

Capital Project Business Case

Beaulieu New Railway Station

The template

This document provides the business case template for projects seeking funding which is made available through the **South East Local Enterprise Partnership**. It is therefore designed to satisfy all SELEP governance processes, approvals by the Strategic Board, the Accountability Board and also the early requirements of the Independent Technical Evaluation process where applied.

It is also designed to be applicable across all funding streams made available by Government through SELEP. It should be filled in by the scheme promoter – defined as the final beneficiary of funding. In most cases, this is the local authority; but in some cases the local authority acts as Accountable Body for a private sector final beneficiary. In those circumstances, the private sector beneficiary would complete this application and the SELEP team would be on hand, with local partners in the federated boards, to support the promoter.

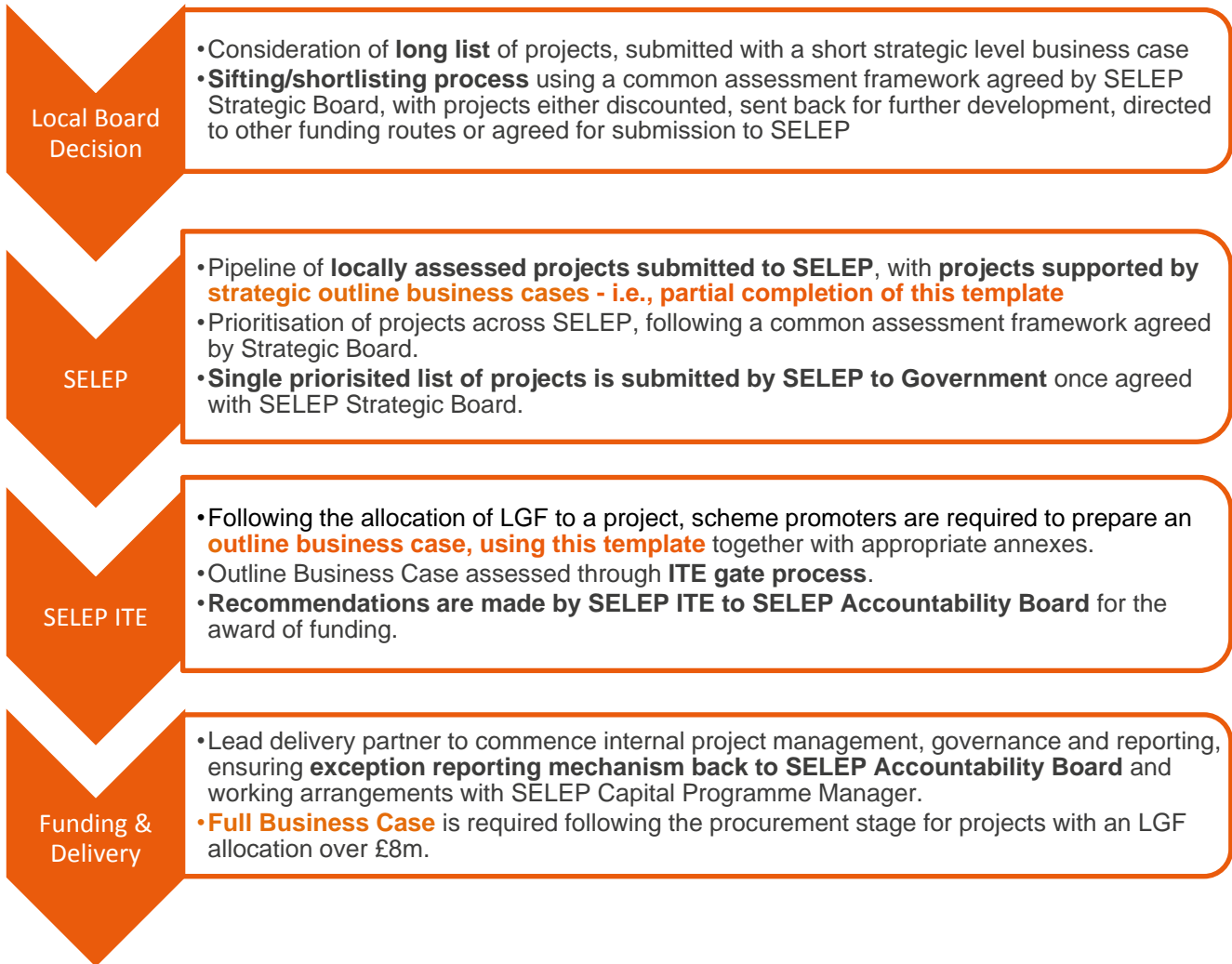
Please note that this template should be completed in accordance with the guidelines laid down in the HM Treasury's Green Book. <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

As described below, there are likely to be two phases of completion of this template. The first, an 'outline business case' stage, should see the promoter include as much information as would be appropriate for submission though SELEP to Government calls for projects where the amount awarded to the project is not yet known. If successful, the second stage of filling this template in would be informed by clarity around funding and would therefore require a fully completed business case, inclusive of the economic appraisal which is sought below. At this juncture, the business case would therefore dovetail with SELEP's Independent Technical Evaluation process and be taken forward to funding and delivery.



The process

This document forms the initial SELEP part of a normal project development process. The four steps in the process are defined below in simplified terms as they relate specifically to the LGF process. Note – this does not illustrate background work undertaken locally, such as evidence base development, baselining and local management of the project pool and reflects the working reality of submitting funding bids to Government. In the form that follows:



Version control	
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1. PROJECT OVERVIEW

- 1.1. **Project name:**
Beaulieu New Railway Station (known previously as Beaulieu Park Railway Station)
- 1.2. **Project type:**
Rail
- 1.3. **Federated Board Area:**
Essex
- 1.4. **Lead County Council / Unitary Authority:**
Essex County Council
- 1.5. **Development location:**
The proposed railway station is located on the Great Eastern Mainline (GEML), approximately 3 miles north east of Chelmsford station. The proposed railway station is located adjacent to substantial and growing residential and mixed use developments on its north western side (Beaulieu and Channels) and adjacent to a long-standing mixed use development (CM2 5PY) and the A12, A130, A138, B1137 Boreham Interchange, also known as A12 Junction 19 on its south-eastern side.
- 1.6. **Project Summary:**
Beaulieu and Channels represent an ongoing development of 4,000+ homes in North East Chelmsford. These expand Chelmsford's urban area from previous phases of housing and employment development in nearby North Springfield in the 1980s and 1990s. Looking ahead, the spatial strategy (Policy SP9) that underpins Chelmsford City Council's Draft Local Plan which has now been submitted for Examination (commencing autumn 2018), proposes North Chelmsford as one of three growth areas to focus housing and employment growth in the most sustainable locations. This involves a further 3,000 homes and 45,000 m² of office/business park space in North East Chelmsford, 1,100 homes in Great Leighs and 450 homes in Broomfield over the Local Plan period to 2036, with a further 2,500 homes in North East Chelmsford beyond 2036.

Beaulieu station has been proposed on the existing GEML on the eastern side of Beaulieu, located adjacent to the A12/A138/B1137 junction 19 to help serve these developments sustainably as well as wider growth in parts of Maldon, Braintree and Uttlesford districts not well served by rail.

Appendix F illustrates its location relative to the development planned at Beaulieu.

The need for a new station to support Local Plan growth aspirations north of Chelmsford has been identified since 1998, when the first feasibility study was carried out to assess the capacity of the GEML timetable to accommodate a new two-platform station north of Chelmsford. The introduction of the station forms part of the adopted North Chelmsford Area Action Plan and the Draft Chelmsford Local Plan, scheduled for Examination in autumn 2018.

Further work has continued to develop the design of Beaulieu station, and the design has evolved through NR's GRIP stage 1 and 2 processes to become a three-platform station with a passing loop. The turnback / passing loop provides operational resilience and flexibility in a network that is heavily used and operating at near capacity. The station is proposed to be a rail head and would be used to start / terminate some of the services that today start / terminate at Chelmsford, to distribute demand effectively and to allow for services to be timetabled effectively. It works with the strategic need for improved journey times and capacity on the GEML for locations beyond Chelmsford.

Network Rail is currently working with the GEML Task Force (SELEP is a member) to articulate a longer-term vision for the Anglia Route to 2043. This includes working on the strategic outline business case to prioritise and secure funding for critical projects to facilitate growth on the railway. This will build on previous work such as *Once in a generation – A rail prospectus for East Anglia (2012)* which previously prioritised a third section of track north of Chelmsford to increase capacity and enable faster train running, and a new station to support housing growth.

In parallel Essex County Council and Chelmsford City Council are developing a bid for grant funding from the Housing Infrastructure Funding (HIF) to forward fund the remainder of the funding need for Beaulieu station as well as investment for the Chelmsford North East Bypass (CNEB) to accelerate and unlock homes and improve connectivity between the A12 and A131 at Great Leighs. This is described further in 1.15 below.

1.7. Delivery partners:

Partner	Nature and / or value of involvement (financial, operational etc.)
Essex County Council (ECC)	Scheme Promoter and Sponsor - Financial, operational, programme management and project direction.
Chelmsford City Council (CCC)	Scheme Promoter and Sponsor – Supporting financial, operational, programme management and project direction, including co-ordinating funding from developers
Network Rail (NR)	Responsible for design, management and coordinating the delivery of rail schemes. This includes the commissioning of the GRIP 2 and 3 studies and the parallel development of a strategic case for investment in the GEML.
Countryside Zest	Developer of mixed use community adjacent to station and a part funder of the station. This comprises Countryside Properties (Joint Ventures) Limited and L&Q New Homes Limited.

The delivery partners are using advisory and technical support from Essex Highways (Jacobs), WSP, VolkerFitzpatrick Limited, Mayer Brown and Abellio Greater Anglia (AGA) to develop the scheme design and business case.

1.8. Promoting Body:
Essex County Council

1.9. Senior Responsible Owner (SRO):
Chris Stevenson
Head of Network Development
Highways & Transportation
Infrastructure & Environment
Essex County Council
Telephone: 03330 136577
chris.stevenson@essex.gov.uk

1.10. Total project value and funding sources:

Funding source	Amount (£m)	Constraints, dependencies or risks and mitigation
SELEP	12.000	To be spent by March 2021
Countryside Zest (Beaulieu Park) LLP	20.350	£1.600m spent of original £21.950m on the GRIP 2 study
Housing Infrastructure Fund	£121.700 to £124.700	HIF is a competitive process. ECC and CCC are developing a Chelmsford HIF bid for March 2019 submission which will request funding for the remaining funding. ECC expects to hear if it has been successful by May 2019.
Total project value	£154.000 to £157.000	GRIP 2 estimate range for NR Options 1 and 3 provides the initial basis. We have re-profiled costs to reflect completion now in 2024/25. NR expects to provide an updated cost associated with the GRIP 3 design at the end of Q1 2019

1.11. SELEP funding request, including type (LGF, GPF etc.):
£12.0m capital funding through the Local Growth Fund is requested from SELEP in the form of a financial contribution. The funding will not constitute State Aid.

1.12. Exemptions:

Exemption 2 within the Value for Money guidance in the 2018 SELEP Assurance Framework applies, as the Core Benefit Cost Ratio is less than 2.0. The following points are relevant

- When viewed as part of the delivery of a wider transformational growth scenario in North East Chelmsford, the case is compelling, as demonstrated by the Land Value Uplift switching value analysis in Section 3.11. This analysis shows a high value for money categorisation is achievable even with conservative assumptions.
- The scheme provides significant housing additionality, given existing planning conditions for development in excess of 2,500 homes at Beaulieu Park, and the ambition for 5,500 further homes in North East Chelmsford in the new Local Plan. The Ministry of Housing, Communities and Local Government will be undertaking assurance of the related Housing Infrastructure Fund business case during March 2019.
- The Strategic Case provides a strong rationale for the scheme in terms of helping to deliver ambitious housing and employment growth for Chelmsford and the Heart of Essex, reduce congestion at Chelmsford station, as well as improve access to the railway.
- Network Rail is currently undertaking the GRIP 3 scheme development which is seeking to mitigate risks previously identified.
- Network Rail is currently developing a strategic outline business case for investment in the GEML to 2043. Alongside other projects this will evaluate whether Beaulieu station and passing loops is a priority.

1.13. Key dates:

Project Milestone	Indicative Date
GRIP 3 Option Selection	Q1 2019
Submission of Housing Infrastructure Fund (HIF) Bid	March 2019
Government decision on HIF funding	May 2019
GRIP 3 Approval in Principle	Q4 2019
GRIP 3 Stage Gate	Q1 2020
GRIP 4 Award and Funding Statement Secured	Q2 2020
GRIP 4 Design Complete	Q1 2021
TWAO Application	Q1 2021
TWAO Approval	Q3 2021
Award D&B Contract	Q1 2022
GRIP 5 Design Complete	Q1 2023
Beaulieu station Construction Start Date	Q1 2023
Handover of station into service	Q4 2025

A summary project programme is included in **Appendix C**.

1.14. Project development stage:

A new station in North East Chelmsford has been proposed in one shape or form since 1998. A summary of the various studies undertaken to develop the project included in the table below.

In addition, the concept of a new station and substantial growth in North East Chelmsford has long been endorsed in local planning policy. It is a feature of the adopted Local Development Framework (LDF) 2001-2021 (Core Strategy, Development Control Policies Development Plan and the North Chelmsford Area Action Plan (NCAAP)) which were subject to extensive public consultation between 2005 and 2006 and 2007 and 2009 and is again included in the Draft Local Plan subject to Examination in autumn 2018. Again, this has been subject to substantial public consultation between 2015 and 2018.

Project development stages completed to date

Task	Description	Outputs achieved	Timescale
Early Station Scheme Development	Development of various operational studies on behalf of the developer of Beaulieu by the Denis Wilson Partnership and subsequently Mayer Brown	Development of 4 platform solution featuring passing loops. Submission of documents to Network Rail for review.	1998 - 2004
Station Feasibility Review	Separate review of station feasibility by Atkins on behalf of Chelmsford Borough Council to provide supporting evidence for Local Development Framework	Project Inception Report covering all of the requirements of the then SRA's New Stations Guidance. Development of cost estimates. Outline of funding strategy.	2004 - 2006
Local Development Framework Core Strategy and North Chelmsford Area Action Plan	Development of a spatial strategy to guide the location and policy principles of new development in Chelmsford Borough and specifically North Chelmsford between 2001 and 2021	Inclusion of new station at Beaulieu within the 2008 adopted Local Development Framework. Growth Plans for North Chelmsford including the new station developed in more detail in standalone Area Action Plan adopted in the summer of 2011.	2005 - 2011
Station High Level Specification	Network Rail review of developer led proposals Ongoing development of scheme by Mayer Brown on behalf of the developer of Beaulieu	Definition of design parameters for ongoing scheme development. Development of Preferred Option Forms basis of planning application in 2010.	2007 - 2012
Outline Planning Application (all matters reserved)	Submission of a railway station application on 22 January 2010	Outline planning consent given on 29 May 2013 including new railway station, car parking, public transport interchange, access roads and landscaping.	2010
Development of 'down-scoped' option	Review of high level specification as scheme costs now considered too high within the then funding package	Development of 'down-scoped' option by the developer as the new preferred option. Informal support by Network Rail and the then Train Operating Company (TOC).	2012
A Rail Prospectus for East Anglia	Cross-party and multi-agency authored prospectus to deliver economic growth through investment in the GEML. Developed in close collaboration with Network Rail and Greater Anglia	Building of a third track north of Chelmsford and an additional station identified as a short-term priority (2014-2019).	2012
Local Growth Fund (LGF) Prioritisation	Prioritisation of scheme as part of LGF1 for Essex	Outline award of LGF monies to close the then funding gap of £12M associated with the 'down-scoped' option.	2014
Operational Review	Review of the operational viability of the 'down-scoped' option by Jacobs as rail advisors to ECC and separately in parallel by the Network Rail sponsor	Production of short paper by Jacobs. Down-scoped option no longer supported as created operational constraints found to be unacceptable to Network Rail and TOC.	2015
Chelmsford New Local Plan to 2036	Development of document to shape growth and new development. Public consultation at each stage of the process	Three formal stages of consultation on the Local Plan. The new Local Plan includes a new railway station at Beaulieu. Subject to Examination in Public in autumn 2018.	2015 to 2018

Task	Description	Outputs achieved	Timescale
GRIP 2 Feasibility Study	Option identification and feasibility. Study developed by WSP on behalf of Network Rail	ECC Entered into Design Services Agreement with Network Rail. Study confirms the feasibility of 4 station and track layout options including costs and drawings. The costs have substantially increased because a more thorough understanding of the scheme requirements has been reached and the completion date has slipped significantly.	2016 to Q1 2017
Funding Review and GRIP 3 Procurement	Review of capital funding gap options. Commission Network Rail to manage GRIP 3 design	Development of MoU between ECC, CCC, NR and Countryside. Procurement of WSP to develop and select a single option. Appraisal of various options to close funding gap – prioritised HIF Forward Fund Bid.	Q2 2017 to Q1 2018
HIF Expression of Interest (EOI)	Evidence Base development and submission of HIF Forward Fund EOI	Development of Evidence Base – including wider economic impacts and understanding of scheme benefits. Submission of Chelmsford EOI covering both Beaulieu station and Chelmsford North East Bypass. Successful in moving through to HIF co-development phase.	Q3 2017 to Q2 2018

Project development stages to be completed

Task	Description	Timescale
SELEP Business Case	Development of this Business Case, update and approval as required	April 2018 to March 2019
HIF Business Case	ECC funded through Advanced Scheme Design Capital Programme	September 2018 to March 2019
GRIP 3 Design	Surveys, Preliminary Design, Single Option Selection, Estimate, Approval in Principle. Secure Funding Statement	Q2 2018 to Q1 2020
GRIP 4 Development	Outline Design, Transport & Works Act Order Application, Full Planning Application and Approval of Consents. Track Access Negotiation for Construction Phase	Q2 2020 to Q3 2021
GRIP 5-8 Procurement	Secure Design & Build Contractor to develop detailed design, construct scheme and hand back into service	Q4 2021 to Q1 2022
GRIP 5-8 Development	Detailed Design and start of long lead procurement	Q2 2022 to Q1 2023

It should be noted that this appraisal has been based on the best available information to meet the timescales of the SELEP business case. A conservative assessment has been employed in relation to assessment of dependent housing, the associated fare revenue with unlocked housing and the scheme programme described above. In addition, no benefits associated with the potential Chelmsford North East Bypass have been included. The HIF business case will include the latest figures in relation to dependent housing and the scheme's delivery programme for opening in line with the December 2024 timetable change.

1.15. Proposed completion of outputs:

For the purposes of the scheme's appraisal a conservative assessment of the scheme's delivery was used. This involves the handover of the new station into passenger service by Q4 2025. This would align with the timescales of the next Greater Anglia Franchise, with the current Franchise due to expire on 11 October 2025.

Other related projects in the Chelmsford area funded by SELEP include:

- Chelmsford Station (Mill Yard) – £3.0m funding, approved in 2015 with construction due for completion in 2018. The project will create a new route to the station, linking the station with the new Marconi quarter and Anglia Ruskin University. It is part of a wider package already delivered (funded by other sources) to enhance Chelmsford station both in terms of passenger capacity (a second entrance and enhanced gate-line within the main ticket hall), sustainable transport interchange and passenger experience.¹
- Chelmsford Urban Expansion. The early phase of development in NE Chelmsford involved heavy infrastructure demands which constrained to 1000 completed dwellings. £1.0m funding has helped deliver a completed improvement to the Boreham Interchange (A12 northbound slips), allowing the threshold of new homes to be raised to 1,350, improving cash flow and the simultaneous commencement of two major housing schemes.² This supports developer infrastructure commitments for delivery between 2018 and 2023.
- A131 Chelmsford to Braintree Route Based Study (RBS) – £3.7m funding, approved at the November 2016 Accountability Board. Work commenced in January 2018 and is to be completed by March 2020.³ The RBS involves the delivery of a package of schemes to provide highways capacity, passenger transport and safety improvements for the Chelmsford to Braintree corridor, including additional bus lane capacity to support the use of Park and Ride and bus services from Beaulieu, dedicated left turn lanes at key roundabouts as well as complementary investment by Countryside Zest in a dedicated left turn lane from A130 Essex Regiment Way to A130 White Hart Lane.
- Chelmsford City Growth Package – £10.0m funding for this £15.0m suite of 16 improvements across the urban area including 5 schemes in the North Chelmsford area. The total package will enable a step change in bus, cycling and highways infrastructure to be provided to respond to the identified congestion and related environmental problems in the City of Chelmsford. Construction is due to be complete by March 2021.⁴

Looking beyond SELEP related investment, developers will be responsible for the delivery of Radial Distributor Road 1 – a single carriageway link between A12 Junction 19 and the Belsteads Farm Roundabout on A130 (A131) Essex Regiment Way with roundabouts for development access. This is to be delivered by 2020. The Chelmsford Draft Local Plan provides a mechanism for developers to fund / deliver Radial Distributor Road 2 (RDR2) and a single carriageway Chelmsford North East Bypass (CNEB) between RDR 1, 2 and the A131 south of Great Leighs.

Essex County Council and Chelmsford City Council are also working to develop the business case for Housing Infrastructure Funding (HIF) to accelerate the delivery of the CNEB and close the funding gap for Beaulieu station. It is currently at the co-development phase with the Ministry of Housing, Communities and Local Government (MHCLG) and Homes England with submission to Government in March 2019. It should be noted that this will use the latest available information for the bid team on housing and scheme programme that was not available for the development of this SELEP business case.

CNEB is not required to deliver Beaulieu station, although it is part of a joint package to support and unlock housing and provide sustainable travel choices. Its early delivery will be supportive in expanding the drive-time catchment of the station to include further parts of Braintree district and

¹ <https://www.southeastlep.com/project/chelmsford-station-station-square-mill-yard/> accessed 26 July 2018

² <https://www.southeastlep.com/project/chelmsford-urban-expansion/> accessed 26 July 2018

³ <https://www.southeastlep.com/project/a131-chelmsford-to-braintree/> accessed 26 July 2018

⁴ <https://www.southeastlep.com/project/chelmsford-city-growth-area-scheme/> accessed 26 July 2018

Uttlesford district (e.g. Great Dunmow) not well served by rail. A plan of CNEB, its inter-relationship with Beaulieu station and growth and its potential phasing is illustrated below.

It should be noted that the economic appraisal of Beaulieu station for this SELEP bid does not include the CNEB in either the do minimum plus or do something scenarios. Insufficient information was available prior to the submission deadline for this to be included in the appraisal as either a core or sensitivity test. Hence a conservative view of the benefits associated with Beaulieu station in attracting patronage from north of Chelmsford has been reported.

Phasing of Chelmsford North East Bypass

Radial Distributor Road (RDR 1)	By 2020
Boreham junction 19 improvements (including current developer commitments)	2018-2023
A12 widening junction 19 to junction 25 (RIS1)	By 2020
Radial Distributor Road (RDR 2) spurs	2020-2025
Chelmsford North East Bypass (RDR to Deres Bridge)	2020-2025

With forward funding available it will be possible to accelerate the road delivery and therefore housing delivery.

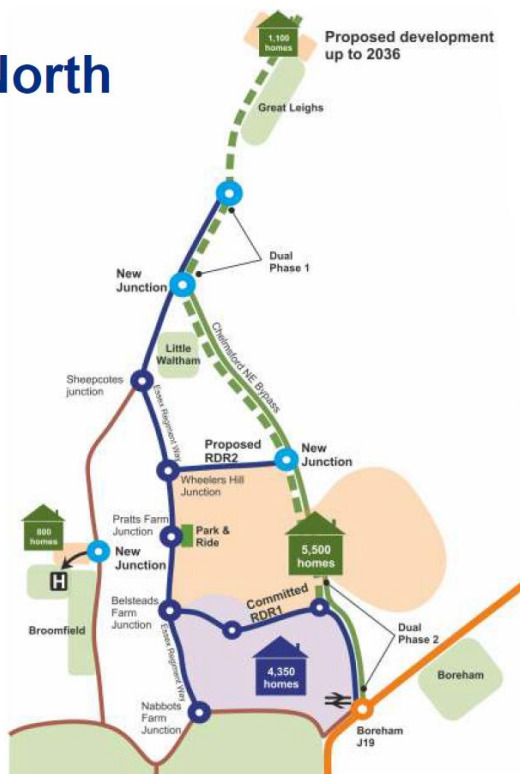


Figure 1.1: Inter-relationship of Beaulieu station and Chelmsford North East Bypass⁵

⁵ Chelmsford City Council & Essex County Council (2017). *Accelerating housing and economic growth in the Heart of Essex*, p. 15.

2. STRATEGIC CASE

2.1. Scope / Scheme Description:

Scheme Summary

The proposed Beaulieu station site is located on the Great Eastern Main Line (GEML), 3 miles north east of Chelmsford. Figure 2.1 illustrates the preferred operational layout. It comprises a 3 platform station incorporating a central loop to allow the turn back of services as required. This scheme option gives Network Rail full operational ability to turn back trains in both directions and also allows trains to pass each other in both directions.

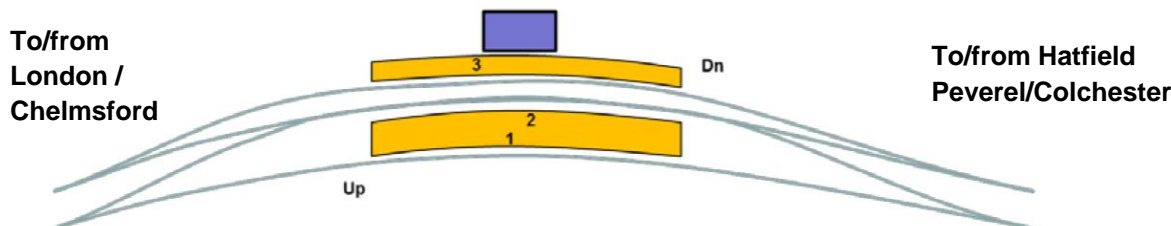


Figure 2.1: Proposed Beaulieu station operational layout

The station will provide train services for residents and workers, support future business development and existing business activity, and will relieve pressure on Chelmsford station. The station design also incorporates a public transport interchange, multi-storey car parking, cycle parking and access from Radial Distributor Route 1 (RDR1) – a road that links the A12/A130/A138/B1137 Boreham Interchange (Junction 19) with the Beaulieu and Channels developments and the A130 (A131) Essex Regiment Way at Belsteads Roundabout. A plan of the station's location in relation to these roads and development at Beaulieu is shown in **Appendix F**.

The delivery of a new station at this location is a priority for Chelmsford City Council and Essex County Council, and is identified as a transport priority in the South East Local Enterprise Partnership (SELEP)'s Strategic Economic Plan and Network Rail's Strategic Plan.

Issues and opportunities

There is substantial growth planned in Chelmsford, already a successful component of the South East's economy. People and businesses want to locate in Chelmsford; it has virtually all the foundations in place to continue to grow, and investment in Chelmsford proves to be a virtuous circle for the economy.

The north of Chelmsford continues to be the location for significant new development growth within the City of Chelmsford. Chelmsford City Council's adopted Local Development Framework allocated a minimum of 3,200 homes and 64,000m² of commercial floor space at North East Chelmsford known as Beaulieu and Channels. Outline planning consent has been given for 4,350 new homes, 40,000m² of business park floor space and a new railway station, with phased delivery of this allocation into the late 2020s.

The new Local Plan proposes to supplement this growth in North East Chelmsford. This comprises a new sustainable neighbourhood of 3,000 homes and 45,000m² of business park / office space with the capacity for a further 2,500 homes beyond 2036. Infrastructure such as Beaulieu station provides the opportunity to bring forward this development earlier. Elsewhere in the north of Chelmsford the new Local Plan proposes 1,100 homes in Great Leighs and 450 homes in Broomfield to 2036.⁶

⁶ Chelmsford City Council (2018): *Chelmsford Local Plan Chelmsford Local Plan Pre-Submission Document January 2018*, p69

However, Chelmsford's transport network is acting as a constraint to some of this potential growth. There is neither the desire nor the space to expand the city centre's road network, which is widely reported to be at 96% capacity at peak periods. City centre car parks and Chelmsford station itself are unable to cater for significant growth in demand. Investment has been made in Chelmsford station both through a second station access, improved ticket hall, public transport interchange and cycle storage and the SELEP supported Mill Yard improvement, but it is a constrained 2 platform site on a viaduct making further enhancement likely prohibitive in cost and benefit.

Chelmsford is also a transport and economic hub for a wider sub-region beyond its administrative boundaries. Improved access to the rail network for growing communities (Maldon, Heybridge, Great Dunmow and Braintree) in the Heart of Essex will help to spread the benefits and increase the attractiveness of these adjacent districts as places to live, work and visit. Maldon East & Heybridge station closed in 1964, Great Dunmow formally in 1961 and Braintree's rail service is provided on an hourly frequency and perceived as unreliable and not well located for recent growth areas such as Great Notley. Our analysis (see **Appendix G**) shows that there is an element of rail heading into Chelmsford from these areas exacerbating transport problems in the city. In addition, the propensity for commuters from Maldon, Heybridge and Braintree to use rail is low compared to similar sized towns with better / cheaper rail services such as Witham and South Woodham Ferrers, demonstrating a gap in transport provision.

Greater Anglia is in the process of replacing its entire train fleet, providing a likely 20% increase in passenger capacity on the GEML from 2019, and capacity for up to 27 trains per hour into London Liverpool Street by 2024. These new trains will be able to cater for increased demand from North Chelmsford and the Heart of Essex at Beaulieu as well as at other GEML stations.

Network Rail is investing in asset renewals to improve performance of the railway. However, the increase in trains on the network and the largely twin track nature of the GEML north of Shenfield with its mix of stopping and fast passenger and freight trains is likely to result in no overall improvement in performance. Network Rail's functional requirements for the GEML in 2043 (its long term planning horizon) include additional capacity to pass and turn back trains, alongside the need to improve journey times to locations such as Colchester, Ipswich and Norwich.

The city of Chelmsford is increasingly a destination in its own right and the priority now is to secure and maximise the appropriate level of infrastructure investment from public and private funding sources to support future sustainable growth. The private sector has already made and is willing to make further significant investment in new infrastructure, yet the cost of the proposed scheme far outweighs what the market can afford. This reinforces the need for SELEP funding for Beaulieu station and the related Chelmsford Housing Infrastructure Fund (HIF) bid to HM Government for Chelmsford (Beaulieu station and Chelmsford North East Bypass).

Intended benefits

The intended benefits associated with the development of Beaulieu station include:

- Acceleration of planned new homes and jobs and their associated economic benefits
- Facilitation of dependent development - new homes and jobs and their associated economic benefits which otherwise could not happen
- Increase in fare box revenue for the railway
- Reduced congestion at Chelmsford station
- Reduced congestion in Chelmsford city centre at peak times (weekday and weekends)
- Improved access to the rail network for residents and businesses in the Heart of Essex not well served by rail
- Improved network resilience and reliability for train services using the GEML.

2.2. Location description:
Beaulieu is located to the north east of Chelmsford. Chelmsford is the 'county town' of Essex and is approximately 32 miles north east from Charing Cross, London. The A12 and GEML corridor have helped to define Chelmsford with strong links to London and within Essex and East Anglia. The A12 passes around the eastern side of Chelmsford, connecting Essex and Suffolk with London. It is a particularly important connection (with the A14) for goods traffic between London, the M25 and the Port of Felixstowe. These and other transport links and its housing market area is shown in Figure 2.2.



Figure 2.2: Strategic Transport Network and the Housing Market

Chelmsford railway station is the busiest in Essex and is an important stop on the GEML between London Liverpool Street / Stratford and Colchester / Ipswich / Norwich, with over 8.5 million entries and exits in 2016/17. Services provide up to ten trains per hour in peak times. Principal stations served by trains using Chelmsford station and the juxtaposition of Beaulieu with other stations on the GEML are illustrated in Figure 2.3.

Population and Demography

In 1971, the urban city of Chelmsford had a population of 58,000, which grew to 112,000 by the 2011 census, with an overall district population of 168,000. Overall



Figure 1.3: Principal GEML services and stations of interest

population is forecast to grow to 192,000 by 2022 with a further 30,000 new residents anticipated by 2036. Chelmsford's population now consists of a large number of City and Docklands commuters, attracted by a rail journey of 30 to 35 minutes to / from Central London. Furthermore, 20,000 residents from adjacent authorities commute into Chelmsford for work daily.

