A12 Chelmsford to A120 widening scheme

TR010060

7.4 DESIGN & ACCESS STATEMENT

APFP Regulation 5(2)(q)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Volume 1

August 2022

Infrastructure Planning

Planning Act 2008

A12 Chelmsford to A120 widening scheme

Development Consent Order 202[ ]

7.4 Design and Access Statement

Regulation Number:	Regulation 5(2)(q)
Planning Inspectorate Scheme Reference	TR010060
Application Document Reference	TR010060/APP/7.4
Author:	A12 Project Team, National Highways

Version	Date	Status of Version
Rev 1	August 2022	DCO Application

Artist's impression of how the Marks Tey (junction 25) may look on day of opening (for illustrative purposes only)

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Executive summary

This Design and Access Statement (DAS) is one of the supporting documents submitted as part of the application for development consent for the A12 to A120 Widening Scheme ('the proposed scheme').

The proposed scheme comprises improvements to the A12 between junction 19 (Boreham) and junction 25 (Marks Tey), a distance of approximately 24km, or 15 miles.

The DAS sets out how the proposed scheme has evolved through working with stakeholders, including design changes that have emerged during consultation processes. The DAS then presents the proposed scheme in design and access terms, demonstrating how the high quality design solution responds to the opportunities and meets the design challenges presented by the site and its setting.

The design has been developed to meet the following proposed scheme objectives:

- Support the growth identified in Local Plans by reducing congestion related delay, improving journey time reliability and increasing the overall transport capacity of the A12
- Private accesses to the strategic road network closed off and alternative access to local roads provided by the proposed scheme
- Improve road user safety
- Improve road worker safety during maintenance and operational use
- Reduce current and forecast congestion-related delays and therefore improves journey time reliability
- Understand the impacts of other schemes and recognises other RIS schemes
- Reduce the visual, air and noise quality impacts of the proposed scheme on affected communities on the route
- Reduce the impact of severance of communities along the route
- Improve accessibility for walkers, cyclists, horse riders, and public transport users
- Improve customer satisfaction, and reduce customer impact during construction

The Case for the scheme [TR010060/APP/7.1] details the development of these objectives and contains an appraisal of all potential scheme options against these objectives.
The proposed scheme proposals incorporate the following key elements:

- Widening to three lanes in both directions between Hatfield Peverel and Marks Tey
- A new three-lane bypass at Rivenhall End (junctions 22 to 23)
- A bypass between junctions 24 to 25
- Improvements made to junctions 19 and 25
- Three new junctions constructed to replace existing junctions 20a, 20b and 23
- New and improved walking, cycling and horse riding routes

The DAS should be read as an example of how the Design Principles [TR010060/APP/7.10] could be translated into physical form, and should be read alongside the Works Plans [TR010060/APP/2.2], General Arrangement Plans [TR010060/APP/2.9] and Engineering Section Drawings and Plans [TR010060/APP/2.12].

01.

Introduction

1.1 Purpose of this document

1.2 Development Consent Order (DCO)

1.3 Structure of DAS

1.4 Background to the proposed scheme

1.5 Character areas

1. Introduction

1.1 Purpose of this document

1.1.1 This DAS supports National Highway's ('the Applicant') application for development consent for the proposed scheme.

1.1.2 The DAS will provide background to the design assurance, which will display National Highway's commitment to high quality design. The DAS should be read alongside the Design Principles [TR010060/APP/7.10].

1.1.3 While there is no statutory requirement for a DAS in supporting Development Consent Orders under the Planning Act 2008 (as amended) (the '2008 Act'), it can be a useful document to support design decisions made throughout the application process.

1.1.4 This document will display all alternative Options considered and consulted upon and how the final option was chosen in response to non-statutory consultation and has evolved since statutory consultation.

1.2 Development Consent Order

1.2.1 The Applicant has submitted an application under section 37 of the 2008 Act to the Secretary of State via the Planning Inspectorate for an order to grant development consent for the proposed scheme.

1.2.2 This document provides an accessible guide to the proposed scheme, Applicant and application, and it will assist in reviewing the application documentation.

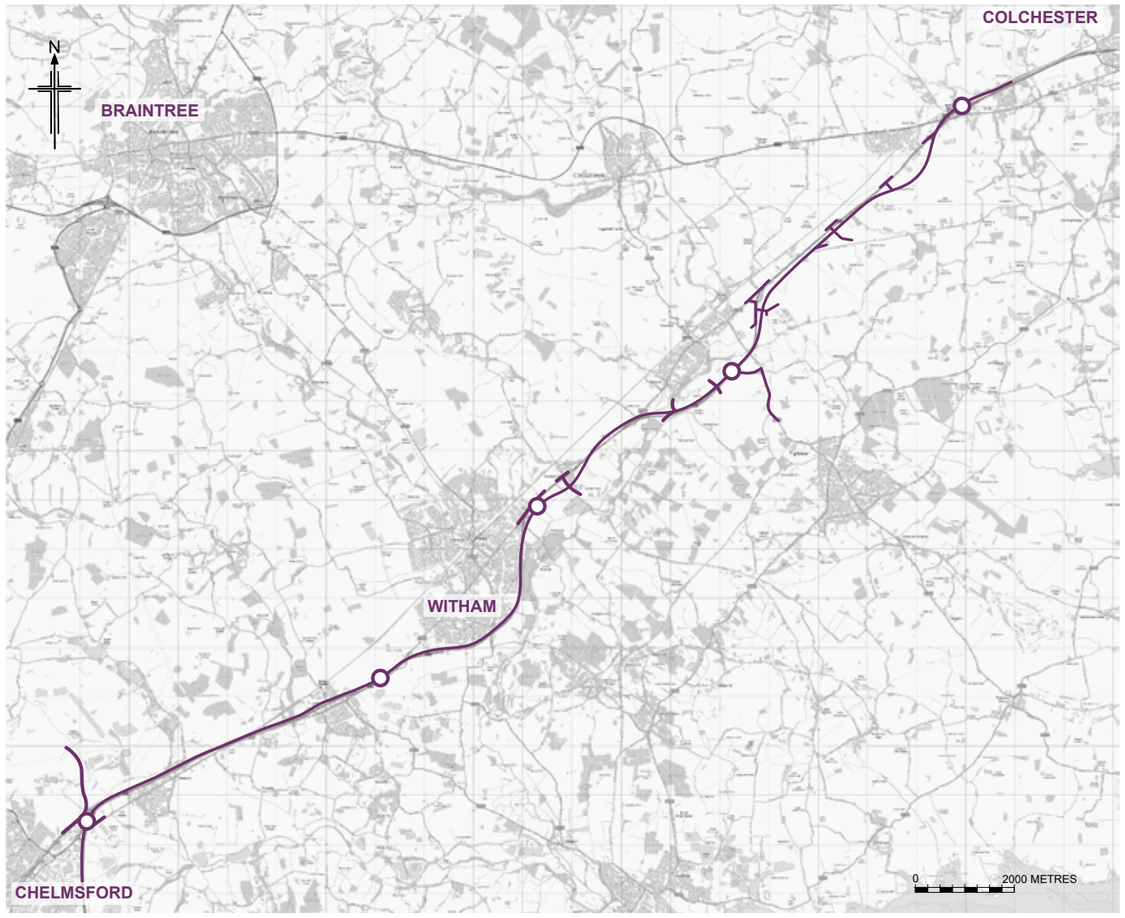
1.3 Structure of DAS

1.3.1 This document will describe the design evolution through the context, design consultation, landscape and structural design.

1.3.2 Document contents are as follows:

- Chapter 1: Introduction - background to document and purpose of DAS
- Chapter 2: Context - context of the proposed scheme in terms of surrounding development, transport improvements and planning policy
- Chapter 3: Consultation, Engagement and Design Development - background information on consultation process and how this informed the design evolution.
- Chapter 4: Proposed scheme Design - illustrates the proposed designs through maps and visualisations.
- Chapter 5: Walking, cycling and horse-riding (WCH) and Side Road Strategy - illustrates the existing, proposed and mitigated WCH strategies.
- Chapter 6: Landscape - sets out landscape strategy, showing how the landscape responds to each junction and surfaced area.
- Chapter 7: Structures - illustrates the design of proposed bridges and WCH bridges between Junction 19 and Junction 25.
- Chapter 8: Summary

Map 1.1: The proposed scheme route



1.4 Background to the proposed scheme

1.4.1 The proposed scheme comprises improvements to the A12 between junction 19 (Boreham interchange) and junction 25 (Marks Tey interchange), a distance of approximately 24km, or 15 miles.

1.4.2 The proposed scheme involves widening the A12 to three lanes throughout (where it is not already three lanes) with a bypass between junctions 22 and 23 and a second bypass between junctions 24 and 25.

1.4.3 The proposed scheme has evolved from the Department for Transport's Road Investment Strategy (RIS) 1: 2015-2020 and RIS 2: 2020-2025. RIS 2 committed the proposed scheme for investment under the second Road Period, covering financial

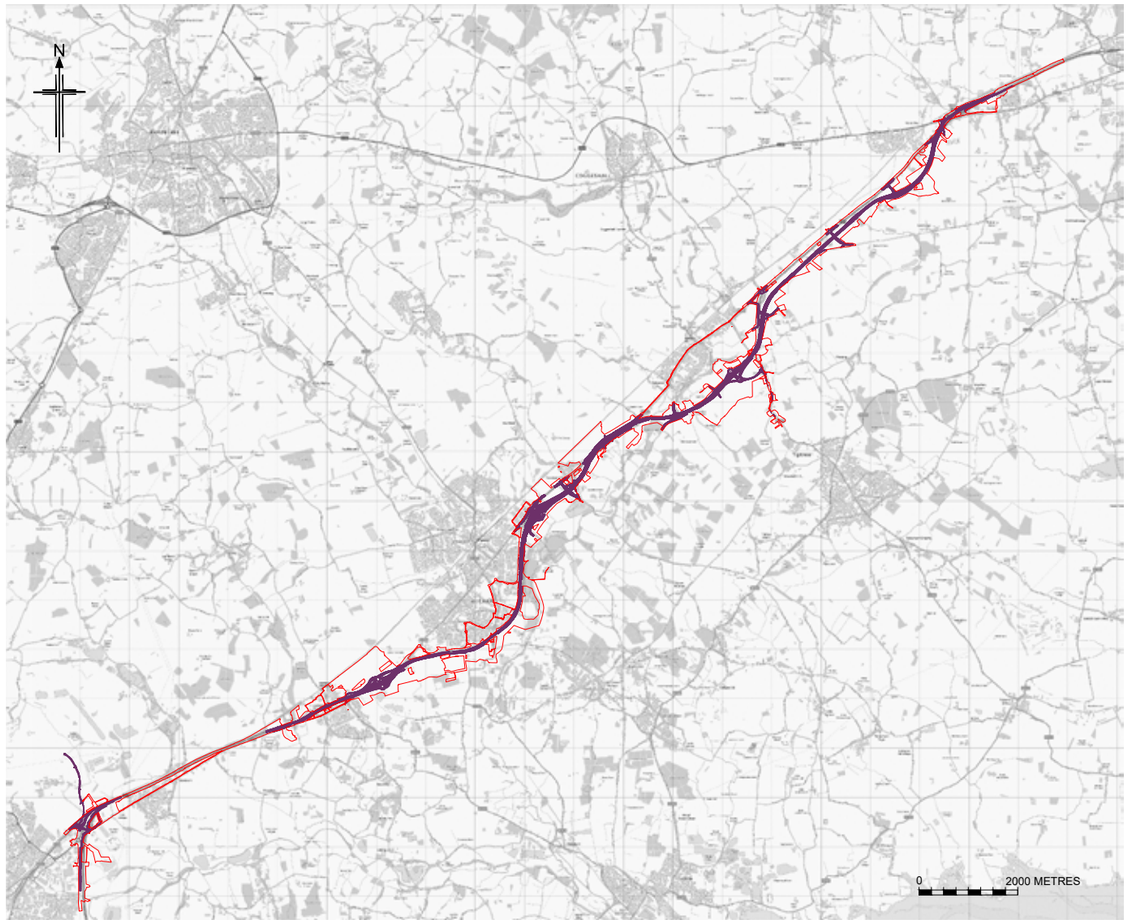
years 2020/1 to 2024/5.

1.4.4 From RIS 1, the order limits were proposed in 2014 and in October 2019, the preferred route was announced. The order limits have since undergone regular reviews as a result of stakeholder consultations and design development. Map 1.2 shows the latest order limits for the proposed scheme.

1.4.5 The key aims for the proposed scheme were derived from RIS 2 strategic outcomes.

1.4.6 The proposed scheme objectives are detailed in the Executive Summary of the DAS.

Map 1.2: proposed scheme order limits



02.

Context

2.1 Introduction

2.2 National planning policy

2.3 Regional planning policy

2.4 Local planning policy

2.5 Transport context

2.6 Development context

2.7 Land uses

2.8 Characteristics

2.9 Development opportunities

2. Context

2.1 Introduction

2.1.1 Chapter 2 provides background to the location and setting of the proposed scheme. It will set out national and regional policies and discuss major regeneration schemes surrounding the proposed scheme which have impacted design and access decisions.

2.1.2 This chapter provides an overview of relevant policy, which supports the Case for the Scheme [TR010060/APP/7.1] and National Policy Statement for National Networks (NNNPS) Accordance Table [TR010060/APP/7.2] which provides a detailed analysis of planning policy.

2.2 National Planning Policy

National Policy Statement for National Networks (NNNPS) (January 2015)

2.2.1 The NNNPS is the principal planning document English road and rail Nationally Significant Infrastructure Projects (NSIPs) are assessed against and therefore the main policy document the proposed scheme will be assessed against. Please see the National Policy Statement for National Networks Accordance Table [TR010060/APP/7.2] for the assessment of each NNNPS policy and the ways in which the proposed scheme will comply.

2.2.2 Clauses 4.28-4.35 of the NNNPS set out the criteria for 'good design' for national networks noting that design shall be an integral consideration from the outset:

Clause.	Criteria for "good design" for national network infrastructure
4.28	Applicants should include design as an integral consideration from the outset of a proposal.
4.29	Visual appearance should be a key factor in considering the design of new infrastructure, as well as functionality, fitness for purpose, sustainability and cost. Applying 'good design' to national network Schemes should therefore produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction, matched by an appearance that demonstrates good aesthetics as far as possible.
4.30	It is acknowledged however, that given the nature of much national network infrastructure development, particularly SRFIs [strategic rail freight interchanges], there may be a limit on the extent to which it can contribute to the enhancement of the quality of the area.
4.31	A good design should meet the principal objectives of the proposed scheme by eliminating or substantially mitigating the identified problems by improving operational conditions and simultaneously minimising adverse impacts. It should also mitigate any existing adverse impacts wherever possible, for example, in relation to safety or the environment. A good design will also be one that sustains the improvements to operational efficiency for as many years as is practicable, taking into account capital cost, economics and environmental impacts.
4.32	Scheme design will be a material consideration in decision making. The Secretary of State needs to be satisfied that national networks infrastructure Schemes are sustainable and as aesthetically sensitive, durable, adaptable and resilient as they can reasonably be (having regard to regulatory and other constraints and including accounting for natural hazards such as flooding).
4.33	The applicant should therefore take into account, as far as possible, both functionality (including fitness for purpose and sustainability) and aesthetics (including the proposed scheme's contribution to the quality of the area in which it would be located). Applicants will want to consider the role of technology in delivering new national networks Schemes. The use of professional, independent advice on the design aspects of a proposal should be considered, to ensure good design principles are embedded into infrastructure proposals.
4.34	Whilst the applicant may only have limited choice in the physical appearance of some national networks infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting and design measures relative to existing landscape and historical character and function, landscape permeability, landform and vegetation.
4.35	Applicants should be able to demonstrate in their application how the design process was conducted and how the proposed design evolved. Where a number of different designs were considered, applicants should set out the reasons why the favoured choice has been selected. The Examining Authority and Secretary of State should take into account the ultimate purpose of the infrastructure and bear in mind the operational, safety and security requirements which the design has to satisfy.

National Planning Policy Framework (NPPF) (July 2021)

2.2.3 Published March 2012 and most recently updated July 2021, the National Planning Policy Framework (NPPF) sets out Government planning policy for England.

2.2.4 Good design is described in Chapter 12, paragraph 126 of the NPPF in the context of *"creation of high quality, beautiful and sustainable buildings and places"*. It explains that 'the creation of high quality, beautiful and sustainable buildings and places is fundamental to what the planning and development process should achieve. Good design

is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities.' It is important that this is read in the context of the NNNPS and in consideration of the role and intended functions of the proposed scheme.

2.3 Regional Planning Policy

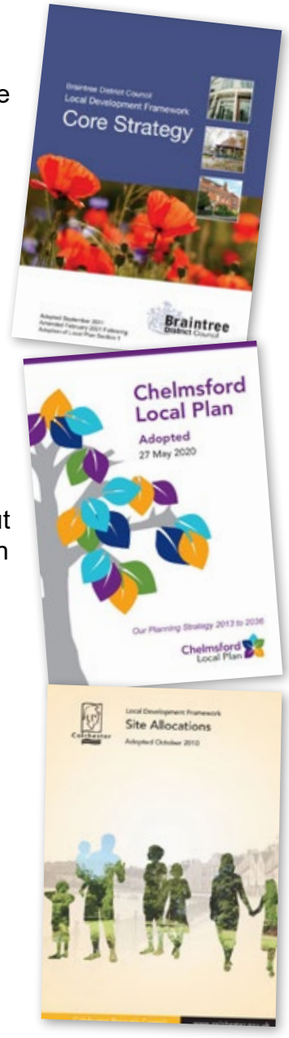
Essex Minerals Local Plan (2014)

2.3.1 Adopted in July 2014, the plan provides planning policies for mineral development in Essex until 2029. The plan identifies future sites for mineral development, long-term direction for mineral development, management policies and safeguarding for extraction.

Essex and Southend-on-Sea Waste Local Plan (2017)

2.3.2 Essex County Council adopted the plan on 11 July 2017 and Southend-on-Sea Borough Council on 19 October 2017. The plan sets out how Essex and Southend-on-Sea aim to manage waste for its duration. It also seeks to deal with waste more sustainably, encouraging recycling and reducing reliance on landfill.

2.3.3 The plan includes the Waste Core Strategy, which sets out the long-term direction for waste development and a plan to deliver this, development management policies for waste planning, strategic site allocations and safeguarding of waste infrastructure and a Policies Map.



2.4 Local Planning Policy

The relevant local planning policies are:

Braintree Local Plan (2013 - 2033)

2.4.1 The Local Plan 2013-2033 is a 2-part document which sets out the strategy for development of the District up to 2033. Section 1 is shared with Colchester and Tendring Councils and covers all three authorities.

2.4.2 The formal adoption of the Section 1 Local Plan by Braintree District Council on 22nd February 2021 has the effect of replacing, in part, a number of the strategic policies contained within the Braintree District Core Strategy, adopted in 2011 .

2.4.3 The Braintree District Local Plan Review (2005) and Core Strategy (2011) have been replaced in full on the formal adoption of Section 2 of Local Plan on 25th July 2022.

Chelmsford Local Plan (2013 - 2036)

2.4.4 Adopted in May 2020, Local Plan identifies the number and locations for houses, jobs and businesses, along with the infrastructure needed to support growth.

Colchester Adopted Local Plan (2001 - 2021)

2.4.5 Adopted in May 2005, this Local Plan compromises the following:

- Core Strategy (adopted 2008, amended 2014)
- Site Allocations development plan documents (DPD (adopted 2010)
- Development Policies DPD (adopted 2010, amended 2014)
- Proposals Maps (adopted 2010)
- Tiptree Jam Factory DPD (adopted 2013)
- Adopted Neighbourhood Plans

Colchester Local Plan (2017 - 2033)

2.4.6 Submitted to the Planning Inspectorate on 9th October 2017, the Local Plan is split into two parts; Section 1 for North Essex and Section 2 for policies and maps considering planning applications.

2.4.7 Section 1 was adopted at Colchester Council's Full council meeting in February 2021. The Section 1 Plan includes policies for a Garden Community at Tendring/Colchester Borders

2.4.8 Section 2 of the Colchester Local Plan 2017-2033 provides the policy framework, site allocations and development management policies for the Borough up to 2033. This was Adopted by Colchester Borough Council on 4th July 2022.

Maldon District Local Development Plan (2014 - 2029)

2.4.9 Approved by the Secretary of State in July 2017, the development plan sets out the planning strategy for future growth over 15 years. It provides a spatial strategy for the delivery of the required future employment, homes, retail, community facilities and infrastructure provision.

Eight Ash Green Neighbourhood Plan (2017 - 2033)

2.4.10 This Neighbourhood Plan sets out the vision for Eight Ash Green and the planning policies for the use and development of land. It forms part of the statutory planning framework. The policies and proposals contained within it will be used as a basis for the determination of planning applications.

Boxted Neighbourhood Plan (2014 - 2029)

2.4.11 Adopted 8th December 2016, Boxted Neighbourhood Plan seeks to represent on part of the development plan for the parish over the period 2014 to 2029. This Neighbourhood Plan includes planning policies currently adopted by Colchester Borough Council.

Mark Tey Neighbourhood Plan (2020 - 2033)

2.4.12 Submitted for examination in December 2020, this plan sets out a framework for future development within the plan area.

Myland and Braiswick Neighbourhood Plan (2016 - 2032)

2.4.13 Adopted in July 2016, this plan establishes a number of policies for housing, education, employment, environment and social amenity.

Tiptree Neighbourhood Plan (2020 - 2033) (Emerging)

2.4.14 Colchester Borough Council, as the local planning authority, designated a Neighbourhood Area for the whole of the Tiptree parish area in 2015 to enable Tiptree Parish Council to prepare the Neighbourhood Plan. The Plan has been prepared by the community through the Tiptree Neighbourhood Plan Steering Group.

West Bergholt Neighbourhood Plan (2018 - 2033)

2.4.15 Adopted August 2019, the plan identifies the main community issues and objectives for West Bergholt as a whole.

2.5 Transport context

2.5.1 The A12 road is an important economic link. It provides the main south-west/north-east route through Essex and Suffolk, connecting Ipswich to London and the M25. It is an important freight connection, especially to Felixstowe and Harwich ports.

2.5.2 A120 is vital for the area's east to west connection. The A12 road plays an important role for A120 with the A120 merging onto the A12 at junction 24, leaving again at junction 25.

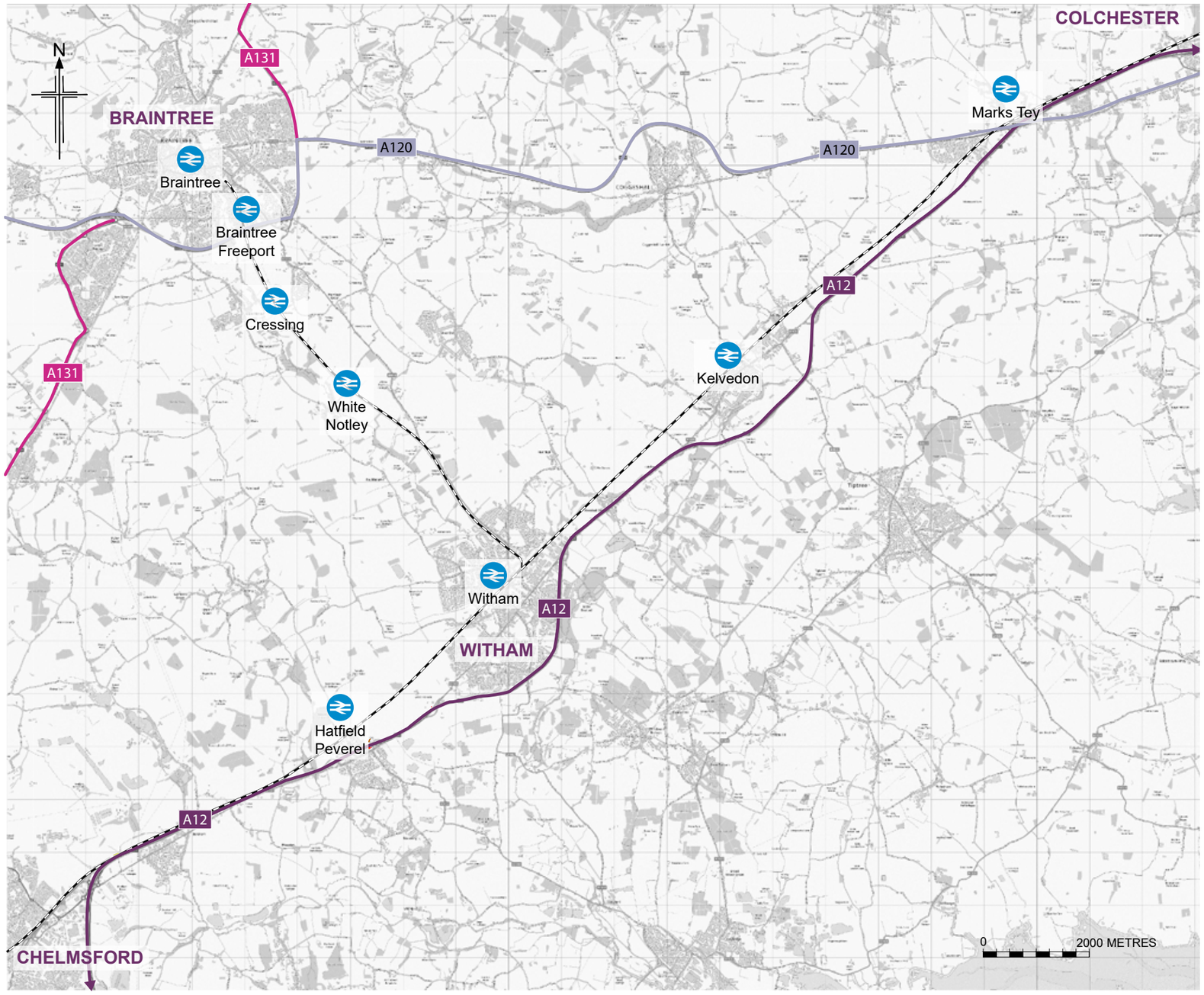
2.5.3 The A12 road performs the same function for the A130, joining at A12 junction 17 until junction 19. From Chelmsford via junction 19, the A131 connects Chelmsford with Braintree and the north-east.

2.5.4 The immediate area is served by the East Coast Mainline operating between London Liverpool Street Station and Clacton-on-Sea/Walton-on-the-Naze.

2.5.5 Rail users are able to connect to Braintree via Witham Station.

2.5.6 Towns south-east of the A12 are not serviced by train stations and therefore rely heavily on surrounding road networks.

Map 2.1: Present transport context



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Regional planning policy and applications

Table 2.1 Regional development allocations and applications

Site No.	Scheme/allocation name	Scheme/allocation status	Scheme/allocation details	Impact on A12 to A120 Widening Scheme
1	Bulls Lodge Quarry	EIA Required	Continuation of development permitted by CHL/1890/87. Planning permission CHL/1890/87 was for the "Winning and working of sand and gravel, the erection of a processing plant and ready mix concrete and mortar plants, workshop and weighbridge and office.'' Most recent application (ESS/66/17/CHL/SO) was submitted January 2018.	The quarry has operated since 1990 (CHL/1890/87 permitted in 1990), supplying around 750,000 tonnes per annum of sand and gravel products to the Chelmsford and south east of England construction market. It is therefore a strategic mineral site in the provision of construction aggregates and was identified as an existing and operational site at optioneering. The primary vehicular access lies off Generals Lane and the A12 / A130 / A138 Boreham interchange and therefore has been considered within the proposed scheme's traffic model. Engagement with the landowner, identified that A130 is the main vehicular access for HGVs and therefore reduces any impact on the proposed scheme.
2	Chelmsford North East Bypass (CNEB)	Approved	A single carriageway road between Roundabout 4 of the Beaulieu Park Radial Distributor Road (RDR1) and a new roundabout on the A131 at Chatham Green plus dualling of the existing A131 between Chatham Green and Deres Bridge roundabout. Application CC/CHL/85/21 was submitted September 2021, and approved March 2022.	The CNEB Scheme has been developed periodically since 2005 as a strategic highway link between the A12 and Boreham interchange in the south and the A131 at Deres Bridge. The overall aim of this route has always been to provide a high standard primary dual carriageway between the A120 and the A12 at Boreham to bypass the existing A130/A131 single carriageway which passes through residential areas. The Option D, as presented at 2006 public consultation, (as amended) route corridor was safeguarded within the Chelmsford Local Development Plan (2008 – 2021). From the longevity of the CNEB development, the proposed scheme has considered all operational impacts within traffic models and assessments. See ES Chapter 16 'Cumulative Effects' [TR010060/APP/6.1] Table 16.6 for details on cumulative effects of CNEB.
3	Colemans Farm Quarry / Policy S8	Approved / Adopted	Continuation of use of land for mineral extraction and ancillary use without compliance with Conditions 2 (Approved Details); 6 (Plant Site Layout) and 47 (Soil Storage Arrangements) of planning permission ESS/39/14/BTE granted for " Extraction of an estimated 2.5 million tonnes of sand and gravel together with the provision of a new access from Little Braxted Lane; and the installation/construction and operation of primary processing and ancillary facilities comprising washing and bagging plant, silt lagoons, weighbridge, site management office, mess room and maintenance workshop; with restoration to agriculture and water based nature conservation habitats" to enable the re-phasing of the working and restoration of the site, changes in soils bunds configuration and to provide car parking for visitors in the ancillary plant site area. Several applications (ESS/10/18/BTE, ESS/39/14/BTE, ESS/40/18/BTE, ESS/98/21/BTE) dating back to June 2016 have been submitted for the extraction of sand and gravel along with additional site services.	National Highways has been continuously engaged with applications to allow the applicant to continue with works while ensuring there is no impact on A12 proposals. Most recent application (ESS/98/21/BTE) was submitted Autumn 2021, is for an extension of the existing Colemans Quarry covering 212,000 tonnes of materials (Area A). There is an additional 'Area B' for 113,000 tonnes of materials which is not included in this application. Both Areas A and B are within the proposed scheme's order limits, residing where junction 22 is proposed. The application is for the excavation of materials and backfill to quarry void. The key issue identified is in relation to the timing of land restoration to ensure there is no impact of the proposed scheme's programme and ability to undertake work necessary for junction 22. National Highways has held multiple workshops with the applicant to resolve the issues identified including zoning areas needed for backfilling to support the proposed scheme's programme and identify materials from the proposed scheme to use as backfill if ESS/98/21/BTE programme is delayed.

