Do Nothing

The consequence of `Do Nothing' is best revealed from a study in 2015 undertaken by Northumberland County Council to assess the wider benefits of reintroducing passenger rail services on the Northumberland Line. This study considered four main approaches:

- Economic profiling which highlights the need for the Northumberland Line;
- Estimating the GVA benefit;
- Estimating employment land allocation supported by the line; and
- Additional benefits.

A comparator area was used to assess the potential impacts of the Northumberland Line by comparing a similar area with a rail line to the proposed Northumberland Line catchment area, currently without a rail line. The comparator is the area served by the existing rail line from Newcastle to Pegswood. This area was chosen as it is nearby, has a comparable age profile, has a similar train timetable to one being considered for the Northumberland Line and will have similar access to jobs once the Northumberland Line is complete. Census 2011 data was used for comparison.

Figure 2-10: SE Northumberland Catchment Area: Northumberland Line and a Comparator Area



The catchment area of the Northumberland Line corridor has a population in excess of 90,000 people who experience a high level of social and economic exclusion. This can be seen in the level of education in the area as only 17% of the population hold a qualification of degree level or above, compared with 27% of the population of England. It also impacts the levels of employment with only 67% of those in the Northumberland Line catchment area in employment while 72% of those of working age in the comparator area are employed. Also, the jobs that are available tend to be lower skilled, compared to the 55% of those employed in the comparator area who work in administrative, professional or managerial jobs (occupation categories 1 to 4). These are deemed `better jobs' in the North East LEP Strategic Economic Plan.

Gross value added (GVA) was used to quantify the benefits of increased employment in the Northumberland Line catchment area. As the Northumberland Line will provide a similar level of access to jobs as the comparator area, it stands to reason that a similar level of employment in the Northumberland Line catchment area will be an impact of the scheme. This means a potential 2,873 more people could be brought into employment as a result of the Northumberland Line. Using the gross annual wage median of Northumberland of £25,190, the GVA would be in excess of £70 million. This is a conservative estimate as it does not include the additional value of pensions, national insurance or profits.

Doing nothing is not conceivably an option given the expectations for growth in the Industrial Strategy, which was launched to build on areas of expertise such as South East Northumberland. The new NoTCMA has the aim to improve the wellbeing of all residents in the area, and this can only be achieved with investment in people, jobs, skills and education, backed up by quality infrastructure.

2.5 The Case for Intervention: Drivers of Change

At a national level, there is a need to continue to stimulate economic growth by ensuring our transport infrastructure can move our people, goods and services efficiently and effectively. Business markets vary across the nation, with areas in the north requiring intervention to support business growth, enhance business routes to market and reduce the productivity gap. Although the North East LEP area economy has witnessed increasing GVA in recent years (it is a net exporter), it is recognised that lack of infrastructure capacity could hold back required economic growth. In Section 2.4, a conservative estimate of £70 million GVA has been calculated as loss to the local economy by not having the Northumberland Line. The North East needs to continue to capitalise on its export growth and inward investment. The provision of well-connected transport infrastructure, with accessible additional routes to market, will support this need and ensure that the UK and the region can continue to build on its global connections and enhance its productivity. A more localised requirement is for people to access employment opportunities in the first place to serve this economic growth. This is the purpose of the scheme.

Figure 2-11 illustrates established governance bodies that will manage and influence infrastructure investment. A myriad of strategy documents on a national and regional scale (either published or under development/consultation) are also illustrated. Some of those reported will be superceded and/or amalgamated by those under development, but remain valid until that time. These set the vision and objectives that the investment seeks to achieve. Delivering the Northumberland Line scheme, at a significant cost, will have to fulfil or contribute to many of the objectives set out in these strategies. Of importance now, is that these changes also afford opportunities to access funding to deliver against new political agendas. It has already been mentioned that the new approach for rail enhancements, the Rail Networks Enhancements Pipeline is a welcome introduction for Northumberland. The intention being to follow that guidance and seek appropriate approvals at the right time for the scheme to progress through to Deliver and Deploy stages.

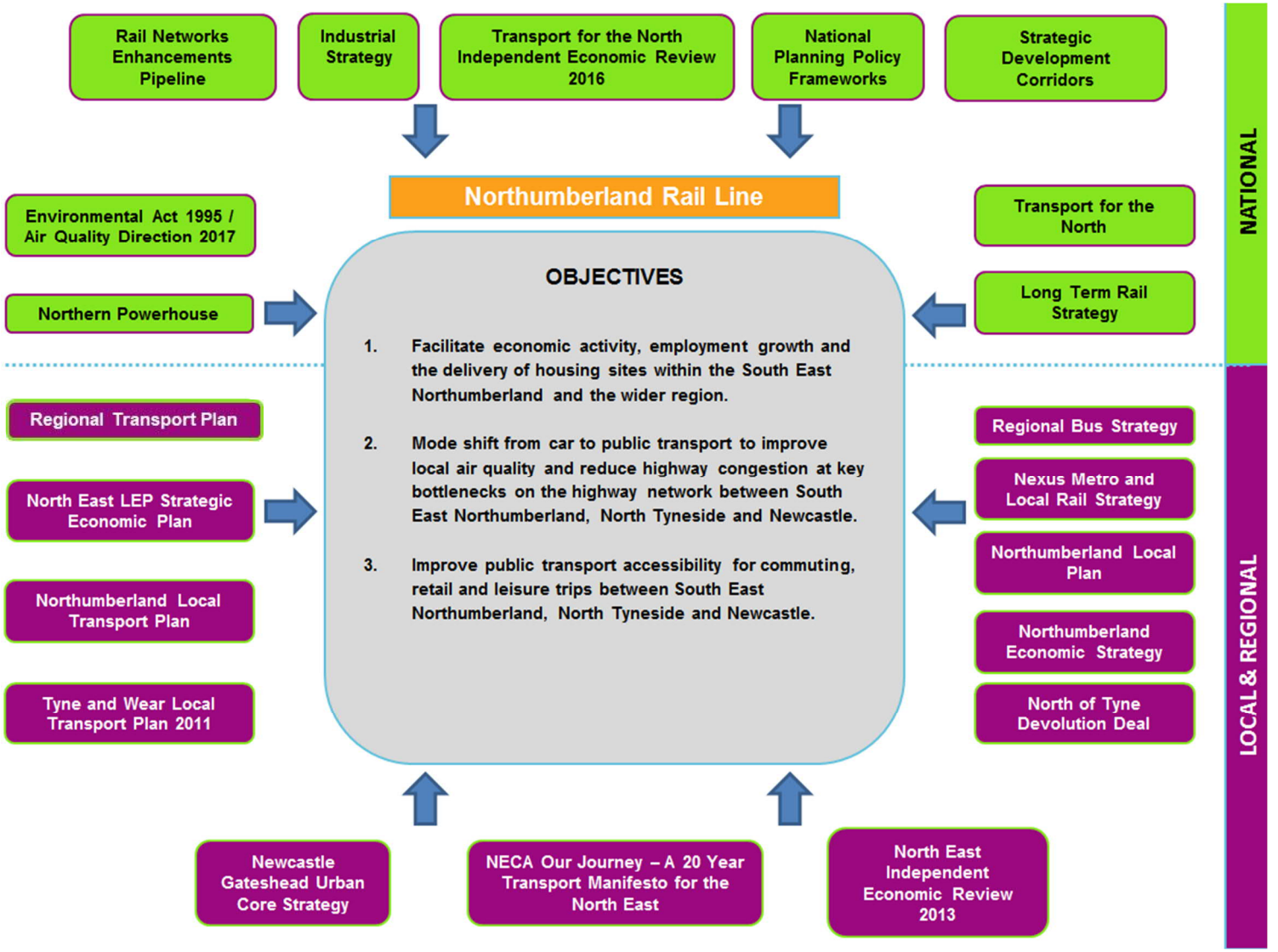
Section 2.2 demonstrates the rationale for the scheme, in essence removing barriers to enable the resident population of South East Northumberland to access current and future opportunities, predominantly in employment, but also for education, health, retail and leisure purposes. It also reported the more local opportunities in South East Northumberland needing better transport infrastructure to make them come forward, in the enterprise zones for example, seizing on the opportunities that the Blyth Estuary can bring, given its recognised role as an important site for renewable energy. The Northumberland Local Plan is not so much a driver for change, it sets out the strategic planning policies for the Council, and the general scale and distribution of new development needed to meet the needs of Northumberland to 2036. It enables the change to happen identifying where homes, workplaces and facilities will be located. Of course to realise these policies requires good transport infrastructure in place, people in the new housing development sites will need better access to opportunities outside of SE Northumberland.

The white paper on the Industrial Strategy for the UK presents a real opportunity for development in South East Northumberland. This was launched in November 2017 as the long term vision for Britain to build on its economic strengths, embrace technological change, whilst boosting the earning power across the UK.

In summary, the strategy sets out four Grand Challenges – global trends that could change the future and which the UK must embrace:

- Artificial Intelligence
- Clean growth
- Ageing society
- Future of mobility

Figure 2-11: Drivers for change



Each challenge is an open invitation to businesses, academia and civil society to work and engage with government to innovate, develop new technologies and seize upon these opportunities.

The white paper also focuses on five foundations for productivity: ideas, people, infrastructure, business environment and places, supported by policies and financial backing to deliver the agenda. This could mean the following for Northumberland:

Ideas: Establish the world's most innovative economy, with £725 million invested in new Industrial Strategy Challenge Fund programmes to capture value of innovation.

People: Establish a technical education system, with £406 million to invest in maths, digital and technical education to address shortages in STEM skills – science, technology, engineering and maths. Create a new national retraining scheme to re-skill people, beginning with £64 million for investment for digital and construction training.

Infrastructure: A further £31 billion National Productivity Investment Fund, supporting investments in transport, housing and digital infrastructure

Business Environment: Roll out of sector deals – partnership between government and industry, the first in areas of life sciences, construction, artificial intelligence and the automotive sector. A £2.5 billion investment fund set up in the British Business Bank for innovative and high potential businesses. Launch a review of actions most effective in improving productivity and growth in SMEs.

Places: Agree local industrial strategies that build on local strengths and deliver economic opportunities. Create a transforming cities fund providing £1.7 billion for intra-city transport – investment to improve connections within city regions.

Setting aside the opportunity for South East Northumberland in many of these future growth sectors, within Tyne and Wear, there are already clusters of excellence already outlined in earlier sections. The challenge is improving access to these opportunities, where poor transport provision exists. It is encouraging that the Industrial Strategy recognises the need for transport infrastructure to link people to jobs, and goods and services to the market place.

The Government recognises that good infrastructure is essential to growth, with estimates that over £250 billion of investment is needed to upgrade the UK's key infrastructure. Infrastructure investment is a key economic driver, providing a multiplier effect for the economy and helps to attract and retain business and jobs. Reliable and accessible transport networks are critical factors for the success of UK companies and the economic health of the UK economy. The Confederation of British Industry's (CBI) Infrastructure Survey "Connect More" (2013) illustrates the business demand and need for effective infrastructure investment.

The Local Growth White Paper 2010 and the Heseltine Review of economic growth 2012 'No Stone Unturned' led to a significant shift in regional governance arrangements, establishing Local Enterprise Partnerships, to support local growth, encourage business investment and promote economic development. The Local Enterprise Partnerships Strategic Economic Plans were refreshed in 2017, they maintain and focus priorities to maximise growth. To support this agenda for growth, the UK government announced 39 Growth Deals across England in 2014. The North East Growth Deal detailed an allocation of £289.3 million to the North East Local Enterprise Partnership (NORTH EAST LEP) which was subsequently expanded by an additional £40.6 million announced by Government in January 2015. The Single Local Growth Fund (LGF) is seeing £329.9 million invested in the North East economy, removing barriers to growth is well underway with around £95 million of this for transport improvements.

The North East LEPs Strategic Economic Plan 2017 was unchanged since the first draft in 2014 in its support for infrastructure requirements and it remains a key driver for change in the North East. The reopening of the Northumberland Line to passenger services remains a priority for the North East LEP.

The scheme is aligned to central government transport policy and supports each of the five DfT Transport Goals as shown in Table 2.12.

Table 2-12: Strategic Alignment of Scheme to DfT Transport Goals

Objective	Scheme Alignment and Rationale
Economic Growth: To support national economic competitiveness and growth by delivering reliable and efficient transport networks	Reopening the Northumberland Line to passenger services will improve access to jobs in South East Northumberland and the rest of the North East, as well as making development land in Northumberland attractive to inwards investment. The Northumberland Line will connect to the national rail network improving the connections between South East Northumberland and the rest of the country.
Reducing Carbon: To reduce transport emissions of carbon dioxide and other greenhouse gases with the desired outcome of tackling climate change.	The reopening of the Northumberland Line to passenger services will enable a mode shift from car to rail. This will lead to reduced congestion on the highway network and a reduction in carbon emissions.
Safer and Healthier Travel: To contribute to better safety, security and health and longer life expectancy by reducing the risk of death of injury, or illness arising from transport by promoting travel modes that are beneficial to health	The reopening of the Northumberland Line to passenger services will be developed alongside a comprehensive network of pedestrian and cycle routes to encourage sustainable access to stations. These routes will be considered within the development of a Local Walking and Cycling Programme (LCWIP) for Northumberland. A reduction in vehicles on the road, caused by a mode shift from road to rail, will result in fewer accidents on the road network. Modal shift to rail will reduce NO2 traffic emissions, which are harmful to health, and a key priority of two authorities north of the Tyne (Newcastle and North Tyneside)
Equality of Opportunity: To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society.	The reopening of the Northumberland Line to passenger services will improve accessibility within South East Northumberland and to neighbouring Tyne and Wear where significant growth opportunities in jobs exist, more so with the launch of the **Industrial Strategy** . This will provide additional opportunities for all residents including access to higher education facilities, access to specialist education facilities and access to leisure and tourism facilities.
Quality of life: To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment.	Quality of life will be improved through greater opportunity and a more sustainable local environment, reduced carbon and NOx emissions.

The alignment of the scheme against some of the key documents that impact the region is outlined in the text below.

2.5.1 Transport for the North – Long Term Rail Strategy (LTRS)

This strategy sets out Transport for the North's (TfN) vision for the transformation of the North of England's railway, for the period up to 2050. It sets the context for rail schemes such as the Northumberland Line and the role that they will play in supporting the development of key strategic schemes such as Northern Powerhouse Rail. The strategy outlines how the network should be improved to realise its potential to support and facilitate a growing and more vibrant economy, whilst enhancing the quality of life for those in the North. The strategy sets conditional outputs and associated with these, a set of desirable minimum standards, setting the tone for the next 30 years. This LTRS supports the vision of Transport for the North's Strategic Transport Plan, which is for:

"A thriving North of England, where modern transport connections drive economic growth and support an excellent quality of life".

This vision and the strategy itself very much complement the SMART objectives set for the scheme (Section 2.6). The LTRS clearly acknowledges that rail has an important role to play in achieving the vision. It is felt that a high-quality railway network will be an enabler of higher productivity and economic growth throughout the North of England, providing a community resource which supports the natural and built environment, delivers an improved quality of life, allowing places/communities to prosper.

The conditional output statements to achieve the vision are intended to deliver:

- A step change in connectivity;
- Provision of capacity within the infrastructure and train services to cater for growth;
- A rail network which customers will find easy to access and use;
- A railway which supports the communities it serves; and
- Enhanced cost-effectiveness of running the railway.

Of particular relevance are the 'Desirable Minimum Standards' that have been developed by TfN alongside their partners and relevant stakeholders and which form the starting point when developing interventions aimed at delivering the conditional outputs. The two of most relevance are replicated below:

- All passenger routes to be served by a minimum two trains per hour; and
- Local and suburban services to achieve average journey speeds of at least 40mph.

This rail strategy is a welcome introduction for Northumberland County Council which will hopefully provide the impetus and rationale that the scheme needs as it develops through the approval stages.

2.5.2 Transport for the North – Strategic Development Corridors

TfN has recently published a multi-modal, long-term Strategic Transport Plan for the North of England. The objective is to connect the key economic areas of the North to drive growth, improve access to jobs and ensure the North is a great place to invest and live. The Plan aims to inform how the Government, Network Rail, Highways England and HS2 Ltd work with TfN to deliver investment in transport infrastructure.

Seven broad corridors of opportunity have been identified. Each corridor represents an area where evidence suggests investment in transport infrastructure will enable transformational economic growth. The proposals for improvements in the Strategic Development Corridors will consider the needs of people and business and align with local transport investment.

'Connecting the Energy Coasts' is one such corridor aimed at***: Improving connectivity between some of the UK's important non-carbon energy advanced manufacturing, research assets, and economic centres in Cumbria, Lancashire, North Yorkshire, the North East and Tees valley.***

This is particularly pertinent to the industries evolving around the Blyth Estuary and Energy Central. The aim for this corridor is to better connect people and goods between energy and research assets along the North West and North East coastlines and the national road and rail networks, to provide a more resilient East-West route across the North of England. In policy terms, the strategic development corridors support all of the more local policy documents summarised elsewhere in this strategic case.

2.5.3 North East Strategic Economic Plan (SEP)

The North East SEP remains central to the North East agenda for growth, even after significant changes around governance, with the establishment of the North of Tyne Combined Mayoral Authority.

The North East SEP has a vision to create a globally competitive economy with more and better jobs. By 2024, the NELEP intends to halve the gap between the North East and the national average (excluding London) across five key indicators:

- gross value added (GVA) per full time equivalent (FTE);
- private sector employment density;
- business density;
- employment rate; and
- unemployment rate.

In order to achieve sustained and structured economic growth, the region must provide over 1 million jobs by 2024, representing 100,000 new jobs or an 11% increase from 2014 in order to close the gap with the rest of country. The SEP has six key strategic themes:

- Innovation;
- Business Support and Access to Finance;
- Skills;
- Inclusion;
- Economic Assets and Infrastructure; and
- Transport and Digital Connectivity.

The latter two strategic themes illustrate that the region fully understands the need to develop its place for business to invest and harness the opportunities within the North East. Improving connectivity, in turn, facilitates economic growth, enabling people and goods to reach their destination efficiently and effectively.

There is compelling evidence that transport investment will have the maximum impact on productivity, job creation and GVA where it improves the area's strategic connectivity, facilitates visitors, provides reliable access to markets and improves access to all parts of the area and to the priority locations for economic growth.

The SEP stresses the importance of strategic transport investments in areas, which provide quick and reliable links in order to assist trading and export to external markets by road, rail, air and sea. It also stresses the issue of investing in infrastructure that ensures urban centres maximise their potential and allow everyone to participate in the benefits of economic gains.

The alignment of the scheme against the key criteria of the North East Strategic Economic Plan is outlined in Table 2.13 below.

Table 2-13: Local Alignment of Scheme to the NE SEP

North East LEP Strategic Economic Plan Criteria	Scheme Alignment and Rationale
Contribution of the scheme to the creation of new jobs and retention of existing jobs in the North East LEP area	The principle aim of the scheme is to improve accessibility between South East Northumberland and Tyne and Wear to increase job opportunities. South East Northumberland is positioned adjacent to Tyne and Wear and due to a lack of jobs in the local area, many inhabitants commute into Tyne and Wear for work purposes. Despite the strong linkages between the two areas, the public transport network is limited with a small passenger rail network, serving Cramlington and Morpeth only, and time consuming bus journeys. The cost of public transport between SEN and Tyne and Wear is also an issue with high public transport costs restricting access. In addition to problems with public transport provision, the highway network is exhibiting areas of peak hour stress on the approaches into Tyne and Wear. The North East LEP vision for growth recognises the need for suitable employment land if the economic growth aspired is to be achieved. Previous regional spatial strategies have tended to suggest that much of this growth will be focused on Tyne and Wear with an emphasis on developing offices and knowledge based industries in the city centres and using out of town locations, with good public transport and road connections, for manufacturing and logistics developments. This suggests that whilst South East Northumberland will be a focus of increased housing provision, many of the new jobs created in the Region will be located in Tyne and Wear. The proximity of the residential areas within South East Northumberland to the new employment opportunities in Tyne and Wear is such that there will be opportunity for residents to take

North East LEP Strategic Economic Plan Criteria	Scheme Alignment and Rationale
	advantage of the additional job prospects. This being the case, it is therefore essential that transport provision between these two areas is improved. That said, the County and its partners are fully committed to developing employment sites within SE Northumberland.
Support of the scheme to the North East LEP area gateways	The scheme will have a direct impact on accessibility to and from the Port of Blyth and the co-located Enterprise zone, for both employees and freight. Blyth port is a long-established facility and a modern Trust Port located in the South East of the County, handling up to 1.5m tonnes of cargo each year and offering a first class handling, storage and distribution service. It is recognised as a key NELEP area gateway whose main trades include unitised cargo (containers & RoRo), bulks including coal, project cargo such as wind turbines, forest products, metals and a wide range of other commodities. There is also onsite warehousing provided for shipping and non-shipping related use. In addition there are regular liner connections that exist to a variety of ports and the port's logistics subsidiary Transped Ltd provide a worldwide logistics service. In proximity (and co-located) to the port and close to NaREC, there is a substantial portfolio of strategic Enterprise Zone sites. The land carry's the benefit of Enterprise Zone tax incentives; transport links (mainly by road) and is suitable for a wide range of service and manufacturing developments. It should be noted that the emerging scheme builds on existing freight lines and has modelled an allowance for hourly freight service from the port that will provide a direct link to the main rail network. There is on-going dialogue with the Port Authority to ensure these assumptions remain relevant.
Encouragement of the scheme to the development or retention of skilled jobs (NVQ level 4 and above) and the support to sites that deliver the training for such skills	The scheme provides improved access to economic development sites situated in the area, who offer skilled jobs (NVQ Level 4 and above) and access to training which will provide that level of skills. At present the Northumberland Adult Learning Service offer training at NVQ level 4 in Business and Administration, and level 5 in Leadership for Health and Social Care and Children and Young People's Services. NVQ's are mainly delivered on employers' premises but off the job training takes place in Ashington and Blyth, both of which will be provided with stations on the proposed passenger line.
Provision of sustainable access solutions to existing and growing development corridors, centres and sectors,	The scheme will provide sustainable access to a number of existing and growing sectors and sites in the area as summarised below: • Low carbon/renewable energy sector: The scheme will improve access to the Blyth Estuary Renewable Energy Zone (BEREZ) which is a strategic employment area for low carbon industries located around the River Blyth Estuary. The local development company, Advance Northumberland, intends to complete a significant industrial/commercial project in this area. • Town Centres: The rail line serves the main towns of Blyth, Bedlington and Ashington, which are identified in the Local Plan as the focus for growth in South East Northumberland. Seaton Delaval and Newbiggin are identified as key local service centres, with land allocated for new housing. Of key significance is the Ashington North East Quarter proposal which is a £74 million proposed redevelopment, delivered by Advance Northumberland over a ten year period, to bring over 1,000 higher quality jobs to

North East LEP Strategic Economic Plan Criteria	Scheme Alignment and Rationale
	the heart of Ashington and transform the town centre's physical environment. • Housing growth: The Local Plan is forecasting 17,700 houses to be delivered in Northumberland in the 20 year period 2016-2036, some of which are identified in land allocations for housing sites that would strongly benefit from the ABT rail line. The rail services will make some sites more attractive opportunities for developers, and may accelerate house building in the earlier years of the Plan.
Ensure capacity and speed of transport links to and within the North East LEP area are maintained and enhanced.	The scheme will increase the capacity of the transport network and provide alternative options to car trips. A transfer of trips from the strategic road network onto the new rail service will help towards alleviating congestion on the key approaches into Tyne and Wear which is restricting the economic growth potential of the North East. Reopening of the Northumberland Line to passenger services also offers the opportunity to make improvements to the existing railway line such as signalling and line speed improvements. This line is an important freight link for Northumberland and any improvements made to the infrastructure as part of the scheme construction will benefit all users.
Improved accessibility from residential areas to areas that have employment, education or other opportunities	The principle aim of the scheme is to improve accessibility between South East Northumberland and Tyne and Wear to increase the opportunities available to residents of South East Northumberland. The scheme will undoubtedly provide better access between South East Northumberland and Tyne and Wear by providing an alternative mode of transport to bus and the private car. This is important given that employment opportunities are more limited in South East Northumberland than Tyne and Wear since the closure of the mining and shipbuilding industries in the 1980's and 90's. As well as allowing job seekers to physically access employment on Tyneside, the scheme will also allow employers access to a larger labour pool and skills base, with much reduced journey times by public transport. As well as employment opportunities, Tyne and Wear offers some of the best universities, colleges and other higher education institutions in the UK. It is clear that the scheme will provide viable and speedy access for students who reside in South East Northumberland, opening up a larger number of educational opportunities. Other facilities in Tyne and Wear, such as leisure, retail and healthcare facilities will also be easier to access. Residents of Tyne and Wear will also have easier access to facilities in South East Northumberland. This is particularly important when considering the tourism facilities which the Northumberland area has to offer.
Improvement in the overall quality of journeys, particularly those providing links to employment and health or education opportunities	The introduction of a new rail line would give residents of South East Northumberland more choice in the transport modes which they use. Quality of journey will be improved through reduced and more reliable journey times. By providing more options to the private motor car, residents of South East Northumberland will be able to adopt modes of transport which prove less stressful and, in the case of public transport, allow better use to be made of the time spent travelling. The scheme will provide faster journeys between South East Northumberland and Tyne and Wear. This includes Newcastle, which is the regional capital of the North East, as well as a number of the main employment and retail sites in the region. The service

North East LEP Strategic Economic Plan Criteria	Scheme Alignment and Rationale
	will provide seamless interchange with the metro system to allow easier of travel throughout all of Tyne and Wear. As well as local journeys the new rail line would also provide an improved access to the national rail network at Newcastle Central.
Improvement in the local environment including improvements in local air quality or reduction in the noise impacts of transport corridors	The proposed scheme will see a transfer of trips from car to the rail network. This will reduce CO2 and NOx emission in the area which will have a positive impact of air quality. Not only will this help in combating climate change, it will also contribute to improvements in people's health, well-being and quality of life. It is a new priority for government which needs to be addressed by authorities in the North of Tyne Combined Mayoral Authority.
Contribution to an overall reduction in carbon emissions relative to the existing situation	The proposed scheme will see a transfer of trips from car to the rail network. This will reduce CO2 emission in the area which will have a positive impact of air quality. Not only will this help in combating climate change, it will also contribute to improvements in people's health and well-being and quality of life.
Improvements to health, reduction in levels of obesity and improvements in road safety within the area	Increased levels of walking and cycling as part of the daily routine can have significant benefits for a person's health. As part of the Network Rail GRIP process the railway stock and station facilities will be designed such that they encourage access to stations through sustainable modes. As part of the scheme construction, active travel routes to stations will also be reviewed to ensure they are of the highest possible standard. As part of the economic case, the economic benefits of the scheme have been calculated. The results show a reduction in the cost of accidents as a result of the scheme. The reduction in accidents is attributable to the reduction in car km travelled as people transfer from the highway to the public transport network.

Notable achievements have been made since the first SEP in 2014, including:

- 53,700 new jobs created;
- 63% of the new jobs are `better jobs' defined as managers, directors, senior officials, professionals etc;
- New Enterprise Zone launched in April 2017;
- £55m loans committed from the North East Investment Fund;
- Three quarters of the European Structural and Investment Funds committed; and
- £57M secured and allocated against 23 transport projects.

The revised SEP in January 2017 highlights many of the growth sectors. These are aligned with the national priorities in the Industrial Strategy, which puts the North East in a strong position to drive economic growth and prosperity. Areas for future growth where good progress has been made to date include:

- Software and technology;
- Automotive manufacturing;
- Health and life sciences;
- Energy: subsea, offshore and technology; and
- Service economy – financial technology, banking, insurance, funding management, legal and accounting services.

The driver for the scheme is to ensure these and new opportunities are available to all, not just those with good existing transport accessibility.

2.5.4 Nexus Metro and Local Rail Strategy

A new Metro and Local Rail Strategy was developed to cover the geography of the North East Combined Authority (NECA) area, the integration of local rail and Metro services, and the potential to exploit under-used and disused railway assets and alignments across the region. This strategy builds on earlier work that looked at the Metro network in isolation. Through closer integration with the regional rail network and empowered by the progressive devolution of authority over local rail services, Metro and local rail will deliver a comprehensive network to improve the local economy, environment and society by making rail the travel mode of choice across a wider area of the conurbation. It is in this context that the Northumberland Line sits, delivering against this more localised strategy focus, whilst supporting the larger scale geographical coverage and needs of Transport for the North.

This strategy outlines plans to enable Metro and local rail to further develop the economy of the NECA area by providing reliable, sustainable transport for people to use to get to work, education, healthcare and leisure facilities. By providing centre-to-centre links avoiding highway congestion, the network will help to redefine the mental map of the region and encourage wider journey to work patterns and travel horizons. This approach has proven successful on networks such as London Overground where the emergence of a prominent, unified network has increased awareness of travel opportunities and helped to increase passenger numbers. Linking Metro, rail and bus interchange opportunities will better meet the needs of the NECA and the local population.

The vision for the strategy is:

"An integrated, modern and sustainable Metro and local rail network for the NECA region that supports the local economy, environment and society"

2.5.5 The Local Transport Plan

The Local Transport Plan 3 (LTP3) for Northumberland was written by Northumberland County Council officers in 2010. A Regional Transport Plan is currently under development following the broad vision set out in the NECA One Journey, a 20 year transport manifesto for the North East. The governance changes recently will still enable the North of Tyne Combined Mayoral Authority to help develop and advise the regional transport strategy, ensuring it is fit for purpose for the agenda of the newly formed combined authority.

Table 2.14 below outlines the five primary objectives contained in the existing LTP3, along with a description of how this scheme will contribute to delivering each of them. Although the plan is dated now, the objectives are still at the core of transport development within the authority.

Table 2-14: Local Transport Plan Objectives

Objective	Contribution the scheme makes to LTP objectives
To support Northumberland's economic competitiveness and sustainable growth by delivering reliable, resilient and efficient transport networks	Reopening of the Northumberland Line to passenger services will reduce congestion on the key approaches into Tyne and Wear. This will result in a more efficient and reliable highway network. The scheme will also enable improved access into Tyne and Wear, and within Northumberland, for goods, residents and visitors, and therefore provide a boost to the economic development of the area.
To minimise the environmental impact of transport by reducing carbon emissions and addressing the challenge of climate change	Creating a modal shift from highway to rail will lead to reduced carbon emissions in the South East Northumberland area and on the key approaches into Tyne and Wear.
To promote greater equality of opportunity by improving peoples' access to services and facilities	The reopening of the Northumberland Line to passenger services will improve accessibility within South East Northumberland and to neighbouring Tyne and Wear. This will provide additional opportunities for all residents including access to more employment opportunities, access to higher education facilities, access to specialist education facilities and access to leisure and tourism facilities.

To improve transport safety and security and promote and enable healthier travel	The reopening of the Northumberland Line to passenger services will be developed alongside a comprehensive network of pedestrian and cycle routes to encourage sustainable access to stations. A reduction in vehicles on the road, caused by a mode shift from road to rail, will result in fewer accidents on the road network.
To ensure that transport helps to improve quality of life for residents, employers and visitors, and protects and enhances the local environment	Upgrades to the junction will provide a less congested, more efficient route along the corridor. Subsequently, air quality will improve giving rise to increased public health. The associated economic benefits of the scheme are also advantageous to both individuals and the area.

2.5.6 Northumberland County Council - Economic Strategy

NCC's economic strategy sets out two priorities for transport:

- Ensuring that Northumberland is well connected into the regional economy, with the best possible intra-regional connectivity and external connections via national and international road, rail and air routes;
- Improving transport and infrastructure within Northumberland and the Region.

The economic strategy cites the reopening of the Northumberland Line to passenger services as a core project within Northumberland due to the catalytic effects it could have for other development. A strategic growth corridor is being promoted alongside the Northumberland Line and significant investment and regeneration is ongoing in Ashington town centre. The strategy also recognises that the scheme will provide improved access to Tyne and Wear, which will allow local residents to access additional opportunities.

The need to enhance economic growth in Northumberland, and provide improved connectivity to opportunities in neighbouring areas, is further emphasised when considering the proposals set out in the Northumberland Local Plan. The Plan sets out the strategic planning policies for the County and makes provision for 17,700+ new homes in Northumberland between 2016 and 2036. The strategy acknowledges that the provision of new transport infrastructure will be essential to achieving these growth aspirations.

2.5.7 North of Tyne Devolution Deal

In forming the new combined authority, three challenges were identified:

- Consistently higher unemployment than the national average;
- Lower productivity than the national average; and
- Social inequality with pockets of deprivation and a lack of job opportunities in some areas.

The real driver for change is that the deal gives the combined authority the chance to make its own decisions about the future, thereby enabling it to target investment where it is needed most. The aim is to make the connection between strong economic growth and providing people with skills, education and confidence to benefit from those opportunities.

The deal includes:

- A new directly elected Mayor to give a strong voice for the area;
- £600 million guaranteed to invest in the North of Tyne;
- Projects to improve education, skills and to help people get into work;
- Control of £23 million per year budget for adult education;
- Powers to develop land for economic growth and regeneration;
- Projects that increase the growth and productivity of rural communities;
- Working better with Government to boost trade and investment; and
- Projects to grow the digital sector and low-carbon economy.

Plans to speed up housing growth in the North of Tyne were discussed at a key meeting in July 2018. Accelerating the speed of house building in the area was just one of the things discussed when the North of Tyne Housing and Land Board met for the first time in Newcastle. The board comprises senior figures from the world of housing and will oversee housing for the North of Tyne Combined Mayoral Authority and help the three-member councils deliver their Local Plans, each with an agreed number of new homes, in a shorter timescale.

The investment and new powers are expected to generate £1.1 billion for the local economy, create 10,000 new jobs and leverage £2.1 billion in private sector investment.

2.5.8 Northumberland Local Plan

The Local Plan set out policies to provide the needs for Northumberland for a 20 year period through to 2036. Table 2.15 reports the strategic objectives for Northumberland. To achieve many, if not all, of these objectives, requires good infrastructure. The Local Plan is more of an enabler for change to happen, rather than a driver, although proposed schemes must fit into and deliver the policies of the Plan. This OBC demonstrates the need for economic growth and new homes and certainly better connections to opportunities. The Northumberland Line scheme will make a big contribution to delivering many of the policies in the Plan.

Table 2-15: Strategic Objectives in Northumberland

Topic	Objective
Economy and Jobs	To grow and diversify the Northumberland economy by making it an attractive and competitive place to start, grow and invest in a broad range of businesses, attracting more and better jobs and attracting and retaining working age people. To drive improvements in education, training and skills to enhance the employability of Northumberland residents.
Homes	To extend housing choice across Northumberland by delivering homes for existing and future communities, and, support the Northumberland economy. To provide well designed, and affordable homes, and housing to meet the diverse needs of Northumberland's population.
Environment	To conserve and enhance Northumberland's distinctive and valued natural, historic, water and built environments, ensuring that these assets continued to be experienced and valued by residents of and visitors to the County and protected from inappropriate development.
Connections	To improve connectivity and movement utilising existing infrastructure and securing the delivery of new and necessary infrastructure upgrades in order to meet the changing needs of people and places.
Community Health & Wellbeing	To support sustainable communities across Northumberland; working to improve the quality of service and facilities to support physical and mental health, social and cultural wellbeing for all including responding to the needs and opportunities created by Northumberland's population.
Climate Change	To ensure the delivery of sustainable development which mitigates climate change, whilst acknowledging and anticipating the likely impact of a changing climate Northumberland and adapting to its effects.
Resources	To manage the prudent use of Northumberland's natural resources, including minerals, energy, land, existing built fabric and water, while producing less waste and minimising adverse impacts on communities and the environment.
Quality of Place	To ensure the high quality design of buildings and spaces in order to create attractive, inclusive places which will instil a sense of civic pride and enrich, rather than harm the diverse character of Northumberland.

The drivers for change as foundations for economic growth and prosperity are in place, as outlined above. Schemes such as the Northumberland Line will enable the vision to become a reality. The scheme should act as the catalyst for new jobs, reducing worklessness, improving the quality of life for those in areas of high deprivation. The objectives in Section 2.6 set out the aims of the scheme.