Travel to Work - origin to destination, Chelmsford area

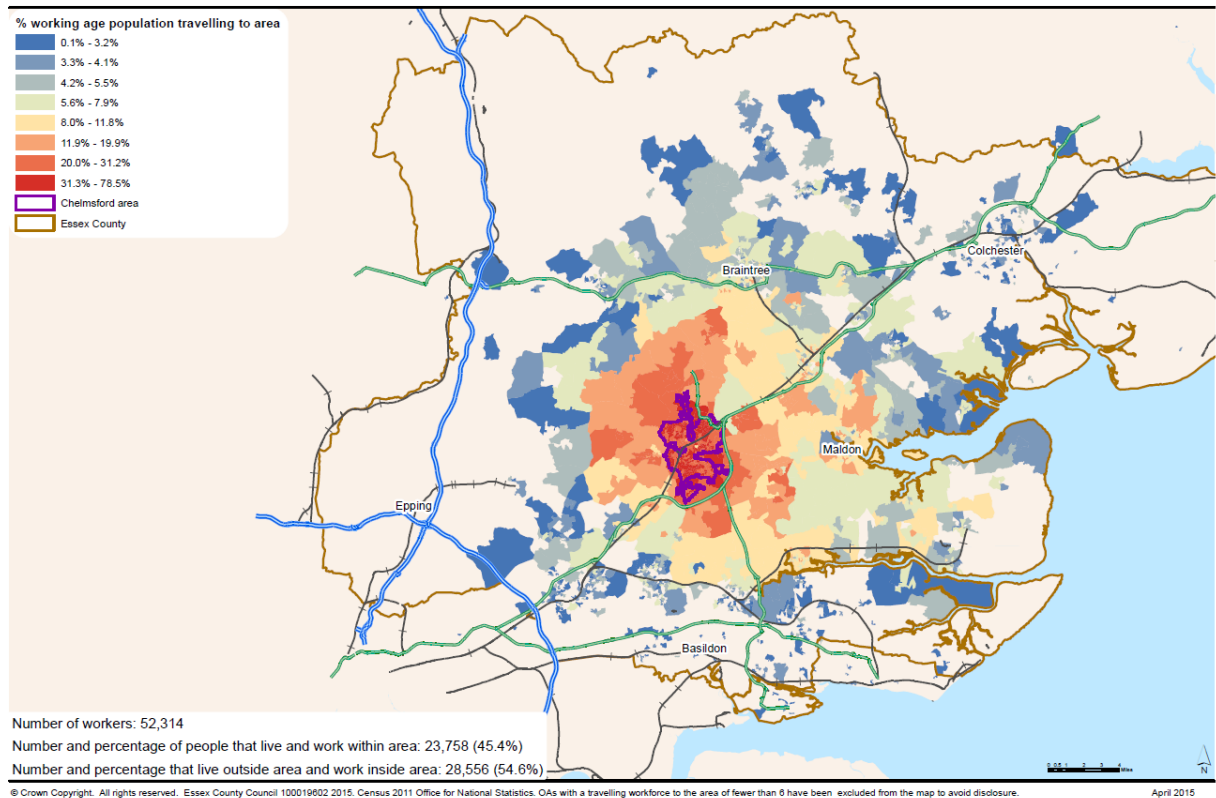


Figure 2.2: Origins of commuters to Chelmsford

2.3. Policy context:

The policy context is set out briefly at national, regional and local scales with the pertinent points identified. At the local level these initially focus on economic growth, then planning and transport.

MHCLG – National Planning Policy Framework (NPPF) (2018)

A key principle in the NPPF is to promote sustainable transport and consider it from the earliest stages of development proposals. Transport systems need to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel. Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised, and the use of sustainable transport modes can be maximised.⁷

The provision of a new railway station at Beaulieu will strongly support the sustainable delivery of significant housing and employment growth in North Chelmsford. It has long been considered an integral part of plan making and development proposals, supporting alignment with the NPPF.

Department for Transport – Transport Investment Strategy (2017)⁸

More than £61 billion of capital investment in infrastructure has been allocated up to 2020/21 to

⁷ Gov.uk. (2018) *National Planning Policy Framework*. Ministry of Housing, Communities and Local Government.

⁸ Gov.uk (2017) *Transport investment strategy*. Department for Transport.

connect communities and businesses and help deliver balanced growth. The investment seeks to:

- create a more reliable, less congested, and better connected transport network that works for the users who rely on it;
- build a stronger, more balanced economy by enhancing productivity and responding to local growth priorities;
- enhance our global competitiveness by making Britain a more attractive place to trade and invest and;
- support the creation of new housing.

Beaulieu station ticks all of these boxes. It would help enhance reliability on the GEML, reduce overcrowding at Chelmsford station and provide easier access to the rail network for the Heart of Essex. It is a direct response to local growth priorities and will help deliver further investment in business and new housing in a place people and firms want to be.

Department for Transport – Connecting people – a strategic vision for rail (2017)⁹

This vision looks to build on a successful period of growth since privatisation by implementing measures to deliver a more reliable railway, an expanded network and a better deal for passengers. This means making the most of existing capacity and a particular focus on expanding capacity in line with expected demand and to unlock significant housing or economic development.

Beaulieu station aligns well with this vision. It provides additional station capacity in the Heart of Essex as a catalyst for housing and economic growth. It also provides a means to turn back and regulate services to enhance reliability.

MHCLG – Fixing our Broken Housing Market – White Paper (2017)

The White Paper recognises that housing is becoming increasingly unaffordable and as a nation we need build more homes to slow the rise in housing costs: *“We need to build many more houses, of the type people want to live in, in the places they want to live. To do so requires a comprehensive approach that tackles failure at every point in the system.”*

This means amongst other things providing more land for homes where people want to live (places such as the Heart of Essex), and building homes faster. *“Development is about far more than just building homes. Communities need roads, rail links, schools, shops, GP surgeries, parks, playgrounds and a sustainable natural environment. Without the right infrastructure, no new community will thrive.”* The Housing Infrastructure Fund (which this project is also seeking funding from) is a particular policy initiative to help break that deadlock in infrastructure.¹⁰

The provision of Beaulieu station strongly aligns with the narrative within this White Paper, helping Councils and developers deliver and bring forward homes where people want to live.

BEIS – Industrial Strategy: Building a Britain fit for the future (2017)¹¹

The strategy is about helping businesses boost productivity and create high quality, well paid jobs across the UK. A vision of a transformed economy has at its heart five foundations of which a major upgrade to the UK’s infrastructure, people, places – prosperous communities, ideas and business environment are pivotal.

The Industrial Strategy references the need for future local industrial strategies building on the work of the LEPs and initial Science and Innovation Audit Themes. Life sciences and healthcare is a particular strength of and an opportunity for the East of England, and Chelmsford is well placed to contribute further through the presence of Broomfield Hospital, private hospitals, Anglia Ruskin

⁹ Gov.uk (2017) *A Strategic vision of rail*. Department for Transport.

¹⁰ Gov.uk (2017) *Fixing our broken housing market*. Ministry of Housing, Communities and Local Government.

¹¹ Gov.uk (2017) *Industrial Strategy: building a Britain fit for the future*. Department for Business, Energy & Industrial Strategy

University, MedTech Campus and existing road links to firms on the M11 Corridor (London-Harlow-Cambridge). However, Chelmsford City Council's Employment Land Review (2015)¹² indicates that there is a relatively limited availability of land supply in Chelmsford City Centre to accommodate future employment growth particularly in the context of increasing demand for residential, and there is a risk that a lack of quality office space could lead to a struggle to retain existing firms and bring in new investment in the long-term.

There is an opportunity for growth in North Chelmsford to deliver much needed Grade A office and other employment space that can meet the needs of both Chelmsford and the wider Essex market. The provision of accommodation in a location served by a new railway station as well as existing and potentially improved road connections to the M11 corridor (via the CNEB) will help Chelmsford make a strong contribution to Essex's and the East of England's potential within the context of the Industrial Strategy.

SELEP Strategic Economic Plan (SEP) (2014)¹³

This report outlines the ambitions of Essex, in partnership with Kent, Medway, Thurrock, Southend and East Sussex. Whilst a new version is being finalised for publication in autumn 2018, its previous conclusions that further investment is required to unlock the full economic potential along the GEML / A12 Brentwood – Colchester corridor, and to support increasing commuter flows to, and from, the Capital remains valid. This included the inclusion of Beaulieu station as part of the SEP's growth programme for the Mid Essex Growth Corridor.

In North Chelmsford, investment in Beaulieu station will help encourage a faster pace of development of both residential and employment areas, to help attract higher value occupiers to the business park more quickly, with catalytic effects on local job creation. The station will improve access to the rail network and to the capital from the Heart of Essex.

Greater Essex Growth and Infrastructure Framework (GIF) (2016-2036)

Greater Essex (Essex, Southend & Thurrock) already has an excellent basis to work from. It enjoys a successful economy and is a significant driver of the UK economy generating £36 billion of Gross Added Value and over 816,000 jobs. The GIF presents an overview of the growth ambition (180,000 new homes and 79,000 new jobs), external drivers and the infrastructure deficit (£10.6 billion) that needs to be addressed to make the most of this potential. Capacity within Greater Essex will be affected by housing and economic growth in neighbouring areas. In particular, the influence and reach of the London City Region, and the overheating Cambridge economy will impact in different ways on localities within Essex. The emergence of the new London Plan is expected to displace housing and employment from London along strategic growth corridors into Essex with Chelmsford being a main attractor.¹⁴

This increase in demand for housing and transport will impact an area where growth in road and rail journeys has not been matched by sufficient government investment to enhance the network. Beaulieu station represents an important component of addressing that infrastructure deficit and will help to contribute to realising the growth ambition for a successful part of the UK's economy.

Chelmsford Economic Strategy (2017)¹⁵

This Strategy was produced to support the new Local Plan, looking ahead to 2036 with predictions of immense growth with 725 new jobs each year, 14,500 new homes in this period, a £2.1m

¹² Chelmsford City Council (2015): *Employment Land Review*.

¹³ South East Local Enterprise Partnership (2014). <http://www.southeastlep.com/our-strategy/strategic-economic-plan/> accessed 26 July 2018

¹⁴ AECOM (2017): *Greater Essex Growth and Infrastructure Framework 2016-2036* <https://www.essex.gov.uk/Documents/GIF.pdf>, accessed 26 July 2018

¹⁵ Chelmsford City Council (2017). Chelmsford Economic Strategy. <https://www.chelmsford.gov.uk/EasySiteWeb/GatewayLink.aspx?allid=76517> accessed 1 August 2018

increase in GVA and a 25.5% increase in labour productivity if the building blocks are in place. To do this the Strategy has identified seven strategic priorities which align well with the Government's Industrial Strategy.

These priorities include the following of particular relevance to this business case:

- Delivering enabling infrastructure - Beaulieu station is identified as a key component to support homes and jobs there as well as unlock the capacity at the city centre rail station, the busiest (8.5 million entries and exits) two-platform station outside London, and one constrained on a viaduct.
- Enhancing the City Centre – significant public and private investment has already been made including the Bond Street retail development which has significantly increased Chelmsford's catchment area and its comparison goods market retention. Further investment in public realm and way finding alongside the reduced impact of traffic will support these goals further.
- Ensuring a supply of suitable land and premises – including supporting and promoting the development of a new business park in North Chelmsford as well as the site of the MedTech campus and future Local Plan growth.
- Targeting priority sectors, such as healthcare and life sciences in line with the Industrial Strategy – again the link between quality and accessible land made possible by high quality road and rail links (such as a freed up Chelmsford and new Beaulieu station) is pivotal to this goal.

Chelmsford City Council Core Strategy (2008)
North Chelmsford Area Action Plan (Adopted 2011)
Accelerating Housing and Economic Growth in the Heart of Essex¹⁶
Chelmsford City Council Draft Local Plan (2018)

A series of local planning documents have been produced over the past decade to plan and make the case for growth and new infrastructure. The current local plan is based on five overarching strategic objectives: managing growth; environmental protection and enhancement; balanced communities; quality of life; and economic prosperity.

The current local plan has helped Chelmsford become one of the fastest growing centres in Essex, with the pace of delivery recognised in its City Status award in 2012 and as one of the only two Housing Business Ready authorities by the Housing Finance Institute in 2017. Much of the focus of the City's growth is towards the north, where over 4,300 new homes in Beaulieu and Channels are already under construction alongside a 50,000m² business park, new schools and community facilities. A further 5,500 homes and 45,000m² of commercial space is being promoted beyond Beaulieu and Channels through the new Local Plan, with further growth in nearby Great Leighs (1,100 new homes) and Broomfield (450 new homes) bringing total growth to 7,000+ homes over and above those with planning permission. Each of these documents highlights that:

- Beaulieu station has been a long-held ambition for Chelmsford and has been at the forefront of strategies and policies for many years, with a new rail station to the north east of Chelmsford to maximise employment opportunities. The new station will provide improved accessibility to rail services to London and East Anglia.
- The new station would alleviate congestion on the platforms at Chelmsford station.
- A new railway station is a key element of the Council's planning strategy for North Chelmsford, supported by the rail industry, Highways England and Essex County Council.
- The station and Boreham Interchange together will comprise an important transport hub, which in turn, will stimulate investment in the area north east of the station.¹⁷
- A strategic outer zonal focus alongside the provision of Beaulieu station would encourage rail use to access the city centre.

¹⁶ Chelmsford City Council & Essex County Council. (2017) *Accelerating housing and economic growth in the Heart of Essex*

¹⁷ Chelmsford Borough Council. (2011) *North Chelmsford Area Action Plan*. Chelmsford Borough Local Development Framework.

Maldon District Council Local Development Plan 2014-2029¹⁸

Maldon's Local Plan was adopted on 21 July 2017. Its plans for strategic growth within the South Maldon and North Heybridge Garden Suburbs with sustainable transport links vital in a location without a rail station (Policy S4). Its Policy T1 Sustainable Transport included an emphasis on enhancing railway station facilities and the interchange arrangements between rail and other forms of transport. For Maldon and Heybridge, this means improved sustainable transport connections to the mainline stations of Hatfield Peverel, Witham and Chelmsford, and in future Beaulieu.

Essex Highways – Chelmsford Future Transport Strategy (2017)¹⁹

Essex County Council has developed a vision of a 'Future Transport Network' for the city, with the intention to make all modes of transport attractive, giving people a real and credible choice in the way they travel to work, to the shops and on social trips, in order to supporting the city's expanding economy. Encouraging more sustainable travel on foot, by bicycle, and on public transport will reduce the number of cars making short journeys (i.e. less than 5 km) on the road network, improving congestion and air quality for all residents. For journeys that start and finish outside the city the focus is on rail, park and ride and making best use of the Strategic Road Network. There is a pressing need to do this with only 4% capacity left on the city centre road network at peak periods. This Strategy has already informed successful SELEP funding of infrastructure associated with the Chelmsford City Growth Package.

The proposed new railway station and sustainable access to it will be a vital part of supporting sustainable housing and economic growth within the Strategy. The new station will also provide convenient access to rail travel for those living in other parts of Essex, as they should find it easier to use services at Beaulieu, rather than travelling in to the congested city centre to use services from Chelmsford station.

Network Rail – Anglia Route Strategic Plan (2018)²⁰

Network Rail's vision for Control Period 6 (CP6) from 2019 to 2024 is to "deliver a safe, high performing railway with greater capacity and efficiency to power economic growth and make Anglia a place where people want to live, work and invest." This means amongst other things:

- Provide a safe, high performing, efficient and sustainable railway for Anglia
- Grow capacity in the Anglia region to enable an uplift in passenger and freight volumes
- attract and realise investment in the region: in the franchises, concessions and in third party funded projects.

The costed renewals plan outlined in the Strategic Plan is expected to give a minor reduction in the number of infrastructure service affecting failures. However, an increase in the number of passengers forecast to travel, coupled with the risks around introducing new trains, and running more services through timetable changes, means that there will not be a significant rise in performance over CP6 and performance will remain relatively stable. This will not meet the operators' expectations, although customers will benefit from faster, more frequent services.

Network Rail is currently working with the GEML task Force to articulate a longer term vision for the Anglia Route to 2043. This includes working on the business case to secure funding for critical projects to achieve Norwich in 90, Ipswich in 60 and Colchester in 40 journey time outputs.

Beaulieu station is being developed by the project partners with this CP6 and longer term context firmly in mind.

¹⁸ Maldon District Council (2017). *Approved Local Development Plan 2014 – 2029*

¹⁹ Essex County Council & Ringway Jacobs (2017) *Chelmsford's Future Transport Network Public Engagement Document* <https://www.essexhighways.org/uploads/Highway-Schemes/Major-Schemes/Chelmsford-Future-Transport-Network/Chelmsford-Future-Transport-Network.pdf>

²⁰ Network Rail (2018). *Anglia Route Strategic Plan*

2.4. Need for intervention:

This section provides a brief overview of why the project is needed in terms of the current context and issues (problems / opportunities) which are **emboldened** for ease of cross-reference with Section 2.7. Reference should also be made to **Appendix G** for supporting diagrams and maps.

Chelmsford represents a thriving economy. It has particular strengths in the financial and business services sectors, research and development, and advanced manufacturing sectors, and has built successfully on its new city status since 2012. Chelmsford enjoys a Gross Value Added (GVA) higher than the east of England average and significantly higher than the rest of Essex, Maldon and Braintree (Figure G.1 in **Appendix G**).

Chelmsford is also a growing commercial centre which employs around 80,000 people and consists of three medium-sized shopping centres. Chelmsford's visitor economy is not limited to commercial purposes, but for also societal and cultural purposes. It is host to several seasonal festivals, heritage sites such Hylands House, theatres, cinemas and Essex County Cricket Club's main ground.

Economic forecasts predict that the contribution the Chelmsford economy makes to the UK will reach £5 billion by 2035. Since 2014, Chelmsford's housing delivery has increased from 826 to 1,002 homes per year, and the city's population is expected to grow to over 200,000 by 2035 as a result of the Local Plan growth.

Related to the growth in population already discussed in relation to the Local Plan, Essex County Council forecast an additional 91,000 train journeys per year from Chelmsford district between 2016 and 2036, with the vast majority likely to be served by Chelmsford and Beaulieu.

As such Chelmsford plays a key role in ensuring the prosperity of the wider Essex region. However, **strategic infrastructure is needed to support the ambition of Chelmsford and in particular North Chelmsford as a location for significant new development growth** to deliver its potential. As noted in Section 2.1 and 2.3, the north of Chelmsford is a key focus for the City's growth to 2036, with total growth of 7,000+ homes and 45,000m² of employment space over and above the 4,000+ homes and 40,000m² of employment space already with planning permission. In order to capitalise on its prime location adjacent to the GEM, A12 and A130 (A131), a station is required in order to provide the connectivity for residents and firms to jobs, suppliers, customers and workers both within Essex and to London and further afield.

Highway network and car park capacity

During weekday morning and evening peak hours, Chelmsford city centre experiences significant congestion, and car parks reaching full capacity. Traffic modelling of Chelmsford has identified that in the morning and evening rush hours, Chelmsford's road network is currently operating at approximately 96% capacity. There is very little long stay capacity in Chelmsford city centre car parks after 8:30am on weekdays until 5pm. The location of Chelmsford's long stay car parks in the vicinity of Chelmsford station and the capacity of the principal Chelmsford City Council operated facilities are shown in Figure G.2 and G.3 in **Appendix G**.

Coval Lane car park reaches its full capacity at 8:15am, and only falls below full capacity around 4:00pm. Townfield Street car park also consistently reaches 90% by 8:30am on weekdays and often reaches 95% occupancy by mid-morning. This is despite successful park and ride services from Sandon and Chelmer Valley providing a viable means to travel into the city. This means that some rail users (especially off peak) could be dissuaded from using Chelmsford station or visiting Chelmsford for other purposes because of a lack of a guarantee of a parking space. With a station at Beaulieu, then commuters and off peak users could travel from Beaulieu, and car parking spaces that have now become free at Chelmsford could be used for other purposes, resulting in additional rail demand and wider benefits.

Chelmsford City Council’s Draft Local Plan and Chelmsford’s Future Network place great emphasis on the issues associated with over capacity car parks and the highway network. An increase in the public transport capacity in and around Chelmsford, including intercepting long distance trips on the periphery (via park and ride and Beaulieu station) should help alleviate some of this congestion.

Existing congestion in Chelmsford during both the morning and evening peaks can be seen in Figure G.4 and G.5, with many areas in the city centre seeing speeds far below the free flow levels. The Saturday lunchtime peak can be seen in Figure G.6 demonstrating that this is not just a problem confined to the working week. Again potential rail passengers could be dissuaded from using Chelmsford station at the weekend given the delay in accessing the station by car.

Traffic Speeds on key radial routes into the city centre from North Chelmsford in 2016 are shown in Figure G.8 to G.10. The data shows a strong influence on commuting on traffic speeds, with the slowest speeds on the A1099 (ring road) which is an important link to the Townfield Street car park from the north of Chelmsford.

Chelmsford rail station usage and capacity

Chelmsford station is the busiest two platform station on the Greater Anglia network and the busiest two platform station outside London, with a mix of passengers joining and leaving every train. The growth in Chelmsford’s economy as well as the popularity and catchment area of its schools has contributed to this increasing conflict. As seen in **Figure 2.3**, there has been substantial growth in the number of entry and exits from Chelmsford station between 2006 and 2017, with correspondingly little change at other nearby stations.

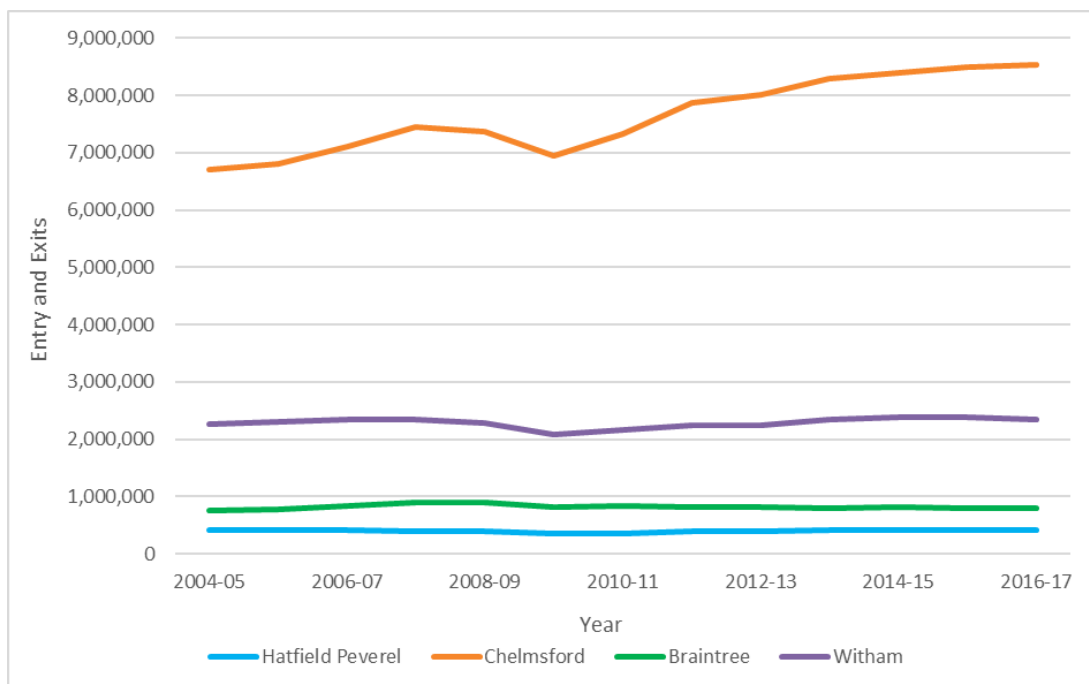


Figure 2.3: Annual estimated passenger usage based on sales of tickets in stated financial year(s) which end or originate at selected stations from Office of Rail and Road statistics ²¹

Most of the entries and exits at Chelmsford station occur during the peaks (see **Appendix G**, Figure G.11 and Figure G.12). Further growth to passenger numbers could add to train dwell times,

²¹ <http://orr.gov.uk/statistics/published-stats/station-usage-estimates>, accessed 2 July 2018

increase passenger platform and stairwell congestion and lead to passengers over-crowding carriages closest to the exits. A £3.4m investment from Greater Anglia has improved circulatory space within the station, with an additional station entrance to provide faster access to the bus station, cycle racks, NCP, Fairfield Street and Coval Lane car parks. Further investment to improve access to development immediately north of the city centre through the £3.0m SELEP supported Mill Yard improvement is under construction. However, further capacity is constrained both physically and financially by its position on a viaduct, which makes adding any additional entry points and ticket gatelines expensive. Removal of some passenger demand by opening Beaulieu station could defer the need for another scheme to improve Chelmsford station's capacity.

Access to the rail network

Maldon and Heybridge (23,000 population) lost its rail service when the Witham to Maldon East & Heybridge line closed in 1964. Consequently, any rail commuters from these two towns must travel by car or bus on the B1018 and / or B1019 for 6 ½ miles to the stations of Witham and Hatfield Peverel or 10 miles to Chelmsford. Witham has more frequent services and a larger car park than Hatfield Peverel.

Braintree is served by a single-track branch line from Witham. Most services are through services to London Liverpool Street. There is limited car parking and small population catchment areas for the intermediate stations. The service is also significantly less frequent, restricted by a low line speed and an absence of passing loops on the single track line. The service is also more expensive than the mainline services. The route also suffers from poor reliability, with a perception that delays on the mainline often resulting in curtailment of the branch service.

Great Dunmow formally lost its passenger service to Braintree and Bishop's Stortford in 1961 and most of the town's inhabitants use Chelmsford or Bishop's Stortford as railheads.

These issues result in rail passengers travelling to stations closer to London or stations with better frequency. Analysis of Chelmsford long stay car park season ticket data, station season ticket data and previous passenger surveys at Chelmsford station demonstrate the impact of these issues with:

- There is some obvious correlation between the locations of car park permit holders and Chelmsford season tickets from outside the city, particularly along the A131 towards Braintree and B1008 towards Great Dunmow, as well as pockets along the A414 from Danbury and Maldon. This is also aligned with the origins of the 2014 survey passengers who used a car to access the station.
- Season tickets from Braintree are almost entirely from within Braintree.
- Season tickets from Hatfield Peverel are mainly from Hatfield Peverel but also clusters from Boreham, Danbury and Maldon.
- Season tickets from Witham – large clusters from Braintree, Wickham Bishops and Maldon.

There is also likely latent demand, with potential passengers not using the rail network for their journey or not making a journey at all. Analysis of Census Journey to Work data demonstrates that the propensity to use the rail network for commuting is lower for Braintree, Maldon and Heybridge compared to Kelvedon, Witham and Hatfield Peverel and stations on other GEML branch line routes with slightly more frequent and cheaper services than Braintree (South Woodham Ferrers and Burnham-on-Crouch).

The Beaulieu Station Interconnectivity Study, published in 2018²², recommended increasing the frequency of and altering the routes of services to connect with Maldon, Heybridge, Chelmer Village, Chelmsford Business Park, Boreham and Hatfield Peverel to maximise the accessibility of areas not currently well served by rail once the new station is open.

²² Essex Highways (April 2018): *Beaulieu Station Interconnectivity Study*

Reliability

Network Rail’s CP6 plan provides a focus on tackling asset related reliability issues. However, the railway in CP6 will need to cater for in the short term a wholesale fleet change, and a 6% increase in train count which will put further stress on train performance, and in reality not meet operator expectations. The result being that Network Rail do not expect performance to improve further on CP5 forecast outputs.²³

When delays occur the ability to recover performance on neighbouring sections of the railway is to some extent dependent on the infrastructure available and service pattern, including the availability and length of passing loops, configuration of turn back facilities, line speed and signalling headways. Between Shenfield and Colchester, the railway is largely twin track and is used by fast passenger services to Norwich (calling at Colchester for all services and Chelmsford on alternate services), semi fast and all stations passenger services as well as freight services to the Haven Ports and other freight facilities. Passing loops are found between Shenfield and Ingatestone (country bound ‘down’ only), immediately north of Chelmsford, Witham station (four tracks and platform faces) and between Colchester and Marks Tey (London bound – ‘up’).

The section of track between Chelmsford and Witham (where Beaulieu station would be situated) in itself is not necessarily a source of significant delay (responsible for 3% of delays from our analysis of performance data), however delays imported from other sections cannot be recovered on this twin track section.

In the morning peak period, three services start at Chelmsford station. Trains are held in a turnback siding accessed from the country-bound line (see Figure 2.6). These trains then operate on a bi-directional section of track using Platform 2 at Chelmsford before crossing over to the London bound tracks to the south of Chelmsford trains. Any delay to the departure of these services has a knock-on impact on ‘down’ services waiting to call at Platform 2.

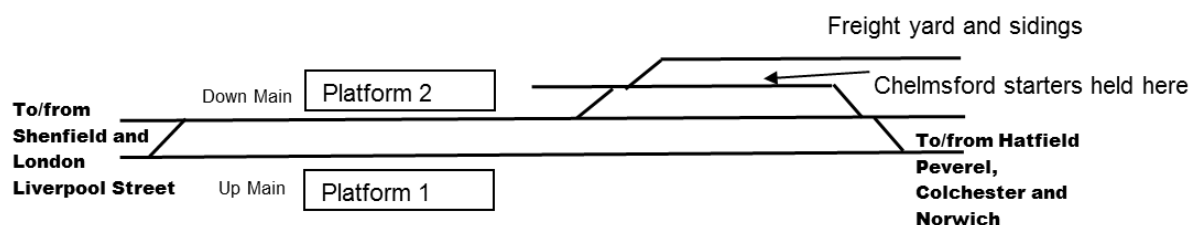


Figure 2.6: Chelmsford station and environs operational layout

The Network Rail – System Operator has provided this commentary to support the track layout configuration planned at Beaulieu.

“A central, 3 platform operational layout is critically important for the new Beaulieu station considering its location on the GEML. The station is proposed to be a rail head and would be used to terminate some of the services that today terminate at Chelmsford, to distribute demand effectively and to allow for services to be timetabled effectively. It would therefore move some terminating services and associated Empty Coaching Stock (ECS) moves out of the way to allow for better segregation of services. It works with the strategic need of improved journey times and capacity.”

“Having a two-platform station would not help achieve improved journey times nor improved capacity as it is adding another constraint on the existing heavily constrained two-track railway and cannot be supported at Beaulieu. Whilst service patterns are still to be agreed in terms of what a good Beaulieu station is and what it could look like, a central loop / turnback station will further help resilience, performance of the network and the planning of fast/slow services.”

²³ Network Rail (2018): Anglia Route Strategic Plan

Rail growth, new rolling stock and services

In the 10 years from 2013-2023 the GEML is expected to see 32% growth in passengers in the outer areas and 52% in the inner commuter area. Even with the Elizabeth Line to partly manage this demand, it is an extraordinary increase. A complete replacement of Greater Anglia rolling stock by 2020, new stations, and an increase in services across the region supported by new timetables; all mean that the route will be stretched to maintain and improve performance.

Individual trains will provide 22-45% more capacity than the current fleet.²⁴ Furthermore, there is expected to be an increased service frequency on the GEML fast lines via Chelmsford or Wickford as the new Elizabeth Line and Greater Anglia timetables are implemented in December 2019 and Network Rail delivers its Control Period 6 works programme. The expectation is that the peak capacity will increase from 22 trains per hour to 27 by the end of Control Period 6.²⁵

2.5. Sources of funding:

Chelmsford City Council have secured £22 million of funding through a Section 106 agreement with the developers of Beaulieu – Countryside Zest towards the cost of the development of the new Beaulieu station. There is potential to secure further private funding through future Section 106 and Community Infrastructure Levy as new homes elsewhere in North Chelmsford come forward. However, the likelihood is that these are more likely to come forward and be able to contribute to other transport infrastructure and reduce the burden on the public purse, with the certainty of a new railway station.

The station scheme has wider beneficiaries than just the developers of North Chelmsford, with benefits for the city of Chelmsford and neighbouring districts. Users of the wider rail network also benefit given the additional resilience delivered through the turn back and passing loop. This and the location's engineering complexity results in a scheme cost far in excess of what a developer could reasonably afford.

Chelmsford City Council and Essex County Council have also considered the potential to use private finance to reduce some of the funding gap through ownership and / or operation of the car park and / or station. The expectation being that the car park could provide the financier with a steady stream of revenue on which to recoup their investment. The private financing and operation of the station is more difficult given known examples elsewhere in the UK are confined to airports (e.g. Southend Airport Parkway) and a new business park related station yet to open in Cardiff. The rail industry is also reluctant to support these options unless all other avenues have been exhausted as it provides an added layer of complexity to day to day operations, with other stations under the management of one franchisee. All things being equal the project will also likely cost more given the private sector is unable to borrow at the same favourable rate as the public sector.

Essex County Council and Chelmsford City Council will keep open the option of private finance, but the current intention is to seek HIF funding to close the remaining funding gap, with a business case due for submission by March 2019. This would complement the funding allocated by the SELEP LGF.