Local development allocations

2.5.7 In addition to Essex County Council, the proposed scheme covers a number of Councils, including:

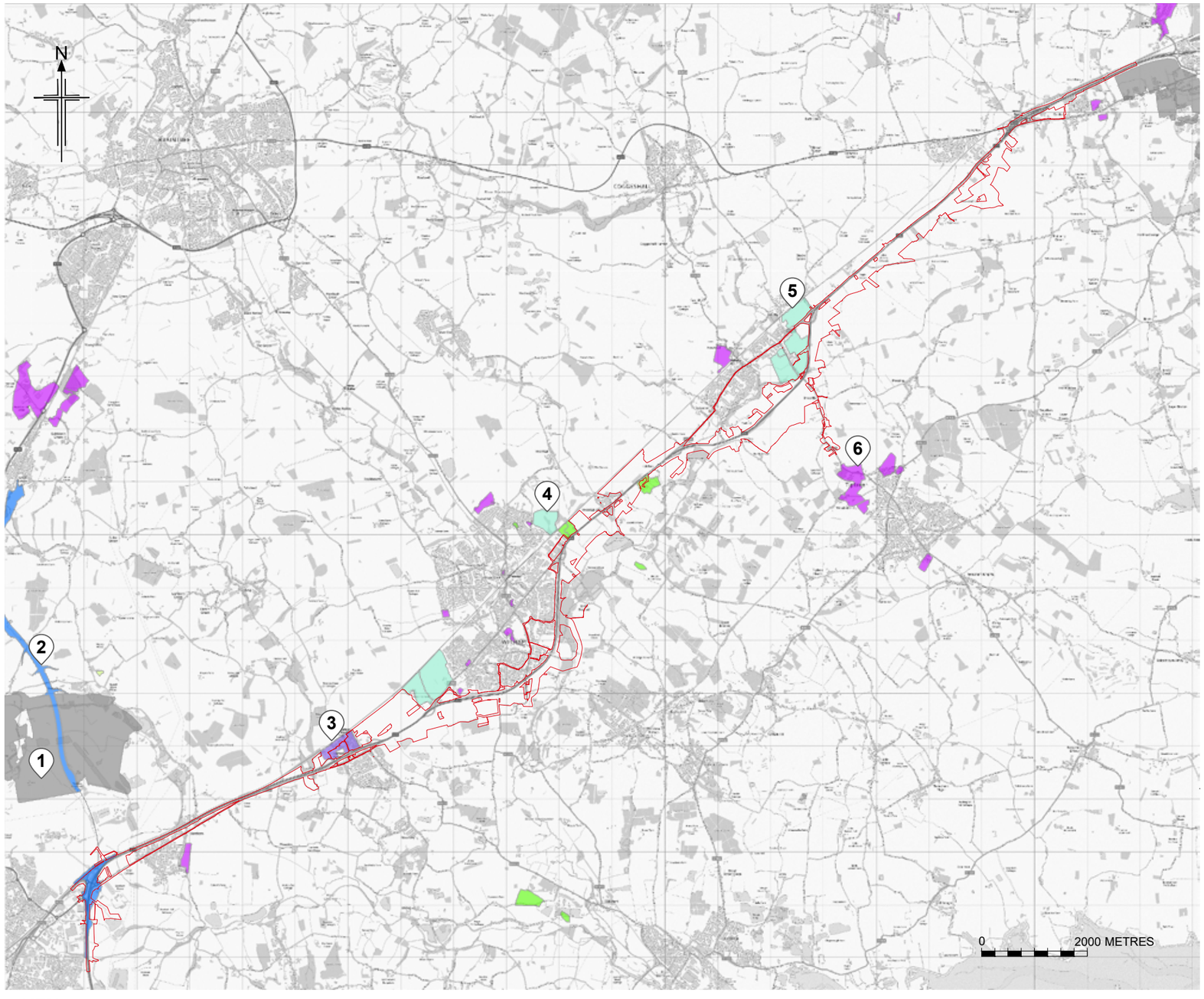
- Chelmsford City Council
- Braintree District Council
- Maldon District Council
- Colchester Borough Council

2.5.8 The following plans have detailed site allocations associated with their policies which have been reviewed and accounted for in relation to the design of the proposed scheme:

- Braintree Core Strategy (2010 - 2026)
- Chelmsford Local Plan (2013 - 2036)
- Colchester Adopted Local Plan (2001 - 2021)
- Colchester Adopted Local Plan (2017 - 2033) (Part 1)
- Colchester Emerging Local Plan (2017 - 2033) (Part 2)
- Maldon District Local Development Plan (2014 - 2029)

2.5.9 Map 2.3 shows all local council development allocations from all adopted and emerging Local Plans in the proposed scheme's vicinity. Table 2.2 provides an overview for a number of the allocations and details the potential impact of each allocation in the context of the proposed scheme. For a comprehensive list of allocations see ES Chapter 16: 'Cumulative Effects' [TR010060/APP/6.1].

Map 2.2: Local development allocations



Local planning allocations

Table 2.2 Local development allocations

Site no.	Allocation Name	Allocation status	Allocation details	Impact on A12 to A120 Widening Scheme
1	Strategic Growth Site Policy 6 – North East Chelmsford	Under construction	Around 3,000 new homes of mixed size and type to include affordable housing and specialist residential accommodation. 45,000sqm of floorspace in a new office/business park providing a range of unit sizes and types Travelling showpeople site for 9 serviced. Application 09/01314/EIA was submitted September 2009 and approved March 2014.	Alternatives considered at options stage included re-designing junction 19. Prior to announcing the preferred route for A12, Greater Beaulieu Park developers announced their proposal to upgrade existing junction 19 which provided an opportunity for the proposed scheme to tie into their junction 19. Greater Beaulieu Park provides both a train station and business park, both parcels of land impacting existing WCH routes. The proposed scheme proposes to mitigate this through redirecting the existing WCH to take users to both the business park and open fields. See ES Chapter 16 'Cumulative Effects' [TR010060/APP/6.1] table 16.6 for details on cumulative effects of Strategic Growth Site Policy 6.
2	Strategic Policy S11: Chelmsford North East Bypass (CNEB)	Approved	Chelmsford North East Bypass. Safeguarded route included in the emerging plan. Application CC/CHL/85/21 was submitted September 2021, and approved March 2022.	The CNEB Scheme has been developed periodically since 2005 as a strategic highway link between the A12 and Boreham Interchange in the south and the A131 at Deres Bridge. The overall aim of this route has always been to provide a high standard primary dual carriageway between the A120 and the A12 at Boreham to bypass the existing A130/ A131 single carriageway which passes through residential areas. The Option D, as presented at 2006 public consultation, (as amended) route corridor was safeguarded within the Chelmsford Local Development Plan (2008 – 2021). From the longevity of the CNEB development, the proposed scheme has considered all operational impacts within traffic models and assessments. See ES Chapter 16 'Cumulative Effects' [TR010060/APP/6.1] Table 16.6 for details on cumulative effects of CNEB.
3	Comprehensive Redevelopment Area, Policy LPP 31	Under construction	Comprehensive Redevelopment Area - Land between A12 and Great Eastern Main Line (GEML), Hatfield Peverel. The following development is supported within the comprehensive redevelopment area at land between A12 and GEML. Mixed use development of up to 200 dwellings on former Arla D. 17/00341/OUT was submitted in February 2017 which reflects Policy LPP 31 development area.	The proposed development is a cul-de-sac masterplan which makes use of the existing Bury Lane as its primary access. In addition there is a condition (29) which restricts vehicular access (excluding emergency vehicles) accessing Station Road through the former Arla Dairy site. National Highways supported this condition whilst A12 remained in its current form. As part of the proposed scheme both Bury Lane Bridge and Station Road Bridge will be replaced and therefore impact access to Witham and 17/00341/OUT. The proposed scheme proposes to divert traffic from Station Road during construction through the application site to make use of Bury Lane Bridge. Similarly, temporary access is proposed to Station Road for residents during Bury Lane Bridge construction to avoid the cul-de-sac being landlocked. The proposed scheme will sequence the construction of both bridges to ensure limited impact on the residents and allow road access at all times.

4	RIVE 363, Policy LPP 2	Approved with S106	Extension to Eastways Industrial Estate, Witham (Rivenhall Parish). Braintree District Council's Local Plan site allocation RIVE 363 was realised through application 20/00128/OUT in January 2020 and approved in December 2021.	The site allocation and application overlaps with the proposed scheme, where earthworks and utility corridors were proposed. National Highways optimised the design to reduce earthworks and remove utility corridors to enable the industrial park to be developed without impact. See ES Chapter 16 'Cumulative Effects' [TR010060/APP/6.1] table 16.6 for details on cumulative effects of application 20/00128/OUT.
5	FEER233	Proposed Development Location	Provision of approximately 750 dwellings.	To reduce impact on Prested Hall, the proposed junction 24 design was moved further south which in turn requires a larger take of Crown Estate land. In relation to Policy FEER233, the movement of junction 24 will allow the developer to utilise this junction opposed building a new junction solely for the housing development.
6	Tiptree - Jam Factory	Proposed Development Location	The redevelopment of the existing factory site for housing and residential development of land to the north of Factory Hill. Public open space on land to the north of Factory Hill. A new factory on land to the south of the existing factory on the employment site allocated in the Adopted Site Allocations Document. The indicative number of dwelling units to be provided for the two residential sites is 250.	In addition to reducing impact on Prested Hall, the movement of junction 24 was a result of Tiptree development location and their future requirement of a road network. By moving junction 24 further south, residents will more easily access the A12 via Inworth Road. Improvements to Inworth Road will allow for this higher increase in users joining the A12 via junction 24.

2.6 Development context

Introduction

2.6.1 South-east Essex, where the A12 sits, is undergoing significant development primarily residential, industrial and green energy sector.

2.6.2 To meet the national and regional housing demand, surrounding villages and towns are expanding their urban boundaries by encroaching into green space to provide housing in a mainly rural setting, altering the character of several areas along the A12.

2.6.3 This section looks at a handful of key developments along the A12 route and considers how they have and/or should influence the design of the proposed scheme.

2.6.4 See ES Chapter 16: 'Cumulative Effects' [TR010060/APP/6.1] for more detail on impacts caused by other developments together with the proposed scheme.

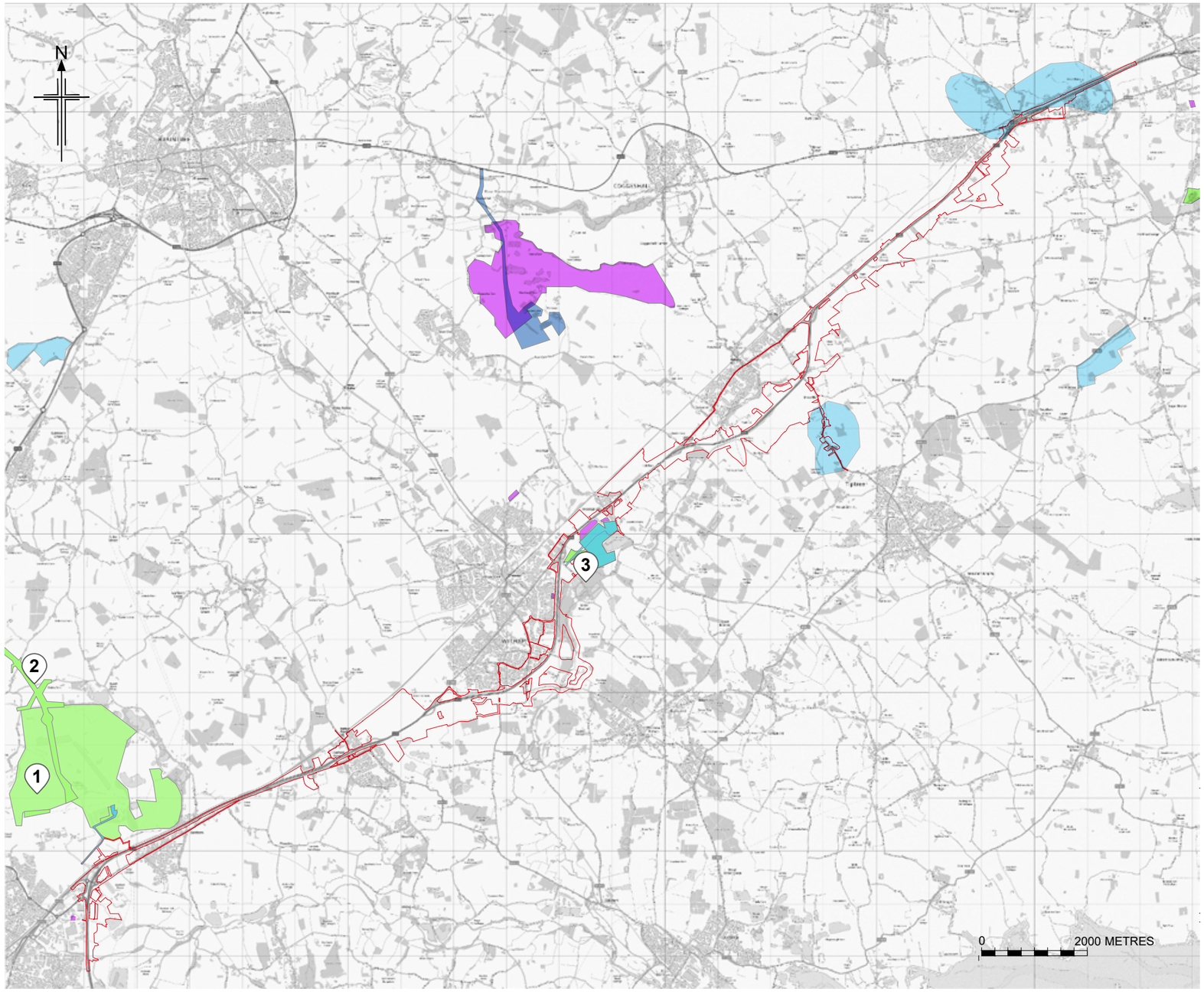
Regional Development Allocations and Applications

2.6.5 Essex County Council is party to several significant developments through local planning policies (Essex Minerals Local Plan 2014 and Essex and Southend-on-Sea Waste Local Plan 2017) and regional planning applications where the council is the determining authority.

2.6.6 Map 2.2 shows all Essex County Council (ECC) development allocations and planning applications (validated within last five years) in the proposed scheme's vicinity, as agreed with ECC.

2.6.7 Table 2.1 provides an overview for a number of allocations and developments and details the potential impact in the context of the proposed scheme. For a comprehensive list of allocations and applications see ES Chapter 16: 'Cumulative Effects' [TR010060/APP/6.1]

Map 2.3: Regional development allocations and applications



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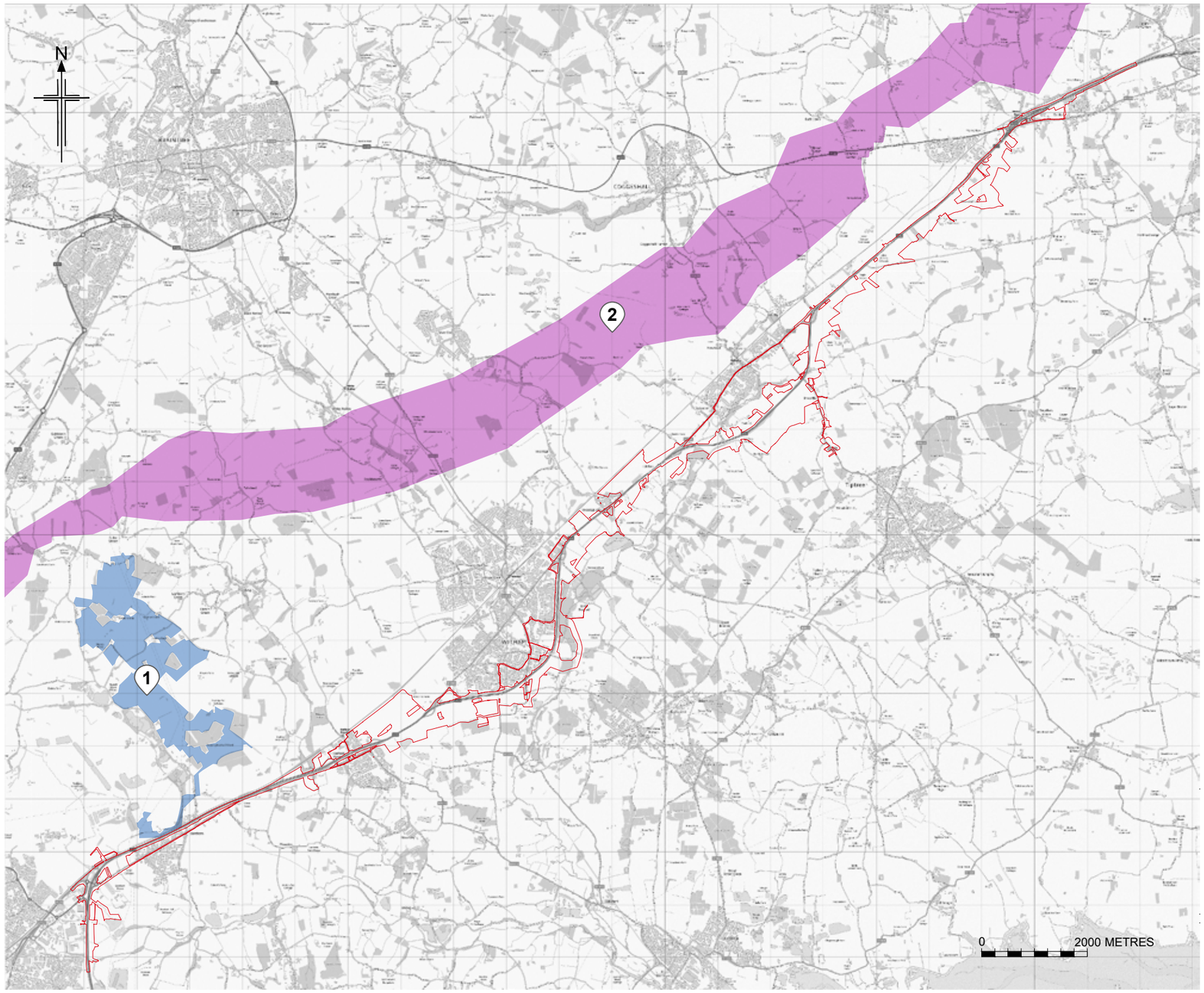
Nationally Significant Infrastructure Projects (NSIPs)

2.6.8 Surrounding NSIPs have been monitored and consulted throughout, to ensure there is no significant impact on either NSIP. This has included engaging on construction timescales, methods and access routes and cumulative effects including labour and materials required.

2.6.9 Map 2.4 shows all applications that are within the assessment methodology (2km from order limits). Table 2.4 provides an overview of the applications and details the potential impact of each application in the context of the proposed scheme.

Map 2.4: Nationally Significant Infrastructure Projects



Nationally Significant Infrastructure Projects

Table 2.3 Nationally Significant Infrastructure Projects

Site No.	Application name	Application status	Application details	Impact on A12 to A120 Widening Scheme
1	Longfield Solar Farm	Pre-examination	Nationally Significant Infrastructure Project (NSIP) for a new solar energy farm, co-located with battery storage.	The proposed solar farm is located north of the existing junction 19. National Highways has engaged with the applicant thoroughly and regularly to discuss their use of junction 19 for construction purposes and timescales to ensure they are not impacted by the proposed scheme's construction timescales at junction 19. The applicant highlighted the operational uses of the site, informing National highways that only 3-5 vehicles will be accessing the site on a daily basis, therefore, there will be no operational impact on the proposed scheme and therefore have proposed no design changes. The proposed construction timescales and HGV routes mirror the proposed scheme and therefore National Highways has agreed with the developer a shared use of country lanes for construction purposes. See ES Chapter 16 'Cumulative Effects' [TR010060/APP/6.1] Table 16.6 for details on cumulative effects of Longfield Solar Farm.
1	East Anglia Green Energy Enablement (GREEN)	Pre-acceptance	The East Anglia (GREEN) project is a proposal to build a new high voltage network reinforcement between Norwich, Bramford and Tilbury.	The East Anglia GREEN project is at an early stage and it's exact design requirements are not yet known. National Highways and National Grid are working with each other to identify and work through project interfaces so that both projects can be delivered successfully. The programme for East Anglia Green published for consultation indicates a construction start date 2026/7, with completion 2030. Based on this, the construction programme would overlap with that for the proposed scheme. National Highways and National Grid, as well as contractors appointed on their behalf, will work together in the event both projects are to be delivered to ensure construction impacts are managed appropriately.

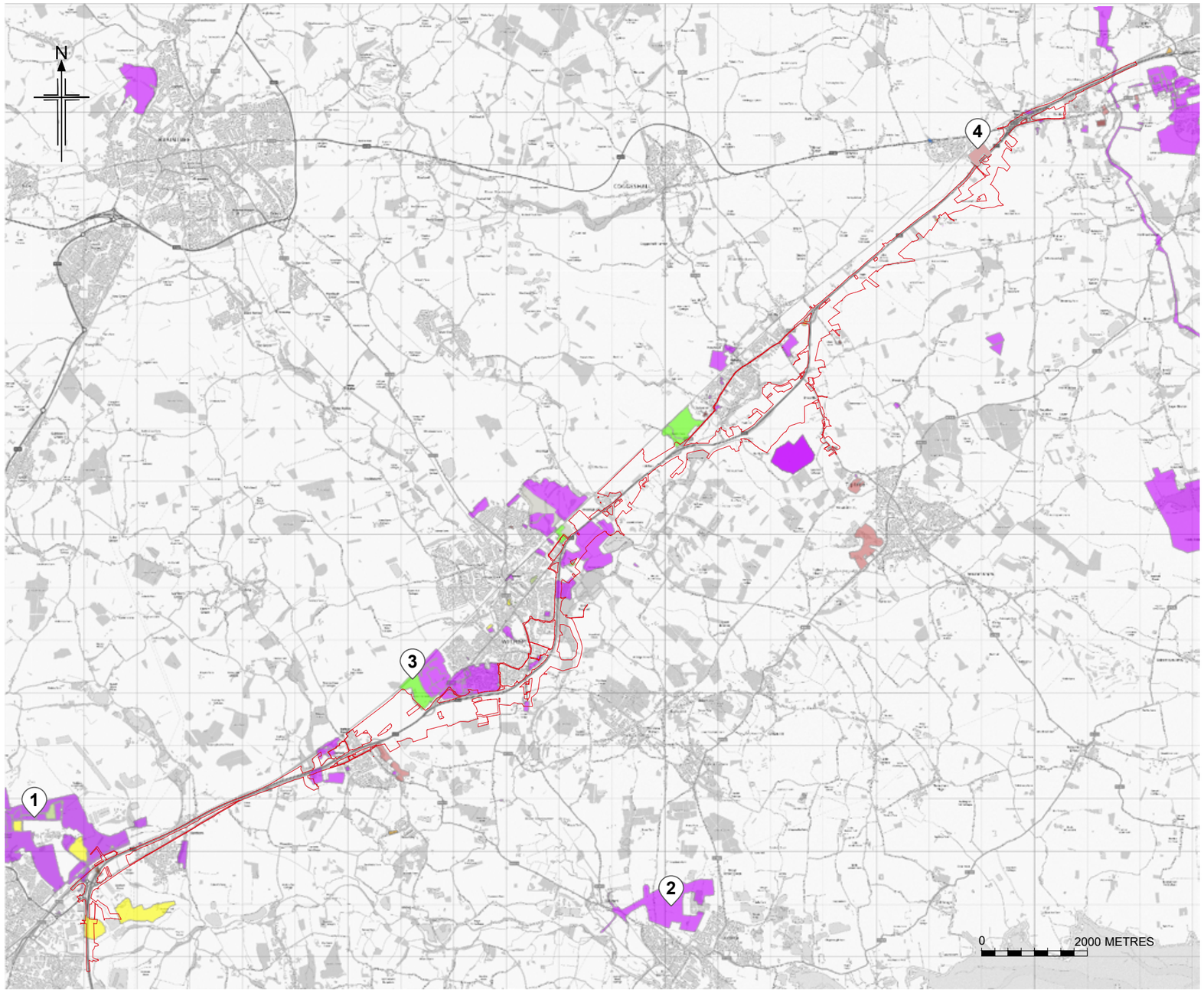
Local applications

2.6.10 In addition to Essex County Council, the following councils have been have been monitored to ensure all applications (validated within five years) are accounted for:

- Chelmsford City Council
- Braintree District Council
- Maldon District Council
- Colchester Borough Council

2.6.11 Map 2.5 shows all applications that are within the assessment methodology (2km from order limits) Table 2.5 provides an overview for a number of the applications and details the potential impact of each application in the context of the proposed scheme. For a comprehensive list of applications see ES Chapter 16 'Cumulative Effects' [TR010060/APP/6.1]

Map 2.5: Local applications



Local applications

Table 2.4 Local applications

Site No.	Application name	Application status	Application details	Impact on A12 to A120 Widening Scheme
1	Greater Beaulieu Park	Under Construction	Outline Application: Mixed use development comprising residential development of up to 3,600 dwellings, mixed uses (up to 62,300sqm gross external) comprising employment floorspace including new business park, retail, hotel, leisure, open space, education and community facilities, landscaping, new highways including a radial distributor road, public transport provisions and associated and ancillary development, including full details in respect of roundabout access from Essex Regiment Way and a priority junction from White Hart Lane. Application 09/01314/EIA was submitted September 2009 and approved March 2014.	Alternatives considered at options stage included re-designing junction 19. Prior to announcing the preferred route for A12, Greater Beaulieu Park developers announced their proposal to upgrade existing junction 19 which provided an opportunity for the proposed scheme to tie into their junction 19. Greater Beaulieu Park provides both a train station and business park, both parcels of land impacting existing WCH routes. The proposed scheme proposes to mitigate this through redirecting the existing WCH to take users to both the business park and open fields.
2	Land At Broad Street Green Road, Maypole Road And Langford Road	Approved with S106	Part outline/part detailed (hybrid) application for mixed use development including: (i) Residential development (Use Class C3) for up to 1138 dwellings including 30% as affordable housing (Outline) (ii) Residential Care for up to 120 beds (Use Class C2) (Outline) (iii) “Neighbourhood” uses which may include retail, commercial, and community uses (Use Classes A1 and/or A2 and/or A3 and/or A4 and/or A5 and/or D1a and/or D1b) (Outline) (iv) Primary school and early years childcare facility (Use Class D1c) (Outline) (v) A relief road between Broad Street Green Road and Langford Road (Detailed element) (vi) Formal and informal open space (including any associated sports pavilion/clubhouse) (Use Class D2e) (Outline); (vii) Construction of initial gas and electricity sub-stations (Detailed); and (Viii) All associated amenity space, landscaping, parking, servicing, utilities (other than as listed in item (vii) above), footpath and cycle links, on-site drainage, and infrastructure works (Outline). 15/00419/OUT was submitted April 2015 and subsequently refused March 2019. The application was taken to appeal where it was grant approval with S106.	This development will provide 1,138 dwellings creating an urban extension to Heybridge. The existing A12 would serve these residents via junction 20a northbound and 20b southbound. The vast amount of new road users from this proposed development influenced the decision to combine both 20a and 20b providing a central junction 21 which takes traffic both northbound and southbound.
3	Land North Of Woodend Farm Hatfield Road Witham Essex	Approved	Application for Outline Planning Permission with all matters reserved Up to 400 residential dwellings and day nursery with all associated access, servicing, parking, drainage infrastructure, landscaping, open space and utilities infrastructure. 19/01896/OUT was submitted October 2019 and is pending decision.	19/01896/OUT proposes a new site access via a new roundabout connecting to Hatfield Road and existing A12. Pre-submission discussions were been held between the applicant and National Highways, where it was confirmed to jointly develop a more feasible and complementary highway layout at Junction 21 that is beneficial to both schemes. See ES Chapter 16 ‘Cumulative Effects’ [TR010060/APP/6.1] Table 16.6 for details on cumulative effects of 19/01896/OUT.
4	Anderson Site	Appeal pending	Development of site for commercial business and service purposes (within Class E) c) and g) and business purposes (B2 and B8) with associated hard surfacing, access and parking. 200388 was submitted to Colchester Borough Council in February 2020 and was withdrawn by the applicant in May 2021. The application is due to be resubmitted.	As a result of interactions with the applicant, National Highways has increased limits of deviation to allow the roundabout proposed off junction 25 (connecting to London Road) to be relocated to better serve the proposed location of the Anderson Site. This will allow the site to connect directly to the A12 which will lower impact on local road network.

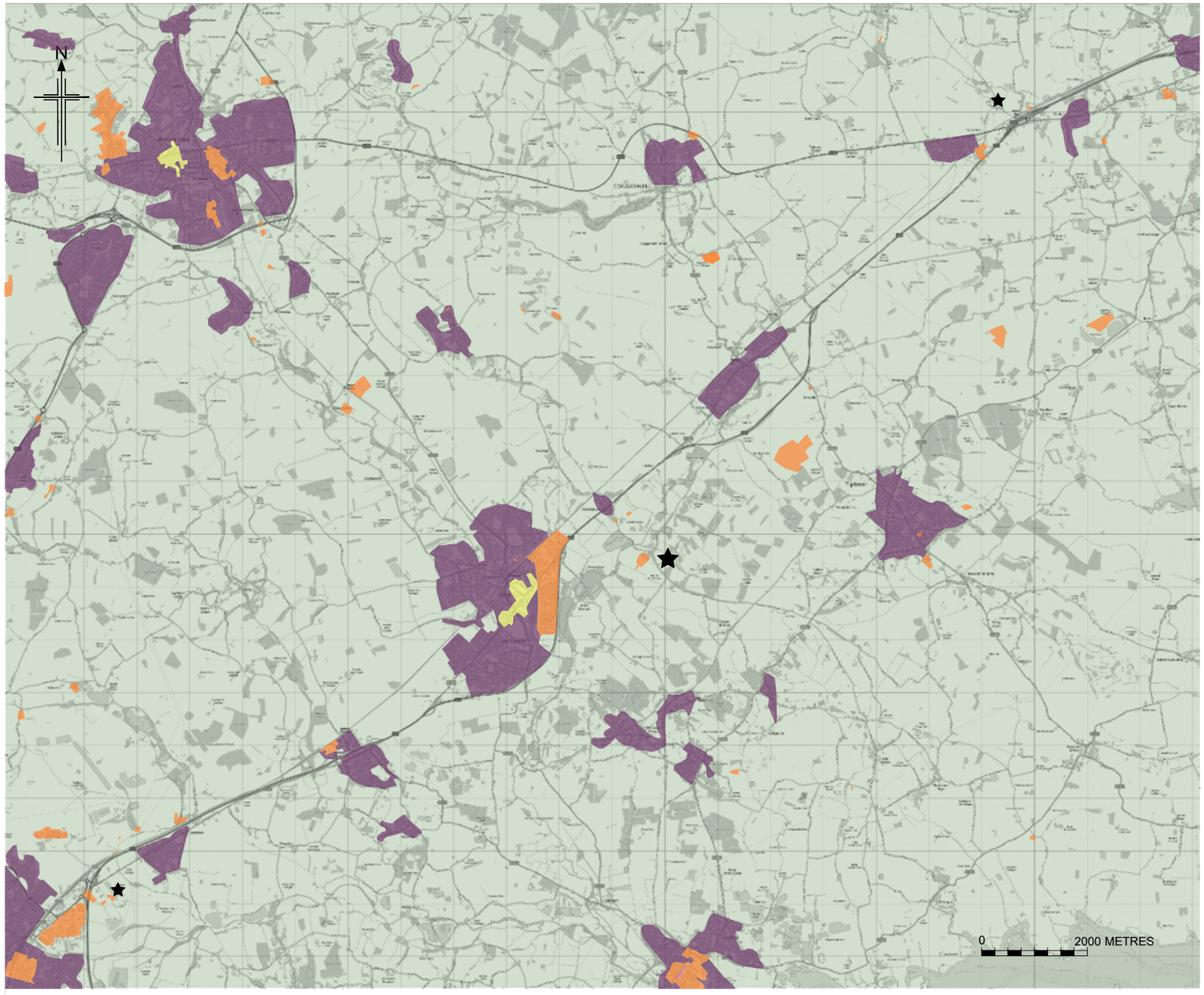
2.7 Land uses: today

2.7.1 The existing conditions within the proposed scheme order limits and surrounding area are reported in Chapters 6-15 of the ES [TR010060/APP/6.1].

2.7.2 The existing A12 connects the large communities of Chelmsford and Colchester. It passes through and connects several smaller communities at Boreham, Hatfield Peverel, Witham, Rivenhall End, Kelvedon, Marks Tey and Copford. These communities are also served by a network of public rights of way including bridleways. Land use outside built-up areas is generally arable land with pockets of other farming types. There are a number of large commercial plots (over 100ha in size) along the route. Soils are generally classed as 'good' or 'very good' according to provisional Agricultural Land Classification data.