2.6 Objectives

Three SMART objectives have been identified for the scheme. The basis for the development of these is the economic, social and transport problems reported earlier in this chapter. Achieving these objectives will not only address many of the problems within the South East Northumberland Delivery Area, but also similar problems experienced in neighbouring authorities. The scheme supports the delivery of many strategic objectives articulated in Section 2.5 - Drivers for Change.

There is new impetus as a result of the changing governance arrangements for the North East, especially with the newly formed North of Tyne Combined Mayoral Authority. This new vision and dynamism in the North of Tyne, backed by long term funding and new powers for housing and economic development, set the tone for the much needed scheme. The objectives support this vision, moreover if they are realised, they will deliver significant secondary benefits for the wider North East LEP area, which is one of the key reasons it has been identified as a priority scheme in the Strategic Economic Plan.

Objective 1: Facilitate economic activity, employment growth and the delivery of housing sites within South East Northumberland and the wider region.

- **Specific** – This objective relates to the delivery of a more fit-for-purpose, better connected more attractive and more sustainable transport service that enables residents to access job opportunities.
- **Measureable** - Increase the number of new businesses in the area. Grow the employment opportunities and average wages, especially in the high growth sectors. Increase the number of people paying council tax from new growth in housing stock. Increase the land value of development sites in Northumberland.
- **Achievable** - Requires investment in transport infrastructure that supports increased access to sites, improved network connectivity and reduced journey times. This supports economic business investment and site acquisitions and development.
- **Realistic** - The objective accords with the NORTH EAST LEP SEP 2017, the Northumberland Local Plan, Newcastle Gateshead Core Strategy and the North of Tyne Devolution Deal.
- **Time bound** - A monitoring and evaluation plan will be derived to review success on some of these longer term outcomes.
- **Rationale**: - The Northumberland Line scheme will increase the attractiveness for developers of the areas it serves for economic development, the creation of new jobs and the take up of land identified for housing. This will help alleviate market failure in development sites for investment and jobs not coming forward and reduce new start up business closures. Designated Enterprise Zones and Accelerated Development Areas were established to stimulate inward investment in the area and create centres of excellence in some industries where tradition strengths reside in the North East. This objective will support the delivery of these sites.

Objective 2: Create mode shift from car to public transport to improve local air quality and reduce highway congestion at key bottlenecks on the highway network between South East Northumberland, North Tyneside and Newcastle

- **Specific:** – This objective refers to the reduced trips on the local and strategic road network, those trips that are forecast to transfer to rail. Journey times will become quicker and more reliable for all road users and emissions from vehicles will reduce.
- **Measurable:** – Journey times and reliability can be easily measured for all modes of transport on the highway network. Air quality levels can be monitored.
- **Achievable:** - Requires the investment in the rail scheme, with additional supplementary highway network investment to remove bottlenecks at key junctions.
- **Realistic: -.** The North of Tyne Combined Mayoral Authority is committed to infrastructure investment, with new powers to support and invest in economic growth.
- **Time bound:** – The objective will be monitored annually on completion of the scheme

- **Rationale: -** The Northumberland Line scheme will enable modal switch from car, reducing emissions from private vehicles and removing congesting on the main radial routes into and out of the urban towns and city centre. Highway improvements for accessing employment sites will further strengthen this objective. Highways England have already raised objections to five developments that put increased demand on the Moor Farm junction which is already at capacity and forms a major bottleneck on the strategic road network.

Objective 3: Improve public transport accessibility for commuting, retail and leisure trips between South East Northumberland, North Tyneside and Newcastle

- **Specific: –** This objective relates to the current poor bus based public transport provision in comparison to car based journeys. The rail based passenger service will become the mode of choice for many trips, improving journey times to key destinations.
- **Measurable:** - Rail and bus passenger transport times to key destinations can be easily measured and monitored. Mode share for public transport can be recorded.
- **Achievable:** - Requires investment in the rail scheme. The level of passenger service provision should be sufficient to encourage the modal switch to rail, in addition to relieving highway congestion and enable quicker and more reliable bus based trips.
- **Realistic:** - The North of Tyne Combined Mayoral Authority is committed to infrastructure investment. Highways England is also investing in schemes to improve trips on the strategic road network, which will benefit bus journeys.
- **Time bound:** – The scheme will have an immediate effect on opening. Monitoring and evaluation will be undertaken annually.
- **Rationale: -** The Northumberland Line scheme will be able to compete with car trips for journey times and reliability. Current forecasts for increased car ownership will place increased congestion on the few classified roads serving South East Northumberland, North Tyneside and Newcastle. This will increase the attractiveness for rail based services as opposed to bus, which is also impacted by congestion on the road network. Many residents of South East Northumberland do not have access to a car and will benefit greatly from this scheme.

2.7 Development of Potential Interventions and Initial Sift

The case for intervention has been developed over a number of years and many options have been considered to improve transport connections to/from the South East Northumberland corridor5. These options have covered a wide range of modes, timescales and costs. The most recent study was undertaken in 2012, when a long list of options was developed. In total, 46 possible interventions were identified covering eight categories as shown in Table 2.16.

Table 2-16 Scheme Options by Intervention Category

Intervention Category	Number of Interventions
Highway Capacity	4
Highway Management	2
Public Transport	19
Park and Ride	3
Parking Strategy	4
Smarter Choices	7
Walking and Cycling	5
Additional/Other	2

[5] South East Northumberland Public Transport Corridor Study, AECOM, 2012

A full list of interventions is included in South East Northumberland Public Transport Corridor Study, which can be found in Appendix A.

The scheme options listed were appraised using the DfT's Early Assessment Sifting Tool (EAST), alongside the study specific objectives, to identify options for further study. Following completion of the EAST appraisal, interventions were prioritised according to their score against the objectives that bore out of the evidence base collated as part of that study. This completed long list appraisal of the interventions, scored by how well they met the objectives, is presented in Appendix A.

In order to rank the interventions, a scoring system was devised which took into account which objectives had been prioritised as being more important and whether the intervention met them partially or fully. The top ranking interventions to come out of the study are listed below.

- Improvements to express bus services from South East Northumberland into Tyne and Wear to identify quicker, more direct routes and gaps in service;
- Personal travel planning at large employment sites across South East Northumberland;
- Reopening of the existing freight line to heavy rail passenger services from South East Northumberland into Tyne and Wear; and
- Extend Tyne and Wear Metro into South East Northumberland.

All of these interventions were identified to contribute to some degree in achieving the objectives of the 2012 study, although some were likely to contribute significantly more than others. On that basis, each one was considered on merit and discussed with relevant stakeholders to determine how each might be progressed, or not:

- Improved bus services: There are already a number of bus routes serving the South East Northumberland corridor, linking it to Newcastle, including some express services. The opportunities to improve these are therefore limited and unlikely to offer a 'step-change' in the public transport offer that is more likely to be presented by a rail-based scheme. The ability to create substantive journey time improvements would need to address traffic hot-spots that are located in Tyne & Wear. It was therefore considered that a rail-based scheme would offer the better opportunities to achieve the scheme objectives, but noting that Northumberland County Council will continue to regularly consult with bus operators to enhance the bus offer provided across the county;
- Personal travel planning at large employment sites: A high proportion of journeys to work in Northumberland are undertaken using the car. Northumberland County Council has committed to engage with businesses across the authority to offer personalised travel planning to employees as a result of the successes achieved from the LSTF funded programme. However, due to the limited alternative transport options often available, this measure is unlikely to achieve the desired objectives, but would be complementary to other options;
- Reopening of the existing freight line between Ashington and Newcastle to rail passenger services: Fully meets the highest priority study objectives of increasing access to job opportunities for South East Northumberland residents and reducing congestion. Re-instating the service also met the further objectives of increasing public transport provision and reducing environmental impacts. This scheme was therefore recommended to be progressed through this business case;
- Extending the Tyne & Wear Metro into South East Northumberland: The opportunity to extend the Metro northwards along the existing heavy rail freight line from Northumberland Park towards Ashington has been discussed with Nexus. There would be a number of considerations to take into account including:
    - Relatively uncompetitive journey times into Newcastle compared to that which can be offered by a heavy rail solution due to the number of station stops that would be necessary on the existing Metro network;
    - The lack of capacity over the core network through central Newcastle to introduce further Metro services – especially in the peak periods. An alternative solution to operate a shuttle service between Northumberland Park and Ashington would be unattractive due to the imposition of an interchange;

- Joint running with heavy rail freight services would be required north of Northumberland Park. Not an insurmountable problem given joint running exists elsewhere on the Metro network, but nevertheless an additional consideration that would need to be addressed;
- The requirement to provide overhead line electrification to 1,500V DC, or alternatively develop an alternative fuels solution (battery, etc), will add to costs and complexity; and
- The opportunity to attract new journeys and modal transfer from car may be diluted with a Metro-based offer compared to a heavy rail-based solution. Metro vehicles are designed for shorter distance journeys with more floorspace dedicated to provision for standing passengers.

On the basis of the above, it clear that a heavy-rail based intervention is required in order to meet the scheme objectives.

2.8 Project Scope

On the basis that the proposed intervention should be a heavy rail-based scheme, the outline scope has been developed that takes account of the potential markets to be served and what might be considered an appropriate service offer.

2.8.1 The Route

- Rail passenger services between Ashington at the north end of the line and Newcastle in the south;
- Possible service extensions to Woodhorn at the northern end;
- Intermediate passenger stops;
- Park and ride facilities to be considered at stations where appropriate; and
- Capacity, line speed and signalling improvements. Ability to achieve a service frequency and an end-to-end journey time that is competitive with other modes, offers service delivery efficiency and is moving demonstrably towards achieving the desirable minimum standards for local rail services set out in TfN's Long Term Rail Strategy.

2.8.2 Stations

The following new station locations are being considered for inclusion in the scheme:

- Ashington;
- Bedlington;
- Blyth Bebside;
- Newsham;
- Seaton Delaval;
- Northumberland Park (extension of existing Tyne & Wear Metro station).

Whilst the intention is to deliver all stations as part of the scheme, stations will be delivered in different phases depending on the statutory procedures required. Consideration will also be given to the requirements to safeguard a station at Seghill.

2.8.3 Service Frequency

Consideration of realistic service frequencies that maximise the opportunities to deliver a scheme that can be delivered, that take account of the existing infrastructure constraints and existing passenger and freight service demands. On that basis, both hourly and half-hourly service frequency options have been considered.

2.8.4 Option Development and Delivery

The development of heavy-rail based options to appraise in the Economic Case will need to take account of the potential for phasing, thereby introducing possible opportunities for early delivery of the scheme, for achieving an affordable scheme within any funding constraints and/or as a means to ensuring a realistic programme for delivery. In addition, the option development needs to recognise the institutional framework that the delivery of the rail services sits within. The conventional delivery of rail passenger services would see the new service added to the existing Northern franchise, with an expectation that Northumberland County Council would 'fund' the service for the initial years of operation, after which the service would pass into the franchise Train Service Requirement. On that basis, the option development will need to recognise and demonstrate moving towards achieving Transport for the North's Long Term Rail Strategy objectives for rail service development in the north[6]. Alternative delivery mechanisms are also possible and recent government advice now encourages consideration of these as an alternative to the franchised approach. As such, a Concession agreement has also been considered in the appraisal of the options.

2.9 Interdependencies

The development and delivery of the project will need to take account of other projects being delivered by key stakeholders. Key interdependencies are outlined in the following table.

Table 2-17: Project Interdependencies

Rail Industry Interdependencies	
RNEP	Scheme needs to align with the priorities of RNEP and must account for the relevant approvals processes. DfT are a key stakeholder and sit on the Project Steering Group to provide advice and input.
Office of Rail and Road	The Office of Rail and Road (ORR) is the independent economic and safety regulator for Britain's railways and hold Network Rail to account.
Rail franchising and Train Operating Companies	TfN and DfT are the joint franchisors for the Northern franchise. The impacts on the existing franchise (which runs through to 2025) need to be understood. Arriva Rail Northern (existing franchisee) is being consulted throughout the development of the scheme to ensure that they input into the scope of the scheme.
Train path and platform availability	New passenger train services will need to fit with current and future aspirations for services on the route into Newcastle. This will be considered in developing the scope of the scheme further.
Network Rail infrastructure upgrades and maintenance regime	Network Rail own the assets and therefore perform an asset protection function. Work will be undertaken in collaboration with Network Rail and will take account of proposed railway infrastructure improvements, such as updates to signalling and proposed level crossing closures. All proposed works on the asset will be subject to Network Rail assurance.
Rolling stock availability	Consideration needs to be given to the availability of units within the existing franchise or whether additional rolling stock will be needed to meet the desired outputs of the Northumberland Line scheme.
Nexus and Tyne & Wear Metro	The heavy rail infrastructure runs parallel to the Metro infrastructure between Northumberland Park and Benton North Junction. There will be a shared station at Northumberland Park. The option to integrate certain elements of the scheme, for example adoption of the Metro fare zones, will also be explored.
Rail freight requirements	The line is currently an existing freight line and provision for current and future freight aspirations will need to be maintained. Freight operators are seen as a key stakeholder and regular consultation will be held to ensure that future freight requirements are understood.

[6] TfN are joint franchisors, with DfT, of the Northern franchise and their Long Term Rail Strategy sets out a number of objectives for rail service development across the north – including a set of Desirable Minimum Standards

Non-Rail Interdependencies	
Highway impacts	There are a number of interdependencies with the highway network, mainly associated with impacts around the proposed stations and at level crossings. These will need to be carefully assessed and any negative impacts mitigated.
Sustainable access	Northumberland and neighbouring authorities will consider improved sustainable access to the stations to promote walking and cycling modes to access new rail passenger services. Parking provision for park and ride will also be considered as an option where appropriate.
Transforming Cities Fund	Transforming Cities Funding has been made available to the region and the Northumberland Line has been included as a key scheme in the bid from NECA.

2.10 Constraints

The major constraint to the reopening of the Northumberland Line to passenger services is funding. Northumberland County Council has committed significant sums to develop the scheme to date, but a shortfall in funding still needs to be addressed. The following table outlines additional constraints that will need to be considered in the development of the scheme.

Table 2-18: Project Constraints

Area	Comment	Mitigation
Funding	NCC has committed funding to the project but a shortfall still needs to be addressed	Previous cost estimates have been challenged and a phased approach to delivery is being considered. Project identified within region as a priority and the scheme has been included in the NECA bid for Transforming Cities Funding.
Programme	Limited scope for delay in programme if funding opportunities are to be secured	Close working relationship between project team and steering group to ensure no delays in programme, supplemented by legal advice in respect of the consenting part of the programme.
Environmental	Environmental constraints along the line could impact on scheme development	Environmental surveys undertaken and constraints identified. Responses from both NCC and NTC have confirmed the project not to be EIA development and identifies the environmental surveys required to inform the planning applications.
Level Crossings	A number of level crossings on the route will require upgrade or closure, which can add significant time to programme.	This has been factored into the programme for the scheme and phased delivery looks to minimise number of level crossing orders which would be needed. If necessary, crossings can be included in the non-works TWAO to avoid programme slippage.
Land Ownership	Construction of stations and additional infrastructure will require purchase of land	Ongoing dialogue with land owners to negotiate a deal, strengthened with the securing of compulsory powers using a non-works TWAO.
Rail Operations	Limited capacity available for new services at Newcastle Central Station	The availability of train paths and platform capacity is being considered as the scheme is developed. This is taking into account future service aspirations.

Construction	As scheme develops, further consideration will need to be given to the construction of the scheme to ensure no deliverability/buildability issues	Contractor advice will be considered during the design stage of the scheme.

2.11 Stakeholders

All local stakeholders are being engaged on the scheme. An initial consultation exercise was carried out in June 2014, with current engagement being on a 1-2-1 basis. A comprehensive list of stakeholders is presented in Table 2.19, which will continue to be refined and developed as the scheme progresses through its stages of development through to delivery. A Stakeholder Communication and Engagement Plan is presented as part of the Management Case. Letters of support from some of these stakeholders can be found in Appendix B.

A steering group was established for the project in Autumn 2018. This group brings together key stakeholders that will be integral to delivering the scheme. The purpose of the group is to review project progress and make decisions, including providing feedback on the design and delivery processes to the project team. The Steering Group feeds back to the Programme Board, which includes key strategic partners, and is responsible for ensuring the project is delivered on time, to budget and in accordance with the expected outcomes. This relationship will be developed further through the next stage of the study.

NCC continue to engage with, and seek support of, rail action groups, including SENRUG (South East Northumberland Rail User Group), CBT (Campaign for Better Transport) and Rail Future.

Table 2-19: Stakeholder Engagement

Stakeholder	Engagement Mechanism
- MP's and elected members - Relevant Project Boards and officer working groups - Strategic Partners – NE1, Chamber of Commerce, - Federation of Small Businesses, public service providers. - Individual businesses - The travelling public - Taxi operators - Bus operators - Pedestrian groups like Living Streets - Cyclists – individuals and organised lobby groups - Disability / accessibility groups - Communities of Interest and identity - Residents - Experts and thinkers (SENRUG, CBT, Rail Future) - Large Employers - Leisure users - Freight handlers - Utility providers - Emergency services - Northern Rail - Nexus - Network Rail	Appropriate engagement will be planned through the project, including frequency of communication with specific stakeholders, various mechanisms are in place to deliver this including: - Steering group - Project board meetings - Milestone meetings - Social media - Local press - Council communication channels - Website - Public consultation

Alongside the ongoing stakeholder engagement, a public consultation exercise was carried out in Autumn 2019. 10 events were held at venues in close proximity to the proposed stations. The public were invited along to view the proposals, chat with council representatives and provide feedback in the form of a questionnaire. The questionnaire was also available on the NCC website, with the events and online feedback form publicised in local newspapers.

A total of 971 survey responses were received and have been analysed. 96% of respondents were supportive of the scheme, with only a small number of people not supportive of proposals. People are in support of the scheme as it will provide quicker and easier connections within South East Northumberland and to Tyne and Wear. Key concerns remain around location and phasing of some of the stations, with people keen to see the Seaton Delaval station delivered earlier than currently programmed. NCC will continue to engage with the public and review programme as the scheme develops

A detailed public consultation report can be found in Appendix I.

2.12 Measures of Success

Having demonstrated the need for the scheme, in the context of national, regional and local policy, a set of scheme specific objectives have been derived, as presented in Section 2.6. In order to assess over a period of time whether the objectives have been met, it is important to align anticipated benefits to each. Relevant benefits are derived at this stage through the consideration of a wide framework of those which are quantifiable and non-quantifiable to ensure they are appropriate to the project. Beyond scheme delivery, the success of the scheme will be measured based on the degree to which the benefits are realised in relation to achieving the scheme objectives. A monitoring and evaluation plan will be developed that will be suitable to capture benefits in the short, medium and long term. The economic upturn in the South East Northumberland economy will take time to evolve.

Table 2-20: Objective Aligned Measures of Success

Project Objectives	Benefits	Benefit Measure	Relative Timescale
Facilitate economic activity, employment growth and the delivery of housing sites within the South East Northumberland and the wider region	Increased economic activity, productivity, people in employment education and training. Increased number of houses built and occupied in the areas served by the rail line.	Number of people in work not claiming job seekers benefit Number of people in education or training. Level of education and skills achievement Economic productivity measured by GVA. Number of housing sites taken by developers Number of houses built	Medium to long term.
Create mode shift from car to public transport to improve local air quality and reduce highway congestion at key bottlenecks on the highway network between South East Northumberland, North Tyneside and Newcastle	Reduced journey times for all highway modes. Improved journey time reliability. Improved passenger satisfaction on bus based public transport Improved air quality	Proportion of rail users sourced from car Public transport journey times and adherence to timetable Car journey times on the key radial routes Bus passenger satisfaction surveys Monitoring of emissions	The benefits of reduced congestion should be achieved in the short to medium term. Extent of modal transfer from car achieved in short to medium term. The benefits of improved air quality will be longer term.
Improve public transport accessibility for commuting, retail and leisure trips between South East Northumberland, North Tyneside and Newcastle	Reduced travel times for commute, retail and leisure trips. Reduced congestion on the network Improved passenger satisfaction Competitive reaction from bus industry	Increased use of public transport Public transport journey times Passenger satisfaction surveys	Short to medium term - upon completion of the scheme and ramp-up in rail scheme usage

3. Commercial Case

The Commercial Case provides evidence on the commercial viability of the Northumberland Line scheme and the emerging procurement strategy that will be used to engage the market. At OBC stage more consideration has been given to the operating model of the scheme

3.1 Introduction

This project has been developed against a backdrop of significant policy change in respect of the procurement, delivery and operation of rail enhancement projects:

- In March 2018, the Department for Transport (DfT) published the Rail Network Enhancements Pipeline (RNEP) document setting out a revised process for the development and approval of major enhancement projects and, at the same time, DfT also published its Market-led Proposals guidance document setting a framework for private sector led proposals for promoters and investors;
- In response to the 2017 Hansford Review, Network Rail rolled out its 'Open for Business' strategy in September 2018 setting out its approach to improving access and processes for third party investment in the Network, a strategy which is now starting to positively affect the terms on which third parties deliver projects on the railway (including new service level obligations introduced in the updated Asset Protection Agreement in July 2019); and
- The Williams Review is expected shortly to report its findings and recommendations on the future of the rail sector. Early indications are that it will propose more devolution to local control of train service specification and station operation, and a more Concession-based approach to service contracts going forward.

The project team is taking the opportunity afforded by this new environment to develop an innovative procurement and delivery structure for this project based on an efficient design, delivery and operational cost structure.

In this Develop phase of the project further work has been undertaken to assess the relative benefits of the two core mechanisms of procuring passenger rail services, Franchise or Concession. The key drivers for each of these options are revenue collection (and risk) and the future ownership and operating strategy, each approach also has potential implications for the project delivery strategy. These themes are explored in more depth in the rest of this Commercial Case and the implications of each approach are also captured in the Economic and Financial cases which follow.

Previous Business Case appraisals indicated that in order to achieve a Benefit:Cost ratio of at least 1.5 (representing medium value for money) the capital costs of the project should be no greater than £50-£60m pre risk/contingency allowance. In August 2016 Network Rail undertook a GRIP 2 costing exercise which produced an estimate of £191m at Q3 2016 prices (£213m at Q4 2018 prices), inclusive of 40% risk, based on the provision of infrastructure required for an all-day half-hourly service. A value management exercise was undertaken in 2016 involving Network Rail and all stakeholders which identified the potential for circa £30m savings by avoiding full re-signalling, reducing the level crossing replacement specification and fewer track renewals. However, alongside this, additional risks were identified that meant in the round there was insufficient justification to bring the capital costs down to a level where an economic appraisal could demonstrate value for money.

In Summer 2018 the Promoter, (Northumberland County Council) engaged AECOM and SLC Rail to critically review the work undertaken up to that point to identify options for delivering the project at a lower capital and operating cost whilst in parallel reviewing the demand appraisal work to ensure all the benefits had been captured.

The result of that work was included in the Strategic Outline Business Case (SOBC) submitted in June 2019 which identified that a phased approach with an initial service introduction of one train per hour and four stations could be delivered up to two years earlier than the full half-hourly, six stations option. Moreover, each element of a phased implementation would deliver a BCR greater than 2, representing high value for money in economic terms.

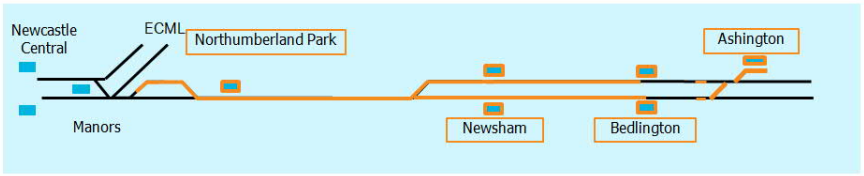
In addition, the work undertaken for the SOBC identified significant capital cost savings not solely resulting from phasing but also for the full scheme, with the Phase 1 cost coming in at £117.2m and the full scheme (including phase 1) coming in at £169.4m at Q4 2018 prices (including QCRA risk at the P80 level).

Four Phases were identified in the SOBC in order to gain a full understanding of the relative impacts of each set of increments for economic modelling purposes. However, the working assumption then, as now, is that the project will be delivered in two Phases. The work undertaken in the Develop Phase has further refined the infrastructure interventions in each to those which are necessary to support the timetable outputs having regard to both constructability and efficient engineering access.

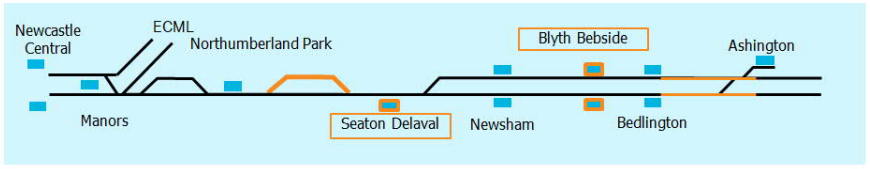
The infrastructure interventions for the two phases are summarised in the diagram below.

Figure 3-1: Infrastructure Phases

Phase 1: Initial hourly service
4 new stations; Line-speed increases Benton-Newsham; Double track extension south of Newsham; LX upgrades; Turnback facility at Ashington off Main Line; Junction improvements Bedlington North



Phase 2: Half-hourly service
Passing loop between Holywell LX and Seghill LX, new stations at Seaton Delaval and Blyth Bebside, line-speed increases north of Bedlington.



3.2 Output Based Specification

The stations, service frequency and journey time outputs of the project based on Class 170 franchised operation are shown in the table below:

Table 3-1: Service Pattern

Phase	New Stations Served	Frequency	Journey Time (end to end)[7]
1	Ashington, Bedlington, Newsham, Northumberland Park	Hourly, half- hourly high – peak	32 minutes
2	As Phase 1 plus Blyth Bebside, Seaton Delaval	Half – hourly all day, hourly late evening	35 minutes

Initial results from modelling Class 230 battery train operation as a proxy for an alternative rolling stock scenario with higher acceleration capabilities indicate that the Phase 1 journey time could be reduced by up to 2 minutes and Phase 2 by up to 3 minutes.

The key outcome of the project is the economic regeneration of the region, connecting areas of economic deprivation to employment opportunities and opening up the area to inward investment, development and housing as well as improving strategic connectivity of the region to the rest of the UK.

[7] Timings are based on Class 170 or equivalent rolling stock, Class 15X rolling stock would be 30 seconds slower

Table 3-2 illustrates how the project meets the key priorities set out under the DfT Rail Network Enhancements Pipeline (RNEP) process

Table 3-2: Scheme Alignment to RNEP Priorities

Keeping people and goods moving safely and smoothly	Delivering the benefits from committed programmes and projects already underway
• Provides a rail-based journey opportunity for current car and bus users into a congested city centre • Improves journey times and capacity on the route for existing freight operators • Delivers additional capacity for the route to be used for diversionary purposes during perturbation and engineering work • Improves highway conditions on the wider A189 corridor and specifically at A19/A189 Moor Farm roundabout due to modal shift from car	• Provides additional demand to support the Trans-Pennine upgrade and new rolling stock and services on ECML via Newcastle Central Station from Dec 2021. • Potentially accelerates the programme for re-signalling the route (late CP7), by providing a key strategic benefit from early delivery. • Enhanced connectivity, and therefore demand, into Tyne and Wear Metro services, for which investment is being made in new rolling stock. • Supports NE LEP Strategic Economic Plan targets for access to jobs and improved freight capacity to Port of Blyth area Gateway and Enterprise zones
Offering More: new and better journeys and opportunities for the future	**Changing the way the rail sector works for the better**
• Provides access to the passenger rail network to communities who were last served by rail services in 1964. • Improves access to jobs for local communities that are some of the most economically deprived in the North-East. • Supports the development of employment and housing in the rail corridor and sub-region. • Improves the strategic connectivity of this area with the wider North-East and rest of UK.	• Provides an alternative project development and delivery approach compared to traditional default options (via RNEP rather than GRIP). • Identifies innovative ownership and operation approaches, and selects the best fit for the economic and financial circumstances, taking due account of the evolving railway commercial environment. • Enables genuine consideration and selection from a choice of alternative delivery and operational strategies. • Facilitates more local accountability, control over facility and service specification, development and delivery programme. • Identifies a more cost-effective base operating model, reducing subsidy requirements, which also provides the opportunity for further savings.

3.3 Procurement Strategy

Northumberland County Council (NCC) will continue to lead the scheme, and as lead sponsor is currently working with partners on the governance arrangements to ensure that the necessary resources and expertise are assembled prior to commencement of the Design phase. This includes the resources required to lead the Deliver phase procurement process in order to maintain momentum.

Accountability for delivery of the project may change prior to the commencement of the Deliver phase, depending upon the outcome of the discussions in respect of ownership, operation and delivery strategy; however, as recipient of central government funding for the scheme, and in the interests of ensuring achievement of its objectives, NCC will continue to retain overall programme and financial responsibility.

3.3.1 Project Phasing

The drivers for the proposal to implement the project in two phases is as follows:

1. Speed of Delivery
    a. The full half-hourly service with 6 stations may require a full Transport and Works Act process which could take up to 2 years to complete.
    b. The full half-hourly service requires significant additional Signalling and Track work which will add to the design and construction timescales.
2. Availability of Funding
    a. Phase 1 of the project which delivers an hourly service with 4 stations could be delivered in time for the May 2023 timetable and therefore fit within the timescales for 'Transforming Cities Fund'.
3. Network Capacity
    a. Capacity on the network north of Newcastle will become more constrained from December 2021 as a result of additional services being planned for the route. The project is working closely with the rail industry December 2021 Events Steering Group to ensure that the Northumberland Line services are taken account of in the timetable planning process and can be planned to fit the new service pattern.

3.3.2 Ownership and Operating Model

The route is relatively self-contained between the point of signalling control interface between Newcastle IECC and Newsham Signal Box (just west of Northumberland Park station) and Ashington, except for the freight branch line from West Sleekburn Junction to the Port of Blyth.

Currently freight traffic operates over the route between Benton North Junction and Lynemouth (up to 6 return trips per day moving biomass), between Benton North Junction and Port of Blyth (up to 3 coal trains per week to/from South Wales) and between Bedlington and Port of Blyth (one alumina train movement per day to/from Fort William via Morpeth). Regular passenger services last operated on the route in 1964, although it remains cleared for modern Diesel Multiple Unit (DMU) vehicles between Benton North Junction, Bedlington and Morpeth for diversionary purposes.

The Develop phase has provided the opportunity to review a number of future ownership and operating options which have the potential to reduce short term implementation, and long-term operating costs. These opportunities were highlighted in the SOBC but have been further refined in discussion with key stakeholders and through early market testing in the Develop phase.

The current default industry option under the standard regulated model for a rail project is Network Rail ownership of any completed assets, stations and infrastructure, and franchisee operation.

Further review since the SOBC has concluded that vertical integration (either publicly or privately delivered) along the route would be unnecessarily complex and unlikely to result in any significant operational or financial benefit. This is for several reasons:

- The route is not entirely self-contained in that the service operates on the East Coast Main Line (ECML) for 4 miles between Benton North Junction and Newcastle such that a vertically integrated train operator would need a separate agreement on the ECML.
- Furthermore the route already has existing Freight Operating Companies who, under a vertically integrated structure, would need a further set of Track Access Agreements.
- The route is cleared as a diversionary route for passenger train services and this is likely to be an ongoing and potentially expanding requirement.
- A third party would need to be prepared to accept (and price) existing asset condition risk for any infrastructure that is not being upgraded as part of the scheme, there may not be an efficient cost model that delivers such risk transfer.
- Delivering a PFI-style Concession-based approach (such as certain elements of Dockland Light Railway in London), would be complex to structure and procure, carrying high transaction and set-up costs, unnecessary when alternative grant funding options exist, such as TCF funding.
- Third party finance would drive cash outflows (repayments and interest), for which a subsidy would be required, the detailed case for this could only be made on the basis of full construction cost risk, something that is difficult to achieve in the rail market at present.

As a result the current working assumption is that the existing and new track and signalling infrastructure will remain part of the Network Rail Regulated Asset Base although an option exists for the new stations to be 'owned' and operated by a third party.

There are two mechanisms for procuring passenger rail services on the heavy rail mainline network; Franchise and Concession. Both of these options are legally and practically viable based on existing regulatory provisions and powers although de-designation of the route may be required under section 24.3 of the Railways Act in order to allow a body other than the Secretary of State to let a Concession on the heavy rail network. This is not a novel arrangement and has been done before in respect of Merseyrail and London Overground services.

In respect of the operation and maintenance of rolling stock, train service and stations, a matrix of further options exist under either a Franchise or Concession option. These are illustrated in the table below:

Table 3-3: Further Options

<table>
<tr><th>Phase</th><th colspan="4">Operation Phase</th></tr>
<tr><th>Element</th><th>Trains</th><th>Train Service</th><th>Stations</th><th>Infrastructure</th></tr>
<tr><td>Default Option</td><td colspan="3">Northern Franchise</td><td rowspan="4">NR</td></tr>
<tr><td>Alt Base 1</td><td colspan="3">Concession</td></tr>
<tr><td>Alt Base 2</td><td colspan="2">Concession</td><td>Public Body/Other</td></tr>
<tr><td>Alt Base 3</td><td>Direct to Public Body/Other</td><td>Concession</td><td>Direct by Public Body/Other</td></tr>
</table>

3.3.2.1 Franchise Option

The franchise procurement route is an established process, and in this case would require a single tender action to the current Northern Franchise on the assumption that the service is introduced prior to the current Northern Franchise end date of 31st March 2025. For the next new franchise, or whatever structure follows, it is assumed that some form of competitive process will apply and further discussions will be held with local stakeholders and the Transport for the North / Department for Transport Rail Partnership to determine the most appropriate means of procuring the continued service provision.

Franchise Assumptions

The working assumptions in respect of the Franchise option contained within the Economic and Financial cases are as follows:

Scope of Service

The Franchisee would be responsible for rolling stock maintenance, fuelling and cleaning, operating the trains and operating and managing the stations. Revenue risk and operating costs risk would be taken by the Franchisee subject to potential for Revenue or Profit Share arrangements.

Rolling Stock

It is assumed that a Franchise option would utilise existing diesel rolling stock which has been identified as being likely to be available off-lease in the period from 2022 to 2025 as a result of franchise driven rolling stock cascades. The Franchise option timetable is based on Class 170 operation which the current Northern franchisee has confirmed is a reasonable assumption for this Business Case.

Depot, Stabling and Train Crew Strategy

It is assumed that the trains would be maintained and stabled overnight at Heaton train maintenance depot in Newcastle. An alternative rolling stock option based on battery, hydrogen fuel cell or diesel hybrid technology is an option under a franchise arrangement but likely to require higher capital and training costs at Heaton depot than a conventional DMU option.

The current franchisee has confirmed that train crew would be based at Newcastle train crew depot which currently has 75 drivers and 54 Conductors. A significant proportion of these train crew would need to be trained on the new route and traction in addition to the recruitment of the additional drivers and conductors required to operate the service. Existing Northern franchise train crew salaries, terms and conditions have been assumed.

Stations

The six new stations are assumed to follow the standard industry model with Network Rail as the asset owner/landlord and the franchisee operating and managing the stations under a station lease from Network Rail. All stations are assumed to be unstaffed.

Fares and Ticketing

Fully inter-available national rail ticketing is assumed with fares being set by the franchisee and ticket retailing and fulfilment via Ticket Vending Machines (TVM's) at stations, online ticketing and via Conductors on trains.

3.3.2.2 Concession Option

The Concession option ordinarily involves the Concession holder being paid a fee to run the service which is tightly specified by the awarding authority. The Concession holder would not be expected to take full commercial risk and passenger revenue would be for the benefit of the awarding authority. The Operator is incentivised to achieve and exceed a range of performance targets through a reward and penalty mechanism.

Potential arrangements that may need to be put in place in order to procure a Concession have been reviewed and exploratory discussions held with local stakeholders.