²⁴ Editorial (11 October 2017): *On board a Greater Anglia Aventura*, RailStaff
<https://www.railstaff.uk/2017/10/11/board-greater-anglia-aventra/> accessed 1 August 2018

²⁵ Network Rail (2018): *Strategic Business Plan 2019-2024 Summary Anglia*
<https://cdn.networkrail.co.uk/wp-content/uploads/2018/02/Strategic-Business-Plan-2019-2024-Summary-Anglia.pdf> , accessed 1 August 2018

2.6. Impact of non-intervention:

If Beaulieu station cannot be funded, then the following outcomes would likely materialise:

- The delivery of over 4,000 homes in North Chelmsford will not be supported by a sustainable public transport option to London and other key settlements in Essex. High quality bus services and cycling links to Chelmsford city centre will still be provided, although the added journey time will make rail services and jobs elsewhere in London and Essex less attractive.
- The mix of jobs associated with the business park would change, with reduced attractiveness for office and R&D orientated firms, with a greater emphasis on light industrial uses expected. This will not allow Chelmsford to provide the kind of contribution to the Industrial Strategy and the Strategic Economic Plan that is within its potential.
- It is also expected that the business park would be slower to build out, with a time of 10 years compared to 7 years. This would have knock-on impacts for the number of jobs and GVA generated. Previous work by Lichfields suggested that without a station, there would be 2,500 fewer jobs and £250 million less GVA per annum than the potential with the station.²⁶
- The market may not bring forward certain developments elsewhere in North Chelmsford or deliver them more slowly.
- Lichfields' work also suggested that there would be less income for local government and central government through the New Homes Bonus, Council Tax, Stamp Duty payments and Business Rates.
- Both rail and road journeys from North Chelmsford to London will be time consuming, difficult, and expensive.
- Maldon and Heybridge and parts of Braintree and Uttlesford districts not well served by rail would remain relatively unattractive locations for rail borne commuting, adding pressure on local road networks into centres such as Chelmsford.
- There will be less fare income for the Greater Anglia franchise, impacting subsidy / premium payments for the next franchise from 2025.
- The road network around Chelmsford will become more congested, and car parks will reach capacity earlier in the morning.
- Chelmsford station will become more congested, with crowd management techniques more typical of Central London stations or expensive capacity improvements required to alleviate the problems.
- Network Rail would need to bring forward proposals for passing loops elsewhere on the GEML (north of Witham / south of Colchester) which are not currently funded.

²⁶ Lichfields (2017): *Beaulieu Station Economic Impact Assessment*.

2.7. Objectives of intervention:

The Project Delivery Team developed an initial set of scheme objectives for discussion with project stakeholders²⁷ at a Thought Leadership Session on 8 March 2018. These were tailored to the North Chelmsford locale, based on objectives / principles within the Chelmsford Future Transport Network Strategy, the adopted Chelmsford Local Plan (2008), North Chelmsford Area Action Plan (2011) and the Chelmsford Local Plan Pre-Submission Document (2018). These are in themselves aligned with national transport and land use planning goals). These were then reviewed and agreed during the session and are illustrated below. These were deliberately non mode specific to aid appropriate option assessment.

Project Objectives:

- Objective 1:** Support the ambition for planned growth, development and high value jobs in Chelmsford City Centre and the north of Chelmsford.
- Objective 2:** To put in place strategic infrastructure to enable growth in Chelmsford beyond 2036.
- Objective 3:** Improve journey time reliability and maximise the use of the transport network.
- Objective 4:** Improve accessibility and connectivity between the north of Chelmsford and key services, transport hubs and opportunities in Greater London, Essex and Chelmsford City Centre.
- Objective 5:** Offer an attractive and effective choice of sustainable travel options to encourage its increased use and reduce pressure on the local and strategic road network.
- Objective 6:** Protect, enhance and improve the quality of the natural, built and historic environment to enhance residents, workers and visitors' quality of life.
- Objective 7:** Reduce the impacts of air pollution and raise health standards.
- Objective 8:** Improve safety on the transport network and enhance and promote a safe and secure travelling environment.

Problems or opportunities the project is seeking to address:

- Problem / Opportunity 1:** The infrastructure to support North Chelmsford's ambition
- Problem / Opportunity 2:** Highway and car park capacity
- Problem / Opportunity 3:** Rail station usage and capacity
- Problem / Opportunity 4:** Access to the rail network
- Problem / Opportunity 5:** GEML reliability
- Problem / Opportunity 6:** Rail growth, new rolling stock and services

	Problems / Opportunities identified in Need for Intervention section					
	North Chelmsford's ambition	Highway & car park Capacity	Station Capacity	Access to the railway	GEML reliability	Rail growth, train fleet, services
Objective 1	✓✓✓	✓	✓✓	✓✓	✓	✓✓
Objective 2	✓✓✓	✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓
Objective 3		✓	✓	✓	✓✓✓	✓✓
Objective 4	✓✓✓			✓✓✓		
Objective 5	✓✓	✓✓	✓	✓✓		✓
Objective 6	✓	✓	✓			
Objective 7		✓				
Objective 8	✓	✓	✓		✓	✓

These align with the current situations Chelmsford is seeking to address; for example, Chelmsford city centre experiences significant congestion, with the road network currently operating at approximately 96% capacity. This can be reduced through providing strategic rail infrastructure and maximising usage of the transport network through sustainable travel modes.

²⁷ Attendees included representatives from Essex County Council, Chelmsford City Council, Network Rail, Countryside Properties and Jacobs.

Alignment of Objectives with Key Policy Documents:

The strong alignment of these objectives with key local, regional and national policy is shown below. As noted above these objectives were adapted based on the objectives of Essex Highways' Chelmsford Future Transport Strategy, the "strategic priorities" within Chelmsford's Draft New Local Plan and the objectives within the adopted North Chelmsford Area Action Plan.

	Local & Regional Policy / Strategy					
	CCC Adopted Local Plan (2008) / North Chelmsford AAP (2011)	CCC Draft New Local Plan (2018)	CCC Economic Strategy (2017)	Chelmsford Future Transport Strategy	Greater Essex GIF (2017)	SELEP Strategic Economic Plan (2014)
Objective 1	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Objective 2	✓	✓✓✓	✓✓✓	✓✓	✓✓	✓
Objective 3	✓✓✓	✓✓✓	✓	✓✓✓	✓✓	✓✓
Objective 4	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Objective 5	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓	✓✓
Objective 6	✓✓✓	✓✓✓		✓✓✓	✓✓✓	
Objective 7	✓✓✓	✓✓✓		✓✓✓		
Objective 8	✓✓	✓✓		✓✓✓		✓

	National Policy / Strategy					
	MHCLG – NPPF (2018)	DfT – Transport Investment Strategy (2017)	DfT – Connecting people (2017)	MHCLG – Fixing our Broken Housing Market (2017)	BEIS – Industrial Strategy (2017)	NR – Anglia Route Strategic Plan (2018)
Objective 1	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓
Objective 2	✓	✓	✓✓✓	✓✓✓	✓✓	✓✓
Objective 3	✓	✓✓✓	✓✓✓		✓	✓✓✓
Objective 4	✓✓	✓✓✓	✓✓	✓	✓✓	✓✓✓
Objective 5	✓✓✓	✓✓✓	✓✓	✓	✓	✓✓
Objective 6	✓✓✓	✓✓✓	✓	✓		✓
Objective 7	✓✓✓	✓✓✓			✓✓✓	✓
Objective 8	✓✓✓	✓✓✓	✓✓✓		✓	✓✓✓

Objective 1: Support the ambition for planned growth, development and high value jobs in Chelmsford City Centre and the north of Chelmsford.

Objective 2: To put in place strategic infrastructure to enable growth in Chelmsford beyond 2036.

Objective 3: Improve journey time reliability and maximise the use of the transport network.

Objective 4: Improve accessibility and connectivity between the north of Chelmsford and key services, transport hubs and opportunities in Greater London, Essex and Chelmsford City Centre.

Objective 5: Offer an attractive and effective choice of sustainable travel options to encourage its increased use and reduce pressure on the local and strategic road network.

Objective 6: Protect, enhance and improve the quality of the natural, built and historic environment to enhance residents, workers and visitors' quality of life.

Objective 7: Reduce the impacts of air pollution and raise health standards.

Objective 8: Improve safety on the transport network and enhance and promote a safe and secure travelling environment.

2.8. Constraints:

A platform length of 250m is required in order to accommodate trains up to 245m in length. The extent of the track work is also constrained by the White Hart Lane Overbridge and Boreham Viaduct. Furthermore, the access road to New Hall school limits any northward change in horizontal track alignment at the southwestern end of the site and is itself constrained by a balancing pond where great crested newts have been recorded in the past.

The gradient of the existing track in the area of the proposed station is in the order of 1:250, which is substantially steeper than the 1:500 gradient considered safe at a station in HMRI Railway Safety Principles and Guidance. Whilst this does not prohibit the construction of a station, it does influence the vertical track alignment. Furthermore, the replacement of Generals Lane Bridge also influences the vertical track alignment, as there needs to be a clearance of 5.9m.

Land boundaries also constrain the extent of the site. The New Hall School Grade 1 listed buildings are located approximately 1km to the north of the site, and land to the south of the railway are owned by Essex County Council. There is an associated height restriction in view of New Hall, so any plans for car parks must consider this.

Whilst the developer, Essex County Council and Chelmsford City Council have been instrumental in acquiring, and bidding for, funding for this project, the ongoing design and delivery will be undertaken by Network Rail. This action, as well as the operation of the services by the Train Operating Company, will be outside the control of the Councils and developer. This is not foreseen as a problem or barrier to project delivery, given that Essex County Council have agreed a Development Services Agreement with Network Rail, but is stated here for information.

There is also the issue of delivering the project alongside an active rail line. There will need to be a construction timetable in order to ensure safe completion of the project, with any possessions to effect a temporary closure of the line booked 2 years in advance.

The time taken to develop and deliver a railway station project is also a constraint in view of the requirement to spend LGF monies by March 2021. ECC have agreed with SELEP an approach to spend the LGF on ECC capital projects and ring-fence a sum of £12.0m for exclusive use on the Beaulieu station project between 2021 and 2025 when required.

2.9. Scheme dependencies:

Phase	Status	Key Issues	Target Date to Close Out
Statutory Powers	Outline planning received for station on 28 May 2013 Order must be made under Transport and Works Act, 1992 (known as TWAO) Full planning application required	<ul style="list-style-type: none"> • Scheme could get rejected • Risk of delay in obtaining order • Risk or pressure groups delaying scheme • TWAO cannot proceed until GRIP 3 single option selection complete (March 2020) 	TWAO and Full Planning application by March 2022 (end of GRIP 4)

Phase	Status	Key Issues	Target Date to Close Out
Funding	<p>Application for funding from SELEP has been submitted herein</p> <p>Application for funding from HIF to be submitted in March 2019 with government decision by May 2019. HIF bid also includes Chelmsford NE Bypass component</p> <p>£22M of developer contributions from Countryside secured via S106 in March 2014</p> <p>There is the potential for future growth in North Chelmsford to make a contribution via S106 and there is also the potential for some Community Infrastructure Levy receipts to be used, but there is no certainty around either of these at the present time in terms of timing and amounts</p> <p>Private finance for the station and / or car park is also an option</p>	<ul style="list-style-type: none"> • The £12 million previously awarded from SELEP funding must be used by 2021. ECC have suggested a way to spend these monies and ring-fence £12M of public money • Homes England and the MHCLG have not yet made a definitive statement regarding whether funding must be spent by 2023/24. Essex County Council have been open with Homes England and the MHCLG with the timescales of the Chelmsford HIF project during the expression of interest and co-development phases, and continue to progress the business case with the support of Homes England and the MHCLG 	<p>May 2019 for government decision on HIF</p> <p>Other funding sources keep open</p>
Tendering	<p>The current rail franchise will end October 2025</p> <p>This coincides with scheme handback</p>	<ul style="list-style-type: none"> • Train Operating Company may not be the current TOC - Abellio Greater Anglia • Calls at the station must be specified within the new franchise. • Calls could be specified as a short term amendment to the current franchise – this would require agreement of all parties 	<p>2023-2025 (prior to development of next Greater Anglia timetable specification)</p>
Public Transport	<p>Existing bus routes to be re-routed / extended.</p> <p>Potential for new bus routes.</p> <p>Current working assumption is that the recommendations of the Beaulieu Interconnectivity Study are taken forward with operators</p>	<ul style="list-style-type: none"> • If the bus services are not provided, as per the Beaulieu Connectivity Study, then catchment area of station by sustainable modes would be reduced 	<p>Upon completion of the station (2025)</p>

Phase	Status	Key Issues	Target Date to Close Out
Highways	<p>Developers are committed to providing enhanced road access and a dedicated access to Beaulieu station. This access involves a reconstructed Generals Lane bridge feeding into the Boreham Interchange and the provision of a radial distributor road connecting to the A130 Essex Regiment Way</p> <p>A HIF bid includes the acceleration of the Chelmsford NE Bypass to unlock further housing development and reduce journey times to strategic destinations. CNEB is not needed to deliver Beaulieu station although its existence would increase patronage.</p>	<ul style="list-style-type: none"> The acceleration of CNEB is dependent on the success of the HIF bid and the option funded (the Government could decide to fund the station and not the bypass). However, the Local Plan has a mechanism to deliver it as a single carriageway during the Local Plan period. The appraisal has not included the CNEB in either the do minimum plus or do something scenario. Hence a conservative appraisal of benefits has been reported. 	Distributor Road to be completed by 2020. Acceleration of the CNEB would allow this be completed by 2024.
Housing	<p>Housing construction has already begun in Beaulieu and Channels associated with determined planning applications</p> <p>Ultimate potential for homes and jobs in NE Chelmsford dependent on the timely provision of suitable transport infrastructure, such as Beaulieu station and new roads.</p> <p>Growth plans to be tested during the Local Plan Examination in 2018</p>	<ul style="list-style-type: none"> Current S106 for Beaulieu Park requires a sustainable transport provision in lieu of a station if that is not in place by the 2500th house Additional growth plans still to be validated through the Local Plan process Without the station and bypass, fewer homes will come forward and the pace of delivery will not accelerate 	Local Plan – Inspectors Report expected by 2019

2.10. Expected benefits:

The following benefits beyond those to be articulated in the Economic Case are expected. Housing benefits have been informed by ongoing work for the HIF business case (which as of September 2018 is still work in progress). Employment and GVA benefits have been informed by the Beaulieu Station Economic Impact Assessment prepared by Lichfields in 2017.

Housing

The delivery of the station will support the following development considered “dependent”.

- 1,100 homes with outline planning permission subject to the provision of Beaulieu station or alternative sustainable transport mechanism utilising Countryside Zest’s S106 contribution
- 2,500 homes in North East Chelmsford allocated in the Draft Local Plan beyond 2036.

Research has indicated that average house prices in areas near to new rail stations and existing rail stations benefiting from improved accessibility and connectivity can increase by between 5 -14%. Furthermore, developers are likely to accelerate the delivery of homes in areas of high demand and marketability. The following quantum of development in the north of Chelmsford either has planning permission or is expected to be delivered through the draft Chelmsford Local Plan to 2036:

- 3,250 homes at Channels and Beaulieu (some of which have already been delivered),
- 3,000 homes in North East Chelmsford,
- 1,100 in Great Leighs
- 450 north of Broomfield.

Within the wider Chelmsford urban area, complementary if smaller land value uplift benefits are expected for 4,000+ homes under construction or proposed in the draft Local Plan as these future residents will be able to use a congestion relieved Chelmsford station.

Elsewhere in the Heart of Essex, complementary if smaller land value uplift benefits are expected for 1,383 new homes in Maldon, 1,750 new homes in Braintree and 1,538 new homes in Uttlesford through residents improved ability to access the rail network and choice of local jobs.

All of the above will expand the range and quantity of housing available to residents of Chelmsford, generate additional New Homes Bonus payments (over a 6-year period), council tax revenues and stamp duty receipts.

Construction phase impacts

Lichfields work reported that Beaulieu Station will generate a 20% uplift in construction employment and GVA, supporting 740 FTE jobs and £170 million GVA in total, building on the employment and GVA already expected for the urban extension's construction. Lichfields assumed that the total number of gross direct, indirect and induced construction jobs will be equal to the net additional construction jobs, i.e. there will be no displacement or leakage of benefits.

Commercial floor space and jobs

40,000 m² of business park space and 22,300 m² of other commercial and employment uses is allocated within Beaulieu. The following impacts are expected from Lichfields' work:

- With the station in place the mix of B1a/b vs. industrial land use would change to reflect the enhanced connectivity and attractiveness of the site for office suppliers. This would be unique within Essex and one of very few business parks in the UK with such connectivity; this could be expected to enhance the image and attractiveness of Chelmsford and the surrounding area as a business location.
- There would likewise be an expected intensification of the mixed-use area and demand for ancillary services such as retail. Both of which would create additional jobs.
- The station would accelerate the build out and occupation of all of this floor space by up to 3 years.
- Beaulieu could support around 2,500 net additional jobs, and generate nearly £250 million GVA per annum once the station is fully constructed and operational.
- An additional £0.5m in business rates per annum in perpetuity on top of that expected without the station in place.

Lichfields applied a 10% displacement factor to the calculation of these new employment benefits. Their work assumed that new employment and commercial floorspace could displace some jobs from existing local businesses.

Chelmsford's Local Plan also allocates 45,000 m² of business park space in North East Chelmsford beyond 2036. Similar acceleration and increase in the value of jobs could be expected.

2.11. Key risks:

Network Rail and Essex County Council have currently identified 28 significant to major risks in the Beaulieu Risk Register, whereby the following ten risks were specified as major.

- Insufficient capacity in the signalling power feeder for the turnback facility.
- Unknown ground conditions for platform and station buildings – the ongoing GRIP 3 related surveys will help to understand this in more detail.
- Design changes for the Radial Distributor Road (RDR) Bridge to the north of the station impacting on signal sighting and overhead line equipment. This road is being delivered by Countryside Zest as a condition of its planning consent – linking the Beaulieu Park development with the A12 Boreham Interchange.
- Transport Works Act Order (TWAO) with public consultation may be required because of permanent land take – the scheme programme as presented makes allowance for this to happen, but consent is dependent on a successful outcome. The TWAO will then define the limits of the works which the GRIP5-8 detail design and construction will then have to respect.
- Incorrect LIDAR surveying information resulting in major subsequent changes.
- The proposed track alignment and overhead line equipment cannot be accommodated under the Generals Lane Bridge.
- Poor condition of existing culvert which could mean its extension and remedial works.
- Change of scope requirements resulting in abortive work and re-design.
- Potential for additional land for drainage outfall associated with the multi-storey car park.
- Unsuccessful in Chelmsford Housing Infrastructure Fund submission to make up the remaining shortfall in capital costs.

Ongoing GRIP 3 surveys and single option development will help to understand the impact of these and other risks in more detail and mitigate these as far as possible. During GRIP 3 Network Rail will also undertake a Quantified Risk Assessment (QRA) for the scheme with this then kept up to date throughout the GRIP process.

Essex County Council have appointed a Rail Assurance Lead to provide them with independent advice on Network Rail's project delivery to reflect the relative lack of these skills and domain knowledge within Essex County Council. Key risks and issues are communicated and escalated as required through the Project Manager, Project Board and HIF Programme Board as appropriate for action.

All risks are currently owned by a combination of the project delivery partners identified in Section 1. As the project develops it is expected that some of these risks will be transferred to contractors constructing the infrastructure depending on who is best placed to manage and own the risk.

3. ECONOMIC CASE

3.1. Options assessment:

Long list of options considered:

The development of a station in North Chelmsford began in 1998 and the process is detailed in Table 3.1. This represents a summary of the detail provided in Section 1.14.

Table 3.1: Scheme development history

Task	Description	Timescale
Early Station Scheme Development	Development of various operational studies on behalf of the developer of Beaulieu Park by the Denis Wilson Partnership and subsequently Mayer Brown	1998 - 2004
Station Feasibility Review	Separate review of station feasibility by Atkins on behalf of Chelmsford Borough Council to provide supporting evidence for Local Development Framework. This considered other modal options besides rail.	2004 - 2006
Local Development Framework Core Strategy and North Chelmsford Area Action Plan	Inclusion of new station at Beaulieu within the 2008 adopted Local Development Framework. Growth Plans for North Chelmsford including the new station developed in more detail in standalone Area Action Plan adopted in the summer of 2011.	2005 - 2011
Station High Level Specification and Outline Planning Consent	Network Rail review of developer led proposals. Ongoing development of scheme by Mayer Brown on behalf of the developer of Beaulieu Park. Definition of design parameters for ongoing scheme development and development of Preferred Option which forms the basis of an outline planning application in 2010. Planning consent secured 29 May 2013.	2007 - 2013
Development of 'down-scoped' option	Review of high level specification as scheme costs now considered too high within the then funding package. Development of 'down-scoped' option by the developer as the new Preferred Option. Informal support by Network Rail and the then Train Operating Company (TOC).	2012
A Rail Prospectus for East Anglia	Cross-party and multi-agency authored prospectus to deliver economic growth through investment in the GEML. Developed in close collaboration with Network Rail and Greater Anglia. Building of a third track north of Chelmsford and an additional station identified as a short-term priority (2014-2019).	2012
Local Growth Fund (LGF) Prioritisation	Outline award of LGF monies to close the then funding gap of £12M associated with the 'down-scoped' option.	2014
Operational Review	Review of the operational viability of the 'down-scoped' option by Jacobs as rail advisors to ECC. Down-scoped option no longer supported as created operational constraints found to be unacceptable to Network Rail and TOC.	2015
Chelmsford New Local Plan to 2036	Three formal stages of consultation on the Local Plan. The new Local Plan includes a new railway station at Beaulieu.	2015 to 2018
GRIP 2 Feasibility Study	ECC enter into Design Services Agreement with Network Rail. Option Identification and feasibility study by WSP on behalf of Network Rail Study confirms the feasibility of 4 station and track layout options including costs and drawings. Costs substantially increase as a more thorough understanding of the scheme requirements is reached and the completion date slips significantly.	2016 to Q1 2017
Funding Review and GRIP 3 Procurement	Review of capital funding gap options. Network Rail commissioned to manage GRIP 3 design. Procurement of WSP to develop and select a single option. Appraisal of various options to close funding gap – prioritised HIF Forward Fund Bid.	Q2 2017 to Q1 2018
HIF Expression of Interest (EOI)	Evidence Base development and submission of HIF Forward Fund EOI for Beaulieu station and Chelmsford NE Bypass. Successful in moving through to HIF co-development phase.	Q3 2017 to Q2 2018

Whilst the majority of previous work has focussed on rail options, it is important to take a step back to consider whether other modal options are more suitable in meeting the defined objectives. This is to enable a sufficient range of options to be evaluated, and to ensure the best solution, in terms of affordability, suitability and deliverability is selected, especially due to the potential cost of the considered solutions.

The longlist of options was developed during the 8 March 2018 workshop with stakeholders²⁸. The options that have emerged include a range of highway infrastructure, public transport and rail schemes aimed at resolving the identified network issues caused by the housing development at Beaulieu. The longlist included the following:

Beaulieu Station

- Building a 3 platform station with turnback and car park
- Building a 2 platform station with car park

Other stations and rail links

- Constructing an extra platform and turnback at Chelmsford station
- Additional parking at Chelmsford station
- Additional parking at Hatfield Peverel station
- Improved Braintree Branch services with a Cressing Loop

Highway Improvements

- Additional highway capacity into the City Centre from Beaulieu / NE Chelmsford.

Alternative transportation measures

- Coach solutions to London via the A12 (new operator services and strategic Park and Ride)
- Express bus links to Braintree and Maldon Districts from Chelmsford station via Beaulieu
- More bus services from Beaulieu to Chelmsford
- Further passenger capacity (access/egress/circulating) at Chelmsford with a suite of rapid transit, park and ride and cycling enhancements to get people from Beaulieu to Chelmsford station

²⁸ Attendees included representatives from Essex County Council, Chelmsford City Council, Network Rail, Countryside Properties and Jacobs.

Options assessment:

The assessment of potential options has been carried out using a bespoke appraisal framework tool. The framework has been developed to assess options based on their ability to contribute to the following criteria:

- Meeting the Study Objectives (Initial sift)
- Scheme Deliverability, Acceptability, Affordability (Secondary sift)

The framework aims to provide an efficient, robust and easily presentable means of identifying legitimate options to be considered further. It has been developed with a light touch and consideration of the DfT's Early Assessment and Sifting Tool (EAST). The scoring process was based on existing evidence where available, and qualitative assessment to allow a structured approach to be adopted. The simple numerical basis aimed to provide consistency in the approach to appraising each option.

Table 3.2: Secondary Sift Descriptions

Supporting Analysis	Description
Deliverability	Consideration of issues around deliverability e.g. in terms of political, planning, timescale or third-party issues
Acceptability	Assessment of the anticipated public acceptance of the scheme
Affordability	Assessing what extent of additional funding would be required to deliver the scheme and whether this is likely to be available through existing funding sources

Any options which clearly do not achieve one or more of the criteria in Table 3.2 in the secondary sift were discounted from future consideration within this study. The results of the initial sift are shown below in Table 3.3.

Table 3.3: Initial sift against objectives and secondary sift on the longlist options

	New 3 platform station with turnback and car park	New 2 platform station with car park	Further Chelmsford station passenger capacity and suite of rapid transit, P&R and cycling	Extra platform and turnback at Chelmsford	Additional parking at Chelmsford station	Additional parking at Hatfield Peverel station	Additional highway capacity into Chelmsford	Coach solution via A12	Express bus to Braintree and Maldon from Chelmsford via Beaulieu	Crossing Loop	More Beaulieu to Chelmsford bus services
Support the ambition for planned growth, development and jobs in Chelmsford and the north of Chelmsford	2	2	1	1	0	0	1	0	0	0	1
To put in place strategic infrastructure to enable growth in Chelmsford beyond 2036	2	1	1	1	1	0	1	1	0	0	1
Improve journey time reliability and maximise the use of the transport network.	2	-1	2	1	0	1	1	0	1	1	1
Improve accessibility and connectivity between the north of Chelmsford and key services, transport hubs and opportunities in Greater London, Essex and Chelmsford City Centre	2	1	1	0	0	0	1	1	1	0	1
Offer an attractive and effective choice of sustainable travel options to encourage its increased use and reduce pressure on the local and strategic road network.	2	1	2	1	0	0	0	1	1	1	1
Protect, enhance and improve the quality of the natural, built and historic environment to enhance residents, workers and visitors' quality of life.	1	1	1	0	-1	0	-1	0	0	0	1
Reduce the impacts of air pollution and raise health standards.	1	1	1	0	-1	0	-1	0	0	0	0
Improve safety on the transport network and enhance and promote a safe and secure travelling environment.	2	2	2	1	0	0	0	1	1	0	1
Total	14	8	11	5	-1	1	2	4	4	2	7
Objective Ranking	1	3	2	5	11	10	8	6	6	8	4

Secondary Sift

Deliverable	G	R	A	A	A	A	A	A	G	G	G
Acceptable	G	R	G	A	R	A	R	A	G	G	G
Affordable / Commercially Viable	A	A	G	A	G	G	R	A	G	G	G

Total	14	DISCARD	11	5	DISCARD	1	DISCARD	4	4	2	7
Final Ranking	1		2	4		8		5	5	7	3

2	Strong alignment with objective
1	Moderate alignment with objective
0	Neutral alignment with objective
-1	Negative alignment with objective

The initial sift found that the most appropriate measure was to construct a new 3 platform station at Beaulieu, with a turn back and car park. Whilst a 2 platform station at Beaulieu gained an initial ranking of 3, it failed in the secondary sift in terms of deliverability and acceptability, and as such was removed from the final ranking. Network Rail advised that this option could not be accommodated for, due to the inability of accommodating a terminating train clear of the main lines, and the inability for trains to overtake.

The second most favourable option involved improving the passenger capacity of Chelmsford station with a suite of rapid transit, P&R and cycling schemes. This performed well in both the initial and secondary sift, achieving a Green ranking in terms of acceptability and affordability. Whilst recent capacity has been added to Chelmsford station, no work has been done on whether additional on platform capacity or station entrances is feasible, and so this was ranked as amber.

Increasing the number of bus services from Beaulieu to Chelmsford ranked third after considering deliverability, acceptability and affordability. However, there will be increased pressure at Chelmsford station, which may become overcrowded in future years. This, however, was not an objective, and as such was not considered in the sift. Furthermore, there may need to be appropriate highway interventions if this option was pursued, due to the expected increase of buses utilising the station bus stop. This option performed well in the secondary sifting, scoring Green in all three categories.

The fourth most preferred option involved installing an additional platform and turn back at Chelmsford. This would allow for additional capacity to and from London; however, residents wishing to commute from Beaulieu to London would still have to utilise Chelmsford station and travel there. This option scored amber on all three secondary sifting criteria, highlighting that it may not be the best option when compared to other, higher ranking options, with the likely cost and engineering feasibility an issue.

The two options which ranked joint fifth were the coach solution and the express bus to Braintree and Maldon via Beaulieu. Long-distance coach services would require encouraging a private operator to run from Beaulieu, but the journey time to London would be quite slow. There is a lack of a market compared to say North Kent or Oxford where coach services are competitive in terms of journey time. The capacity of these services would be low in relation to rail services, and it requires the private sector to lead. Currently, only 3 coaches run per day from London to Chelmsford, with only one service operating in the evening peak.

An express bus to Braintree and Maldon from Chelmsford does have potential, although may only realistically be viable in combination with a station at Beaulieu, as it is a mutually supportive option.

A passing loop at Cressing would double service capacity between Braintree and Witham or London, improving connectivity. This scheme ranked 7th; whilst passing the secondary sifting, it scored 0 for its lack of support for the planned growth in Chelmsford, as it will largely improve access for commuters from Braintree to Chelmsford and London. It is nonetheless a project of importance to Essex County Council in improving services to a growing part of the Heart of Essex.

The lowest ranked scheme was to create additional parking at Hatfield Peverel station. Whilst this would enable residents from Beaulieu to drive to the station, most individuals would instead travel to Chelmsford station, due to the cheaper rail fares and higher train frequency. It would also appear counter-intuitive for passengers to drive in the opposite direction of London. The scheme also fails to improve accessibility between Beaulieu and Chelmsford, as residents would have to drive away in order to take the train.

The other two options to fail the secondary sifting were additional parking at Chelmsford station, and adding additional highway capacity into Chelmsford. Both of these schemes would be problematic in terms of acceptability, due to a lack of space for extra capacity in the city centre. Furthermore, adding extra highway capacity into Chelmsford was deemed to be unaffordable, due to the cost of purchasing the necessary land, and the amount of disruption improvements it could cause. It is also politically and publicly unacceptable, in that it does not align with the County Council's Future Transport Network policy and City Council's Local Plan.

Short list of options:

The best three performing options were therefore:

- 3 platform Railway station with turn-back and loop facilities
- Enhancements to Chelmsford station with additional station capacity, alongside rapid transit, walking and cycling improvements to Chelmsford station. This would likely take the form of increased frequency and quality for existing bus services between Chelmsford and Beaulieu. It would make use of bus priority measures to offer an attractive journey time as possible for residents and businesses at Beaulieu.
- Increased frequency and quality of buses between Chelmsford and Beaulieu only.

The provision of a new railway station within North-East Chelmsford is viewed as a key element of the City Council's planning strategy for North Chelmsford and is supported by the rail industry, Highways Agency and the County Highways Authority. The new station would inevitably abstract trips from the existing Chelmsford station and presents a decongestion benefit to that station concourse as well as having the effect of reducing congestion within the city centre area by removing car movements to and from the station and on the radial routes.

The City Council has always accepted that the timing of delivery of the railway station would be based on an agreed level of trips being observed on the local highway network. Following discussion between the City Council, the Highways Authority and the then Highways Agency and given legal advice from the DfT on behalf of the Highways Agency and from Counsel acting on behalf of the City Council the obligations, as now contained within the s106 Agreement for the mixed-use residential-led development at Beaulieu (09/01314/EIA refers) were agreed. Specifically, the railway station, track works, and ancillary development are to be delivered and fully operational prior to the earlier of the occupation of the 2,501st dwelling, or more than 25,000 m² of employment floorspace within the proposed Business Park with no occupations to be permitted beyond these thresholds until the works have been completed.

The second-best option - enhancements to Chelmsford station alongside walking, cycling and rapid transit links between Chelmsford and Beaulieu has not been appraised further. There is no available information on the likely cost or the deliverability of further improvements at Chelmsford station. It also does not support the same level and ambition for growth in North Chelmsford (and thereby patronage on the railway) as shown by the lower score for this objective.

Should Beaulieu station not be deliverable then the developer would need to set out an alternative transport strategy based using their committed S106 funding. Should this be the case then it would be for the developer to specify the precise alternative transport strategy for ECC's agreement. Its development and agreement would need appropriate buy-in from a range of stakeholders including Chelmsford City Council.

For the purposes of the economic appraisal the third best option – an alternative transport strategy based around bus fully funded by the developer – has been assumed to form the basis of the alternative transport strategy and is included in the Do Minimum Plus baseline against which the preferred option is appraised. It should be noted that this assumption does not mean that this would be acceptable to ECC, Chelmsford City Council or the developer as the alternative transport strategy for Beaulieu Park. It has been purely used to provide a meaningful and proportionate basis for the economic appraisal.

3.2. Preferred option:

The preferred option is a new 3-platform station at Beaulieu, with a turnback / central loop and car park, as detailed in Network Rail's GRIP 2 report. As noted previously, various workshops were conducted with key stakeholders in order to reach a suitable solution for all parties.