2.7.3 The area has 100+ Grade II listed buildings comprising residential dwellings, churches and manor houses. There are two Grade I listed buildings; Boreham House and St Andrew's Church.

Map 2.6: Existing land uses



2.8 Land uses: future

2.8.1 The proposed scheme's geography is undergoing a transformation through multiple mixed-use urban extensions and piecemeal industrial, residential and agricultural development. Map 2.7 shows the potential land use changes to the area based on committed developments and Local Plan data.

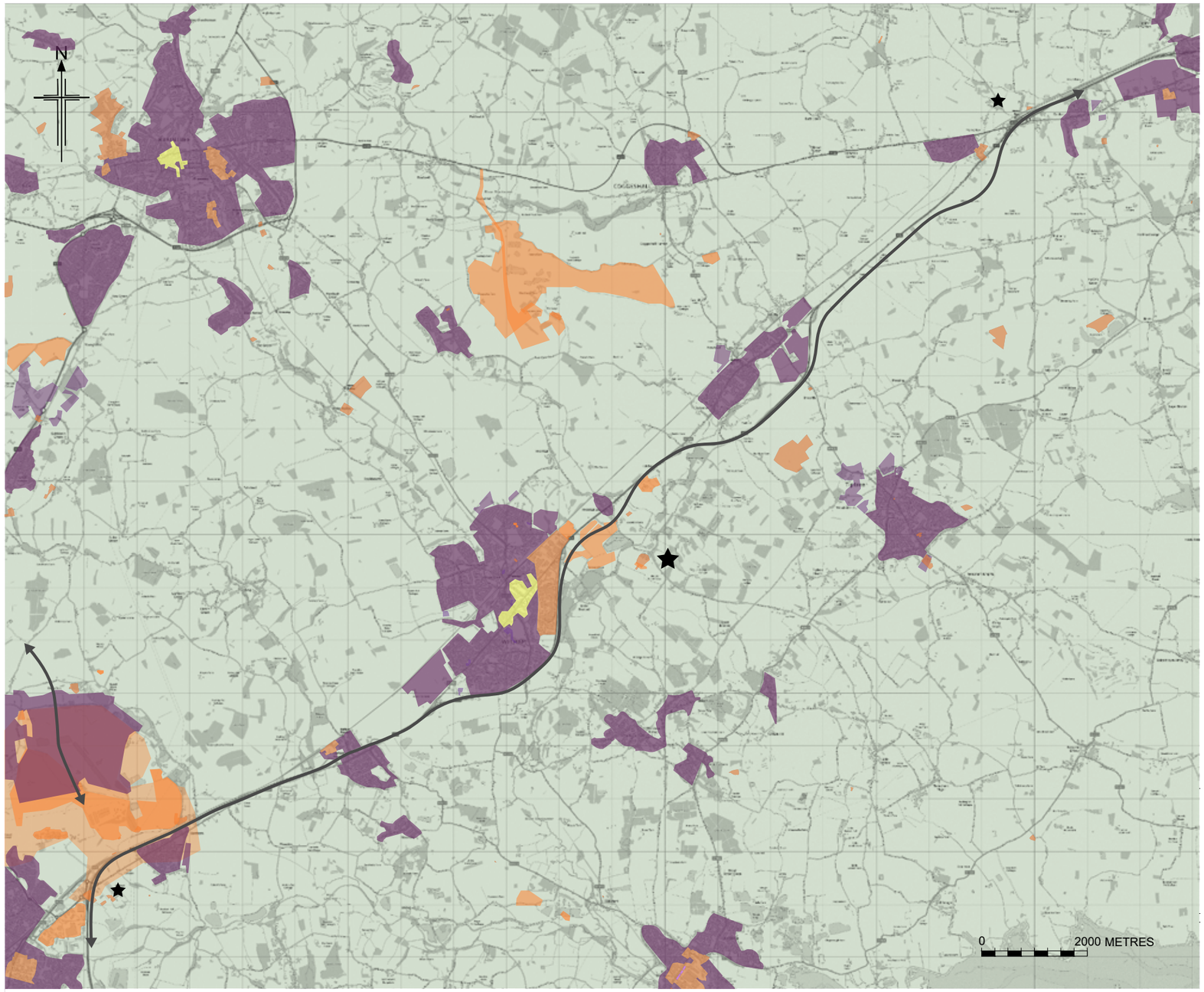
2.8.2 Chelmsford is undergoing the construction of Greater Beaulieu Park which comprises 3,600 dwellings, mixed uses (up to 62,300sqm gross external) comprising employment floorspace including new business park, retail, hotel, leisure, open space, education and community facilities.

2.8.3 Chelmsford is undergoing road infrastructure improvements including junction 19 improvements from Greater Beaulieu Park and CNEB.

2.8.4 Witham and its surrounding area is expanding to meet both residential and industrial requirements of Essex. This will generate different movement requirements to the north and south of Witham.

2.8.5 There are a number of major schemes under construction, consented or pending decision in Kelvedon and Tiptree which will see several major mixed-used developments realised.

Map 2.7: Future land uses



2.9 Character areas (CA)

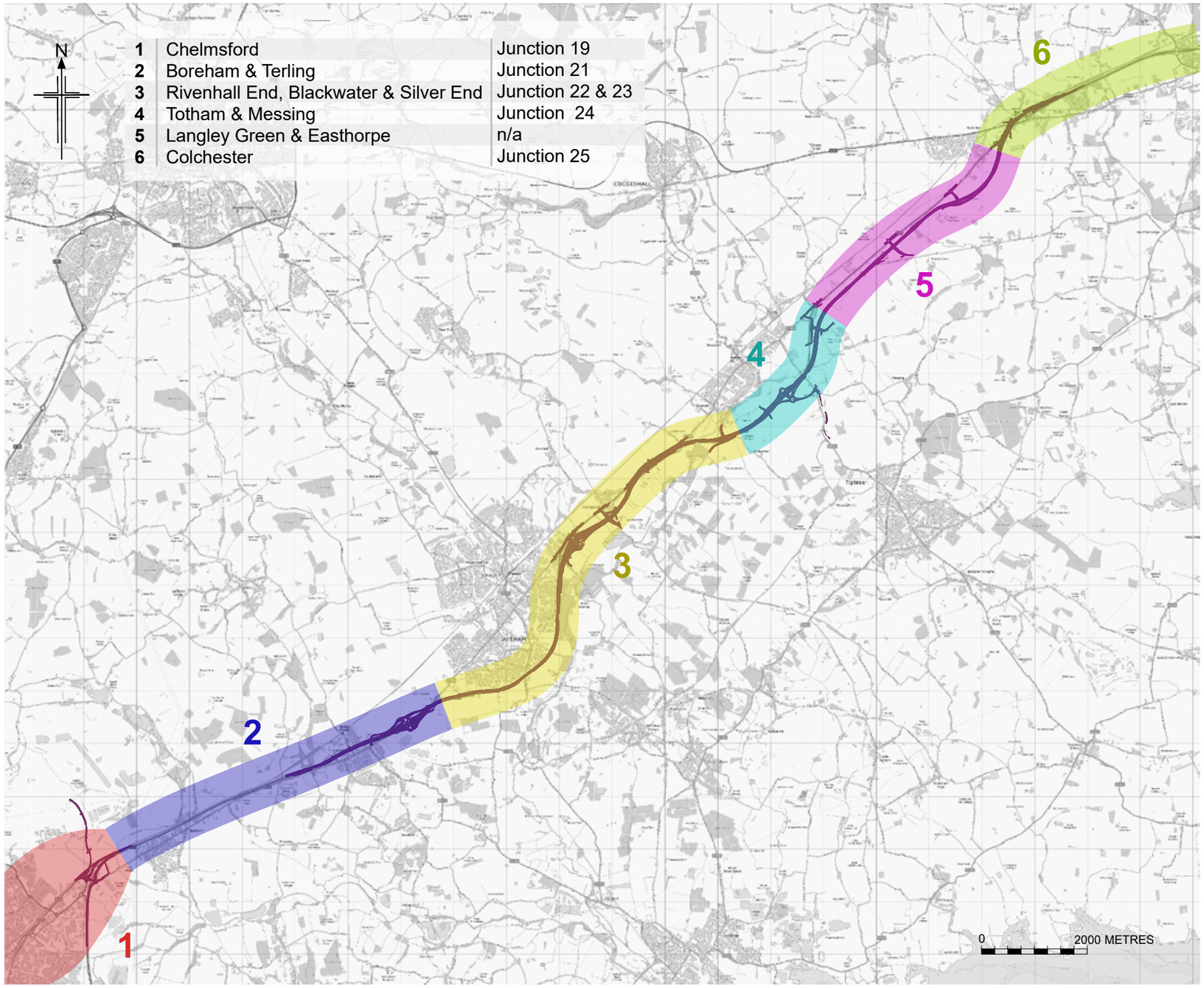
2.9.1 The proposed scheme route is approximately 24km long, spanning one city (Chelmsford) and two towns (Witham and Colchester). Over a scheme of this scale, the design affects individuals at very different scales from national to local. It is therefore appropriate that this document is structured around different scales.

- Scheme-wide: The factors that have influenced choice of road alignment and design strategies that have been applied across the proposed scheme.
- Regional: How the proposed scheme responds to landscape character and is integrated into networks of green infrastructure and public rights of way.
  How design development, environmental considerations and traffic modelling have influenced the inclusion of sizable elements of the proposed scheme, such as junctions.
- Area-specific: Including information on the design of highways, utilities, specific structures, WCH routes and particular areas of landscape design that evolved into the final proposed scheme. This also covers small changes to the alignment when it has responded to the context at a local level.

2.9.2 To respond to design requirements at both regional and area-specific levels, the design proposals within the DAS are split into their CAs.

2.9.3 Where design interventions are appropriate Scheme-wide, this will also be signposted.

Map 2.8: Character Areas

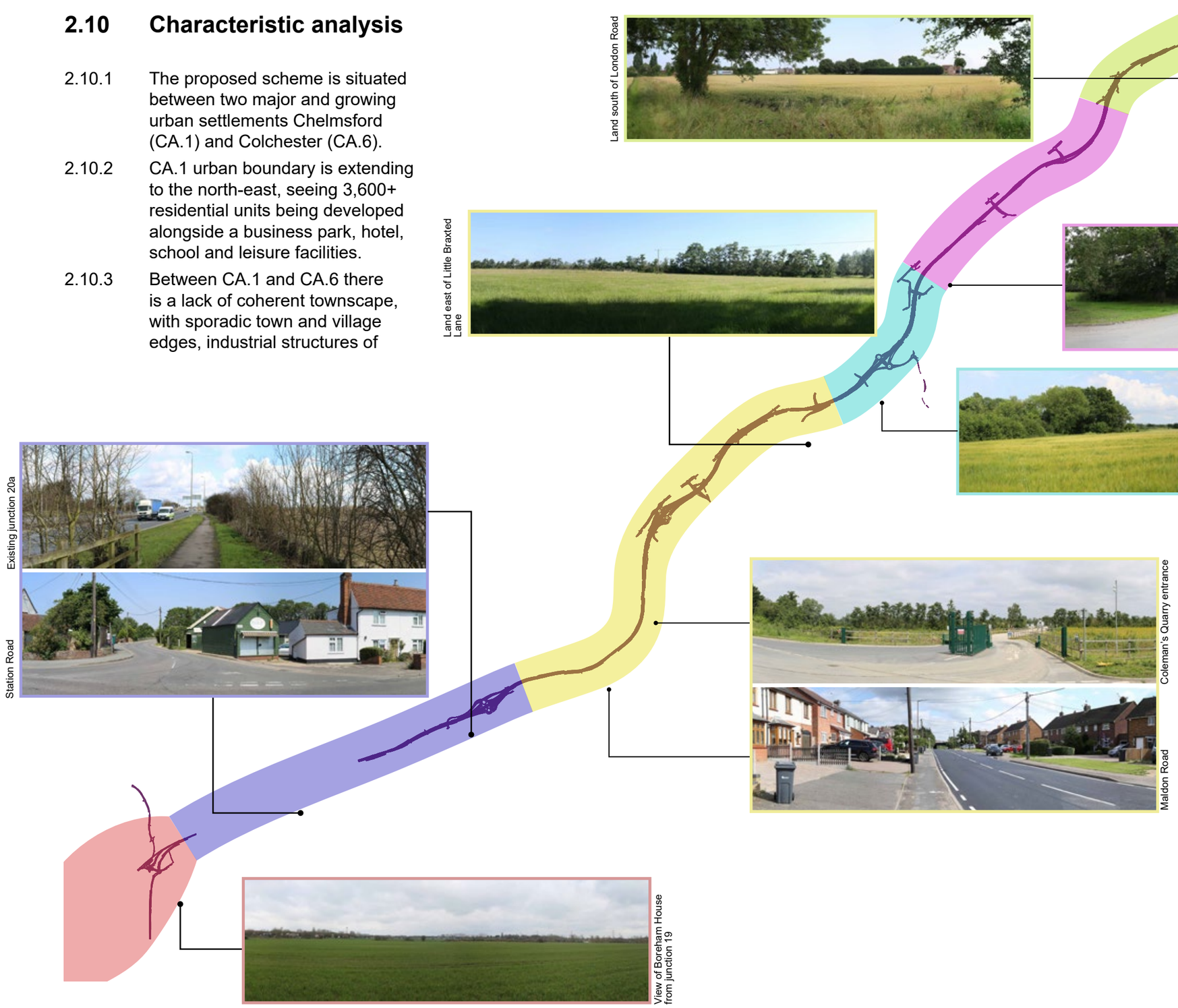


2.10 Characteristic analysis

2.10.1 The proposed scheme is situated between two major and growing urban settlements Chelmsford (CA.1) and Colchester (CA.6).

2.10.2 CA.1 urban boundary is extending to the north-east, seeing 3,600+ residential units being developed alongside a business park, hotel, school and leisure facilities.

2.10.3 Between CA.1 and CA.6 there is a lack of coherent townscape, with sporadic town and village edges, industrial structures of relatively modern construction and majority rural landscape.



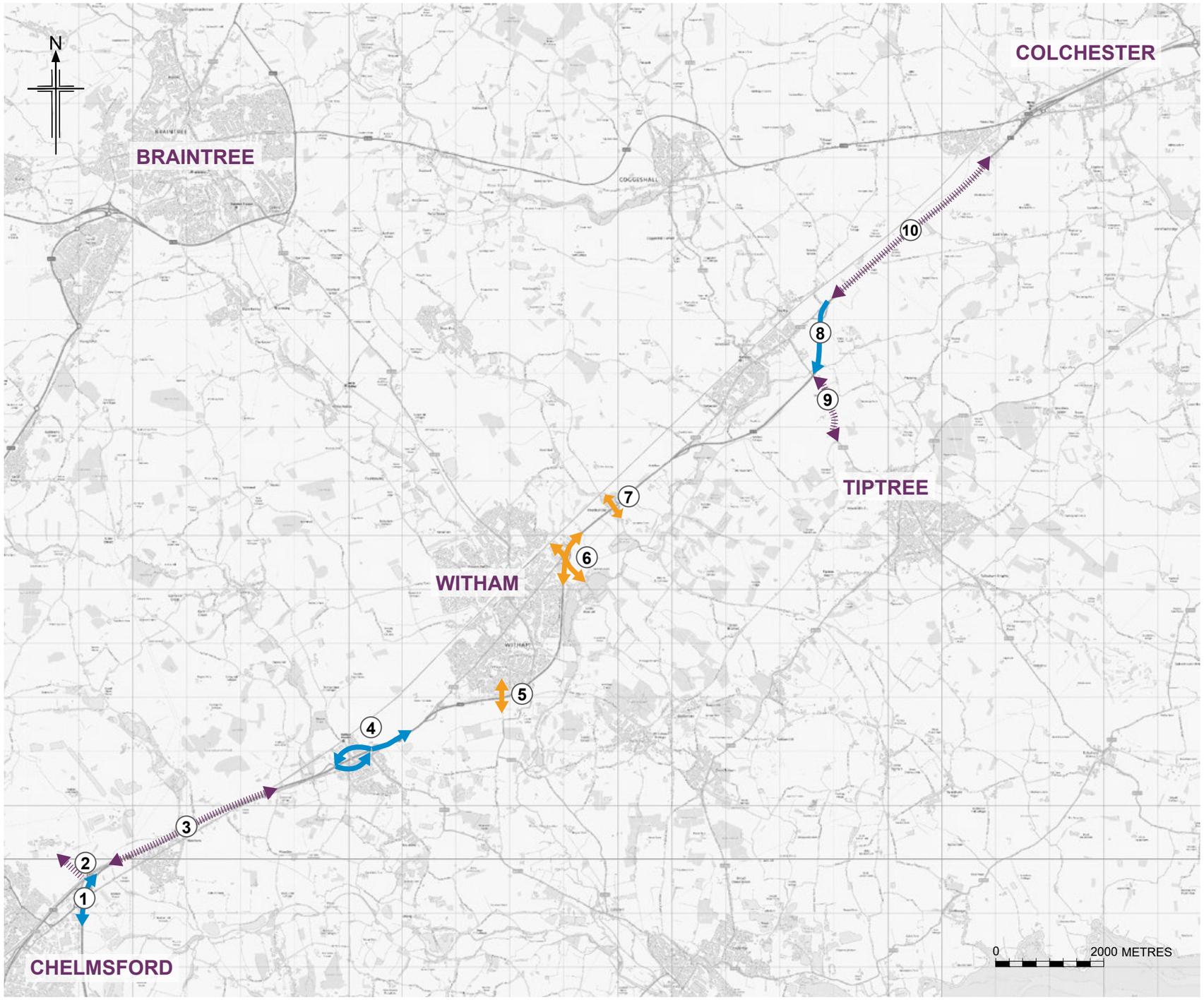
2.10.4 There are some heritage assets, including Boreham House (CA.1) and Prested Hall (CA. 5).

2.10.5 The landscape is dominated by existing A12 infrastructure, agricultural farmland, nature reserves and quarries including Coleman's Quarry. This allows the general characteristics to be well suited to infrastructure development.

2.11 Identified improvements

1. Build on and complement Beaulieu Park developers junction 19 proposals to be constructed by 2023.
2. Provide a dedicated link road to A131 to improve access for future regeneration sites including Greater Beaulieu Park housing development.
3. Utilise existing three-lane carriageway and undertake local improvements to roadside infrastructure including signage and resurfacing.
4. Combine junctions 20a and 20b to create single junction between Hatfield Peverel and Witham to serve both northbound and southbound A12.
5. Improve WCH access between Witham and local villages south of A12.
6. Provide a route for the National Cycle Route (NCR) 16 and improve the existing cycle route along the north-west side of the junction.
7. Reduce north-south severance through improved WCH routes and reduced road speeds on de-trunked A12.
8. Relocate junction 24 to take traffic to Kelvedon, Inworth and Tiptree which will better serve Inworth Road and new housing developments in Tiptree.
9. Widen Inworth Road to improve the substandard width of the existing carriageway and also remove the pinch points along the curvatures of the road to facilitate smooth flow of the traffic and reduce risk of HGV collision.
10. Enable local traffic to gain access into and out of Marks Tey, Feering, Kelvedon and other surrounding villages by using de-trunked A12.

Map 2.9: Development opportunities



03.

Consultation, Engagement and Design Development

3.1 Introduction

3.2 Public consultation

3.3 Stakeholder meetings and workshops

3.4 Design development

3. Consultation, Engagement and Design Development

3.1 Introduction

3.1.1 This chapter sets out how the design process was conducted and how the proposed design evolved, in compliance with criteria for “good design” for national network infrastructure of the NNNPS, in particular showing how feedback from consultation and stakeholder meetings has shaped the proposed scheme.

3.1.2 The NNNPS, which is the guiding document for NSIPs highway schemes, states that design must be an integral consideration from the outset of a proposal.

3.1.3 The Road to Good Design (Highways England, 2018) commits highway development to high quality designs while connecting communities.

3.1.4 Engagement included workshops, meetings and group events with stakeholders (including landowners and local authorities) which included two non-statutory consultations in January - March 2017 and October - December 2019, statutory consultation in June - August 2021 and supplementary statutory consultation in November - December 2021.

3.1.5 This chapter also records how the proposed scheme has evolved as a result of consultation and engagement, particularly the junction designs.

3.2 Public consultation

3.2.1 This section details all public consultation undertaken in relation to the proposed scheme. See Consultation Report [TR010060/APP/5.1] for more detailed information.

3.2.2 A number of studies and consultations have taken place over the last decade on the A12, including the A12 Commission Inquiry (2008) and two studies by National Highways (then Highways England); A12/A120 Route Based Strategy 2013 and East of England Route Strategy, 2015. These all recognised the need to improve the A12, noting the following issues, congestion, safety, resilience and reliability, substandard junctions, holding back economic growth and lack of provision for non-motorised users.

Non-statutory consultation (23rd January 2017 to 3rd March 2017)

3.2.3 The first public consultation brought four options for consideration:

- Option 1: follows and widens the existing A12 corridor to three lanes in each direction between junctions 19 and 25.
- Option 2: widen the existing A12 corridor between junctions 19-22 to three lanes in each direction, from junction 22 create new three-lane bypass in each direction rejoining at junction 23 again widening to three lanes in each direction. At junction 24, another bypass is created running parallel to existing A12 re-joining at junction 25.
- Option 3: widen the existing A12 corridor between junctions 19-22 to 3 lanes in each direction, from junction 22 create new three-lane bypass in each direction rejoining at junction 23 again widening to three lanes in each direction.
- Option 4: widen the existing A12 corridor between junctions 19-24 to three lanes in each direction and from junction 24 create a bypass until junction 25.

3.2.4 Seven public information events were held in towns and villages along the A12. 14,000 households and businesses received invitation letters.

3.2.5 1,853 visitors were received with 89% of attendees giving positive feedback. The A12 Chelmsford to A120 widening Scheme website recorded 10,424 page views, and the Government’s A12 Chelmsford to A120 widening Scheme website recorded 952 page views. A total of 907 responses were received during the consultation period.

3.2.6 Of the 907 responses that were received, 824 respondents expressed a preference for one of the four options or supported none of the options. Consultation Option 2 received the most support from respondents with 402 of the 824 (49%) expressing it as their preferred route option. The second most popular consultation option was Option 1 with 227 of the 824 (28%) expressing it as their preferred route option.

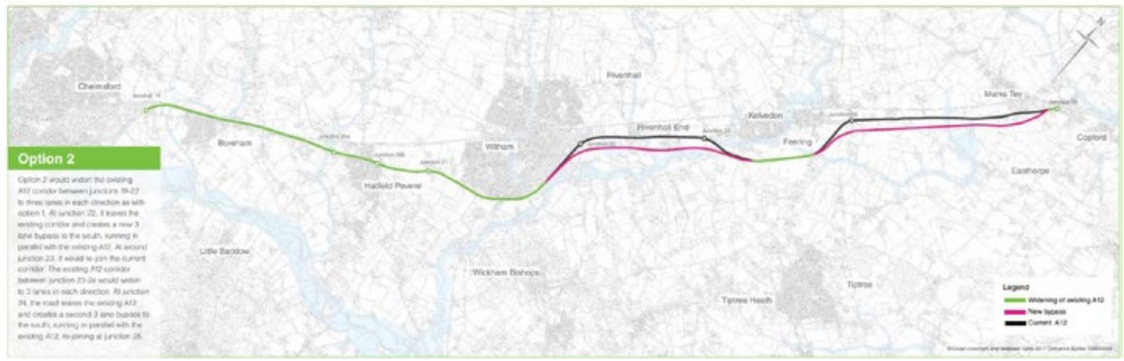


Image 3.1 Option 2 as presented at non-statutory consultation (2017)

Non-statutory consultation (21st October 2019 to 1st December 2019)

3.2.7 Since 2017 non-statutory consultation, the local authorities of Colchester, Braintree and Tendring pursued a joint Local Plan which proposed several garden communities that could impact on the route options presented previously.

3.2.8 Due to the potential impact of the proposed garden community, this consultation presented new options for the section between junction 24 (Kelvedon North) and junction 25 (Marks Tey interchange). All options provide three lanes in each direction along the route of the current A12 from junction 23 to 24, and three lanes in each direction from junctions 24 and 25 to the south of the current A12. Differences are summarised below:

- Option A: upgrade junction 24 and junction 25 to serve local roads and create new junction 25 to the south-west of its current position.
- Option B: upgrade junction 24 and junction 25 to serve local roads and create new junction 25 to the south of its current position.
- Option C: new junction 24 where current A12 crosses Inworth Road and upgrade existing junction 24 to serve local roads. Junction 25 would be retained and upgraded to serve local roads.
- Option D: new junction 24 to the east or west of Inworth Road and upgrade

existing junction 24 to serve local roads. Junction 25 would be retained and upgraded to serve local roads.

3.2.9 It was clearly stated in consultation documents that If the proposed Colchester Braintree Borders Garden Community does not go ahead, the route between junctions 23 and 25 will be based on the 2017 consultation.

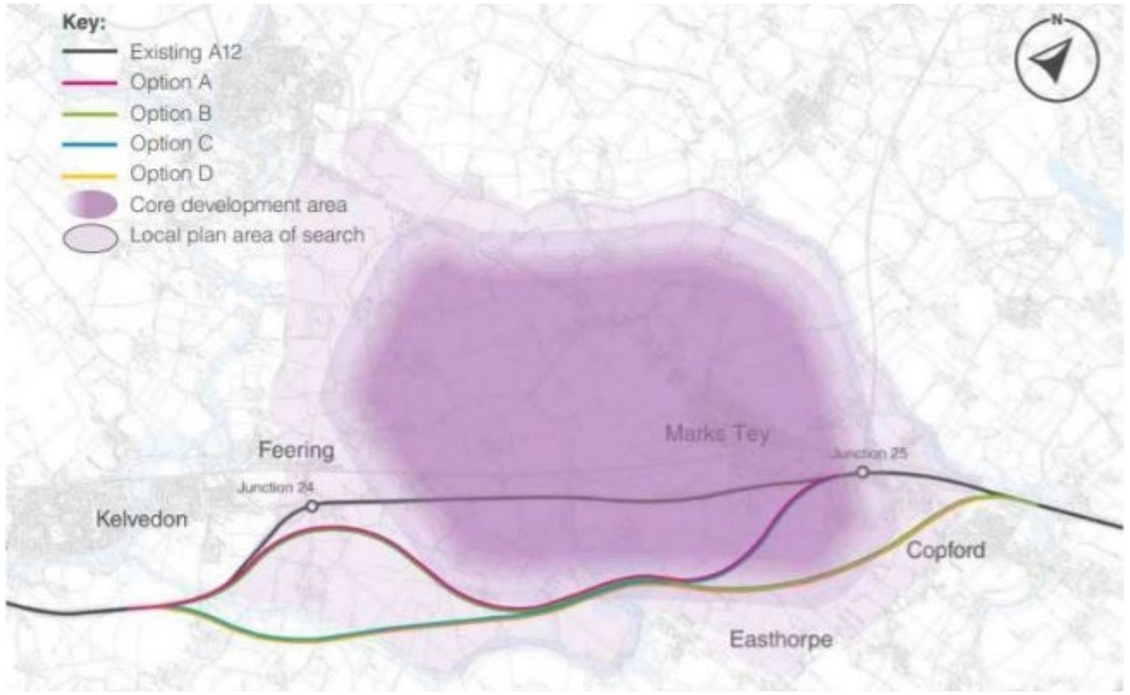


Figure 3.1 Options A-D as presented at non-statutory consultation (2019)

3.2.10 Eight public information events were held in towns and villages along the A12 including two engagement van events and a local coffee morning.

3.2.11 A total of 822 responses were received during the consultation period. Moreover, the public consultation exhibitions received 974 visitors over the eight public information events. While many of those in attendance had concerns about the routes being proposed, we many positive comments were received from stakeholders on the quality of the consultation as a whole. Likewise, 88.46% of those who responded to the exit survey stated that they felt their questions had been answered.

3.2.12 There was a clear opposition to all options presented. The majority of respondents strongly opposed all options on the basis that they were against the proposed garden community and showed preference for the options presented in 2017 (namely Option 2).

3.2.13 Option D was the most supported option, with 89 respondents supporting, or strongly supporting this option. However, it was also the most opposed option, with 654 respondents strongly opposing it. The second most supported option was option C which was supported, or strongly supported by 81 respondents. Option B was the least supported option, with 52 respondents supporting, or strongly supporting it.

Statutory consultation (22nd June 2021 to 16th August 2021)

3.2.14 Following the non-statutory consultations, and subsequent preferred route announcements, on the 22nd of June we launched the statutory consultation.

3.2.15 As a result of the first consultation in 2017 and Colchester Braintree Borders Garden Community being halted, the preferred route is based on route Option 2. The proposals widen the existing A12 between junctions 19 and 25 to three lanes in each direction (where it is not already) and create a three-lane bypass in each direction at Rivenhall End. This route reflects 2017 comments about the Rivenhall End bypass being close to the Rivenhall Long Mortuary Enclosure scheduled monument. The proposals include constructing a bypass between junctions 24 and 25 as identified in Consultation B.

3.2.16 The route presented at statutory consultation was selected based on several factors, including environmental impacts, journey times, complexity of build, affordability, feedback from the public. It also considered advice given by the Planning Inspectorate on the joint Local Plan for that area to not implement the Colchester Braintree Borders Garden Community.

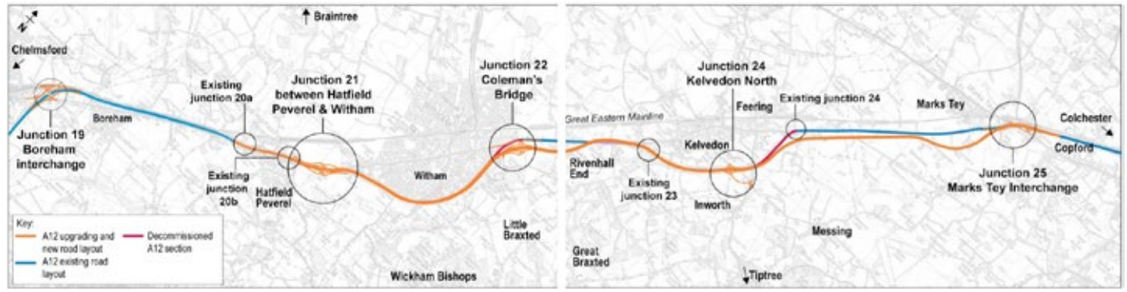


Image 3.2 Option taken to statutory consultation

3.2.17 Six in-person COVID-19 secure events were held, alongside hosting a virtual event space. 357 members of the public attended the events over June to August.

3.2.18 794 form responses were received, there was 16,481 visits to the consultation website and over 2,000 people visited the virtual event space.

Supplementary consultation (9th November 2021 to 19th December 2021)

3.2.19 Following the statutory consultation, further design work was undertaken, and the feedback received was considered. Supplementary consultation presented that work. Proposals addressed common themes and concerns raised, while continuing to deliver on key proposed scheme objectives. These changes included:

- removal of junction 21 southern link road, so the traffic will use a new and enhanced northern link road via Wellington Bridge to access the proposed junction 21 alongside walkers, cyclists and horse riders
- removal of proposed noise barriers through Hatfield Peverel to be replaced with improved road surfacing with better noise performance

- options for gas main diversion corridors near Witham
- temporary removal of a noise barrier at Market Lane to enable construction of the proposed scheme
- local road interventions at Inworth Road
- closure of Easthorpe Road access to the A12 (except walkers, cyclists, horse riders, emergency services and private agricultural access).