Concession Assumptions

The Concession sub options range from:

a) including all of rolling stock provision and maintenance, train service operation and station management and operation to

b) train service operation only.

The key determinants of which approach to take are:

- The financing risk associated with rolling stock and any associated facilities if they are bespoke to the Concession.
- The size and scale of operation and its potential appeal to the market.
- How would a future change to the current franchise model under a post Williams review impact on the market and the wider North-East rail services.

Rolling Stock

The choice of rolling stock to be deployed is a key driver of infrastructure requirements, journey time and therefore, demand and revenue. Both the Franchise and Concession routes could conceivably deliver an alternative, faster, more energy efficient rolling stock solution such as battery, hydrogen fuel cell, diesel hybrid; but a Concession arrangement is more likely to attract a range of competitive alternative offers.

In order to demonstrate the impact of an alternative rolling solution Viva Rail's Class 230 battery train data has been used because it is readily available in respect of purchase/leasing costs and performance data from recent main line UK trials. As well as meeting current Government aspirations in respect of cleaner energy sources the train's acceleration capability compared to traditional diesel rolling stock makes a significant difference to end-to-end journey times driving additional patronage and economic benefits. As an example, in the Phase 1 timetable the Class 230 cuts up to 2.5 minutes off the Newcastle-Ashington end to end journey time compared to a Class 150 or 156 and 2 minutes compared to a Class 170. For Phase 2 the Class 230 journey time advantage is up to 3.5 minutes compared to Class 150 or 156 and 3 minutes compared to a Class 170.

Further options exist in relation to rolling stock procurement, such as lease versus purchase, and these will be further refined during the Design phase in line with the preferred ownership and operating strategy.

Depot, Stabling and Train Crew Strategy

A Concession based operation could either seek to contract with the Northern franchise holder for depot access at Heaton depot or seek dedicated depot and stabling facilities on the route. A potential location for a small dedicated depot and stabling sidings has been identified at Furnace Way sidings at Bedlington which will also be required to be brought back into use to enable the run-round of the daily Blyth-Fort William Alumina train.

A new dedicated depot has both operational and economic benefits for the project; As is the case for most urban flows the train service tends to start and finish at the 'country end' so the additional train and vehicle miles required to run empty stock movements to and from Heaton depot and Newcastle Central can be eliminated.

The train crew required to operate the service are assumed to be based at the new maintenance depot site reducing diagram shift length and cost compared to a franchise solution which would rely on using the existing train crew depot at Newcastle.

For a Concession based operation only the train crew required to operate the service would need to be recruited and trained. A new Concession start-up also provides the opportunity for a fresh start on train crew terms and conditions including the potential for driver control only or driver only operation, part time working which opens the roles up to a wider societal cross-section, and unit rates which are more reflective of the more restricted traction and route knowledge requirements of a local passenger service. This benefit is partly offset by the need to have a slightly higher spare cover ratio for the Concession arrangement due to the relatively small depot size; estimated at one additional driver and one additional conductor. Also with regard to staffing the safety and security of passengers will be a key consideration as well as revenue protection requirements.

Although a Concession option enables a fresh approach to train crew terms and conditions this is not assumed in the economic appraisal and the potential for DOO is examined in the appraisal as a sensitivity test.

From an economic standpoint the benefits of introducing new well-paid traincrew and maintenance staff jobs into Ashington, Blyth and Bedlington are very significant for an area which suffers from high levels of unemployment and social deprivation. A further economic multiplier effect could also be gained if the short-term train crew recruitment and training requirement could be expanded into a longer-term employment

facility training train crew for the wider rail network. This would provide a focus for further regeneration of the area which also fits well with its historic rail legacy. Further discussions with local stakeholders during the Design phase will also identify opportunities for synergies with existing facilities to reduce capital and operating costs.

Ticketing and Fares

A Concession scenario could adopt either the standard rail industry model with fully inter-available ticketing under the Ticketing and Settlement Agreement (T&SA) model or a model which is fully integrated with Tyne and Wear Metro (Nexus) ticketing, retailing and settlement arrangements. The latter is not an agreed approach but is an example to demonstrate the potential of this option. It has been used to inform the economic and financial appraisal and drives higher patronage and hence higher economic benefits. These options are explored in more detail in the Pricing Mechanisms and Charging Framework section below.

3.3.2.3 Summary of Franchise vs Concession Options (Pros and Cons)

The rest of this Outline Business Case provides a comparison between the Franchise and Concession options in Economic appraisal and Financial terms. From a commercial standpoint the pros and cons of each approach are highlighted in the following table.

Table 3-4: Franchise versus Concession

	Pro	Con
Franchise	• Mobilisation may be more straightforward, relying on the TOC's existing management structure and expertise that is already in place • Economies of Scale may materialise because much of the management overhead structure already exists	• A single tender action is unlikely to produce costs as low as a fully competitively tendered process • No opportunity to challenge or reduce existing industry operating practices, unit rates and operating costs • Limited opportunity for local input to specification and performance management • Limited opportunity to reduce delivery costs
Concession	• Start-up business has freedom to negotiate lower unit rates and more efficient operating practices • Greater potential fares integration leading to higher patronage figures • Higher economic benefits arising from higher patronage numbers (linked to better journey times and lower fares) • More local control and management of specification and performance outputs • More innovative rolling stock options may drive lower infrastructure costs	• Need to set up new structures to procure, manage and operate the Concession • A relatively small service operation may have a disproportionately high level of management overheads and overseeing structure compared to incremental addition to an existing Franchise • Market appetite for relatively small Concession may result in fewer bidders

3.3.2.4 Areas for Further Refinement of Operating Options during Design Phase

The following areas will be explored and refined during the Design phase in order to reach a preferred option prior to the Full Business Case submission:

- Rolling stock purchase versus leasing, as a means to reducing the call upon subsidy;
- Opportunity to exploit new, more sustainable and lower cost rolling stock technology, e.g. battery technology, hydrogen fuel cell or diesel hybrid;
- Opportunities to introduce greater operating efficiency such as Driver Control Only Operation (DCOO), Driver Only Operation (DOO) or social flexibility, such as part time drivers;
- Further detailed discussions with Northern Rail (and Arriva) who are currently investigating alternate rolling stock strategies for the Windermere branch and in the Tees Valley;
- Potential to use the service mobilisation to act as a catalyst to enhance employment opportunities in South-East Northumberland and North Tyneside such as new depot facilities, a train crew training centre and sponsored rail apprenticeship schemes;
- Assessment of the costs and benefits of extending the Northumberland service south of the River Tyne as a potential future further Phase, which though may incur additional operating costs may also lead to significant economic and financial benefits may arise, and in terms of the Concession option it may also provide a more attractive future scale of proposition for the market.
- Post Williams review impact assessment of whether the Northumberland Line might in future form part of a wider North East Concession proposition with respect to further devolution of rail services.

3.3.3 Infrastructure Delivery Strategy

The options for infrastructure delivery are, to a large extent, determined by the ultimate ownership and operating strategy. Under a Concession arrangement where, for example, the Concession Procurer responsible for the Concession is taking or sharing revenue risk, there is a greater incentive and need to be in control of the procurement and delivery of the built assets to ensure co-ordination with the asset management and service specification.

The table at below illustrates the current thinking around options. Even if Network Rail is not selected as the final option, there may be certain work packages which lend themselves to NR implementation because of their interface with current NR assets & systems and maintenance & renewal requirements (e.g. operational telecoms, signalling).

Table 3-5: Delivery Options

<table>
<tr><th>Lead Organisation (Funder)</th><th>Option</th><th>Contracting Method</th><th>NCC Head Delivery Contract</th><th>Management Contractor</th><th>Works Contractor</th></tr>
<tr><td rowspan="4">Northumberland County Council (NCC & TCF)</td><td>1.</td><td>Direct</td><td colspan="3">D&B Contractor (OJEU)</td></tr>
<tr><td>2.</td><td>NR Delivery</td><td>Network Rail (EC IA)</td><td colspan="2">D&B Contractor (Framework, Target Cost)</td></tr>
<tr><td rowspan="2">3.</td><td rowspan="2">Concession Procurer Delivery</td><td rowspan="2">Concession Procurer</td><td>Network Rail (EC IA)</td><td>D&B Contractor (Framework, Target Cost)</td></tr>
<tr><td colspan="2">D&B Contractor (OJEU)</td></tr>
</table>

Early Contractor Involvement has been engaged from Morgan Sindall, who have been appointed to review design, constructability, possessions and programme deliverability initially but subsequently to advise on the procurement strategy in respect of specific work packages and phasing that would underpin completion dates. This will be concluded during the Design phase.

The outputs from the ECI contractor and further market testing will be used to inform a detailed risk mitigation strategy during the Design phase to determine the most appropriate construction procurement route (or routes if multiple procurements are required). These themes are explored in more detail in the Payment Mechanisms section below.

In order to maintain project momentum the project will undertake a number of de-risking activities prior to confirmation of funding for the Design phase, including additional ground investigation, ecology surveys, preparation and commencement of land acquisition, detailed discussions commencing on delivery and operation strategy, amongst other things.

In all options it is assumed that Northumberland County Council (NCC) will enter into the required funding agreements, act as the conduit of funding and remain lead Sponsor / Promoter of the scheme through to completion. It is intended that NCC will continue to oversee the project through the Design phase, and towards the end of this phase establish (through various means including commercial and practical assessment of implications) the desired route for delivery and will oversee either a procurement or transition into the delivery phase arrangements.

Potential options for contracting for delivery of the works are described in more detail below:

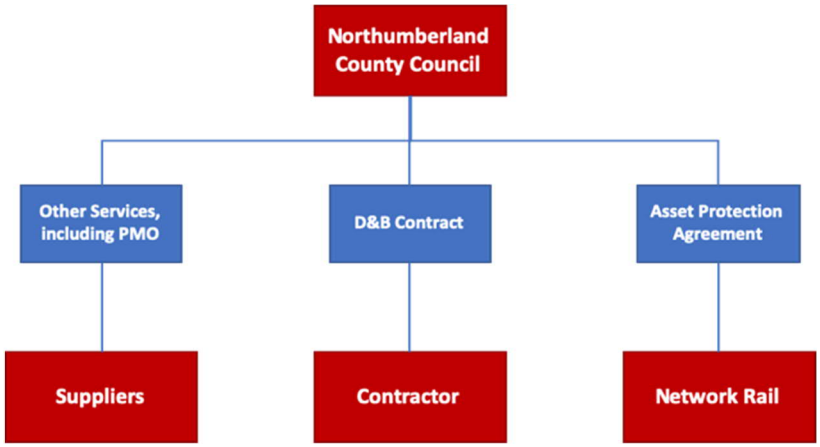
Option 1 – Base Assumption – NCC Promoter & Procurer, NR in Asset Protection mode

Northumberland County Council directly procure any required contractors and support services through the Design and into the Delivery Phase, engaging Network Rail through one or several asset protection agreement(s) to provide the required enabling services (design and method statement acceptance, safety oversight and access to the network).

Since ownership drives acceptance of the assets, and number of accepting bodies drives interfaces that require management, this structure is best employed where all assets (or at least the majority should NCC decide to retain car parks) fall to be owned by Network Rail.

NCC would need to ensure it has the required competence and capacity to oversee all the contracts, manage engagement with the rail industry, and understand all the potential risks for which mitigation measures/strategies will be required. Even with a full engagement of the market in the procurement process (which will need to be OJEU compliant, and monitored through constant market engagement prior to commencement of the procurement process to ensure market readiness) there are likely to be residual risks and liabilities that sit with the Council, for which specialist resources will need to be procured in support.

Figure 3-2: Option 1 Delivery Structure



Option 2 – Network Rail Delivery, via a Framework Contractor or Tendered

In order to properly assess this as a real alternative delivery route, a detailed review of the allocation of roles, responsibilities and commercial incentives needs to be undertaken and checked with Network Rail (NR).

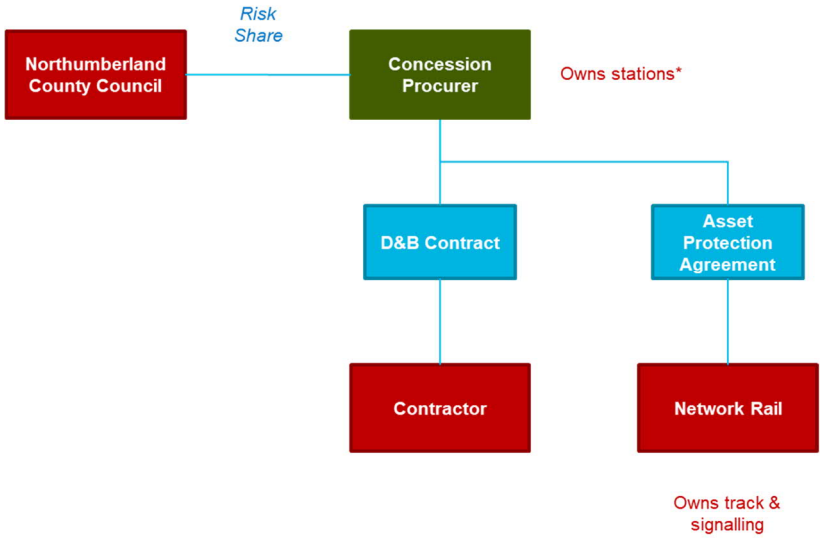
The current default contracting mechanism with NR is through an emerging cost implementation agreement, and this doesn't sit comfortably commercially between a fixed funding envelope and a target cost delivery contract (or worse multiple target cost delivery contracts if a 'hub and spoke' approach is adopted).

Implementation agreements are part of a suite of enhancement agreements available to third party scheme promoters, however, and it is possible that a post-Hansford Review version of these agreements could contain the possibility of fixed price delivery. This is something over which a watching brief should be maintained, however until this is resolved the commercial imperatives and incentives will remain misaligned, which makes this option unattractive.

Option 3 – Alternative Assumption – NCC and Concession Procurer Create a Delivery Consortium

If a Concession Procurer has a role in the ownership and operation of the new service and stations it naturally follows that they would also require a level of oversight of the procurement and management of the delivery. The Concession Procurer must have in house resources capable of managing design and build contracts, recent experience of major scheme procurement and management, and relevant multi-disciplinary technical expertise.

Figure 3-3: Option 3 Delivery Structure



The above structure aligns the specifier, owner and acceptor roles for stations, track and signalling, and avoids the commercial disincentives from having an emerging cost agreement central to the delivery contracts. NCC and the Concession Procurer would need to agree between them the allocation of roles, responsibility and risk including a full bi-lateral due diligence exercise in order to establish a baseline understanding that shapes any commercial arrangements.

3.4 Risks and Incentives

The guiding principle is that we are seeking to provide a high-quality service that meets the specified outputs at the lowest cost to the public purse with risk being held by those parties who are best able to manage it.

3.4.1 Development, Design and Construction Risk

NCC will continue to be the Promoter of the project through to the end of the Design Phase and has a significant capital programme allocation to enable it to maintain project momentum in advance of key funding decisions whether TCF or RNEP.

Further discussions are required with key Stakeholders prior to and during the Design phase:

- to determine the most appropriate base delivery structure for the project;
- to design into the final base operating strategy, with buy into and acceptance of design as it emerges during the Design phase from the ultimate owning body of each asset;
- to identify which elements are variable according to the final decision (and to keep these to a minimum); and
- to understand the extent to which each final option impacts on capital costs of the scheme.

Irrespective of which party or parties take the lead role in respect of project delivery it is also vital to ensure that the wider Stakeholder group remains closely involved to ensure that the project remains aligned with wider regional and national objectives.

Towards the end of the Design stage, once relative certainty of the design is achieved, the Risk Management Strategy will be developed to determine the most appropriate level of risk to be passed to the Contractor (and its designer) during the Deliver phase. This will be supported by further early contractor involvement, more intrusive survey work and land acquisition strategies, to establish clarity over constraints and consents, in order to maximise the Contractor's understanding of the scheme, and to firm this up in the tender process.

3.4.2 Operating and Revenue Risk

Each ownership model brings with it a different cocktail of risk management strategies. The key risk in respect of a new service start-up is fare-box revenue risk due to the lack of a demand track record. For that reason it is anticipated that within a Franchise option the perceived risk will drive a higher level of subsidy unless the franchising body (or NCC as funder sponsor) was prepared to take or share revenue risk.

It is currently assumed that a Concession arrangement would be based on a management / service contract structure with the Concessionaire taking cost risk and the Concession Procurer (supported by NCC) would take revenue risk, on an ongoing basis including during the early years. Given the revenue risks associated with a new service such as here, and the risk of uptake during the ramp up period, this may be a more appropriate operating model in any case.

3.5 Payment Mechanisms

There are many ways in which a contractor can be procured and at what stage in the project this occurs. These can generally be divided into three categories:

i. Early Contractor Involvement (ECI) – popular with partnering arrangements, where the client and contractor foresee a long-term relationship, commonly used by public sector bodies, particularly in high risk, high impact (and high potential disruption) projects that require substantial pre-planning;

ii. Design & Build (D&B) – a very mature procurement route, used across all sectors of construction, and has become the preferred route in the railway industry for third party local authority schemes; and

iii. Design, Bid and Build (or "traditional") – historically used by Network Rail, up to March 2014, under this option detailed design is concluded by the client's designer prior to any contractor involvement.

The choice of contracting mechanism will depend on a more detailed understanding of risk, risk allocation and the relative pros and cons of each route to achieve the required objective of containing cost to within the funding envelope.

In reality, however, Design, Bid and Build is likely to be inappropriate, since much of the risk remains with the client, for example design integrity, and this is extremely difficult to manage on multiple stakeholder (who can each and all impact on the scope of works) projects. Both D&B and ECI can be engaged using different payment mechanisms, as outlined below.

3.5.1 Excluded Forms of Payment Mechanism

Firstly, it should be noted that a number of forms of payment mechanism have been excluded from the analysis here, as follows:

- Engineering, Procurement and Construction (EPC) – this is a form of contracting where the EPC contractor is made responsible for all the activities from design, procurement, construction, commissioning and handover of the project for a fixed price. These forms of contract are used on very large projects, and not used on UK railway schemes, and thus their introduction would potentially be extremely expensive;
- Guaranteed Maximum Price (GMP) – very similar to the above, plus the extent of potential stakeholder engagement and potential for variation makes the pricing of full risk unaffordable; and
- Cost Reimbursable or Emerging Cost Contracts – are excluded, simply because they do not fulfil the objective of cost certainty generally required by public sector clients.

This basically leaves fixed price and target cost contracts as the subject of assessment.

3.5.2 Fixed Price or Lump Sum Contracts

Fixed price contracts are not as the name suggests actually 'fixed price'. Before the works begin, a single price 'lump sum' is agreed, and if the costs of the works is higher than the agreed value then the contractor bears the risk of overrun, and if the cost is lower the contractor keeps any savings.

However, the cost is fixed only in relation to contractor obligations under the contract, it is not fixed in all circumstances (as would typically be the case in either an EPC or GMP contract). Within the contract there will be a description of the requirements for the works the contractor is to deliver together with a balanced allocation of risk deemed acceptable to contractors and employers in the relevant market (as normally determined by a relevant industry body in consultation with deliverers and clients).

Typical circumstances where prices can be changed are as follows:

- Variations – changes in the specification for the works, as instructed by the project manager or employer, which lead to changes in design or quality requirements, and potentially to provide an additional previously unknown constraint (perhaps from an unknown subsequent consent);
- Compensation events – which may arise from failure by the employer to do or provide something required under the contract, or from a neutral event (for example adverse weather conditions), which result in additional time and/or money to complete the works;
- Provisional sums – where included, provisional sums establish a budget for a certain element of the contract which is not defined enough at contract award to be properly priced, which is then replaced with the emerging actual cost once known (and typically wrapped in a process to achieve the final value);
- Inflation pricing mechanisms – where contracts last over a number of years a mechanism may be inserted to protect the contractor for changes in inflation;
- Payments to nominated suppliers – such as utility providers, if management and payment of these are included in the works requirements; and
- Statutory fees.

Asking a contractor to price for all of the above, to achieve a genuine fixed price, would not necessarily be in anyone's interests, the contractor may not be able to get internal approval to submit prices for unknown risks or risks over which it has little or no control and may or may not arise, and the employer may not be prepared to pay the sort of total price that may be required in order to secure such a level of risk taking.

3.5.3 Target Cost

Target cost contracts contain a mechanism for sharing risk and rewards known colloquially as a “pain/gain” mechanism, as a specific way of managing risk in a collaborative way, suitable for situations where either there are specific elements of the scope that are not fully defined or where the levels of risk are greater than would normally be the case.

Target cost mechanisms allow the financial impact (and risk) to be shared between client and contractor, providing a financial incentive as a means to motivate the contractor to carry out the works, managing the risk, as cost efficiently as possible.

To achieve this, the delivery contract contains a target cost agreed between employer and contractor, including the contractors estimate of elements of the works that are defined, together with a fee that covers contractors management costs, overheads and profit. The target cost is then adjusted during the course of the works for specific circumstances as laid down in the contract, typically similar to those described under fixed price above (variations, compensation events and so on).

Once the works are completed the final defined costs plus the fee are compared to the target cost (as revised by adjustments). If the final price is lower than the target the contractor shares in the savings at the pre-agreed level and if the price is higher then the contractor will contribute its share of the difference, typically up to a cap (beyond which the employer is liable).

Target cost contracts can require additional resources to administer, not least because target and actual costs are being managed at the same time. The fact that two separate total cost values are being monitored, managed and negotiated, requires suitable level of commercial resources, and also provides a higher probability of dispute on interpretation or risk and calculation of impact, with the pain/gain sharing acting as an additional financial incentive to take differences to adjudication or alternative dispute resolution mechanism.

Nevertheless, target cost contracts have their place and, as noted above, were the default industry standard for rail enhancement projects for the last five years. It should also be noted that certain forms of target cost contracts (NEC for example) also contain the ability to engage contractors prior to completion of designs, to progressively assure the specification, and to de-risk the construction phase through early contractor involvement and early enabling works. This additional option also generally delivers programme improvement.

As the design develops through the Design stage, a market engagement will be undertaken to inform the best choice of payment mechanism based on the feedback received.

3.6 Pricing Framework and Charging Mechanisms

The pricing, fares, retailing and settlement implications of the Franchise and Concession options have been individually modelled and the results are included within the Economic and Financial Cases.

The core assumptions in respect of each option are set out in table overleaf.

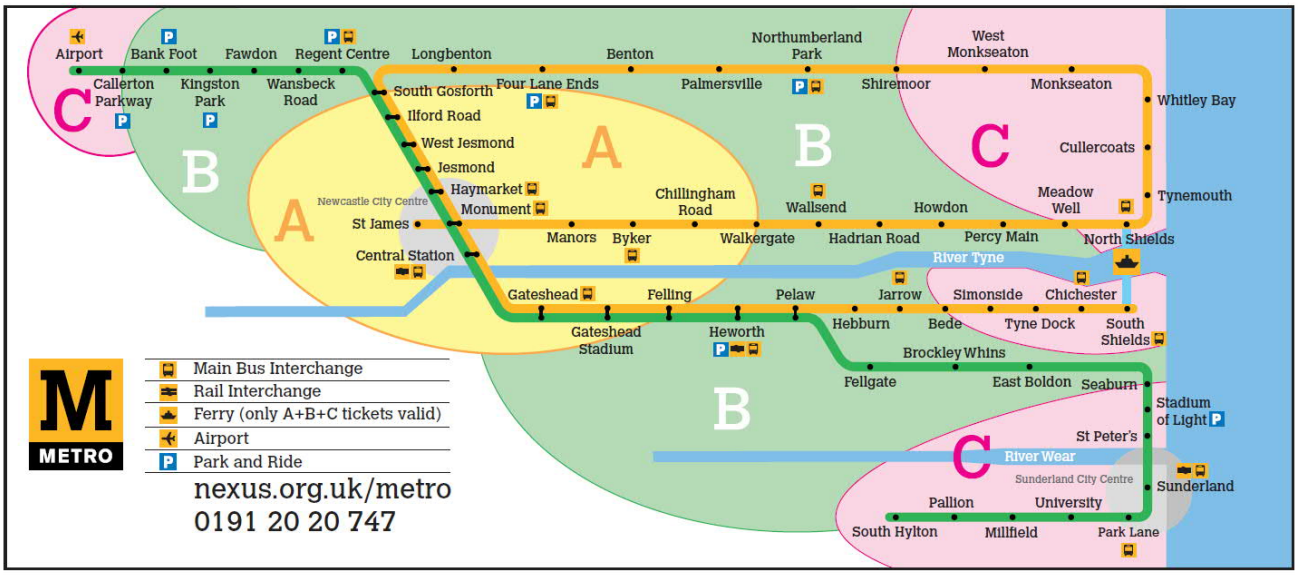
Table 3-6: Core Assumptions

Model	Who Sets Fares	Ticketing	Settlement	TIS	Benefits/Risks
Franchise only	Franchise TOC	On Station TVM, Online, On-Train RSP full inter-available. Some through ticketing e.g. PlusBus, Metro add on	Rail Settlement Plan (RSP)	RSP Accredited	Full range of National Rail RSP products. Some through but no integrated ticketing with Metro
Concession only	Nexus (subject to approval by the North East Joint Transport Committee)	Nexus products only	Nexus either direct or via the Concessionaire	Nexus ticket machines which don't need to be RSP approved if not settled via RSP, but can be still be valid on heavy rail services.	Full ticketing integration with rest of Metro. Through ticketing to national rail network would be challenging.
Concession Hybrid	Nexus (subject to approval by the North East Joint Transport Committee)	All Nexus point to point and Nexus Smartcard and Seasons other products which are valid between Ashington and Newcastle plus Metro/bus etc. RSP fully inter-available ticketing online only.	RSP settled fares back to Nexus via the Concessionaire or Nexus via RSP private settlement arrangement on all flows involving NL stations. Nexus fares either direct back to Nexus or via Concessionaire	Nexus ticket machines for walk up/point to point ticketing to/from Metro. Through rail ticketing online from NL stations, normal RSP point to point from National Rail to NL accepted on NL.	Full ticketing integration with both Metro and national rail network. National rail through ticketing maybe online only (ORCATS split settled via RSP to Concessionaire) . Need to understand ability to sell on-train tickets.

The key differentiators between the two models are as follows:

The Franchise model is based on fully inter-available Rail Settlement Plan (RSP) ticketing and approved ticket issuing systems. This model should maximise the through 'off-line' revenue from fully inter-available ticketing but the scope for integration with Nexus/Tyne and Wear Metro ticketing is limited. Assumed point to point fare levels on the Northumberland Line are 15% - 25% higher than the equivalent assumed Metro fares.

The Concession model is based on the 'Concession Hybrid' scenario in the table above with a Metro zonal fares structure and products, and Metro ticketing and settlement. RSP fully inter-available ticketing is available online to maintain the availability of through 'off-line' ticketing to the rest of the UK mainline network. The current Metro zonal fares structure is shown below and the assumption for the demand modelling approach at this stage is that the Northumberland line would have an extension to the current Zone C north of Northumberland Park and a new Zone D which would include Blyth Bebside, Bedlington and Ashington. It should be noted that Nexus' involvement and the precise boundary stations and the fare cost assumptions are yet to be confirmed.



The demand and revenue results of the two options are set out in more detail in the Economic and Financial sections, but a summary table is shown below.

Table 3-7: Demand and Revenue by Option, including demand ramp-up

Option	2023			2025			2039		
	Annual demand	Rail Revenue (£m)	Metro Revenue (£m)	Annual demand	Rail Revenue (£m)	Metro Revenue (£m)	Annual demand	Rail Revenue (£m)	Metro Revenue (£m)
T1	362,000	£3.2m	£0.2m				752,000	£7.8m	£0.4m
A1	442,000	£1.7m	£1.6m				927,000	£4.3m	£3.5m
T2				564,000	£5.1m	£0.3m	1,160,000	£12.0m	£0.6m
A2				704,000	£2.9m	£2.5m	1,453,000	£6.9m	£5.2m

Demand is number of return journeys made

Revenue at 2018 prices

Based on the 2039 results the Concession generates higher demand than the Franchise option for both Phase 1 (+23%) and Phase 2 (+25%) due primarily to lower fares, but slightly less overall revenue (rail and metro). However, from an economic evaluation standpoint the BCR of the Concession option is higher because the greater levels of demand generate higher user benefits in economic appraisal terms. These results are presented and discussed in more detail in the Economic Case.

The difference in the modelled impact on through demand to/from the rest of the National Rail network between the Franchise and Concession options is negligible, due to the ability to purchase through tickets online for journeys from the Northumberland Line and since RSP ticketing from the National Rail network could be accepted as valid for travel on the Northumberland Line.

3.7 Contract Length and Management

The contract management is considered and discussed in two phases below.

3.7.1 Deliver Phase

The work done by the ECI contractor, Morgan Sindall, on constructability and phasing of work packages during the latter stages of the Develop phase has identified the benefit of undertaking early detailed design works in respect of switches and crossings and signalling systems in order to accelerate and de-risk the procurement of long-lead items. It is intended that this element of detailed design work will run from February 2021 to July 2021.

Early works in respect of embankment widening, stabilisation and remediation and line speed improvements are planned to take place between October and November 2021 prior to full design approval for all disciplines from Network Rail at GRIP 5 (Authorised for Construction). This is illustrated in the indicative Phase 1 and Phase 2 programme shown below.

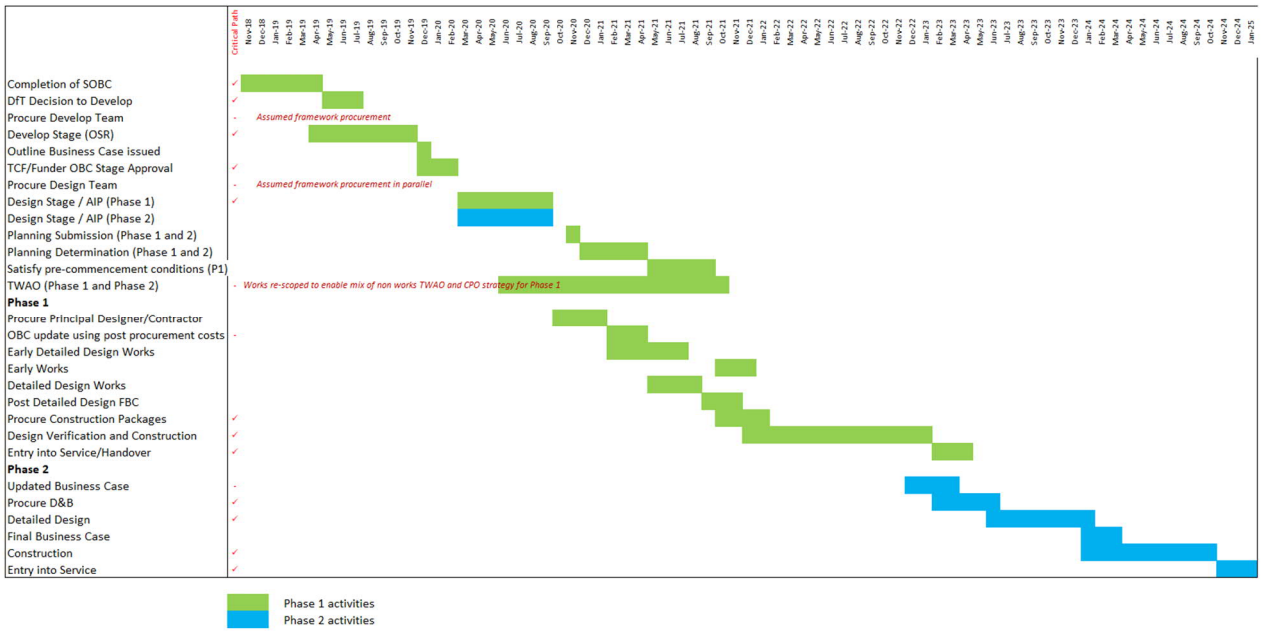
A phased and engineering discipline specific procurement, design and construction approach is proposed which results in the main works commencing in December 2021 and being completed based on four signalling phases by September 2022.

Table 3-8: Phased Approach

Phase	Route / Coverage	Dates
1	Ashington to Bedlington	December 2021 – February 2021
2	Bedlington North and South	March 2022 – May 2022
3	Benton East Junction	May 2022 – June 2022
4	Newsham	July 2022 – September 2022

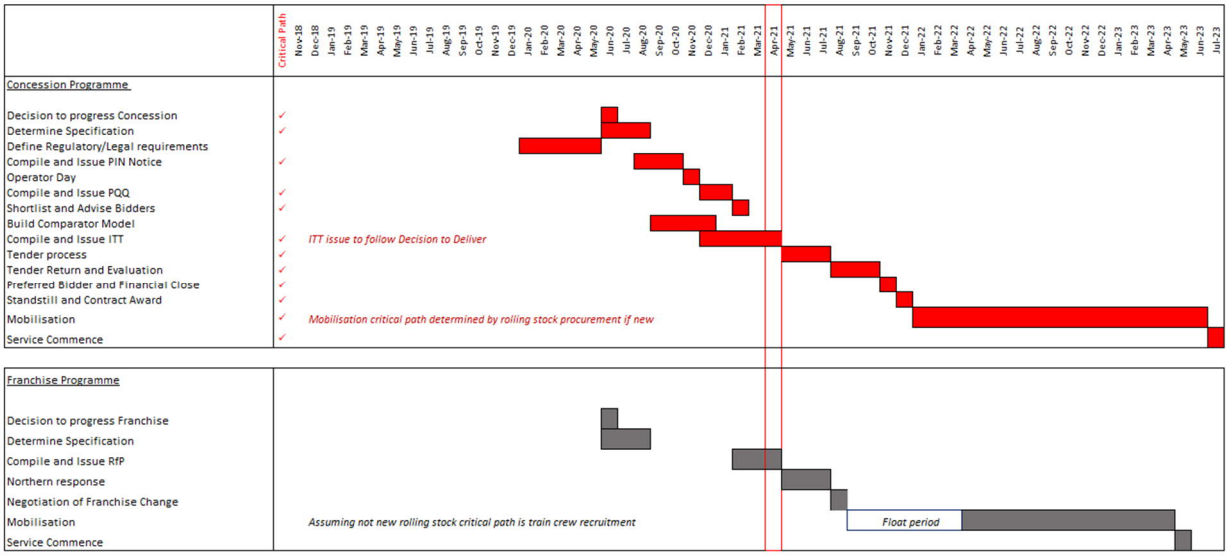
Thereafter, following completion of the double tracking south of Newsham in December 2022 and stations completion in January 2023, entry into service, operational training and handover activities are assumed to be completed by late Spring 2023

Figure 3-4: Indicative Programme



To provide further clarity on the programme, in Figure 3-5, indicative timescales for procurement through Phase 1 have been shown separately for the Concession-based and Franchise-based operating models. Work will continue through the Design stage with relevant industry stakeholders to refine this programme accordingly.

Figure 3-5: Procurement Timescales through to Phase 1



Irrespective of the method chosen in respect of procurement and delivery of the final design and main works contracts the Contracting Authority will need to assemble a dedicated Project Management Team to manage the process through to completion. The procurement of the Project Management team itself is intended to take place through the latter part of the Design phase and will require the following areas of expertise:

- Project Management
- Design Management
- Commercial Management
- Site/Works Supervision
- Legal and Property Management
- Stakeholder and Communications Management
- Regulatory and industry processes
- Operational Interface Management including Timetable implementation
- Planning and Ecology

The Management Case explores in more detail the availability of sufficiently qualified resources required to undertake this work, but this is not a major risk to the project based on the capabilities of the project team currently in place.

The key risk area is the ability of the Contracting Authority to identify, procure and integrate the additional project management resources to meet the programme requirements.

3.7.2 Deploy Phase

Depending upon the operational phase procurement route selected the contract management and duration would either follow the Franchise principles prevailing at the time (subject to outcome of Williams Review) or Concession principles to be determined by the Concession procurer.

If the Concession is to include new rolling stock and a maintenance depot and depending on how these assets are to be procured, a Concession period of up to 15 years may be appropriate to provide the market with the opportunity to recoup its investment and incentivise a higher level of risk transfer. As discussed in previous chapters, a more detailed procurement risk strategy will be developed during the Design phase and included within the Full Business Case.