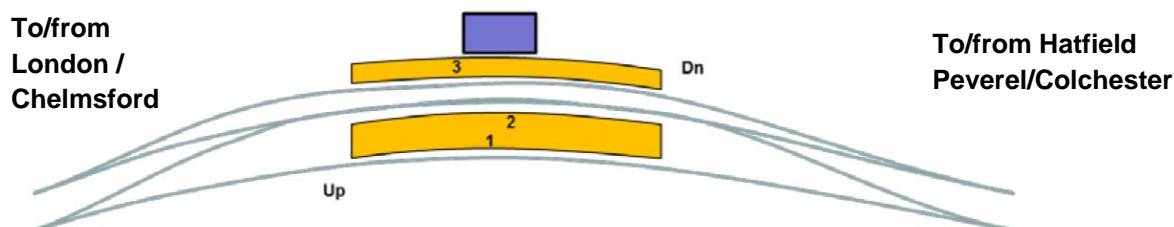


Figure 3.1: GRIP 2 Preferred Operational Layout

Following the Value Management Workshop in 2016, stakeholders including Network Rail, Countryside Properties, Mayer Brown, AGA, ECC and CCC agreed that car parking should consist of 1,400 spaces, including 300 premium spaces and 1,100 in a multi-storey car park. The station should also have an adequate drop-off space, in addition to 2-4 bus stops within a reasonable distance of the main station building. Cycle parking should allow for up to 500 bikes.

This scheme helps support the ambition for growth in Chelmsford and Beaulieu, as it allows residents to easily commute to jobs in other locations along the GEML. Furthermore, the creation of a new station offers an attractive sustainable travel option, as residents in Beaulieu would not have to rely on cars or buses in order to get to other stations if they desire to use the train. The inclusion of cycle parking and at least 2 high-quality bus stops also increases the attractiveness of sustainable travel options for residents, potentially helping to reduce the impacts of air pollution.

The station would also help maximise usage of the transport network through the usage of the turn back, which can be used to increase capacity on the line. This turn back will allow for services to terminate and return to London, potentially increasing the frequency of services from Chelmsford to London, also helping to both reduce overcrowding at Chelmsford station, and improve accessibility between North Chelmsford, Chelmsford City Centre, and London.

For the purposes of the business case, various timetable options have been analysed to understand the optimum performance in terms of new rail demand and impact on existing users. The business case presents sensitivity tests on the better performing options in Section 3.5, but for the purposes of a core preferred case the Medium B timetable option has been selected. This involves 5 trains per hour calling at Beaulieu in the peak period and 2 trains per hour in the off-peak period. This involves the move of existing Chelmsford starters to Beaulieu and additional station calls on existing services with consequent journey time impacts. Frequencies at all other stations remain as now.

3.3. Assessment approach:

The Appraisal Specification Report (ASR), included in **Appendix H**, articulates a proportionate approach to assessment in line with WebTAG guidance. The basis of this approach is a uni-modal appraisal of the impacts of the preferred option on the rail network, in line with WebTAG unit A5.3. This has been supplemented by marginal external impacts assessment in line with WebTAG unit A5.4 to determine the environmental, social and economic impacts due to the change in travel patterns on the road network caused by the scheme. Additional commercial modelling has been undertaken to determine the impacts of the scheme on transport providers, car park operators and broader public finances, while supplementary economic modelling has been undertaken to determine wider economic impacts. The approach to appraising the main WebTAG economic, environmental, social and public accounts indicators is outlined in the Appraisal Specification Summary Table below (Table 3.4).

Analysis of the future transport situation within Chelmsford has identified a reference case including "near certain" and "more than likely" interventions and land use changes. This analysis has

concluded that a “Do Minimum” with no additional infrastructure beyond what is already committed is not realistic, due to the deterioration in the transport market in Chelmsford which would occur, and as such a “Do Minimum Plus” scenario, including a low cost alternate transport strategy which would be provided through the developer’s committed S106 contributions which are already available, has been used as a reference case.

The preferred option scenario, “With Scheme”, considers the provision of the preferred option for Beaulieu station, along with changes to local bus, walking and cycling provision that could be delivered without additional public expenditure as identified in the Beaulieu Station Interconnectivity Study, in place of the alternate transport strategy from the reference case.

Further, analysis of the pre-submission Local Plan has identified that not all local plan allocations can be fully delivered in the reference case, and as such housing growth has been taken to match the pre-submission Local Plan except for those developments considered dependent on the provision of new infrastructure in North East Chelmsford. In line with WebTAG guidance, both the reference case and preferred option scenarios have used this assumption, with a sensitivity test for dependent development included to consider the impact of the unlocking of new development on the Economic Case.

Table 3.4: Appraisal Specification Summary Table

Impacts	Sub-impacts	Estimated Impact in OAR	Level of uncertainty in OAR	Proposed proportionate appraisal methodology	Reference to evidence and rationale in support of proposed methodology	Type of Assessment Output (Quantitative/ Qualitative/ Monetary/ Distributional)
Economy	Business users & transport providers	Moderate Positive	High	Rail Demand modelling Marginal External Cost Calcs Chelmsford Station Pedestrian Capacity Model	TAG Unit A1.3	Monetary
	Reliability impact on Business users	Moderate Positive	High	Reliability Impacts Assessment	TAG Unit A1.3 Ch 6	Monetary
	Regeneration	Small	Low	none	n/a	n/a
	Wider Impacts	Large positive	Low	Static Clustering Productivity Impacts Output change Imperfectly Competitive Markets	TAG Unit A2.1 TAG Unit A2.2 TAG Unit A2.4	Monetary
Environmental	Noise	Small Positive	Medium	Marginal External Cost Calcs	TAG Unit A5.4	Monetary
	Air Quality	Small Positive	Medium	Marginal External Cost Calcs	TAG Unit A5.4	Monetary
	Greenhouse gases	Small Positive	Medium	Marginal External Cost Calcs	TAG Unit A5.4	Monetary
	Landscape	Small	n/a	Summary of GRIP2 Environmental Assessment findings	n/a	Qualitative
	Townscape	Positive	n/a	Proportionate assessment using TAG Unit A3, Chapter 7	TAG Unit A3	Qualitative
	Heritage of Historic resources	Small	n/a	Summary of GRIP2 Environmental Assessment findings	n/a	Qualitative
	Biodiversity	Small	n/a	Summary of GRIP2 Environmental Assessment findings	n/a	Qualitative
	Water Environment	Small	n/a	Summary of GRIP2 Environmental Assessment findings	n/a	Qualitative
Social	Commuting and Other users	Moderate Positive	High	Rail Demand modelling Marginal External Cost Calcs Chelmsford Station Pedestrian Capacity Model	TAG Unit A1.3	Monetary
	Reliability impact on Commuting and Other users	Moderate Positive	High	Reliability Impacts Assessment	TAG Unit A1.3 Ch 6	Monetary
	Physical activity	Small	Low	none	n/a	n/a
	Journey quality	Small Positive	Medium	Qualitative only - TAG Journey Quality Worksheet	TAG Unit A4.1	Qualitative
	Accidents	Small Positive	Medium	Marginal External Cost Calcs	TAG Unit A5.4	Monetary
	Security	Unknown	High	Qualitative only - dependent on GRIP stage 3	TAG Unit A4.1	Qualitative
	Access to services	Positive	Low	Qualitative Distributional assessment	TAG Unit A4.1	Qualitative Distributional
	Affordability	Unknown	High	Qualitative Distributional assessment	TAG Unit A4.1	Qualitative Distributional
	Severance	Neutral	Low	None	n/a	n/a
Option values	Small positive	Low	None	n/a	n/a	
Public Accounts	Cost to Broad Transport Budget	Large negative	Medium	Affordability assessment Commercial model	TAG Unit A1.2	Monetary
	Indirect Tax Revenues	Small Negative	Medium	Marginal External Cost Calcs	TAG Unit A1.3 TAG Unit A5.4	Monetary

3.4. Economic appraisal inputs:

Details of the key appraisal inputs for the business case are provided below.

Table 3.5: Key appraisal inputs

Key Appraisal inputs	Details
Demand	A rail demand model has been created. Demand growth has been determined using Exogeneous Growth Factors using DfT forecasts and the Passenger Demand Forecasting Handbook (PDFH) v6. Population growth and development in the study area has been based on the latest pre-submission local plans for Chelmsford, Braintree and Maldon districts, with district totals constrained to TEMPRO. Further detail on the work to develop the rail demand model will be provided in Appendix I .
Mode Shift	The rail demand model includes demand growth due to mode shift both to and from the rail network as a result of the changes to the Generalised Cost of rail travel from each MSOA, in line with PDFH recommendations and values and WebTAG guidance. Mode shift for accessing the rail network has also been included for users who change which station they use to access the rail network.
User Benefits	User benefits have been calculated using WebTAG recommended Values of Time and in line with PDFH. User Benefits have been calculated under fixed land use, excluding dependent development, in line with WebTAG A2.1 guidance.
Non-User Benefits	External non-user benefits have been determined through a marginal external costs appraisal, using WebTAG data book values for decongestion, noise, air quality, greenhouse gas, accidents, infrastructure and indirect taxation impacts due to change in vehicle km driven. These impacts have been calculated under fixed land use. Other environmental impacts have been informed by Network Rail's GRIP2 Environmental Appraisal.
Revenue	Fare Revenue changes for Train Operating Companies have been determined using PDFH methodology. Car park revenue has been determined using car park day ticket price assumptions provided by Chelmsford City Council and passenger surveys to determine the share of passengers parking at or near each modelled station. Additional revenue resulting from the unlocking of dependent development has been included, as this is an externality of the development and a true impact of the scheme.
Indirect Tax Revenues	Change in Fuel Tax receipts have been calculated through the Marginal External Costs calculations described under "Non-User Benefits" above and have been calculated under fixed land use. Change to Indirect Tax revenues resulting from changes in consumer spending on rail fares (which are not taxed) have been calculated in line with PDFH, using the assumption that total consumer spending is unchanged by the scheme. This calculation includes the additional change in spending on fares resulting from the unlocking of dependent development, as this is an externality of the development and a true impact of the scheme.
Capital Costs	Costs have been based on GRIP 2 cost estimates, re-profiled to new construction timetable. An optimism bias of 64% has been included in the Economic Case in line with WebTAG A5.3, risk is not included in the appraisal costs of rail schemes until GRIP3 (this is reflected in the much higher levels of Optimism Bias applied at GRIP 1 and GRIP 2)
Renewal Costs	No renewal costs have been included, as they have been assumed to be covered by long term payments by the franchisee to Network Rail included under operating costs.
Operating Costs	Operating and maintenance costs for the station have been determined based on operating costs for similar small stations with modern buildings, Greenhithe, Rochester and Mitcham Eastfields. Changes in long term charges paid by franchisees to Network Rail have been used as a proxy for these operating costs.
Sunk Costs	Sunk costs incurred prior to GRIP Stage 3 of the project have not been included in the scheme cost.

3.5. Economic appraisal assumptions and results
Key appraisal assumptions are provided below.

Table 3.6: Key appraisal assumptions

Appraisal Assumptions	Details
WebTAG version	WebTAG Databook May 2018 v1.10
Annualisation	In line with PDFH
Growth Assumptions	NTEM/Tempo 7.2 at LAD level, adjusted spatially for Local Plan allocations
Opening Year, Final Modelled Year and Appraisal Duration	Opening Year: 2025
	Final Modelled Year: 2038
	Appraisal Duration: 60 years from opening year
Price Base / GDP Deflator	GDP Deflator real 2010 market prices
Real Growth (i.e. above CPI or below)	Growth in line with RPI
Discounting	Discounting to 2010 values in line with WebTAG

The results of the appraisal for the Medium B timetable scenario are provided below. Further supporting detail is provided in:

- **Appendix J** – Economic Appraisal Report
- **Appendix K** – Chelmsford Station Pedestrian Modelling Report
- **Appendix L** – Commercial Model Spreadsheet
- **Appendix M** – Appraisal Model Spreadsheet.

The economic appraisal for the best performing timetable option – Medium B is shown below.

Table 3.7: Costs and benefits summary – Medium B timetable option (Core Case)

	£m PV (2010 prices and values)
Costs*	
Capital Costs	101.38
Renewal Costs	-
Operating Costs	3.14
Benefits	
Journey Time Benefits	-34.84
Highway Externalities	-5.84
Revenue	141.99
Indirect Tax	-12.21
Appraisal	
Present Value of Costs (PVC)	26.39
Present Value of Benefits (PVB)	30.75
Net Present Value (NPV)	4.35
Benefit Cost Ratio (BCR)	1.16

* Costs represent total Capital Costs, Renewal Costs and Operating Costs of the specific intervention seeking funding under LGF.

Section 3.10 discusses wider economic impacts which can be considered in the appraisal. This includes both induced investments and productivity impacts (static clustering). The impact of including these benefits in an adjusted BCR is shown below for the Medium B timetable option. This is known as the Level 2 BCR.

Table 3.8: Impact of wider economic impacts on the BCR for the Core Case

Timetable option	Core Case BCR	Core Case Adjusted BCR
Medium B	1.16	1.79

For the purposes of the appraisal no other schemes have been assumed to have contributed to the same benefits and impacts identified.

3.6. Sensitivity tests:

The economic appraisal has demonstrated that car parking revenue is a significant component of the economic benefits of the scheme, with these alongside other benefits such as access time to stations, decongestion and reliability benefits outweighing on-rail generalised journey time dis-benefits. Indicative car parking charges have been informed by Chelmsford City Council’s parking team and are not considered excessive, being cheaper than Chelmsford city centre car parks. Nevertheless, it is useful for the decision maker to consider the relative weight of these car park revenue benefits (which are not experienced by transport users) in their assessment, and so a sensitivity test excluding these benefits from the core calculation is presented below.

Table 3.9: Overview of sensitivity test associated with car parking revenue

Results	£m PV (2010)	
	Medium Timetable B– with car park revenue (Core)	Medium Timetable B - without car park revenue
Present Value of Benefits (PVB)	30.746	-28.572
Present Value of Costs (PVC)	26.394	26.394
Net Present Value (NPV)	4.351	-54.967
Benefit Cost Ratio (BCR)	1.16	-1.08
Wider economic benefits	16.382	16.382
Adjusted BCR	1.79	-0.46

Sensitivity tests associated with dependent development are presented in Section 3.10.

3.7. Environmental impacts:

Environmental impacts have been assessed using a marginal external costs appraisal in line with WebTAG unit A5.4, based on the change in car km driven resulting from the Rail Demand Model. The resulting annual change in car km have been assumed to be split across road types in line with proportions for East Anglia in TAG databook table A5.4.1, and resulting noise, air quality and greenhouse gas impacts have been monetised using values from TAG databook table A5.4.2 and discounted to 2010 prices and values.

The Rail Demand Model shows an increase in vehicle km, due to a combination of abstraction of demand to Beaulieu station from other stations and modal shift from car to rail. This results in Noise, Air Quality and Greenhouse Gas dis-benefits. The monetised value of these benefits is shown in Table 3.10 below.

Direct environmental impacts from the construction and operation of the station were initially assessed in the Environmental Statement and the addenda to support the outline planning permission of the wider Beaulieu development (Ref: 09/01314/EIA and railway station (Ref: 10/00021 EIA). Following the grant of outline planning permission, Network Rail has taken ownership of this element through the GRIP process with these assessed as part of the GRIP 2 Environmental Appraisal, using a preliminary environmental risk assessment (PERA) methodology. This made use of readily available desktop information supplemented by a site walkover by an ecologist to verify the desk-based findings. The outcome of the GRIP2 work is an action plan to guide future environmental surveys and monitoring through the GRIP process.

A summary of the station impacts from the GRIP 2 PERA is presented herein. Some of the car park and access options considered had the potential to cause water environment impacts, but these were considered fully mitigatable. Potential impacts on noise, air quality and biodiversity were identified during construction, and potential mitigation was identified. Several listed buildings are within the site vicinity but none within the site boundary itself. New Hall school to the north is a Grade I listed building with Grade II listed parks and gardens. The potential impacts have been a key consideration in the wider Beaulieu Park Masterplan and have provided height constraints for the proposed station and car park which have been met. Landscape impacts are considered minimal as the heritage impacts have driven a low height visual solution in any case. All impacts were given either a green or amber RAG score using the PERA methodology, with potential methods to mitigate them identified. Such mitigations are accounted for in the cost estimate, and so all these impacts have been assessed as neutral.

Townscape impacts were not considered in the PERA methodology. However, it is considered that the station will make a positive contribution to the vibrancy and human interaction within the public spaces associated with the Beaulieu Park Masterplan. The station architecture to be developed further through the GRIP process will provide an anchor to development in this location.

Table 3.10: Environmental impacts summary

Environmental Impact	Assessment
Noise	-£0.277M
Air Quality	-£0.004M
Greenhouse Gases	-£0.290M
Landscape	Neutral
Townscape	Slight beneficial
Heritage	Neutral
Biodiversity	Neutral
Water Environment	Neutral

3.8. Social impacts:

Accident impacts have been assessed quantitatively for both road and rail impacts. Road impacts have been monetised using the same marginal external costs assessment as for the environmental impacts, which shows a net increase in vehicle km and hence overall accident dis-benefits. Rail accidents have been assessed using RAI0502 rail accident statistics from the Department for Transport Statistics, to assess the resulting change in passenger casualties due to the change in passenger kilometres. This shows a net increase in passenger km and hence also shows overall accident dis-benefits. Combined, these result in net accident dis-benefits.

Qualitative assessments have been undertaken for Journey Quality and Security, using WebTAG worksheets. Accessibility and Personal Affordability assessments have been undertaken through a Distributional Impacts assessment, reported in **Appendix N**.

Table 3.11: Social impacts summary

Social Impact	Assessment
Accidents	-£1.285M
Physical Activity	Not Assessed
Security	Slight Beneficial
Severance	Not Assessed
Journey Quality	Moderate Beneficial
Option values and non-use values	Not Assessed

Social Impact	Assessment
Accessibility	Slight Beneficial
Personal Affordability	Neutral

3.9. Distributional impacts:

Appendix N summarises the distributional impacts in a supporting technical note.

3.10. Wider impacts:

Commercial floor space and jobs

40,000 m² of business park space and 22,300 m² of other commercial and employment uses is allocated within Beaulieu. A further 45,000 m² of business park space is allocated in Chelmsford's Local Plan in North East Chelmsford. Analysis by Lichfields has indicated that with the station in place, the mix of B1a/b vs. industrial land use would change to reflect the enhanced connectivity and attractiveness of the site for office suppliers. This would create additional, higher productivity jobs. This business park would be unique in Essex and one of very few in the UK with such connectivity, and so this increase in business use and productivity would have high additionality.

Output change in imperfectly competitive markets

In line with TAG Unit A2.2, the additional consumer surplus which arise due to the presence of imperfect competition (the market structure distorts the efficient operation of the market), is estimated by applying a 10% uplift factor to the business user benefits calculated by our transport user benefit appraisal model, as long as there is evidence that business would increase output in response to the transport investment.

The Strategic Case has demonstrated that investment in the railway is needed to deliver the ambition for growth, with key issues being congestion at Chelmsford station, congestion in the city centre and access to the rail network from growing settlements in the Heart of Essex not well served by rail. It is therefore considered appropriate that this additional 10% be applied in the form of an adjusted BCR.

Productivity Increases

As previously noted, the delivery of the station would make Beaulieu Business Park one of the best connected in the UK. As Chelmsford is within the London Functional Urban Region, this enhanced connectivity would increase the productivity of jobs at the business park due to the increase in effective urban density due to reduced travel times to London. Static clustering impacts have been assessed in line with WebTAG unit A2.4. This concludes that in the core scenario over £16million of productivity benefits in 2010 prices and values would occur over the 60-year appraisal period, with benefits also calculated for alternate timetable options. Dynamic clustering impacts have also been calculated to determine the productivity impacts that would occur for the additional B1a/b type jobs at Beaulieu Business Park with the presence of the scheme, as identified by Lichfields.

Combined Impact

The impact that these two sets of wider impacts has on the core case is shown below. This is known as the Level 2 BCR.

Table 3.12: Impact of wider impacts on the BCR (Level 2)

Scenario	Initial BCR (Level 1)	Adjusted BCR (Level 2)
Core Medium B	1.16	1.79

Housing

The delivery of the station will support the following development considered "dependent". It should be noted that the quantum is expected to increase through the work being undertaken on the related HIF submission:

- 1,100 homes with outline planning permission subject to the provision of Beaulieu station or alternative sustainable transport mechanism utilising Countryside Zest's S106 contribution

- 2,500 homes in North East Chelmsford allocated in the Draft Local Plan beyond 2036.

In addition, research has indicated that multiple developments in the north east of Chelmsford district, would likely be accelerated by developers in the event that the scheme was delivered due to the enhanced connectivity. These developments include:

- 3,250 homes at Channels and Beaulieu (some of which have already been delivered),
- 3,000 homes in NE Chelmsford Phase 1
- 1,100 in Great Leighs
- 450 north of Broomfield.

The related HIF submission will evaluate the impact of unlocking dependent development, and to a lesser extent the acceleration of other developments. Impacts will be monetised in line with MCHLG guidance using residual land value uplift methods. It should be noted that this work is ongoing as of end January 2019 in terms of establishing the dependency and acceleration of homes linked to the station and the CNEB. In addition, our rail demand modelling does not include the impact of the CNEB in terms of improving drive times to the station in the future (both a potential positive impact in generating additional demand as well as transfer from Chelmsford station), and our assessment of the impact on rail demand and related revenue for this transport business case is considered conservative.

The impact that these homes would have on the transport business case has been evaluated by considering the increase in rail demand and related farebox, commercial and car park revenue and decrease in indirect tax revenue from the new and accelerated dependent. As these are externalities resulting from the unlocking of development, and the unlocking of development is considered part of the true impact of the scheme, these impacts have been included within the Core BCR.

To ensure a consistency of approach with the HIF, and to demonstrate the full impact of unlocking the dependent development outlined above, the potential Land Value Uplift has been estimated using the MHCLG's Land Release Fund Ready Reckoner. A full, site-specific evaluation of the Land Value Uplift will be conducted as part of the development of the HIF submission and will supersede these values. In line with WebTAG guidance, the LVU estimate has been subjected to switching value analysis, shown below, to indicate the proportion of this LVU that would need to be realised in order to change the VfM category of the scheme to "High" (see Table 3.13)

Table 3.13: Switching Value analysis of Land Value Uplift

Results	£m PV (2010)		
	Core Scenario	High VfM Initial BCR	High VfM Adjusted BCR
Estimated Land Value Uplift	110.7		
Proportion included in benefits	-	20%	5%
Present Value of Benefits (PVB)	30.7	52.8	36.4
Present Value of Costs (PVC)	26.4	26.4	26.4
Net Present Value (NPV)	4.4	26.4	10.0
Benefit Cost Ratio (BCR)	1.16	2.0	1.4
Wider Impacts	16.4	16.4	16.4
Adjusted (NPV)	20.7	42.7	26.4
Adjusted Benefit Cost Ratio (BCR)	1.79	2.08	2.0

The calculation of the PVC includes the subtraction of increased franchise premiums, resulting from additional fare revenue associated with the dependent development. As some uncertainty exists over the level of rail patronage by users of this development, this has been subjected to a further switching value analysis to determine the level of reduction that would result in the VfM of the scheme changing to “Poor”

Table 3.14: Switching Value analysis of reduction in Franchise Premium

Results	£m PV (2010)		
	Core Scenario	Poor VfM Initial BCR	Poor VfM Adjusted BCR
Franchise Premium associated with Dependent Development	55.4		
Reduction	-	10%	40%
Present Value of Benefits (PVB)	30.7	30.7	30.7
Present Value of Costs (PVC)	26.4	31.9	48.5
Net Present Value (NPV)	4.4	-1.2	-17.8
Benefit Cost Ratio (BCR)	1.16	1.0	0.6
Wider Impacts	16.4	16.4	16.4
Adjusted (NPV)	20.7	15.2	-1.4
Adjusted Benefit Cost Ratio (BCR)	1.79	1.5	1.0

3.11. Value for money:

Appendix O provides the standalone Appraisal Summary Table, Analysis of Monetised Costs and Benefits (AMCB) table, Public Accounts (PA) table and Economic Efficiency of the Transport System (TEE) table for the Core Scenario (Medium B timetable option, including the externalities of unlocked development).

Based on the DfT’s Value for Money Categorisation (Table 3.15), the core scenario using just the Level 1 BCR can be initially categorised as offering Low value for money. With the inclusion of wider economic impacts, this can be revised to offering Medium value for money. The majority of monetised benefits are associated with access time reduction (47%) and car parking revenue (35%). Other important components include on-rail journey time reliability improvements (11%) and pedestrian delay reduction at Chelmsford station (7%). Dis-benefits are limited to on-rail journey time dis-benefits for inconvenienced passengers further up the GEML (84%), loss of indirect taxation (8%), fare increases relative to using Chelmsford station (4%) and congestion impacts (4%).

Table 3.15: DfT’s Value for Money Benefit Cost Ratio Categorisation

Value for Money Category	BCR Range
Poor VfM	Less than 1.0
Low VfM	Between 1.0 and 1.5
Medium VfM	Between 1.5 and 2.0
High VfM	Between 2.0 and 4.0

SELEP’s Assurance Framework notes that there is a general expectation for a BCR of 2.0 to be achieved for transport capital schemes, unless exceptions relating to the ability to appraise known benefits, a strong strategic case, an ability to mitigate high risks and the support of other Government departments or transport providers (such as Network Rail) apply. This has been described further in response to Section 1.12.

The Appraisal Specification sets out several impacts which have been monetised but not included in the calculation of the BCR (i.e. Land Value Uplift associated with dependent housing) yet should still form part of the overall value for money assessment. Consideration has been given to the impact on

the value for money categorisation if these impacts which can be monetised but not included in the core BCR were considered; or unknown impacts from emerging Network Rail work on the GRIP 3 design (i.e. cost maturity) and the Strategic Outline Business Case for the GEML Taskforce were considered. This is known in DfT's Value for Money Framework as the concept of 'switching values'. The required change in scheme costs or benefits required for the scheme to move to the next value for money categorisation from its initial value for money categorisation is shown below for the core scenario.

Table 3.16: Scale of change in costs or benefits to switch the scheme from its initial value for money categorisation

	BCR	VfM Category	High VfM (BCR > 2.0)		Poor (BCR < 1.0)	
Initial BCR	1.16	Low	10% (£11.4M) reduction in infrastructure cost	20% (£22.0M) of Land Value Uplift	5% (£5.7M) increase in infrastructure cost	10% (£5.5M) reduction in fare revenue associated with dependent development
Adjusted BCR	1.79	Medium	2% (£2.2M) reduction in infrastructure cost	5% (£5.7M) of Land Value Uplift	20% (£22.8M) increase in infrastructure cost	40% (£22.1M) reduction in fare revenue associated with dependent development

As can be seen from the switching value analysis, the upsides required for the VfM category to increase to High are smaller than the downsides required for the VfM category to fall to Poor. In addition, these upsides are more likely to be realised than the downsides, as the high level of optimism bias applied at this stage means schemes costs are more likely to fall than increase as the design matures through GRIP 3.

As WebTAG A2.1.4 states, the economic impacts resulting from land-use change (dependent housing) as captured through Land Value Uplift are a true consequence of the scheme, although there is uncertainty over the final level that will be realised. As the assessment of Transport User Benefits, Marginal External Costs and Wider Economic Impacts was conducted under fixed land use excluding the dependent development, the inclusion of LVU does not represent any double counting of benefits. The switching value analysis has indicated that only 20% of the estimated LVU is required to give a High VfM categorisation, falling to 5% when wider economic benefits are included.

Given the nature of the sites as a strategic allocation and the lack of suitable alternative sites of sufficient capacity within the Housing Market Area, MHCLG guidance suggests 75% additionality is reasonable for a site of this nature. In addition, as the evidence base for the scheme evolves during the preparation of the HIF business case, it is expected that the extent of dependent development associated with the station will increase, as partial or full dependency can be attributed to new sites. As such, we are confident that even by a highly conservative estimate of the potential economic benefit associated with Land Value Uplift, a revision of the Value for Money categorisation to "High" is appropriate.

Although the core case BCR presented initially indicates low to medium value for money, the consideration of benefits has been limited to only transport-related impacts in line with WebTAG. When viewed as part of the delivery of a wider transformational growth scenario in North East Chelmsford, the case is significantly more compelling, as demonstrated by the Land Value Uplift switching value analysis which shows a high value for money categorisation is achievable even with conservative assumptions.

Following the completion of the HIF bid in March 2019 the project team will likely have greater certainty on the impact of:

- Network Rail's emerging work for the Great Eastern Taskforce;
- congestion and other external impacts of the scheme through traffic modelling;
- access time improvements associated with bringing forward CNEB through the Chelmsford HIF business case, and;
- the scale of dependent development attributable to Beulieu station (and resultant farebox revenue) based on assumptions within the Chelmsford HIF business case.

4. COMMERCIAL CASE

The commercial case determines whether the scheme is commercially viable and will result in a viable procurement and well-structured deal. It sets out the planning and management of the procurement process, contractual arrangements, and the allocation of risk in each of the design, build, funding, and operational phases.

4.1. Procurement options:

The main options for procurement are either for Network Rail to deliver the whole of the project on behalf of Essex County Council or for Essex County Council to directly deliver the project, with Network Rail providing asset protection services. For this scheme, to date the only option that has been considered is for Network Rail to deliver the project due to the size and complexity of the project and the interfaces that would need to be managed would affect the programme and projected cost of the project.

For a project of this nature, Infrastructure Projects (IP) is Network Rail's national infrastructure delivery arm, working to increase capacity on the network by developing, designing and delivering enhancements and large complex multi-disciplinary capital projects. IP is split into four regions (Central, Southern, Western & Wales, and Scotland North East) and two discipline lead programme teams (Signalling and Track). IP relies on an extensive supply chain to design and deliver projects. IP utilise a number of routes to the market which predominately is covered via professional service frameworks; alliances; design and construction frameworks; or via a market sought tender. Frameworks are also competitively tendered in accordance with the Contract Utilities Regulations and comply with OJEU regulations.

Network Rail is in the process of tendering its replacement for the professional services and multi-functional frameworks for CP6, during which work on GRIP 4 (Consents) and GRIP 5-8 (Detailed Design, Construction, Testing and Commissioning and Handback) would happen. During the tendering of these replacement frameworks, Network Rail considers suppliers' capability of delivering portfolios of works with the appropriate skills and behaviours to realise these successfully; safety, sustainability, social value, cost and quality absolutes; and what has worked well and not so well in the delivery of its current frameworks and elsewhere in the industry. Figure 4.1 shows the procurement strategy that has been set out by IP for the Southern area during CP6:

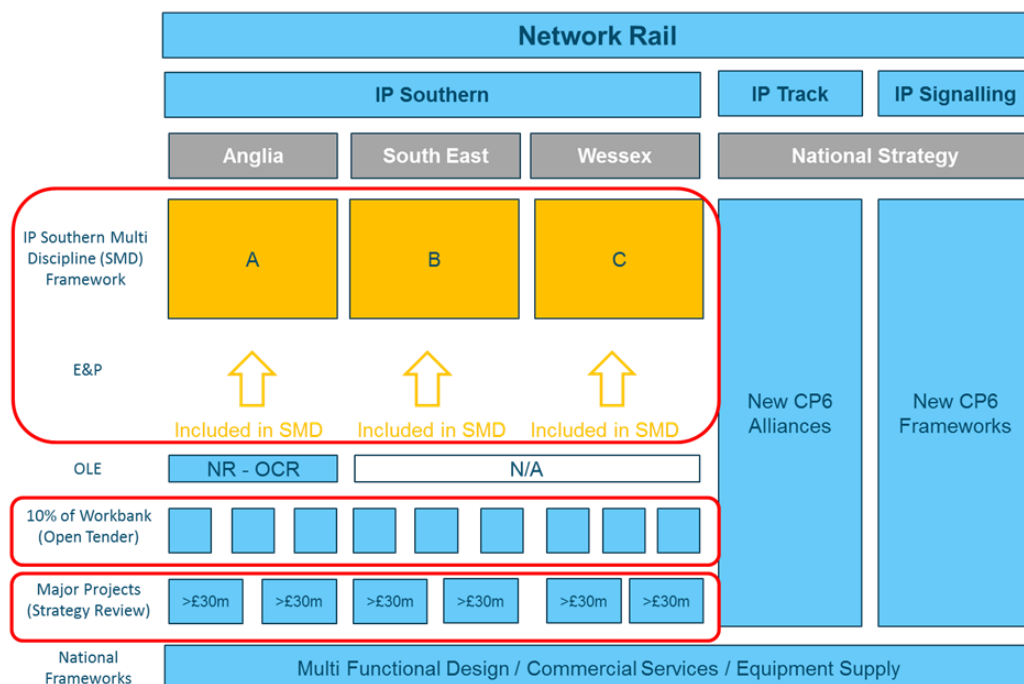


Figure 4.1: Network Rail Infrastructure Projects Southern CP6 Procurement Strategy

For large multi-disciplinary enhancement projects, IP Southern are the lead delivery organisation. For large projects (>£30M in total value) a specific (procurement) strategy review has to be undertaken. The specific strategy review undertaken to date has resulted in the following approach. The project has been designed up to the end of GRIP Stage 2 by VolkerFitzpatrick Limited under the existing Multifunctional Framework (MFF) which is due to expire in March 2020. As the project timescales for award of the delivery contract did not align with the expiration of the MFF contract it was decided to progress the design of the scheme to the end of GRIP Stage 3 via the Multi-Functional Design Framework (MFD), which was competitively tendered to the 9 suppliers under the framework with WSP UK Limited being the successful supplier of the development of the scheme.