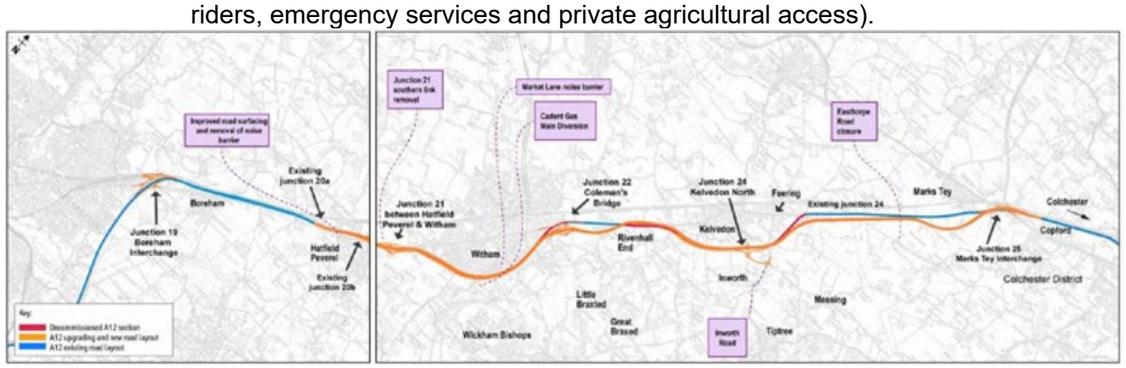


Image 3.3 Summary of changes as presented at supplementary consultation

3.2.20 Annex N of the Consultation Report [TR010060/APP/5.1] summarises the feedback received during the consultation as well as how the project team has considered this feedback in the proposed scheme design.

Targeted consultation (11th February 2022 to 28th March 2022)

3.2.21 This consultation focused on Boreham, Inworth, Marks Tey and Copford locations along the route of the proposed scheme where noise impacts changed since the Statutory Consultation discussed above.

3.2.22 Predicted noise levels have mostly stayed the same, or in some instances gone up or down by a smaller amount than that predicted at the Statutory Consultation. However, more residents have been considered to experience significant effects due to a change in how the proposed scheme reports significant effects on noise.

3.2.23 Previously, the threshold for a significant effect was an increase in noise levels of 3dB. Under the revised approach National Highways consulted affected parties along the proposed scheme, where an increase of 1dB is predicted, and where the existing levels are already considered high. Further information on this targeted consultation can be found in the Consultation Report [TR010060/APP/5.1].

3.3 Stakeholder meetings and workshops

3.3.1 In addition to consultations, National Highways held regular meetings, forums and workshops with key stakeholders and landowners. Participants included:

- Essex County Council
- Chelmsford City Council
- Maldon District Council
- Braintree District Council
- Colchester Borough Council
- Parish Councils along the route including Hatfield Peverel, Copford with Easthorpe, Witham, Messing-Cum-Inworth, Marks Tey, Boreham, Kelvedon and Feering.

3.3.2 Over 220 meetings were held with landowners who would be affected by the proposed scheme were held.

3.3.3 There were 40 forums equaling over 80 hours of engagement sessions with County Councillors, environmental stakeholders and local businesses, plus over 200 hours of workshops with local parish councils and over 20 hours of meetings with local MPs.

3.3.4 Planning officers and highways officers were engaged throughout the process and were over 315 hours of workshops with local authorities.

3.3.5 At key programme milestones, specialist workshops were held with planning officers to introduce and inform on the DCO process, plus the requirements from Section 42(b) consultees and when each input is required to ensure full engagement throughout the process.

3.3.6 Local authorities gained a detailed understanding of the potential changes, at 20 design-led workshops, and were given the opportunity to voice any aspirations.

3.3.7 Following consultation feedback from local authorities, we held engagement sessions were held with technical leads on key areas including traffic, WCH and construction.

3.3.8 There were 40 hours of engagement with road user forums including Green Flag, Essex Fire and Rescue, British Motorcyclists Federation and cyclist communities.

3.4 Independent design advice

3.4.1 The proposed scheme held two design workshops with the Design Council on the 10th and 11th February 2021.

3.4.2 Following the workshops, the Design Council provided the proposed scheme with constructive comments and opportunities relating to:

- Overall approach
- Design narrative
- De-cluttering
- Design Manual for Roads and Bridges (DMRB) GD300 Standard
- Structures
- Communities
- Travel networks
- Bypassed settlements
- Landscape

3.4.3 The proposed scheme responded to each comment in tabular form, acknowledging each suggestion and the how the design team would reflect the suggestion in the design.

3.5 Design development

Introduction

3.5.1 All consultations and engagement events have informed and shaped design changes. Key changes as a direct result of statutory consultation feedback are summarised

below.

3.5.2 For further details on design changes, including design refinements to address environmental concerns and policy requirements in accordance to the NNNPS, see Case for the proposed scheme [TR010060/APP/7.1].

Post-consultation design alterations

Chelmsford

3.5.3 In the vicinity of Hatfield Peverel, the proposed scheme sought to close the existing junctions 20a, 20b and 21, and combine these movements into one junction (21) between Hatfield Peverel and Witham. The closure of the southbound on-slip at junction 20a resulted in an increase in the desirability of using Main Road in Boreham for local journeys between Chelmsford and Hatfield Peverel.

3.5.4 Although this shift in routing is in line with the proposed scheme objective of "the right traffic on the right roads", an increase of traffic on the local road raised concerns about safety and noise in a residential environment.

3.5.5 As a result of public consultation feedback, it is proposed to reduce the existing speed limit of Main Road between Hatfield Peverel and Chelmsford to reduce desirability of rat-running through this road.

3.5.6 It is proposed that improved noise reducing surfacing be provided on the southbound carriageway between junction 19 and existing junction 20a.

Boreham and Terling

3.5.7 A link was provided for traffic interacting with Hatfield Peverel and the proposed junction 21 as a conversion of the existing junction 20B southbound exit slip road to two-way traffic and converting the existing junction 20B northbound entry slip road to an access to residences.

3.5.8 This proposal was subject to additional noise and traffic modelling, and significant noise and vibration effects that could not be reasonably mitigated by physical means were forecasted.

3.5.9 The arrangement was changed to convert the existing junction 20b northbound entry slip road as the two-way link between the proposed junction 21 and Hatfield Peverel, and convert the existing junction 20b southbound exit slip road to a bespoke walking and cycling route to mitigate significant effects experienced by residents of the eastern end of the street.

Totham and Messing

3.5.10 The proposed junction 24 was proposed to be set beneath existing ground level and provide access to Inworth Road, Kelvedon and Feering. The previous arrangement required a very long southbound exit slip road to achieve adequate visibility, and necessitated the demolition of Brick Kiln Farm and extensive widening of Park Bridge over Inworth Road.

3.5.11 Stakeholders asked the team to explore ways to reduce the impact on Brick Kiln Farm and Park Bridge.

3.5.12 By adjusting the position of the proposed southern roundabout of junction 24, the length of the southbound slip road could be reduced whilst still providing improved visibility. This reduces the amount by which Park Bridge needs to be widened and investigations into leaving Brick Kiln Farm in situ are underway.

Langley Green and Easthorpe

3.5.13 The existing junction between Easthorpe Road and the A12 is a "left-in, left-out" arrangement with short lengths for acceleration and deceleration. Direct access from the existing A12 between junction 24 and 25, to Easthorpe Road via an overbridge and a new roundabout was proposed.

3.5.14 The combination of the reduction of speed and traffic numbers on the existing A12, and the roundabout providing access between the northbound carriageway of the existing A12 and Easthorpe Road appeared to increase the desirability of using Easthorpe Road to access the A12, bypassing junction 25.

3.5.15 To eliminate driver's desire to use Easthorpe Road as a rat-run, the proposal has been made to reclassify the northern portion of the proposed Easthorpe Road realignment for WCH and authorised vehicles (such as emergency services) only.

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04.

Proposed Scheme Design

4.1 Proposed scheme summary

4.2 Chelmsford

4.3 Boreham and Terling

4.4 Rivenhall End, Blackwater and Silver End

4.5 Totham and Messing

4.6 Langley Green and Easthorpe

4.7 Colchester

4. Propsed scheme design

4.1 Proposed scheme summary

4.1.1 The existing A12 between junctions 19 and 25 is predominantly a dual two-lane carriageway, with a limited length of dual three-lane carriageway between junctions 19 (CA.1) and 20a (CA.2). There are a number of direct accesses onto the carriageways, particularly between junctions 22 and 23 (CA.3) and between junctions 24 (CA.4) and 25 (CA.6).

4.1.2 The proposed scheme involves widening the existing A12 to three lanes throughout in each direction, where it is not already three lanes. This would mainly involve online (existing) widening of the carriageway, with offline (new) highway created between junctions 22 and 23 (CA.3) and between junctions 24 (CA.4) and 25 (CA.6). This would be accompanied by junction improvements (junctions 19 and 25), construction of new junctions catering for traffic movements both north and southbound (junctions 21, 22 and 24), and removal of existing junctions (20a, 20b and 23).

4.1.3 The proposed scheme works are described in Schedule 1 of the draft DCO [TR010060/APP/3.1]. The General Arrangement Plans [TR010060/APP/2.10] illustrate the preliminary design of the proposed scheme and identify its key components and features. The Highways Engineering Section Drawings [TR010060/APP/2.12] present further proposed scheme design information. Reference to these plans is made in the following sections where applicable.

4.1.4 There would be side road upgrades and local accesses across the proposed scheme, as detailed in this chapter, and shown on ES Figure 2.3: Temporary Working Areas, Side Roads and Structures [TR010060/APP/6.2]

Image 4.1 Visualisation of junction 25

4.2 Chelmsford (CA.1)

Mainline

4.2.1 Tie-in works will ensure the capacity improvements made to junction 19 are compatible with the proposed scheme. There are no planned improvements to the existing A12 mainline in the vicinity of Chelmsford CA.

4.2.2 The approximately 3.2km section between junctions 19 and 20a already consists of three lanes in each direction; works here would consist of localised improvements to roadside infrastructure (such as signage).

Junction

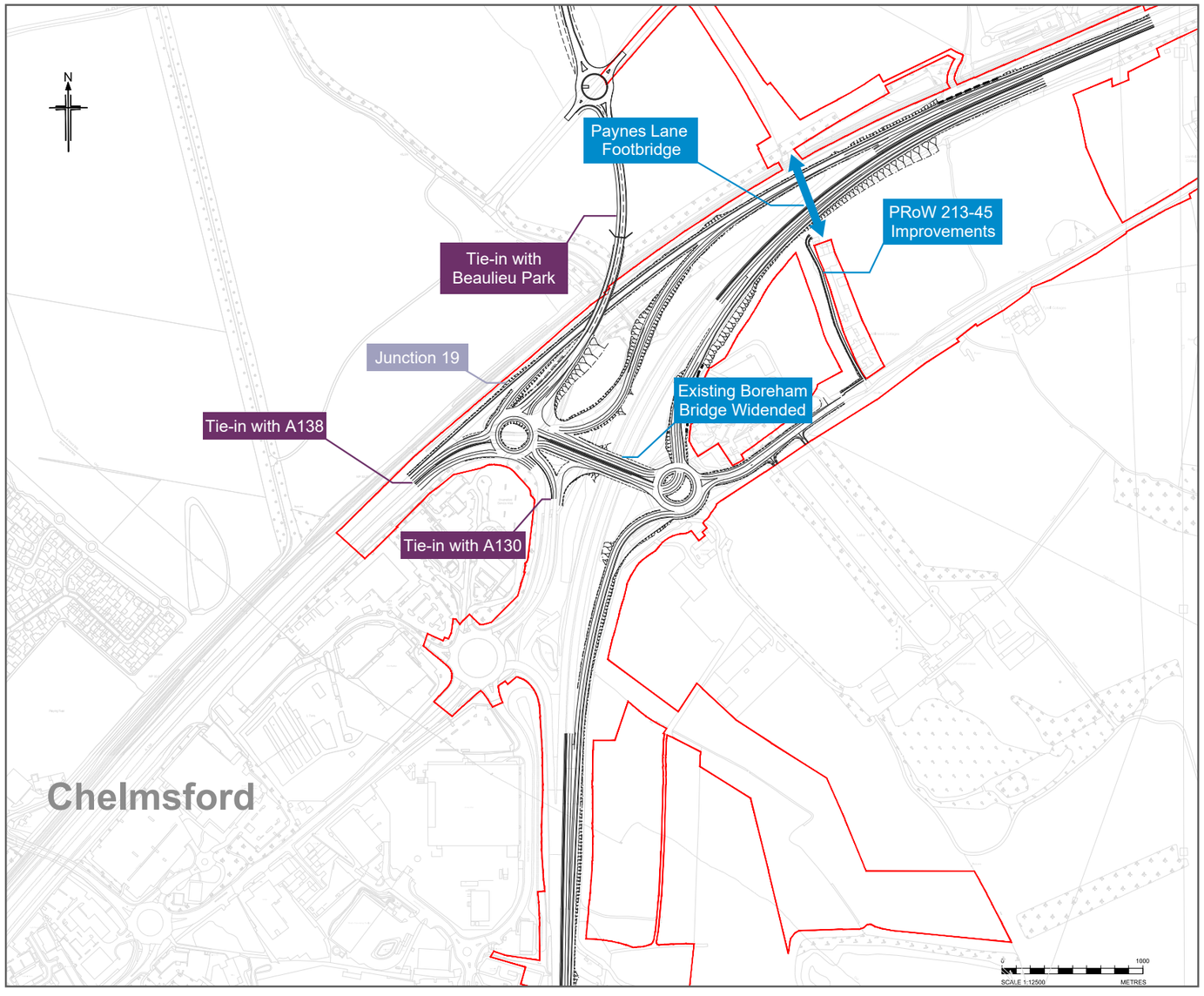
4.2.3 Junction 19 is being improved as part of the Beaulieu Park development. The changes are being made by the developer, and the construction is due to be completed by early 2023. This section of junction 19 links to the realigned Beaulieu Park radial distributor road, serving Beaulieu Park's business park and residential development.

4.2.4 Therefore all Beaulieu Park improvements were taken into account when designing the proposed scheme. The assessment has shown that the additional proposed improvements to the Boreham Interchange should provide additional benefits to complement the developer's junction and ensure that the junction continues to work for all road users further into the future. The proposed scheme improvements include the following:

- Additional lanes on Boreham Bridge through widening the existing bridge.
- Additional traffic lights added to the southern roundabout.
- Additional lanes on various roundabouts, and their approaches and exit roads
- A dedicated link from the A131 onto the northbound A12.
- A new controlled crossing which will allow both walkers and cyclists to cross the A12 safely and a new bridge for WCH on the north side of junction 19 (new Paynes Lane).

4.2.5 The order limits also extend to the south of junction 19 to allow for roadside works in the verges such as new signage and works associated with the junction 19 improvements.

Map 4.1: Chelmsford (CA.1) proposed scheme design summary



WCH

4.2.6 Paynes Lane is an existing PRoW (PRoW 213-45) south of the existing A12, leading to, but not connected to, PRoW 213-23 north of the Great Eastern Main Line railway. The proposed scheme includes a new bridge (Paynes Lane) to link the two bridleways and provide a continuous WCH route across the A12, side roads and railway.

4.2.7 The WCH proposal to the south of the A12 along Paynes Lane is limited to improving the surfacing of the 3m wide existing.

4.2.8 A 35m long, 3m wide shared use footway/cycleway cycle track facility has been proposed adjacent to the northbound lane of the existing B1137 Main Road to provide a connection for these users between the proposed crossing of Main Road (near to its junction with Paynes Lane), and junction 19. The cycle track would continue across junction 19, on the southern side of Boreham Bridge, to connect to the Beaulieu Park Radial Distributer Road.

Side Road(s)

Main Road

4.2.9 Localised amendments to Main Road are proposed to remove the arrangement that allows southbound traffic to access the A12 via junction 20a. A 3m wide cycle track would be provided along Main Road connecting to the existing PRoW crossing over the River Ter.

Image 4.2 Visualisation of junction 19

4.3 Boreham and Terling (CA.2)

Mainline

4.3.1 The approximately 3.3km section between junction 20a and the existing junction 21 would be subject to online widening works to provide a dual three-lane carriageway. This would be predominantly symmetrical widening, where each existing carriageway would be widened by approximately 3.65m. Mainline improvement works include the following:

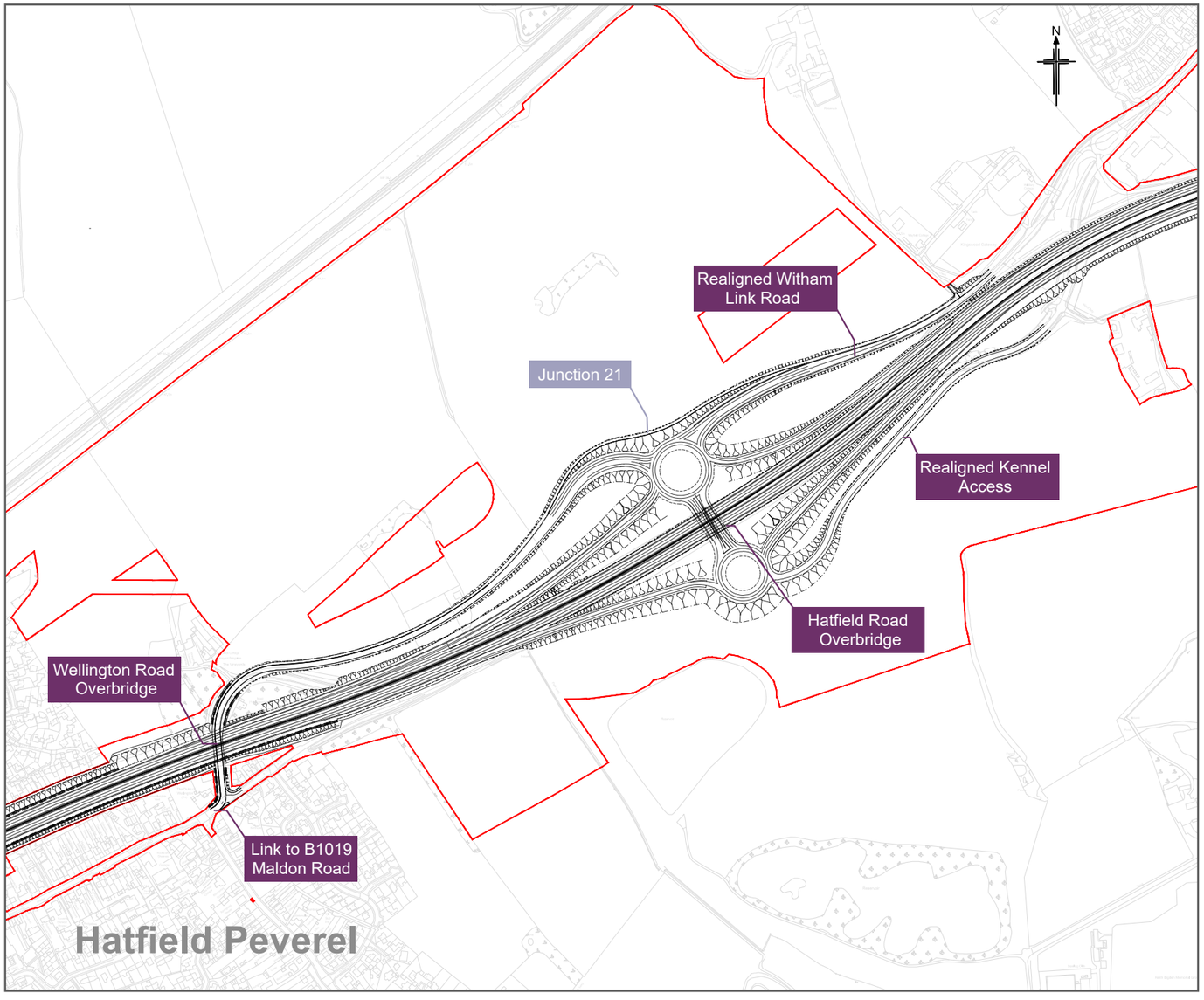
- Addition of a third lane in each direction past junction 20a.
- Replacement of the existing central reserve safety barrier with concrete beginning just south of the existing junction 20a slip roads.
- Proposed online widening of the existing carriageway in the vicinity of Hatfield Peverel.
- Proposed frequent emergency laybys north of junction 21, to allow vehicles to safely pull off the mainline in the event of breakdowns/incidents. These continue until junction 25.

Junction 21

4.3.2 Junctions 20a (Hatfield Peverel South) and 20b (Hatfield Peverel North) will be closed and replaced with a new junction 21 between Hatfield Peverel and Witham. It will provide access to the A12 both northbound and southbound and will take traffic from Hatfield Peverel and Witham. It has been designed as an elevated two-tier junction (raised above the A12 mainline) with a dumbbell layout, connected by a new Hatfield Road Overbridge, with three access roads:

- A road linking the northern roundabout of the junction to Hatfield Peverel, intended as the main access between the proposed new road layout and areas to the south and west, including Hatfield Peverel and Maldon.
- A road linking the northern roundabout of the junction to Witham (B1389), intended as the main access between the proposed new road layout and the west side of Witham.
- A local access road from the southern roundabout of the junction, for access to Latney's Kennels, Cattery and Grooming Parlour only.

Map 4.2: Boreham and Terling (CA.2) scheme design summary



Side Road(s)

Bury Lane Overbridge replacement

4.3.3 This overbridge would be replaced to accommodate the widening of the A12 mainline. The proposed carriageway would approximately match the existing bridge width and would include a shared use footway and cycleway facility adjacent to the southbound traffic lane.

Station Road Overbridge replacement

4.3.4 The existing overbridge would be replaced to accommodate the widening of the A12 mainline. This is a constrained site, with property access directly adjacent to the bridge abutments on both sides. The proposed cross-section would be a standard two-way single carriageway, including a 2.5m footway on both sides of the road to tie in with existing footpaths.

Howbridge Hall Road

4.3.5 Howbridge Hall Road is a 2.5m wide existing private means of access road, providing a connection to a single property to the south of the existing A12 at Witham. The road is required to be realigned slightly to the south due to the existing road clashing with the proposed A12 alignment and earthworks. The majority of the section to be realigned is a private access road within a private plot (title number EX704197). The intention is to provide like for like in terms of road width and category with the existing.

Junction 21 link roads

4.3.6 The proposed junction 21 upgrade is expected to cause an increase in southbound traffic on the B1389. To accommodate the increased traffic, a section of the B1389 in West Witham would be redesigned to provide a straight-through east-to-west arrangement on the approach to the new junction 21. The proposed cross-section would be a two-way single carriageway. A shared use footway and cycleway would be included which would tie in with proposed housing developments.

4.3.7 The closure of junctions 20a and 20b, along with the upgrade of junction 21, means that a northern link road between junction 21 and the B1137 would be required to provide a link with Hatfield Peverel. Therefore, Wellington Bridge would be replaced to accommodate the A12 widening and also provide local access for the Vineyards (a cluster of properties in the northern side of Wellington Bridge) and Hatfield Peverel to the northern roundabout of Junction 21.

4.3.8 The Street, East of Wellington Bridge, would be converted to a cul-de-sac type of road to provide local access.

4.3.9 As junction 21 would be relocated, a local access road would be provided for access between the junctions southern roundabout and Latney's Boarding Kennels, Cattery and Grooming Parlour.

4.4 Rivenhall End, Blackwater and Silver End (CA.3)

Mainline

4.4.1 South of the existing Junction 22, online widening which is broadly symmetrical in nature is proposed. The proposed scheme's first offline bypass is proposed between the existing Junction 22 and Junction 23. The proposed cross-section of the road, with three lanes in each direction separated by a concrete barrier, continues throughout this section of offline road construction.

Junction

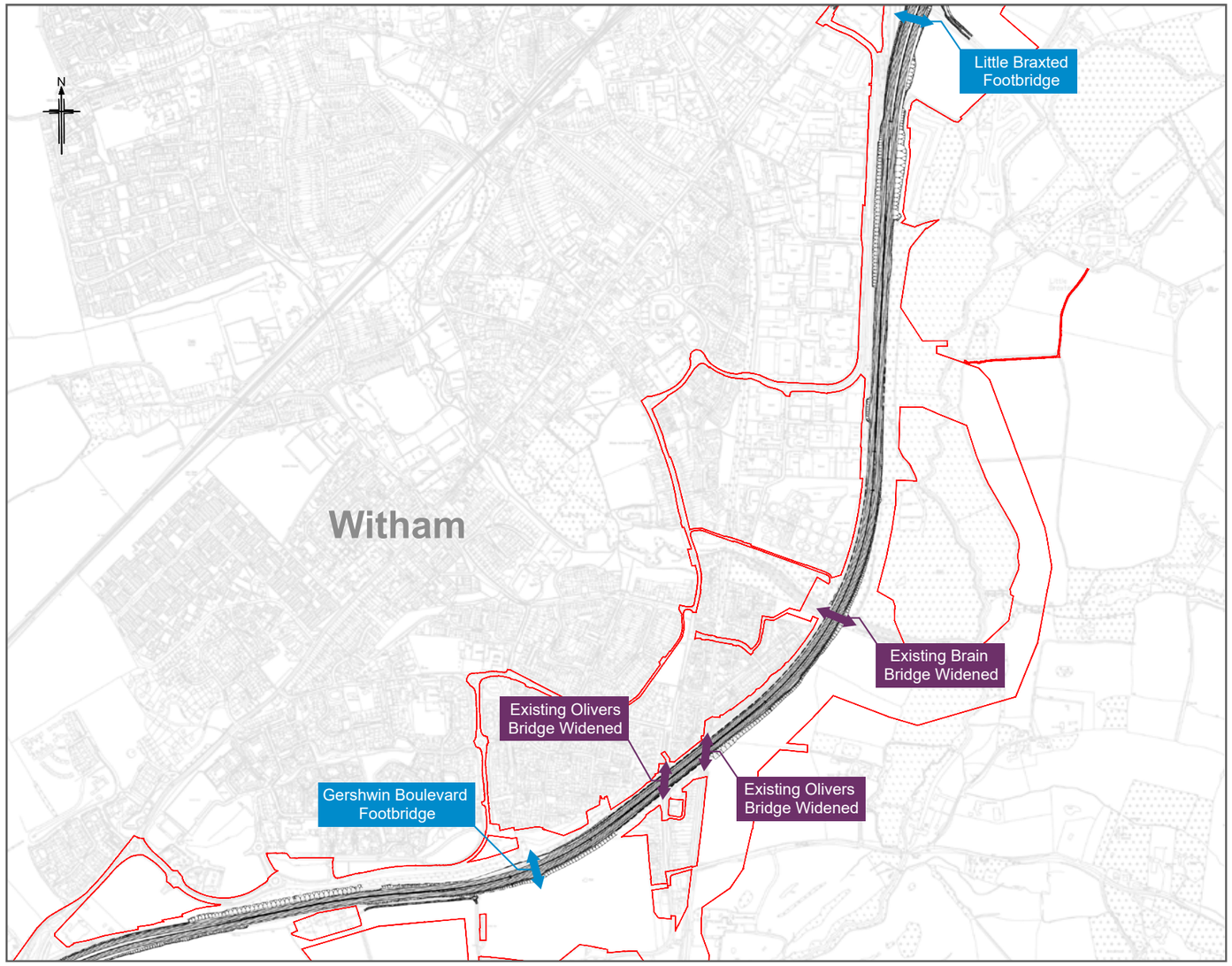
4.4.2 The proposed junction 22 is located north-east of the existing junction 22 and would have a two-tiered elevated dumbbell layout (raised above the A12 mainline) connected by a new Little Braxted Lane Overbridge. The proposed junction 22 will provide access to the A12 both northbound and southbound and will take traffic from all directions. There will be two access roads on the northern roundabout of the junction, using the existing A12 to link to Witham and Rivenhall End. The southern roundabout will provide access to Little Braxted Lane via a realigned link road. A new route for the NCR 16 will be provided, crossing the A12 on a new bridge to the south of the junction. Improvements to the existing cycle route along the north-west side of the junction will also be made.

4.4.3 The existing junction 23 would be removed, with traffic movements associated with this junction being moved to junction 22 and junction 24 (see ES Chapter 3: Assessment of alternatives [TR010060/APP/6.1], for the reasons why junction 23 would be removed). Parts of junction 23 would, however, be retained to provide local access, including Cranes Bridge (which would be widened) and parts of southbound and northbound slip roads.

De-trunking

4.4.4 The existing A12, comprising two lanes, between junctions 22 and 23 through Rivenhall End is proposed to be de-trunked (trunk road status removed) and returned to ECC's Highway Authority control. The de-trunking proposals include the following improvements: layout alterations to the existing local road junction at Rivenhall End; closure of Oak Road to improve safety and restrict through traffic; speed limit reduction (40mph) through Rivenhall End;

Map 4.3: South of Rivenhall End, Blackwater and Silver End



controlled WCH crossing points to eliminate the north-south severance, and pedestrian/cycle routes; and provision of a bus stop at Rivenhall End.

4.4.5 The existing junction 23 southbound on-slip would also be closed and is proposed to be used for access to Hole Farm and Essex County Fire and Rescue Service Headquarters as a single carriageway with one lane in each direction.

WCH

Gershwin Boulevard

4.4.6 Gershwin Boulevard WCH is the location of an existing PRoW (PRoW 121-95) that is severed by the existing A12. Although an informal cross over the A12 appears to be available at this location, crossing a highspeed dual carriageway with high volume of traffic is not safe for any road user.

4.4.7 The purpose of the proposed WCH bridge over A12 is to provide safe crossing points over the A12 and remove existing severance and the proposed shared-use facility connection with Gershwin Boulevard to the north of the A12 is to improve WCH local connectivity.

Little Braxted

4.4.8 The proposal includes foot bridge over A12, converting the existing national cycleway designation to WCH and provide connection with PRoW 105-63 to the south of A12. To the north of the A12 the proposed WCH will utilise part of the existing A12 eastbound carriageway to connect with Eastways Junction and PRoW 121-119 via B1389 Colchester Road as well as other local networks.