4. Economic Case

The Economic Case sets out the expected economic, environmental and social impacts of the Northumberland Line scheme. This has been undertaken through assessing the heavy rail options using both quantitative and qualitative measures and determining their resulting value for money.

4.1 Introduction

Northumberland County Council (NCC) is seeking to improve connectivity and accessibility in the South East Northumberland Corridor (SEN Corridor), in particular improving the links between towns such as Ashington and Blyth with Newcastle, with a view to encouraging more sustainable access to the key regional economic centre.

In 2011 AECOM was commissioned by NCC to develop an overarching evidence base for South East Northumberland[8]; considering economic, social and environmental aspects, including both current and future transport movements. Key challenges were drawn from the evidence base with a view to developing and assessing interventions designed to alleviate the identified challenges. This study showed that reopening the Northumberland rail line to passengers fully met the highest priority study objective of increasing access to job opportunities to South East Northumberland and reducing congestion. As well as this, reopening the line also met the further objectives of increasing public transport provision and reducing environmental impacts.

The background and progress on the scheme to date was discussed with the DfT in November 2011. The methodology for taking the scheme forward in terms of identifying a preferred option was founded on the feedback from this meeting and in accordance with the Guidance Note on Passenger Demand Forecasting for Third Party Funded Local Rail Schemes (DfT).

In 2012 AECOM was commissioned by NCC to undertake the initial business case work for the scheme. This focussed on developing a rail demand forecasting model covering the SEN corridor and an appraisal model to determine the economic costs and benefits. These tools were founded on TAG appraisal guidance. A range of heavy rail service options were identified through consultation with the rail industry, mostly focussed around providing one or two trains per hour between Ashington and Newcastle, whilst maintaining the current provision for freight services. Updates to this demand and appraisal analysis were undertaken in 2014 and 2016 to reflect the latest appraisal guidance; to incorporate opportunities to further define the core scheme proposition; and to robustly inform the wider rail investment debate including possible funding opportunities.

In parallel, NCC commissioned Network Rail to undertake early GRIP[9] work to identify and cost the engineering requirements necessary to re-introduce rail passenger services between Newcastle and Ashington. This reported in 2016 identifying a cost of £191m[10] at GRIP 2 level with some notable exclusions such as land purchase, statutory process and utility diversions. Following a value management exercise with stakeholders, including NCC and Transport for the North, in 2017 Network Rail subsequently identified circa £30m of net savings and reported this in 2018.

The reopening of the Northumberland Line to passenger services is being promoted by Northumberland County Council, as part of, and with the full support of, the North of Tyne Combined Mayoral Authority, established as a recent devolution deal with Government. A new governance model for transport has been created operating across the North East as a pragmatic solution to provide the flexibility to meet the area's unique circumstances. The North East authorities have agreed to continue to work closely with and through the North East LEP in delivery of the North East Strategic Economic Plan. The Northumberland Line scheme is one of the key transport schemes in the plan which will benefit the North East through enhanced sustainable transport connectivity.

[8] "South East Northumberland Public Transport Corridor Study" , AECOM December 2011

[9] Governance for Railway Investment Projects (GRIP) is the management and control process developed by Network Rail for delivering projects on the operational railway

[10] This was a P80 estimate including 40% risk contingency

Transforming Cities Funding has been made available to the region and the Northumberland Line is viewed as being a key element for inclusion in the emerging package of transport interventions to be considered for this funding, for which the SOBC has recently been submitted by the North East Regional Transport Tea. However, Transforming Cities funding would not be used to deliver all elements of the scheme due to the time period in which the money needs to be spent – this is discussed further below in the Option Appraisal section.

The national context is that in 2018 the government introduced the new approach for rail enhancements - Rail Network Enhancements Pipeline (RNEP), alongside Network Rail's 'Open for Business' initiative. RNEP moves the investment in rail enhancements away from rigid five year cycles and seeks to support enhancements to the capability of the railway by adding capacity as one of its four priority considerations for scheme progression. In addition to making railways safer and more reliable, the guidance supports some of the main objectives of the Northumberland Line, to offer new opportunities for citizens and businesses and to unlock much needed housing and economic growth.

The RNEP framework is a process for progressing rail enhancements that are seeking central Government funding. It is made up of five stages, separated by formal decision points as illustrated in Figure 4-1.

Figure 4-1: The RNEP Process

As central Government funding is likely to be sought for delivery of the full Northumberland Line scheme, the submission of this Outline Business Case (OBC) is intended to inform the 'Decision to Design', in line with RNEP guidance.

The government has identified four priorities for investment and action that contribute to achieving the goals set out in the Strategic Vision for Rail:

- Keeping people and goods moving smoothly and safely;
- Delivering the benefits from committed programmes and projects already underway;
- Offering more: new and better journeys and opportunities for the future;
- Changing the way the rail sector works for the better.

We consider that the Northumberland Line proposition contributes across all these key government priorities, and in particular strongly aligns with one of these, namely: Offering More: New and Better journeys and opportunities for the future.

Network Rail has recently designated the Northumberland Line scheme as an "Open for Business" scheme. This essentially opens up the scheme for potential third party delivery as a 'contestable project'. Contestable projects are funded projects that can be delivered by parties other than Network Rail, where it is safe to do so.

The analysis presented in this Economic Case is founded in the demand and appraisal work undertaken to support the OBC that informs the RNEP 'Decision to Design' and the Transforming Cities Fund bid. RNEP, alongside Network Rail's 'Open for Business' initiative, has fostered a new climate for the development of third party promoted rail investment. In particular, for the Northumberland Line scheme, this will allow NCC as scheme promoter to explore alternative delivery mechanisms and employ organisations other than Network Rail to develop the engineering solution and costs to feed into the scheme's emerging business case. A key objective of the analysis and work that has been undertaken to develop this SOBC and OBC is to bring down the capital costs first identified by Network Rail's GRIP 2 exercise and to also determine what can be delivered in line with the timescales imposed by the Transforming Cities Fund guidance.

In preparation for the SOBC, and now the OBC, submission the opportunity has been taken by NCC, as scheme promoter, to re-map the governance of the scheme in line with RNEP and the new approach to developing the scheme. A consultancy team, led by AECOM and supported by SLC Rail, has been commissioned by NCC to drive the development of the scheme through the RNEP process, taking into consideration opportunities that might exist around alternative delivery and funding, including:

- Refining the service and associated infrastructure options to facilitate the earliest and cheapest possible commencement of operations, based on the outcomes from the analysis that supported the SOBC and in line with potential funding opportunities;
- Re-visiting the demand and appraisal models to ensure they reflect the latest government appraisal guidance (TAG), that they have the necessary functionality to robustly model the emerging options and that the models are using the latest available data; and
- Incorporating the set of capital costs developed by the Consultant Team (that updates the initial costs developed for the SOBC).

Both the Department of Transport (DfT) and Transport for the North (TfN) have played a key role in the development of the scheme over the years. Previous business case work, including the development of the demand and appraisal models, has been reviewed by the DfT. As part of the preparation for the OBC the DfT are again playing an integral role through their participation on the Project Steering Group. TfN also participate on the Steering Group and separate meetings have been held to discuss scheme development.

This Economic Case contributes towards the overall Outline Business Case for the scheme through assessing the options to identify all their impacts, and the resulting value for money, in line with TAG and Treasury's requirements for appraisal. Following this introduction, the Economic Case will:

- set out the options that have been appraised;
- provide an overview of the economic appraisal process, including the assumptions used in the appraisal process;
- present the economic appraisal summary, setting out the demand, revenue, benefits and costs alongside other impacts. These include Appraisal Summary Tables; and
- identify the emerging Value for Money statement for the scheme at this stage of scheme development.

In May 2019 NCC submitted the Strategic Outline Business Case (SOBC) for the scheme, which informed the 'Decision to Develop' in line with RNEP guidance. At the SOBC stage a number of options were appraised that aligned with the emerging thinking around phasing of the scheme and service frequency variants (combinations of either 1 tph[11] or 2 tph peak and/or offpeak). A positive value for money outcome was identified for the scheme, with BCRs ranging from 1.96 to 2.97.

The DfT's Autumn 2019 Schemes Update (RNEP) confirmed that the Northumberland Line scheme had passed the Decision to Develop.

At OBC stage the expectation is that the appraisal summary and value for money statement is presented as being 'completed' The development of the bespoke demand and appraisal model at an early stage in the scheme development process has allowed for relatively detailed benefits analysis to be undertaken throughout the business case process. For the OBC, the demand and appraisal model has been updated in a number of key areas, which are discussed in the Economic Appraisal Report (EAR) – Appendix C. The inclusion of wider economic benefits in the OBC means that both a Level 1 and Level 2 BCR can be determined for the scheme. Significant work has been undertaken on the engineering aspects of the scheme development between the SOBC and OBC stages, with the production of an Option Selection Report (Appendix E) and cost estimates produced at a 'GRIP 3 equivalent[12]' level.

[11] Trains per Hour

[12] The cost estimates are based on a design commensurate with Network Rail GRIP stage 3. Essentially, this is not a Network Rail project, and therefore GRIP is not being followed. However, the design has been developed to that level and enough to inform the costs to at least that level of accuracy.

The purpose of an OBC is to inform the Decision to Design process by identifying a preferred way forward for the scheme. A considerable amount of engineering and operational analysis has been undertaken since the SOBC to identify a preferred way forward that identifies:

- the preferred engineering options (for example, station sites and additional trackwork);
- the preferred phasing solutions that align with the funding programmes; and
- the preferred timetables that align with the phasing solutions.

In addition, the OBC presents two approaches to procuring the operation of the service; via the existing franchise or via a Concession arrangement. Both would deliver the preferred scheme as identified above. The presentation of these alternative operating scenarios is in line with the government's aspiration for scheme promoters to investigate alternative methods for scheme delivery, and both were discussed in detail in the Commercial Case. The intention would be that these would be further developed as the scheme progresses through the Design Stage. Clearly the alternative operating scenarios will have different impacts on the value for money appraisal of the scheme and these impacts are presented in the Economic Case below.

An Economic Appraisal Report (EAR) has been produced for this OBC and sits behind the Economic Case as Appendix C. This document contains the Appraisal Specification Report and Option Appraisal Report and provides details regarding the development of:

- the options to be appraised (timetable development, etc);
- the demand forecasting model, including calibration and validation;
- the demand forecasts by option;
- the appraisal model, including the derivation of user and non-user benefits and costs;
- the economic appraisal outputs by option; and
- sensitivity testing.

4.2 Option Appraisal

The Strategic Case has set out the case for intervention in the South East Northumberland corridor and identified that a heavy rail-based solution was the preferred solution that met the overall objectives of the scheme. The Economic Case, therefore, has progressed the appraisal around the heavy rail options, taking account of the phasing and operating scenarios, the development of which are discussed below. The Economic Appraisal Report, contained in Appendix C, sets out how these options have been developed in more detail.

The Northumberland Line scheme consists of the re-introduction of rail passenger services over an existing freight-only line in order to link key towns and communities in the SEN corridor with Newcastle. The following figure presents the line of route, which utilises the East Coast Main Line (ECML) to Benton North Junction at which point the existing freight-only line diverges to run parallel with the Tyne & Wear Metro line as far as Northumberland Park, where it is envisaged that a new platform will be constructed to facilitate interchange between rail and Metro services. The line of route then turns northwards towards Seaton Delaval, skirting the western edge of Blyth before arriving at Ashington. There are freight-only connections off this line of route towards the Port of Blyth, Morpeth (for connections back onto the East Coast Main Line) and extensions beyond Ashington towards the Lynemouth Power Station.

Stations are proposed at Northumberland Park (for connections with Metro services), Seaton Delaval, Newsham, Blyth Bebside, Bedlington and Ashington. Services are also assumed to call at Manors station on the ECML, although as the scheme is further developed it may be that there are operating tensions with ECML capacity resulting in a reduced amount of trains calling at Manors.

The existing route is single track from Benton North Junction as far as Newsham and then double track through to Ashington.

Figure 4-2: The Northumberland Line

The full scheme, as considered by NCC, is to deliver an all-day half-hourly service between Ashington and Newcastle, with competitive journey times. Hourly service patterns have also been considered in the previous work undertaken to date. Anything less than an hourly service pattern was not considered to be an attractive service and the infrastructure constraints and requirement for an hourly freight path meant that a frequency of three or more trains per hour would be difficult to timetable and likely result in the need for prohibitive infrastructure intervention.

The development of the appraisal options for the OBC was informed by the approach to developing infrastructure solutions that could deliver a rail service between Newcastle and Ashington. A phased approach to infrastructure enhancement was adopted in order to facilitate the identification of an initial version of the full scheme as envisaged by NCC that might be able to be delivered more quickly and at a lower cost than delivering the full scheme in one go (of particular relevance being the need to avoid triggering the requirement for a TWAO[13]). This 'first phase' of scheme development could support initial funding opportunities, such as Transforming Cities Funding that has a time limit for funding, with a view to ultimately delivering the full scheme thereafter.

The full scheme, as specified by NCC, delivers a rail service that moves significantly towards meeting TfN's LTRS objectives (desirable minimum standards of a half-hourly service and an average speed of 40 mph). By adopting a phased approach to deliver this scheme, the scheme promoters are ensuring that they maximise the funding opportunities available to them at this time, as well as ensuring that the local and regional benefits associated with the scheme start to flow as soon as feasibly possible.

[13] Transport & Works Act Order

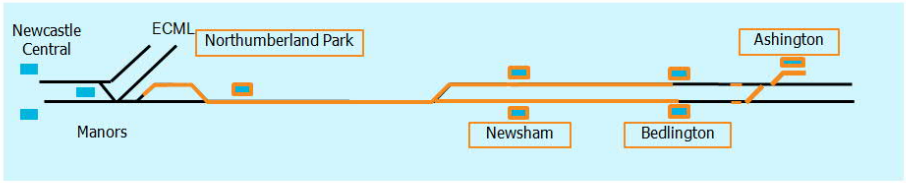
This approach to developing options differs from the previous studies undertaken, where the options developed were focussed on what would be required to deliver a set of timetable aspirations. For example, Network Rail's GRIP work identified, as per their remit, what they considered would be necessary to deliver a half-hourly service all day and was not necessarily focussed on what was the minimum infrastructure requirement to deliver a passenger service.

Therefore, in the first instance for the SOBC, a set of infrastructure enhancement phases were developed that established the line speeds and capacity along the route, driven by affordability, speed of delivery and planning consent processes and resulting in the identification of four Infrastructure Phases. For the OBC, two infrastructure phases have emerged from an integrated review of operational and engineering constraints through the Develop Stage on the assumption that the planning and land assembly constraints relating to Seaton Delaval and Blyth Bebside stations would be resolved co-terminously with the acquisition of funding for Phase 2[14].

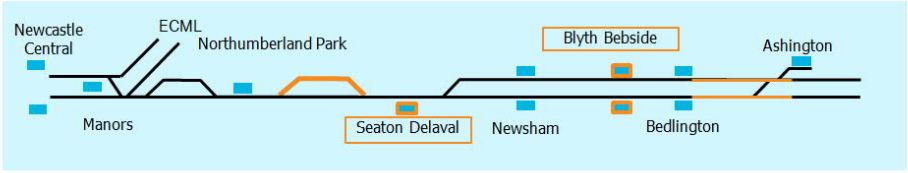
The following figure illustrates these two infrastructure options.

Figure 4-3: Schematic Diagram of the Infrastructure Phases

Phase 1: Initial hourly service
4 new stations; Line-speed increases Benton-Newsham; Double track extension south of Newsham; LX upgrades; Turnback facility at Ashington off Main Line; Junction improvements Bedlington North



Phase 2: Half-hourly service
Passing loop between Holywell LX and Seghill LX, new stations at Seaton Delaval and Blyth Bebside, line-speed increases north of Bedlington.



Phase 1 enables an hourly passenger service to four stations with the option of a higher tidal peak frequency into/out of Newcastle. It requires line-speed improvements between Benton North junction and Newsham, the extension of double track south from Newsham, a new turnback siding at Ashington for train reversal and level crossing and signalling upgrades to enable passenger services to operate (with associated line speed improvements). Phase 2 would deliver the 'full scheme' – a half-hourly service to six stations. It requires a new dynamic passing loop between Northumberland Park and Seaton Delaval for performance robustness and also to enable freight and passenger services to cross each other at certain times in the hour. Also, further line-speed improvements north of Bedlington are required to help offset the journey time impact of the two new stations.

Phase 2 builds on the investment delivered in Phase 1, and the design team has developed the process to minimise any subsequent re-work. Although the delivery strategy envisages these as being incrementally delivered as funding and consents allow, it is entirely possible that Phase 2 could be delivered as a single package if appropriate. However, due to the statutory approvals required, Phase 1 could be delivered quicker, allowing a scheme to be operational in a much shorter time.

The SOBC looked at options that provided an hourly service all day, alongside options that enhanced the hourly all day service with additional tidal peak services in the peak hour using the same level of rolling stock resource. In all cases, the hourly service with peak extras demonstrated a better financial and economic business case compared to a standard hourly all day service pattern. On that basis, the OBC has focussed on Phase 1 delivering an hourly service with an additional tidal peak hour service.

[14] However, it would be possible to operate the Phase 1 timetable with the additional two stations should the introduction of the Phase 2 half-hourly service be delayed creating a Phase 2a comprising 6 stations and hourly service

Finally, two operating scenarios have been presented in the OBC depending on whether the service is delivered by the existing franchise or via a Concession arrangement (discussed in the Commercial Case). Whilst these both deliver the same service that can be operated in Phase 1 or Phase 2, they would generate differences in terms of scheme costs and benefits that need to be separately identified and captured through the economic appraisal.

The above has been translated into options for the purposes of demand forecasting and developing the economic appraisal. These options therefore focus on the delivery of different service frequencies that the infrastructure phases and operating scenarios are able to support and are summarised in Table 4-1.

Table 4-1: Appraisal Options

Infra. Phase ID	Operating Scenario	Appraisal Option ID	Stations Served	Service Headways (peak/ofpk)	Ashington-Newcastle Journey Time	Freight Paths (does option facilitate 1 tph in both directions all day?)
IP1	Franchise	**T1**	4	40* / 60	32	no (paths restricted in both directions in the peak hour only)
	Concession	**A1**	4	40* / 60	30.5	
IP2	Franchise	**T2**	6	30 / 30	35	no (paths restricted in both directions in the peak hour only)
	Concession	A2	6	30 / 30	32.5	

* three services across a two-hour peak period – essentially a half-hourly service in the peak hour in the peak direction only

Options T2/A2 can be viewed as being the 'full scheme' that delivers a half-hourly service all day, serving all the anticipated stations in the corridor and achieving the fastest realistic journey time. It is estimated that the earliest that the full scheme could be delivered by would be 2025. Options T1/A1 could be considered to be an option that delivers a passenger service on the corridor within the shortest practical timescales, with an estimated delivery in 2023. In that context, Options T1/A1 become a strong candidate for the Transforming Cities Fund bid.

For the purposes of the OBC it has been assumed that a conventional delivery of the infrastructure enhancements is undertaken. In that respect it would be Network Rail that delivers the infrastructure enhancements and then owns them (with the stations operated by the service operator). The exception to this would be the station car parks, which are assumed to be operated by NCC.

As discussed above, the rail service delivery is now being appraised under two possible scenarios – via the existing franchise or via an operating concession. Whilst these both deliver the same service that can be operated in Phase 1 or Phase 2, they would generate differences in terms of scheme costs and benefits that need to be separately identified and captured through the economic appraisal. The key differences are highlighted below:

- Franchise: Assumes use of Class 170 diesel rolling stock (2-car rolling stock, with peak train strengthening to 4-car). Operation is added incrementally to the existing depot/traincrew at Heaton/Newcastle. Rail fares are standard RSP[15] fares in line with existing fares to/from Newcastle on existing rail corridors.
- Concession: Operator is procured via a Concession Agreement. The illustration presented in this OBC[16] assumes the use of Class 230 electric battery rolling stock (3-car rolling stock), requiring a small depot and office facility located on the Northumberland Line. The use of this rolling stock generates marginally quicker end-to-end journey times than for the franchise operation. Fares would be set in line with the Tyne & Wear Metro fare zones, thus facilitating ticketing integration between Metro and Northumberland Line services.

[15] Rail Settlement Plan
[16] These organisations (Vivarail Ltd and Vintage Trains Ltd) were asked to supply quotes for operation of the service to a specification aligned with Options A1 and A2. These are not in any way binding and have been provided in order to inform the OBC and ongoing development of the Northumberland Line scheme. Their use is intended to provide an indication of the likely level of costs associated with a Concession operation.

4.3 Overview of Appraisal Process

For a comprehensive description of how the demand and appraisal models were developed please refer to the Economic Appraisal Report in Appendix C. This sets out how the scheme benefits and costs have been calculated and processed in order to prepare an appraisal in line with DfT guidance (TAG). This involves the creation and population of scheme 'Transport Economic Efficiency' (TEE), 'Public Accounts' (PA) and 'Analysis of Monetised Costs and Benefits' (AMCB) tables, with the main products being the Net Present Value (NPV) and the Benefit/Cost Ratio (BCR).

How the benefits and costs are brought together in the final TEE, PA and AMCB tables to produce the NPV and BCR can vary depending on the transport scheme being appraised. In particular, TAG appraisal guidance suggests that rail scheme costs and benefits have to be treated in a different way to (say) how a major highway or bus-based scheme might be processed. This is because of the specifics of the rail industry and how the private sector and public sector finances operate via franchising. The appraisal follows the latest TAG guidance for appraising rail schemes. The basic premise is that after any current rail franchise expires, all rail operating costs and rail revenues ascribed to the scheme should be transferred to government (to be factored into whatever the government wishes to 'buy' in the next round of franchising). Therefore, the rail private sector provider impacts in the TEE table are neutralised (by adjusting the grant/subsidy value) and the rail costs/ revenues transferred to the PA table.

Thus in this appraisal the benefits are made up of user, non-user, environmental and accident benefits minus the reduction in bus revenue and indirect tax revenues. It should be noted that Tyne & Wear Metro related revenue impacts are recorded in the PA table as a Local Government revenue impact. The costs are made up of the scheme costs (investment and operating costs) minus the rail and Metro revenues. These are combined to generate a Level 1 BCR[17]. The addition of wider economic benefits, which have now been determined for the OBC, generates a Level 2 BCR.

The scheme appraisal has assumed a standard 60 year scheme appraisal period (in this case either 2023 to 2082 for Options T1/A1, or 2025 to 2084 for Options T2/A2). Note that all benefits and costs described below are subject to standard discounting treatment (as per TAG guidance: discount rate of 3.5% for years 1 to 30 and 3% for years 31 to 60, discounted back to 2010) and all monetary values are presented at 2010 prices. All relevant benefits are adjusted to account for ramp-up in demand over the first three years of the service (53% in year 1, 78% in year 2, 90% in year 3, 100% thereafter (source: PDFH)). TAG guidance also dictates that in the appraisal of a rail scheme demand growth, which determines the level of benefits, has to be capped 20 years from the date of the appraisal (in this case from 2039), although benefits are allowed to grow beyond that date in line with pre-determined population growth.

Two forecast years were modelled, 2023 (assumed opening year) and 2039 (demand cap year), and therefore the benefits have been determined based on data from these two years. Demand levels and thus benefits between 2023 and 2039 have been interpolated, whilst post-2039 demand and benefits have been capped at 2039 levels with an allowance for population growth in line with appraisal guidance.

The modelling applies the latest standard TEMPro version 7.2 growth rates by model zone, mode and time period to generate future year peak and interpeak matrices by mode. These are then combined to generate total peak and interpeak hourly matrices across all modes. The mode choice model then works out how the relative changes in costs and times by mode into the future impact mode shares for the 2023 and 2039 scenarios.

[17] Benefit Cost Ratio

The standard rail demand forecasting tools, such as MOIRA and elasticity-based approaches, were considered to be unsuitable for this study, given that it is a new passenger service running over an existing freight-only route. The requirements were that the demand forecasting has to be appropriate to support the development of the scheme going forward, including:

- providing robust forecasts of demand and revenue to inform the business case for the scheme in line with RNEP requirements;
- to inform rail industry stakeholders as to the potential viability of the scheme from both a financial (franchise subsidy) and economic (value for money) perspective;
- providing the necessary information to NCC to support their decision-making process in terms of regionally allocated capital funding (and also to note that there could be an expectation that the scheme would have to be revenue funded locally for the initial years of operation[18]); and
- ensuring that the demand model developed can be easily updated, is transparent and has the technical capability to inform the scheme development through to Full Business Case/Decision.

Therefore the modelling structure needed to be flexible and disaggregate enough to be able to distinguish between various options that may be developed (options could be specified in terms of differing journey times, different stations, different service patterns, stopping patterns, etc). This in turn required that an appropriate zoning system was developed and that the journeys by all available modes are assessed, so that modal transfer can be determined. Given the nature of the rail network in the study area, there is limited scope for multi-routing and therefore the need for a network assignment-based approach was deemed to be unnecessary. It was therefore considered that the most appropriate approach was to build a spreadsheet-based mode-choice model, with appropriate imported 'off-the-shelf' parameters, calibrated to ensure a suitable level of validation to the study area. This approach is recommended in the PDFH and ensures good practice is adopted, in that the forecasts are generated 'bottom-up' with built-in sense checks and more formal validation processes at key stages/building blocks. Using a spreadsheet-based platform also ensures model transparency and removes any 'black box' issues.

The mode-choice model was built to represent trip decision-making in the South East Northumberland (SEN) corridor only. Longer distance movements are represented by the application of an appropriate demand uplift factor based on observed levels of rail demand on other rail corridors into Newcastle, whilst new (or 'induced') demand was determined by the application of an uplift factor based on evidence from other new rail schemes across the UK.

4.4 Summary of Demand and Revenue Forecasts

The demand and revenue estimates from the demand model are presented overleaf for the scheme opening year and the future forecast year of 2039, taking into account demand ramp-up (as applied in the modelling and appraisal in line with TAG guidance). It is assumed that Phase 1 (Options T1 and A1) would start operation in 2023, whilst the Phase 2 (Options T2 and A2) would commence operation in 2025.

A more detailed analysis of the forecast demand and revenue is contained in the Economic Appraisal Report presented in Appendix C.

The scheme is predicted to generate between 0.75m and 1.45m return journeys by 2039, with annual revenue ranging from £8m to £13m in 2018 prices. The full scheme with a half-hourly service frequency (Phase 2) is expected to generate circa 55% more demand than Phase 1 with only four stations and an hourly service all day (with peak extras), despite the slightly longer end-to-end journey times due to the presence of two further stations in the corridor. The Concession-based options (A1/A2) generate 20% to 25% more demand than the Franchise-based options (T1/T2), reflecting the cheaper fares in the study corridor, plus the slightly faster journey times.

[18] The actual number of years that NCC might be expected to provide revenue support would be subject to confirmation in discussions with the DfT/TfN

Table 4-2: Demand and Revenue by Option, including demand ramp-up

Option	2023			2025			2039		
	Annual demand	Rail Revenue (£m)	Metro Revenue (£m)	Annual demand	Rail Revenue (£m)	Metro Revenue (£m)	Annual demand	Rail Revenue (£m)	Metro Revenue (£m)
T1	362,000	£3.2m	£0.2m				752,000	£7.8m	£0.4m
A1	442,000	£1.7m	£1.6m				927,000	£4.3m	£3.5m
T2				564,000	£5.1m	£0.3m	1,160,000	£12.0m	£0.6m
A2				704,000	£2.9m	£2.5m	1,453,000	£6.9m	£5.2m

Demand is number of return journeys made

Revenue at 2018 prices

The Metro revenue in Options T1/T2 reflect the additional demand interchanging onto Metro off the SEN corridor at Northumberland Park or Newcastle station (eg: an Ashington to South Shields journey). In the Concession-based scenarios (A1/A2) the Metro revenue also includes the revenue generated across all journeys made in the corridor. In these scenarios there remains a considerable rail revenue value that reflects the long-distance demand (circa 50% of the rail revenue in T1/T2 is associated with the long-distance demand). In overall net revenue terms, whilst the use of cheaper Metro farezone based fares increases overall demand it does not increase the net revenue compared to the Franchise-based options.

Modal transfer from car is the primary source of demand for the scheme, accounting for circa 45% of the scheme's rail demand. Approximately 1 in 6 journeys using the new rail service are forecast to have transferred from bus. Only very small levels of modal transfer are forecast from existing rail or from Metro (park-and-ride) - less than 3% in total. Just over 20% of rail demand is assumed to be induced demand – that is new journeys made as a result of the scheme. Finally, circa 10% of demand is assumed to be long distance demand (eg: an Ashington to London or Bedlington to Carlisle journey). It should be noted that the long distance journeys will include modal transfer from car, coach and rail too.

The rail scheme has the greatest impact on core flows into the Regional Centre (ie Central Newcastle). Rail modal share in the corridor as a whole (ie across all movements) is circa 5%, but car remains the dominant mode. Into Newcastle, rail becomes the dominant public transport mode, taking 15% to 20% modal share. For key flows specifically well-served by the scheme, such as Ashington to Newcastle, the rail modal share increases to between 20% and 25%. It was also observed that the peak rail mode shares are slightly higher than the interpeak rail mode shares – a reflection of the relatively poorer car journey times in the peak period and the greater levels of concessionary travel on bus at offpeak times.

The majority of trips on the corridor originate in Northumberland (circa 80% in all options), whilst Newcastle is the primary destination of outbound trips accounting for circa 40% of outbound alightings. Northumberland Park is also a key destination station for outbound trips, serving circa 19% of passengers. This reflects the interchange opportunities available at the station to change to a Tyne and Wear Metro service (over 60% of alighters from rail at Northumberland Park are interchanging with Metro), plus the large number of jobs concentrated in the Cobalt Park site to the south of the station.

The levels of demand forecast for the Northumberland Line have been benchmarked against the observed demand on the Tyne Valley line between Hexham and Newcastle. Trip rates were established based on observed/forecast demand aligned to the catchment populations around the stations. The implied trip rates across the Northumberland Line stations was observed to closely align with the observed trip rates at the Tyne valley stations.

4.5 Appraisal Summary

4.5.1 Introduction

This section summarises the appraisal of the options as set out in the Appraisal Summary Tables presented in Appendix D for each option. In line with appraisal guidance, each option has been assessed for its impacts on the Economy, Environment, Society and the Public Accounts. This builds on the initial assessment undertaken at the SOBC stage. At this OBC stage those impacts that contribute to the Value for Money evaluation, presented in the next section, have been quantified, including both Level 1 and Level 2 benefits. In addition, the environmental and social impacts have been scoped out to determine whether they can be quantitatively assessed or whether a qualitative level assessment remains appropriate, as indicated in Table 4.3.

Table 4-3: Appraisal Impacts

Appraisal Impacts		Quantitative or Qualitative Appraisal?	Appraisal Impacts		Quantitative or Qualitative Appraisal?
Economy	Business users & transport providers	Quantitative	Social	Commuting & Other users	Quantitative
	Reliability impact on Business users	Qualitative		Reliability impact on Commuting & Other users	Qualitative
	Regeneration	Qualitative		Physical activity	Qualitative
	Wider impacts	Quantitative		Journey quality	Qualitative
Environmental	Noise	Quantitative		Accidents	Quantitative
	Air quality	Quantitative		Security	Qualitative
	Greenhouse gases	Quantitative		Access to services	Qualitative
	Landscape	Qualitative		Affordability	Qualitative
	Townscape	Qualitative		Severance	Qualitative
	Historic environment	Qualitative		Option & non-use values	Qualitative
	Biodiversity	Qualitative	Public Accounts	Cost to Broad Transport Budget	Quantitative
	Water environment	Qualitative		Indirect tax revenues	Quantitative

The appraisal impacts that have been assessed quantitatively are presented by option wherever possible, being able to distinguish at a detailed level key elements such as demand, revenue and modal transfer impacts. This includes distributional impacts where they have been calculated.

For those appraisal impacts that have been assessed qualitatively at this stage there tend to be only marginal differences across the options. The only incremental differences of note between the options is between Phase 1 and Phase 2, where Phase 2 introduces two further stations in the corridor and there is a significant increase in the number of rail services operated across the whole day. On that basis, the appraisal set out below and contained in the ASTs discusses the qualitatively-assessed impacts at the broader level for the scheme as a whole (rather than individually by option).

In line with guidance, a seven point scale has been used to qualitatively assess those impacts that cannot be assessed quantitatively at this stage:

Large beneficial
Moderate beneficial
Slight beneficial
Neutral
Slight adverse
Moderate adverse
Large adverse

The full demand and revenue results by option, alongside details of the scheme costs, can be accessed via the Economic Appraisal Report contained in Appendix C. This report also contains further details of the appraisal outputs. A Distributional Impact Report has also been prepared to inform the AST and this is included as Appendix J. Where the distributional impacts have been determined for a given appraisal element then these are summarised below. Following initial screening, distributional impacts were assessed for noise, user benefits (other and commuting), severance and accessibility.

4.5.2 Economy Inputs

4.5.2.1 Business Users and Transport Providers

Quantified business user benefits and transport provider impacts have been determined and these are presented by option in Table 4-4. It should be noted that the rail revenue, Tyne & Wear Metro revenue and rail operating costs are transferred to the Public Accounts section of the appraisal in line with TAG guidance for rail scheme appraisal, and are therefore discussed in the relevant section of the appraisal summary below.

Table 4-4: Business User and Transport Provider Impacts by Option

Option	T1	A1	T2	A2
Business user time savings	25.1	32.2	39.7	51.6
Business decongestion benefits	14.6	18.1	21.9	27.7
Net bus revenue impacts	-8.6	-10.4	-12.2	-19.1
Total	**31.1**	**40.0**	**49.5**	**60.2**

£m Present Value over 60 year appraisal period (2010 prices)

Business user time savings increase from £25m through to £50m across the options presented, whilst decongestion benefits on the local road network increase from £15m through to £30m. The increases represent moving from a 1tph operation to a 2tph operation with two additional stations (Phase 1 to Phase 2) and also from a Franchise-based operation to a Concession-based operation (with lower fares that generates more demand).

There is a net reduction in bus revenue recorded across all options. This reflects modal transfer from bus to rail, which is outweighing the additional bus revenue associated with rail users using bus to access the new rail stations. The analysis suggests that the impact of the scheme in net terms on the number of journeys made by bus is neutral – that is the number of journeys lost through modal transfer from bus to rail is offset by the number of additional journeys made by bus to access/egress the rail stations in the corridor. However, because the average length of bus journey is significantly shorter to access the local rail station, there is a net reduction in bus revenue overall.

4.5.2.2 Reliability Impacts on Business Users

The introduction of a fixed link public transport service in the corridor will provide better journey time surety for journeys between the towns served in the corridor and the Regional Centre of Newcastle. At the moment, all transport options rely on the car or bus in the corridor and this is becoming increasingly unreliable in terms of journey times, particularly in the peak periods (as evidenced in the Strategic Case).

The introduction of the Northumberland Line service will add 1 tph or 2 tph onto the East Coast Main Line (ECML) between Newcastle Central station and Benton North Junction. Whilst the introduction of the new service is some distance into the future, given the long lead times for timetable planning, an exercise has been undertaken to determine whether the introduction of the new service alongside other confirmed timetable changes over this section of route can be accommodated. This initial overview of the ECML timetable for December 2021 assumed today's level of service, plus the additional TransPennine Express service to Edinburgh (1tph) and the First Open Access service between Edinburgh and London (up to 5 services per day in each direction). The proposed Northumberland Line service pattern was then overlaid for each option, which demonstrated that sufficient capacity exists with the currently assumed additional services.

However, what is not known at this stage is exactly where all of the services will be 'on the graph' (ie at what times around the clock the trains will present themselves within the studied section of route), so this remains at this stage primarily a technical exercise to demonstrate capacity exists between Newcastle and Benton North Junction and also within Newcastle station. The exercise has illustrated that some infrastructure enhancements may be needed to ease Newcastle Central station working, but these are as much generated by existing industry proposals in terms of longer trains and new services than the Northumberland Line services per se. The development of the timetable, and the potential for impacts on service reliability associated with the introduction of the Northumberland Line service, will be further refined, modelled and consulted during the Design Stage with the rail industry and the ECML Dec 2021 Event Steering Group and reported in the FBC. The current project programme envisages Network Change being established by September 2020.