The strategy review for Beaulieu station has not yet considered the works and services for GRIP stage 4 and beyond as the IP approach for CP6 had not at the time of writing the strategy review been finalised at a regional basis. The strategy review for Beaulieu station will require update before moving on, and will consider the following procurement options

- 1) Utilisation of the CP6 IP Southern Multi Discipline Framework (SMDF) as the single delivery partner of the scheme. The SMDF is currently out to tender and is not due to be awarded until April 2019. This framework is underpinned by the principles of ISO44001 for collaborative business relationships. Adopting and implementing ISO44001 supports and complements the NEC3 framework contract, providing a meaningful way to measure and continuously improve performance over the duration of the framework. In the early GRIP phases Network Rail used the current team to provide early contractor involvement through the implementation of robust design, planning and constructability reviews early in project life cycles. The incoming supplier would take over the project at the end of an appropriate GRIP stage, which would tie into the programme dates for the project and the finalisation of the tender and award.
- 2) Continue to develop the scheme through to the end of GRIP Stage 4 with a designer and competitively tender the detail design and construction of the project within the open market with the successful supplier being a single deliverer.
- 3) Utilise all of the frameworks available in IP with SMDF undertaking the Building, Civils, and Electrification & plant works, IP Signalling framework undertaking the signalling works, and IP Track framework undertaking the track works. Similar to option 1, this would have to be handed to the framework suppliers at an appropriate GRIP stage.

In delivering this project it is expected that a similar approach to GRIP 3 will be followed at GRIP 4, with the relevant professional services contracts used to secure multi-disciplinary consultant(s) through a competitive process to deliver the consents. The value of the work required and the specialist requirements (consents) is such that a competitive process is most likely rather than a continuation of the existing GRIP 3 contract.

4.2. Preferred procurement and contracting strategy:

For GRIP stage 2 the delivery has been through the CP5 Multi-Functional Framework (MFF) Anglia Route Collaboration (ARC) between NR and Volker Fitzpatrick with WSP UK Limited working as VolkerFitzpatrick's designer.

For the current commission covering GRIP stage 3 the procurement route has been through the Professional Support Services contract with WSP UK Limited. WSP UK Limited were the successful tenderer for the design works, which was tendered to the 9 suppliers on the framework. The decision to move from VFL on the MFF was because of the pending expiration of the framework, and the MFF contract had reached its cap value and could no longer be extended to accommodate a project the size of Beaulieu station.

Going forward the preferred contracting strategy will be to utilise the new CP6 frameworks to continue utilising the concept of Early Contractor Involvement in the design and consents phase for GRIP4. For GRIP stages 5-8 which cover detailed design, construction and commissioning a separate contract will be let for a combined design and build commission again utilising the new CP6 frameworks. The new CP6 framework gives Network Rail the option to competitively tender discrete projects to ensure the framework maintains its competitiveness. However, this strategy is

still to be agreed in line with Network Rail's Contract and Procurement Policy and will be considered against the entire workbank that is delivered through the frameworks.

4.3. Procurement experience:

Essex County Council have fulfilled promoter roles on recent rail related projects in Essex including a new access bridge at Witham station and also a new bridge structure across the Braintree branch line to connect with the Freeport shopping village. However, given the scale and complexity of the Beaulieu station project, Essex County Council have sought to address the need for the requisite level of procurement and technical experience through the delivery of the new station by Network Rail, rather than self-deliver the project with Network Rail undertaking an asset protection role. Jacobs UK Limited's rail division are acting as Essex County Council's client support for the project. A Development Services Agreement has been signed by ECC and Network Rail, which involves the engagement of a Network Rail Project Sponsor, Project Manager and their procurement frameworks to deliver the project as well as ensuring all necessary third party consents are properly dealt with.

Network Rail have procured and delivered new railway stations on the Anglia Route during CP5 including Lea Bridge, Meridian Water and Cambridge North (details of which are referred to in the Management Case). These schemes were delivered by VolkerFitzpatrick, through the MFF ARC. Network Rail have been using the similar procurement route to use early contractor involvement during the GRIP 2 and 3 design development of Beaulieu New station.

The delivery of the Anglia Workbank has provided Network Rail with valuable information on lessons learned in procurement and project delivery. Network Rail has processes and tools in place to provide all of its project teams with a systematic means of capturing, validating and re-using knowledge for future projects' success by avoiding repetition of previous project errors.

During the early GRIP stages, lessons learnt from other relevant projects have been consulted, and the recommendations incorporated where relevant into the Beaulieu station project via the Lessons Learned page within the IPS Smarter Southern intranet site. This has included the "New Stations Combined Lessons Learned Consolidated Report.

At each of the procurement stage gates the latest information will be reviewed and actioned where required. A key lesson learned from previous station projects is the effective management and utilisation of railway possessions during the construction phase.

4.4. Competition issues:

Network Rail is a public body and therefore all projects have to comply with the Government's Managing Public Money policy. It is also considered as a utility under the OJEU regulations and therefore all of the tendering activities Network Rail undertakes for the procurement of the CP6 Frameworks will be bought in accordance with the Utilities Contract Regulation 2016. Any specific strategy will be developed to make sure that they comply with these policies and regulations and will consider competition risk.

Network Rail do not envisage any issues at this stage.

4.5. Human resources issues:

The same development team within Network Rail IP Southern (Anglia) who have completed GRIP stage 2 will continue to be responsible for developing the project through to the end of GRIP stage 4 where they will then hand over to their sister delivery organisation within IP Southern Anglia. This takes the form of a phased transition with the delivery team progressively increasing its involvement through the later phases of the development of the project.

To further mitigate against team communication and continuity issues, both functions within IP Southern (Anglia) are co-located in the same office together with Network Rail IP Southern (Anglia) assurance engineers, the current MFF framework partner and the Network Rail Sponsorship team for the Anglia route thus maximising collaboration in the decision making process. It is planned to continue the co-location with the new CP6 framework partner once awarded in late 2018.

It is also noted that the Network Rail Project Manager responsible for the Beaulieu New station project was also responsible for delivering the Witham second entrance and access bridge referenced in section 4.3, giving continuity with working with Essex County Council.

4.6. Risks and mitigation:

Essex County Council, Chelmsford City Council, Network Rail and Countryside Zest as the scheme partners have all signed up to a Memorandum of Understanding (MoU). Clause 5 (d) of the MoU states that the partners are to “work collaboratively to identify solutions, eliminate duplication of effort, mitigate risk and reduce cost”.

The GRIP process governs how risks associated with the station design and construction are identified, mitigated or removed, and re-evaluated at each GRIP stage. The process is very robust, is well documented and calls for a Quantified Risk Assessment at GRIP 3 which is then re-assessed and updated at each subsequent stage. Part of this assessment is to assign risks to relevant owners for action.

The works also fall under the Common Safety Method (CSM) which Network Rail actions as part of the design development and is a further method of risk and hazard identification, mitigation and elimination.

When the scheme is ready to move on to the detailed design and construction phase (GRIP 5-8), an Implementation Agreement will be put in place between Network Rail and the “funding party” – at this stage this is assumed to be Essex County Council but could be a relevant central government department. This will likely be developed back to back with the contract between Network Rail and the delivery contractor.

These contracts will specify ownership of risk based on who is best placed to manage the risk and specific parties’ responsibilities should cost overruns materialise, depending on the reason for the overrun. Network Rail will also have a Risk Fee Fund in place – this will allow Industry related risks to be managed outside of the project and gives a mechanism of redress to the external client for risks.

4.7. Maximising social value:

Social Value is a standard question within Network Rail frameworks, prequalification questionnaires and project tenders for both professional services and solution delivery. Network Rail is also a contributor to the Social Value Taskforce. This was formed to provide further information and practical guidance of how to apply the Social Value Act 2012 and what the real benefits are. They provide a steer on social value as well as supplier engagement workshops and feedback events.

Social Value is a key theme in the way that Network Rail celebrates success, through events such as the Rail Partnership Awards. Four out of fifteen awards in 2018 explicitly cover social value in one way or other – namely Community Engagement, Sustainable excellence, Investing in People and SME of the Year.

Considering a recent project example on the Anglia route, the new Cambridge North station is an example of a project that has respected its location and natural surroundings. For instance, a brown roof was included in the specification, using materials from the surrounding environment to promote biodiversity enhancement and help the station blend in with its science and biology-themed surroundings.

Future tender specifications will provide the project team with a means to incorporate appropriate economic, social and environmental requirements to deliver a project that respects and advances the well-being of the local area.

Within the new CP6 framework contract terms, Network Rail have extended their “Fair payment Charter” to commit tier 1 suppliers to pay their subcontractors within 28 days to replicate the same terms with Network Rail. It also removes the use of retentions on those payments, something that

has long been an area of debate across the industry due to the detrimental effect it can have on smaller suppliers' viability.

These changes are part of a number of improvements being made to help create a healthier environment for suppliers at all levels and will result in the rail industry becoming the first sector within the wider UK construction industry to enforce these payment measures, overhauling the way large contractors do business with their supply chain. The Fair Payment Charter is about recognising that cash flow is the 'life blood' for every supplier by committing to pay for goods and services in a fair, predictable and timely way. Culturally, it sends a huge signal as to the value Network Rail places on a sustainable supply chain and the way they want to do business.

5. FINANCIAL CASE

The Financial Case determines whether the scheme will result in a fundable and affordable Deal. It presents the funding sources and capital requirement by year, together with a Quantitative Risk Assessment (QRA), project and funding risks and constraints. All costs in the Financial Case should be in nominal values.

The profile of funding availability detailed in the Financial Case needs to align with the profile of delivery in the Commercial Case.

5.1. Total project value and funding sources:

Cost estimates have been produced for the identified options under Network Rail Estimating Guidelines appropriate to the level of project development at GRIP stage 2. The design for Beaulieu station is currently being progressed through GRIP stage 3 (single option) development. The GRIP 2 cost estimates for the options taken forward to GRIP3 range between £154M and £157M (inclusive of risk and inflation). For the purposes of the Financial Case, the £157M figure is used herein to illustrate the profile and split of costs.

In addition to the monies sought from SELEP, the project also has a contribution from the developers Countryside Zest, secured through a S106 agreement. This sets out a schedule for release of funding and its purpose. With money spent on GRIP 2 design, the remaining funding contribution for the station's development now totals £20.350M.

Beaulieu station is part of a wider Chelmsford Housing Infrastructure Fund (HIF) submission to the Ministry of Housing, Communities and Local Government (MHCLG), due to be submitted by 1 March 2019. The remainder of the project's funding will be through this bid.

Recognising that LGF can only be sought to 2020/21, Essex County Council have been working with SELEP to agree a mechanism that allows the previously prioritised funding to be retained for this complex project should this be required. A letter to seek agreement for flexibility in drawdown and expenditure of the allocated LGF has been sent through to Ministry of Housing Communities and Local Government (MHCLG). This is appended (appendix R). Based on the advice received from Central Government, Essex County Council will work with SELEP to come to an agreement on the exact mechanism for transfer and administrative arrangements associated with the funding.

Therefore, the funding will be drawn down in accordance with the table below:

Funding source	Expenditure Forecast (£M)								
	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	Total
SELEP Funding (this submission)	0.00	0.00	2.73	1.31	7.96	0.00	0.00	0.00	12.00
Developer Contributions (Countryside Zest)	1.30	1.30	0.32	1.25	4.63	4.62	6.93	0.00	20.35
ECC TRAS Budget (Revenue)	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.05
Housing Infrastructure Fund	0.00	0.00	0.00	0.85	4.98	34.91	44.49	39.44	124.67
Total	1.30	1.30	3.05	3.41	17.57	39.53	51.44	39.47	157.07

5.2. SELEP funding request, including type (LGF, GPF, etc.):

£12.0m capital funding through the LGF is requested from SELEP in the form of a financial contribution.

5.3. **Costs by type:**

	Expenditure Forecast (£M)								
Cost type	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	Total
Capital									
<i>Direct Construction Works</i>						19.36	26.43	20.27	66.06
<i>Preliminaries</i>						4.07	5.55	4.25	13.87
<i>Overheads & Profit</i>						1.98	2.71	2.08	6.77
<i>Design Team</i>	0.72	0.72	1.21	1.38	3.74	0.95			8.72
<i>Project Team</i>	0.58	0.58	0.98	1.11	1.60	0.95	0.74	0.57	7.11
<i>Other Project Costs</i>						1.57	2.14	1.64	5.35
<i>Network Rail Fee</i>			0.13		5.35				5.48
<i>Industry Risk Fee</i>			0.06		2.14				2.20
Non-capital									0.00
QRA Capital	0.00	0.00	0.67	0.92	4.74	10.65	13.85	10.63	41.46
Monitoring and Evaluation Revenue							0.02	0.03	0.05
Total funding requirement	1.30	1.30	3.05	3.41	17.57	39.53	51.44	39.47	157.07
Inflation (%)	0%	0%	2.8%	2.7%	2.8%	2.7%	2.7%	2.7%	

Cost estimates have been produced for the identified options under Network Rail Estimating Guidelines appropriate to the level of project development at GRIP stage 2.

Direct Construction Works include the following cost elements:

- Railway Control Systems
- Train Power Systems
- Electric Power & Plant
- Permanent Way
- Operational Telecom
- Buildings & Property
- Civil Engineering
- Enabling Works.

Preliminaries and overheads & profit comprise indirect construction works.

Project / Design Team and Other Project Costs are split by the following categories:

- Design Team
- Project Team
- Other Project Costs
- Network Rail Fee
- Industry Risk Fee. This is a form of contingency and will allow industry related risks to be managed outside of the project and gives a mechanism of redress to the external client for risks. No further contingency has been added, given the 40% risk premium mentioned below.

Risk has been calculated in line with NR corporate guidance for GRIP 2 in the absence of a detailed Quantified Risk Assessment (QRA). An uplift of 40% was applied to the point estimate, minus cost of work done, industry and risk fees. Removing these results in the 36.9% figure presented above. NR considered that this risk uplift was appropriate given the unknowns expected at GRIP 2 and significant impact of constructing a new station on the existing GEML.

The cost estimates were developed during GRIP2 in 2016 and assumed completion of the project in 2024. Jacobs has revisited the spend profile and inflation (escalation) to take into account the development services agreement for GRIP3 now in place and deferred delivery of the scheme by one year. This assumes no risk and inflation % for the GRIP3 costs given that Network Rail are working under a Development Services Agreement with Essex County Council to a defined budget including contingency. The construction spend profile assumed 30% construction spend in 2023/24, 40% in 2024/25 and 30% in 2025/26.

Inflation has been calculated by Jacobs in line with Network Rail's Estimating Guidelines. This involves the use of the latest RPI (Average Annual Index (RPI CHAW ONS Actual to 2016/17, NR Forecast to 2023) figures to uplift spend on a quarterly basis for spend on GRIP4 and beyond. As a guide the original estimate was prepared at a 2016 Q3 (264.7) price basis.

Optimism bias has not been applied in the Financial Case.

5.4. Quantitative risk assessment (QRA):

The unit costs for the scheme's capital costs was produced following Network Rail Estimating Guidelines undergoing the following reviews:

- 07/12/2016 - Internal Infrastructure Projects Anglia / Volker Fitzpatrick review
- 31/01/2017 - Peer review
- 02/02/2017 - IP Southern Review
- 15/02/2017 – IP National final governance review
- August 2018 – An adjusted cost profile and inflation figures have been calculated by Jacobs to reflect the current scheme programme with a construction mid-point in Q3 2023 rather than Q3 2022 previously assumed in the Network Rail GRIP 2 study.

The original estimate was produced by the Infrastructure Projects (IP) Anglia Multi-Function Framework (MFF) contractor Volker Fitzpatrick and signed by the IP Southern Estimating manager as being fit for purpose according to the IP Southern Approval Endorsement and Release of Estimate Work Instruction. Being a GRIP 2 level estimate, a full Bill of Quantities were not available from which to measure volumes from.

The Commercial Model developed to underpin the LGF business case appraisal takes into account the operating and maintenance costs of the station and related infrastructure such as car parking. These are based on benchmark figures of similar stations and facilities, both in terms of modern construction and scale. The Commercial Model also takes into account the impacts on train and freight operating costs and franchise payments.

A QRA has not yet been undertaken for the project given the level of detail required to make this meaningful and the development stage of the project. The GRIP process governs how risks associated with the station design and construction are identified, mitigated or removed, and re-evaluated at each GRIP stage. The process is very robust, is well documented and calls for a QRA at GRIP 3 which is then re-assessed and updated at each subsequent stage.

A sum for Monitoring and Evaluation has been agreed with Essex County Council to represent a typical figure to evaluate a project such as this.

5.5. Funding profile (capital and non-capital):

Other than a small sum of £50,000 for monitoring and evaluation which is assumed to come out of the ECC TRAS budget, all of the remaining funding is capital expenditure. ECC considers that the £50k for monitoring and evaluation is considered comparable to other projects. As the Monitoring and Evaluation Plan makes clear, there is an excellent opportunity to make use of data routinely collected to compile these desktop-led reports.

Funding sources are shown again below for completeness.

	Expenditure Forecast (£M)
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Funding source	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	Total
Capital									
SELEP Funding (this submission)	0.00	0.00	2.73	1.31	7.96	0.00	0.00	0.00	12.00
Developer Contributions (Countryside Zest)	1.30	1.30	0.32	1.25	4.63	4.62	6.93	0.00	20.35
Housing Infrastructure Fund	0.00	0.00	0.00	0.85	4.98	34.91	44.49	39.44	124.67
Revenue									
ECC TRAS Budget (Revenue)	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03*	0.05
Total	1.30	1.30	3.05	3.41	17.57	39.53	51.44	39.47	157.07

* Denotes spending in future years (2026/27 and 2030/31) for 1 year post and 5 year post opening Monitoring and Evaluation reports.

It is a condition of SELEP funding that it should be spent by 31 March 2021. As noted in Section 5.1 above, Essex County Council have in principle agreed a mechanism with SELEP to use any unspent LGF monies associated with Beaulieu station to fund expenditure within the Essex County Council capital programme, on any project, to reduce borrowing requirements. This amount of money will then be returned to the Beaulieu station project to allow this to progress and complete with Essex County Council funding.

Chelmsford City Council, Essex County Council and Countryside Zest have entered into a Section 106 agreement which sets out the timetable for the release of funding for station development work. This can be varied with the agreement of all parties.

Any funding from the MHCLG and Homes England through HIF is dependent on a successful business case. The status of which should be known by May 2019. As part of that bid there will be a need to set out a likely funding profile, with the likelihood that all HIF related funding to be spent by the end of 2023/24. Essex County Council have been open with Homes England and the MHCLG with the timescales of the Chelmsford HIF project during the expression of interest and co-development phases and continue to progress the business case with the support of Homes England and the MHCLG.

5.6. Funding commitment:

The following factors are of note in relation to the various funding commitments:

Funding Source	Status of commitment
SELEP	The scheme was previously prioritised as part of the Local Growth Fund 1 for Essex in 2014. Continued funding support from SELEP is dependent on the successful approval of this business case and Essex County Council’s proposed mechanism to use any unspent LGF monies by March 2021 associated with Beaulieu station to fund expenditure within the Essex County Council capital programme, on any project, to reduce borrowing requirements. This amount of money will then be returned to the Beaulieu station project to allow this to progress and complete with Essex County Council funding.
Developer Contributions	Chelmsford City Council, Essex County Council and Countryside Zest have entered into a Section 106 agreement which sets out the timetable for the release of funding for station development work.
Housing Infrastructure Fund (HIF)	Essex County Council is seeking to cover the remainder of the funding gap through its Chelmsford HIF bid due for submission in March 2019. The status of this should be known by May 2019. This business case will be evaluated against various factors including its strategic case, the quantum of housing unlocked and the net present value of the scheme in terms of land value uplift. Reduced weight will be given to the scheme’s impact on the transport network. A scheme with Local Growth Funding would demonstrate clear alignment with the region’s economic plan and strong evidence of actual support and joint working, further strengthening the case for HIF funding.
ECC TRAS Budget (Revenue)	Revenue funding for the next financial year is subject to formal approval in each preceding February as part of ECC budget setting, i.e. February 2019 for the 2019/20 Financial Year.

Throughout the project Essex County Council and Network Rail will continuously review the project budget and estimated costs to identify at the earliest opportunity any risk of cost overruns. As the scheme develops, Network Rail’s GRIP process provides a robust point review at each stage of the design development in terms of cost and funding.

The construction cost estimate is reviewed and updated prior to the completion of each GRIP stage and is integral to the Stage Gate review process which determines the project’s fitness to progress to the next stage. At GRIP 3, a revised cost estimate will be prepared on the basis of a QRA and the discipline ‘Approval in Principal’ designs (Outline design). If the budget is being challenged at this stage it may be that the stage gate is not passed until additional value exercises are undertaken, or a schedule of measures to be taken at the next stage is devised. On completion of GRIP 4 the cost estimate and QRA will be refreshed and updated and a stage gate review undertaken. It is recognised that overlapping of the GRIP stages particularly during GRIP stages 3, 4 and 5 will increase the risk of cost overruns occurring as the risk of rework and abortive work increases.

At this stage it is anticipated that the detailed design and construction (GRIP 5-8) will be let as a single fixed price contract following a competitive tender drawn from Network Rail’s supplier frameworks. The use of this contractual mechanism is the most advantageous to ECC as it will give the greatest cost certainty on award and will incentivise the contractor to exercise robust early warning in the event of potential change.

For GRIP 5 to 8 it is envisaged that an Implementation Agreement will be in place between Network Rail and the “funding party” – at this stage this is assumed to be Essex County Council but could be a relevant central government department. This will specify ownership of risk based on who is best placed to manage the risk and specific parties’ responsibilities should cost overruns materialise, depending on the reason for the overrun. Network Rail will also have a Risk Fee Fund in place – this

will allow risk and contingency to be effectively owned and managed by the Project Manager. Also, the Industry Risk Fund (IRF), to which a contribution is made, based on a proportion of scheme costs, will effectively act as insurance against low-probability, high-impact industry risks.

One of the principal risks of cost over run is the late and unexpected loss of track access during the construction period. The required track access is evaluated as the design is developed through the GRIP stages through constructability and risk assessments. This will include the need for the booking of contingency track access as a mitigation measure. The tenderers for the GRIP 5-8 contract will also be expected to make an assessed allowance for loss of track access in their submissions.

Essex County Council will also be working routinely with Chelmsford City Council to assess the potential for future S106 payments from later development in North Chelmsford associated with the new Chelmsford Local Plan. This work will be used to examine opportunities to cover any cost overrun where value engineering is not desirable.

A signed assurance from Essex County Council's Section 151 Officer will be provided at **Appendix A**.

5.7. Risk and constraints:

Key Funding Risks and Constraints

Any new railway station is a complex project and as such will most likely need to be developed and constructed over a longer timeframe outside of the public sector funding windows often dictated by parliamentary spending cycles.

SELEP funding should be spent by 31 March 2021. As noted in Section 5.1 above, Essex County Council will work with SELEP to come to an agreement on the exact mechanism for transfer and administrative arrangements associated with the funding (Appendix R). If no agreement can be made, then the fall-back position is that the shortfall will be added to the HIF bid.

Whilst Essex County Council was successful with its Chelmsford HIF Expression of Interest, it is noted that this is a competitive process and will favour options that can quickly unlock housing growth, a different objective to the LGF process, albeit one that is strongly aligned to the objectives of Beaulieu station. Homes England and the MHCLG have now as of January 2019 confirmed that HIF funding must be spent by 2023/24, however other funding sources can be used to complete a scheme beyond this deadline. The HIF business case is able to make that case using the latest information. This was not available when this SELEP business case was developed in 2018.

Allocation within the SELEP Local Growth Fund also strengthens the likelihood of successful HIF funding. The HIF business case process includes questions on whether bidders have the support of Local Enterprise Partnerships and how the projects contribute to the economic growth goals of the locality and region, beyond just housing. This SELEP business case demonstrates a clear alignment with SELEP's economic plan, whilst LGF would show actual support and joint working in action.

Should we not be successful with HIF we will work with the rail industry and stakeholders to build the case through the GEML Taskforce Strategic Case. This will seek to prioritise schemes for funding through the DfT administered Rail Network Enhancements Pipeline for Control Period 6. In addition, consideration would be given to a privately funded and operated station or elements of it to provide alternative funding.

Key project risks and constraints

Network Rail has specified 27 significant to major technical risks in the Beaulieu station Risk Register as of 23 February 2018, whereby the following nine technical risks were specified as major. Ongoing GRIP 3 surveys and single option development will help to understand the impact of these and other risks in more detail once the GRIP 3 study concludes in March 2020:

- Insufficient capacity in signalling power feeder for the turnback facility.
- Unknown ground conditions for platform and station buildings – the ongoing GRIP 3 related surveys will help to understand this in more detail.

- Design changes for the Radial Distributor Road (RDR) Bridge to the north of the station impacting on signal sighting and overhead line equipment. This road is being delivered by Countryside Zest as a condition of its planning consent – linking the Beaulieu Park development with the A12 Boreham Interchange.
- Transport Works Act Order (TWAO) with public consultation may be required because of permanent land take – the scheme programme as presented makes allowance for this to happen, but consent is dependent on a successful outcome. The TWAO will then define the limits of the works which the GRIP5-8 detail design and construction will then have to respect.
- Incorrect LIDAR surveying information resulting in major subsequent changes.
- The proposed track alignment and overhead line equipment cannot be accommodated under the Generals Lane Bridge.
- Poor condition of existing culvert which could mean its extension and remedial works.
- Change of scope requirements resulting in abortive work and re-design.
- Potential for additional land for drainage outfall associated with the multi-storey car park.

6. MANAGEMENT CASE

The management case determines whether the scheme is achievable and capable of being delivered successfully in accordance with recognised best practice. It demonstrates that the spending proposal is being implemented in accordance with a recognised Programme and Project Management methodology, and provides evidence of governance structure, stakeholder management, risk management, project planning and benefits realisation and assurance. It also specifies the arrangements for monitoring and evaluation in terms of inputs, outputs, outcomes and impacts.

6.1. Governance:

An appropriate governance structure is essential to the successful delivery of Beaulieu station's ongoing design, planning and construction activities to enable its opening in 2025. Figure 6.1 demonstrates the project management structure responsible for delivering the scheme, its executive oversight and key external partners. Further information on how this works in practice and the roles of key individuals is then described.

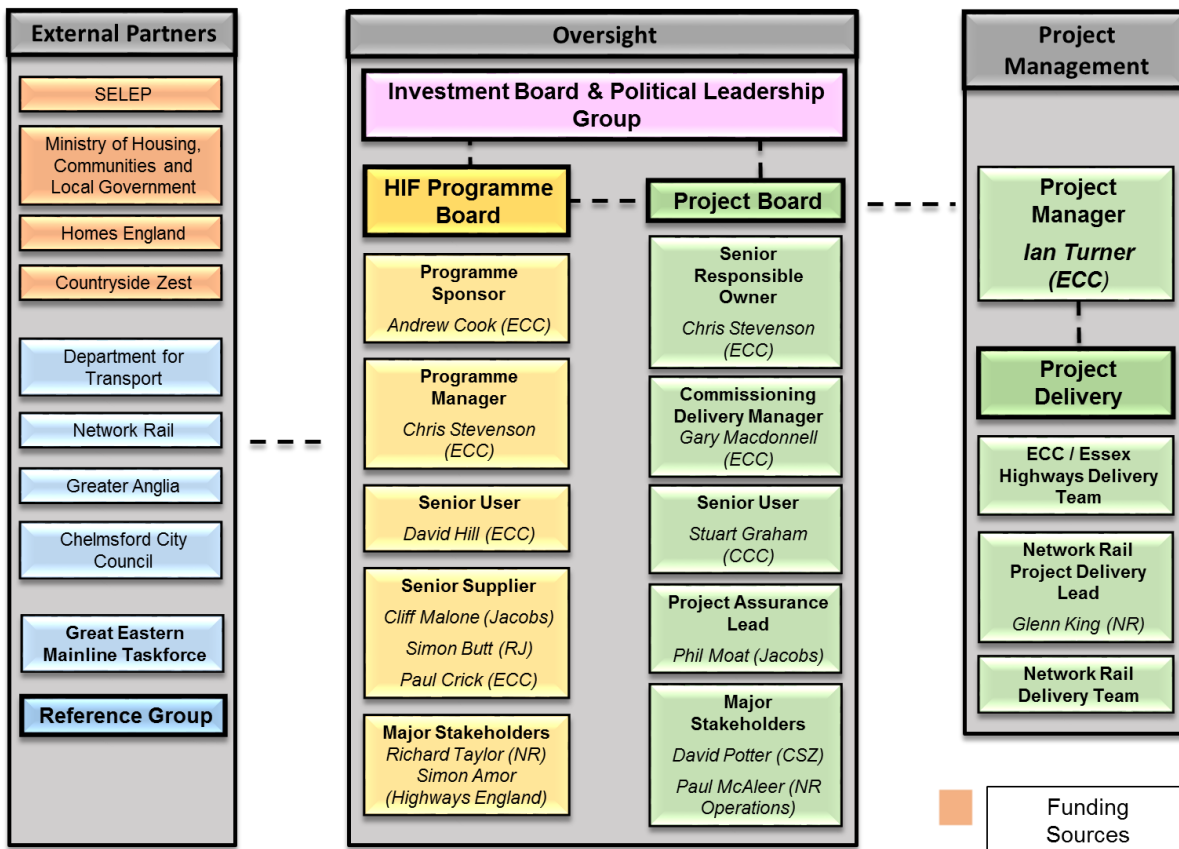


Figure 6.4: Project Governance

Ian Turner, Infrastructure Project Manager, Essex County Council is the **Project Manager** and hence responsible for organising, controlling and delivering the Beaulieu station scheme as well as Essex County Council's related Chelmsford North East Bypass (CNEB) project. He leads and manages the project delivery teams, with the authority and responsibility to run the project on a day-to-day basis. Key project delivery teams reporting to Ian are:

- The Essex County Council / Essex Highways teams developing the SELEP business case for Beaulieu station and HIF business case for Chelmsford (Beaulieu station and CNEB) respectively.
- The Network Rail team responsible for progressing the GRIP 3 design and subsequent phases of the project's design development and construction. Essex County Council and Network Rail

have agreed a Development Services Agreement to specify ECC's high level requirements of Network Rail for GRIP 3. Glenn King (Network Rail Project Manager) is responsible for the delivery of the GRIP 3 work, using professional services (WSP) and early contractor involvement (VolkerFitzpatrick Limited) alongside internal Network Rail resources to select a single option for the station in 2019.

Ian Turner and his project delivery teams report regularly to the **Project Board**, with formal meetings typically at two monthly intervals and progress updates and requests for guidance and action as and when required. The Project Board's responsibilities include:

- Setting the strategic direction of the project.
- Defining the scope and setting the timescales for major project milestones.
- Providing the Project Manager with the strategy and decisions required to enable the scheme to proceed to schedule and resolve any challenges.
- Securing necessary approvals through the partner statutory authorities.
- Approving the project scope of work, programme and budgets, as well as subsequent changes;
- Signing off project stage gates and authorising the start of the next stage.
- Monitoring project risks, providing guidance and taking any appropriate action to mitigate risks.

The Project Board is chaired by the **Senior Responsible Owner (Chris Stevenson)** and made up of the Commissioning Lead for Essex County Council, the Senior User for Chelmsford City Council, the Project Assurance Lead on behalf of Essex County Council, and two major stakeholders – Countryside Zest as a funding partner, and Network Rail as the operator of the railway. The individual responsibilities are:

- Chris Stevenson, Head of Network Development, Essex County Council – has ultimate responsibility and delegated authority for ensuring effective delivery of the scheme on time and on budget. Chris is also the Essex County Council Programme Manager for the Housing Infrastructure Fund submissions.
- Commissioning Delivery Manager (Gary MacDonnell, Project Manager, Commissioning Delivery, Essex County Council) – provides coordinated management of projects, liaises with internal County Council functions (such as finance) and change management, all to achieve the aims and objectives associated with external funding requirements.
- Senior User (Stuart Graham, Economic Development and Integration Manager, Chelmsford City Council) – is responsible for the delivery of economic growth outcomes in Chelmsford through the Local Plan and ongoing development, of which this railway station is an integral element for current and future residents, businesses and visitors to the city.
- Project Assurance Lead (Phil Moat, Technical Director, Jacobs) – provides an independent view of how the Network Rail scheme design and development is progressing on behalf of Essex County Council. Tasks include checking that the project remains viable, in terms of costs and benefits (business assurance), the users' requirements are being met (user assurance), and that the project is delivering a suitable solution (technical assurance).
- Major Stakeholders – David Potter (Countryside) provides oversight on part of a major deliverer of growth in North Chelmsford and part funder of the project, and Paul McAleer (Network Rail) will ensure that rail operational requirements are taken into consideration during design, construction and operation.