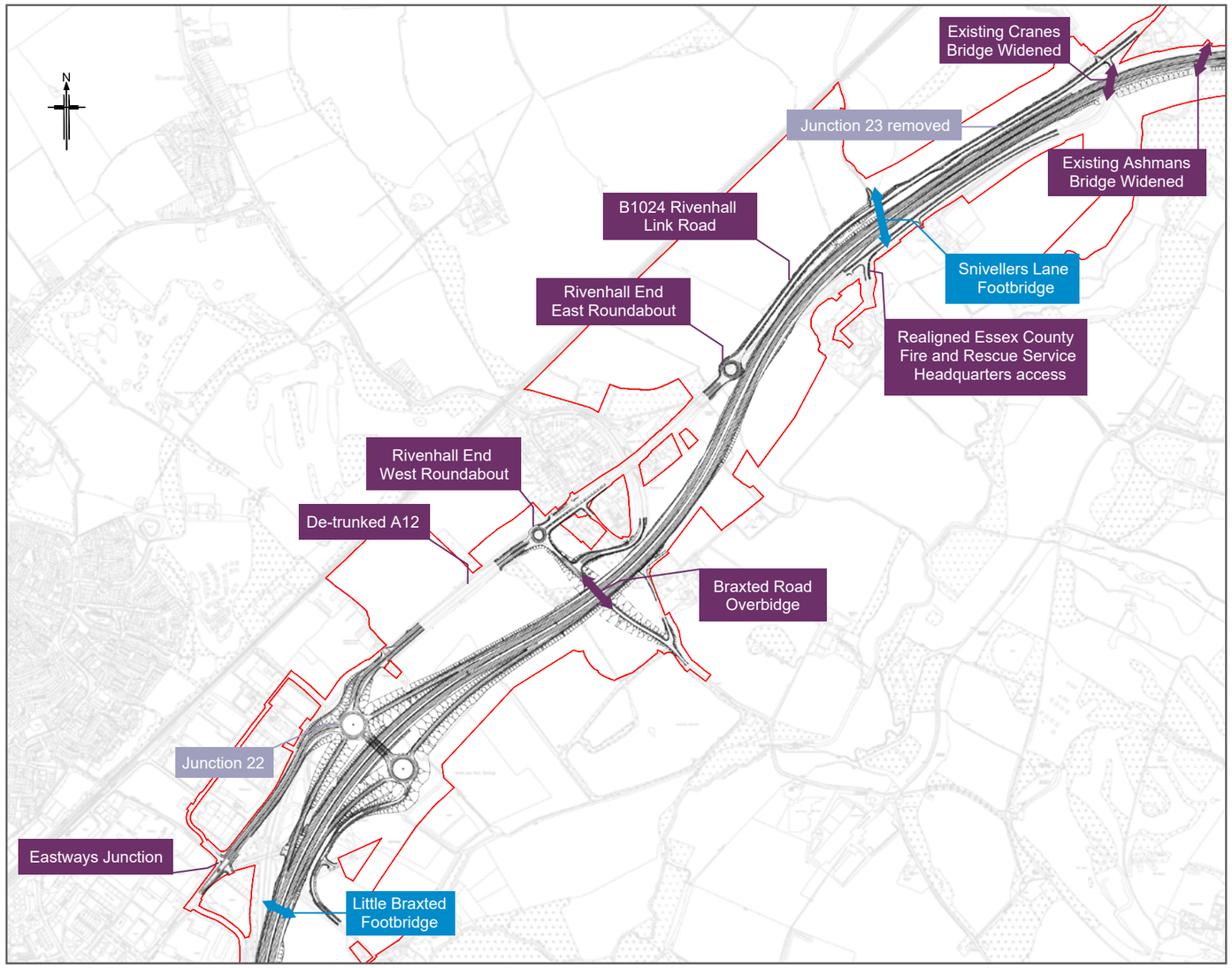
Side Road(s)

Howbridge Hall

4.4.9 Howbridge Hall Road is a 2.5m wide existing private means of access (PMA), providing a connection to a single property to the south of the existing A12 at Witham. The PMA would be realigned slightly to the south due to the land forming the existing PMA being required for the proposed A12 alignment and earthworks. The majority of the section to be realigned is a private access road within a private plot, with minor amendments required to the existing section under Essex County Council's ownership where the alignment bends from north–south to east–west. The width and surface of the new PMA would be similar to the existing PMA.

Eastways Junction

Map 4.4: North of Rivenhall End, Blackwater and Silver End (CA.3) scheme design summary



4.4.10 The proposed A12 junction 22 includes a new dual carriageway link from the western dumbbell to the B1389 Colchester Road, leading to existing Eastways junction in Witham. Construction of the new Junction 22 and removal of the existing Colemans Bridge southbound on and off-slips, and the new dual carriageway layout on the northern arm triggered the requirement for the Eastways junction reconfiguration.

4.4.11 The Eastways junction proposal is a four-arm signalised junction with dual carriageway in the eastern arm and single carriageways on the remaining three arms with improved WCH routes on both sides of the B1389 road.

4.4.12 The current junction reconfiguration design will be accommodated within existing highway boundary and will have minimal impacts on the adjacent areas and all existing connections will be maintained except the Colemans Bridge connection which will be stopped up as the result of the A12 realignment.

Rivenhall End Roundabout(s)

4.4.13 A roundabout linking the existing A12 to Braxted Road and Henry Dixon Road; a new overbridge to Braxted Road from Rivenhall End and the de-trunked A12; Oak Road (north) to be closed at the existing A12; and Oak Road (south) junction with the de-trunked A12 to be converted to a simple priority junction.

B1024 Rivenhall Link Road

4.4.14 A new road linking Rivenhall End to Kelvedon would run adjacent to the northern carriageway of the proposed scheme. A roundabout has been proposed to facilitate the transition between the A12 de-trunked section and this single road connecting section of the existing Junction 23 northbound off-slip. The proposed cross-section would be a two-way single carriageway with a shared-use footway/cycleway adjacent to the northbound carriageway. Bus stops would be provided within this new section connecting the Essex County Fire and Rescue Service Headquarters to public transport links.

4.4.15 The removal of the junction 23 on and off slips roads has triggered the requirement for slight modification of the existing B1024 and Cranes Lane crossroad to a staggered type of junction at the eastern side of the proposed single carriageway. The intention with modification is to improve safety road users and smooth flow for traffic.

Essex County Fire and Rescue Service Headquarters access

4.4.16 The existing A12 and Junction 23 southbound on-slip would be utilised as access from Witham for the Essex County Fire and Rescue Service Headquarters and Hole Farm. The proposed cross-section would be a two-way single carriageway with a shared-use footway/cycleway facility adjacent to the northbound carriageway.

Ashmans Bridge

4.4.17 The proposed relocation of the WCH bridge is approximately 65m south of the existing location and this was decided to minimise the potential impacts on the flood plain and avoid clashes with construction traffic haulage. The PRoW 92-30 will also be realigned to provide the required connection with the WCH bridge on both sides. The foot bridge ramps will be constructed with reinforced earthworks at 1:20 slopes on both sides. The proposed effective width of the WCH at the bridge and ramps is 3.0m.

Highfields Lane Overbridge replacement

4.4.18 The existing overbridge would be replaced by a new bridge adjacent to the existing to accommodate the A12 mainline widening. The bridge would connect to a realigned Maldon Road north of the A12, and to Highfields Lane to the south of the A12. The bridge would include a shared-use footway/cycleway facility.

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4.5 Totham and Messing (CA.4)

Mainline

4.5.1 Between junction 23 and 24, online widening which is broadly symmetrical in nature is proposed. To facilitate widening of the existing Cranes and Ashmans bridges around the existing junction 23, widening to the south is proposed. Our design allows for the existing concrete road surface to be overlaid with bound surface, resulting in a quieter and more comfortable road surface.

Junction

4.5.2 Junction 24 will provide access to the A12 both northbound and southbound, and the proposed junction 24 will take traffic from Inworth Road, which will serve the communities of Kelvedon, Inworth, Tiptree and others. Subject to further surveys, the new junction is expected to be below the existing ground level, with the proposed A12 road passing over the junction at its existing level.

Side Road(s)

Ewell Overbridge replacement

4.5.3 The existing overbridge would be replaced by a new bridge adjacent to the existing to accommodate the A12 mainline widening. The proposed carriageway would include a single lane with a footway adjacent to the southbound verge.

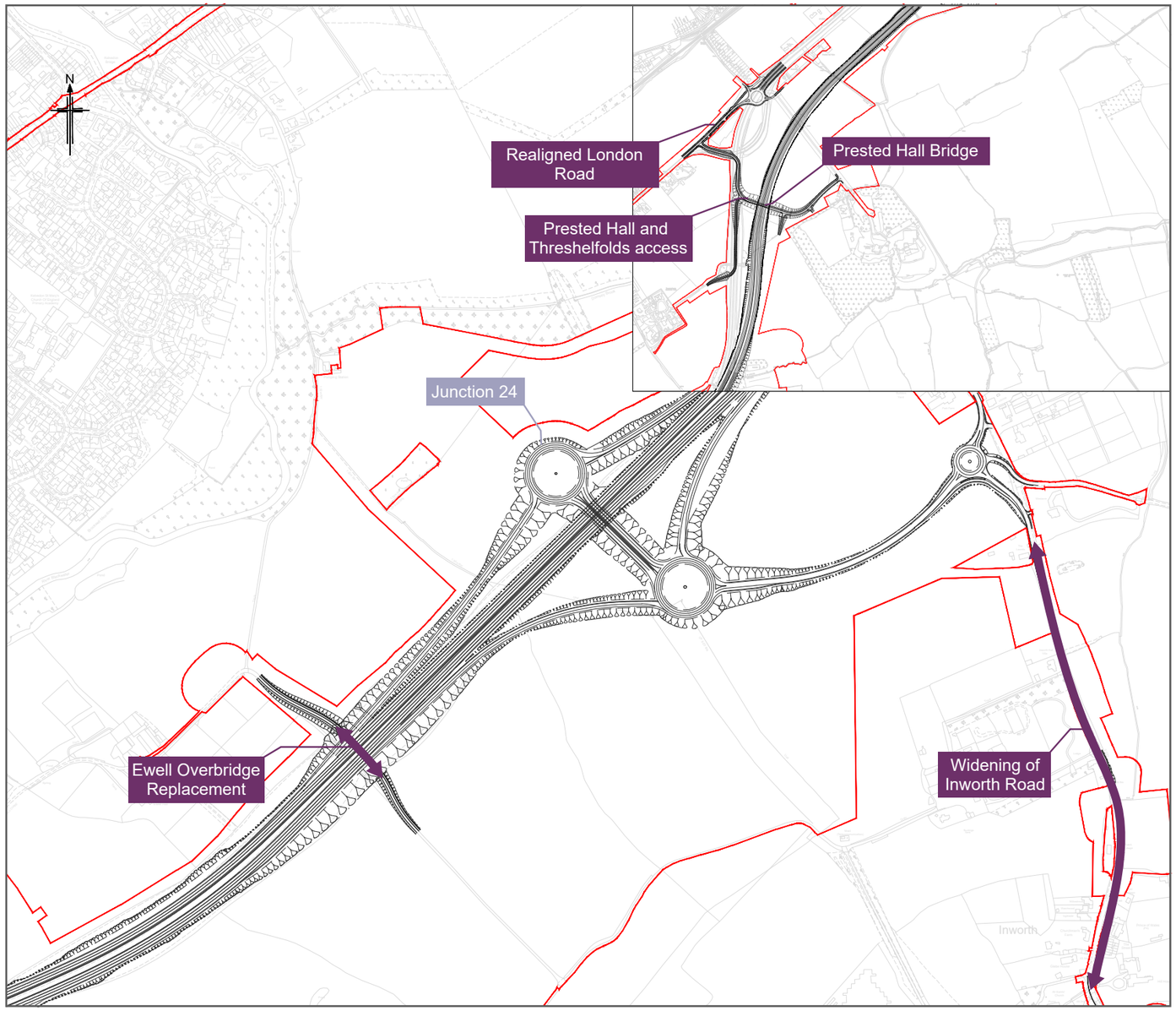
Prested Hall and Threshelfolds access road

4.5.4 The Threshelfords accommodation bridge would be demolished, with a new bridge providing joint access to Threshelfords and Prested Hall, crossing over the proposed scheme near the existing Junction 24. The new road is expected to be designated partly as an Essex Highways County Route local road and partly as a private road. The proposed Prested Hall access road is a two-way single carriageway with a shared-use footway/cycleway adjacent to the southbound carriageway. The proposed Threshelfords access road is a farm track access with a shared-use footway/cycleway facility adjacent to western edge of the track access.

Inworth road

4.5.5 To accommodate the predicted traffic flow and improve the safety of road users along the Inworth Road, a carriageway widening between the proposed junction 24 roundabout and garden centre has been proposed. The proposed carriageway widening ranges from 0.25m to approximately

Map 4.5: Totham and Messing (CA.4) scheme design summary



1.5m. The main purpose of the widening is to improve the substandard width of the existing carriageway and also remove the pinch points along the curvatures of the road to facilitate smooth flow of the traffic and reduce risk of HGV collision.

Image 4.3 Visualisation of junction 24

4.6 Langley Green and Easthorpe (CA.5)

Mainline

4.6.1 The proposed scheme's second offline bypass is proposed between the existing junction 24 and junction 25. The proposed cross-section of the road, with three lanes in each direction separated by a concrete barrier, continues throughout this section of offline road construction.

De-trunking

4.6.2 It is proposed that the existing A12 dual carriageway between Feering and Marks Tey (between junctions 24 and 25) would be returned to Essex County Council's Highway Authority control. The total carriageway length is approximately 4.5km. This section of de-trunked road would continue to be used by local traffic to gain access into and out of Marks Tey, Feering, Kelvedon and other surrounding villages and would enable traffic to gain access to the proposed scheme via the new junctions 24 and 25.

4.6.3 The design proposals are to maintain the dual carriageway as per the existing layout and provide roundabouts in three locations to improve connectivity with local road networks and WCH routes: a five-arm roundabout at the existing junction 24; a four-arm roundabout at Easthorpe Road; and a three-arm roundabout at Wishing Well Farm access road.

WCH

Potts Green Bridge (Doggetts Lane)

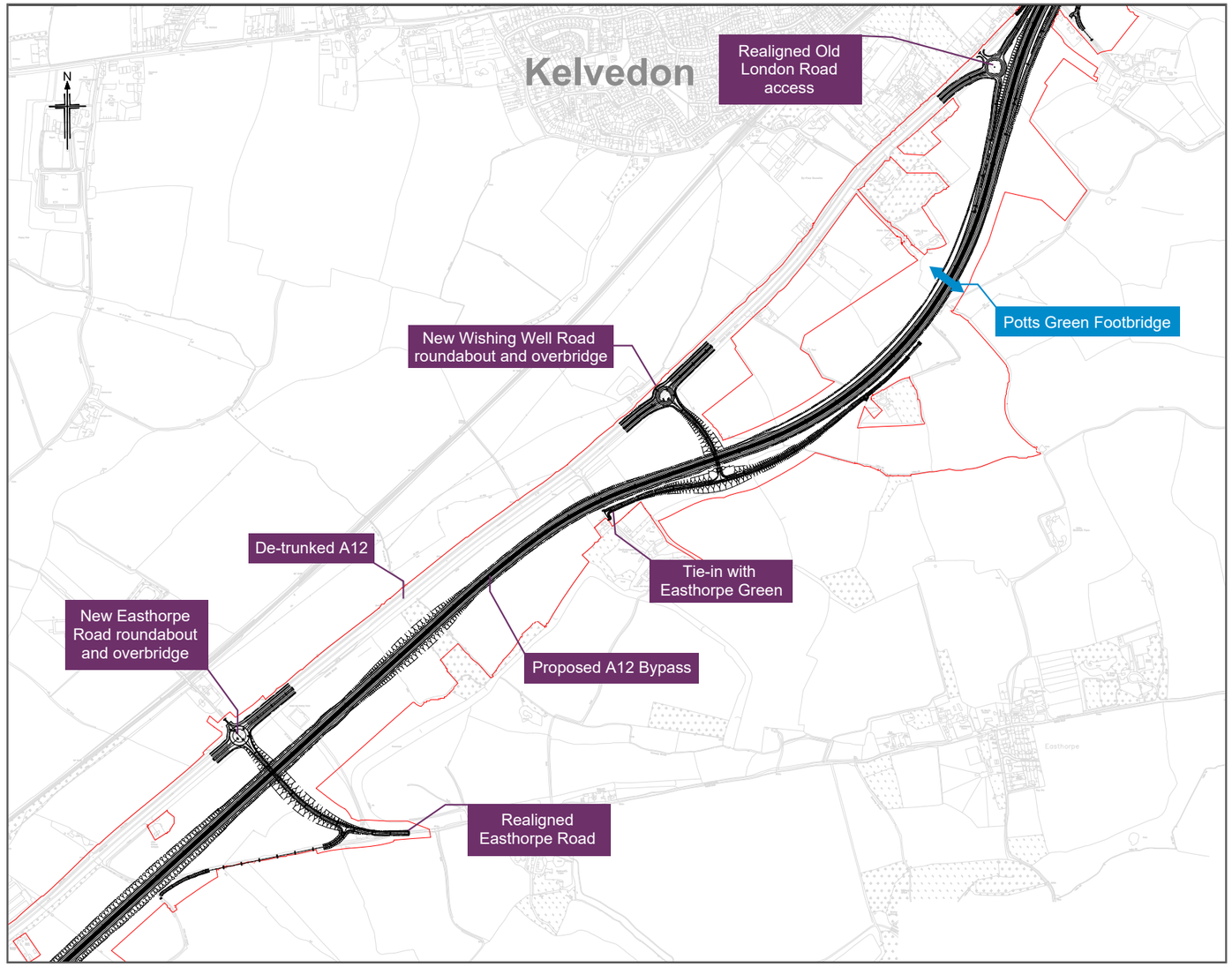
4.6.4 Doggetts Lane is an existing PMA to Doggets and Hammer Farm from the existing A12, and it is the location of PRoW 144_19 (a public footpath) that would be severed by the new alignment of the A12.

4.6.5 To the north of the proposed A12, PRoW 144_19 continues northwards and connects to the footway that runs along the existing A12 to connect with PRoW 144_15 and PRoW 144_18 (a public footpath) crossing over the existing A12.

4.6.6 To the south of the proposed A12, PRoW 144_19 continues south-westwards and joins PRoW 128_28 (a bridleway).

4.6.7 A new bridge for walkers (Potts Green Bridge), with an effective width of 4m, has been proposed over the new alignment of the A12. This bridge would connect the extended Doggetts Lane (PRoW 144_19) on the north side of the A12 to the proposed footway running on the southern side of the A12 (as described above for the Wishing Well

Map 4.6: Langley Green and Easthorpe (CA.5) scheme design summary



Farm side road).

4.6.8 This proposal would ensure the existing PRoW 144_19 maintains existing local connections and serves the community at large on both sides of the proposed A12.

4.6.9 A shared use footway/cycleway cycle track, with an effective width of 3m, would be provided to the south of the A12 and would provide connections with the new J25 roundabout at Hall Chase, and the PRoW network north of Easthorpe.

Side Road(s)

Easthorpe Road

4.6.10 To maintain the existing connectivity with the de-trunked A12, Easthorpe Road would be replaced with a new overbridge to cross the proposed A12 mainline. A farm access road is located approximately 160m away from the existing junction between Easthorpe Road and the A12, and would be realigned to form a T-junction with the proposed new Easthorpe Road. A new four-arm roundabout would be included at the tie-in location with the existing A12 de-trunked section to provide all-direction movements. The proposed new Easthorpe Road is a two-way single carriageway with a footway adjacent to the southbound lane. This road is intended for farm and emergency access only and not for public traffic.

Wishing Well Farm

4.6.11 Wishing Well Overbridge would be a new offline road for access to Easthorpe Green Farm and Wishing Well Farm. The proposed new road and overbridge are expected to be designated in accordance with Essex Highways County Route Local Road (PR2) and is assumed to be a Category D2 road. The tie-in with the de-trunked A12 would be a new three-arm roundabout. The proposed access road consists of a two-way single carriageway with a shared-use footway/ cycleway adjacent to the southbound carriageway.

4.7 Colchester (CA.6)

Mainline

4.7.1 As the proposed scheme progresses towards junction 25, the proposed offline mainline alignment ties in with the existing A12 which has three lanes on the northbound carriageway, and two lanes on the existing southbound carriageway. Widening this southbound carriageway to three lanes is proposed until the exit slip road, from which point the carriageway is three lanes wide again.

Junction

4.7.2 South of the existing junction 25, will be connected to the existing A12. At this point, new slip roads and a roundabout are proposed. Alongside this, we will modify and improve the existing junction will be modified and improved. Junction 25 will remain an elevated junction and provide access to the A12 both northbound and southbound. It will take traffic from Marks Tey, Copford and the A120, and provide a connection to the existing A12 (which will be kept for use by local traffic). The Marks Tey roundabout will be converted to a signalised crossroads to improve capacity at the junction. New crossings and a replacement bridge will be provided for walkers and cyclists across the A12.

Side Road(s)

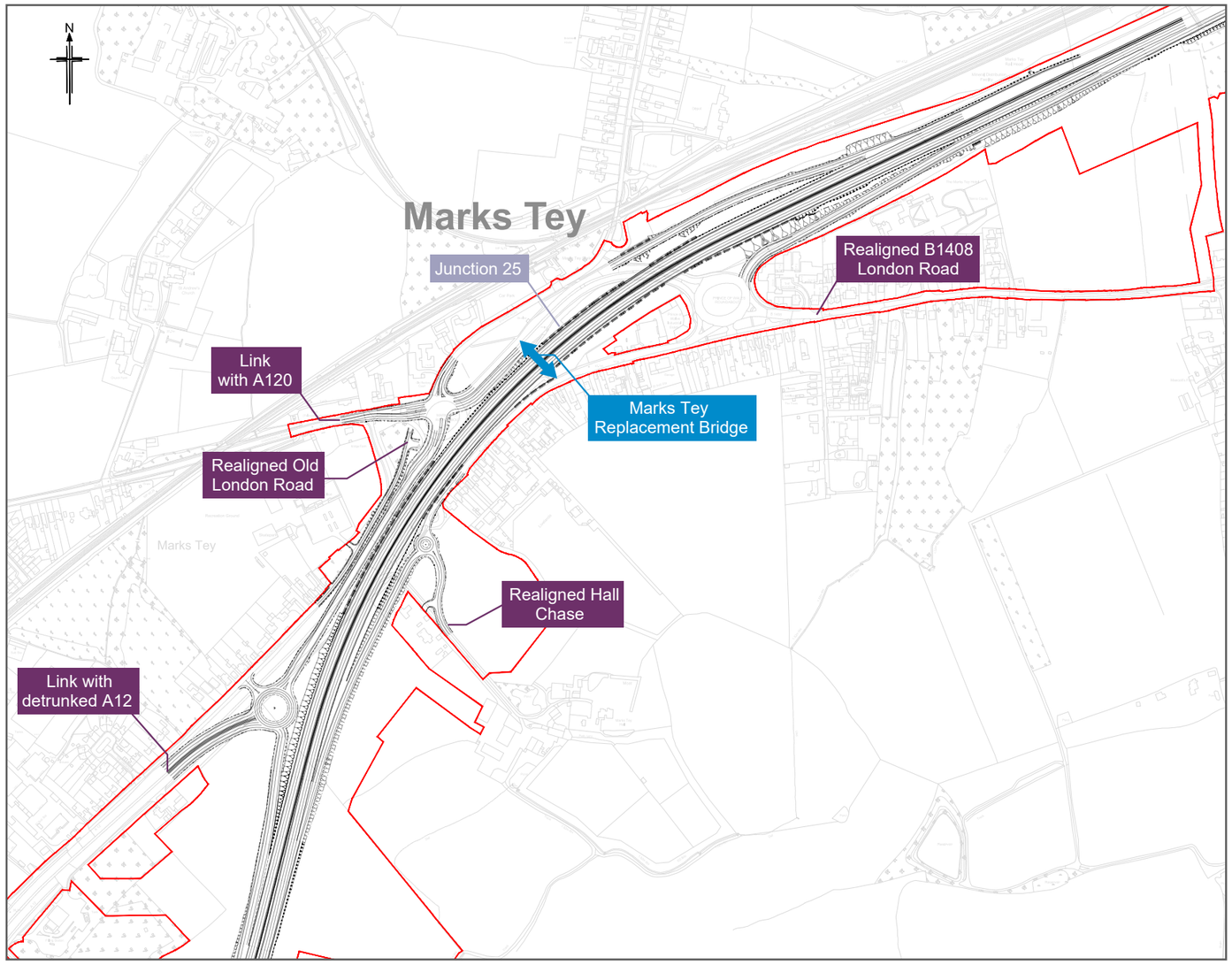
Old London Road

4.7.3 To facilitate capacity improvements at the A120 approach to J25, the existing junction between the A120 Coggeshall Road and Old London Road is planned to be closed and Old London Road to be realigned to the east to provide a turning head. Access to Old London Road is currently achievable from the northbound carriageway of the existing A12, and to supplement this arrangement a further access is proposed from the roundabout at the northern end of the proposed J25 northbound diverge exit slip road.

Hall Chase

4.7.4 The current junction between London Road (Marks Tey) and Hall Chase is proposed to be relocated due to the alignment of the offline A12 as it ties-in to the existing alignment near J25. At the junction of London Road (Marks Tey) and the northern end of the J25 southbound entry slip road, a third arm would provide access to the realigned Hall Chase. The realigned section of Hall Chase consists of a two-way single carriageway.

Map 4.7: Colchester (CA.6) scheme design summary



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05.

Walking, Cycling and Horse-riding (WCH) Strategy

5.1 Introduction

5.2 Chelmsford

5.3 Boreham and Terling

5.4 Rivenhall End, Blackwater and Silver End

5.5 Totham and Messing

5.6 Langley Green and Easthorpe

5.7 Colchester

5. WCH strategy

5.1 Introduction

5.1.1 The proposed scheme has been assessed in accordance with DMRB GG 142 Walking, Cycling and Horse-Riding Assessment and Review (Highways England, 2019). In this context, all existing WCH provision has been assessed, and impacts identified. Additionally, existing and potential desire lines for WCH usage have been identified. The impact of the proposed scheme on existing PRoWs has also been reviewed, including consideration of those locations where there is severance (including existing severance).

5.1.2 Where the proposed scheme would directly affect existing PRoWs, such as footpaths, bridleways and existing cycle routes, provision has been proposed to ensure that, once the proposed scheme is open to traffic, these routes remain open. This is through provision of overbridges or, where a direct connection is not feasible, alternative routes using suitable diversions are proposed.

5.1.3 The proposed scheme would impact 25 PRoWs, and a further 11 PRoWs would be impacted on sections of the A12 which would be bypassed by the proposed scheme. It would also impact a national cycle route, links at various proposed junctions and where the existing A12 is to be bypassed, and existing shared walking/cycling facilities.

5.1.4 Proposals for WCH provision have been developed in discussion with a broad range of stakeholder groups and with local authorities throughout the development of the proposed scheme. The proposals are shown on Maps 5.1 - 5.7 and include the following:

- Separate WCH links across four proposed major junctions, enabling users to bypass slip road junctions, including the national cycle route affected by the proposed scheme.
- 3.1 miles of new PRoW footpath, 0.3 miles of new PRoW bridleway, 6.8 miles of new cycleway and 2 miles of footway.
- 1.5 miles of improved cycleway, 2 miles of improved footway and 1 mile of cycleway upgraded from footway.
- 1.7 miles of diverted PRoW footpath and 0.1 miles of diverted cycleway.
- Five new WCH bridges and one replacement/upgraded overbridge designed for WCH at junction 25.
- Six overbridges with walking and cycling provision, five of which is new cycling provision.
- Five overbridges with walking provision.
- Provision of paths to link groups of PRoWs to proposed bridge facilities.
- Provision of new toucan crossing facilities (crossings that allow both walkers and cyclists to cross).
- Improvements to existing shared pedestrian/cycling facilities.
- Improved WCH connections across sections of the existing A12 to be bypassed, and reintroduction of bus stopping facilities.

5.1.5 For safety reasons, WCH (and possibly slow-moving vehicles) would be prohibited from using the A12 mainline between junctions 21 and 25 (Witham South interchange to Marks Tey interchange) and WCH would be encouraged to use the B1137 between junction 19 and Hatfield Peverel; if users are prohibited from using the A12, alternative routes would be provided for WCH and slow-moving vehicles.

5.1.6 The proposed scheme has endeavoured to achieve Local Transport Note 1/20 (Cycle Infrastructure Design Guidance) compliance, a standard adopted by ECC, for all cycle proposals, including buffer zone offsets from carriageway, path widths, island dimensions and crossing point geometry. For the vast majority of locations this has been achieved with the exception of a small number of locations where particular site constraints do not allow for it.

5.1.7 Grade separated crossings over the A12 are being provided at many locations to address historic severance and provide new routes. In addition to proposed road bridges carrying walking and cycling routes this includes a total of six new walking, cycling and/or horse-riding bridges. It is not feasible or desirable to provide grade separated provision at all road crossings. Given the length and scale of the proposed scheme, and site-specific criteria which are investigated in the provision of all crossings, the number and type of at-grade crossings proposed are appropriate.

5.1.8 National Highways are working to use proposed replacement land and private means of access as permissive paths upon agreement with the landowners to provide WCH access from junction 21 to junction 22.

5.1.9 For further, detailed information on the proposed WCH bridges and bridges, including the optioneering, see Chapter 7 ‘Structures’. Proposals are also shown on the Streets, Rights of Way and Access Plans [TR010060/APP/2.6].

5.1.10 To view the proposed schemes wider masterplan detailing the WCH routes, see Appendix A.

5.2 Chelmsford (CA.1)

Existing and impacted

1A Paynes Lane is an existing PRoW (bridleway PRoW 213-45) south of the existing A12 which is parallel, but not connected to, bridleway PRoW 213-23 north of the Great Eastern Main Line railway. The proposed scheme proposals will have no impact on existing WCH routes or PRoWs, however improvements are proposed.

Mitigation and improvement

1B The proposed scheme includes a new bridge (Paynes Lane) to link the two bridleways with the PRoW and provide a continuous WCH route across the A12, side roads and railway. The WCH bridge will connect all WCH users to the proposed Beaulieu Park Station and wider Chelmsford area from Boreham without negotiating junction 19.

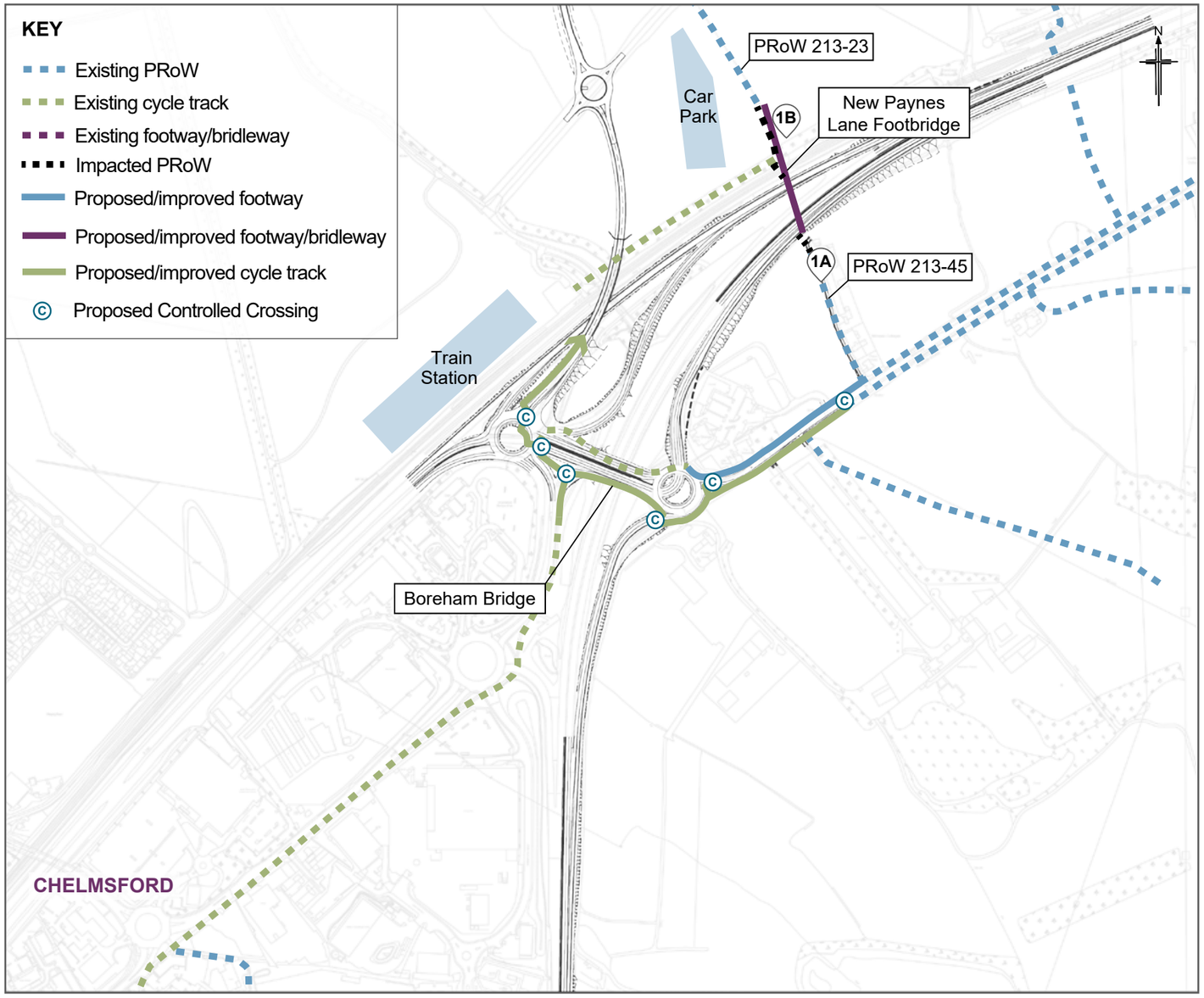
The WCH proposal to the south of the A12 along Payne's Lane is limited to improving the surfacing of the 3m wide existing, shared unsegregated cycleway/footway along the PRoW. See Chapter 7 'Structures' for details on Paynes Lane.