Impact on Reliability (business) for the overall scheme (across all options):	Slight beneficial

4.5.2.3 Regeneration

Although there has been much investment in South East Northumberland in recent years, the area has never fully recovered from the closure of the mining industry and suffers from many of the social problems inherent with poor employment opportunities. Reopening the Northumberland Line to passenger services will regenerate the region by providing access to employment opportunities in Newcastle and beyond, as well as places such as Cobalt Business Park, which is located close to the proposed station at Northumberland Park. Not only will the line provide opportunity outside of Northumberland, better transport connections will also make investment in South East Northumberland more attractive, and will help to deliver strategic employment sites such as Blyth Estuary. The reopening of the Northumberland Line therefore presents a real chance to connect our areas of need with areas of opportunity.

Impact on Regeneration for the overall scheme (across all options):	Moderate beneficial

4.5.2.4 Wider Impacts

Level 2 Wider Economic Benefits (WEBs) have been considered for the OBC in terms of the assessment of the wider economic impacts of the scheme.

The Economic Narrative that supports the OBC, setting out the context for developing the wider economic benefits, is included as Appendix K. Further detail outlining how the WEBs have been calculated, in line with TAG guidance, is set out in the Economic Appraisal Report (Appendix C).

Level 2 WEBs are normally expected to constitute the following benefits:

- Agglomeration Impacts - most likely when a potential transport scheme falls within or is neighbouring a Functional Urban Region;
- Output Change in Imperfectly Competitive Markets - most likely if businesses benefiting from the transport improvement have large shares of their markets; and
- Labour Supply Impacts - transport is most likely to be a barrier to employment when an area has poor connections to employment centres and/or high transport costs relative to incomes.

The Economic Narrative summarises discussions with local bodies and stakeholders who are supportive of the scheme and can see the benefit in terms of access to employment and improved labour catchment areas. However, little evidence has been gathered to suggest there will be significant benefits to businesses by bringing areas closer together. Thus, only agglomeration and labour supply impacts have been estimated for each of the core scenarios.

Table 4-5 summarises the levels of WEBs generated by the scheme. It can be seen that the majority of the WEBs constitutes agglomeration benefits.

Table 4-5: Wider Economic Benefits

Option	Agglomeration Benefits	Labour Supply Impacts	Total WEBs
T1	*39.5*	*2.9*	42.4
A1	*43.5*	*2.7*	46.1
T2	*42.3*	*3.4*	45.7
A2	*47.2*	*3.3*	50.4

£m Present Value over 60 year appraisal period (2010 prices)

4.5.3 Environmental Impacts

An initial (desk and site survey) appraisal of the potential environmental impacts of the scheme has been undertaken that reflects the 'Develop Stage' reported in this OBC. In accordance with the TAG guidance these have been quantified where possible and where they have not, they have been scoped out. The appraisal has addressed potential impacts arising from noise and impacts on greenhouse gases and local air quality. Further details relating to how these have been quantified can be accessed in the Economic Appraisal Report (Appendix C), along with a more detailed analysis of the results. The potential impacts on 'Environmental Capital' (landscape, townscape, historic environment, biodiversity and water environment) have been appraised on a qualitative basis in line with TAG (Section 5 in TAG Unit A3). This appraisal was undertaken to inform the; 'Request for a Screening Opinions' (RfSO) and the scope and content for the pre-planning application enquiries made to both Northumberland County Council and North Tyneside Council. These initial appraisals have been used to inform the scope of the further studies and assessments required to support the planning applications as part of the 'Design Stage'. Full details can be found in Appendix L.

4.5.3.1 Noise

The noise-related benefits associated with car-km removed from the road network, via modal transfer from car to rail, have been calculated and are presented in Table 4-6.

The introduction of a regular rail passenger service in the corridor will introduce more trains that will generate some new noise impacts on households close to the railway. It is an existing operational railway, but the current number of rail services is low as it is only used by infrequent freight services. The introduction of a regular passenger service will introduce between 40 (Phase 1 options) and 64 (Phase 2 options) new passenger services per day (Monday to Saturday). It is envisaged that these services will operate between circa 05:30 hours to 00:00 hours. So, whilst not operating through the night, there is likely to be some sleep disturbance possible at each end of the operating day.

Noise disbenefits associated with the operation of additional train services have been calculated in line with TAG guidance Unit A3, including the identification of households along the railway corridor that would be forecast to experience a change in noise levels as a result of the introduction of the scheme. For the Phase 1 options, just under 3,700 properties are anticipated to experience some form of increase in noise levels, with 163 experiencing a decrease. For the Phase 2 options nearly 6,400 properties are estimated to experience a noise level increase and 192 properties experience a noise level decrease. Using the TAG Noise Workbook, these have been converted into a monetary level of disbenefit, summarised in Table 4-6.

Table 4-6: Noise Related Benefits over the Scheme Life

Option	Noise benefits due to reduced Car-km	Noise disbenefits due to additional trains	Net noise (dis)benefits
T1	+0.86	-1.59	-0.73
A1	+1.06	-1.59	-0.53
T2	+1.23	-2.93	-1.67
A2	+1.57	-2.93	-1.36

£m Present Value over 60 year appraisal period (2010 prices)

The scheme registers a slight net noise disbenefit in monetary terms, due to the noise disbenefits associated with the additional rail services outweighing the noise benefits associated with car-km removed from the road network. The Phase 2 options generate a higher level of disbenefits than the Phase 1 options, given that they operate just under twice as many additional services.

In terms of the distributional impacts analysis (Appendix J), the results presented for the impacts in noise levels on certain groups illustrate that changes occur along the rail line. This is to be expected as there are new passenger services being introduced that currently are not in existence. However, the scheme also has positive impacts in noise reduction, in particular, adjacent to the Hartley Curve. There are a number of amenities that fall outside of the area of impact, nursing homes, schools etc, which will not be impacted by noise changes whatsoever. Others in the impact area will be subject to an increase in noise, but the increase in noise levels is not expected to be perceptible.

4.5.3.2 Air Quality

In terms of total transport emissions, rail transport accounts for less than 1% of the total. Therefore, even with the most rail orientated transport schemes, perhaps doubling the rail kilometres, the potential for any significant impact on emissions will lie mainly with the saving in emissions from road transport brought about by modal transfer, rather than those generated by rail. Hence, in line with TAG guidance, it is considered that emissions from rail sources can be scoped out in this case. The introduction of a regular rail passenger service in the corridor in Options T1 and T2 will introduce more diesel trains that will generate some air quality impacts on households close to the railway. However, Options A1 and A2 assume battery-operated trains and in the longer term it is noted that the Government has stated that diesel-only trains will be phased out by 2040. The introduction of a regular passenger service will introduce between 40 (Phase 1) and 64 (Phase 2) new passenger services per day (Monday to Saturday).

The air quality benefits associated with car-km removed from the road network, via modal transfer from car to rail, have been calculated and are presented in Table 4-7.

Table 4-7: Air Quality Benefits from Modal Transfer from Car

Option	T1	A1	T2	A2
Air Quality Benefits	0.07	0.09	0.08	0.10

£m Present Value over 60 year appraisal period (2010 prices)

The quantified benefits relating to air quality improvements resulting from modal transfer from car are relatively small, making it difficult to really distinguish between options.

4.5.3.3 Greenhouse Gases

Greenhouse gas emissions are assumed to be proportionate to the number of litres of fuel burnt or the number of kilowatt-hours (kWh) of electricity used, with different rates for different fuels and vehicle types. Two impacts have been measured for the OBC:

- There will be a saving in emissions associated with car-km removed from the road network, via modal transfer from car to rail; and
- There will be additional emissions associated with the operation of the new passenger rail service. The introduction of a regular passenger service will introduce between 40 (Phase 1) and 64 (Phase 2) new passenger services per day (Monday to Saturday).

The TAG Greenhouse Gases Workbook has been used to determine the extent of the anticipated change in CO2 emissions and their conversion to a monetary value. The analysis takes into account the extent of electric-operated cars (as per TAG guidance) and trains (services are assumed to be operated by battery-operated trains in the Concession-based scenario). In line with TAG guidance, any CO2 emissions generated by electric-operated vehicles (whether car or train) are assumed to be 'traded'. This means that these emissions would not have an impact on the UK net carbon account and therefore do not contribute to the BCR calculation. However these impacts are reported via the ASTs. All CO2 emissions generated by other transport energy sources, such as diesel, petrol, etc, are deemed to be 'non-traded' and as such impact on the UK's net carbon account and are reported both via the BCR and the ASTs.

The results of this calculation are presented in the following table

Table 4-8: Greenhouse Gases related benefits over the scheme life

Option	Total Scheme Life Emissions, tCO2e			Total Scheme Life Monetary Value, £m Present Value			
	Non-Traded emissions	Traded emissions	Total emissions	*Non-Traded Benefits due to reduced Car-km*	*Non-Traded Disbenefits due to additional trains*	Non-Traded Net (dis)benefits*	Traded Net (dis)benefits
T1	50,268	-1,144	49,124	*2.26*	*-4.52*	-2.25	0.05
A1	-63,528	6,580	-56,947	*2.79*	*0.00*	2.79	-0.27
T2	81,356	-1,641	79,715	*3.16*	*-6.81*	-3.65	0.07
A2	-90,094	9,386	-80,707	*3.97*	*0.00*	3.97	-0.39

* These values contribute to the BCR calculation

All the options generate CO2 emissions savings from the reduction in car-km as a result of modal transfer to rail. However, the Franchise-based options (T1 and T2) are assumed to operate diesel-powered trains for the full 60 year scheme life which results in a net increase in non-traded CO2 emissions, as the additional emissions associated with additional train km outweighs the reduction in emissions from the reduced car-km. It should be noted, however, that this can be considered a pessimistic assumption given the current government policy to eradicate diesel-only operated trains by 2040 in the UK. A sensitivity test has been undertaken that reflects this policy position and the revised impacts on CO2 emissions for Options T1 and T2 indicate that the level of disbenefits associated with the operation of the new trains reduces considerably, as the replacement of diesel trains by electric trains in 2040 switches the Greenhouse Gases emissions from the non-traded to the traded sector of emissions. This in turn converts the overall net impact of Greenhouse Gases for these options into a positive benefit. In Options A1 and A2, where the train services are electric-operated, the non-traded benefits reflect the reduction in (diesel & petrol) car-km only. The levels of traded emissions and monetary values are a lot smaller, reflecting the separate treatment of energy consumption for electric-operated transport. As per the non-traded values, in Options A1 and A2 the impacts associated with the additional train-miles outweighs the reduction in (electric) car-km.

4.5.3.4 Landscape

The completed TAG Worksheets for Landscape are contained in Appendix L.

The basis for the scheme is an existing railway, where the physical interventions will be limited to the construction of some new stations or the restoration of some old station buildings. In addition some new track will be required to be constructed, but mostly within the existing railway curtilage. It is likely that existing railway infrastructure will be refurbished/replaced as appropriate.

The scheme is within a rural /urban transition area which requires an assessment against both Landscape and Townscape criteria.

A significant proportion of the works to implement the scheme are located within the existing railway corridor. This proportion includes:

- the construction works for the platforms for all the stations;
- some of the car parking to one of the stations (Bedlington);
- relaying of track; and
- works to and at the level crossings.

As these works are within the defined railway corridor the changes to the character of the local landscape will be very limited and localised.

The ancillary works to provide access to the associated car parking for four of the stations will take place outside of the railway corridor. The works will take place at the edge of existing settlements. In these locations there is a poorly defined transition between urban and rural landscape, with elements of both character areas. The landscape of these urban fringe areas will undergo some changes. However, given the interaction of rural and urban elements, the mosaic of uses will not be perceived as changing to any great extent, with the overall effect on the character of the local landscape being limited and localised. The scheme will include new tree planting and habitat creation which will be designed to mitigate any adverse impacts on the landscape and complement the existing character of the landscape.

The use of land for temporary storage and construction will change the local character of the landscape for a short period but will have no long lasting effects.

Impact on Landscape for the overall scheme (across all options):	Neutral

4.5.3.5 Townscape

The completed TAG Worksheets for Townscape are contained in Appendix L.

The basis for the scheme is an existing railway, where the physical interventions within the urban areas will be limited to the construction of some new stations or the restoration of some old station buildings. It is likely that existing railway infrastructure will be refurbished/replaced as appropriate.

Three of the stations are in urban locations. The townscape in the vicinity of the stations and the associated car parks will change. However, two of the sites for the stations are unused brownfield land with a generally unkempt appearance. The other urban location is in an existing railway cutting. The 'townscape' in these locations will be enhanced by the schemes with modern attractive stations with new lighting, signage, access arrangements and fencing. Three other stations and their associated car parks are on the edge of urban areas. Although these urban areas include unkempt and semi derelict areas, the scheme will cause a perceived extension to the 'townscape'. The high quality design, with attention to detail and integrated landscaping, will soften and improve the visual appearance of some of these urban edges. Enhancements to the railway corridor; with new boundary fencing, removal of derelict structures, the renovation of signal-boxes and level crossings and the introduction of new signage will upgrade the general townscape.

The majority of the proposed works are likely to have a neutral impact on Townscape; however, there is likely to be a moderately beneficial impact for the townscape of both Ashington and Bedlington.

Impact on Townscape for the overall scheme (across all options):	Neutral /	Slight Beneficial

4.5.3.6 Historic Environment

The completed TAG Worksheets for Historic Environment are contained in Appendix L.

The basis for the scheme is an existing railway, and at this stage it is not envisaged that there will be any adverse impacts on buildings of architectural or historic significance, nor areas or sites of historical significance.

The scheme will largely be constructed within the railway corridor and land immediately adjacent thereto. There are no Listed Buildings, Scheduled Ancient Monuments or Conservation Areas which will be impacted by the proposed works. Some locally listed heritage assets are within the study area. Although they will not be directly impacted by the scheme, there is the potential for the setting of the listed building 'Head office/ showroom of Delcor Furniture Ltd, Double Row' to be altered at a negligible scale. Based on the scheme design and careful siting of the works there will be a neutral impact on the setting of these assets and any adverse impact can be successfully mitigated.

Impact on Historic Environment for the overall scheme (across all options):	Neutral

4.5.3.7 Biodiversity

The completed TAG Worksheets for Biodiversity are contained in Appendix L.

A significant proportion of the proposed works for the scheme are located within the existing railway corridor. This proportion includes:

- the construction works for platforms for all the new stations;
- relaying of track; and
- works to and at the level crossings.

Existing trees, shrubs and other vegetation along the existing rail line will need to be removed to facilitate these works. Sections of the route have been identified as of interest for wildlife and are considered by the local planning authorities to function as a wildlife corridor. The Preliminary Ecological Appraisals (PEA's) have confirmed that the habitats within the existing rail corridor are replaceable in the short term and are commonly found in Northumberland and North Tyneside. The PEA's have confirmed that none of the land required for the stations or car park are formally 'designated' of local, regional or national importance. There is a site of National importance adjacent to the scheme. However, working methods will be adopted which will protect the integrity of this site from any adverse impact from the scheme.

The works to construct two of the new stations and the associated car parking, together with the works to construct the car parking for one other station, will take place on agricultural land. The PEA's have confirmed that this agricultural land is of negligible biodiversity value. The car park and some of the Seaton Delaval station will be constructed on a site which was a former coal pit which has now been reclaimed and is semi-naturally vegetated. The scheme can include off site habitat creation to ensure that there is no net biodiversity loss.

Some protected species including bats and great crested newts have the potential to be impacted by the scheme. However, detailed surveys have been used to inform the design so that protected species are not adversely impacted. Mitigation in the form of a sensitive Construction Environment Management plan will ensure no adverse impact on protected species during construction. The construction programme has been designed to comply with relevant biodiversity legislation.

The scheme will include additional habitat creation and landscaping at the new stations.

The removal of vegetation and trees is essential to allow the scheme to be constructed. This loss will have a short-term impact on the scale and extent of the habitats and local biodiversity resource. This is an adverse impact, notwithstanding it being only short term. Protected species can be safeguarded through translocation and mitigation. Taken together with the potential for mitigation the impact is determined to be Slight Adverse. However, it is not anticipated that there will be any significant impacts on ecological resources as a consequence of the proposed scheme.

Impact on Biodiversity for the overall scheme (across all options):	Slight adverse

4.5.3.8 Water Environment

The completed TAG Worksheets for Water Environment are contained in Appendix L.

A significant proportion of the works are within the existing rail corridor. Most of the works associated with the scheme have the potential to impact on the hydrology of the local areas. The water environment could be affected specifically by the construction works for four of the six new stations, all the new car parking; relaying of track; and works to and at the level crossings. These works have the potential to impact the quality and quantity of surface runoff into the local hydrological systems. Detailed working method statements (incorporated into Construction Environment Management Plans) will ensure that the potential for any effects during construction are mitigated.

A flood risk assessment will be undertaken for the entire scheme and this will inform the drainage designs for the stations, level crossings, relaying of any ballast and works to exiting drains etc. These assessments and designs will be compliant with CIRIA SuDS manual (C753) on assessing pollution and flood risk on controlled waters, including groundwater. This approach will allow any mitigation to be included in the detailed design and working methods so that there will be no significant impacts on the Water Environment.

Impact on Water Environment for the overall scheme (across all options):	Neutral

4.5.4 Social Impacts

4.5.4.1 Commuting and Other Users

User benefits and non-user benefits have been specifically calculated at this stage in the scheme appraisal. Details as to how these have been quantified are set out in the Economic Appraisal Report contained in Appendix C. User benefits are made of user time savings whilst the non-user benefits reflect decongestion benefits derived from the car km removed from the road network via modal transfer from car to rail.

These are presented by option in Table 4-9.

Table 4-9: User and Non-User Benefits by Option

Option	T1	A1	T2	A2
User Time Savings	157.3	193.5	235.4	295.3
Non-User Decongestion Benefits	64.3	79.0	93.1	116.5
Total	**221.6**	**272.5**	**328.4**	**411.7**

£m Present Value over 60 year appraisal period (2010 prices)

The Phase 1 scheme (Options T1 & A1) is estimated to generate over £200m of user and non-user time savings over the 60 year appraisal period. The full scheme (Phase 2) increases these benefits by 50%.

In terms of the distributional impacts analysis (Appendix J), the user benefits have been analysed across the full scheme options (Phase 2 options). The key findings from the analysis indicate that over the appraisal period the most deprived areas will receive a lower percentage of the benefits (55%) than the population within these groups (63%).

4.5.4.2 Reliability Impact on Commuting and Other Users

The introduction of a fixed link public transport service in the corridor will provide better journey time surety for journeys between the towns served in the corridor and the Regional Centre of Newcastle. At the moment, all transport options rely on the car or bus in the corridor and this is becoming increasingly unreliable in terms of journey times, particularly in the peak periods (as evidenced in the Strategic Case).

The introduction of the Northumberland Line service will add 1 tph or 2 tph onto the East Coast Main Line (ECML) between Newcastle Central station and Benton North Junction. Whilst the introduction of the new service is some distance into the future, given the long lead times for timetable planning, an exercise has been undertaken to determine whether the introduction of the new service alongside other confirmed timetable changes over this section of route can be accommodated. This initial overview of the ECML timetable for December 2021 assumed today's level of service, plus the additional TransPennine Express service to Edinburgh (1tph) and the First Open Access service between Edinburgh and London (up to 5 services per day in each direction). The proposed Northumberland Line service pattern was then overlaid for each option, which demonstrated that sufficient capacity exists with the currently assumed additional services.

However, what is not known at this stage is exactly where all of the services will be 'on the graph' (ie at what times around the clock the trains will present themselves within the studied section of route), so this remains at this stage primarily a technical exercise to demonstrate capacity exists between Newcastle and Benton North Junction and also within Newcastle station. The exercise has illustrated that some infrastructure enhancements may be needed to ease Newcastle Central station working, but these are as much generated by existing industry proposals in terms of longer trains and new services than the Northumberland Line services per se.

The development of the timetable, and the potential for impacts on service reliability associated with the introduction of the Northumberland Line service, will be further refined, modelled and consulted during the Design Stage with the rail industry and the ECML Dec 2021 Event Steering Group and reported in the FBC. The current project programme envisages Network Change being established by September 2020.

Impact on Reliability for the overall scheme (across all options):	Slight beneficial

4.5.4.3 Physical Activity

The scheme attracts some modal switch from car and from bus to rail. As a result, some previous car users will now start and end their journey using active modes – ie: walk or cycle. Some previous bus users might now have a longer walk to access the nearest rail station. It is recognised that increased physical activity has an important role to play in terms of generating health benefits. These impacts have not been quantified.

Impact on Physical Activity for the overall scheme (across all options):	Slight beneficial

4.5.4.4 Journey Quality

Journey quality impacts can be sub-divided into three groups, according to their nature:

- Traveller care: aspects such as cleanliness, level of facilities, information and the general transport environment – including levels of overcrowding. This scheme is introducing a new rail service into a corridor where one does not currently exist. Therefore station environments will be new and well-designed in line with the latest design principles. All stations and trains will be maintained and cleaned in line with existing practice. Train lengthening has been assumed in the business case on peak trains;
- Travellers' views: the view and pleasantness of the external surroundings in the duration of the journeys. The Northumberland Line runs through both urban and rural environments, with a mix of cuttings, embankments and including two large viaducts; and
- Traveller stress: frustration, fear of accidents and route uncertainty. Public information on timetables will be provided both online and at stations. The introduction of a fixed transport link engenders a degree of traveller certainty. Significant modal transfer from car (circa 45% of the forecast rail demand is estimated to have transferred from car) will lead to improved traveller stress.

Based on the TAG guidance a qualitative score can be determined by assessing that if the change in impact across the sub-factors above is, on balance, for the better, then the assessment is likely to be beneficial. The introduction of a new rail service in the corridor can be considered to improve traveller care, travellers' views and traveller stress, especially in the context of encouraging modal switch from car to rail. The estimated volumes of travellers using the new rail service (between 2,500 and 4,500 rail travellers per average weekday by 2039) would therefore make this impact Moderate Beneficial (as per TAG guidance).

Impact on Journey Quality for the overall scheme (across all options):	Moderate beneficial

4.5.4.5 Accidents

The impacts of accidents is measured in terms of the cost (to society and to the individual) saved per prevention of a fatality. All injury types are weighted in respect of a fatality. In terms of a rail scheme, there are essentially two impacts:

- The reduction in road traffic accidents due to the reduction in car km, via modal transfer from car to rail; and
- An increase in rail-related accidents due to the introduction of the new rail service.

The accident benefits associated with car-km removed from the road network, via modal transfer from car to rail, have been calculated and are presented in the following table

Table 4-10: Accident Benefits from Modal Transfer from Car

Option	T1	A1	T2	A2
Accident Benefits	12.3	15.1	17.9	22.5

£m Present Value over 60 year appraisal period (2010 prices)

The Phase 2 options generate circa 25% more benefits than the Phase 1 options, reflecting the greater demand catchment provided by the addition of two further stations to the scheme, plus the enhanced service frequency that attracts further modal transfer from car.

The introduction of a regular rail passenger service in the corridor will introduce more trains (between 40 (Phase 1 options) and 64 (Phase 2 options) new passenger services per day (Monday to Saturday)) that will generate some accident disbenefits. A forecast of the number of fatalities, major or minor injuries that might occur via rail accidents has not been specifically estimated for the scheme. However, the monetised disbenefits associated with increased passenger accidents are anticipated to be marginal compared to the benefits of reduced road traffic accidents[19].

Of particular note are the number of level crossings along the route which will need to be upgraded to reflect their greater use and the higher rail line speeds that will be introduced as part of the scheme.

In terms of the distributional impacts analysis (Appendix J), the screening process identified that there will be a reduction in vehicle kms travelled on the highway network as a result of the scheme, which should have a positive impact on the number of accidents. However, this impact will be dispersed over a large spatial area and is not considered to be significant. It was also identified that the increased number of train services on the railway line could lead to more conflict at level crossings. However, improvements will be made to the standard of crossings currently in place. On the basis of this evidence, no further distributional assessment was undertaken.

Impact on Accidents for the overall scheme (across all options):	Slight beneficial

4.5.4.6 Security

The introduction of a new rail service in the corridor introduces some new security issues that need to be mitigated, principally focussed around the presence of stations and the operation of rail services in the evening. The core proposition is that the new stations to be introduced along the corridor will be unstaffed. It is therefore anticipated that CCTV and alarm points will be provided at all the new stations as a minimum requirement. It is also envisaged that all rail services will have a conductor on-board the train.

Table 4.11 presents the completed TAG Worksheet.

In terms of the distributional impacts analysis (Appendix J), the new railway stations will enhance the security of the local area due to more people, CCTV, improved lighting and emergency contact points. However, railway stations can also attract crime and antisocial behaviour. Therefore the impact of the scheme on security is considered to be neutral and no further assessment was undertaken.

Impact on Security for the overall scheme (across all options):	Neutral

[19] Based on 2018/19 rail passenger fatalities and injuries on the railway (ORR statistics portal) and using TAG values per rail passenger accident (Table A4.1.5 in databook), an accident value of less than £0.08 per rail journey was determined (2010 prices). This would therefore translate into an accident disbenefit of no more than £0.2m per annum (2039).

Table 4-11: TAG Worksheet - Security

TAG Security Impacts Worksheet

Security Indicator	Relative importance	Without scheme	With scheme
	(High/Medium/Low)	(Poor/Moderate/High)	(Poor/Moderate/High)
Site perimeters,	Medium	Not applicable	High. Use of open fencing and clearly marked site
entrances and exits	High - some stations on the line will depend on good quality access paths	Not applicable	High. Use of open fencing and clearly marked site
Formal surveillance	High - Passenger expectation that CCTV exists	Not applicable	Moderate. CCTV will be installed. Remote surveillance.
Informal surveillance	Medium	Not applicable	Moderate. Will vary by station location. Active use of station buildings will be encourgaed (where applicable).
Landscaping	Medium	Not applicable	High. Positive use of landscaping features will be designed in.
Lighting and visibility	High - reflecting pasenger expectations	Not applicable	High. Good design to minimise obstructions.
Emergency call	High - stations will be unstaffed	Not applicable	High. Intention to provide good provision at each station, reflecting fact that stations will be unstaffed.

Approximate Number of Users Affected

Between 2,500 and 4,500 passengers per average weekday (2039)

Reference Source

Outputs from engineering design and demand model

Summary Assessment Score

Neutral

4.5.4.7 Access to Service

The appraisal of accessibility focuses on the public transport accessibility aspect of accessing employment, services and social networks. This provides a holistic approach to considering the accessibility needs of different groups of people, taking into account a wide range of factors, including journey times to reach key destinations, service frequencies and provision of accessible boarding at stations.

The introduction of a new rail service in the study corridor provides a new and alternative transport option for different groups of people to access employment and services, particularly linking areas of South East Northumberland with the Tyne & Wear conurbation. It is assumed that the rail facilities at stations will be designed in line with the latest accessibility regulations and guidance.

In terms of the distributional impacts analysis the accessibility benefits are expected to be significant and spread across a wide spatial area. The distributional impacts analysis is detailed in (Appendix J).

To examine the impact of the Northumberland Line on public transport accessibility, TRACC mapping has been conducted, which visually shows improvements in accessibility for a particular destination. In this appraisal, Newcastle Central Station has been appraised given that Newcastle city centre is home to a number of key services and facilities and will be the key destination for journeys using the Northumberland Line.

TAG A4-2 also recommends considering other elements of the scheme that would impact on accessibility in the form of an accessibility audit. Whilst there will be benefits to assessing the accessibility of the proposed station layouts, the scheme is not currently at a level of design to provide sufficient information. This will be looked at during subsequent stages of the study.

The results of the accessibility assessment show that the introduction of passenger rail services on the Northumberland Line will result in significant journey time savings for parts of South East Northumberland. This will benefit some of the most vulnerable in society, including those without access to a car, with car ownership rates in South East Northumberland being lower than the national average. The scoring of accessibility is not as high as might be expected given that the TRAAC mapping clearly shows accessibility benefits. This is due to the baseline population covering the whole of the catchment area for the Northumberland Line, which includes larger urban zones in Tyne and Wear. Overall, the accessibility impact of the Northumberland Line has been calculated as Moderate Beneficial.

Impact on Accessibility for the overall scheme (across all options):	Moderate beneficial

4.5.4.8 Affordability

Within the South East Northumberland corridor there are a number of areas of low income and deprivation – as outlined in the Strategic Case. The introduction of a new rail service in the study corridor provides a new and alternative transport option for different groups of people to access employment and services, particularly linking areas of South East Northumberland with the Tyne & Wear conurbation. However, it is acknowledged that a new rail service will likely charge higher fares than existing bus fares in the corridor (reflecting the faster journey times and higher quality 'offer'). In the demand model, rail fares are typically 5% to 10% greater than bus fares in the peak / 35% to 45% greater than bus fares in the off-peak across some of the key flows in the corridor. However, the scheme appraisal currently assumes that there will be no reduction in bus services once the scheme is delivered – thereby ensuring continuity in terms of access to these bus fares. On that basis, and as set out in the distributional impacts analysis (Appendix J), the affordability impacts are therefore likely to be small and no further assessment was undertaken.

Impact on Affordability for the overall scheme (across all options):	Neutral

4.5.4.9 Severance

Community severance is defined as the separation of residents from facilities and services they use within their community caused by substantial changes in transport infrastructure or by changes in traffic flows. Severance will mainly be an issue where either vehicle flows are significant enough to significantly impede pedestrian movement or where infrastructure presents a physical barrier to movement. Severance primarily concerns those using non-motorised modes – particularly pedestrians.

In this scheme the new rail service is using an existing rail line, which remains a physical barrier for the communities it runs through. There are, however, a number of level crossings along the route which will need to operate more often given the substantial increase in the number of rail services per day compared to today[20].

In terms of the distributional impacts analysis, the severance disbenefits are therefore expected to be noticeable within the vicinity of the level crossings and a distributional impacts analysis has been undertaken (detailed in Appendix J).

There are 21 level crossings on the section of railway line between Ashington and the East Coast Mainline. Under the existing situation, where the line is only used by freight trains, the level crossing barriers are not down very often throughout the day. The upgrade of the existing freight line to accommodate passenger services will mean that level crossings are down more often, and for longer, than the existing situation. This will worsen issues of severance, in locations where the level crossing provides access to key services and facilities. At the current time, it is assumed that all existing level crossings will remain open, although this could change as the scheme develops.

[20] There are 21 level crossings along the route, including Manned Controlled Barriers (MCB), Manned Controlled Barriers with CCTV (MCB-CCTV), Automatic Half Barrier Crossings (AHB), Auto Barrier Crossing Locally Controlled (ABCL), Footpath Crossings (FP) and User Worked Crossings (UWC).

Literature has highlighted the groups of people in society that are potentially vulnerable to the effects of severance as a result of changes to the transport network. Such groups include people without access to a car, older people, people with disabilities and children. Assessment of severance, therefore, has analysed where an increase in the downtime of level crossings will impact on access to key services and facilities that these groups of people may want to access. These facilities are schools, shops and GP services.

In accordance with TAG A4-2, key services and facilities along the Northumberland Line have been mapped in GIS. A walking catchment to each service or facility of 1km has been mapped in GIS. Where the catchment extends to the other side of the railway line from the service or facility, it is assumed that severance will worsen as a result of the Northumberland Line. The numbers of vulnerable people within these catchment areas have then been calculated, and is presented in the table below.

Table 4-12: Estimated Population Impacted by Severance

Facility	Children (<16)	Older (70+)	Disabled	No Car Households
GPs	269	186	211	194
Shops	578	345	417	441
School	191	120	143	136

Given the length of the railway line and the number of level crossings, the population that is impacted by severance is relatively small. At this stage in the development of the scheme, it is assumed that all level crossings will remain open and therefore the impact on severance is an increase in journey time, rather than an increase in distance travelled. It is unlikely that this would have any material impact on a person's willingness to make a journey, but will clearly be a disadvantage compared to the existing situation. The impact at each of the level crossings along the line is therefore considered to be slight adverse.

Discussions are still ongoing regarding potential upgrades or closures of level crossings. This could impact on the outcome of this appraisal should distances between services and catchment areas increase.

Impact on Severance for the overall scheme (across all options):	Slight adverse

4.5.4.10 Option and Non-Use Values

An option value is the willingness-to-pay to preserve the option of using a transport service for trips not yet anticipated or currently undertaken by other modes, over and above the expected value of any such future use. Non-use values are the values that are placed on the continued existence of a service (i.e. transport facility), regardless of any possibility of future use by the individual in question. Option and non-use values should be assessed if the scheme being appraised includes measures that will substantially change the availability of transport services within the study area (e.g. the opening or closure of a rail service).

The number of households in 2011[21] around each new station has been calculated, assuming a 2km catchment around the station and taking into account station catchment overlaps:

- Seaton Delaval: 5,355 households;
- Newsham: 7,155 households;
- Blyth Bebside: 3,845 households;
- Bedlington: 4,846 households; and
- Ashington: 12,018 households.

On the basis of the above, there would be a total of 33,219 households obtaining an option value across five stations, at an average of 6,644 households per station. On that basis, and in line with the TAG guidance, this impact can be scored as large beneficial. Clearly the number of households within these station catchments is likely to increase on these 2011 values, which will in turn increase the number of households that will obtain an option value.

[21] Source: 2011 Census Data

The option and non-use values have not been monetised for the purposes of scheme appraisal on the basis that they do not contribute to the core Value for Money estimate.

Impact on Option Values for the overall scheme (across all options):	Large beneficial

4.5.5 Public Accounts

4.5.5.1 Cost to Broad Transport Budget

The costs to the broad budget bring together the following items:

- Investment costs – made up of the capital costs, plus the renewals costs and mobilisation costs;
- Operating costs – transferred from the Private Sector Provider Impacts to the Public Accounts table in line with rail scheme TAG guidance. In addition, operating costs associated with the new station car parks are assumed to fall on Northumberland County Council;
- Rail revenue – as per the rail operating costs, transferred from the Private Sector Provider Impacts to the Public Accounts table in line with rail scheme TAG guidance. In the Public Accounts table shown as a negative cost (ie a benefit). It should be noted that the revenue impacts are split between those that accrue to the rail industry and those that accrue to the Tyne & Wear Metro, the latter also including Concession-based revenue on the Northumberland Line in Options A1 and A2;
- Infrastructure investment benefits – these are the calculated savings in highway maintenance determined as a function of the car km removed from the road network via modal transfer from car to rail. In the Public Accounts table shown as a negative cost (ie a benefit).

The costs are presented in Table 4-13 and the derivation of these costs is set out in the Economic Appraisal Report in Appendix C.

Table 4-13: Cost to Broad Transport Budget Impacts by Option

Option		T1	A1	T2	A2
Central Government	Investment Costs	146.2	158.6	175.1	187.0
	Rail Operating Costs	85.6	87.5	116.5	120.2
	Rail Revenue	-128.9	-70.4	-189.1	-108.1
	Infrastructure benefits	-0.7	-0.8	-1.0	-1.3
Local Government	Rail Operating Costs	0.3	0.3	0.3	0.3
	Rail Revenue	-4.6	-59.4	-7.2	-83.9
Cost to Broad Transport Budget		**97.9**	**115.7**	**94.6**	**114.2**

£m Present Value over 60 year appraisal period (2010 prices)

The scheme's overall Present Value cost to the Broad Transport Budget, which is also the scheme's PVC, falls between £94m and £116m. Comparing the Franchise options and the Concession options, it is clear that the PVC increases with the Concession options reflecting the higher operating costs and slightly higher capital costs (new depot), coupled with the lower revenue generated (due to the lower fares). PVC therefore increases by circa 20%. Moving from Phase 1 to Phase 2 the PVC reduces slightly under both operating scenarios. This is because the rail revenue increases proportionally more than the increase in costs (investment plus operating), thus dampening the overall impact on the Public Accounts.