The Project Delivery Team and Project Board also interfaces with Essex County Council's **HIF Programme Board**. Its overall remit is to ensure that Essex County Council submits high quality business cases that align with housing policy and capital programme objectives for every scheme that progressed through the HIF expression of interest stage. The HIF Programme Board has authorised the funding to develop the SELEP and HIF business cases for Beaulieu. The HIF Programme Sponsor (Andrew Cook, Essex County Council) will ensure the Programme and associated projects remains focused on achieving its objectives and realising the agreed outputs to enable all projects to progress to the next stage of bidding for HIF.

The Project Board and Programme Board use input from a **Reference Group** to understand the wider implications of the project, in particular the interface of Beaulieu station with Abellio Greater Anglia's existing franchise and Network Rail's long term planning (to 2043) to enhance the Great Eastern Main Line and stakeholders' aspirations for the route. This includes a strong interface with

the **Great Eastern Main Line (GEML) Taskforce** – made up of political, local government and business leaders responsible for ensuring that:

- Abellio East Anglia delivers on the investments and commitments outlined in its franchise.
- Network Rail delivers on the required planned investment in Control Periods 5 and 6.
- Support is given to the delivery of improved services and investment across the wider network.
- Evidence-based business cases for additional investment are continually provided.

The Reference Group membership will be reviewed regularly to ensure that relevant stakeholders are engaged at the appropriate time. Membership will include but will not be limited to Abellio Greater Anglia (and its successors), other local authorities, regulatory bodies and representatives of the business community.

6.2. Approvals and escalation procedures:

The information provided in Section 6.1 confirms that the:

- Project Board is ultimately responsible for approvals of the station design development and SELEP business case.
- The HIF Programme Board is responsible for the approvals of decisions affecting the HIF Business Case.
- There is integrated decision making with a common Project Manager in Ian Turner, and Chris Stevenson fulfilling a key role on both Boards.

Both Boards are responsible for resolving any conflicts escalated by the project delivery teams and escalating any conflicts with other corporate activity. Both the Project Board and Programme Board can escalate issues and decisions further to Essex County Council's investment board and political leadership group as required.

6.3. Contract management:

Essex County Council has agreed a Development Services Agreement with Network Rail. The Development Services Agreement signed by Network Rail and Essex County Council contains a detailed scope of works, as well as defined delivery milestones. Essex County Council receive a 4 weekly detailed progress report from Network Rail and also conduct a period review meeting using the Network Rail progress report as a basis. Essex County Council and other stakeholders are engaged via workshops to contribute to key design decisions. Essex County Council also employ Jacobs as rail advisor to assist in the review of deliverables and Network Rail's progress on a 4 weekly basis.

Network Rail have their own Project Management Plan (PMP) which describes how they manage their internal and external suppliers on the project, including the project scope, project outputs, roles and responsibilities, stakeholder management, reporting, planning, change control, risk and value, lessons learned, commercial management, environment, sustainability, health and safety. The PMP includes supporting documents.

This approach will be revisited at each GRIP stage. Prior to GRIP 5-8 (detailed design and construction) Network Rail and the funding party (assumed to be Essex County Council, but could potentially be a central government department) will develop an Implementation Agreement. This will likely be developed back to back with the contract between Network Rail and the delivery contractor.

These contracts will outline the required outputs, expectations around time and quality and specify ownership of risk based on who is best placed to manage the risk and specific parties' responsibilities should cost overruns materialise.

6.4. Key stakeholders:

A refresh of the project's stakeholder mapping exercise has been completed as part of the development of the business case. This has been based on Network Rail's Stakeholder Management Plan associated with its PMP, but extended further to include Essex County Council and Chelmsford City Council engagement activities for the station and related CNEB project. A

detailed list of partners and their key areas of interest are included in **Appendix P**. These cover the following groups:

- Government departments and the relevant Secretaries of State
- Members of Parliament
- Local community groups and Parish Councils
- Natural and built environment stakeholders
- Local Enterprise Partnerships
- Supporting upper tier authorities
- Supporting lower tier authorities
- Business stakeholders
- Rail stakeholders
- Highways development control, sustainable transport and travel planning functions
- Transport users and providers (non-rail)
- Utilities.

The Project Introduction (Section 1.14) has demonstrated that the new station has been through a full consultation exercise in developing the Adopted Chelmsford Local Plan and up to submission stage of the New Chelmsford Local Plan. Both exercises have demonstrated full community support, including the support of Highways England.

6.5. Equality Impact:

An EqIA has been prepared by ECC (13 November 2017) and included as **Appendix Q**. It concluded that the Beaulieu Railway Station scheme will not have a medium or high inverse impact on one or more equality groups.

It also states that:

- Existing and new GEML users will have improved access to the railway network from a new station located on the mainline.
- The most likely affected population has been consulted and continues to be discussed and supported.
- The development will:
 - Improve connectivity and transport interchange options and is consistent with Essex County Council principles and fully support the achievement of the organisation's desired outcomes.
 - Drive sustainable economic growth in Essex widening access to employment and improving the competitiveness of the Essex economy, opportunities for local communities and businesses and accelerate the pace of development and job creation.
 - Encourage mode shift to rail and thus ensure that the people in Essex experience a high quality and sustainable environment. Improved access to rail travel will ensure that the people in Essex can live independently and exercise control over their lives.
 - Have a positive impact on elderly users and those with disability who do not have access to a car via improved bus, cycle and walking networks linked to the station and the new Beaulieu development.
 - Have a neutral impact across all genders, race, religion, marital status, sexual orientation groups as well pregnant users.
 - Have a positive socio-economic impact through improved access to public transport.
 - Have a positive environmental impact due to the improved railway provisions.

6.6. Risk management strategy:

Essex County Council's and Network Rail's Project Managers are responsible for a proactive risk management culture and set of procedures, which ensures that risks are continuously identified, owners assigned and mitigation measures put in place. Regular reviews check the status of each risk and regulate their control and mitigation.

Network Rail manage risk in accordance with the Anglia Risk and Value Management Plan, with enterprise risk management in operation using Active Risk Manager (ARM) for the project. The

project’s current risk register is enclosed in **Appendix B**, which sets out the project risks in qualitative terms, including impacts, exposure and mitigation measures. Network Rail and Essex County Council have currently identified 28 significant to major risks in the Beaulieu Risk Register, whereby the following ten risks were specified as major.

- Insufficient capacity in the signalling power feeder for the turnback facility.
- Unknown ground conditions for platform and station buildings – the ongoing GRIP 3 related surveys will help to understand this in more detail.
- Design changes for the Radial Distributor Road (RDR) Bridge to the north of the station impacting on signal sighting and overhead line equipment. This road is being delivered by Countryside Zest as a condition of its planning consent – linking the Beaulieu development with the A12 Boreham Interchange.
- Transport Works Act Order (TWAO) with public consultation may be required because of permanent land take – the scheme programme as presented allows time for this to happen, but consent is dependent on a successful outcome. The TWAO will then define the limits of the works which the GRIP5-8 detail design and construction will then have to respect.
- Incorrect LIDAR surveying information resulting in major subsequent changes.
- The proposed track alignment and overhead line equipment cannot be accommodated under the Generals Lane Bridge.
- Poor condition of existing culvert which could mean its extension and remedial works.
- Change of scope requirements resulting in abortive work and re-design.
- Potential for additional land for drainage outfall associated with the multi-storey car park.
- Unsuccessful in Chelmsford Housing Infrastructure Fund submission to make up the remaining shortfall in capital costs.

Ongoing GRIP 3 surveys and single option development will help to understand the impact of these and other risks in more detail, and mitigate these as far as possible. During GRIP 3 Network Rail will also undertake a Quantified Risk Assessment (QRA) for the scheme with this then kept up to date throughout the GRIP process.

Essex County Council have appointed a Rail Assurance Lead to provide them with independent advice on Network Rail’s project delivery to reflect the relative lack of these skills and domain knowledge within Essex County Council. Key risks and issues are communicated and escalated as required through the Project Manager, Project Board and HIF Programme Board as appropriate for action.

All risks are currently owned by a combination of the project delivery partners identified in Section 1. As the project develops it is expected that some of these risks will be transferred to contractors constructing the infrastructure depending on who is best placed to manage and own the risk.

6.7. Work programme:

The project will be delivered in line with the milestones and dependencies identified within the programme. The following actions are considered part of the critical path based on the work programme as of 9 July 2018.

Table 6.1: Critical Path

Milestone	Date
NR Approval process to move to GRIP 4	Quarter (Q) 2 2020
TWAO application	Q3 2020 to Q1 2021
TWAO approval	Q3 2020 to Q1 2021
NR Approval process to move the GRIP 5-8	Q1 2022
Procurement of D&B Contractor	Q1 2023 to Q3 2023
Activities to support key track access possessions	Q2 2021, Q3 2021, Q2 2023 to Q3 2023, Q1 2024 to Q2 2024 & Q1 2025 to Q3 2025

Appendix C provides further information on the work programme.

Essex County Council and Network Rail currently have available and suitable resource from within their organisations and supply chain to deliver this programme.

6.8. Previous project experience:

Since 2014, Essex County Council has, or is, in the process of delivering nearly £100M of transport improvement schemes through SELEP LGF funding.

Network Rail has delivered a number of similar schemes including the following stations on the Anglia route through the Anglia Route Collaboration (ARC):

- Lea Bridge Station re-opening – has been successfully delivered as part of the regeneration efforts due to the 2012 Olympic Games and provides a well-used connection towards Stratford and Tottenham Hale. With constant dialogue between the project team (NR Sponsor, NR PM and VolkerFitzpatrick’s PM) and the operator (AGA), Network Rail was able to hand the station over to AGA a week early to fit out and familiarise the customer service team. The project had incidents and led the way in approaching a positive safety culture on site to be learnt by other projects.
- Cambridge North new station - is an important part of an integrated transport network for the area, and a key transport node in the north east quadrant of the city as well as the catalyst for further regeneration of Chesterton. The scheme was Design and Build delivered by VolkerFitzpatrick through the ARC and has delivered a main station building, with high quality passenger waiting facilities, accessible overbridge, ticket gate line, car and cycle parking facilities. Two new through platforms were constructed on the main rail line in addition to a bay platform. Interchange facilities cater for pedestrians, cyclists, bus users, car drivers and passengers.

6.9. Monitoring and evaluation:

The monitoring and evaluation plan as currently developed incorporates the requirements of SELEP’s Assurance Framework. It will be further developed to incorporate the MHCLG and Homes England’s future requirements for HIF.

The project’s benefits realisation plan (section 6.10) and the monitoring and evaluation plan that sits alongside it has been developed using a logic model approach linking the need for intervention, to the project objectives (as discussed in section 2.7) to the project inputs, activities, outputs, direct and non-direct outcomes and impacts (including benefits). These are now described below:

Inputs

- Expenditure
- Construction equipment and materials
- Management and Supervision.

Activities

Project management, planning, design and construction of a new railway station and accompanying earthworks, structures, railway systems and mitigation measures

Outputs

- New station buildings and 3 platform faces
- New central passing loop with signalling to enable the turnback of trains on the GEML for both capacity and resilience purposes to meet Network Rail’s functional requirements for the railway to 2043
- New car parking spaces to facilitate usage of the new station
- Local bus and taxi interchange to provide improved access to the railway system
- New cycle parking to help increase the use of sustainable travel modes
- Integration with highway, walking and cycle networks under development at Beaulieu.

Outcomes

The desired outcomes correspond with the need for intervention specified in the Strategic Case and are shown in Table 6.3 below. These have been mapped against likely impacts and key performance indicators. The key performance indicators contain a combination of SELEP metrics

and project specifics, with these shown in more detail in **Appendix D**. There is also a strong link to the Benefits Realisation Plan, with this describing how these will be monitored and realised in more detail in **Appendix R**.

Other SELEP funded schemes such as Chelmsford to Braintree RBS, Mill Yard, Chelmsford City Growth Package and Chelmsford Urban Expansion will both have an effect on the traffic flows into Chelmsford and usage of Chelmsford and Beaulieu stations.

Other initiatives that will have an impact on performance indicators and will need careful consideration during the development of the baseline report:

- Chelmsford North East Bypass which is part of a common Chelmsford HIF bid with Beaulieu station.
- Greater Anglia's new timetable and complete refresh of its rolling stock, albeit these will be in position prior to the opening of Beaulieu station.

Table 6.2 : Anticipated Scheme outcomes

Need for Intervention	Outcome	Key Performance indicators
Infrastructure to support North Chelmsford's ambition	<p>Delivery of new homes and high quality jobs at an accelerated pace</p> <p>Support the delivery of Chelmsford's Local Plan</p> <p>Safe delivery of new infrastructure to time, cost and quality requirements</p>	<ul style="list-style-type: none"> • Jobs connected to intervention (permanent, paid FTE) • Commercial floor space planned and constructed to date • Housing unit starts and completed • Follow-on investment at site • Anticipated and actual commercial floor space occupied • Commercial rental values • Earned Value • Delivery to Milestones • Number and severity of incidents and accidents during works
Access to the railway	<p>Improved choice of sustainable travel options for residents of existing and new developments in the north of Chelmsford</p> <p>Improved accessibility and connectivity between the Heart of Essex and key transport hubs in Greater London, Essex and East Anglia</p>	<p>Transport service improvement</p> <ul style="list-style-type: none"> • Train frequency at Beaulieu to/from London • Catchment area of Beaulieu station • Number of rail passengers • Origin and destination of rail station users • Number and use of connecting bus routes • Number and utilisation of cycle parking spaces • Number and utilisation of car parking spaces
Highway and car park capacity	<p>Reduction in driving to Chelmsford station</p> <p>Reduced pressure on city centre long stay car parking</p> <p>More reliable journeys</p> <p>Improved public health</p> <p>Use of the Radial Distributor Road</p>	<ul style="list-style-type: none"> • Traffic volumes • Average speed (% of free flow speed) • Journey time reliability and variability • Nitrogen Dioxide and Particulates (PM₁₀) concentrations and changes at annual monitoring sites
Rail station	Improved journey ambience and	<ul style="list-style-type: none"> • Number of rail passengers

Need for Intervention	Outcome	Key Performance indicators
usage and capacity	reduced crowding at Chelmsford station Improved public safety	(Chelmsford station)
GEML reliability	More reliable journeys for passengers and freight	‘GE Outers’ and ‘Intercity’ service groups <ul style="list-style-type: none"> • Rail punctuality (PPM) • Cancellations and Significant Lateness (CaSL)
Rail growth, new rolling stock and services	Increase rail patronage without adversely affecting existing journeys and their experience	<ul style="list-style-type: none"> • Number of rail passengers (Chelmsford, Beaulieu, Hatfield Peverel, Witham, White Notley, Cressing and Braintree, Kelvedon, Marks Tey, Colchester and other stations served by Beaulieu)

Evaluation of impacts

Essex County Council’s Commissioning Manager will be responsible for monitoring and evaluating the scheme’s desired outcomes in line with the SELEP Assurance Framework and HIF. This will include the use of the Monitoring and Evaluation Plan in **Appendix D** and the completion of SELEP template reports setting out the baseline situation, impacts one year after opening and then five years after opening. For the purposes of this business case, it is assumed that these reports would be published in December 2024 (baseline), March 2027 (1 year after opening) and March 2031 respectively (5 years after opening).

These reports will maximise data routinely collected by the rail industry, existing Essex County Council data analysis, and monitoring reports for other purposes (such as other SELEP schemes and the Chelmsford Local Plan Authority Monitoring report) where possible.

During project delivery the safe delivery of new infrastructure to time, cost and quality requirements will be the responsibility of Network Rail. The Project Manager will report to the Project Board on delivery to milestones, the management of risk and performance against cost, quality and safety requirements. Network Rail will make use of earned value management, risk management, Primavera P6 cost loaded programmes and leading / lagging indicators supplied by the contractor and their internal teams to monitor and evaluate performance and enact improvement and feedback lessons learned where required.

6.10. Benefits realisation plan:

The Benefit Realisation Plan aims to articulate what benefits are anticipated due to the intervention, how it will be known that benefits have been achieved, and the assessment of what has occurred in reality against what was planned.

A Benefits Realisation Plan has been produced (see **Appendix R**) and monitoring / evaluation will be undertaken at the appropriate points during scheme development. Monitoring activities will be aligned to those best placed to do so and to existing regular monitoring and evaluation work. Land use development related outputs are routinely monitored by Chelmsford City Council and neighbouring local planning authorities and this information will be tracked and linked to scheme completion where appropriate.

7. DECLARATIONS

Has any director / partner ever been disqualified from being a company director under the Company Directors Disqualification Act (1986) or ever been the proprietor, partner or director of a business that has been subject to an investigation (completed, current or pending) undertaken under the Companies, Financial Services or Banking Acts?	Yes / No
Has any director / partner ever been bankrupt or subject to an arrangement with creditors or ever been the proprietor, partner or director of a business subject to any formal insolvency procedure such as receivership, liquidation, or administration, or subject to an arrangement with its creditors	Yes / No
Has any director / partner ever been the proprietor, partner or director of a business that has been requested to repay a grant under any government scheme?	Yes / No

If the answer is "yes" to any of these questions please give details on a separate sheet of paper of the person(s) and business(es) and details of the circumstances. This does not necessarily affect your chances of being awarded SELEP funding.

I am content for information supplied here to be stored electronically, shared with the South East Local Enterprise Partnerships Independent Technical Evaluator, Steer Davies Gleave, and other public sector bodies who may be involved in considering the business case.

I understand that a copy of the main Business Case document will be made available on the South East Local Enterprise Partnership website one month in advance of the funding decision by SELEP Accountability Board. The Business Case supporting appendices will not be uploaded onto the website. Redactions to the main Business Case document will only be acceptable where they fall within a category for exemption, as stated in Appendix E.

Where scheme promoters consider information to fall within the categories for exemption (stated in Appendix E), they should provide a separate version of the main Business Case document to SELEP six weeks in advance of the SELEP Accountability Board meeting at which the funding decision is being taken, which highlights the proposed Business Case redactions.

I understand that if I give information that is incorrect or incomplete, funding may be withheld or reclaimed and action taken against me. I declare that the information I have given on this form is correct and complete. Any expenditure defrayed in advance of project approval is at risk of not being reimbursed and all spend of Local Growth Fund must be compliant with the Grant Conditions.

I understand that any offer may be publicised by means of a press release giving brief details of the project and the grant amount.

Signature of applicant	
Print full name	
Designation	

8. APPENDIX A - FUNDING COMMITMENT

Draft S151 Officer Letter to support Business Case submission

Dear Colleague,

In submitting this project Business Case, I confirm on behalf of Essex County Council that:

- The information presented in this Business Case is accurate and correct as at the time of writing.
- The funding has been identified to deliver the project and project benefits, as specified within the Business Case. Where sufficient funding has not been identified to deliver the project, this risk has been identified within the Business Case and brought to the attention of the SELEP Secretariat through the SELEP quarterly reporting process.
- The risk assessment included in the project Business Case identifies all substantial project risks known at the time of Business Case submission.
- The delivery body has considered the public-sector equality duty and has had regard to the requirements under s.149 of the Equality Act 2010 throughout their decision-making process. This should include the development of an Equality Impact Assessment which will remain as a live document through the projects development and delivery stages.
- The delivery body has access to the skills, expertise and resource to support the delivery of the project
- Adequate revenue budget has been or will be allocated to support the post scheme completion monitoring and benefit realisation reporting
- The project will be delivered under the conditions in the signed LGF Service Level Agreement with the SELEP Accountable Body.

I note that the Business Case will be made available on the SELEP website one month in advance of the funding decision being taken, subject to the removal of those parts of the Business Case which are commercially sensitive and confidential as agreed with the SELEP Accountable Body.

Yours Sincerely,

SRO (Director Level)

S151 Officer

9. APPENDIX B – RISK MANAGEMENT STRATEGY

This is an adapted version of the SELEP Risk Register incorporating information from Network Rail's own register from the GRIP 2 work. As the GRIP 3 surveys and design are ongoing the residual impact / likelihood scores cannot be completed fully at this stage. As noted in the Management Case, Network Rail will be conducting a full QRA during the development of the GRIP 3 design

Description of Risk	Impact of Risk	Risk Owner	Risk Manager	Likelihood of occurrence *	Impact **	Risk Rating ***	Risk Mitigation
Insufficient capacity in signalling power feeder	Insufficient capacity in signalling power feeder for turnback facility	Glenn King	Glenn King	3	4	7	To be evaluated as part of the GRIP 3 design
Unknown ground conditions for platform and station buildings	Ground conditions are worse than the design accounted for	Glenn King	Glenn King	4	3	7	Undertake Ground Investigation surveys at the start of the GRIP 3 design phase
Design changes for Radial Distributor Road (RDR) Bridge	There may be a threat of redesign of signal sighting and Overhead Line Equipment (OLE)	Glenn King	Glenn King	4	3	7	Minimum span and height has been forwarded to Mayer Brown. Latest RDR bridge design will be reviewed in conjunction with station design during GRIP 3
Transport & Works Act Order (TWAO) with public consultation may be required	Risk that a TWAO requiring consultation is necessary due to requirements for permanent land take	Glenn King	Glenn King	3	4	7	Scheme programme allows time for TWAO, previously the station has received outline planning permission and so it is not envisaged a public enquiry will be required. Legal advice obtained to date confirms need for TWAO to avoid nuisance objections.
Incorrect LIDAR information	Threat that LIDAR information is not accurate and major changes are required	Glenn King	Glenn King	3	4	7	Sample check topographical surveys to be carried out at GRIP 3 to cross check and amend as required
Cannot accommodate proposed track alignment and OLE under Generals Lane Bridge	Threat that the 5.9m is not adequate	Glenn King	Glenn King	2	5	7	Establish early in GRIP 3 design through survey. Review alignment options and carry out option assessment to produce compliant design building on GRIP 2 feasibility work.
Poor condition of existing culvert	Risk that it will have to be extended and remedial works will be required	Glenn King	Glenn King	3	4	7	Review existing historic asset condition reports and verify current condition during GRIP 3 surveys and identify any required remedial works

Description of Risk	Impact of Risk	Risk Owner	Risk Manager	Likelihood of occurrence *	Impact **	Risk Rating ***	Risk Mitigation
Change of requirements	Risk of abortive design work and delay to programme as a result of having to re-design	Glenn King	Glenn King	3	4	7	Requirements remit for GRIP 3 agreed before progressing
Additional land for drainage outfall (Multi Storey Car Park (MSCP) Option 1)	The MSCP1 option (compliant version) needs extra land outside the red line Acceptance of additional land acquisition is likely.	Glenn King	Glenn King	3	4	7	Establish drainage requirements early in GRIP 3 design to enable land acquisition process to be activated at earliest opportunity
Contaminated materials	Threat of the project coming into contact with contaminated materials	Glenn King	Glenn King	3	3	6	Contaminated land surveys carried out at GRIP 3 to establish risk. Include as part of Pre-construction information if controlled removal is required for construction phase
Protected species	Risk of the project having to move/protect all or some species at an additional cost to the project	Glenn King	Glenn King	3	3	6	Ecology surveys carried out at GRIP 3. On basis of these surveys establish a removal strategy
DNO Supply	Sufficient power available to power the DNO supplies required by the Station, lifts, lights, etc but may not be fixed at a sufficient cost	Glenn King	Glenn King	3	3	6	Establish power requirements in GRIP 3 design
Planning permission delays / challenges	Risk of delays of approval	Glenn King	Glenn King	3	3	6	Outline planning permission received. Develop robust consents strategy and engage collaboratively with Chelmsford City Council as the Local Planning Authority
Availability of resource for signalling and telecoms	Threat that resources are not available to adapt the signalling and telecoms system	Glenn King	Glenn King	3	3	6	Once signalling and Telecoms designs are better informed during GRIP stage 4, identify resource requirements on the national critical resource register to secure for the project

Description of Risk	Impact of Risk	Risk Owner	Risk Manager	Likelihood of occurrence *	Impact **	Risk Rating ***	Risk Mitigation
S&C units may not be acceptable by the Track RAM	Threat that Track RAM does not accept solution for S&C Units	Glenn King	Glenn King	2	4	6	Continue the initial engagement with the RAM undertaken already to advise of the site constraints which are driving the S&C design at GRIP 3 and during GRIP 4 to ensure RAM has full understanding of proposed solution
Insufficient space to locate REBs and cannot connect to FTN	Threat that there is not enough space to locate REBs and not able to connect to FTN	Glenn King	Glenn King	3	3	6	Undertake sufficient space planning at GRIP 3 and GRIP 4 to ensure requirements are incorporated within land take requirements
Procuring staff at fixed prices	Risk is that sufficient skilled staff are unavailable to design and construct the project.	Glenn King	Glenn King	3	3	6	Utilisation of framework contracts manages resource constraints by provides stabilised controlled work bank for consultants and contractors.
Long lead items manufactured and delivered on time	The risk is if the Switches and Crossings (S&C) can't be manufactured on time	Glenn King	Glenn King	3	3	6	Identify long lead manufacturing order time is for critical components and manage design approval in accordance with these times. Utilise a Design and Build contracting strategy for GRIP 5-8 to integrate the planning.
Services on site – in the ground and above	Risk of additional costs to divert or temporary diversion of service. Risk of damage with controls in place.	Glenn King	Glenn King	3	3	6	Identify interfacing services within the design footprint of site early in GRIP3. Engage with relevant service providers as early as possible to determine likely costs and timeframes if re-location is required.
Access to Survey	Risk is that access is not granted for AiP / GRIP 5 surveys at the required timescales on the operational railway and private land	Glenn King	Glenn King	3	3	6	Establish robust Survey Strategy at GRIP 3 and implement

Description of Risk	Impact of Risk	Risk Owner	Risk Manager	Likelihood of occurrence *	Impact **	Risk Rating ***	Risk Mitigation
Extensive alteration to existing signal positions	Extensive alterations to existing signal positions to achieve compliant signal spacing.	Glenn King	Glenn King	3	3	6	Identify likelihood during GRIP 3 and review mitigation options and subsequent impact on overall design
Additional signalling sections	Risk is the scheme is not viable with 3 minute headway.	Glenn King	Glenn King	3	3	6	Develop signalling scheme in GRIP 3 and understand constraints imposed on train operations. and review mitigation options
DIA compliant access	There is a threat that the provision of a mix of stairs and ramps may not be suitable for impaired persons	Glenn King	Glenn King	2	3	5	Design to undertake DIA and provides compliant lift and stair proposal
Invasive Species	There is a threat that the project comes into contact with invasive materials and the species spread	Glenn King	Glenn King	3	2	5	Ecology surveys during GRIP 3 will establish extent. Subsequent surveys as design develops and control strategy devised
Design alterations due to visual and lighting effects	There is a threat that the lighting may cause localised effects on nearby residents and ecology (e.g. deter bats from their commuting and foraging routes)	Glenn King	Glenn King	2	3	5	To be considered as part of the Environmental impact assessment with suitable mitigation measures defined. Station has gone through outline planning and further mitigation will be developed as the design evolves to satisfy the TWAO submission requirements
Additional environmental works for 17.75 offset from Pond	There is a threat that in some locations the 3.5m is not sufficient and additional environmental works may be required	Glenn King	Glenn King	2	3	5	Options being taken forward in GRIP 3 to be reviewed to confirm this is not an issue.
Station Change/ Network Change	Network Change is not approved.	Glenn King	Glenn King	2	3	5	Early engagement with Asset Stewards and RAMS during GRIP 3 to address their concerns. Review with Freight and passenger train operators during GRIP 3 to gain their

Description of Risk	Impact of Risk	Risk Owner	Risk Manager	Likelihood of occurrence *	Impact **	Risk Rating ***	Risk Mitigation
							informal acceptance prior to submission of the Network Change application in GRIP 4
Unsuccessful in Chelmsford Housing Infrastructure Fund Submission	Significant capital funding shortfall to be addressed prior to embarking on GRIP 4	Ian Turner	Ian Turner	2	5	7	Co-development of HIF business case with Homes England to validate approach and option appraisal. Development of strong strategic case. In addition, ECC and project partners have been exploring the potential for private finance to close the funding gap should public finance not be an option. This could include the operation of the car park and / or the station. This would still require a business case to be reviewed by DfT and the generation of a net benefit to society.

Residual likelihood/ impact scores associated with the risk mitigation strategy not calculated as the likelihood and impact is largely dependent on outcome of the current GRIP 3 work. The Network Rail Risk Assessment approach uses the following scales.

* Likelihood:

Very Low	Low	Medium	High	Very High
1	2	3	4	5
Less than 5%	5%-20%	21% - 50%	51%-75%	Over 75%

** Impact:

Very Low	Low	Medium	High	Very High
1	2	3	4	5

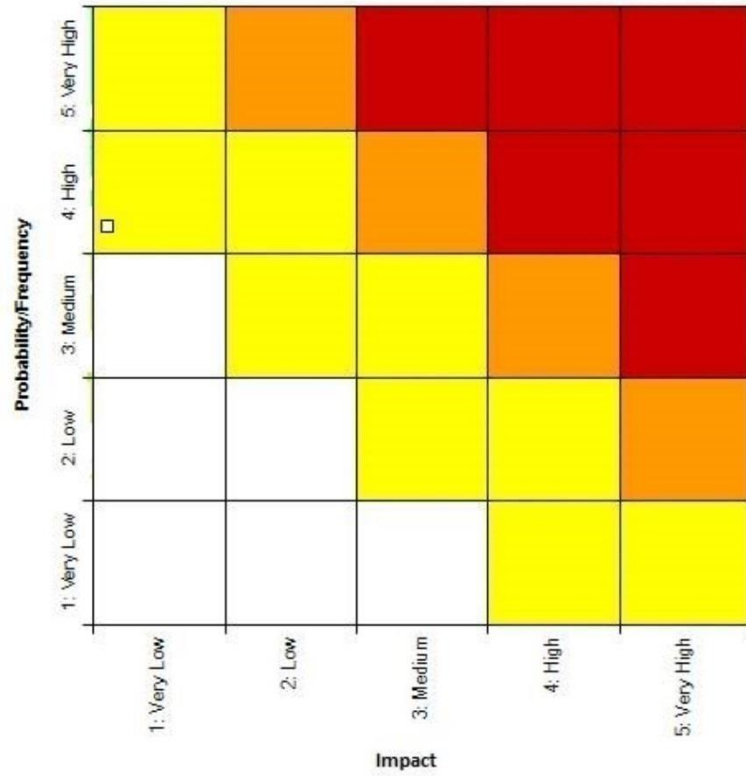
*** Risk Rating (Impact + Probability):

1-4 = Minor (white)

5-6 = Significant (yellow)

7 = Major (orange)

8-10 = Critical (red)



11. APPENDIX D – MONITORING AND EVALUATIONS METRICS

The following table includes additional categories relevant to transport outputs of the scheme and the Benefits Realisation Plan.