Junction 19 crossings

The designed crossings take into account the guidance contained within the Local Transport Note LTN1/20.

The wider route strategy for WCH considers that most will use the new Paynes Lane Bridge for most journeys, thus negating the need to interact with junction 19. The proposed scheme seeks to retain the existing routes followed by pedestrians and cyclists at junction 19, enhancing the routes within the constraints of the location.

Map 5.1: Chelmsford (CA.1) WCH strategy



5.3 Boreham and Terling (CA.2)

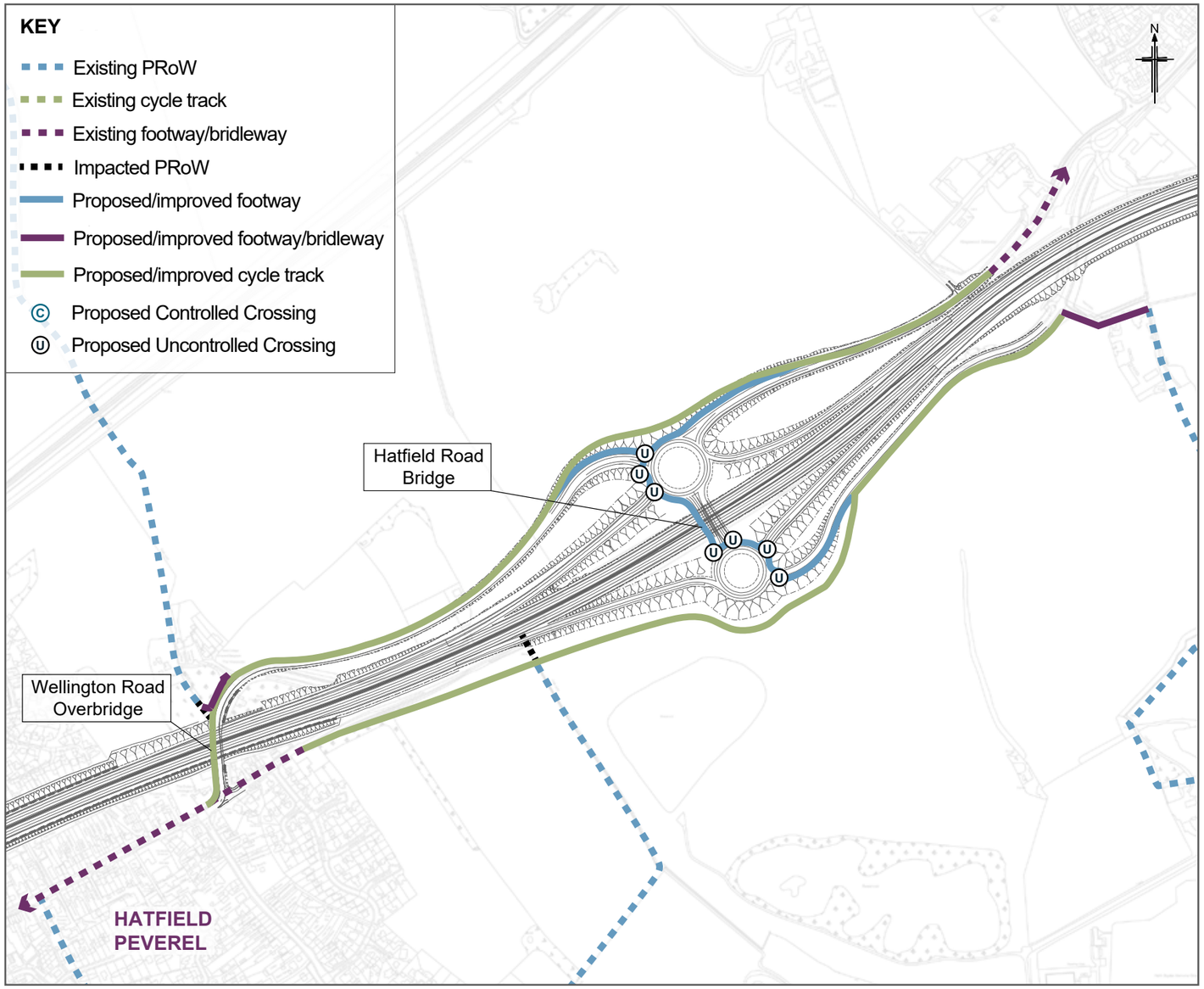
Junction 21 Crossings

There are uncontrolled crossings are at junction 21 (see Map 5.2). Uncontrolled crossings are proposed at this location due to there being a very limited number of expected users and ongoing destinations. This crossing will be signed appropriately.

Hatfield Peverel to Witham Connections

The main proposed route and connection for walkers and cyclists bypasses the junction to the north from Witham, which is segregated from the road and to the residential area of Hatfield Peverel, which is prominently commuters. The southern route, which is prominently used for lesuire, connecting Hatfield Peverel with the south of Witham/A12. The proposed route will retain users to access the north of the A12 utilising the uncontrolled crossings.

Map 5.2: Boreham and Terling (CA.2) WCH strategy



5.4 Rivenhall End, Blackwater and Silver End (CA.3)

Existing and impacted

1A To the North of the existing A12 the PRoW 121-95 runs along Olivers Drive to provide local connectivity. To the south of the existing A12 the existing PRoW 121-95 continues south-wards to provide connectivity to Oliver Farmhouse and links with PRoW 268-4. PRoW 121-95 is severed by the existing A12.

2A Asymestric widening for the proposed embankment to the south of the A12 will impact PRoW footpath at Brain bridge and therefore a permenant diversion is needed to maintain connectivity to the PRoW.

3A The existing PRoW footpath of asset (PRoW 121-103) which provides connection from Little Braxted Lane to Freebournes Road with access available to cross over the A12 via a staggered crossing, will be severed by the new proposed A12 alignment.

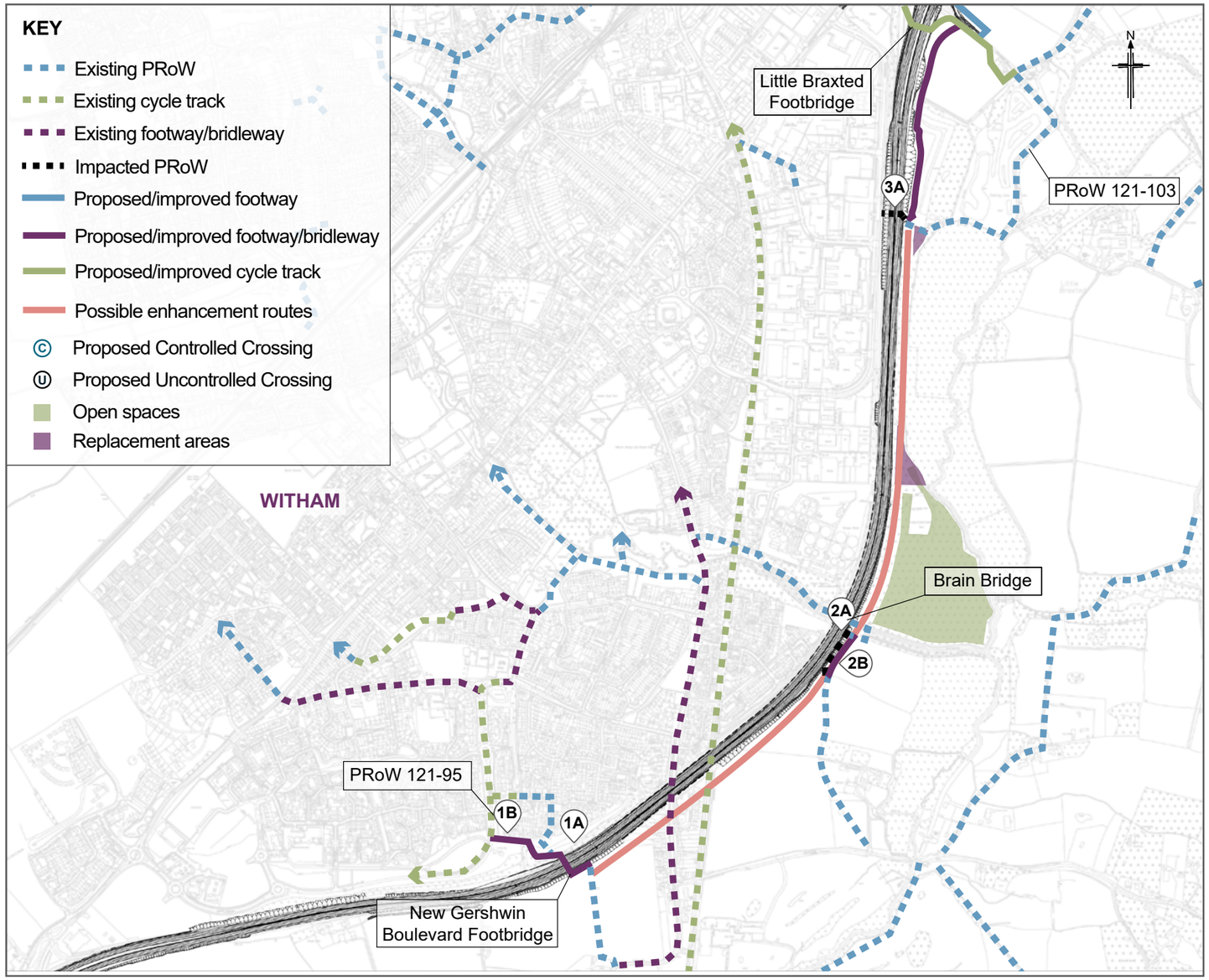
4A The proposed scheme severs an existing WCH network, where no formal crossing exists.

5A The existing PRoW 92-30 is located to the south of the A12 Ashmans Bridge, runs parallel to the A12 and provides connections with B1024 in the western side and Highfield Lane via PRoW 246-19 at the eastern side. The PRoW includes an existing timber WCH bridge across the River Blackwater which will be required to be relocated due to the widening of Ashmans Bridge.

Mitigation and improvement

1B Although a crossing of the A12 appears to be available at this location, crossing a high speed dual carriageway with high volume of traffic is not safe for road users. The purpose of the proposed Gershwin Boulevard is to a provide safe crossing points over the A12 and remove existing severance allowing access to the proposed shared-use facility connection. The WCH proposal to the north of the A12 is a 3m wide shared-use unsegregated footway/cycleway mainly to provide connections between the existing shared-use facility along the Gershwin Boulevard and the PRoW 121-95. No improvements are considered to the south of the A12 except connecting the proposed WCH bridge ramps to the existing PRoW levels.

Map 5.3: South of Rivenhall End, Blackwater and Silver End (CA.3) WCH strategy



2B Replacement footway/bridleway is proposed to connect the existing impacted route to the surrounding PRoW and Brain bridge.

3B The proposal includes Little Braxted Bridge over the A12, converting the existing national cycleway designation to a WCH route and providing connection with PRoW 105-63 to the south of the A12. To the north of the A12 the proposed WCH route will utilise part of the existing A12 eastbound carriageway to connect with Eastways Junction and PRoW 121-119 via B1389 Colchester Road as well as other local networks.

4B The severed WCH route will be diverted to a formal crossing point at Rivenhall Bridge and Snivellers WCH bridge which is a more desirable location for public transport users accessing the bus laybys. This route with continue to Kelvedon providing a continuous route for WCH users.

5B The proposed relocation of the PRoW and the WCH bridge has been determined in discussion with the consultants' construction, flood risk assessment, highways and structure teams. The proposed relocation of the WCH bridge is approximately 69m south of the existing location and this was decided to minimise the potential impacts on the floodplain and avoid clashes with construction traffic haulage. The PRoW 92-30 will also be realigned to provide the required connection with the WCH bridge on both sides. The ramps will be constructed with reinforced earthworks @ 1:20 slopes on both sides. The proposed effective width of the WCH route at the bridge and ramps is 3.0m.

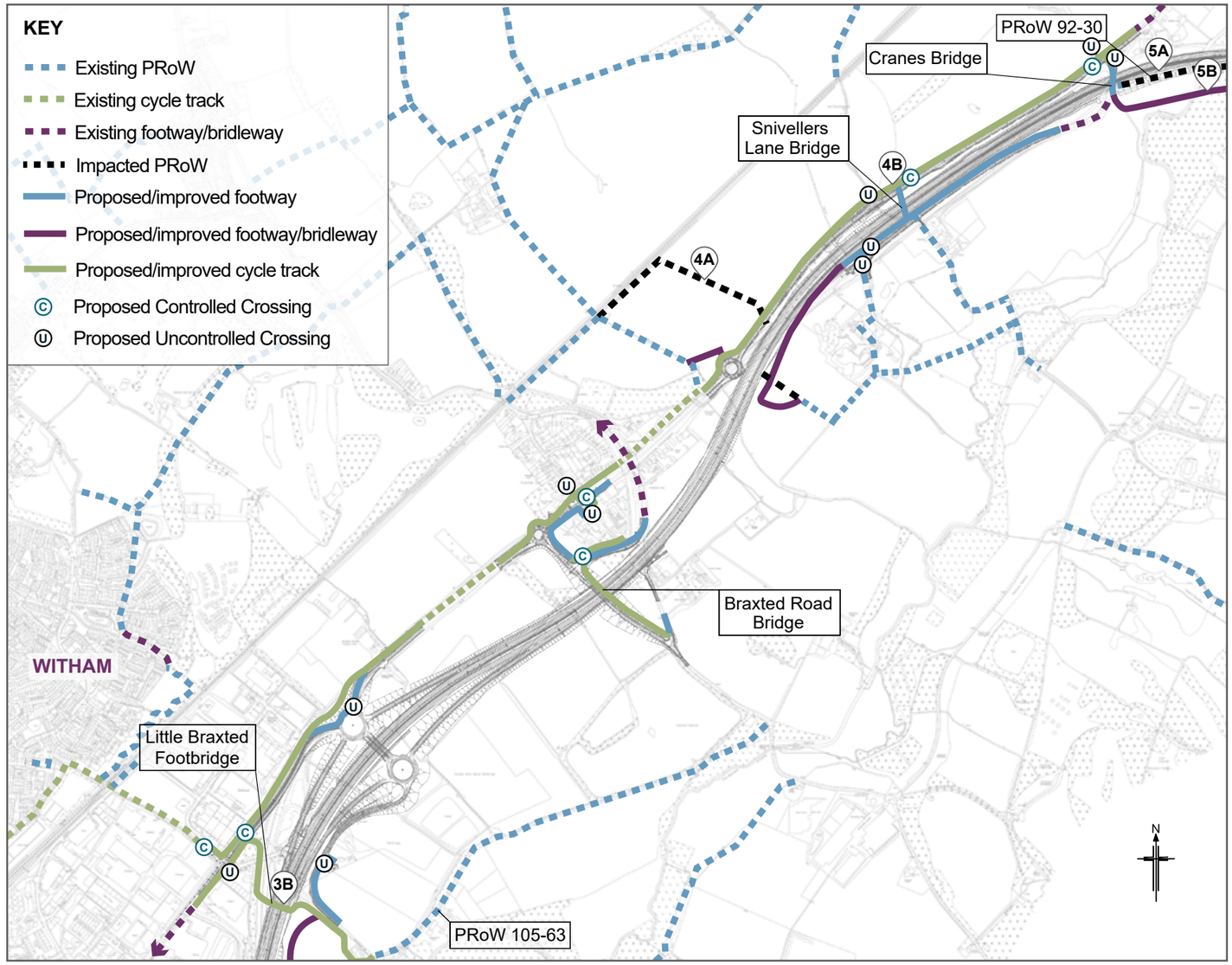
Junction 22 crossings

There is no provision for uncontrolled or controlled crossings within junction 22 itself, including over the Little Braxted Lane overbridge. This follows the recommendation of the road safety audit, and analysis showing that the alternative Little Braxted walking and cycling bridge provides a preferable alternative to all ongoing destinations.

Possible enhancement routes

The proposed scheme is providing replacement land and opening up access to the open space using permissive paths. National Highways are working to use proposed replacement land and private means of access as permissive paths upon agreement with the landowners to provide WCH access from junction 21 to junction 22.

Map 5.4: North of Rivenhall End, Blackwater and Silver End (CA.3) WCH strategy



5.5 Totham and Messing (CA.4)

Existing and impacted

1A The proposed scheme runs approximately 206m to the south of the existing A12 and would sever the existing Prested Hall connection with A12 and the local road networks.

2A The proposed scheme requires widening of the A12 online section to three-lane carriageways and the widening necessitates demolition of the existing Threshelfolds bridge to accommodate the required widening. The existing Footpath PRoW 78-18 which provides connections between Prested Hall in the south and Feering/Kelvedon in the north via the existing Threshelfords Farm bridge will be severed by the new A12 widening and demolition of the existing bridge.

3A PRoW 145-7 will be severed by a proposed southbound slip road from junction 24.

Mitigation and improvement

1B Several options were investigated to provide alternative access to Prested Hall, as the proposed A12 is on embankment to the north of Prested hall. The final decision was made to locate the proposed bridge to the west of existing junction 24 to avoid the embankment section of the A12. It is a shared bridge between Prested hall and Threshelfords Farm access intended to provide north-south connections across the A12. This option provides the opportunity to utilise rather than abandon the existing A12 carriageway which would minimise the environmental impacts and also cost of construction. The alignment will form a T-junction with B1024 at London Road to provide local road connections.

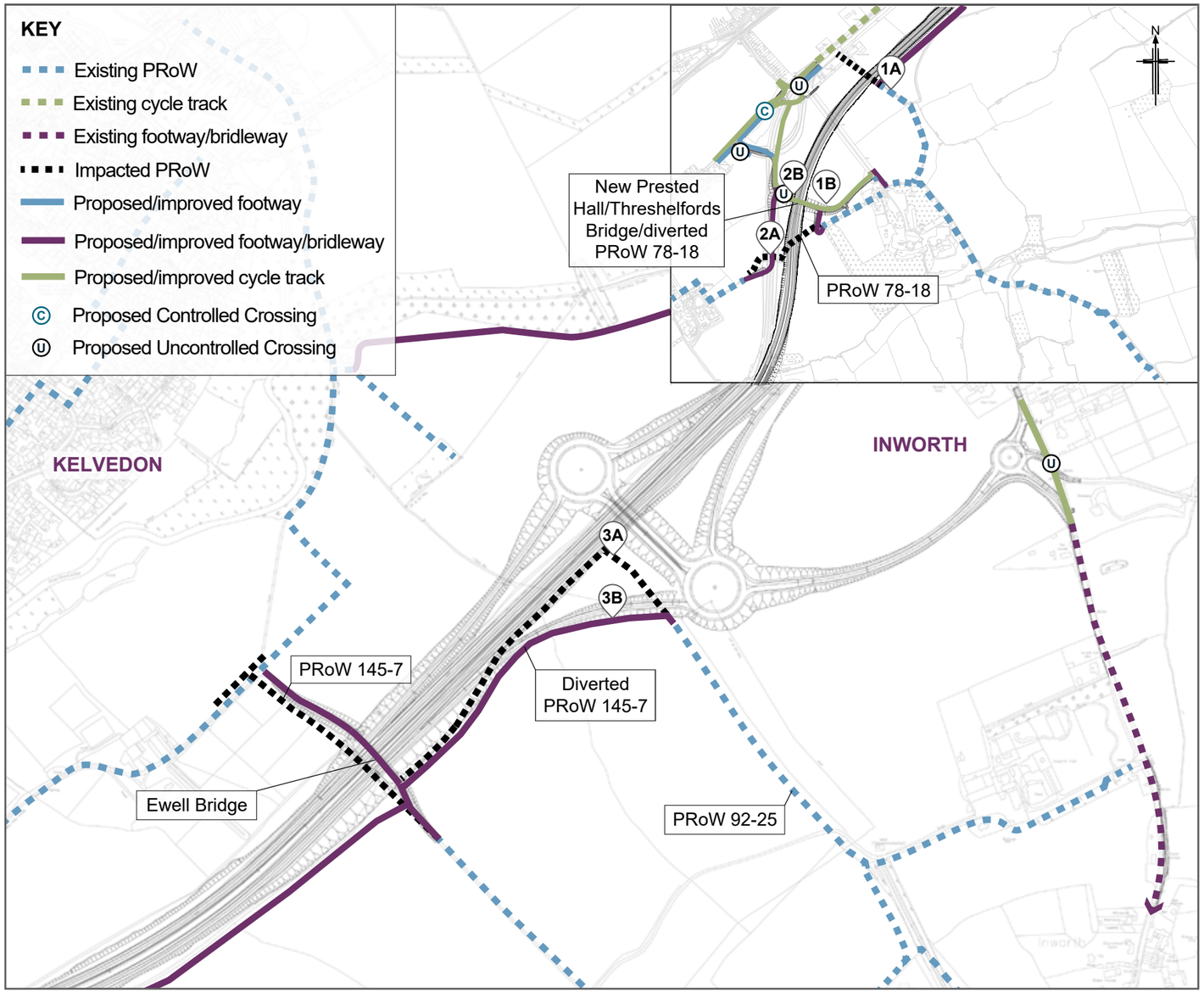
2B The new Prested Hall/Threshelfords access bridge has been designed to accommodate a 6.0m carriageway and 3m unsegregated shared-use facility intended to address the severance caused by the proposed scheme. The existing PRoW 78-18 will be diverted to the proposed bridge to cross the A12 and follow the Threshelfords Farm alignment in the north to connect with the existing.

3B PRoW 145-7 will be diverted south of the proposed slip road connecting to PRoW 92-50 and PRoW 92-25.

Junction 24 crossings

There are no proposed uncontrolled or controlled crossings within junction 24, as there are no ongoing WCH routes through the junction. Ewell Hall Chase Bridge provides a walking route over the A12.

Map 5.5: Totham and Messing (CA.4) WCH strategy



5.6 Langley Green and Easthorpe (CA.5)

Existing and impacted

1A To the north of the proposed A12, PRoW 144-19 continues north and runs along the A12 to connect with PRoW 144-15 and PRoW 144-18 at the informal crossing point over the existing A12. To the south of the proposed A12, the PRoW 144-19 continues south-westwards and joins the PRoW 128-28 to provide local connectivity. Doggetts Lane is an existing private means of access to Doggets and Hammer Farm from the existing A12 and is the location of PRoW 144-19 that would be severed by the proposed A12.

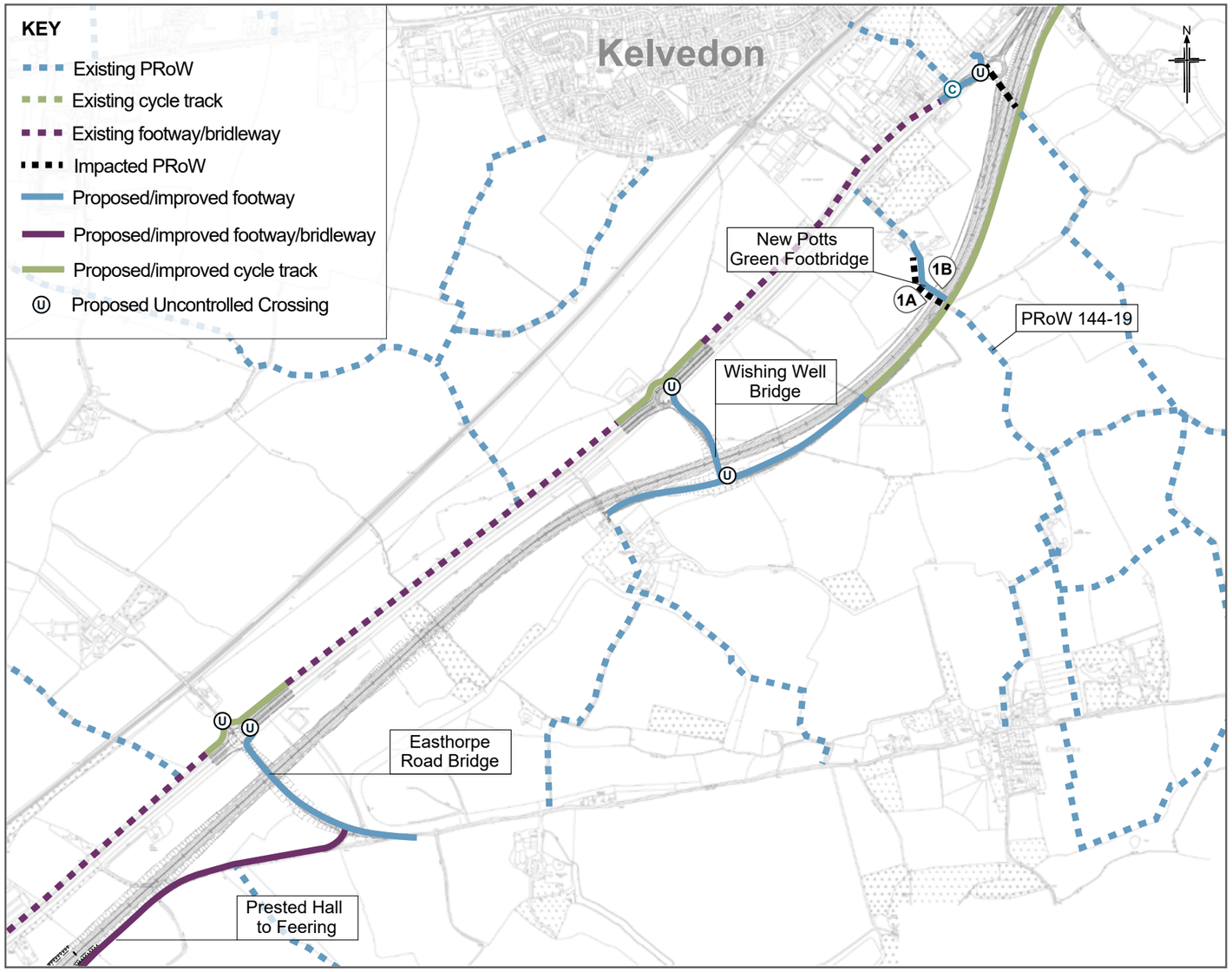
Mitigation and improvement

1B To remove the severance by the new A12, the WCH bridge with standard effective width of 3.0m has been proposed over the A12. This WCH bridge will connect the extended Doggets lane (PRoW144-19) on the north side of the A12 and proposed WCH route running on top of the A12 embankment on the southern side. This proposal will ensure the existing PRoW 144-19 maintains existing local connections and serves the community at large on both side of the new A12. The proposed WCH route to the south of the A12 will have 3m effective width and provide connections with the new junction 25 roundabout at Hall Chase, PRoW 144-18 and PRoW 144-17.

Prested Hall to Feering connection

Acting as a continous route from the proposed Prested Hall/ Threshelfords, a new footway will connect the existing PRoW at Prested Hall to Feering.

Map 5.6: Langley Green and Easthorpe (CA.5) WCH strategy



5.7 Colchester (CA.6)

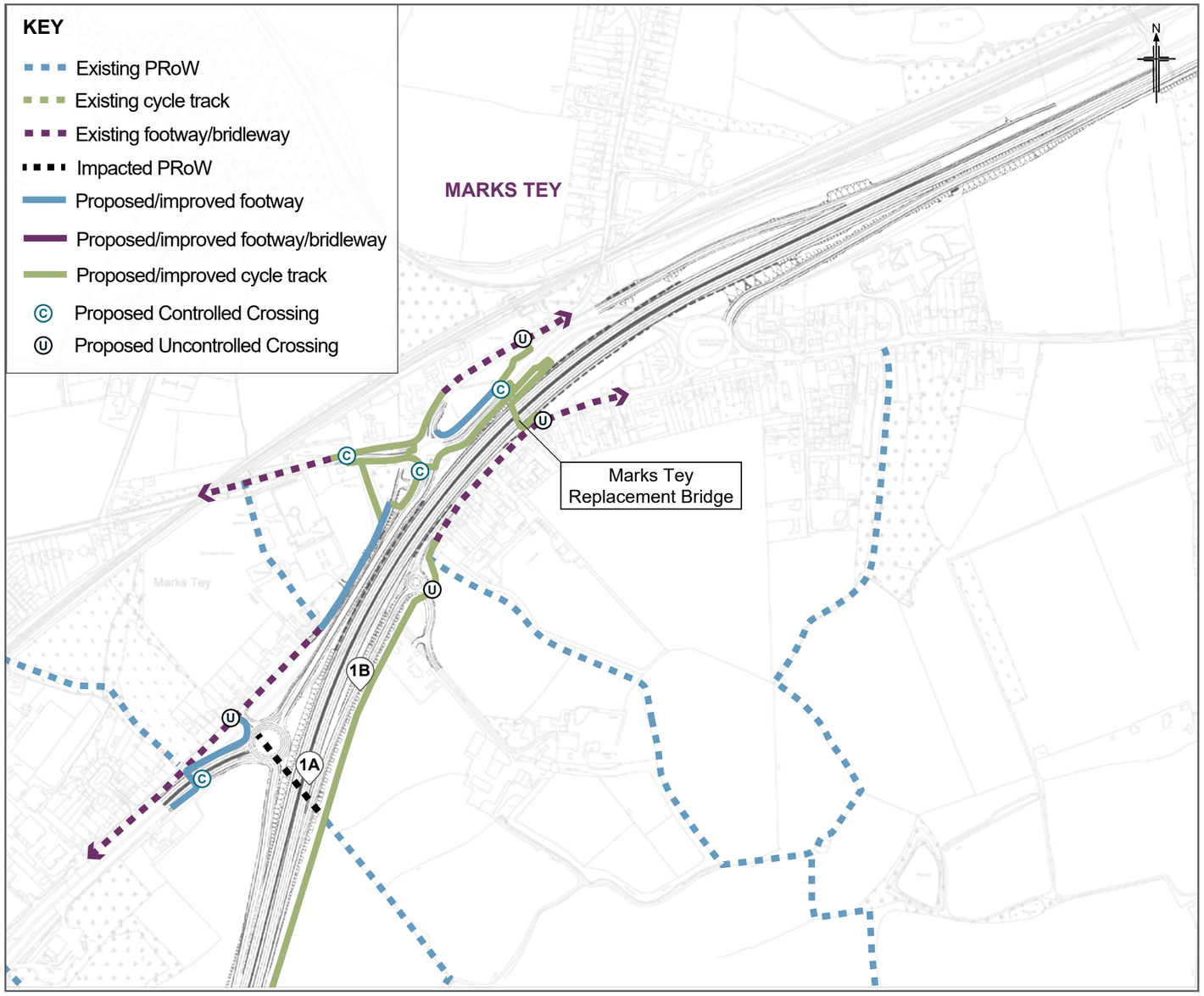
Existing and impacted

1A To the south of junction 25, PRoW 144-18 crosses the existing A12 towards to Marks Tey. The proposed A12 causes severance to the PRoW.