4.5.5.2 Indirect Tax Revenues

The indirect tax revenues have been calculated in line with TAG guidance for rail scheme appraisal and constitute the tax impacts of:

- Modal transfer from car (less fuel duty);
- Changes in public transport demand (greater use of public transport and spend on zero-rated fares); and
- Changes in diesel train use (more fuel duty).

The indirect tax revenues by option are presented in Table 4-14.

Table 4-14: Indirect Tax Revenue Impact by Option

Option	T1	A1	T2	A2
Indirect Tax Revenues	-20.2	-21.2	-29.2	-30.8

£m Present Value over 60 year appraisal period (2010 prices)

The estimated net impact on the Exchequer is to reduce indirect tax receipts by circa £20m to £30m in Present Value terms over the 60 year appraisal period.

4.6 Value for Money

4.6.1 Core Scheme

A full economic appraisal of each option was undertaken in line with DfT TAG appraisal guidance for the appraisal of rail schemes. This appraisal has been undertaken at the 'UK plc' level to demonstrate the impact on society as a whole.

The Present Value of Benefits (PVB) includes:

- User time savings;
- Non-user time savings (decongestion benefits);
- Impacts on bus revenue;
- Benefits of modal transfer from car (noise, air quality, greenhouse gases, accidents);
- Disbenefits associated with additional train services (noise, greenhouse gases);
- Indirect taxation impacts.

The Present Value of Costs (PVC) includes:

- Investment costs (capital, renewals and mobilisation costs);
- Operating costs (separate for Central and Local Government);
- Rail revenue;
- Tyne & Wear Metro revenue;
- Infrastructure cost savings.

The Net Present Value (NPV) gives an indication of the magnitude of net benefit to society. It is determined by subtracting the PVC from the PVB.

The Benefit: Cost Ratio (BCR) is a measure of value for money for government expenditure and is of principal value when government is considering the allocation of scarce funds. It is calculated by dividing the PVB by the PVC. Value for money guidance produced by the DfT has set four categories for calculating value for money:

- BCR less than 1 = poor value for money;
- BCR between 1 and 1.5 = low value for money;
- BCR between 1.5 and 2 = medium value for money;
- BCR between 2 and 4 = high value for money; and
- BCR greater than 4 = very high value for money.

Any scheme with a BCR above 1 should be worth pursuing in a world of unconstrained resources.

Table 4-15 sets out the economic appraisal results in Present Value 2010 prices. A more detailed breakdown of the economic appraisal results are presented in the TEE, Public Accounts and AMCB tables presented in the Economic Appraisal Report (Appendix C).

Table 4-15: Level 1 Economic appraisal results, figures in 2010 prices

Phase	Operating Scenario	Option	PVB (£m)	PVC (£m)	NPV (£m)	Level 1 BCR
1	Franchise	T1	241.9	97.9	144.0	**2.47**
1	Concession	A1	308.7	115.7	193.0	**2.67**
2	Franchise	T2	361.3	94.6	266.7	**3.82**
2	Concession	A2	470.8	114.2	356.6	**4.12**

All options return a positive business case, with the Present Value of Benefits exceeding the Present Value of Costs.

The Phase 1 results demonstrate that the initial service proposition of an hourly service, with some additional peak services, will generate a BCR of between 2.47 and 2.67, depending on which operating model is procured. The appraisal results therefore suggest that the scheme would be categorised as a high value for money scheme. The Net Present Value of the Phase 1 scheme ranges from £145m to £195m.

The Phase 2 results demonstrate that the full service proposition of a half-hourly service will generate a BCR of between 3.82 and 4.12, depending on which operating model is procured. The appraisal results therefore suggest that the scheme would be categorised as a high value for money scheme, moving towards a very high value for money scheme. The Net Present Value of the Phase 2 scheme ranges from £265m to £355m.

A Phase 2 versus Phase 1 incremental analysis suggests that there is a circa 50% increase in the PVB moving from Phase 1 to Phase 2. This reflects the additional demand generating increased user and non-user benefits. The PVC hardly changes between Phase 1 and Phase 2, suggesting that in broad terms the increased costs (capital, renewals and operating) are being offset by the increase in revenue to rail and Metro. As a result, the NPV in Phase 2 is circa 80% higher than in Phase 1 and the BCRs improve from 2.47 to 3.82 (Phase 1) and from 2.67 to 4.12 (Phase 2). Therefore, it is clear that Phase 2 performs better than Phase 1 and that there would be a clear benefit in moving from Phase 1 to Phase 2 (i.e. an hourly service with four stations to a half-hourly service with six stations).

Comparing the Franchise options and the Concession options, it is clear that the PVC increases with the Concession options reflecting the higher operating costs and slightly higher capital costs (new depot), coupled with the lower revenue generated (due to the lower fares). PVC therefore increases by circa 20%. However, the additional demand generated by the lower fares, and to a lesser extent the slightly quicker journey times, generates an additional 30% in the PVB user and non-user benefits, which more than offsets the increase in the PVC. As a result the Concession options record an NPV that is circa 35% greater than for the Franchise options and the relative BCRs jump from 2.47 to 2.67 (Phase 1) and from 3.82 to 4.12 (Phase 2). This would suggest that a Concession-based operation would be favourable to a Franchise operation. However, the format of a Concession-based operation could take a number of different forms which could significantly alter the construction of the benefits and costs that feed into the scheme appraisal. Therefore further work to refine the possible Concession-based approach for this scheme needs to be undertaken as the scheme is developed through the Design Stage. What can be highlighted is that the analysis suggests that the use of lower fares that are integrated with the Metro fares generates significant benefits that would likely improve the scheme's overall business case[22].

4.6.2 Wider Economic Benefits

Table 4-16 presents the impacts that the value of the WEBs benefits has on the Level 2 BCR values. The WEB value reported represents the sum of the agglomeration and the labour supply benefits.

[22] It is, however, worth noting that the sensitivity testing, as set out in Section 4.6.3, suggests that with increasing demand there comes a point where the Franchise-based options do overtake the Concession-based options in terms of their relative BCRs.

Table 4-16: Impact of wider economic benefits in economic appraisal results, 2010 prices

Option	Level 1 (Initial BCR)				Level 2 (Adjusted BCR)				
	PVB (£m)	PVC (£m)	NPV (£m)	BCR	*WEBs (£m)*	PVB (£m)	PVC (£m)	NPV (£m)	BCR
T1	241.9	97.9	144.0	**2.47**	*42.4*	284.3	97.9	186.4	**2.90**
A1	308.7	115.7	193.0	**2.67**	*46.1*	354.8	115.7	239.1	**3.07**
T2	361.3	94.6	266.7	**3.82**	*45.7*	407.0	94.6	312.4	**4.30**
A2	470.8	114.2	356.6	**4.12**	*50.4*	521.2	114.2	407.0	**4.56**

Results show a similar range of wider economic benefits across all scenarios. WEB results are mostly driven by changes in the average Generalised Travel Cost, where the peak demand weighs more in this calculation. There is less service headway variation in the peaks across the options (40min in T1/A1 v 30min in T2/A2), as opposed to the interpeak period (60min in T1/A1 v 30min in T2/A2). Furthermore, the Concession-based options (A1 and A2) provide significantly cheaper fares on the Northumberland line compared to the Franchise-operated scenarios T1 and T2. Consequently, cheaper travel costs combined with slightly faster journey times result in higher WEBs.

PVBs increase by a range of +10% (A2) to +18% (T1). Given the absolute value of the WEBs benefits ranges from just £42m to £50m across all the options, the higher the user benefits a scenario has, the lower the impact of WEBs in the adjusted PVB. On average, the adjusted BCR implies an increment of 0.4-0.5 in the BCR value.

4.6.3 Sensitivity Tests

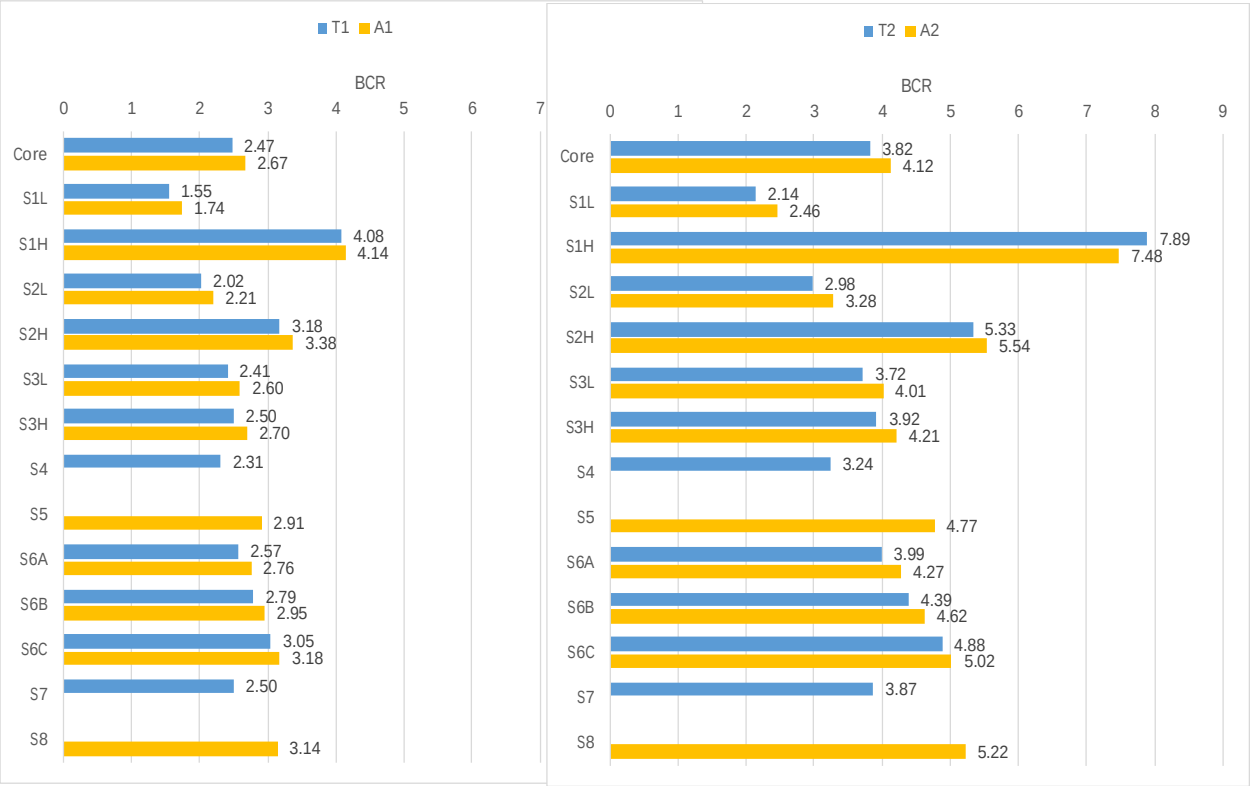
A range of sensitivity tests has been defined to assess how changes to model parameters and assumptions might impact on the scheme's value for money. These tests acknowledge that demand and revenue forecasts and the appraisal model are subject to a degree of uncertainty associated with the stage of the scheme's development and the uncertain nature of demand and revenue forecasting. The test were applied across all options and the following table summarises the set of sensitivity tests modelled. Further detail and justification of why the tests have been performed is provided in the Economic Appraisal Report (Appendix C). These tests were applied across all the relevant core options.

Table 4-17: Summary of Sensitivity Tests

Sensitivity test	Variant	Description
S1L	Low	Demand -20%
S1H	High	Demand +20%
S2L	Low	CAPEX +20%
S2H	High	CAPEX -20%
S3L	Low	Fuel prices +20%
S3H	High	Fuel prices -20%
S4	-	Use of 3-car Class 170s in Franchise scenarios
S5	-	Use of 2-car Class 230s in Concession scenarios
S6	-	Inclusion of Network Rail renewals costs avoided
S7	-	Switch to electric rolling stock in 2040 in Franchise scenarios
S8	-	20% reduction in the Concession-based operating costs

The results of the sensitivity tests are presented in Figure 4-4.

Figure 4-4: Sensitivity Test Benefit Cost Ratios for Phase 1 and Phase 2 Options



In all cases for the Phase 1 options, the BCR for the scheme remains positive (i.e. above 1.0) and in most cases remains 'high value for money' (i.e. a BCR greater than 2.0), with the impacts of one test pushing the BCRs into the 'very high value for money' (i.e. a BCR greater than 4.0) category. Those tests that reduce overall forecast demand by 20% push the BCR for the scheme into the 'medium value for money' category. In all cases for the Phase 2 options, the BCR for the scheme remains positive (i.e. above 1.0) and in all cases remains 'high value for money' (i.e. a BCR greater than 2.0) or 'very high value for money' (i.e. a BCR greater than 4.0).

It is apparent from the above figures that Sensitivity test 1 (20% change in demand) leads to the greatest changes in the scheme's BCR. This is because all the appraisal benefits are a direct product of the overall demand in the corridor. The mode choice model simply calculates a share of the overall demand travelling by rail in the Do-Minimum and Do-Something scenarios.

It is worth noting that in the Phase 2 options, when the demand increases by 20% the Franchise-based option (T2) now produces a better BCR than the Concession-based option. Further analysis of this has identified that the same impact occurs with the Phase 1 options when demand is increased by between 25% and 30%. The reason this occurs is due to the fact that revenue makes up a greater proportion of scheme costs in the Franchise-based options, so as revenue increases there comes a point within the BCR calculation (which is more sensitive to changes in the PVC as the denominator in the calculation) that increases in revenue (demand) has a proportionally greater impact than with the Concession-based options.

Changes in capital costs also lead to significant variations of the scheme's BCR. However, the tests reveal that an increase of 20% in the capital costs does not impact on the value for money categorisation of the scheme – with all BCRs remaining above 2.0. This demonstrates the potential impact that the capital cost has on the value for money of the scheme and the degree to which capital costs can fluctuate without altering the value for money categorisation.

A 20% increase or reduction in fuel costs can be expected to trigger a relatively small change in the scheme's BCR as indicated by sensitivity test 3.

The operation of a 3-car diesel fleet in Option T1, rather than a 2-car diesel fleet with peak strengthening, reduces the BCR from 2.47 to 2.31, reflecting a circa 10% increase in annual operating costs. In Option T2 the increase in operating costs is proportionally greater given the greater amount of train miles involved, and thus the BCR for T2 reduces from 3.82 to 3.24. In the Concession-based Option A1, altering the fleet composition from 3-car battery trains to 2-car battery trains (with peak strengthening) reduces the annual operating costs by 13%, which is reflected in the BCR increasing from 2.67 to 2.91. In Option A2 the same test increases the BCR from 4.12 to 4.77. These tests therefore demonstrate that the different rolling stock assumptions do not significantly alter the overall scheme's value for money categorisation.

The impacts of incorporating renewals costs saved by Network Rail as a result of the scheme investment are explored in Sensitivity test 6. This has been undertaken by reducing the scheme's renewals costs by 10% (S6a), 30% (S6b) or 50% (S6c), as a proxy for any savings on committed renewals that might be able to be captured by the scheme. In all cases, across both the Phase 1 and Phase 2 options, the BCRs increase in increments as the renewals costs are reduced. A renewals costs saving of 30% in Option T2 moves that option's BCR into the 'very high' value for money categorisation.

The operation of the new diesel train services in Options T1 and T2 produce additional Greenhouse Gas emissions that outweigh any emissions savings from modal transfer from car to rail. This is over the scheme appraisal period, where the assumption is that diesel train operation continues throughout the 60 year period. However, in reality, and in line with current government policy, the operation of diesel-only trains is expected to be eradicated by 2040. Therefore, Sensitivity test 7 has looked at how the Greenhouse gas emissions alter for Options T1 and T2 based on this happening. The level of disbenefits associated with the operation of the new trains reduces considerably, as the replacement of diesel trains by electric trains in 2040 switches the Greenhouse Gases emissions from the non-traded to the traded sector of emissions. As a result, the BCR for Option T1 increases slightly from 2.47 to 2.50, whilst the BCR for Option T2 increases from 3.82 to 3.87.

Sensitivity test 8 was undertaken to assess the impacts of a 20% reduction in the overall annual operating costs for the Concession-based scenarios, reflecting the potential opportunities that might exist to bring down the operating costs that have been determined through some initial market testing to inform this OBC. The impact of reducing the operating costs in Option A1 are to increase the BCR from 2.67 to 3.14. In Option A2 the BCR increases from 4.12 to 5.22.

5. Financial Case

The Financial Case concentrates on the affordability of the Northumberland Line scheme, focusing on the estimated costs for the scheme based on the engineering assessment undertaken since the SOBC. The broad financial viability of the scheme, comparing revenue and operating costs, are presented alongside a discussion around the funding proposals.

5.1 Introduction

The Financial Case concentrates on the affordability of the proposed scheme, its funding arrangements and technical accounting issues. At OBC stage the minimum requirements for the Financial Case are to have completed a full assessment of both the costs and funding cover. Since the completion of the SOBC, significant engineering development work has been undertaken in order to inform the Option Selection Report (OSR), which is included as Appendix E. The OSR sets out the development of the scheme from an engineering, environmental and consents perspective The OSR documents the development of the Northumberland Line project from SOBC to OBC following a tried and tested process of “optioneering” which developed a series of preferred options for the suite of interventions that make up the scheme. This process has led to a much greater understanding of the existing asset base and the proposed design solutions which has ultimately generated an overall Anticipated Final Cost (AFC), which has been subject to a formal Quantitative Cost Risk Assessment process.

At the previous SOBC stage, the delivery strategy proposed a four phased approach, however this is now expected to be delivered as two phases. This is subject to anticipated funding being secured in line with the overall development programme, and legal consents and planning consents being secured. The proposed two-phased scheme will see Phase 1 delivered for the May 2023 timetable change. Phase 2 would be delivered under a different funding stream and programme to be agreed, but it is envisaged that Phase 2 will be operational by January 2025 (a detailed programme for delivery across the two phases can be found in the Management Case).

The Commercial Case discussed the options for procuring and delivering the Northumberland Line rail service, essentially via a Franchise-based operation (as an extension of the existing Northern Franchise) or alternatively via a Concession-based operation. Both would deliver the preferred scheme as identified above. The presentation of these alternative operating scenarios is in line with the government’s aspiration for scheme promoters to investigate alternative methods for scheme delivery, and both were discussed in detail in the Commercial Case. The intention would be that these would be further developed as the scheme progresses through the Design Stage. Clearly the alternative operating scenarios will have different impacts on the affordability and funding commitments of the scheme and these impacts are presented in the Financial Case below.

The above has been translated into options for the purposes of scheme appraisal. These options therefore focus on the delivery of different service frequencies that the infrastructure phases and operating scenarios are able to support and are summarised in Table 5.1

Table 5-1: Appraisal Options

Infrastructure Phase ID	Operating Scenario	Appraisal Option ID	Stations Served	Service Headways (peak/ofpk)	Ashington-Newcastle Journey Time
IP1	Franchise	**T1**	4	40* / 60	32
	Concession	**A1**	4	40* / 60	30.5
IP2	Franchise	**T2**	6	30 / 30	35
	Concession	A2	6	30 / 30	32.5

* three services across a two-hour peak period – essentially a half-hourly service in the peak hour in the peak direction only

Options T2/A2 can be viewed as being the 'full scheme' that delivers a half-hourly service all day, serving all the anticipated stations in the corridor and achieving the fastest realistic journey time. It is estimated that the earliest that the full scheme could be delivered by would be 2025. Options T1/A1 could be considered to be an option that delivers a passenger service on the corridor within the shortest practical timescales, with an estimated delivery by 2023. In that context, Options T1/A1 become a strong candidate for the Transforming Cities Fund.

Significant work has been undertaken on the engineering aspects of the scheme development between the SOBC and OBC stages, with the production of the OSR and cost estimates produced at a 'GRIP 3 equivalent23' level. A Quantitative Cost Risk Assessment (QCRA) has been developed to model the level of risk value that should be applied to the GRIP 3 cost estimate for the OBC. A risk analysis has been undertaken for both phases to produce a risk contingency for each phase.

Two different sets of operating costs have been determined for the OBC, representing either the Franchise-based operation (T1/T2) or the Concession-based operation (A1/A2). The development of the Franchise-based operating costs for the scheme has been undertaken 'bottom-up' through the application of core operating cost rates sourced either from Northern Rail or from data available on the Network Rail website. The Concession-based operating costs have been determined via some initial market testing with the rail industry, where a service specification has been agreed in line with the defined options and a costed proposal has been received. For certain operating cost items, such as those relating to stations, it has been assumed that the costs would be the same across all operating scenarios.

Renewals costs have been updated from the SOBC, with further analysis undertaken to link the incremental costs associated with the renewal of the scheme's additional infrastructure over the scheme life with the initial capital cost elements. In addition, mobilisation costs have been revisited since the SOBC from both the perspective of a Franchise operator and a Concession operator.

In addition to the costs, in order to inform an estimation of the potential 'operating position' for the scheme, the results from the demand and revenue forecasting analysis undertaken to date has generated a set of revenues. These revenues can be broken down and compared to the estimated operating costs in order to identify the extent to which the scheme might call on public support. This would typically be routed via the relevant franchise subsidy – in this case the Northern Franchise, or via a Concession.

[23] The cost estimates are based on a design commensurate with Network Rail GRIP stage 3. Essentially, this is not a Network Rail project, and therefore GRIP is not being followed. However, the design has been developed to that level and enough to inform the costs to at least that level of accuracy.

On the basis of the above therefore, the contents of this Financial Case includes:

- a summary of how the capital cost estimates for the scheme have been developed – with further, more detailed, analysis contained in the OSR in Appendix E;
- a description of the estimated operating costs and how these have been developed bottom-up based on the option timetables and costs supplied by the rail industry;
- initial analysis around the emerging operating position and specifically the potential impacts on the Northern Franchise and potential Concession-based operation. This will be informed by a comparison of the operating costs with the revenue estimations that were presented in the Economic Case; and
- a discussion around potential sources of funding, both in terms of the capital expenditure and the ongoing revenue support once in operation.

5.2 Capital Costs

This section presents the capital costs that have been estimated for the scheme, including some context around how these have been developed. Further, more detailed, analysis covering the engineering inputs that support the generation of the capital costs can be found in the OSR in Appendix E.

The project involves the conversion of the Northumberland Line from its current use as a freight railway back to a passenger and freight railway. It will provide six new stations at Ashington, Bedlington, Blyth Bebside, Newsham, Seaton Delaval and Northumberland Park. Of those stations, Ashington and Bedlington stations are expected to be located broadly on the historic station sites which are now significantly dilapidated.

This study builds on the work carried out by Network Rail in their development of the Governance for Rail Investment Projects (GRIP) stage 2 report (June 2016) and addendum (May 2018). The GRIP 2 study developed an operationally viable scheme priced at £191m at 2016 prices with a subsequent value management exercise identifying savings opportunities of between £18m and £47m. At SOBC stage the key driver for the subsequent analysis undertaken by AECOM was to review the previous work undertaken and identify the potential for cost and programme savings, operational efficiencies and improved demand. The project team therefore developed a delivery strategy driven by affordability and planning consent processes that resulted in an incremental delivery approach consisting of four Infrastructure Phases - each providing additional service functionality, capacity or resilience. A Phase 1 Anticipated Final Cost (AFC) of £117m was determined for the SOBC at 2018 prices, whilst an AFC for Phase 4 (the full scheme) was estimated at SOBC stage as being £169m.

For the Develop Stage and OBC, the project team embarked upon a series of workshops to challenge previous decisions based on emerging information, and then to develop and test each proposal against emerging requirements obtained through stakeholder engagement exercises. Workshops included relevant discipline design experts, along with representatives from NCC (the client), Network Rail (the infrastructure owner), and Morgan Sindall (a major UK contractor engaged through an Early Contractor Involvement (ECI)). This collaborative and inclusive approach ensured the engineering, operational, planning, land and environmental decisions were well informed to provide a robust and well tested preferred solution to the various project interventions. Wider consultation and elicitation of specific requirements was achieved through ongoing project steering group and project board meetings, an initial public consultation exercise, as well as direct discussions with key stakeholders.

Through development of design ideas and discussions with organisations and individuals who may be affected by the scheme, the project team has developed a clearer understanding of both the requirements to be met and the constraints within which they must be achieved. In most cases the team has been able to test the proposed solutions with relevant stakeholders and reflect emerging concerns in the selection or development of sub-options, though this work will be refined further in the next stage. This has been undertaken in a collaborative workshop environment with attendees presenting work in progress and peer reviewing across disciplines to ensure integration.

The proposed solutions have been developed for pricing and quantified risk assessment purposes to update the Anticipated Final Cost (AFC) for the scheme and its component Phases.

The diagrams below (Figure 5-1, Figure 5-2 and Figure 5-3) illustrate the current two phased strategy in schematic format. The four-phased approach in the SOBC know as Infrastructure Phases (IP1, IP2, etc) was refined by effectively combining IP 2-4 into the new Phase 2. This is because of the extent of signalling work initially proposed in IP3 now needed to be brought forward into the new Phase 1. The remaining works in IP3 and IP4 were then relatively small packages of work and considered likely to be bundled into Phase 2 works for efficient procurement and minimise disruption to what will by then be a live passenger railway environment.

Phase 2 remains primarily defined by works that may require a full Transport and Works Act Order (TWAO) and thus are unlikely to be deliverable within the TCF timescales, and/or are lower priority features that would otherwise increase project costs beyond what the Phase 1 budget is likely to be able to bear. If the Phase 1 budget were to increase, and land negotiations concluded without the need for a TWAO, then it is possible that some Phase 2 elements could be brought forward into Phase 1.

There would also be an opportunity to deliver Phase 2 in smaller sub phases if the need arises. This would allow for the additional stations to be constructed as and when legal powers are obtained in advance of the implementation of the full half-hourly service pattern or independently of each other at different times if capital expenditure were constrained in the future.

Figure 5-1: Existing Schematic

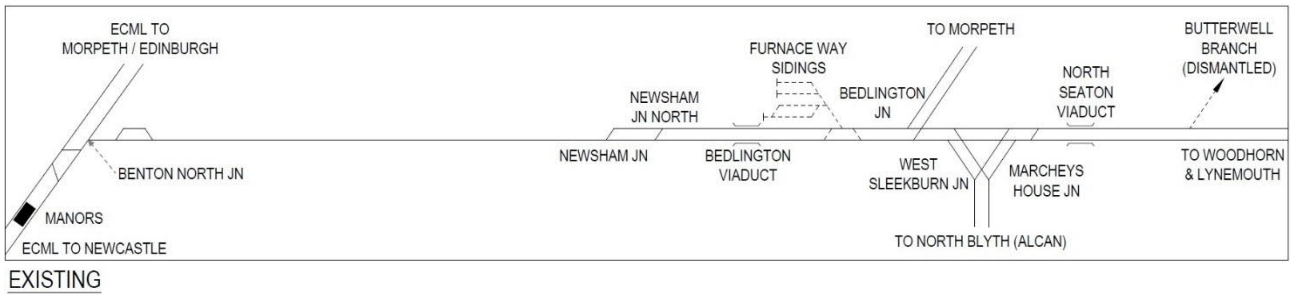
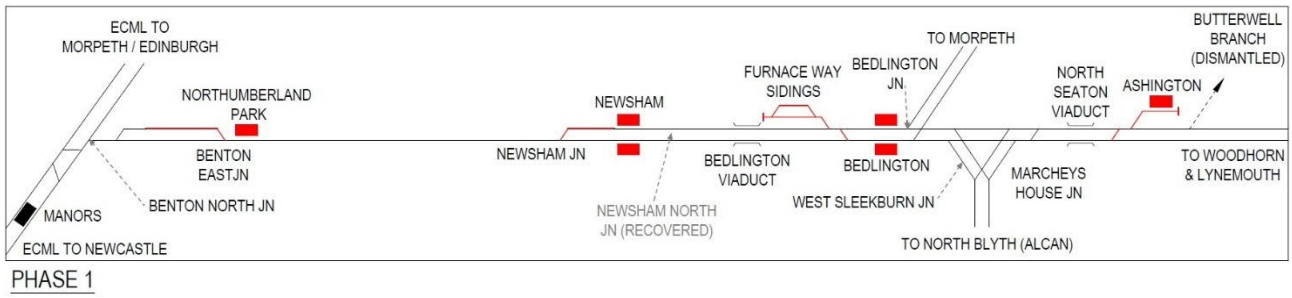
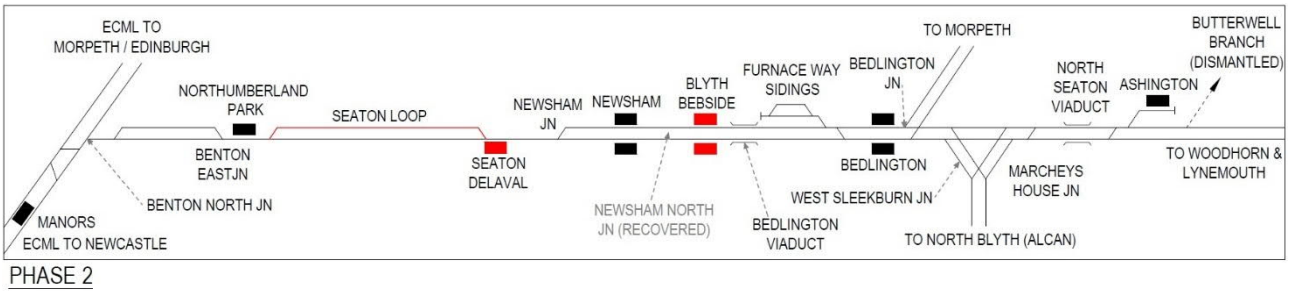


Figure 5-2: Phase 1 Schematic



Phase 1 sees the introduction of four new stations at Northumberland Park, Newsham, Bedlington and Ashington, and new track for double track extensions east of Benton North Junction and south of Newsham. A new turnback platform siding at Ashington, the reinstatement of Furnace way sidings and significant signalling improvements and enhancements complete the major interventions of Phase 1. Other track, infrastructure and systems works are necessary, particularly to the single line section, to upgrade level crossings, and improve linespeeds.

Figure 5-3: Phase 2 Schematic



Phase 2 provides the two additional stations, at Seaton Delaval and Blyth Bebside which are subject to the TWAO and so could not be achieved within the timescales of Phase 1. A passing loop south of Seghill between Northumberland Park and Seaton Delaval stations completes the major interventions required at Phase 2. The passing loop is required to enable the hourly freight path to continue when passenger lines step up to half-hourly intervals throughout the day; it is noted that allowing an hourly freight path is a robust assumption given that freight trains do not currently use the line each hour. Remaining line speed improvements partially offset the increased time due to two more station stops.

The selection of stations for Phase 1 and Phase 2 has remained the same and the layout of each station has been comprehensively challenged and refined, but these are all still subject to availability of land through the appropriate legal consents and acquisition processes. The ability to access the railway in this OBC stage, as well as feedback from the public consultation exercise, has allowed better identification of local constraints with the result that the current situation for each station is as follows:

- Northumberland Park station (Phase 1) has remained in essentially the same position;
- Seaton Delaval (Phase 2) has remained broadly in the same position, but is now placed adjacent to the existing track which is now not being shifted for a future passing loop in this location;
- Newsham station (Phase 1) now has both platforms on the south side of the level crossing, but each is moved further south than previously indicated to reduce barrier down times at the level crossing;
- Blyth Bebside station (Phase 2) location has moved south of the level crossing to take advantage of land currently for sale and reduce traffic risks at the level crossing;
- Bedlington station (Phase 1) has remained in essentially the same location;
- Ashington station (Phase 1) has remained in broadly the same location but has changed to an offline arrangement to avoid the need for a northern turnback with a difficult crossing arrangement.

Each preferred option for a particular infrastructure intervention has been cost estimated and the information provided to the team generating the outline business case. These costs in general form the Capital Cost estimate portion of the overall financial impact of the scheme.

Where two viable options are available and both offer similar engineering challenges or benefits, both have been costed from a Capital Cost perspective and in general the cheaper option has been presented as preferred at this stage. Value engineering at the next stage of the project development may include whole life cost analysis to be undertaken and a different solution may become preferred on that basis if the Capital Cost fits within the available initial budget.

The project team cost estimates were validated by Morgan Sindall under an Early Contractor Involvement arrangement.

The AFC cost estimate has been based on 3Q2019 prices and is summarised below in Table 5.2.

Table 5-2: Cost Estimate

Estimate Breakdown	Phase 1	Phase 1 to Phase 2 Increment	Phase 2Total
Direct Construction Works Costs	**Value (£)**	**Value (£)**	**Value (£)**
Signalling	£7,576,601	£133,515	£7,710,116
Operational Power	£2,248,520	£0	£2,248,520
Permanent Way	£15,162,357	£5,627,511	£20,789,868
Operational and Retail Telecommunications	£2,172,004	£382,831	£2,554,835
Stations	£9,361,675	£6,770,180	£16,131,855
Civil Engineering	£3,025,540	£107,444	£3,132,984
Level Crossings	£10,666,500	£0	£10,666,500
Structures	£1,276,177	£0	£1,276,177
Utility Diversions	£1,280,000	£250,000	£1,530,000
DIRECT CONSTRUCTION WORKS COST TOTAL	**£52,769,374**	**£13,271,481**	**£66,040,855**
INDIRECT CONSTRUCTION WORKS COST TOTAL	**£26,194,402**	**£7,615,229**	**£33,809,630**
TOTAL CONSTRUCTION COST	**£78,963,776**	**£20,886,710**	**£99,850,486**
DESIGN, PROJECT MANAGEMENT AND OTHER PROJECT COST TOTAL	**£26,074,133**	**£6,706,013**	**£32,780,146**
BASE COST ESTIMATE	**£105,037,908**	**£27,592,723**	**£132,630,631**
RISK COST TOTAL	**£19,502,864**	**£8,032,915**	**£27,535,779**
LAND COST TOTAL	**£443,217**	**£1,307,950**	**£1,751,167**
ANTICIPATED FINAL COST (excluding Inflation)	**£124,983,989**	**£36,933,588**	**£161,917,576**
Comparison with SOBC ***(SOBC Phases 2-3-4 compared with OBC Phase 2)***			
SOBC AFC @ 4Q2018:	*£117,216,519*	*£52,197,805*	*£169,414,324*
SOBC AFC @ 3Q2019 (Assumed construction price inflation @ 3/4 x 3.2% = 2.4%):	*£120,029,715*	*£53,450,552*	*£173,480,268*
Change (OBC-SOBC) in £GBP @ 3Q2019	*£4,954,273*	*-£16,516,965*	*-£11,562,691*
Change (OBC-SOBC)/SOBC @ 3Q2019 in %	*+4.1%*	*-30.9%*	*-6.7%*

The primary cost driver for the scheme is the track (permanent way) – at circa 30% of the direct construction costs. The next most significant cost contributors are the stations (buildings and property) and level crossings. The increase in level crossing risk presented by the addition of frequent passenger trains to a freight railway will result in the need to upgrade most of the level crossings and in turn to modify the signalling that protects them. These costs are almost all included as Phase 1 costs and, as a result, the railway control systems (which include signalling, power and level crossing works) account for circa 40% of the Direct Costs in Phase 1.

The overall picture is one of remarkably little change since SOBC, which was at 4Q18 pricing and the OBC estimate, which was at 3Q19 pricing, with the total Direct cost for all phases rising by only 1.6% from the SOBC – about half the average annual rate for new build construction costs for the public sector in this period.

The comparison of total costs at SOBC shows a 4.1% increase in Phase 1, and this is dominated by the changes in Permanent Way costs, of which £3.8m in direct costs comes from the inclusion of works to rehabilitate Furnace Way sidings that was specifically excluded in the SOBC. Additional Permanent Way cost increases come from the need to upgrade significantly more track than anticipated. Further Phase 1 increases come from stations and signalling, although these are partially offset by savings in level crossings and utility diversions, as well as a reduction in overhead allowances following further assessment.