Category	Key Performance Indicators	Description
High-level outcomes	Jobs connected to intervention (permanent, paid FTE)	The absolute number of jobs created due to the intervention and the deviation from anticipated job growth. These will include construction jobs associated with the station and related development in North Chelmsford as well as operational jobs associated with the business park, mixed use and neighbourhood floorspace in Beaulieu and North Chelmsford. Account will also be taken of jobs displaced (10% assumption). Data captured as part of Chelmsford City Council's annual monitoring. Current estimates of 2,595 jobs during construction and 4,325 during operation – these include direct and indirect impacts from Lichfields Economic Impact Assessment (2017)
	Commercial floorspace planned - please state sqm and class	These will focus on B1a/b, B2 and B8 in Beaulieu and North Chelmsford. The planned split of floorspace will reflect the likely without station scenario estimated by Lichfields work on the Economic Impact Assessment of Beaulieu (2017). Data captured as part of Chelmsford City Council's annual monitoring. The following land use has outline planning and is expected to be delivered in phases between 2022-26 and 2026-31. - 40,000 m ² business park - 22,300 m ² of other commercial and employment uses including retail, leisure and hotel Chelmsford's Local Plan also allocates 45,000 m ² of business park space in North East Chelmsford beyond 2036.
	Commercial floorspace constructed to date - please state sqm and class	None
	Housing unit starts (forecast over lifetime)	These will focus on developments categorised as directly dependent, indirectly dependent and complementary to the scheme as part of the HIF Business Case and Essex Growth Model updates. This is expected to include relevant developments in Chelmsford, Maldon, Braintree and Uttlesford local authority areas from analysis of their annual monitoring reports. The homes categorised as dependent in the above analysis are shown below. This includes homes with planning permission as well as new allocations in the new Chelmsford Local Plan to beyond 2036 4008 homes – Beaulieu & Channels 7050 – NE Chelmsford, Great Leighs and Broomfield 1383 homes – Maldon district 1750 homes – Braintree district 1538 homes – Uttlesford district



Category	Key Performance Indicators	Description
	Housing unit starts (to date)	1339 homes
	Housing units completed (forecast over lifetime)	As above
	Housing units completed (to date)	As above
Transport (outputs)	Total planned length of resurfaced roads (km)	None
	Total completed length of resurfaced roads (km)	None
	Total planned length of newly built roads (km)	Unknown at this stage – car park and forecourt access roads only
	Total completed length of newly built roads (km)	None
	Total planned length of new cycle ways (km)	None
	Total completed length of new cycle ways (km)	None
	Train frequency at Beaulieu to/from London Liverpool Street	Analysis of Greater Anglia franchise timetable for peak period, off peak, Saturday and Sundays
	Catchment area of Beaulieu station (number of households within a defined drive time and connecting bus time)	GIS analysis of catchment area using TRACC software and address point data
	Number of rail passengers	Use of ORR estimates of annual station usage (http://orr.gov.uk/statistics/published-stats/station-usage-estimates) alongside Greater Anglia Gateline data for daily / hourly variation for neutral weeks at Beaulieu and Chelmsford. Use of ORR annual statistics for a Chelmsford / Witham / Braintree area grouping to assess any abstraction impacts
	Origin and destination of rail station users	Use of Greater Anglia and / or car park season ticket data
	Number of connecting bus routes	Bus routes serving Beaulieu from ECC's Passenger Transport Team
	Use of connecting bus routes	Manual counts of passengers joining and leaving buses at Beaulieu station
	Number of cycle parking spaces	Number of spaces provided at Beaulieu station as a project output. Up to 500 cycle parking spaces
	Utilisation of cycle parking spaces	Manual survey of usage (middle of the weekday) where utilisation is likely to be highest
	Number of car parking spaces	Number of spaces provided at Beaulieu station as a project output. 1,100 multi-storey car park 300 premium car park
Utilisation of car parking spaces (Beaulieu, Townfield Street, adjacent areas)	Specification of automatic data collection as part of Beaulieu station's car park's operation to complement data routinely collected by Chelmsford City Council at Townfield Street. This provides a profile of usage throughout the day. Monitoring of nuisance car parking on nearby roads in North Chelmsford through beat surveys	
Average speed (% of free flow speed)	ECC monitor and map these outputs on an annual data using Teltrac (previously TrafficMaster) data provided by DfT. Outputs are shown in Appendix H.	
Highway journey time reliability and variability	ECC monitor journey times, average speeds and their variability for selected inter-urban	



Category	Key Performance Indicators	Description
		and urban routes using teltrac data. These include the following routes to/from North Chelmsford and the City Centre: B1008 & A1016 (A1099 to Valley Bridge); B1137 Springfield Road; A1099 Victoria Road. Their current performance in terms of journey time variability throughout the day is shown in Appendix H
	Rail punctuality, cancellations and significant lateness	ORR publish data on a periodic basis for different sub-components of the Greater Anglia network (Table 3.20 - http://dataportal.orr.gov.uk/browse/reports/3). GE Outers and Intercity are the most relevant to the impacts of Beaulieu station
	Nitrogen Dioxide and PM10 concentrations and changes	Data from Chelmsford's Annual Status Report - Appendix E references automatic monitoring and diffusion tube locations, including relevant sites on Springfield Road and Parkway
Land, Property and Flood Protection (outputs)	Anticipated area of site reclaimed, (re)developed or assembled (ha)	Unknown
	Actual area of site reclaimed, (re)developed or assembled (ha)	Unknown
	Length of cabling/piping planned (km) - Please state if electricity, water, sewage, gas, telephone or fibre optic	Unknown
	Length of cabling/piping completed (km) - Please state if electricity, water, sewage, gas, telephone or fibre optic	Unknown
	Anticipated area of land experiencing a reduction in flooding likelihood (ha)	Unknown
	Actual area of land experiencing a reduction in flooding likelihood (ha)	Unknown
	Follow-on investment at site (£m) - Private Sector & Public Sector	Further investment by developers in new homes, commercial and mixed use in North and North East Chelmsford HIF funding is being sought for the remaining funding gap for Beaulieu
	Anticipated commercial floorspace refurbished - please state sqm and class	None
	Actual commercial floorspace occupied - please state sqm and class	Using data from Chelmsford's Annual Monitoring – helping to understand the attractiveness of the North Chelmsford area
	Commercial rental values (£/sqm per month, by class)	Data to be provided by Chelmsford City Council – helping to understand the attractiveness of the North Chelmsford area
Business, Support, Innovation and Broadband (outputs)	Anticipated number of enterprises receiving non-financial support (#, by type of support)	N/A
	Actual number of enterprises receiving non-financial support (#, by type of support)	N/A
	Anticipated number of new enterprises supported	N/A
	Actual number of new enterprises supported	N/A
	Anticipated number of potential entrepreneurs assisted to be enterprise ready	N/A
	Actual number of potential entrepreneurs assisted	N/A



Category	Key Performance Indicators	Description
	to be enterprise ready	
	Anticipated number of enterprises receiving grant support	N/A
	Actual number of enterprises receiving grant support	N/A
	Anticipated number of enterprises receiving financial support other than grants	N/A
	Actual number of enterprises receiving financial support other than grants	N/A
	Anticipated no. of additional businesses with broadband access of at least 30mbps	Unknown
	Actual no. of additional businesses with broadband access of at least 30mbps	Unknown
	Financial return on access to finance schemes (%)	N/A
Construction delivery	Earned value	Data collected by the Commercial Management Team
	Delivery to programme milestones	Data collected by the Project Controls Team
	Number and severity of near misses and lost time incidents during works	Data collected by the Project HSE Co-ordinator

12. APPENDIX E – CATEGORIES OF EXEMPT INFORMATION

There is a clear public interest in publishing information and being open and transparent. But sometimes there is information which we can't publish because it would cause significant harm to the Council - for example by damaging a commercial deal or harming our position in a court case. Equally sometimes publishing information can harm someone who receives a service from us or one of our partners.

The law recognises this and allows us to place information in a confidential appendix if:

*(a) it falls within any of paragraphs 1 to 7 below; and
(b) in all the circumstances of the case, the public interest in maintaining the exemption outweighs the public interest in disclosing the information.*

- 1. Information relating to any individual.*
- 2. Information which is likely to reveal the identity of an individual.*
- 3. Information relating to the financial or business affairs of any particular person (including the authority holding that information)*
- 4. Information relating to any consultations or negotiations, or contemplated consultations or negotiations, in connection with any labour relations matter arising between the authority or a Minister of the Crown and employees of, or office holders under, the authority.*
- 5. Information in respect of which a claim to legal professional privilege could be maintained in legal proceedings.*
- 6. Information which reveals that the authority proposes— (a) to give under any enactment a notice under or by virtue of which requirements are imposed on a person; or (b) to make an order or direction under any enactment.*
- 7. Information relating to any action taken or to be taken in connection with the prevention, investigation or prosecution of crime.*

13. APPENDIX F – LOCATION PLAN OF BEAULIEU STATION

PHASING OF DEVELOPMENT



Source: Countryside Properties: Beaulieu Development Phasing Document, November 2013.

14. APPENDIX G FURTHER DETAIL ON ECONOMY AND TRANSPORT

14.1. Current context

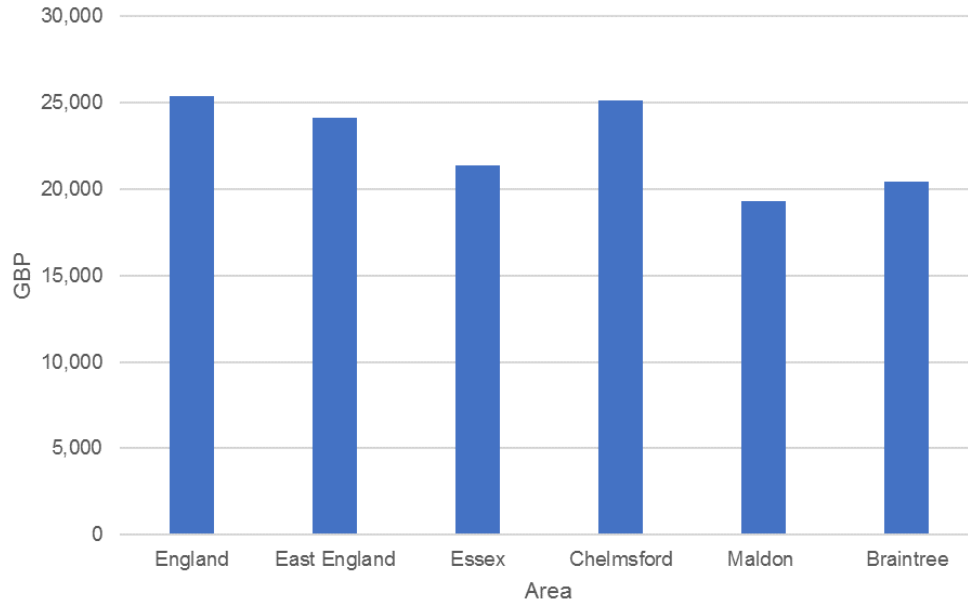


Figure G.1: GVA per head (£) in 2015

14.2. Highway network and car park capacity

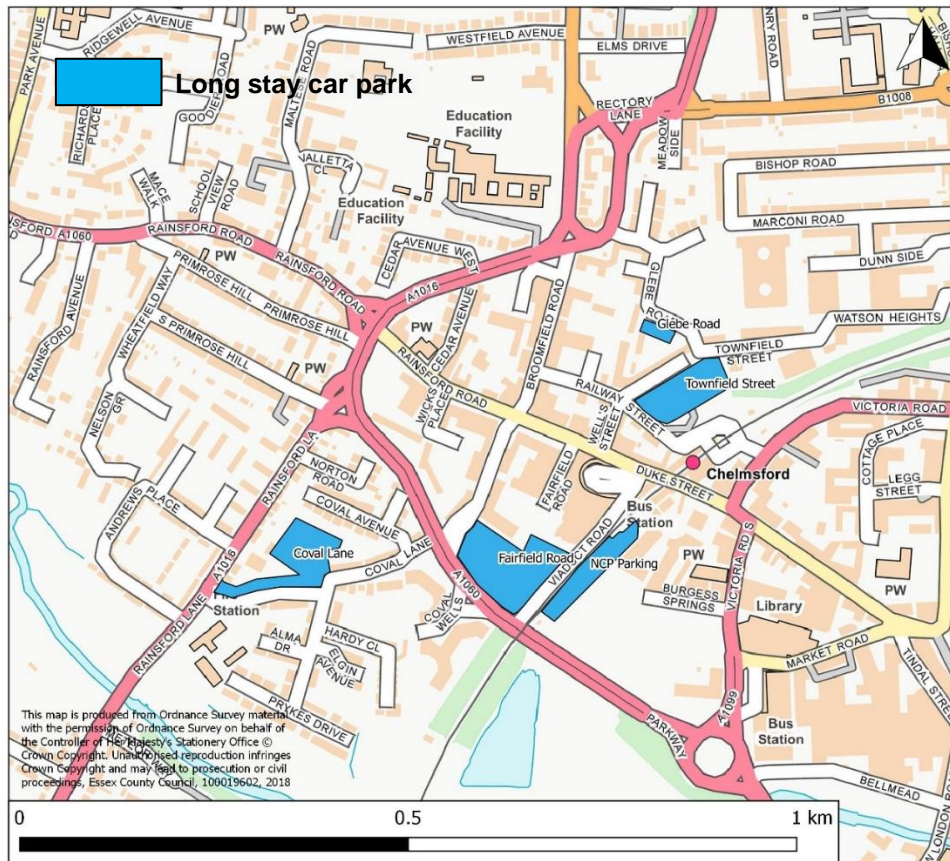


Figure G2: Map of long-stay car parks near Chelmsford station

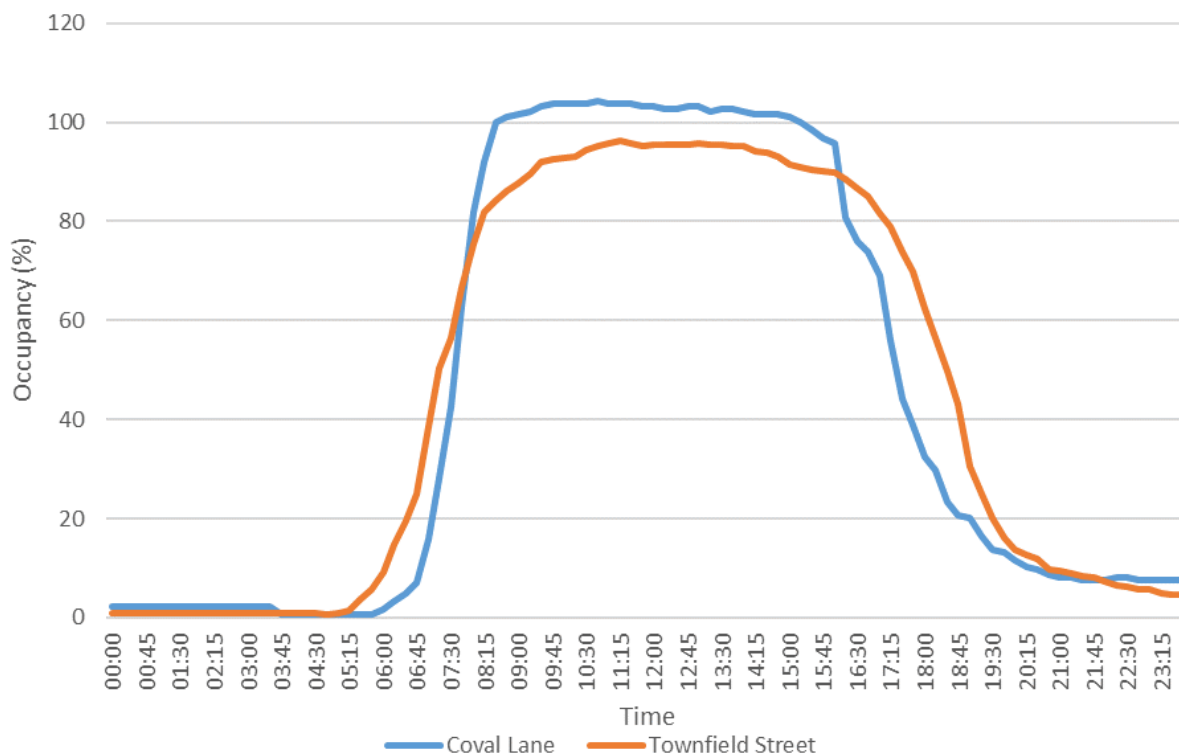


Figure G.3: Average occupancy in Coval Lane and Townfield Street car parks, 2018 (%)

Data is only available for the two largest car parks operated by Chelmsford City Council, which represent 914 spaces in total. Where capacity is in excess of 100% this represents a lag between vehicles entering and leaving the car park, as well as vehicles searching for space.

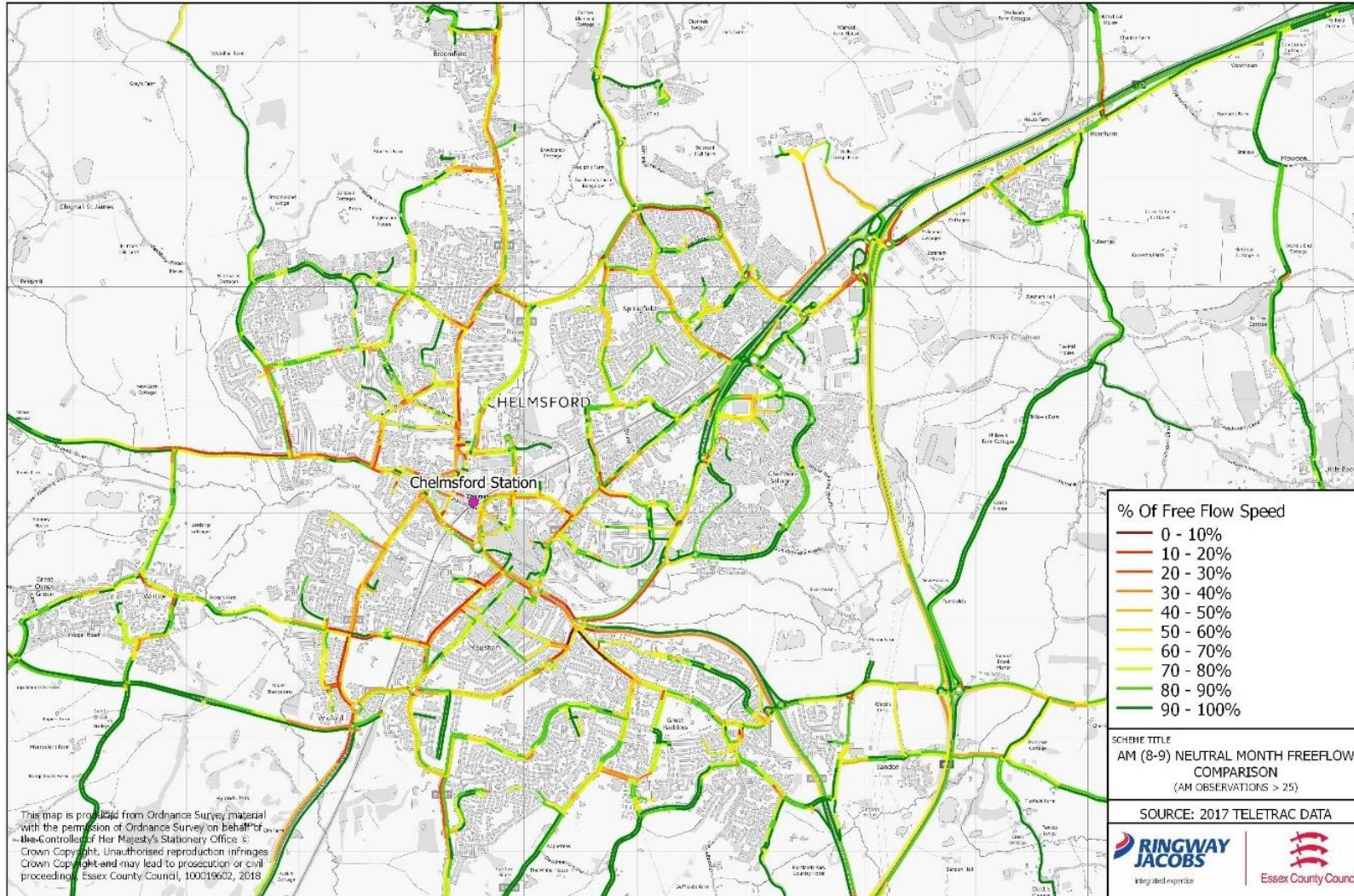


Figure G.4: Congestion at 8am in 2017

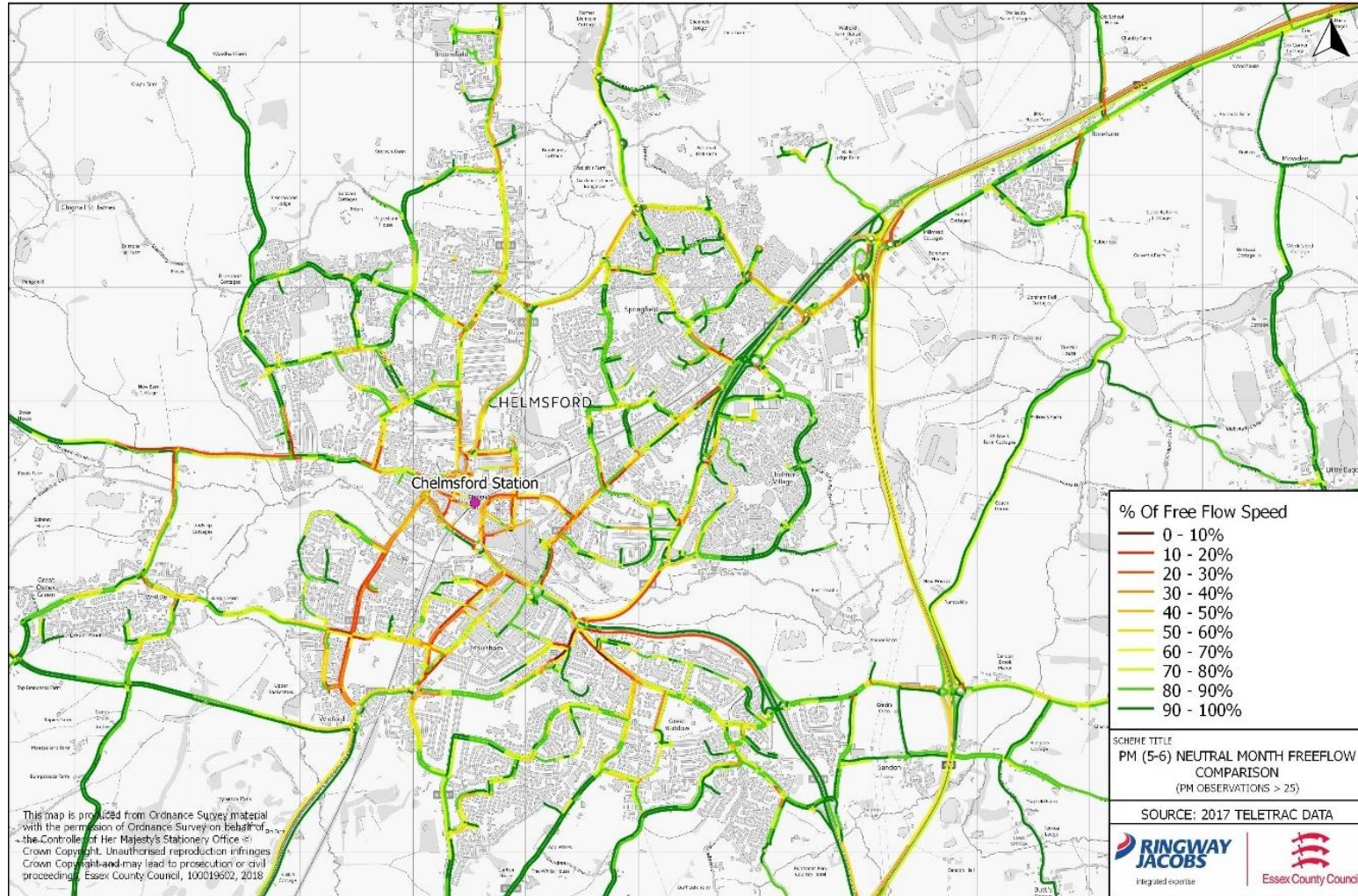


Figure G.5: Congestion at 7pm in 2017

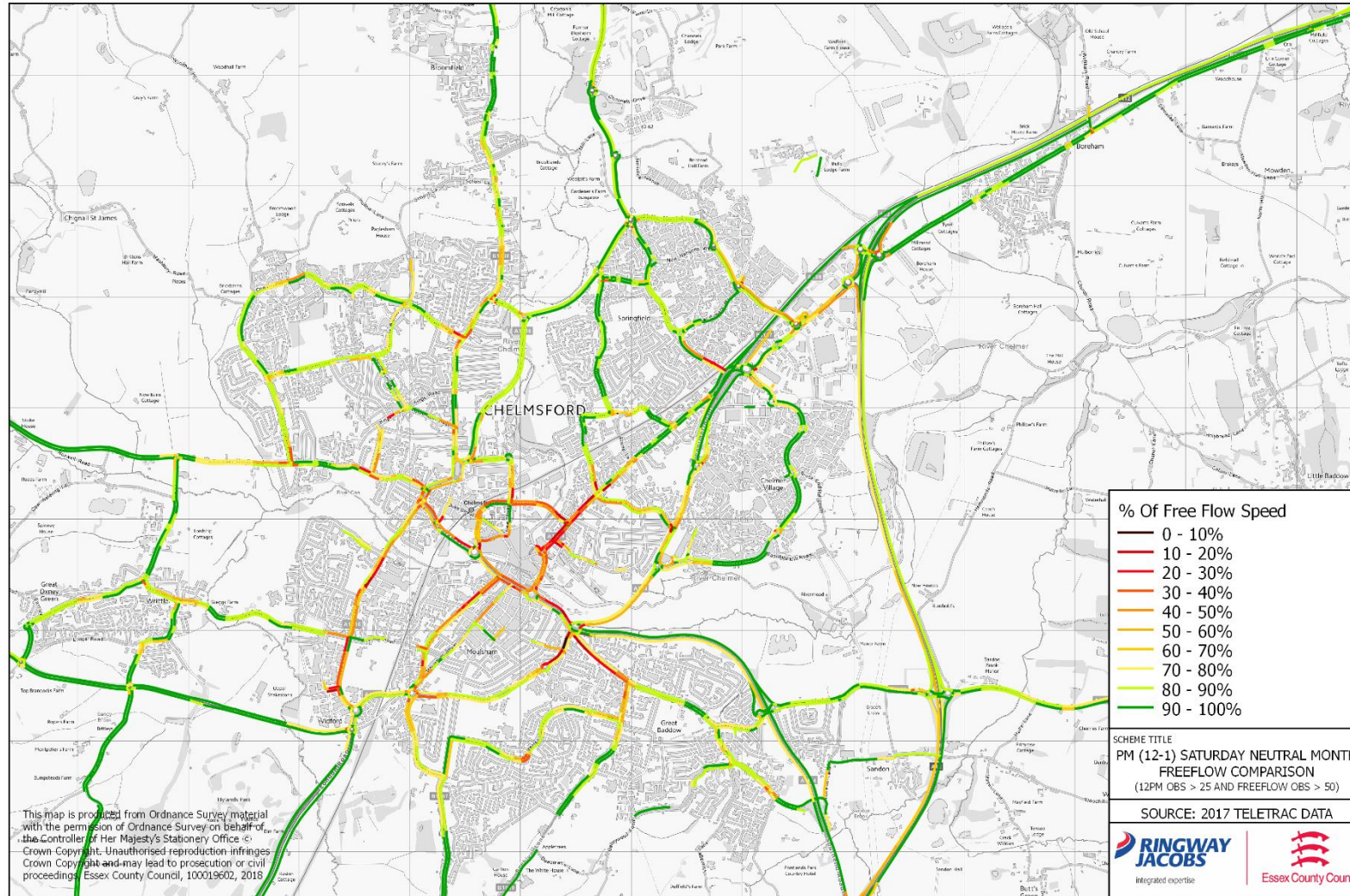


Figure G.6: Saturday Congestion at 12pm

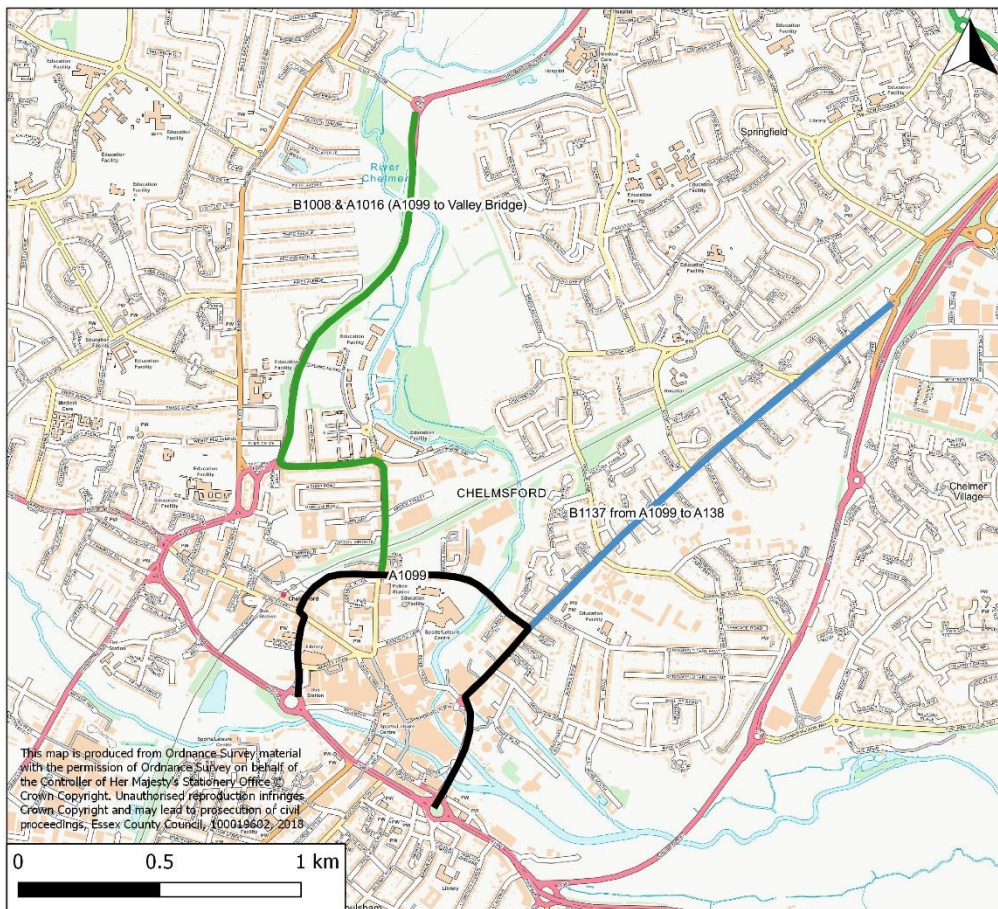


Figure G.7: Map of roads included in Figure G.7 to G.9

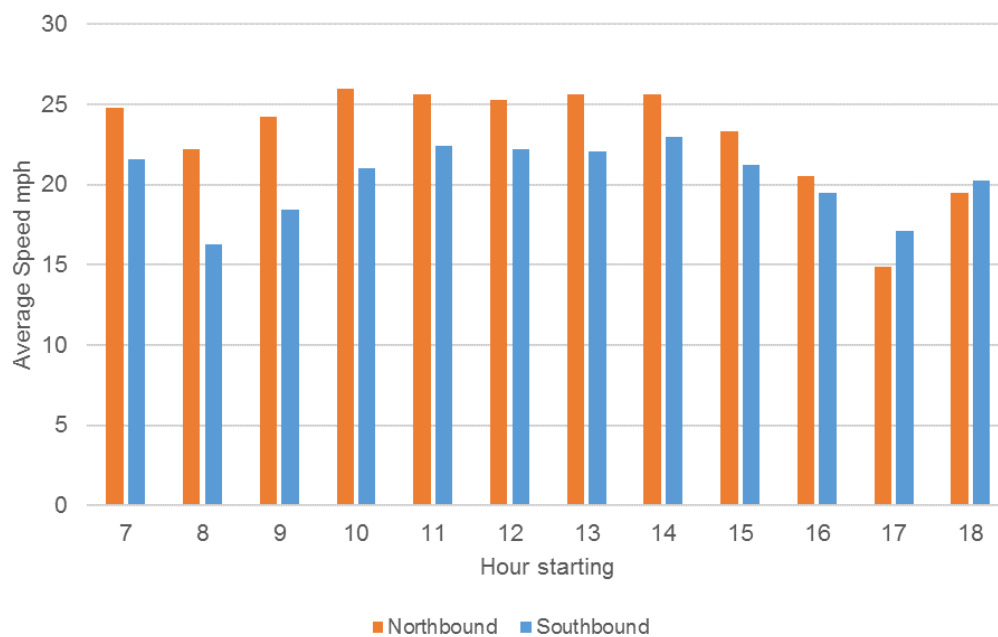


Figure G.8: B1008 & A1016 (A1099 to Valley Bridge) Average Weekday Speed (Green)

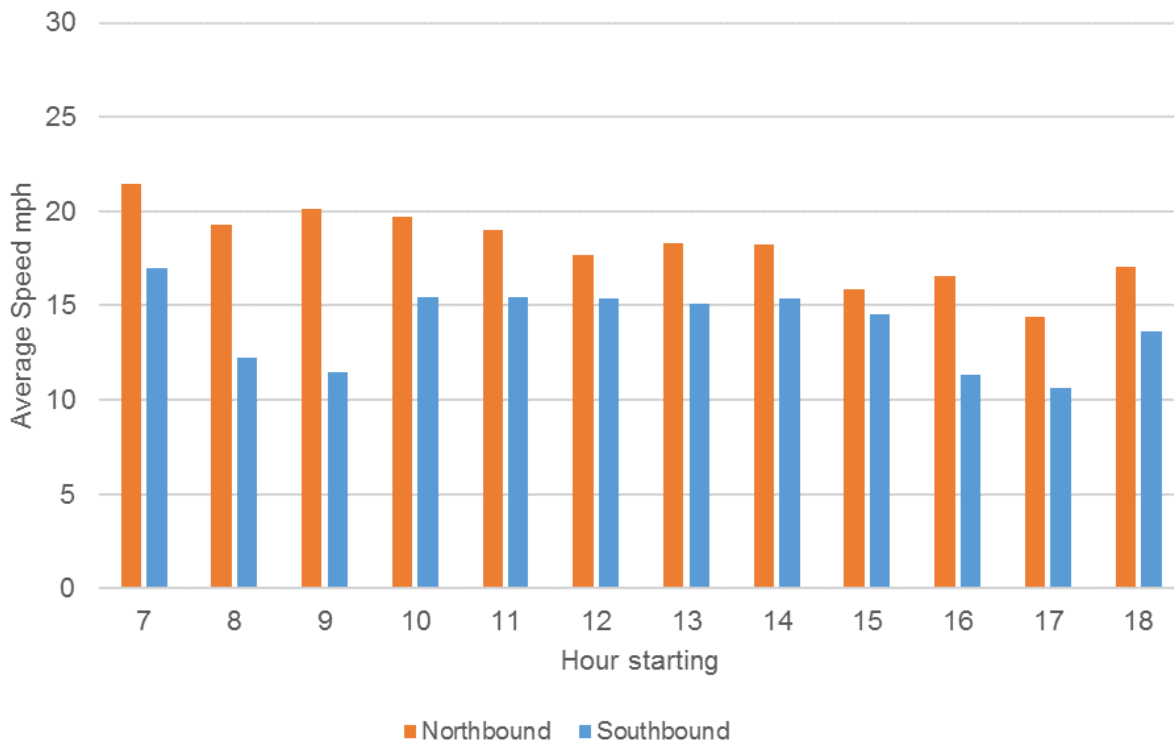


Figure G.9: B1137 from A1099 to A138 Northbound & Southbound Average Weekday Speed (Blue)