Mitigation and improvement

1B The proposed WCH route would mitigate the severance to PRoW 144-18 runs north and south to Potts Bridge and Marks Tey WCH bridge. The bridges attract higher foot traffic than the existing location of PRoW 144-18, therefore the mitigation will prove more desirable for users.

Map 5.7: Colchester (CA.6) WCH strategy



06.

Landscape

6.1 Introduction

6.2 Landscape character areas

6.3 Landscape considerations

6.4 Landscape design

6.5 Landscape character area 1

6.6 Landscape character area 2

6.7 Landscape character area 3

6.8 Landscape character area 4

6. Landscape

6.1 Introduction

6.1.1 Overarching design considerations affecting the proposed scheme are presented within this chapter. The proposed scheme wide landscape design principles are defined in Design Principles [TR010060/APP/7.10], describing how the design will respond to the proposed scheme's context. The proposed scheme wide landscape design principles have been informed by the strategies and guidance identified within Design Principles [TR010060/APP/7.10], the overarching design considerations presented within Section 6.3.

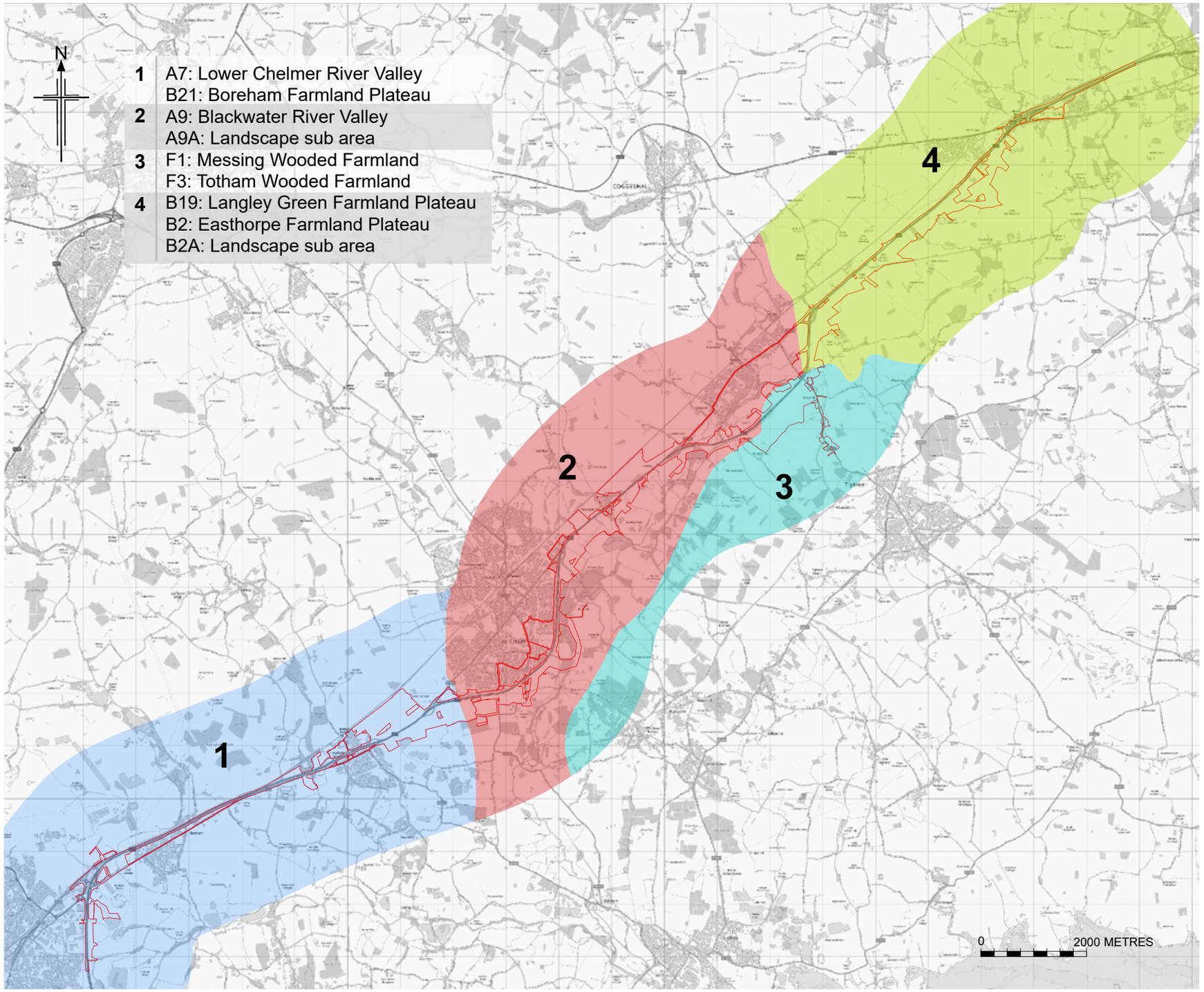
6.1.2 To describe the way the design will respond to its context and contribute towards the experience of users along the route, landscape objectives have been applied within Section 6.5-6.8 to four landscape character areas (LCAs) illustrated on Map 6.1.

6.1.3 The environmental design is illustrated on Environmental Statement Figure 2.1 Environmental Masterplan and Environmental Statement Figure 2.2 Illustrative Cross Sections [TR010060/APP/6.2].

6.2 Landscape character areas

6.2.1 To illustrate how the landscape design principles presented within Design Principles [TR010060/APP/7.10] have been applied to the proposed scheme, the route of the proposed scheme and the

Map 6.1: Landscape character areas



surrounding landscape has been divided into four LCAs based on geographical location and the LCAs defined within Braintree, Brentwood, Chelmsford, Maldon and Uttlesford Landscape Character Assessment (Chris Blandford Associates, 2006) and Colchester Borough Landscape Character Assessment (Chris Blandford Associates 2005). Further information on landscape character is provided in Environmental Statement Chapter 8 Landscape and visual [TR010060/APP/6.1] and Appendix 8.1 Published Sources of Landscape Character [TR010060/ APP/6.3].

6.2.2 For the purpose of this design narrative, the published LCAs have been rationalised to combine LCAs within similar geographical areas and which share similar characteristics and constraints, where the opportunities and design principles would therefore be consistent.

6.2.3 The amalgamated LCAs that would be directly affected are illustrated on Map 6.1.The urban area of Kelvedon and Feering and urban edges, such as the urban edge of Chelmsford and Whitham, are relevant to the proposed scheme and are therefore considered within the design principles.

6.2.4 Design objectives are identified, based on the proposed scheme wide landscape Design Principles [TR010060/APP/7.10], within each of the four LCAs defined on Map 6.1.

6.3 Landscape considerations

6.3.1 Drawing from the principles within the Road to Good Design (Highways England, 2018), five overarching considerations have influenced the design of the proposed scheme:

- Environmental constraints
- Stakeholder and community asks
- User experience
- Smarter design
- Technical and operational requirements

6.3.2 A high level overview of each of these considerations is given below.

Environmental constraints

6.3.3 Key environmental designations and features along the route include Whetmead Local Nature Reserve to the east of the A12 at Witham; Boreham House and New Hall Boreham Registered Parks and Gardens at junction 19; Rivenhall Long Mortuary Enclosure Scheduled Monument, located south of the A12 to the east of Rivenhall End; a geological Site of Special Scientific Interest to the north of junction 25; and conservation areas, listed buildings, trees with Tree Preservation Orders, and veteran trees along the route.

Stakeholder and community asks

- Permeability with connectivity: Places designed with well-defined routes, spaces and entrances that provide convenient movement without compromising security, especially when addressing existing PRoWs.
- Subliminal crime prevention: Public realm spaces designed where safety and security is subliminal to the user of that space.
- Landscape consideration: Landscape provision is carefully considered across the proposed scheme.
- Appropriate Wayfinding: Encourage connectivity with appropriate levels of permeability across its proposals.
- Management and maintenance: A robust management and maintenance plan and layered management plan to self-police the proposal to clarify the means to mitigate any unwanted activity.
- Lighting: Inclusion of detailed lighting design, evidencing current and relevant industry standards within all public realm areas as to not promote the perception, actuality and fear of crime. Co-ordinate between landscape and lighting plans to avoid conflict between lighting, planting strategies and conservation.

User experience

6.3.4 The landscape the proposed scheme would run through is largely a low lying, arable landscape, but there are some variations provided by the edges of urban areas and River valleys in particular. The western part of the proposed scheme would run through the Lower Chelmer River Valley, close to the urban edges of Chelmsford and Boreham before passing through a largely arable, plateau landscape to Witham. South and east of Witham, the proposed scheme would run along the urban edge of Witham and through the Blackwater Valley with its distinctive willow plantations. East of Kelvedon there is a higher frequency of woodland within arable farmland, before the landscape plateaus and becomes more open south of Marks Tey. The proposed scheme would predominantly fall within the infrastructure corridor containing the existing A12 and Great Eastern Main Line east of Marks Tey where the landscape is largely urban in character.

6.3.5 The proposed scheme provides an opportunity to allow road users to understand and experience the variations within the landscape.

Smarter design

6.3.6 The proposed scheme team will strive for the best approach to design. Among other things, this means working collaboratively to design elements of the proposed scheme or mitigation measures to achieve multiple objectives where possible, such as embedding mitigation into the engineering design, seeking to enhance rather than detract from the local environment and designing in a way that aligns with broader aspirations of local communities and stakeholders. Such an approach need not add cost to the proposed scheme; it is about doing things that need to be done anyway, such as reinstatement of areas affected by construction, but doing so in a more thoughtful and imaginative way. Examples include the following:

- Improvements to the rights of way network, particularly providing new connections of value to local communities
- Creation of habitats for wildlife
- Developing a coherent design for bridges, and integrating them with the landscape works to contribute positively to their context
- Ensuring the design of signage locations and structures is integrated with the

broader engineering, architectural and landscape design to achieve a coherent, distinctive approach
- Amalgamating signage and structures for a less cluttered design
- Consideration given to keeping lighting and signage to minimum required
- Earthworks and planting design to strengthen landscape character, repair damaged landscapes and improve visual amenity

Technical and operational requirements

6.3.7 To serve its strategic transport objectives, the proposed scheme will be designed and built to the appropriate standards and will respond to site specific constraints and characteristics such as geology, ground conditions and flood risk. It will be designed against ambitious safety targets for 2041, in line with on safety. The design will consider whole-life requirements of operation, management and maintenance. In addition, it will seek to minimise adverse health and environmental impacts and meet the Department for Transport's target for construction cost.

6.4 Landscape design

6.4.1 This section summarises the key characteristics and the landscape planning and land management guidelines and design objectives relating to LCAs that would be directly affected. Design objectives are identified, based on the proposed scheme specific landscape Design Principles [TR010060/APP/7.10], within each of the four LCAs defined on Map 6.1

Landscape Character Area 1

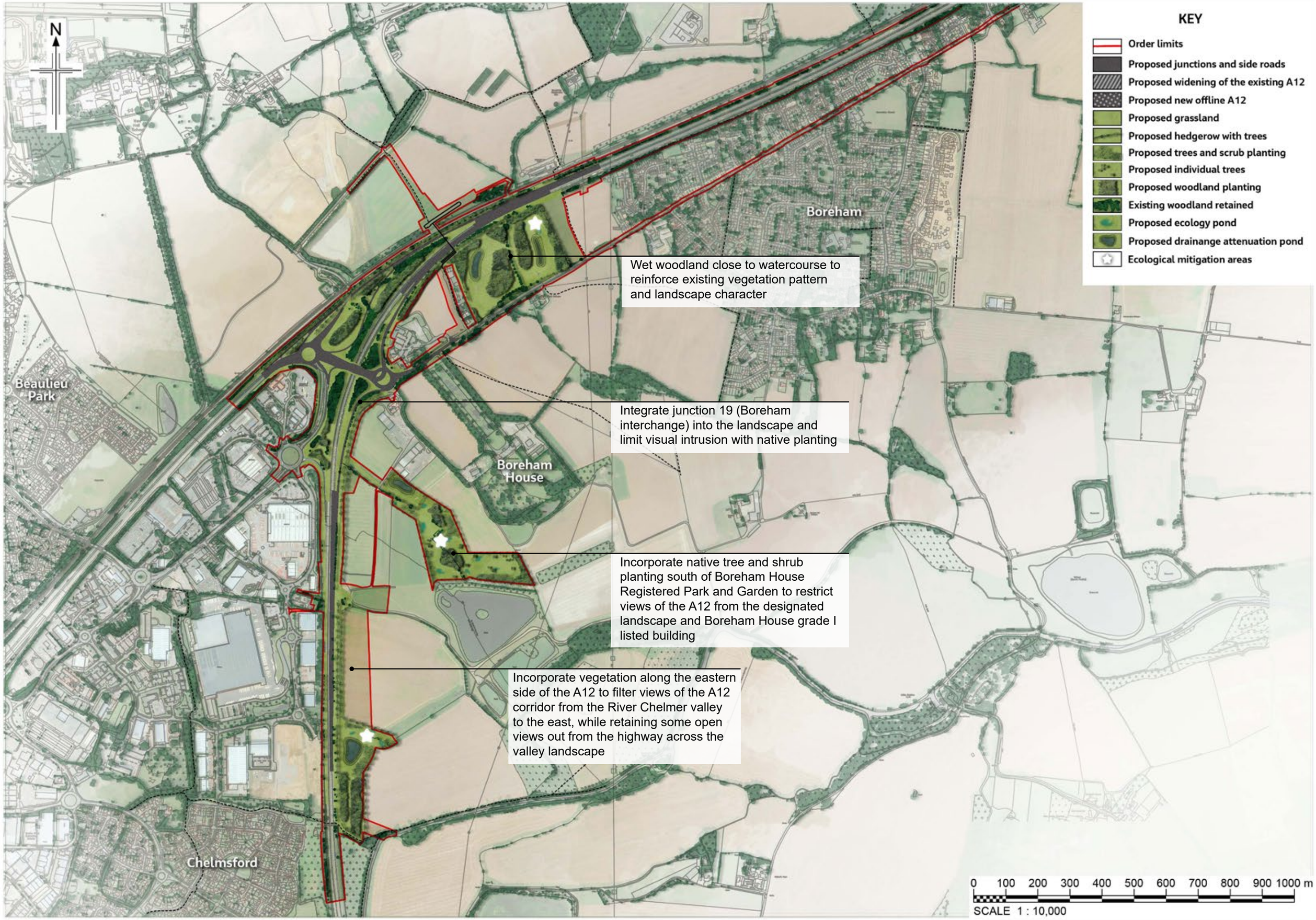
6.4.2 The landscape character within LCA. 1 is dominated by the more extensive farmland plateau landscape and proposals are limited within the Lower Chelmer Valley. The key characteristics differ within the valley landscape and are therefore considered separately.

6.4.3 A7 Lower Chelmer River Valley comprises a shallow valley. Land use is predominantly arable farmland, and there is an overall strong sense of place and tranquility away from Maldon and the A12 and railway line.

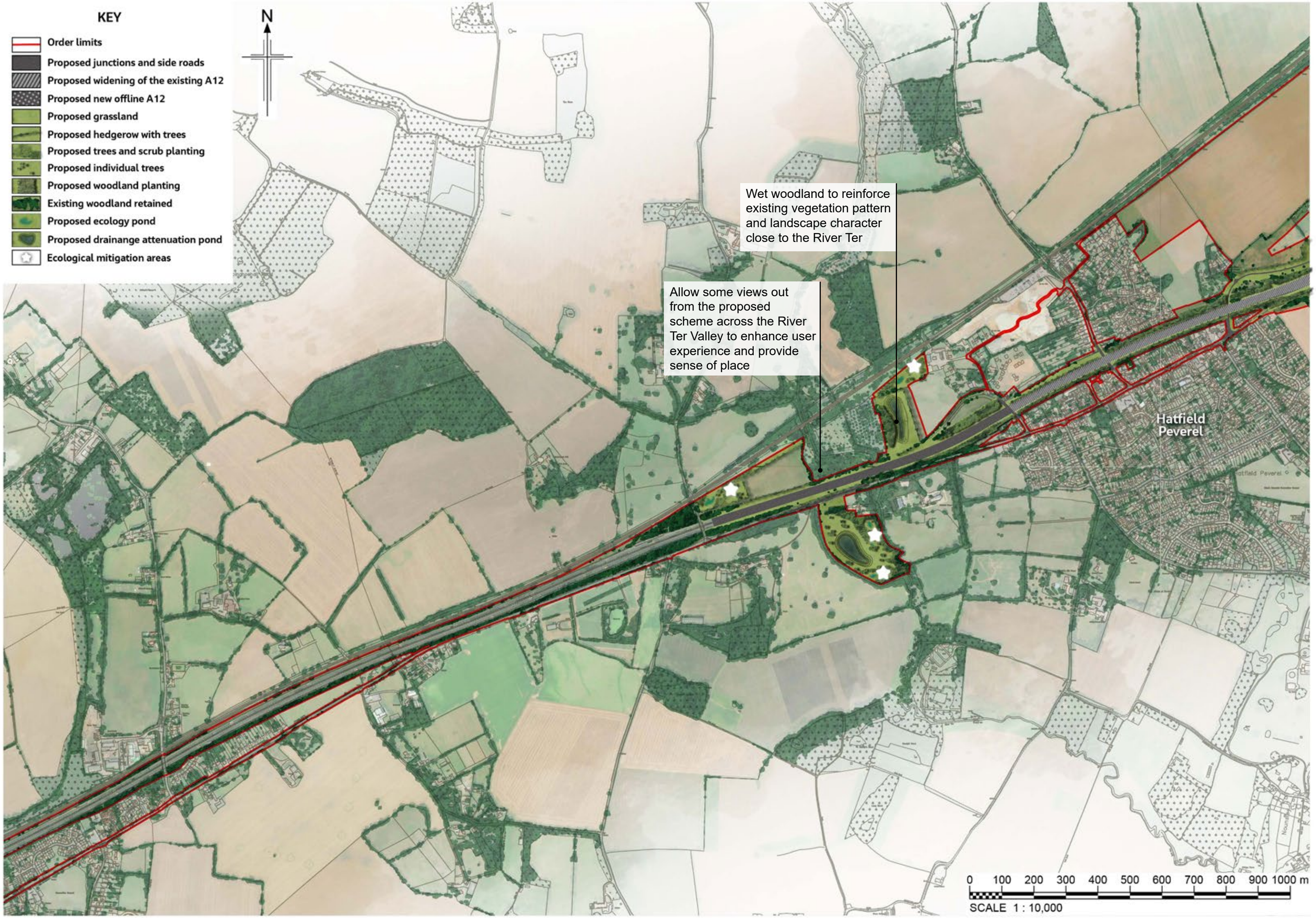
6.4.4 B21 Boreham Farmland Plateau has an irregular field pattern of mainly medium size arable and pastoral fields, marked by hedgerows, banks and ditches. Small woods and copses provide structure and edges in the landscape. There is a scattered settlement pattern, with frequent small villages.

6.4.5 A commercial and industrial area is situated west of the A12 on the eastern periphery of Chelmsford, with large-scale buildings and areas of car parking. A strong vegetation belt between the A12 and eastern edge of Chelmsford restricts inter-visibility.

6.4.6 Landscape planning and land management guidelines across LCA.1 include to enhance the screening of the A12 and the railway line, ensure that new built development is in keeping with landscape character, conserve and enhance the landscape setting of settlements, conserve and enhance the existing hedgerow pattern and strengthen through planting where appropriate to local landscape character, conserve and manage areas of ancient and semi-natural woodland as important historical, landscape and nature conservation features and conserve and manage the ecological structure of woodland, copses and hedges.



Source for aerial imagery: OpenStreetMap


KEY
Order limits
Proposed junctions and side roads
Proposed widening of the existing A12
Proposed new offline A12
Proposed grassland
Proposed hedgerow with trees
Proposed trees and scrub planting
Proposed individual trees
Proposed woodland planting
Existing woodland retained
Proposed ecology pond
Proposed drainange attenuation pond
Ecological mitigation areas
N
Wet woodland to reinforce existing vegetation pattern and landscape character close to the River Ter
Allow some views out from the proposed scheme across the River Ter Valley to enhance user experience and provide sense of place
Hatfield Peverel
0 100 200 300 400 500 600 700 800 900 1000 m
SCALE 1 : 10,000

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Landscape Character Area 2

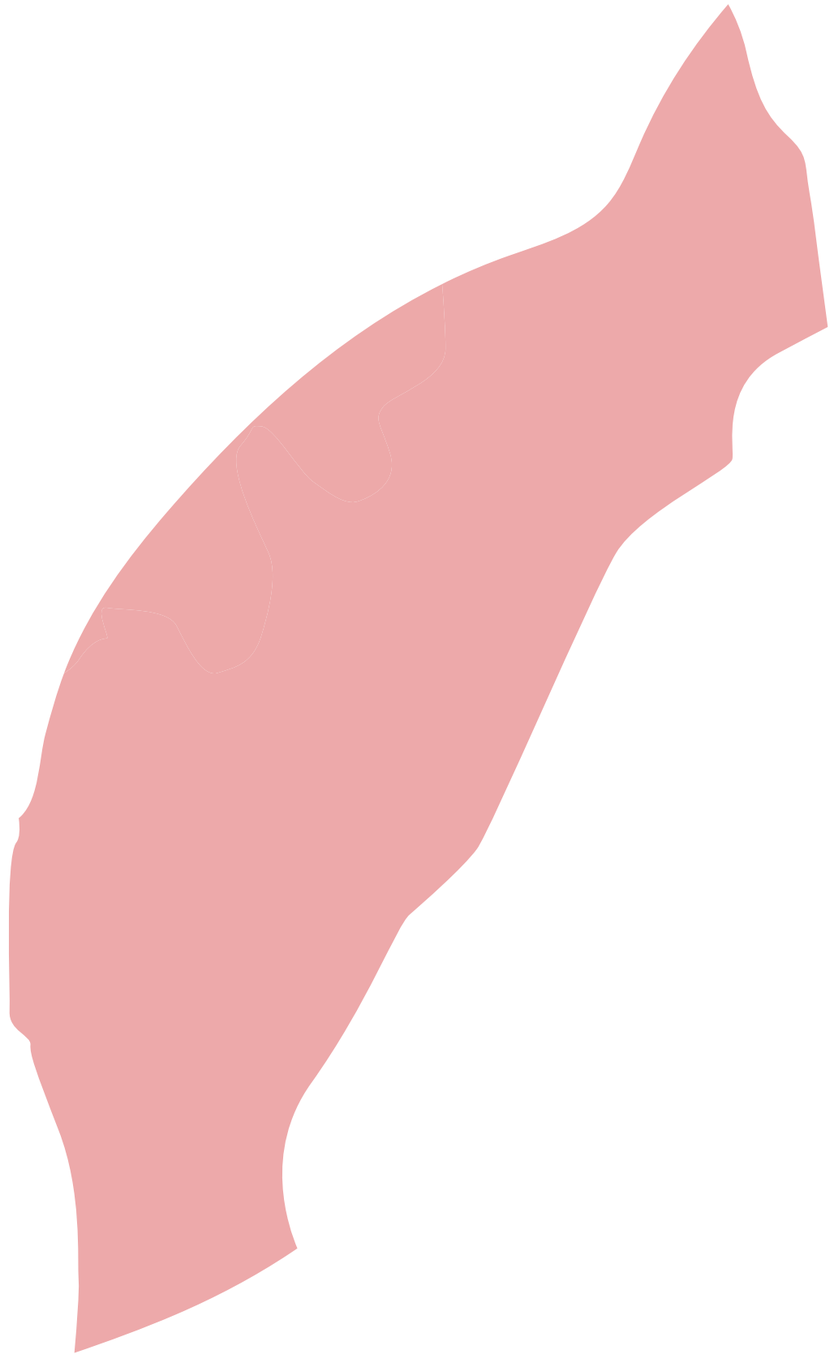
6.4.7 LCA.2 comprises the Blackwater River Valley. A9 Blackwater River Valley is characterised by a shallow valley. Land use is predominantly arable farmland, and there is an overall strong sense of place and tranquility away from the settlements of Braintree, Witham and Maldon and the A120, A12 and the railway line.

6.4.8 Landscape sub area A9A supports a mixture of arable and pastoral land use on the valley floor. Extensive linear poplar and willow plantations are a distinctive feature, especially along the River banks.

6.4.9 There is a commercial and industrial area west of the A12 on the eastern periphery of Witham (north of Blackwater Lane and the River Brain), with large-scale buildings and areas of car parking. The southern residential edge of Witham (south of Blackwater Lane and the River Brain), comprises typical 20th century housing. A strong vegetation belt between the A12 and eastern and southern edges of Witham restricts inter-visibility.

6.4.10 Kelvedon Conservation Area incorporates numerous historic listed buildings along High Street and part of Feering Hill. The streetscape within Kelvedon Conservation Area is varied, comprising medieval buildings, small Victorian terraces and 19th and 20th century buildings. The well treed course of the River Blackwater passes beneath Feering Hill, marking the divide between Kelvedon and Feering

6.4.11 Landscape planning and land management guidelines across LCA.2 include to enhance the screening of the A12 and railway line, ensure that new built development is in keeping with landscape character, conserve and enhance the landscape setting of settlements, conserve and enhance the existing hedgerow pattern, and strengthen through planting where appropriate to local landscape character and conserve and manage the ecological structure of hedges and ditches.



KEY

- Order limits
- Proposed junctions and side roads
- Proposed widening of the existing A12
- Proposed new offline A12
- Proposed grassland
- Proposed hedgerow with trees
- Proposed trees and scrub planting
- Proposed individual trees
- Proposed woodland planting
- Existing woodland retained
- Proposed ecology pond
- Proposed drainange attenuation pond
- Ecological mitigation areas

N

Witham

Whetmead Local Nature Reserve

Retain views out west across the River Brain Valley to provide sense of place for road users

Wet woodland to reinforce existing vegetation pattern and landscape character close to the River Brain

Integrate junction 21 (Witham South interchange) into the landscape and limit visual intrusion with native planting

Native woodland adjacent to existing woodland to connect with surrounding woodland and reinforce landscape character

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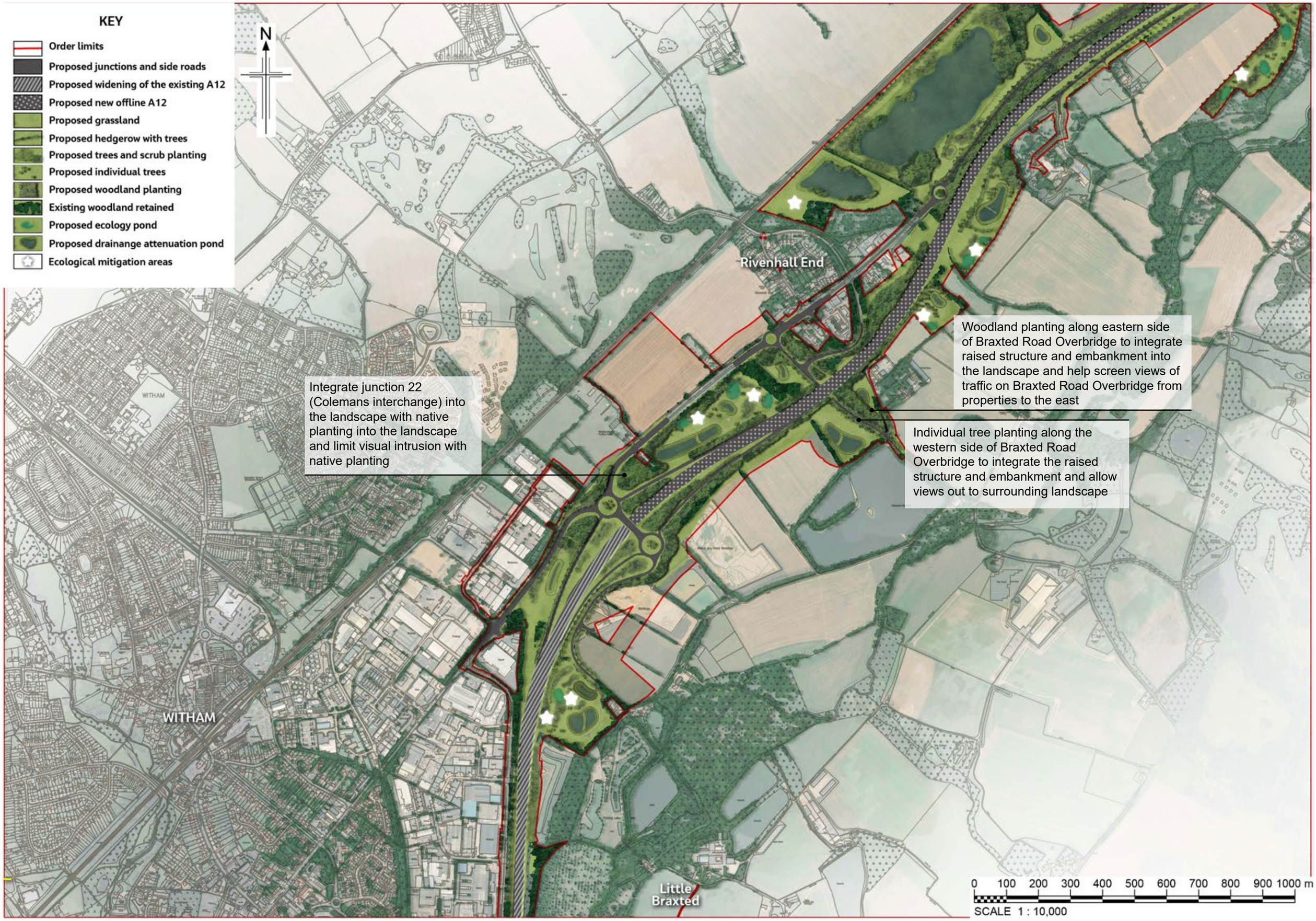
SCALE 1 : 10,000


KEY
Order limits
Proposed junctions and side roads
Proposed widening of the existing A12
Proposed new offline A12
Proposed grassland
Proposed hedgerow with trees
Proposed trees and scrub planting
Proposed individual trees
Proposed woodland planting
Existing woodland retained
Proposed ecology pond
Proposed drainange attenuation pond
Ecological mitigation areas
N
Rivenhall End
WITHAM
Little Braxted
Integrate junction 22 (Colemans interchange) into the landscape with native planting into the landscape and limit visual intrusion with native planting
Woodland planting along eastern side of Braxted Road Overbridge to integrate raised structure and embankment into the landscape and help screen views of traffic on Braxted Road Overbridge from properties to the east
Individual tree planting along the western side of Braxted Road Overbridge to integrate the raised structure and embankment and allow views out to surrounding landscape
0 100 200 300 400 500 600 700 800 900 1000 m
SCALE 1 : 10,000

KEY

- Order limits
- Proposed junctions and side roads
- Proposed widening of the existing A12
- Proposed new offline A12
- Proposed grassland
- Proposed hedgerow with trees
- Proposed trees and scrub planting
- Proposed individual trees
- Proposed woodland planting
- Existing woodland retained
- Proposed ecology pond
- Proposed drainange attenuation pond
- Ecological mitigation areas

N

Feering

Individual tree planting along Prested Hall Overbridge to reinforce parkland character and sense of place near Prested Hall

Kelvedon

Integrate junction 24 (Kelvedon North interchange) into the landscape and limit visual intrusion with native planting

Inworth

Individual trees along the B1024 to allow views out from the highway to help promote a sense of place for vehicle travellers

0 100 200 300 400 500 600 700 800 900 1000 m

SCALE 1 : 10,000

Landscape Character Area 3

6.4.12 LCA.3 comprises a landscape characterised by wooded farmland.

6.4.13 F1 Messing Wooded Farmland has an elevated plateau landform which is situated on a broad ridge and dissected by small streams, providing undulations in topography. There are large areas of mixed woodland, single mature trees at field boundaries or standing within fields and a number of small ponds and lakes. There is a sparse settlement pattern consisting of the small village of Messing, and a number of small, isolated farmsteads.