The OBC Phase 2 has been compared with SOBC Phases 2-4 combined and shows a significant reduction of £16.5m or 30.9%, contributing to an all-phases reduction of £11.6m or 6.7% at 3Q2019 prices. This is a result of reduced scope in signalling, operational power, and the removal of need for significant earthworks after Phase 1. Risk and overheads have fallen as the relocation of the passing loop has assisted the efficiency of construction.

The scheme opening year is assumed to be 2023 for Phase 1 (Options T1 and A1) and 2025 for Phase 2 (Options T2 and A2). On that basis, a capital costs spend profile has been developed with the engineers as illustrated in Table 5.3.

Table 5-3: Capital Cost Spend Profile

Year	Spend Profile to 2023 (Options T1 & A1)	Spend Profile to 2025 (Options T2 & A2)
2020	21%	5%
2021	37%	7%
2022	39%	17%
2023	3%	19%
2024		47%
2025		5%

The capital costs presented above are the costs associated with taking the scheme forward from this point and, as such, do not include for costs that have already been spent on developing the scheme to date. These have been confirmed by NCC and added to the scheme appraisal:

- 2015: £0.05m
- 2016: £0.45m
- 2017: £0.11m
- 2018: £0.01m
- 2019: £3.50m

An additional item of capital expenditure has been added to the two Concession-based options (A1/A2) to represent the construction of a depot and office facilities to house the rolling stock and staff. At this stage this is assumed to be a sum of £15m. This cost item will be subject to more detailed refinement at the next stage of scheme development.

5.3 Project Cost Risk

In the development of the OSR and the AFC presented above, the project team has carried out both a Hazard Identification ("HAZID") and Quantified Cost Risk Assessment (QCRA). These have been used to inform the risk allowance in the cost estimate but also the design investigations. The project team cost estimates were also validated by Morgan Sindall under an Early Contractor Involvement arrangement.

Details of each of these are included in the OSR (Appendix E).

Quantitative Cost Risk Analysis (QCRA)

The objective of a Quantitative Cost Risk Analysis (QCRA) was to support the estimating of cost and project management of a project. Understanding of the key assumptions, risks, opportunities and uncertainties that drive the cost forecast are an integral part of the exercise. Monte Carlo simulation is the most common method for assessing the data developing in undertaking a QCRA. It is a recognised industry norm in assessing risk throughout the rail and civil engineering sectors.

A Quantitative Cost Risk Analysis (QCRA) workshop was held on Friday 4th October 2019. The workshop assembled data gathered both prior to and during the workshop, surrounding the scope, programme, costs and associated risks pertaining to the works. Representatives from Northumberland County Council, AECOM, SLC, Kilborn Consulting, Morgan Sindall (ECI contractor), and Network Rail were all invited to both contribute in advance of the workshop and to attend to support the development of the data for modelling. The freight industry was also engaged through separate workshops. Prior to the workshop, all attendees were asked to provide a list of risks they were aware of, for discussion during the meeting, in addition to the data contained within the project risk register. These risks were collated and used to focus discussion and prompt thought and debate on other risks.

As project risks were identified, the group agreed the probability of the risk occurring, the minimum cost of the risk, the most likely impact of the risk and the maximum likely cost impact to the project. All identified risks were analysed with Minimum, Most Likely and Maximum costs of the risks assessed alongside the probability percentage of the risk occurring. This data enabled a triangular distribution simulation.

Following the meeting, all risks were collated and reviewed outside of the workshop environment and further assessed to complete any missing minimum, most likely and maximum cost impacts for each of the relevant data sets. The resulting information was input into Palisade @Risk Software which ran a Monte Carlo Analysis to produce costs of the P80 for the works associated with the estimate. At this stage, no distinction was made between client risks and contractor risks. The analysis ran 10,000 iterations for the simulation and probability of each risk, along with the likely cost of its impact.

Following the running of the simulation, the data produced showed the risks likely to occur and what the likely cost impact of these risks will be to the project at varying probability levels. The chosen probability level for this project was P80 or 80% probability of the total risk amount NOT being exceeded.

The risk analysis advised a contingency of £19.5m (16% of the AFC value) be included in the project budget for Phase 1 of the estimate and £27.5m (17% of the AFC value) for Phase 2 (the full scheme).

Project Hazard Record

The Project Hazard Record has been compiled from several sources including the Hazard Log from the previous GRIP 2 Ashington, Blyth & Tyne scheme, notes from the regular Design Review Meetings and a formal HAZID Workshop held on 19 September 2019 and attended by representatives from Design, Construction, Maintenance, Operations and the Infrastructure Manager. The output of the workshop and other sources has been captured and an initial review undertaken to classify the hazards in accordance with Network Rail Core Hazards, which broadly align with the industry common hazards identified by RSSB, and to assign lead Disciplines as owners capable of and responsible for identifying and implementing suitable mitigations. Some items captured through this process have been classified as Project Risk (rather than CDM/CSM Hazards) and will be transferred to the Project Risk Register for management of mitigation actions, however they have been initially recorded in the Hazard Record to provide a complete record of the workshop output.

Pricing Support Exercise Undertaken by Morgan Sindall (under an Early Contractor Involvement)

The pricing support exercise undertaken by Morgan Sindall was used to evaluate and inform the project estimator's development of the project estimate. As a bottom-up exercise based on a defined programme, methodology and design, it supports an increased level of confidence on the overall estimate and the allowances for overheads in particular.

Overall, the direct and indirect construction cost figure varied by less than 1%. Although this is a very positive outcome, it should be noted that there were greater percentage variances at discipline level, but positive and negative differences largely cancelled each other out.

Areas of variance and concern that will require addressing in the following design stages included:

- Signalling – Morgan Sindall's combined price for signalling and level crossings at £22.9m was higher than the project team at £18.4m but lower than the budget provided by signalling specialist, Amaro, in the range of £25m to £27m. The project estimate price for the level crossing components was used because Morgan Sindall has insufficient historical data for such replacement / upgrading work. It is anticipated that the range of prices is reflective of the uncertainty inherent in the outline signalling design and differing views of the complexity of staging, testing and commissioning.
- Telecoms – Validation was limited to scrutiny of the project team's quantities and rates for adequacy because this discipline was not a focus for Morgan Sindall at this stage.
- Civil engineering – Variance attributed to differing views on access points allowances not reconciled during this stage.
- Telecoms – Validation was limited to scrutiny of the project team's quantities and rates for adequacy because this discipline was not a focus for Morgan Sindall at this stage.

5.4 Renewals Costs

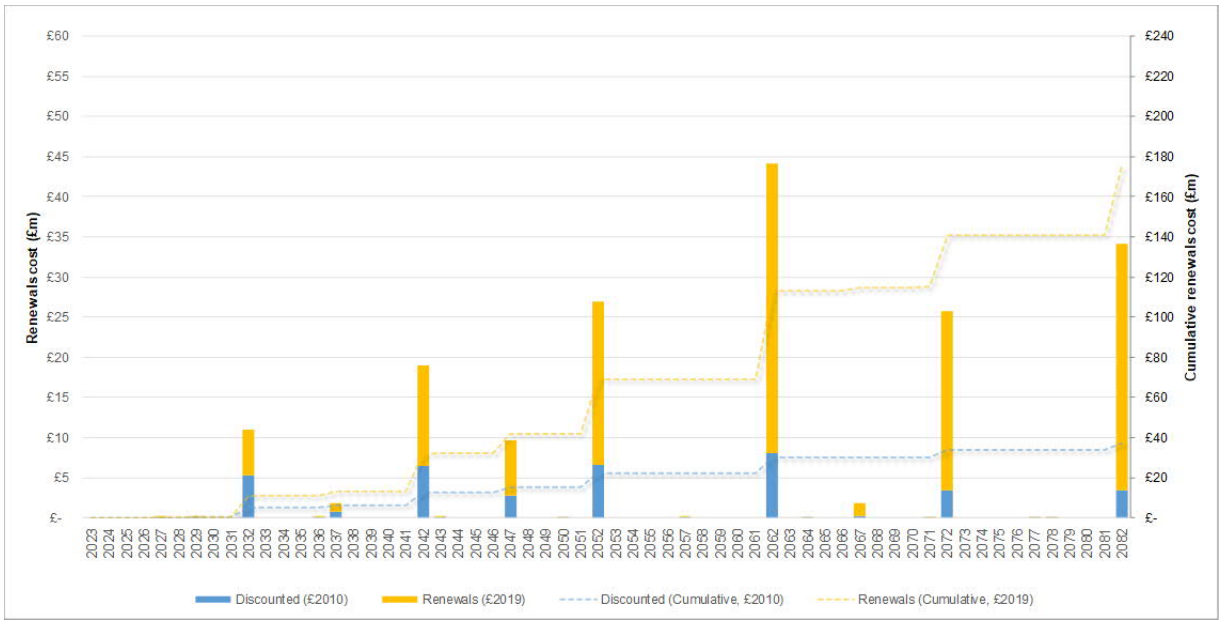
There are incremental renewals costs associated with renewing and replacing the additional infrastructure provided by the scheme over the defined appraisal period (60 years).

The method for ensuring a cost allowance for this in the economic appraisal was to estimate the frequency (in years) and extent (as a percentage of first cost) of renewals, undertaken by the discipline engineers to reflect both minor and major renewals. Minor renewals recognises that for some assets, there are significant components that are renewed at a more regular frequency than the major renewals, where the majority (though not necessarily all) of the asset is renewed. The frequency of renewals is assumed to be repeated throughout the 60-year horizon, with costs captured at nominal values and then discounted in the business case model.

Figure 5.4 and Figure 5.5 present the incremental renewal costs for Phase 1 and Phase 2 respectively and illustrate the how these costs are distributed over the 60 year scheme life as well as presenting the overall cumulative totals. Renewals costs are made up of both the direct and indirect construction costs. The diagrams show both the nominal values in 2019 prices (including real cost inflation) and the discounted values (to 2010) at 2010 prices. The latter values represent what is input to the economic appraisal analysis and demonstrates how the costs reduce in value over time once discounting has been applied.

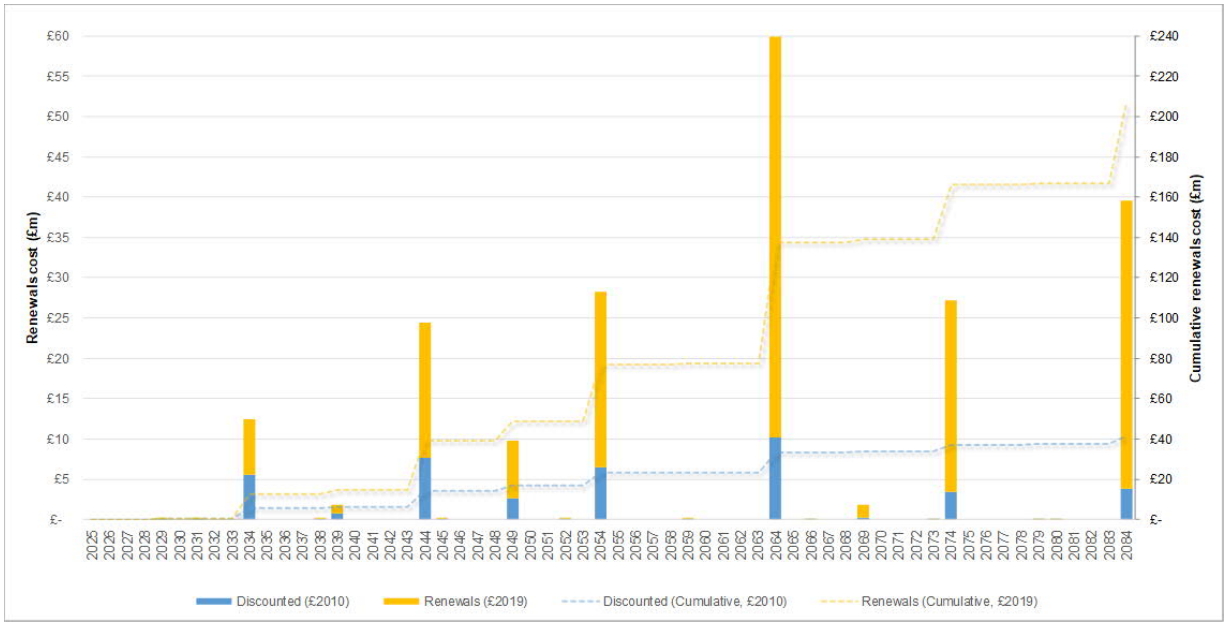
In total, Phase 1's cumulative renewals cost is £175m over 60 years (2019 prices) and it can be seen how this distributes across a number of key years at the 10/20/30/40/50 and 60 year mark, representing when it is considered that key major renewals are anticipated. Whilst the indication from the diagram is that there is a particular focus on renewals costs in key years, this does hide what is in fact a considerable mix of cost allocations and frequency of spend across the various engineering elements. For example, permanent way minor renewals are allocated as 5% of initial cost every 10 years and a major renewal of 75% of initial cost every 40 years, a signalling minor renewal has been assumed as being 20% of initial cost every 10 years whilst a major renewal is 50% of initial cost every 25 years, whilst level crossing minor and major renewals vary by type of level crossing. Once the discounting factor is added, alongside a re-basing to 2010 prices, then the total cumulative value becomes £37m for Phase 1.

Figure 5-4: Phase 1 Renewals Costs over 60 Years



It is a similar pattern for Phase 2, with a total cumulative renewals cost of £206m over 60 years (2019 prices), again focussing on a number of key years at the 10/20/30/40/50 and 60 year mark. Once the discounting factor is added, alongside a re-basing to 2010 prices, then the total cumulative value becomes £41m for Phase 2.

Figure 5-5: Phase 2 Renewals Costs over 60 Years



Some new assets provided by the project will be replacing existing assets that would otherwise be renewed by Network Rail in accordance with the relevant asset management policy. There is, therefore, a potential benefit to Network Rail that the renewal of these assets is effectively brought forward. The potential for 'costs avoided' by Network Rail over the 60 year project life is something that will be determined in greater detail in the Design Stage and reported in the FBC. For the purposes of the OBC a sensitivity test has been undertaken whereby the net renewals costs have been reduced by -10% / -30% / -50%.

5.5 Mobilisation Costs

Mobilisation costs are the one-off costs experienced by the train operator during service mobilisation including items such as driver recruitment and training, route learning, new uniforms and conductor ticket machines. For the Franchise-based options, based on previous experience on other projects, an allowance of £90,000 per additional traincrew required has been added to the scheme appraisal. In addition to this, following further discussions with Northern Rail, a sum of £150,000 was added to this cost to represent anticipated costs that would be incurred at Heaton depot. For the Concession-based options, mobilisation costs were provided via the market testing exercise. In total the mobilisation costs ranged from between £1.0m and £1.5m.

5.6 Operating Costs

Two different sets of operating costs have been determined for the OBC, representing either the Franchise-based operation (T1/T2) or the Concession-based operation (A1/A2). The development of the Franchise-based operating costs for the scheme has been undertaken 'bottom-up' through the application of core operating cost rates sourced either from Northern Rail or from data available on the Network Rail website. The Concession-based operating costs have been determined via some initial market testing with the rail industry, where a service specification has been agreed in line with the defined options and a costed proposal has been received[24]. For certain operating cost items, such as those relating to stations, it has been assumed that the costs would be the same across all operating scenarios.

For reasons of commercial confidence, it is not possible to replicate the detailed cost breakdowns provided by Northern or the organisations consulted via the market testing. The information provided in this section is therefore presented at an aggregate level.

Operating costs are made up of:

- Rolling stock running costs: A function of the net additional vehicle or train miles and includes fuel, maintenance and cleaning, variable track access and the capacity charge;
- Rolling stock leasing costs: A function of the number of trains (units) required to operate the service, including an allowance for spare cover. Made up of the capital lease and the non-capital lease costs. Non-capital lease costs often represent the heavy maintenance costs;
- Traincrew costs: A function of the driver and conductor establishment determined to operate the new service;
- Station operating costs: All stations are assumed to be unstaffed. Operating costs have been split between the station building/platforms and the station car parks. The planning assumption at this stage is that the station car parks would be operated by Northumberland County Council;
- Other operating costs: These are other operating cost items not captured by the above (such as admin, ATOC fees, BTP fees, industry system costs, etc). These tend to be a function of overall train miles and get added pro rata.

The operating costs have been developed separately for each option at 2018 prices. In broad terms it is the option timetable that defines the level of operating costs (actual train requirement, train miles, etc) and these are presented in Economic Appraisal Report (Appendix C), but there are some standard assumptions applied across all options, including:

- All trains are assumed to operate between Newcastle and Ashington;
- All services in the Franchise-based options are operated by 2-car trains – assumed to be a class 170 (equivalent). An additional train has been assumed to provide additional peak hour train capacity (ie a 4-car train). For the Concession-based options all services are assumed to be operated by 3-car trains – assumed to be battery operated class 230s[25];

[24] These organisations were asked to supply quotes for operation of the service to a specification aligned with Options A1 and A2. These are not in any way binding and have been provided in order to inform the OBC and ongoing development of the Northumberland Line scheme. Their use is intended to provide an indication of the likely level of costs associated with a Concession operation.

[25] This is based on the outcomes of the initial market testing undertaken to date to inform the OBC. A Concession operation would have the ability to procure rolling stock from the market that might be considerably different to that presented in this OBC for illustrative purposes.

- For the Franchise-based options, an allowance has been made for spare cover (for maintenance etc) based on Northern Rail's standard operating assumption of 1 spare train for every 6 trains in operation. The Concession-based options assume 1 spare train;
- The vehicle and train miles calculated includes for anticipated Empty Coach Stock (ECS) movements to/from depot;
- There is some slight variations in journey times by train as individual trains have been flexed in order to get the timetable to work;
- Weekday timetable starts with an 05:39 departure from Ashington and finishes with an 21:59 departure from Newcastle;
- Saturday timetable is the same as the weekday timetable – except in Phase 1 there are no additional peak hour services. Also no peak train strengthening on Saturdays;
- Sunday timetable is hourly between 0800 to 2200 hours across all options;
- Sunday service on bank holidays (except no service on Christmas Day).

Table 5-4 sets out the operating specification across each of the options. The use all day of 3-car trains in the Concession-based options increases overall vehicle mileage by 25% to 35%. Two trains are required to operate the Phase 1 timetable, whilst three trains are required to operate the Phase 2 timetable. The requirement for a peak strengthening train in the Franchise-based options increases the number of trains required compared to the Concession-based options. The traincrew numbers are the same across both operating scenarios.

Table 5-4: Operating Specification by Option

Option	T1	A1	T2	A2
Annual Vehicle Mileage	613,775	760,059	954,255	1,267,731
Number of Trains Required	3.5	3.0	4.7	4.0
Driver Establishment	11	11	16	16
Conductor Establishment	10	10	13	13
Number of Stations - 1 platform	2	2	3	3
Number of Stations - 2 platforms	2	2	3	3

The specifications outlined above have been discussed with, and reviewed by, Northern Rail. They were also used as the basis for initial market testing with potential Concession operators.

For the Franchise-based options Northern Rail supplied cost rates relating to rolling stock running costs, leasing costs and staff costs. Equivalent cost data was supplied by the invited organisations via the market testing to inform the operating costs associated with the Concession-based options. User charges, EC4T[26] and electrification asset user charges were sourced from the Network Rail website. Other operating costs have been determined as a percentage cost uplift based on our consultant's database.

Typical average station operating costs have been used, with separate costs identified for one or two platform stations and whether they will have lifts or not. In all cases it has been assumed that the stations would be un-staffed. It should be noted that the station operating costs do not include the Long Term Charge administered by Network Rail on the assumption that this charge reflects the cost for renewals and replacement which is costed as a separate item in this scheme appraisal. Equally, no costs have been included for the additional costs that would be incurred by the operator at Newcastle Central (these are costs levied by the SFO[27] on all other operators at the station pro-rata to the number of trains calling at that station – referred to as Qualifying Expenditure). As these are essentially redistributing these costs amongst operators based on the proportion of trains operated, it is considered unlikely that there would be any net material change in operating costs at a 'UK Rail plc' level.

[26] Network Rail's charge for electricity
[27] Station Facilities Operator – in the case of Newcastle Central this is LNER at the time of writing

Table 5-5 presents the annual operating costs in 2018 at 2018 prices. The Phase 1 related operating costs come out at £4m to £4.5m per annum, whilst the Phase 2 related operating costs, reflecting the higher service frequency, are circa 45% higher at between £6.1m and £6.7m per annum. As it stands, the Concession-based operating costs are circa 8% to 10% higher than the Franchise-based operating costs. At this stage, however, it would be premature to assume that this would remain the case as the scheme is further developed and the Concession-based approach is refined via more detailed and thorough market testing. A sensitivity test that presents the impact on the scheme appraisal of a 20% reduction in the Concession-based operating costs has been undertaken and has been reported in the Economic Case.

Table 5-5: 2018 Annual Operating Costs

	Franchise	Concession
Phase 1	£4.24m	£4.56m
Phase 2	£6.06m	£6.67m

It should be noted that these operating costs account for changes in user charges, which are mileage-based, but not any fixed track access charges (FTA), which are a fixed annual block payment made by train operating companies to Network Rail that reflect the size of their operation and their use of Network Rail's infrastructure (referred to as their Regulatory Asset Base (RAB)). In this case, the proposed service is a new passenger service over a currently freight-only line. Therefore, by definition, the train operating company might be expected to see a rise in their annual FTA accordingly (ie: taking their share of the use of the existing RAB associated with the line, plus any additional RAB (ie: new infrastructure) required to provide the service).

Preliminary discussions with the ORR (Office of Rail Regulation), Network Rail and the DfT have, however, forged the view that there is little precedent for how this might work in practice (in terms of how FTA charges might be reallocated). Also, the FTA charges are fixed across each Control Period and therefore won't now change until 2024 at the earliest.

5.7 Financial Appraisal

This section presents the scheme's financial appraisal and focuses on the estimated impacts at three different levels:

- at the 'UK plc' level, by comparing total incremental rail revenue to total incremental operating costs;
- at the Northern Franchise level, by comparing the estimated incremental revenue to the Northern Franchise, noting that this will include impacts such as transfer of demand away from Morpeth/Cramlington as well as additional demand elsewhere on Northern network (eg: a new Ashington to Harrogate journey), with the estimated scheme operating costs (which are assumed to fall to the franchise); and
- at the Concession level, by comparing the estimated incremental revenue to the Concession with the estimated scheme operating costs (which are assumed to fall to the Concession).

This analysis therefore determines whether introducing the service might lead to an operating surplus (reducing the overall franchise subsidy requirement), or alternatively if the franchise subsidy requirement will increase to balance the difference between the operating costs and the change in franchised revenue.

Scheme operating costs comprise rolling stock running costs, rolling stock lease costs, staff costs, station costs and other costs. The latter category including fees paid by Northern to Network Rail, ATOC plus other admin costs. The calculation of the operating costs by option has been discussed earlier. The treatment of these costs into the future has been assumed as per the economic appraisal and in line with TAG guidance, including:

- Real wage rate inflation;
- Depreciation of rolling stock leasing costs over time;
- Replacement of class 170s by class 170 (equivalent) rolling stock in 2030;
- Changes in fuel consumption efficiency and cost rates.

It is also important to note that for the purposes of the financial appraisal a number of different assumptions have been applied (compared to what was assumed for the economic case analysis):

- No optimism bias, market price uplift or discounting has been applied;
- An estimated value for the Long Term Charges that will be incurred by the franchise or Concession at each new station has been added, based on industry evidence for comparable station specifications;
- An estimated value for the change in Qualifying Expenditure that will be incurred by the franchise or Concession at Newcastle Central station has been added, based on the existing levels of Qualifying Expenditure at the station.

Subsidy requirement is based on the overall impact to the franchised operator, therefore discounting revenue transfer from other Northern services and including any Northern revenue generated outside the study area. Table 5-6 summarises the sources of revenue considered for the financial appraisal and how these have been determined for the purposes of the financial appraisal. The factors in the table are based on LENNON data for the Tyne Valley corridor and a high level estimate of the ECML revenue split based on service frequencies and journey times.

Table 5-6: Sources of Revenue for Financial Appraisal

Revenue source	Internal/ External	Treatment in financial appraisal
Transfer from other modes	Internal	New Northern revenue
Induced	Internal	New Northern revenue
Transfer from ECML (Morpeth trips)	Internal	Revenue for all passengers who now use Northumberland Line who previously used any ECML service, minus ECML revenue on Northern services from those who have transferred
Transfer from ECML (Cramlington trips)	Internal	Revenue for all passengers who now use Northumberland Line minus revenue for these same passengers who previously used Northern ECML service
Long distance (from other modes & induced)	External	New Northern revenue on Northumberland line, plus share of revenue on other Northern services outside the corridor (10% of long distance revenue)
Transfer from ECML (Morpeth trips)	External	Northumberland line revenue as above, minus share of Northern revenue lost on the EMCL
Transfer from ECML (Cramlington trips)	External	Northumberland line revenue as above, minus share of Northern revenue lost on the ECML

The outputs from this analysis are presented below, indicating what the estimated level of subsidy requirement or surplus in a given year might be. An indication of the proportion of operating costs that are covered by the revenue is also presented. This has specifically focussed on the first three years of operation, year 5 and then year 10. It should be noted that for years 1 to 3 the impacts of revenue 'ramp-up' have been assumed.

Table 5.7 sets out the financial appraisal at the 'UK plc' level. This demonstrates that after year 1 the scheme as a whole generates a revenue surplus. This reflects both the local (study corridor) impacts and the additional long distance demand generated by the scheme. In this sense, it is important to note that incremental revenue to other operators/franchises is excluded from the franchise and Concession tables below. Long distance operators such as LNER, TransPennine Express or Cross Country are expected to experience an increase in revenue as a result of the additional rail passengers generated and attracted by the rail service that is only captured in the 'UK plc' table below.

Table 5-7: Financial Appraisal at 'UK plc' Level (2018 prices)

Year	T1		T2		A1		A2	
	Subsidy Requirement*	% costs covered	Subsidy Requirement*	% costs covered	Subsidy Requirement*	% costs covered	Subsidy Requirement*	% costs covered
1	-1.1m	75%	-1.2m	80%	-1.4m	70%	-1.7m	75%
2	0.5m	112%	1.3m	121%	0.2m	105%	0.8m	112%
3	1.4m	132%	2.6m	142%	1.1m	123%	2.1m	131%
5	2.2m	151%	3.9m	164%	1.9m	140%	3.4m	151%
10	2.4m	152%	4.4m	165%	2.3m	149%	4.1m	160%

* negative values indicate that the additional revenue accrued does not fully cover operating costs

Table 5-8 summarises the financial appraisal undertaken for the franchise options T1 and T2. As discussed above the subsidy requirement is calculated as the difference between the operator's estimated net incremental revenue and the scheme/operator's operating costs. The table indicates that the introduction of the Northumberland Line service is likely to trigger the requirement for additional subsidy for the Northern Franchise. For the first three years of operation there will be significant demand ramp-up, which results in an initial subsidy requirement of between £2.5m and £3.5m in the first year of operation. As the demand ramps up to 100% the subsidy requirement reduces considerably to circa £1m by year 3, with revenue accounting for circa 80% of the scheme operating costs. By year 10 the annual subsidy requirement is expected to be less than £0.5m.

Table 5-8: Financial Appraisal of Franchise Options T1 and T2 (2018 prices)

Year	T1		T2	
	Subsidy Requirement*	% costs covered	Subsidy Requirement*	% costs covered
1	-2.5m	44%	-3.4m	46%
2	-1.5m	66%	-1.9m	69%
3	-1.0m	77%	-1.2m	82%
5	-0.5m	89%	-0.4m	94%
10	-0.5m	89%	-0.3m	95%

* negative values indicate that the additional revenue accrued by the franchised operator does not fully cover its operating costs

Table 5.9 summarises the financial appraisal undertaken for the Concession options A1 and A2. As discussed above the subsidy requirement is calculated as the difference between the operator's estimated net incremental revenue and the scheme/operator's operating costs. The table indicates that the Concession operator is likely to require ongoing revenue support of between £2.0m and £4.5m across the first three years of operation as demand ramps up. This falls to a revenue support requirement of £1.4m by year 10 for Option A1 and £1.9m by year 10 for Option A2.

There are a number of reasons why the Concession operator will require a greater level of revenue support than the franchise operator would:

- The Concession operator receives marginally less revenue than the franchise operator in the study corridor by 2039, due to the lower fares and the fact that whilst these lower fares do attract additional demand, it is not enough to offset the impact of the lower fares;
- The Concession operator's operating costs are circa 8% to 10% higher than the Franchise-based operating costs. At this stage, however, it would be premature to assume that this would remain the case as the scheme is further developed and the Concession-based approach is refined via more detailed and thorough market testing. A sensitivity test that presents the impact on the scheme appraisal of a 20% reduction in the Concession-based operating costs has been undertaken and is reported in the Economic Case;

- The Concession operator does not have the benefit of additional revenue elsewhere on the rail network like Northern does.

It is worth noting that any additional revenue associated with use of the Tyne & Wear Metro (eg: through transferring at Northumberland Park) has not been included in this analysis. In other words, the revenue used in this appraisal is essentially that associated with the 'heavy rail' operation on the Northumberland Line.

Table 5-9: Financial Appraisal of Concession Options A1 and A2 (2018 prices)

Year	A1		A2	
	Subsidy Requirement*	% costs covered	Subsidy Requirement*	% costs covered
1	-3.1m	35%	-4.5m	36%
2	-2.3m	52%	-3.3m	53%
3	-1.9m	61%	-2.7m	62%
5	-1.5m	69%	-2.1m	71%
10	-1.4m	72%	-1.9m	74%

* negative values indicate that the additional revenue accrued by the Concession operator does not fully cover its operating costs

5.8 Funding

Northumberland County Council has already committed significant funding from its capital programme to help design and develop the scheme. In the period 2020-2023, a further £29.6 million has been identified and will be considered by the Council's Cabinet in February 2020.

Additional funding opportunities for the Northumberland Line still need to be identified to cover the shortfall in funding from NCC's commitment. One avenue being pursued is the Transforming Cities Fund. The North East area is one of twelve areas which has been shortlisted to bid for a share of £1.28 billion of capital funding to improve public and sustainable transport connectivity.

Bids for Transforming Cities Funding will be prioritised based on their ability to meet two key objectives:

- Schemes must support the local economy and facilitate economic development;
- Schemes must reduce carbon emissions.

As set out in the OBC Strategic Case, improving economic activity and encouraging a mode shift from private car to sustainable modes are central objectives of the Northumberland Line scheme, making it an excellent candidate for Transforming Cities Funding. Given the regional benefits that the scheme will deliver, the scheme also has support from other partners within the North East area.

The North East business case for Transforming Cities Funding was delivered in November 2019, with decisions on funding expected in March 2020. Any funding awarded to the Northumberland Line scheme would need to be spent by 2022/2023. This aligns with our phased approach to delivery, with infrastructure phase 1 deliverable within this programme.

Northumberland County Council is however committed to delivering both phases of the scheme, increasing the service frequency and including additional stations at Blyth Bebside and Seaton Delaval, which are not deliverable by 2023. Work is currently ongoing to identify alternative sources of funding from the private sector from those businesses that will benefit from the reopening of the Northumberland Line to passenger services. Initial discussions have been positive with further discussions planned as the scheme develops.

The RNEP process is a further area for potential scheme funding to deliver phase 2 of the scheme. Given the Northumberland Line scheme has now been accepted into the RNEP pipeline, the potential for funding through RNEP is being explored.

Alongside the capital costs of the scheme, NCC recognises the need to cover the revenue support for the scheme in the initial years of operation and this will be considered by the Council's Cabinet in February 2020.

6. Management Case

The Management Case sets out the project planning, governance structure and risk management for the delivery of the scheme. Stakeholder management and benefits realisation are also key areas that should be highlighted as part of this Case. Established at the Develop Stage, the Northumberland Line project continues to benefit from an established governance structure and the involvement of all the key stakeholders.

6.1 Introduction

The Northumberland Line scheme has been the subject of a thorough GRIP 2 study funded by NCC and undertaken by Network Rail and Jacobs in 2016. A subsequent value engineering exercise, overseen by Network Rail, Nexus, NCC and Rail North, was carried out in September 2017, with the report issued May 2018. AECOM undertook an initial Business Case appraisal in June 2012, which was further updated in March 2016. The outcome of that work was that, despite the value engineering exercise reducing the capital costs of the project from circa £190m to £160m, the affordability and initial indications around value for money suggested that the costs would require further scrutiny alongside the benefits of the scheme in order to generate a positive BCR.

Since the summer of 2018, NCC has engaged AECOM and SLC Rail to critically review the engineering, operational and business case work undertaken to date, in order to identify a project which is capable of being delivered at an efficient level of capital and ongoing operational cost. The SOBC for the scheme was submitted in the summer of 2019, which placed the scheme on the RNEP process through the Decision to Develop. Subsequently the scheme has now been further developed as part of the Develop Stage. Within those timescales the RNEP, Network Rail 'Open for Business' and Market Led strategies have emerged and this OBC reflects much of the new thinking on alternative funding/financing and delivery strategies that are now required.

As a result of the work that has been carried out and updated guidance, this OBC has identified a viable project scope, delivery strategy and identified operating/ownership options that will meet the required outputs of the project.

It is intended that the project is delivered as part of the Rail Network Enhancements Pipeline (RNEP) process, although the possibility of utilising funding from the 'Transforming Cities Fund' is also being considered and phase 1 of the Northumberland Line scheme was included in the recently submitted North East Transforming Cities Fund bid.

The following sections of this chapter of the Business Case set out further details on how the project will be delivered.

6.2 Evidence from Similar Projects

Northumberland County Council has extensive experience in the delivery of large capital investment projects. Of particular relevance to this project, in terms of the scale of investment, is the Morpeth Northern Bypass, which was successfully completed in Spring 2017. This major highway scheme, delivered a new junction on the A1 to connect the A1 with the Pegswood Bypass. The aim of the scheme was to reduce congestion and facilitate much needed economic growth and job creation in the area. The bypass is 3.8km long and took approximately 20 months to complete at an expense of £30m, with £21m being contributed by DfT.

Pegswood Bypass is also of particular note. This scheme was successfully completed in July 2007. The Pegswood Bypass is a 2.7km single carriageway road on the A197 linking Ashington and Morpeth, which was constructed to alleviate traffic flows in the former pit community of Pegswood. The capital cost of the scheme was £9.2 million, with Northumberland County Council providing £3 million funding and an additional £6.2 million being provided by the Department for Transport. The scheme was constructed over a 58 week period from start to finish and was completed 10 weeks ahead of program.

The experience demonstrated by Northumberland County Council in the delivery of schemes, and the best practice used in the development of the business case, provides an excellent framework on which to progress the Northumberland Line scheme in a timely and efficient manner, whilst helping to minimise risks.

Although Northumberland County Council has no recent experience in the delivery of major rail projects, they will be supported in the development of the scheme by AECOM and their partners SLC. AECOM and SLC have considerable experience in providing technical support to third party rail scheme promoters in order to progress their rail schemes through the rail industry and business case processes. This has focused on the production and submission of the SOBC, the OBC and the FBC, taking each of these through the relevant assurance processes accordingly.

AECOM and SLC's support then continues through the deliver and deploy stages in terms of procuring the rail services (including negotiating with train operating companies) and post-implementation monitoring. Relevant examples of AECOM and SLC's work in this area include:

- AECOM supported Lancashire County Council in producing the business case (including demand forecasting) to obtain funding for the introduction of rail services between Burnley and Manchester via the re-instated Todmorden Curve. Following introduction of the service in May 2015, AECOM continued to monitor demand and revenue on behalf of Lancashire County Council for the first three years of operation.
- AECOM produced the business cases through to FBC for the Halton Curve project promoted by Merseytravel with Welsh Government, which ultimately saw the introduction of a new new service operating between Liverpool and Chester that commenced in May 2019.
- AECOM has been Warrington Borough Council's technical advisor on the Warrington West station scheme, producing the business case for the scheme – including demand forecasts, and assembling the New Stations Fund bid. This station is due to open in December 2019 and AECOM continued to be involved as design consultants to the contractor and also from a planning perspective in procuring the trains to call at the new station (including an operational analysis on behalf of the rail industry partners).
- The SLC Rail team worked with Worcestershire County Council to evaluate the Worcester Parkway proposal against a number of other options to identify the preferred option to address the barriers to growth. Next steps involved working with key rail and non-rail stakeholders to develop the new station design, train service timetable plans, business case and the commercial structures required to produce a viable proposition for the new station. The station is expected to open early in 2020.