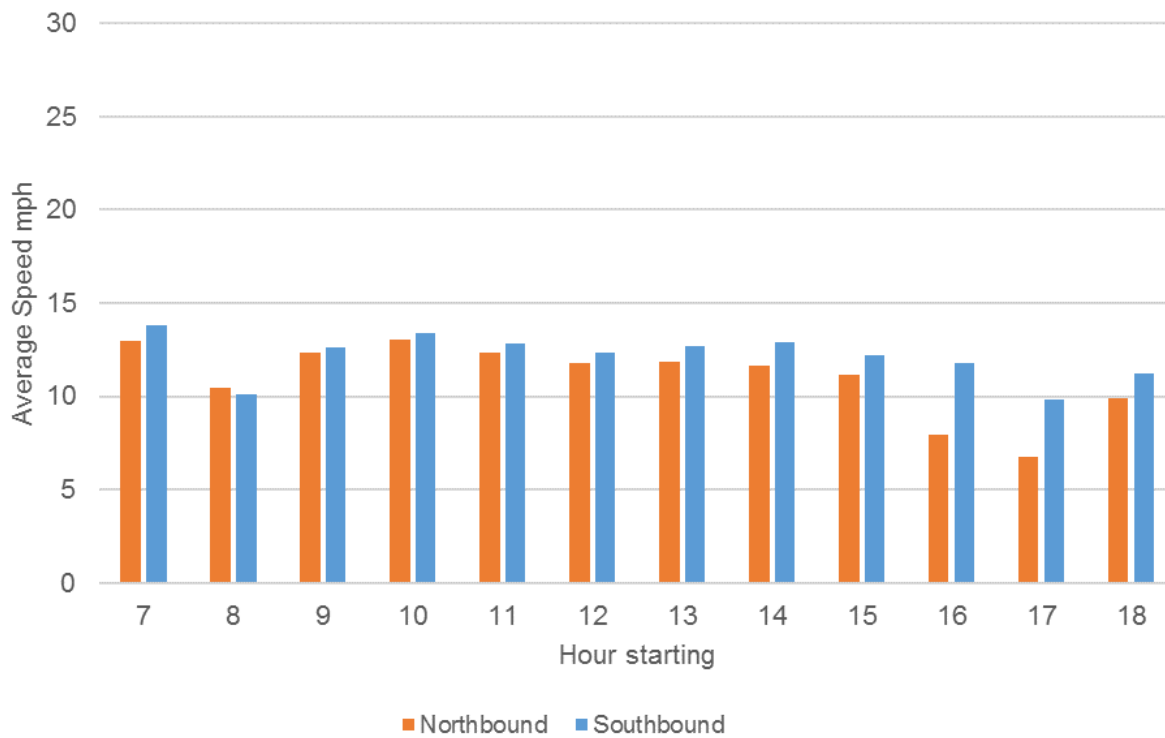


Figure G.10: A1099 Clockwise and Anti-Clockwise Average Weekday Speed (Black)

14.3. Chelmsford rail station usage and capacity

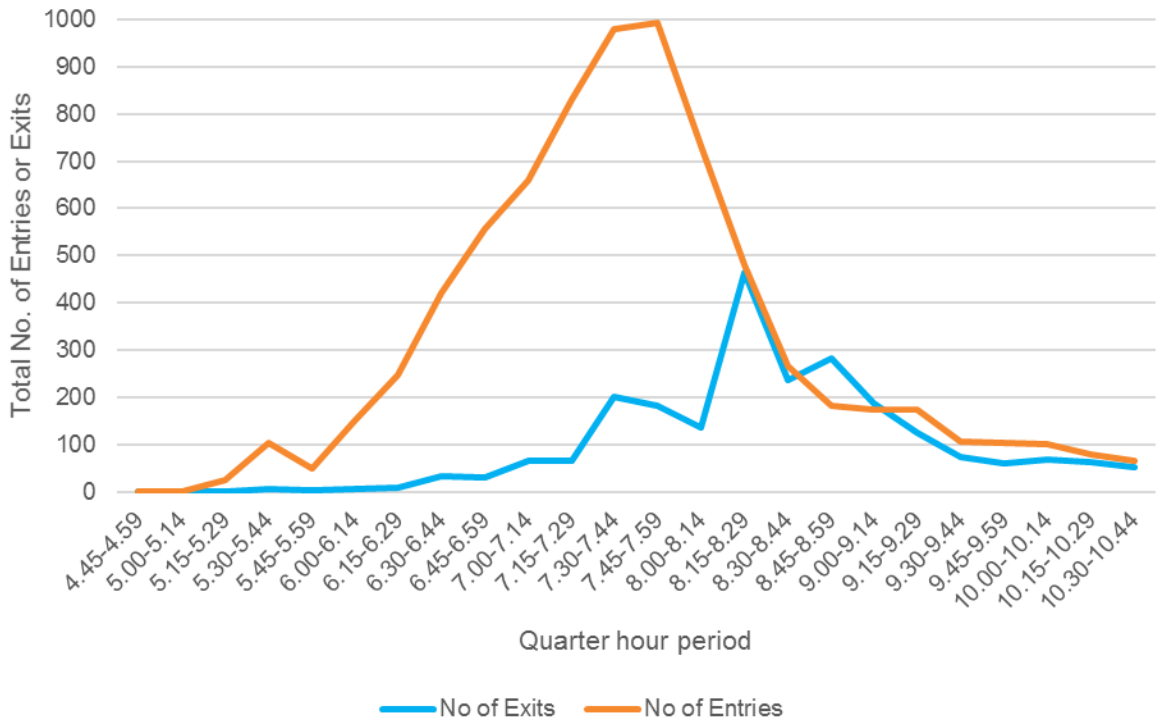


Figure G.11: Gateline entries and exits at Chelmsford station during the AM peak, 21-27 April 2018. Source: Greater Anglia data provided to Essex Highways, June 2018

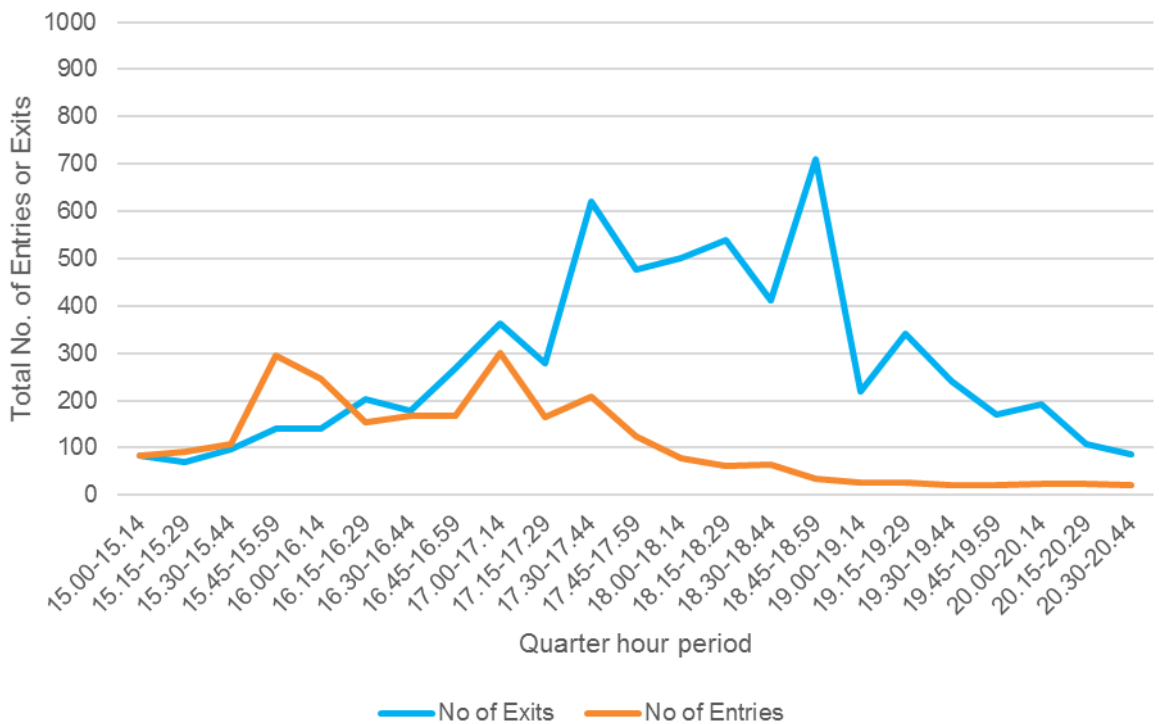


Figure G.12: Gateline entries and exits at Chelmsford station during the PM peak, 21-27 April 2018. Source: Greater Anglia data provided to Essex Highways, June 2018

14.4. Access to the rail network

The following maps illustrate the catchment area of season ticket holders at Chelmsford and Witham demonstrating the rail heading in operation. These should be considered in light of various components of generalised cost (train fare, car parking charge, train frequency and journey time) provided below.

Table H.3: Generalised cost components at the study area stations

	Stations			
	Braintree	Witham	Hatfield Peverel	Chelmsford
Annual Season ticket to London Liverpool Street	£4,500.00	£4,428.00	£4,280.00	£3,968.00
Off Peak Return Fare to London Liverpool Street	£28.40	£28.20	£25.10	£21.20
Peak Frequency	1 per hour	8 per hour	3 per hour	9 per hour
Off Peak Frequency	1 per hour	4 per hour	1 per hour	5 per hour
Station Car park charges, Mon – Fri 7am – 6pm	(NCP Parking): £4.20 (Station Approach): £4.50	(NCP Parking): £8.00 (Easton Road): £6.50 (White Horse Lane): £5.50	(NCP Parking): £7.10	(Townfield Street): £7.50 (NCP Parking): £7.34 per day (1-week ticket) (Coval Lane): £5.50
Car Park Capacity	(NCP Parking): 26 (Station Approach): 135	(NCP Parking): 418 (Easton Road): 66 (White Horse Lane): 72	(NCP Parking): 195	(Townfield Street): 726 (NCP Parking): 118 (Coval Lane): 188

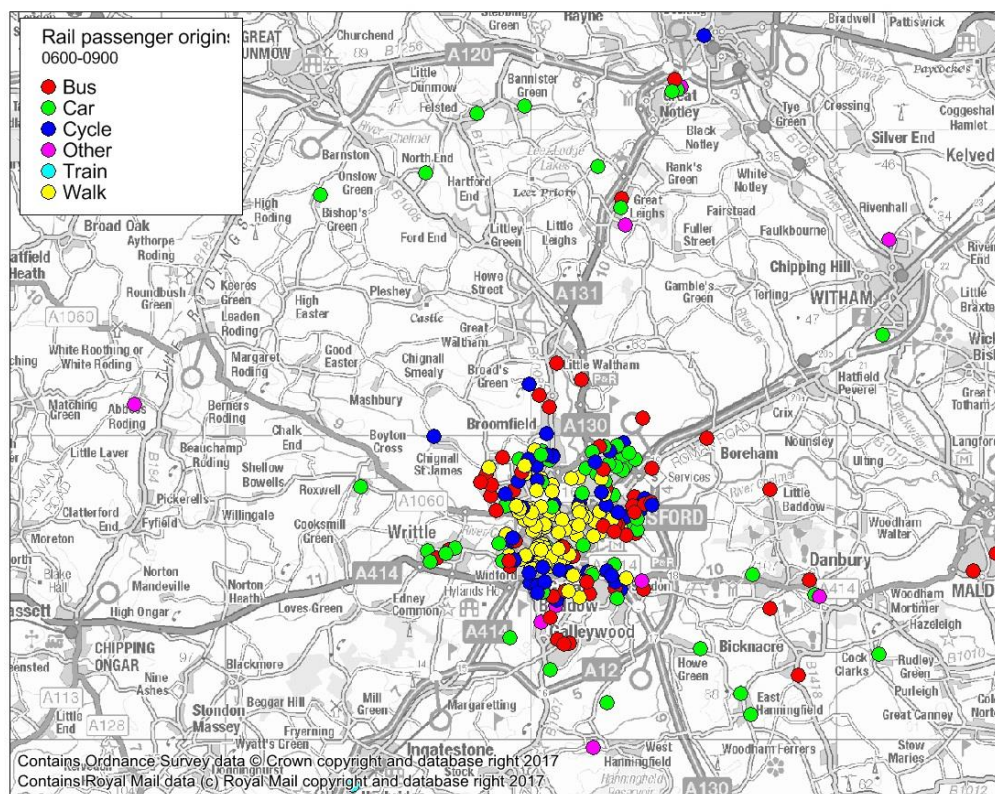


Figure G.13: Origin and mode of travel for respondents to Chelmsford station travel survey, July 2014, 0600-0900 (wide scale)

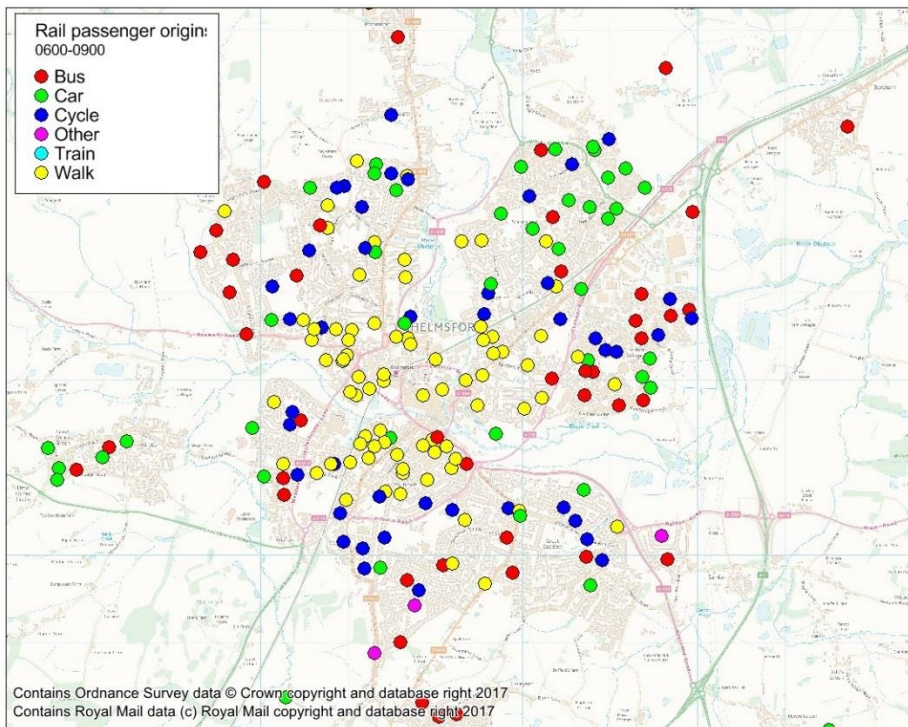


Figure G.14: Origin and mode of travel for respondents to Chelmsford station travel survey, July 2014, 0600-0900 (zoomed)

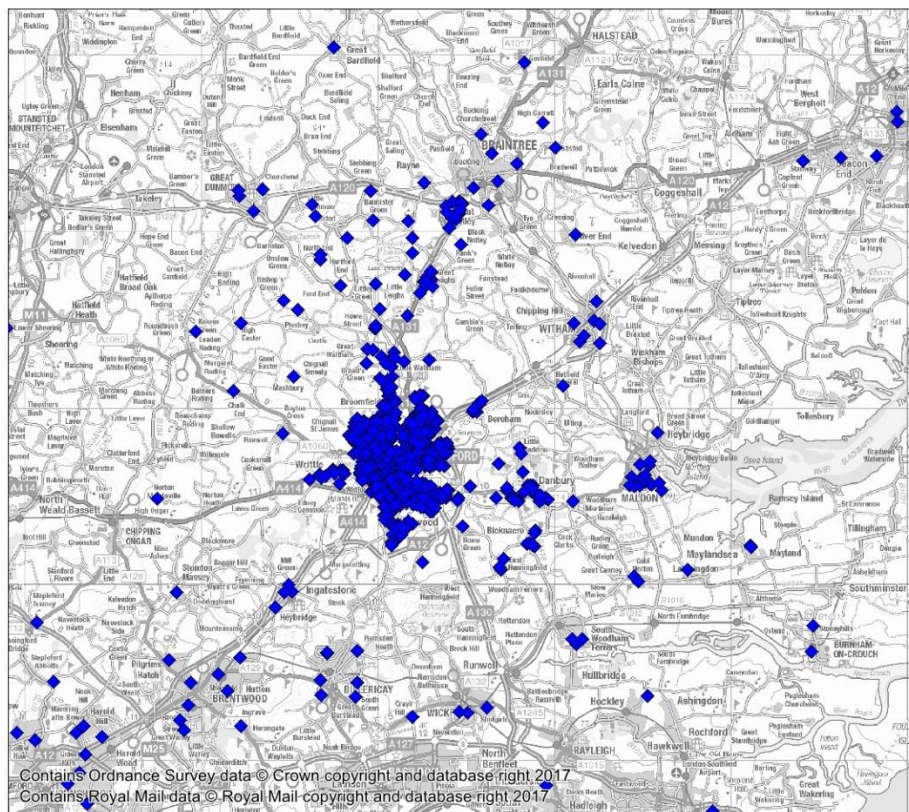


Figure G.15: Origin of Chelmsford station season ticket holders (origin London destinations), Expiry Date 2018-19

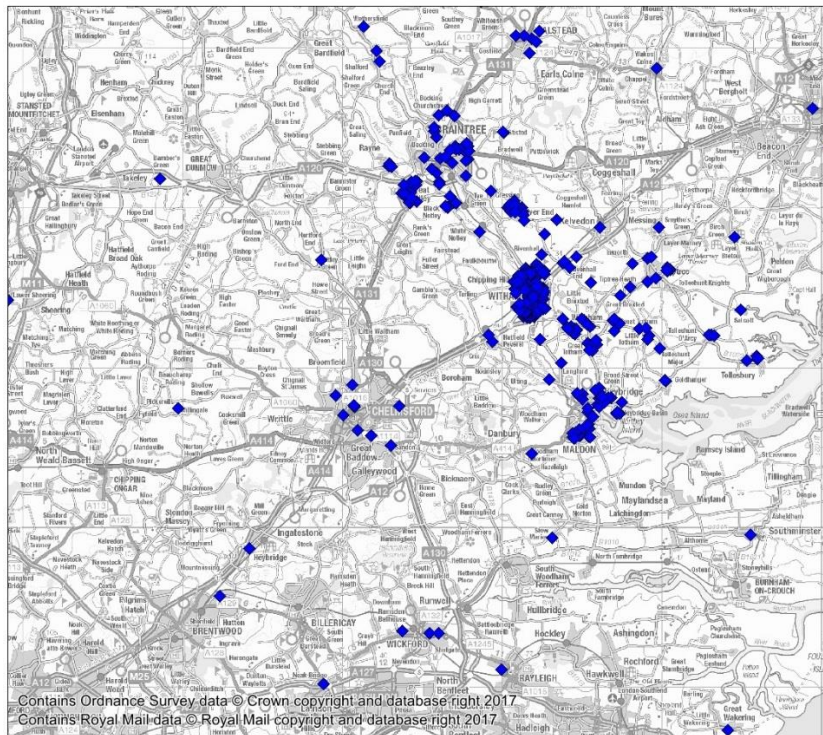


Figure G.16: Origin of Witham station season ticket holders (London destinations), Expiry Date 2018-19

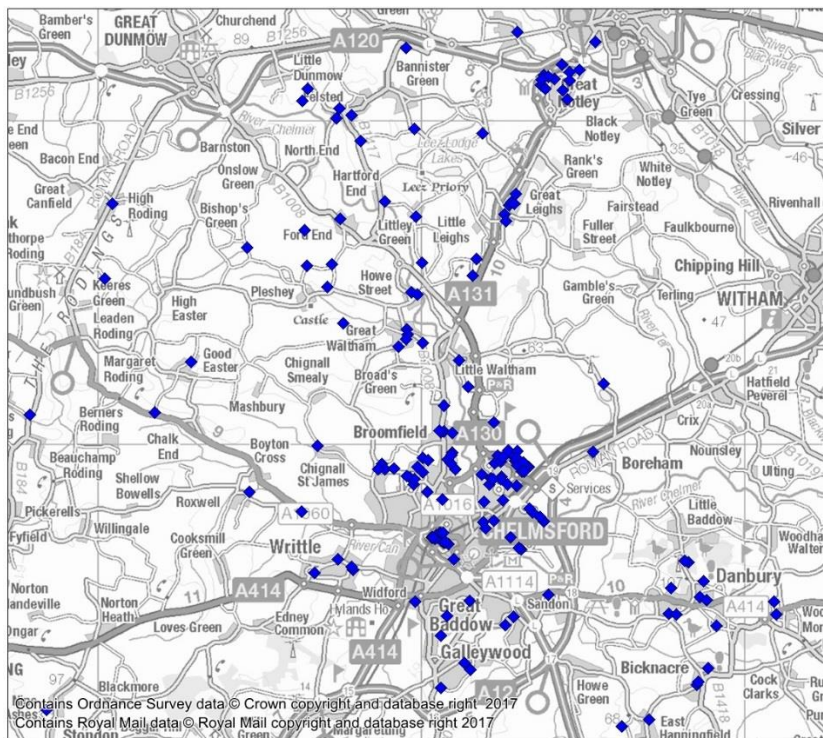


Figure G.17: Origin of Chelmsford Car Park Permit Holders at Fairfield Street and Townfield Street, May 2018

Table G.2: Propensity to use the Rail Network for Journeys to Work. Source: WU03EW, 2011 Census

Location	MSOA #	% travel to work by train
Braintree	Braintree 8-12	7%
Great Notley	Braintree 13	10%
Kelvedon & Coggeshall	Braintree 14	22%
Witham	Braintree 15-17	17%
Hatfield Peverel	Braintree 18	18%
South Woodham Ferrers	Chelmsford 19-20	15%
Runwell (near Wickford station)	Chelmsford 21	15%
Maldon & Heybridge	Maldon 1, 3-5	6%
Wickham Bishops (near Witham)	Maldon 2	15%
Burnham-on-Crouch	Maldon 8	15%

15. APPENDIX H: APPRAISAL SPECIFICATION EXECUTIVE SUMMARY

Please refer to the standalone technical note.

16. APPENDIX I: RAIL DEMAND MODEL REPORT

Please refer to the standalone technical note.

17. APPENDIX J: ECONOMIC APPRAISAL REPORT

Please refer to the standalone technical note.

18. APPENDIX K: CHELMSFORD STATION CROWDING MODEL REPORT

Please refer to the standalone technical note.

19. APPENDIX L: COMMERCIAL MODEL

Please refer to the standalone excel spreadsheet.

20. APPENDIX M: APPRAISAL MODEL

Please refer to the standalone excel spreadsheet.

21. APPENDIX N: TECHNICAL NOTE ON SOCIAL AND DISTRIBUTIONAL IMPACTS

Please refer to the standalone technical note.

22. APPENDIX O: SUPPORTING APPRAISAL TABLES – AST, AMCB, PA AND TEE

Please refer to the standalone set of worksheets.

24. APPENDIX P: STAKEHOLDER MAP

Partner	Key Areas of Interest
Government	
Department for Transport and its Secretary of State, Ministry of Homes, Communities and Local Government and its Secretary of State Homes England	<ul style="list-style-type: none"> • Transport and Works Act Order • Funding • Value for Money • Greater Anglia Franchise • Delivery of / acceleration of new homes • Timely spending
Local Members of Parliament	
Kemi Badenoch (Saffron Walden), Vicky Ford (Chelmsford), John Whittingdale (Maldon), James Cleverly (Braintree), Priti Patel (Witham) and members of the wider GEML Task Force	<ul style="list-style-type: none"> • Constituent concerns and interests • Local authority goals and plans • Contribution of the station to the GEML Task Force objectives, e.g. Norwich in 90, Ipswich in 60, Colchester in 40
Local community groups / Parish Councils	
Boreham Parish Council Springfield Parish Council Chelmsford Commuters Rail Group Witham and Braintree Rail Users Association	<ul style="list-style-type: none"> • Improved access to the rail network • Rail operational reliability • Journey time, frequencies and ambience from current stations and Beaulieu
Natural and built environment stakeholders	
Natural England, Historic England, Environment Agency, New Hall School (setting), existing Beaulieu residents, Bulls Lodge / Brick House Farm residents	<ul style="list-style-type: none"> • Setting of school and listed buildings • Protected species • Flooding • Short-term construction impacts • Improved access to the rail network (residents)
Local Enterprise Partnerships	
SELEP & New Anglia LEP (NALEP)	<ul style="list-style-type: none"> • Value for money (SELEP) • Timely spending (SELEP) • Ensure that new station does not compromise GEML Task Force objectives (NALEP)
Supporting upper tier local authorities	
Essex County Council - Leader, Portfolio Holder and Local Members: David Finch, Kevin Bentley, John Aldridge (Broomfield & Writtle ward); Chief Executive - Gavin Jones, Greater London Authority, Suffolk County Council, Norfolk County Council	<ul style="list-style-type: none"> • Appropriate planning process; • Linkage with key policy drivers, including organisational strategy, housing delivery and transport plans • Improved access to the rail network for residents and businesses • Ensure that the new station does not compromise GEML Task Force objectives
Supporting lower tier local authorities	
Chelmsford City Council, Maldon, Braintree and Uttlesford District Councils Chelmsford CC Leader - Roy Whitehead,	<ul style="list-style-type: none"> • Appropriate planning process (Chelmsford) • Linkage with emerging / adopted Local Plans and delivery of housing and jobs

Ward Members for Chelmer Village & Beaulieu Park, Broomfield & Walthams, Springfield North, Boreham & The Leighs – Ron Alcock, John Galley, Neil Gulliver, Paul Hutchinson, Barry Knight, Duncan Lumley, Sandra Pontin, James Raven, Susan Sullivan, Louis Ward, Philip Wilson Chief Executive - Nick Eveleigh, Director of Planning - David Green	<p>growth</p> <ul style="list-style-type: none"> Improved access to the rail network for residents and businesses Ward concerns and interests
Business stakeholders	
Countryside Zest, North East Chelmsford Garden Village Consortium, Chelmsford Business Board, Chamber of Commerce, Essex Business Board, local businesses, health and education establishments, New Hall School (school operation)	<ul style="list-style-type: none"> Delivery and sale/lease of new homes and business space Productivity and profitability of existing and future businesses Marketability of Chelmsford Operation of existing business and access to land Use of station when open
Rail stakeholders	
NR Operations, NR Group Strategy, NR Asset Management, NR Infrastructure Maintenance Greater Anglia, Freight Operating Companies Office of Road and Rail, Health and Safety Executive, Transport Focus	<ul style="list-style-type: none"> Future impact on GEML operational performance and capacity Maintainability of new assets Resolve capacity problems at Chelmsford station Train driver training Safety Public perception
Highways development control, sustainable transport and travel planning functions	
Highways England, ECC Strategic Development Team, ECC Passenger Transport, ECC Sustainable Travel, ECC Network Assurance, ECC Network Operations, South Essex Parking Partnership	<ul style="list-style-type: none"> Performance of Boreham Interchange Interface with the Radial Distributor Road and plans for the Chelmsford North East Bypass Public transport, walking and cycle links Car parking management Travel Planning Land ownership (ECC)
Transport users and providers (non-rail)	
Essex Local Access Forum, Access Groups Bus Operators and users, Sustrans, Cycling Touring Club, Chelmsford Cycling Action Group Taxi and mini cab operators Emergency Services	<ul style="list-style-type: none"> Accessibility Capacity Safety and security, Station design Welfare facilities
Utilities	
Essex & Suffolk Water, Anglian Water, National Grid, UK Power Networks, Cadent	<ul style="list-style-type: none"> New connections and capacity Diversions and safe operation of existing assets (if relevant)

25. APPENDIX Q: EQUALITY IMPACT ASSESSMENT

Please refer to the standalone technical note.

26. APPENDIX R: BENEFITS REALISATION PLAN

	Benefits	Performance Indicator	Type	When Measured	Responsibility for Delivery	How Measured	Success Management
1.	<p>Infrastructure to support North Chelmsford's ambition: Delivery of new homes and high quality jobs at an accelerated pace</p> <p>Support the delivery of Chelmsford's Local Plan</p> <p>New Homes Bonus</p> <p>Council Tax Receipts</p> <p>Stamp Duty</p> <p>Business Rates</p>	SELEP – Homes, jobs, commercial floorspace, commercial rental values, follow on investment	Indirect (£ and non £)	1/ 5 years after completion	Private sector / Chelmsford City Council / Essex County Council	Chelmsford City Council's annual monitoring	Countryside Zest – one of the main developers is part of the Project Board. Marketing of the new station once under construction and prior to opening. Using public and private investment to accelerate growth further through schemes such as Chelmsford North East Bypass
2.	<p>Infrastructure to support North Chelmsford's ambition: Safe delivery of new infrastructure to time, cost and quality</p>	Project specific - Near Misses Lost Time Incidents Earned Value Delivery to programme milestones	Direct (£ and non £)	During construction	Network Rail & Contractor	Project HSE Plan Commercial Management and Project Controls tools – Oracle, Primavera P6, Eagle graphs etc	Proactive behavioural safety and quality culture Robust programme baseline Collaborative working Project Management Plan Dedicated project and commercial management teams Robust change control and governance
3.	<p>Access to the Railway Improved choice of sustainable travel options (option values)</p> <p>Improved accessibility and connectivity</p>	Project specific – train frequency, catchment area, patronage, origin and destination of users, use of bus routes, cycling and car parking	Direct (£ and non £)	1 / 5 years after completion	Greater Anglia franchisee (trains) Essex County Council / Chelmsford City Council	ORR data on station usage, gateline ticket data analysis for neutral week(s), season ticket data analysis of station / car park users, manual and automatic counts, TRACC analysis of catchment area alongside Address Point data to take into account new homes	Proactive monitoring of usage during year 1 Marketing of new station to users of Chelmsford station and customers on Greater Anglia Flexibility
4.	<p>Highway and car park capacity: Reduction in driving to Chelmsford</p>	Project specific – traffic volumes, average speed, journey	(In) direct (£ and non £)	1 / 5 years after completion	Essex County Council / Chelmsford City Council	Traffic volumes from automatic and manual traffic surveys Analysis of Teltrac data	Proactive monitoring of traffic volumes and highway network performance

	<p>station</p> <p>Reduced pressure on city centre long stay parking</p> <p>More reliable journeys</p> <p>Improved public health</p> <p>Use of the Radial Distributor Road</p>	<p>time variability and reliability, NO₂ and PM₁₀ concentrations</p>				<p>routinely collected and analysed by ECC regarding speed, reliability and variability</p> <p>Chelmsford City Council's annual monitoring on air quality – this includes permanent monitoring and diffusion tubes on Springfield Road and Parkway in the city centre and its approaches</p>	
5.	<p>Rail station usage and capacity:</p> <p>Improve journey ambience and reduce congestion at Chelmsford station</p> <p>Improve public safety</p>	<p>Project specific-patronage</p>	<p>Direct (£ and non £)</p>	<p>1 / 5 years after completion</p>	<p>Network Rail / Greater Anglia franchisee</p>	<p>Analysis of gateline usage at Chelmsford station</p>	<p>Proactive monitoring to enable appropriate station operational staff presence and marketing of new station</p>
6.	<p>Rail:</p> <p>GEML Reliability</p>	<p>Project specific – more reliable journeys for passengers and freight</p>	<p>Direct (£)</p>	<p>Periodic basis</p>	<p>Network Rail / Greater Anglia franchisee</p>	<p>Rail punctuality, cancellations and significant lateness is routinely monitored as part of all rail franchises</p>	<p>Proactive analysis of data to understand performance of timetable</p>
7.	<p>Rail: Growth in demand, new rolling stock and services</p>	<p>Project specific – passenger usage</p>	<p>Direct (£ and non £)</p>	<p>1 / 5 years after completion</p>	<p>Network Rail / Greater Anglia franchisee</p>	<p>Analysis of gateline and annual data at stations directly and indirectly affected</p> <p>Analysis of train occupancy using on train monitoring equipment</p>	<p>Timetable development</p> <p>Timetable and operational flexibility</p> <p>Publicising busy and not so busy trains at stations and through web channels as is currently done</p>