As well as providing support through the delivery and deploy stages, AECOM has extensive experience in the design of rail schemes. Specific examples include:

- AECOM delivered the civil engineering design of the Borders Railway. This included new under and over bridges, seven stations, road improvements, car parks and the refurbishment of existing bridges. Throughout the construction of the scheme, AECOM provided engineering support, ensuring a quick response to unforeseen site issues, changes in design and additional investigations. The project was delivered to time and on budget and received the award of most innovative project at the Scottish Transport Awards.
- AECOM (formally URS) was the Principal Designer for the Airdrie to Bathgate Line Regeneration, which looked to reopen 24km of disused railway and upgrade 26km of existing railway between Glasgow and Edinburgh. As well as preparing the outline design for the entire route and the detailed design for the 24km of previously discussed railway, AECOM assisted with the stakeholder engagement, including liaising with statutory consultees and planning the public exhibitions.

The knowledge and lessons learnt on all of these projects will be invaluable in finalising and delivering the Northumberland Line scheme proposals.

6.3 Programme/Project Dependencies

There are a number of elements that will need to be taken into consideration for the delivery of the Northumberland Line project. These elements are summarised below.

Freight strategy: Discussions have commenced with freight operators to determine their future requirements and to informally consult on the timetable structure in order to minimise the risk of objections in respect of the Network Change process.

Land requirements/constraints: The phased approach that is being proposed minimises the requirement for land take outside the current Network Rail boundary in Phase 1. However, there are sections of the existing track-bed in the Seaton Delaval area which are owned by a third party and leased to Network Rail. There are also significant areas of land adjoining the Network Rail boundary which are in the control of the Estate of the Duke of Northumberland, which may be impacted by later phases of the project. Discussions have commenced with landowners during the 'Develop' phase of the project and will continue during the 'Design' phase.

Highways issues: The most material highway issue is at the proposed Blyth Bebside station, which is adjacent to the A189 dual carriageway and sited close to an existing level crossing on the A193. The interface with the level crossing and the potential to block-back traffic on to the A189 dual carriageway slip roads suggest a more complex highways solution might be required. The timescales required to achieve a solution here has led to the decision to defer the Blyth Bebside station to a later phase in the project to avoid delaying the initial opening. There are highways issues at five other level crossing locations, Holywell, Seghill North, Hartley, North Seaton and Green Lane, which may need to be upgraded to Manually Controlled Barriers with Obstacle Deflectors (MCB-OD) requiring Level Crossing Orders.

Level crossings: There are a total of 22 level crossings on the route impacted by the increase in either line-speed or frequency. These are a mix of road, occupation and footpath crossings. Risk scores have been generated from the previous GRIP 2 and subsequent Network Rail studies and are being further reviewed as part of this project. Our strategy is to critically review each crossing to determine whether closure or diversion is an option before embarking on costly mitigation works.

Network Rail Renewals: The route has some planned track renewals included within Control Period 6 involving the renewal of circa one third of the pre 1976 rail on the route. The increase in line-speeds and frequency may require the acceleration of the track renewals which will be determined in the develop/design phases in liaison with Network Rail. There are no signalling renewals planned for the Northumberland Line route until the introduction of the European Train Control System (ETCS) Level 2 as part of the Digital Railway rollout in late CP7. Any interim signalling solution that is proposed by this project will need to be designed in accordance with future requirements including the interface with Tyneside IECC/York ROC.

Structures: The Network Rail GRIP 2 Addendum Study, published in May 2018, provided a desktop appraisal of work, which may be required at 36 structures on the route (underbridges, overbridges, viaducts, footbridges and culverts). 16 of the 35 structures were judged to require no further work but these assumptions will be validated during the design phase. The two highest risk structures are the Bedlington and North Seaton viaducts; both are long steel span structures supported on trestle piers which currently have 10 mph speed restrictions applied to heavy axle-weight vehicles.

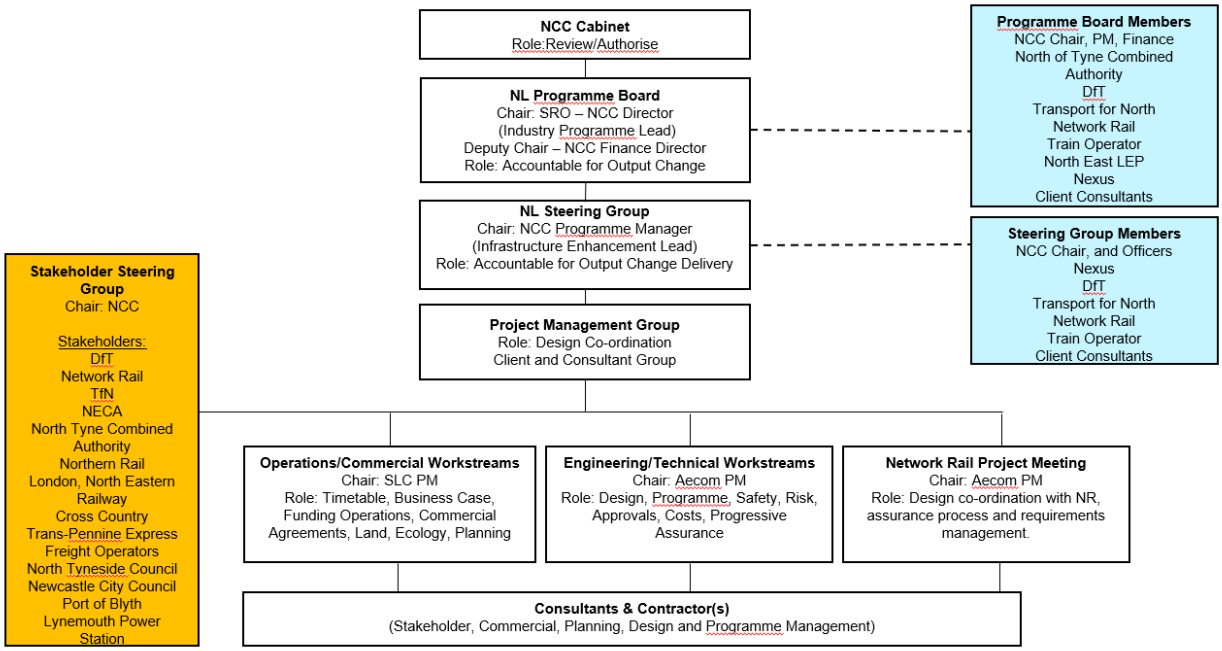
6.4 Governance, Organisational Structure and Roles

A governance structure has been agreed with stakeholders and has operated through the 'Develop' phase. This has been updated for the 'Design' phase and will evolve as the project moves through the Deliver phases to reflect the revised stakeholder/governance requirements. The structure is outlined overleaf and the full current Governance Plan is included in Appendix F.

This evolving structure will reflect an assessment at each phase of the project as to whether the client/promoter role is aligned with the risk/funding/legislative powers requirements of the project.

At this stage, however, it is assumed that NCC will continue to promote the project through the Design Phase.

Figure 6-1: Northumberland Line Project Governance Structure



6.5 Outline Programme

Figure 6-2 presents an outline programme for delivery of the scheme, which illustrates the key milestones/decision points in respect of the project. For the purposes of the key milestones, the project is split into two parts, with Phase 1 representing the initial Phase 1 introduction (four new stations and an hourly rail service with peak hour extras), and Phase 2 representing the full scheme (additional stations at Blyth Bebside and Seaton Delaval and a half-hourly rail service). The phased approach to delivery would allow Phase 1 of the project to be delivered by spring 2023, with Phase 2 to be delivered by January 2025, once further statutory approvals are agreed.

To provide further clarity on the programme, in Figure 6-3, indicative timescales for service procurement through Phase 1 have been shown separately for the Concession-based and Franchise-based operating models. Work will continue through the Design stage with relevant industry stakeholders to refine this programme accordingly.

Figure 6-2: Outline Programme

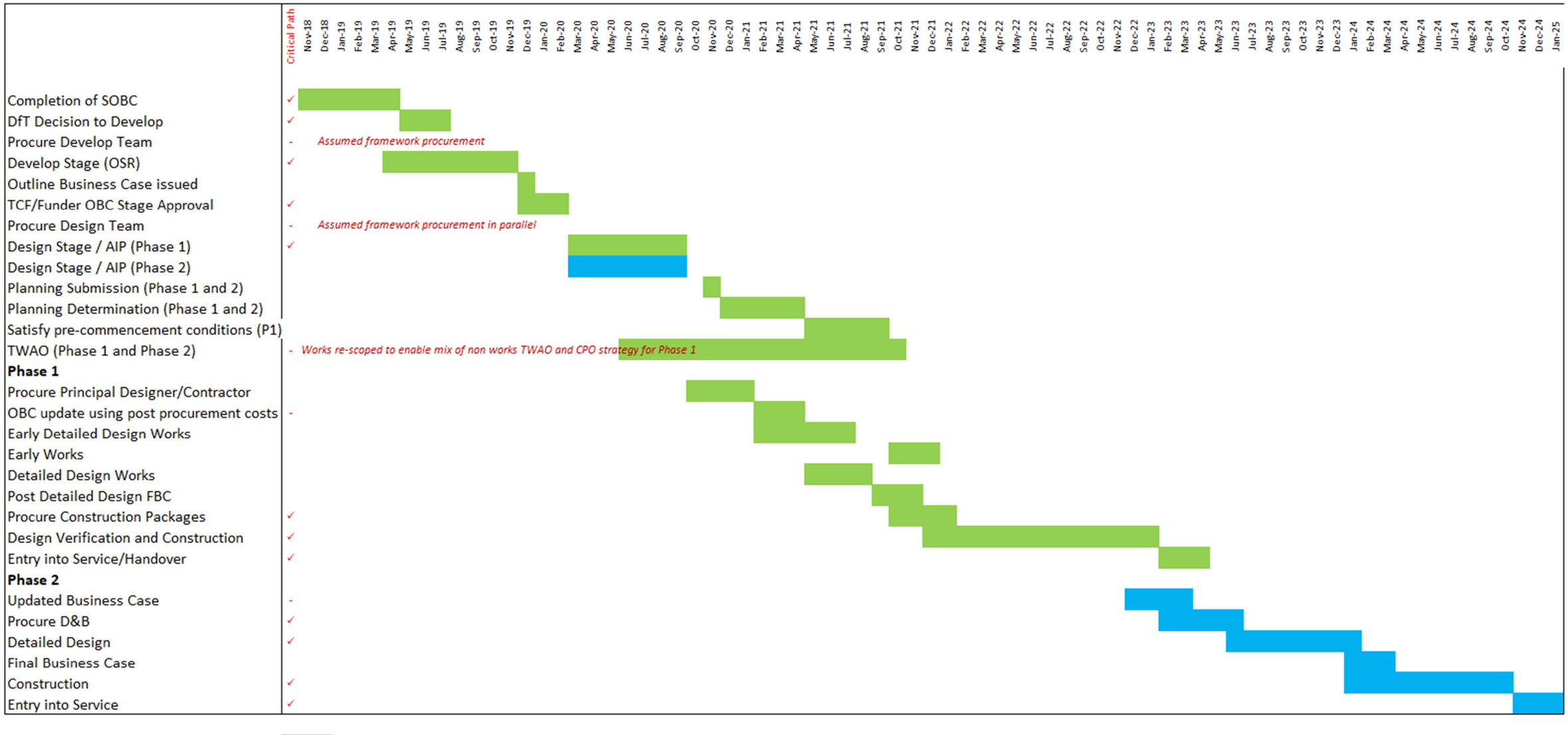
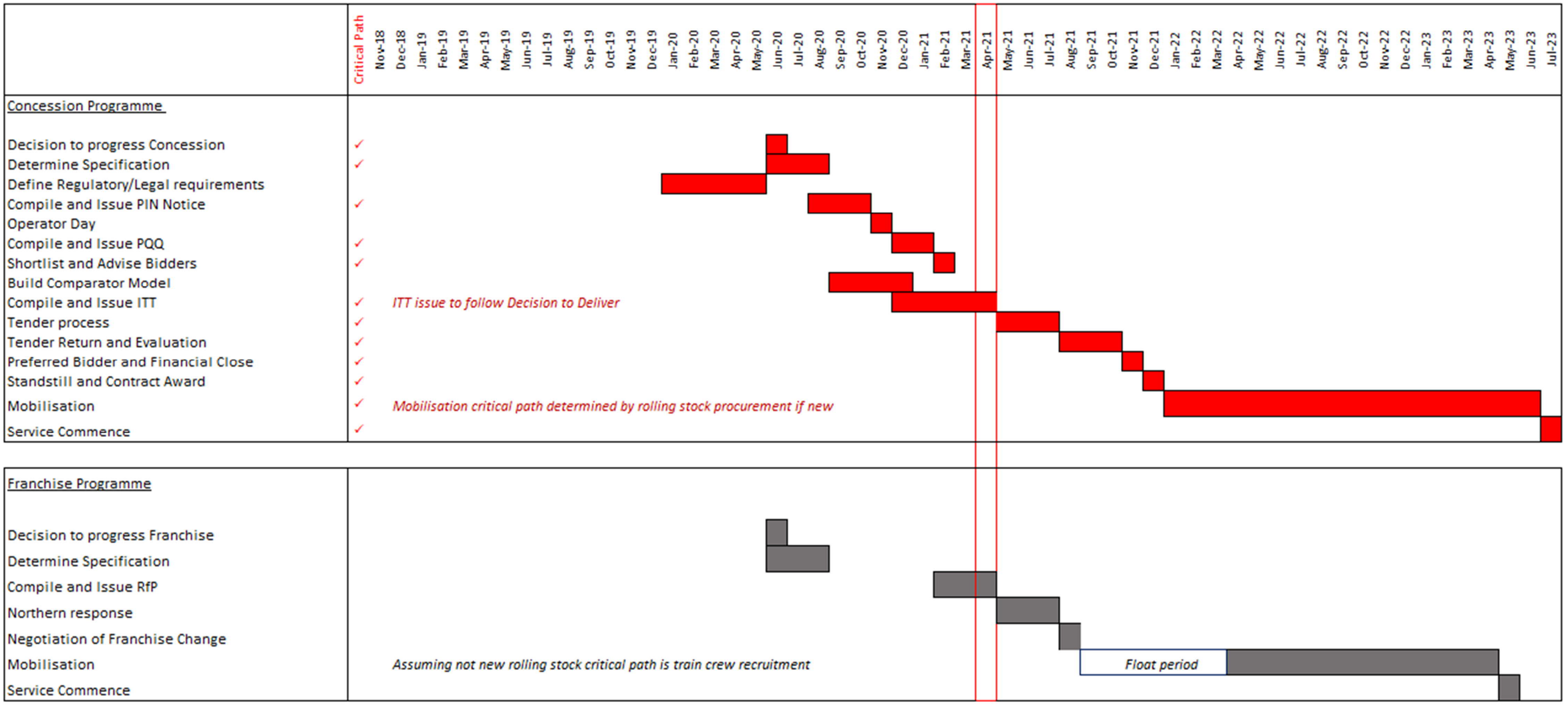


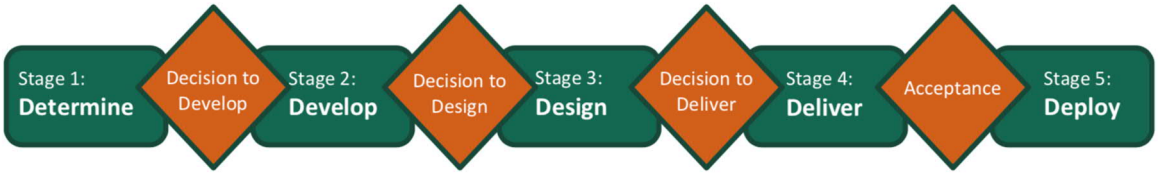
Figure 6-3: Service Procurement Programme through to Phase 1



6.6 Assurance and Approvals Plan

The project is proposed to be developed through the RNEP process, illustrated below. Although the elements of the RNEP process do not necessarily align with the Network Rail GRIP process, there are elements of GRIP with Network Rail in asset protection mode that form key Gateways for the project, e.g Option Selection Report, Approval in Principle, Authorised for Construction.

Figure 6-4: RNEP Process



The key milestones and Gateways are identified in the indicative programme, but an Integrated Assurance and Approvals Plan which includes the wider Planning and Regulatory requirements is attached in Appendix G.

6.7 Communications and Stakeholder Management

Key stakeholders are engaged in the development of the scheme through the Northumberland Line Programme Board and Steering Group. Both groups are chaired by Northumberland County Council and bring together stakeholders with an interest in the project.

The representation on the Programme Board is designed to ensure review and co-ordination of development proposals to ensure that infrastructure and operational plans meet the project objectives and wider stakeholder strategy.

Additional stakeholder engagement will be needed as the proposals and delivery mechanisms develop through the RNEP framework. Resources to ensure local communities and businesses are informed and have an appropriate opportunity to contribute to plans will be provided, and we have already held a series of public consultation events during the 'Develop' stage of the project.

A summary Stakeholder Communications and Engagement Plan is included at Appendix H.

6.8 Project Reporting

The Project Manager will maintain regular dialogue with the Programme Manager regarding progress and project specific issues. Monthly progress reports will be submitted to the Programme Manager to inform dashboard reports to be produced by NCC, which will reference key deliverables identified in project deliverables trackers. The dashboard reporting format includes:

- Executive Summary
- Key milestones achieved in period (month)
- Planned activities in the next period (month)
- Programme update (high level, showing the baseline and any slippage explained in the summary)
- Finance forecast cashflow report update
- Top five risks and proposed mitigation.

Interim Reports, or presentations, may be submitted to the senior responsible officer to provide interim updates, or information required to facilitate decision-making processes, the format and content of which will be agreed with the Programme Manager, as and when required.

Presentations and reports to the Programme Board, Steering Group or Stakeholder Steering Group shall be agreed by the Northumberland Line Programme Manager on a monthly basis, providing updates on costs, programme, key issues and decisions required, as a minimum.

6.9 Risk Management Strategy

The risk management process being followed by the project complies with the risk management process defined in Network Rail's GRIP standard, the Common Safety Method (CSM) required under European and UK Law and Highways Design Standards and processes, (Road Safety Audit Stage 1 for Preliminary Design).

During this stage of the project, a risk register has been established covering overall project risks. The risk register was collated during a risk workshop held on Friday 4th October 2019, which was attended by technical experts on the design team, Morgan Sindall (ECI) and Network Rail. The risks will continue to be reviewed as the scheme develops. A process of hazard identification and preliminary system definition, to establish whether the project represents a 'significant' risk in respect of CSM, will be undertaken. This will be undertaken in conjunction with Network Rail, leading to the potential procurement by the Promoter of an independent Assessment Body (AsBo), in respect of Safety Assessment, and a Notified Body (NoBo) to determine whether the rail elements of the project meet European Inter-operability Regulations.

Further information on how risk will be managed is summarised below.

Monthly Updates: The Northumberland Line Programme Manager will review the identified risks each period / month, to ensure they are being mitigated and make a qualitative assessment of the impact on the Programme risk exposure. New risks will be added to the register where it is felt appropriate by the Northumberland Line Programme Manager. The monthly risk reviews will be run by the Northumberland Line Programme Manager, as part of the Northumberland Line Steering Group agenda, and discussed at designated meetings.

The purpose of the monthly reviews is to ensure mitigating actions are being put in place and to report the impact on the risk profile to the Northumberland Line Steering Group, and ultimately to report on the top 5 or 10 identified risks and any new potential risks to the Programme Board.

Quarterly Risk Review: Each quarter, or at Stage Gate reviews if it is felt appropriate by the Northumberland Line Programme Manager, there will be a review of the full risk register by the Northumberland Line Steering Group, with support from technical and operations team, and Network Rail.

At this review, all newly identified risks that have been added to the register since the last quarterly review will be assessed and validated by the whole team. The quantification of all risks, new and existing, will be assessed, and any changes to mitigating actions identified.

Our current view of the key risks to the project are shown in the following table.

Table 6-1: Northumberland Line Risks

Key Risk Area	Impact	Likelihood	Mitigation
Strategic			
NR require increased signalling scope for future-proofing/preferential design	Higher Cost, Programme delays	Medium to High	Early engagement with NR
Industry Review/Current Issues reduces resources to assist third party projects	Programme delays, loss of funding opportunities	Medium to High	Fully exploit 'Contestability' process, alternative suppliers
Increased Freight Traffic Forecast	Higher Scope, increased cost	Medium	Agree capacity requirement assumptions early with FOCs
Insufficient future capacity on the East Coast Mainline	Programme delays, increased cost, scope of service does not meet requirements	Medium	Requirements for future paths on East Coast Mainline taken into consideration in timetabling development

Key Risk Area	Impact	Likelihood	Mitigation
Regulatory/Legal			
Need to use Transport and Works Act instead of Planning, LX Orders	Programme Delays for early phase delivery, increased cost	Medium	De-risk specific locations to later phases. Early engagement with Highways England/ORR/Landowners
Financial			
Land Assembly/Acquisition	Programme Delays, increased costs	Medium to High	Early engagement with Landowners. Phase delivery to maximise use of NR PD powers
Unforeseen Ground Conditions (Former Coal Mining area)	Programme Delays, increased costs	Medium to High	Early GI, desktop studies to minimise risk in Design Phase
NR Asset Condition Poor (track, formation, structures).	Programme Delays, increased costs	Medium to High	Gain full understanding at Develop phase and agree remediation plan with NR

As part of the risk register, the level of risk was quantified to be used in the economic appraisal of the scheme. Further information on the risk workshop and quantification of risk can be found in Appendix E of this OBC.

6.10 Benefits Realisation Plan

The Benefits Realisation Plan (BRP) is designed to enable benefits that are expected to be derived from the scheme to be planned for, tracked and realised. The expected benefits are identified and then the plan details the key activities that are required to manage the successful realisation of these benefits.

The scheme objectives reported in both the Strategic and Economic Cases, have been used to develop an outline plan at this stage. The outputs are those tangible effects that are funded and produced directly as a result of the scheme and the outcomes of the scheme are the final impacts brought about by the scheme in the short, medium and long term. As part of the design stage of the study, a full plan will be developed, which will set measurable targets for scheme benefits to determine whether the objectives are being realised. The outline plan is summarised overleaf.

Table 6-2: Project Objectives, Outputs and Outcome

Project Objectives	Desired Outputs	Desired Outcomes	Timing of Review
Facilitate economic activity, employment growth and the delivery of housing sites within the South East Northumberland and the wider region	A scheme that reduces traffic flows on the highway network, freeing up capacity for further development.	Increased economic activity, productivity, people in employment education and training. Increased number of houses built and occupied in the areas served by the rail line.	Five years post scheme opening.
Create mode shift from car to public transport to improve local air quality and reduce highway congestion at key bottlenecks on the highway network between South East Northumberland, North Tyneside and Newcastle	A scheme that reduces reliance on the private car, with increased modal share of sustainable modes for journeys undertaken in South East	Change in modal share, improved air quality through reduction in car use	One year post opening Five years post opening
Improve public transport accessibility for commuting, retail and leisure trips between South East Northumberland, North Tyneside and Newcastle	A scheme which means that residents of South East Northumberland can access key services and facilities by public transport within a reasonable journey time.	Reduced travel times for commute, retail and leisure trips. Reduced congestion on the network Improved passenger satisfaction Competitive reaction from bus industry	One year post opening Five years post opening

6.11 Monitoring and Evaluation Plan

The Magenta Book (Guidance for Evaluation, HM Treasury, April 2011) provides guidance from HM Treasury; it is the central guidance for all UK government departments on evaluation and therefore sets the standard in the public sector on the evaluation of projects, detailing best practice to be followed. The Magenta Book covers:

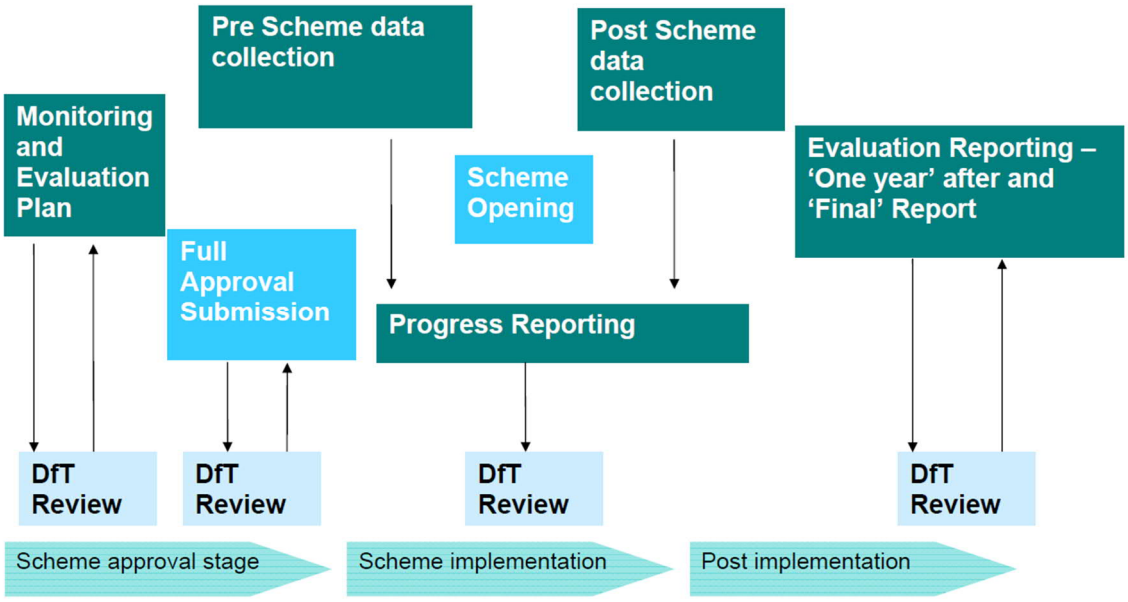
- How evaluations should be designed and managed;
- The different evaluation options available;
- How evaluation results and evidence should be interpreted and presented; and
- How think about evaluation before and during the policy design phase can help to improve the quality of evaluation results.

A key tenet of the Magenta Book is that evaluation should be 'proportionate to the risks, scale ad profile of the policy or project' The Northumberland Line scheme will be subject to a rigorous programme of monitoring and evaluation, in order to demonstrate that:

- Project delivery is against plan, including spend, risk and programme;
- Immediate post-opening issues are promptly identified and addressed;
- Delivery of scheme objectives are on track via the Benefits Realisation Plan;
- Lessons learned are captured for subsequent scheme development.

The most current and appropriate guidance for monitoring is set out in the Department for Transport publication Monitoring and Evaluation Framework for Local Authority Major Schemes (2012) and will be used for the Northumberland Line scheme unless subsequent guidance is published to supersede it. The following figure shows the current indicative monitoring and engagement process.

Figure 6-5: Monitoring and Engagement Process



Data collection during the 'design' phase of the project, will ensure a baseline for the monitoring and evaluation process is determined. The following table shows the monitoring measures necessary to complete the task. The process and outcomes will be reported 1-year and 5-year post-opening, and mapped to targets set out in the Benefits Realisation Plan.

Table 6-3: Monitoring and Evaluation Measures

Monitoring Area	Detail	Mechanism for Reporting
Scheme Build	Project Plan	Full Business Case
	Stakeholder Engagement Strategy	Monitoring and Evaluation Reporting
	Risk Register and Risk Management Plan	
Scheme Delivered	Full description of scheme outputs	Monitoring and Evaluation Reporting
	Identification of design changes since funding approval	
	Identification of mitigation changes	Benefits Realisation Plan
	Assessment of benefits realisation	
Outturn Costs	Outturn investment costs	Monitoring and Evaluation Reporting
	Identified risk manifestation in investment costs	
	Analysis of cost savings and overruns	
Objectives	Economic growth	Monitoring and Evaluation Reporting
	Increase mode share of public transport	
	Improved accessibility	Benefits Realisation Plan

6.12 Project Management Strategy

The 'Design' phase work will be undertaken using a combination of external consultants and in-house NCC resources in respect of planning, legal, financial and programme management resources in a virtual project team structure. The relationship with Network Rail will be under a Basic Asset Protection Agreement in respect of supply of records, inspections, surveys and design assurance requirements. To ensure the project progresses to programme, NCC is undertaking early activities in the Design stage at risk.

6.13 Design Stage Plan

The first part of the Design Phase for the project is planned to run from March 2020 to April 2021. This includes the Outline Design of both Phases, procurement of Phase 1 Principal Designer and Contractor and achievement of Planning Consent. At the end of this period an updated OBC is proposed to be submitted reflecting post procurement costs for the project and any scope changes arising from Outline Design and the Planning Process.

The costs associated with the Detailed Design work can only be established with any confidence once the Outline Design is completed and the procurement process for the Design and Build has been undertaken. Therefore the second part of the Design Phase, to complete the Detailed Design, finalise scheme costs and produce the Full Business Case will be completed between April 2021 and November 2021, with associated costs to be confirmed.

Early activities in advance of the DfT Decisions to Design and Deliver are proposed to be funded 'at risk' by NCC in order to de-risk critical path activities in the programme and enable immediate starts on the Design and Deliver Phases.

The key workstreams planned during the Design Phase are outlined in the tables below.

Table 6-4: Design Phase Key Workstreams

Engineering Deliverables

Stations - **Outline & detailed design for:**	Phase 1	Phase 2
Northumberland Park Station, including a single face 100m platform and 1No access stairs and lift to Algernon Drive Overbridge.	√	
Seaton Delaval Station, including a single 100m platform, car park and access road to the A192.		√
Newsham Station, including twin 100m platforms with a platform to platform footbridge and 2No. lifts, plus car park and access road to the A1061.	√	
Blyth Bebside Station, including twin 100m platforms with a platform to platform footbridge and 2No. lifts, plus car park and access road to the A193 Front Street.		√
Bedlington Station, including twin 100m platforms and car park and access road to Barrington Road.	√	
Ashington Station, including a single 100m flanked platform with a single lift for DDA compliant access from Wansbeck square and car park and access road to Kenilworth Road.	√	

Track - Outline **& detailed design for:**	Phase 1	Phase 2
Routewide Through Alignment for Line Speed Improvements, including track renewals of time expired components.	√	
New S&C to move existing junction at Benton East 260m further East.	√	
New 2.4km loop at Seghill with entry and exit S&C off the existing single line between Holywell and Seghill Level Crossings.		√
New 1.7km double track extension with a single to double turnout between Hartley Curve and Newsham Level Crossing.	√	
Renew 2No sidings and headshunt at Furnace Way Sidings with new S&C.	√	
Renew double junction at Bedlington with like for like S&C.	√	
New crossover, single turnout S&C and turnback line at Ashington Station	√	

Civils Engineering – **Detailed level 2 assessment**, outline **& detailed design for:**	Phase 1	Phase 2
Full inspection & detailed Level 2 Assessment of Bedlington & North Seaton Viaducts	√	√
Structure works at 3No. underbridges including a deck replacement, deck strengthening and deck extension.	√	
New Footbridge to replace Chase Meadows Level Crossing	√	
Ancillary Civils, including lineside fencing, access points, cess walkways and signal bases & cabinet foundations.	√	√

Signalling – **Outline & detailed design for:**	**Phase 1**	**Phase 2**
Upgrade of 23No. Level Crossings	√	
Upgrade of existing signal boxes at Newsham, Bedlington South, Bedlington North, Marcheys House and North Seaton.	√	
Upgrade of routewide signals.	√	
New signalling for 6No. stations	√	√
New signalling for Seghill Loop.		√

Operational Telecommunications – **Outline & detailed design for:**	**Phase 1**	**Phase 2**
Retail telecoms at Northumberland Park, Newsham, Bedlington and Ashington Stations	√	
Retail telecoms at Blyth Bebside and Seaton Delaval Stations		√
Routewide telecoms	√	
Telecoms upgrade at all existing level crossings and signal boxes	√	

Power – **Outline & detailed design for:**	**Phase 1**	**Phase 2**
Routewide power upgrade for signalling, points heating, level crossings and stations.	√	√
New PSP at Blyth Bebside	√	
New DNO's for signalling and points heating.	√	

Surveys	**Phase 1**	**Phase 2**
Routewide topographical survey.	√	
Targeted intrusive ground investigations	√	√
Environmental and Ecological surveys	√	

Non - Engineering Deliverables

Environment, Planning & Consents	Phase 1	Phase 2
Confirmation of Permitted Development rights (for works inside of Limits of Deviation i.e. the railway corridor)	√	√
Planning applications for construction outside of the above (including stations at Ashington, Bedlington, Newsham and Northumberland)	√	
Planning applications for remaining elements (including stations at Blyth Bebside and Seaton Delaval), unless captured in the TWAO (Phase 2) below		√
Licences for Protected Species and other environmental consents	√	√
Management and delivery of environmental surveys and assessments	√	
Procurement of Principal Designer and Contractor	√	
Decision in principle on Concession versus Franchise procurement route	√	√
Market Testing and Detailed Delivery Plan for Service introduction	√	
Commencement of Legal/Regulatory activities required for new service	√	√
Agreement of Funding/Risk Strategy with Key stakeholders/Funders	√	
Level Crossing Orders (works to update, close or alter)	√	

Rail Industry Engagement	Phase 1	Phase 2
Timetable Development including Infrastructure Modelling	√	√
Design assurance and approvals	√	√

Demand Revenue Forecasting and Business Case	Phase 1	Phase 2
Update to demand forecasting and appraisal to reflect changes in TAG guidance	√	√
Update to demand forecasting and appraisal to reflect changes in scheme and costs	√	√
Benefits Realisation Plan	√	√
Monitoring and Evaluation Plan	√	√
Updated OBC and FBC production	√	√

The consultant team has undertaken a detailed costing exercise to further develop the designs to Outline Design (Approval in Principle) procurement of Phase 1 Principal Designer and Contractor, update of the Outline Business Case and achievement of Planning Consent to the end of April 2021. It is important to note that the costs set out below do not include for subsequent Detailed Design and completion of the Full Business Case between April 2021 and November 2021. The associated costs associated with completion of works to the end of April 2021 are summarised as follows:

Table 6-5: Design Phase Costs

Item	Expected Value
Consultant Fee including: • Project and Programme Management • Land and Property • Planning and Consents • Business Case • Constructability • Surveys and Inspections • Intrusive Investigations • Design Development to AIP • Timetable and Operations • Highways • Strategic Advisory • NR ASPRO interface • Contingency	£9.06m
Network Rail Costs and other third party costs procured by NCC directly: • BAPA Services (excl. possession management resources & Schedule 4 / 8) • Access & Supervision (incl. possession management, no Schedule 4 / 8 expected) • NRFF and IRF • A further provision is recommended to allow for contribution to costs that may be incurred through supporting design development to outline design (Approval in Principal) and potential requirements around train path booking	£0.88m
Total Estimated Costs	£9.94m

The anticipated first part of the Design Phase (third party costs are subject to confirmation) is in the region of £10million including all survey & design works, planning & consents, project management, programme management, business case and stakeholder management through to April 2021 (post Phase 1 contractor procurement). DfT is asked to contribute £5million of this on the basis of match funding from NCC, where the NCC funding is to be front-loaded in order to expedite the project.

Appendix A: South East Northumberland Public Transport Corridor Study

Appendix B: Letters of Support

Appendix C: Economic Appraisal Report

Appendix D: Appraisal Summary Tables

Appendix E: Option Selection Report

Appendix F: Governance Plan

Appendix G: Assurance and Approvals Plan

Appendix H: Stakeholder and Engagement Plan

Appendix I: Public Consultation Report

Appendix J: Distributional Impacts Report

Appendix K: Economic Narrative Report

Appendix L: Environmental Capital Worksheets

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