6.4.14 F3 Totham Wooded Farmland contains wooded ridges and hillsides to the east of the River Blackwater. This is a landscape of predominantly agricultural fields enclosed by woodland patches or hedgerows with mature trees. Field boundaries vary some are thickly enclosed; while other are more open with gappy hedges.

6.4.15 Landscape planning and land management guidelines across LCA.3 include to conserve the mostly rural character, ensure that any new development responds to historic settlement pattern and scale, conserve and restore the existing hedgerow network where gappy and depleted, conserve, manage and enhance areas of woodland, copses and hedges, plant half-standard trees within field hedgerow boundaries to succeed over mature trees and conserve historic lanes and unimproved roadside verges.

KEY

- Order limits
- Proposed junctions and side roads
- Proposed widening of the existing A12
- Proposed new offline A12
- Proposed grassland
- Proposed hedgerow with trees
- Proposed trees and scrub planting
- Proposed individual trees
- Proposed woodland planting
- Existing woodland retained
- Proposed ecology pond
- Proposed drainange attenuation pond
- Ecological mitigation areas

N

Feering

Kelvedon

Inworth

Intermittent trees and shrubs on embankment to allow filtered views out across the River Blackwater Valley and promote a sense of place for vehicle travellers

Native planting to help integrate the proposed scheme and limit views of the highway infrastructure from Kelvedon Conservation Area

Individual tree planting around junction 24 (Kelvedon North interchange) to promote dRiver interest

0 100 200 300 400 500 600 700 800 900 1000 m

SCALE 1 : 10,000

Landscape Character Area 4

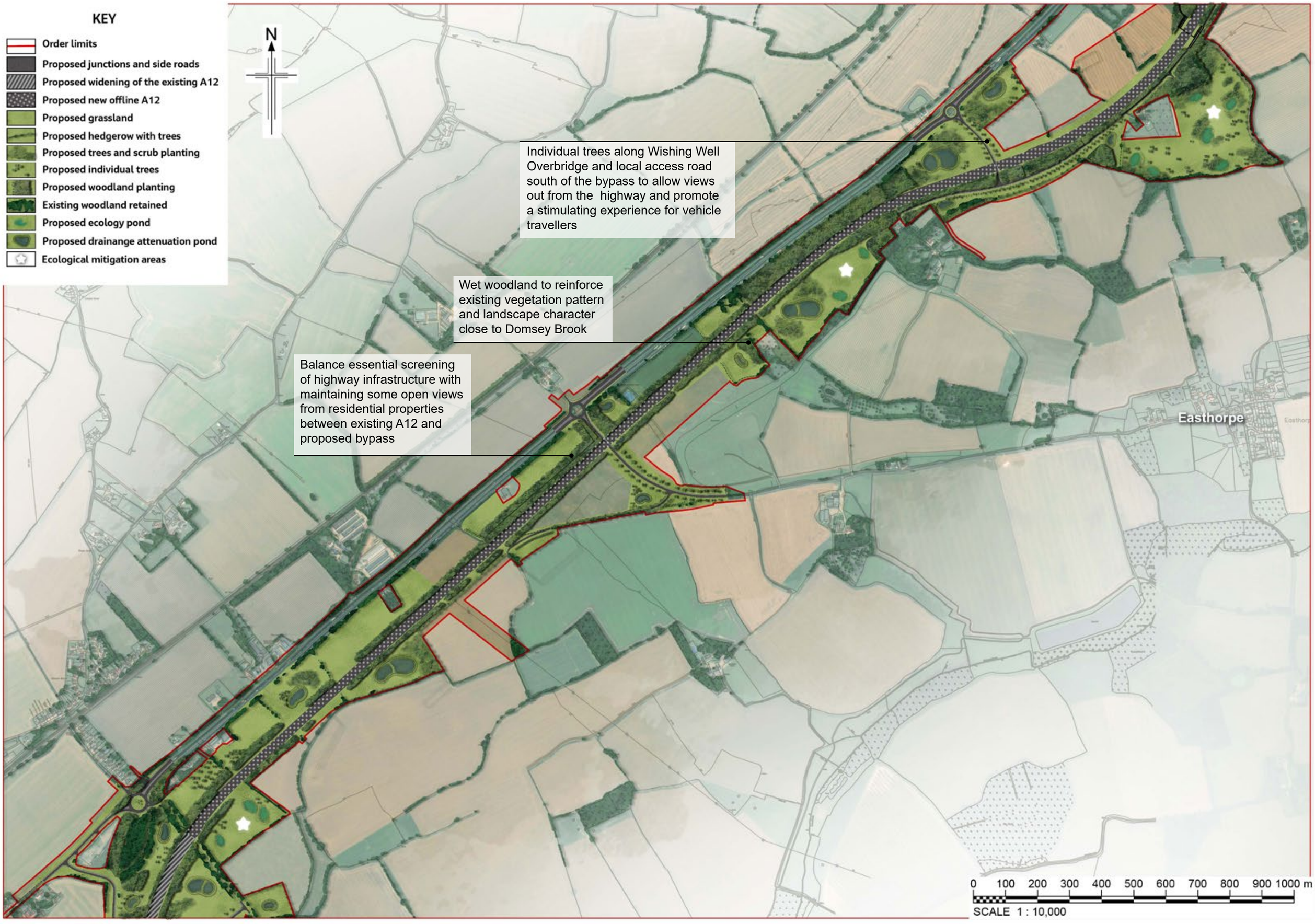
6.4.16 The key characteristics of LCA. 4 differ slightly from west to east.

6.4.17 To the west, B19 Langley Green Farmland Plateau comprises flat to gently sloping farmland dominated by large arable fields. Field boundaries are generally gappy and fragmented, especially adjacent to roads. Settlement pattern consists of small villages with scattered farmsteads among predominantly arable land. There is an overall strong sense of place and tranquility away from the A120, A12 and the railway line.

6.4.18 B2 Easthorpe Farmland Plateau comprises raised farmland, dissected by the wooded Roman River valley in the east. There are small patches of deciduous woodland and several ponds/reservoirs. There is a mixture of small, medium and large, irregular, predominantly arable fields. The area is crossed by a network of narrow, sometimes winding lanes. Settlement pattern consists of small villages and hamlets with scattered farmsteads among predominantly arable agricultural land.

6.4.19 Landscape sub area B2A comprises a linear settlement corridor extending from the western edge of Colchester urban area, including the western edges of Stanway, Copford village and Marks Tey in the west. The northern boundary is delineated by the A12 and railway corridor which is a dominant visual feature within the character area. Major road junctions/roundabouts are visually dominant within the character area, and the landscape character is disturbed by the visual movement and noise intrusion of cars on the A12 and also by frequent trains on the railway line.

6.4.20 Landscape planning and land management guidelines across LCA.4 include to ensure that new built development is in keeping with landscape character and responds to historic settlement pattern, conserve and enhance the landscape setting of settlements, conserve the mostly rural character of the area, consider the introduction of new structure planting to shield/mitigate the visual effects on the A120, A12 and the railway line corridor, conserve and enhance the existing hedgerow pattern, conserve and manage areas of ancient and semi-natural woodland and conserve historic lanes and unimproved roadside verges.


KEY
Order limits
Proposed junctions and side roads
Proposed widening of the existing A12
Proposed new offline A12
Proposed grassland
Proposed hedgerow with trees
Proposed trees and scrub planting
Proposed individual trees
Proposed woodland planting
Existing woodland retained
Proposed ecology pond
Proposed drainange attenuation pond
Ecological mitigation areas
N
Individual trees along Wishing Well Overbridge and local access road south of the bypass to allow views out from the highway and promote a stimulating experience for vehicle travellers
Wet woodland to reinforce existing vegetation pattern and landscape character close to Domsey Brook
Balance essential screening of highway infrastructure with maintaining some open views from residential properties between existing A12 and proposed bypass
Easthorpe
0 100 200 300 400 500 600 700 800 900 1000 m
SCALE 1 : 10,000

KEY

- Order limits
- Proposed junctions and side roads
- Proposed widening of the existing A12
- Proposed new offline A12
- Proposed grassland
- Proposed hedgerow with trees
- Proposed trees and scrub planting
- Proposed individual trees
- Proposed woodland planting
- Existing woodland retained
- Proposed ecology pond
- Proposed drainange attenuation pond
- Ecological mitigation areas

N

Native woodland planting along realigned Roman River to integrate with and reinforce landscape character

Copford

Incorporate native planting around junction 25 (Marks Tey interchange) to help limit views of highway infrastructure from residential properties

Utilise tree and shrub planting to strengthen the well treed setting of Marks Tey Hall and reinforce screening of the proposed scheme

Integrate the realigned access to Marks Tey Hall sensitively, using avenue planting to reinforce the formal character of the access along Hall Chase

Marks Tey

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SCALE 1 : 10,000

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07.
Structures

7.1 Introduction

7.2 Underbridge design

7.3 Overbridge design

7.4 WCH bridge design

7.5 Culvert design

7. Structures

7.1 Introduction

7.1.1 The proposed scheme includes a variety of new, modified, existing, demolished and replaced structures. These include underpasses, bridges, retaining walls and culverts that are detailed in the following sections.

7.1.2 The modified and new structures have been designed in accordance with current good practice and to comply with Department for Transport approved design standards; for example, DMRB CD 127 'Cross-Sections and Headrooms' and DMRB 'CD 143 Designing for Walking, Cycling and Horse-Riding'. These fulfill the following the proposed scheme criteria:

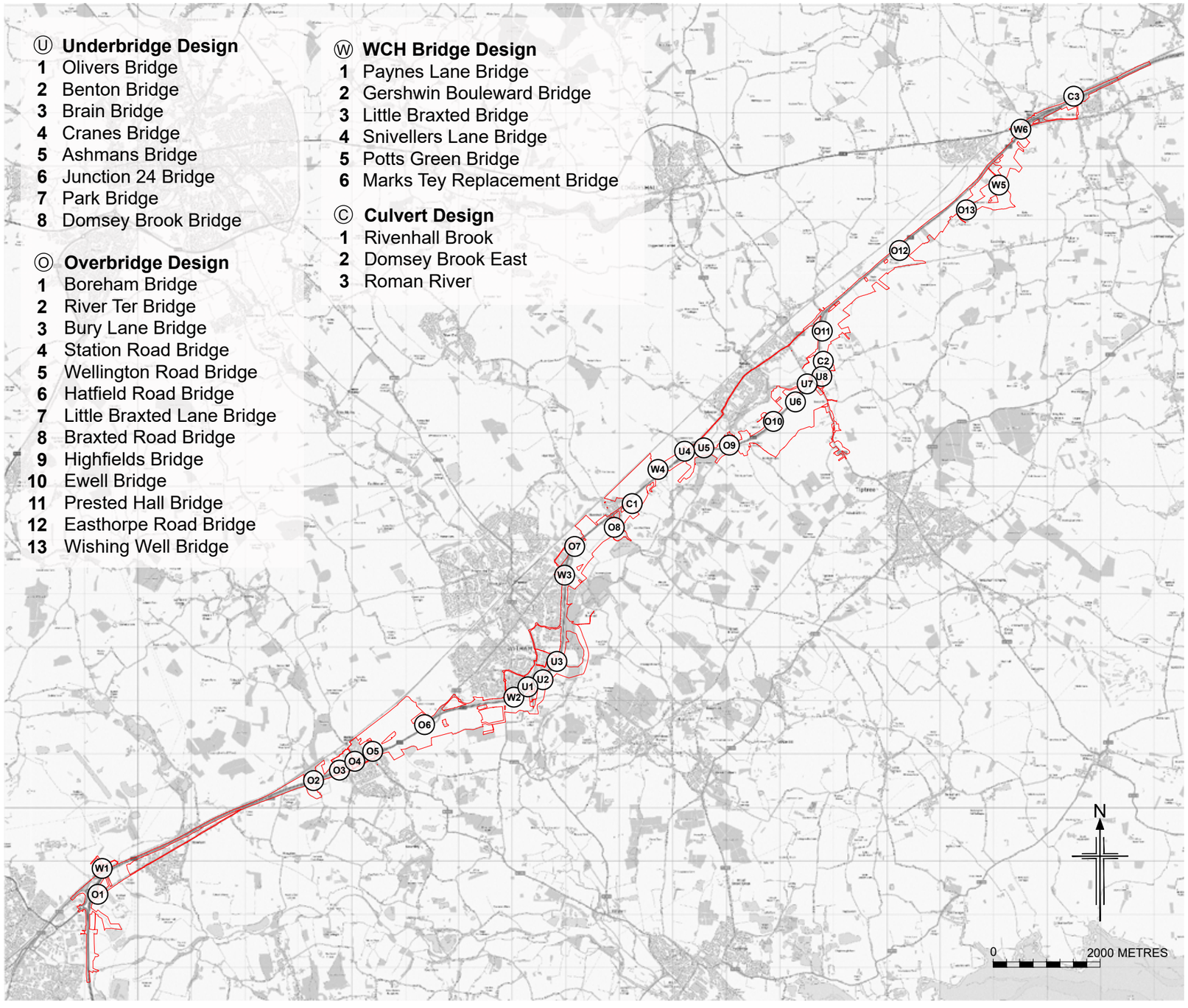
- Provide highway clearances, headrooms and loading requirements
- Provide WCH requirements
- Comply with the requirements of third-party stakeholders where relevant.

7.1.3 All structures have been designed to ensure durability requirements are met but will also ensure materials are used efficiently. Structural concrete will incorporate a cement replacement combination mix to reduce the amount of cement and therefore reduce the associated embodied carbon of the structure.

7.1.4 All structures have been through a rigorous optioneering process, which has covered structural efficiency, environmental impact, cost, maintenance, construction impact and associated CO2 footprint, durability, site constraints, buildability and health and safety. Structure options presented in this chapter were chosen from achieving highest score at optioneering.

7.1.5 The following sections describe the design considerations for the modified and proposed structures, Options considered and detail of the chosen option. The structures are illustrated on the General Arrangement Plans ([TR010060/APP/2.10]) and Engineering Drawing and Sections ([TR010060/APP/2.12).

Map 7.1: Location of structures



7.2 Underbridge design

Within the proposed scheme the following underbridge widening and upgrades are required:

Olivers Bridge (U1) and Benton Bridge (U2)

7.2.1 The following structural widening share similar characteristics, site considerations and therefore the chosen option applies to each bridge.

Site specific considerations (Olivers Bridge - U1)

7.2.2 Vegetation along the existing A12 verges including a priority habitat of deciduous woodland, approximately 79 m west of Olivers Bridge. This vegetation along the existing A12 verges currently provides screening to the adjacent residential properties including the Church of Jesus Christ of Latter-day Saints to the south. It is proposed to maintain the tree screening adjacent to the structure where possible.

7.2.3 The dismantled Witham to Maldon railway line beneath Benton Bridge approximately 80m east of Olivers Bridge. The dismantled railway line beneath Benton Bridge is part of the Blackwater Rail Trail Country Park which currently provides habitats potentially suitable for protected species such as bats, badgers, breeding birds and reptiles. The dismantled railway line beneath Benton Bridge provides a pathway for badgers and other species to safely cross beneath the A12.

7.2.4 Olivers Bridge is within Defra's Noise Important Area No 5415.

Site specific considerations (Benton Bridge - U2)

7.2.5 Vegetation alongside the A12 verges and the abandoned railway line currently provides screening to the adjacent residential properties. The railway line which is part of the Blackwater Rail Trail Country Park and users of the path are considered to have high visual sensitivity. The cycle path beneath the A12 provides a pathway for species to cross the A12 safely.

7.2.6 There are private residential properties to the north and south-west of the structure.

7.2.7 The Order Limit to the north of the structure may pose a constraint on the works as it is approximately 9m north of the extent of the widened structure.

7.2.8 The proposed structure is within Defra's Noise Important Area 5415.

Options considered

7.2.9 Four options were considered in response to the Site specific considerations:

- Option 1: No changes to the existing substructure.
- Option 2: Widen deck with weathering steel I girders.
- Option 3: Demolish and re-build, single span simply supported weathering steel I girders composite (not applicable for Olivers Bridge).
- Option 4: Widen deck with precast prestressed concrete beams (not applicable for Benton Bridge).

Preferred option

7.2.10 No changes to the existing substructure (Option 1) is preferred (see Image 8.1), to realign and resurface to achieve a widened carriageway. As a result, the design period will be reduced and all works to enable the construction of new abutments and piers will not be required. The majority of the environmental concerns associated with Options 2 and 3 will therefore be eliminated and the programme significantly reduced.

7.2.11 Option 1 will require maintaining the existing structure only and is therefore considered to have a lower maintenance requirement than Options 2 and 3. However, the reduced verge widths of 0.857m to 0.870m (Benton Bridge) and 0.72m to 0.745m (Olivers Bridge) are not wide enough to allow use by maintenance vehicles required for structural inspection and maintenance. Therefore, disruption to traffic through temporary closure of Lane 1 under suitable traffic management will be required for all future routine maintenance of the superstructure.

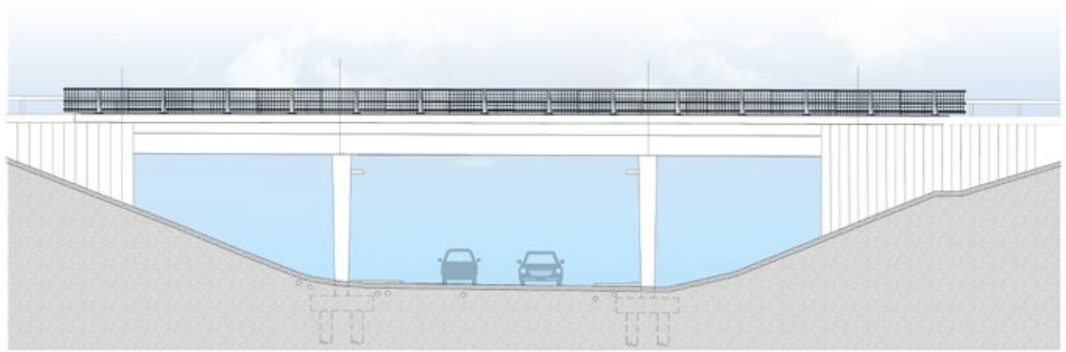


Image 7.1 Olivers Bridge Elevation

Brain Bridge (U3)

Site specific considerations

7.2.12 Groups of trees on the bridge embankments and alongside A12 verges currently provide screening to the Whetmead Local Nature Reserve and residential properties south-west of the proposed structure.

7.2.13 Whetmead Local Nature Reserve (Local Nature Reserve) is partially within the footprint of the proposed structure to the east. The site is a previous landfill site now comprising unimproved grassland and lagoons, it supports a range of common butterflies and dragonflies, and seed-eating birds. There is good foraging and commuting potential for bats along the River Brain corridor which is surrounding by deciduous woodland priority habitat. In addition to bats, the area provides habitats for protected species such as badgers, water voles, breeding birds and reptiles.

7.2.14 The River Brain beneath the proposed structure is classified as a Water Framework Directive (WFD) water body (GB105037041140). Several fish species have been recorded within the River Brain including: bullhead, chub, dace, European eel, gudgeon, minnow, pike, roach, stone loach and 3-spined stickleback.

7.2.15 An unclassified road passes below the structure adjacent to the northern abutment which is also a designated footpath that is to be retained.

Options considered

7.2.16 Three options were considered in response to the Site specific considerations:

- Option 1: Widen deck on both sides with precast concrete beams and infill, matching existing, supported on reinforced concrete substructure to match existing on piled foundations.
- Option 2: Widen deck on both sides with precast concrete beams and deck slab,

not matching existing, supported on reinforced concrete substructure to match existing on piled foundations.

- Option 3: Widen deck on both sides with braced steel girders and deck slab, not matching existing, supported on reinforced concrete substructure to match existing on piled foundations.

Preferred option

7.2.17 Option 1 is the recommended option, involving widening on both sides, 4.991m to the west and 7.456m to the east. The existing central reserve will be hydro-demolished and resurfacing works undertaken to achieve a widened carriageway, central reserve, and verges. This provides a cost-effective, structurally efficient solution where compatibility with the existing deck is of high importance.

7.2.18 The widened deck must form a continuous structure through being stitched together. The precast MY6 beam deck will have a similar construction depth, stiffness and hence deflections to the existing deck.

7.2.19 It is proposed to temporarily divert the River Brain by pumping the River using a pipe to facilitate the widening works. This will prevent any contamination during the works. The proposed temporary pumping and pipe diversion solution would have fish screens fitted to the pump inlet to prevent any fish from passing through the pump, with fish rescues carried out to retrieve any fish and move upstream. All of the proposed works would have to take place outside of the fish spawning season (October to June).

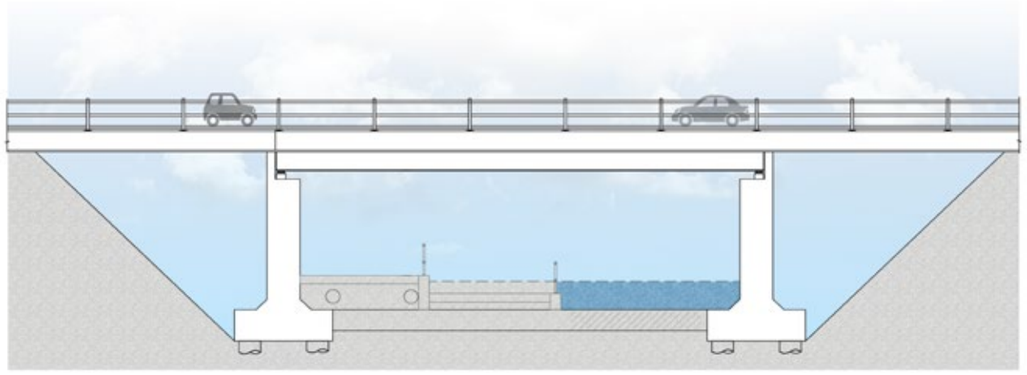


Image 7.2 Brain Bridge Cross-Section

Cranes Bridge (U4) and Ashmans Bridge (U5)
Site specific considerations (Cranes Bridge - U4)

7.2.20 An area with archaeological remains of a linear feature, a track way known as Crab's Farm, an area with a linear feature known as Cropmarks along Crane's Lane and an archaeological find of post-medieval date approximately 72 m and 19 m north-west, and 104 m south-east of the bridge, respectively. There is a further low value heritage asset, an area known as Ashmans Farm with a pre-historic linear feature ring ditch, rectilinear enclosure, and ring ditch approximately 118m south-east of the bridge.

7.2.21 Vegetation along the existing A12 verges currently provide screening of the existing bridge to the adjacent agricultural fields and properties.

7.2.22 Vegetation along the existing A12 verges including a priority habitat of deciduous woodland immediately north-east of the proposed bridge and the surrounding agricultural fields currently provides habitats which are potentially suitable for protected species such as badgers, barn owls, otters, bats, breeding birds and reptiles.

7.2.23 The River Blackwater runs parallel to the bridge to the east. At the closest distance, the River is approximately 119 m away. River Blackwater is classified under the WFD as a Heavily Modified Water body (GB10503704116). Environmental constraints to be considered for the proposed bridge widening include effects on water quality as a result of changes in sediment dynamics; likely effects of suspended sediment load via runoff into the water body during construction and potential instability from bank side works. Secondary effects include disturbance to fish during piling because of noise and vibration.

7.2.24 There is a PRoW approximately 6m south of the proposed widened bridge connecting Braxted Road to London Road.

Site specific considerations (Ashmans Bridge - U5)

7.2.25 The proposed widening is surrounded by woodland including a priority habitat to the north east which provides screening to the surrounding area. The woodland and the River Blackwater corridor provides habitat to protected species such as badger, barn owl, otter, bats, breeding birds and reptiles.

7.2.26 The pier substructure is located within the 1 in 2-year flood level. Only discreet column type piers are permitted within the 1 in 100-year flood plain and riparian zone. Abutments and solid leaf type piers shall not be located within this area.

7.2.27 There is a PRoW (246) immediately south of the proposed structure connecting Braxted Road to and from London Road which connects to the A12.

Options considered

7.2.28 Non-structural widening options have not been considered as the existing Cranes Bridge does not have sufficient available width to accommodate a compliant highway alignment.

7.2.29 Four options were considered in response to the Site specific considerations:

- Option 1: Widen deck with precast concrete beams and concrete infill supported on reinforced concrete substructure on piled foundations.
- Option 2: Widen deck with precast concrete beams supported on reinforced concrete substructure on piled foundations.
- Option 3: Widen deck with braced steel girders, supported on reinforced concrete substructure on piled foundations.
- Option 4: Widen deck with precast concrete beams supported on reinforced concrete substructure on piled foundations (not applicable for Ashmans Bridge).

Preferred option

7.2.30 Option 1 is preferred and widens to the south by approximately 10.0m. The existing central reserves will be hydro-demolished and resurfacing works undertaken to achieve a widened carriageway, central reserve and southbound verge.

7.2.31 The deck widening will be stitched to the existing deck to form a continuous structure. The precast MY6 beam deck will have a similar construction depth and stiffness to the existing deck which will ensure similar levels of deflection.

7.2.32 The PRoW at Cranes Bridge is to be realigned approximately 50m to the south of the existing and access to the PRoW shall remain at the same location off of the B1024. Vegetation screening will be maintained where practicable.

7.2.33 Options 2 and 3 were discounted as they are less structurally efficient, have higher capital and relative whole life costs and perform less favourably in terms of health and safety considerations when compared to Option 1.

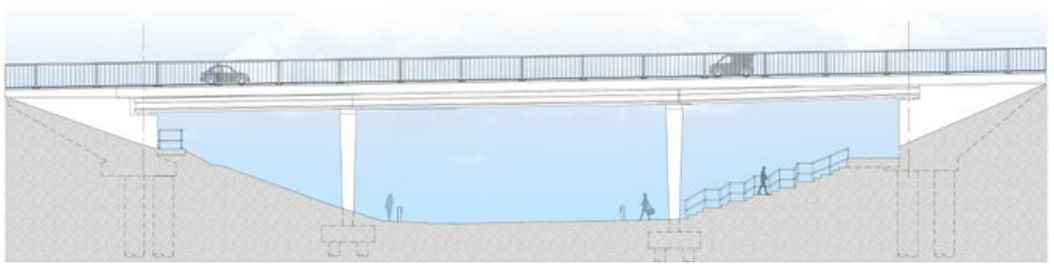


Image 7.3 Cranes Bridge Elevation

Junction 24 Bridge (U6)
Site specific considerations

7.2.34 Archaeological objects of early medieval date, have been recorded approximately 80m west, 90m west, and 250m south-west of the proposed bridge respectively.

7.2.35 Vegetation along the existing A12 verges currently provides screening of the A12 from the surrounding landscape. The proposed bridge and junction are surrounded by agricultural land with the River Blackwater and Domsey Brook deciduous wooded corridors to the north.

7.2.36 Domsey Brook, approximately 300m north of the proposed bridge, is classified as a WFD water body (GB105037033870).

Options considered

7.2.37 Three options were considered in response to the Site specific considerations:

- Option 1: Fully integral single-span multi weathering steel plate girder composite bridge supported on reinforced concrete full height wall type abutments, on piled foundations.
- Option 2: Fully integral single-span multi precast prestressed concrete beam bridge supported on reinforced concrete full height wall type abutments, on piled foundations.
- Option 3: Three-span continuous normally articulated multi weathering steel plate girder composite bridge supported on reinforced concrete verge piers and bank seats. The verge piers and bank seats would be supported on piled foundations.

Preferred option

7.2.38 Option 2 is the Preferred option, compromising single-span multi precast prestressed concrete beam bridge supported on reinforced concrete full height wall abutments. The use of precast prestressed concrete beams would eliminate the need for future maintenance painting over the carriageway.

7.2.39 The structures would be fully integral to minimise maintenance ensuring minimal ongoing impact on the surrounding environmental considerations.

Park Bridge (U7)
Site specific considerations

7.2.40 Archaeological remains of a post-medieval industrial building known as Brickfield within Parish of Inworth are immediately within the footprint of the proposed structure. Archaeological remains of a track way west of Brick Kiln Farm are approximately 33 m north of the bridge and Inworth pumping station is approximately 75 m north of the bridge.

7.2.41 Vegetation on the bridge embankments and alongside the A12 verges currently provides screening to nearby residential and commercial properties. A broad-leaved woodland is also approximately 110m east of the proposed structure.

7.2.42 A deciduous woodland priority habitat, which is part of the A12 verges, falls within the footprint of the proposed structure to the east. The A12 verges and agricultural land surrounding the proposed structure provide habitats for protected species such as badgers, bats, reptiles and breeding birds including barn owls.

7.2.43 The proposed structure is within Defra's Noise Important Area 5416.

7.2.44 There are three private residential properties on Inworth Road north of the proposed structure; the closest is approximately 40m north-west of the bridge.

7.2.45 Domsey Brook, approximately 66m north of the bridge, is classified as a WFD water body (GB105037033870).

Options considered

7.2.46 Three options were considered in response to the Site specific considerations:

- Option 1: Widen deck with precast concrete beams and infill-supported on RC substructure on piled foundations.
- Option 2: Widen deck with precast concrete beams supported on RC substructure on piled foundations.
- Option 3: Widen deck with braced steel girders supported on RC substructure on piled foundations.

Preferred option

7.2.47 Option 1 is the Preferred option, widening to the north by approximately 5m and to the south by approximately 27m. The existing central reserve will be hydro-demolished and resurfacing works will be undertaken to achieve a widened carriageway, widened central reserve, and narrower verges.

7.2.48 This option uses precast pretensioned concrete MY5 beams with mass concrete infill, providing a cost-effective, structurally efficient solution where compatibility with the existing deck which is of high importance.

Domsey Brook Bridge (U8)

Site specific considerations

7.2.49 Archaeological remains are approximately 7 m (industrial building known as Brickfield), 127 m (track way west of the Barconn Ltd buildings) and 95 m (Inworth pumping station) south of the bridge.

7.2.50 Vegetation along the existing A12 currently provides screening of the existing structure to the adjacent agricultural fields and Prested Hall grounds approximately 520 m north-east of the structure.

7.2.51 A deciduous woodland priority habitat adjacent to the A12 falls within the footprint of the proposed structure to the east. The A12 embankments, the Domsey Brook corridor and the agricultural fields surrounding the proposed structure provide habitats for protected species such as badgers, bats, breeding birds and reptiles.

7.2.52 Woodlands along Domsey Brook approximately 177 m north-east and 118 m south-west of the proposed structure are considered to be potential groundwater dependent terrestrial ecosystems (GWDTEs) habitat. Woodland around the eastern end of a pond approximately 106m southeast of the proposed structure is also considered to be a GWDTE habitat.

7.2.53 The nearest residential and commercial properties are on Inworth Road approximately 70 m south-west and 115m south of the bridge respectively.

Options considered

7.2.54 Five options were considered in response to the Site specific considerations:

- Option 1: Widening the structure with an in situ parabolic arch to match the existing supported on piled foundations.
- Option 2: Widening the structure with a precast concrete arch supported on kicker walls and piled foundations.
- Option 3: Widening the structure with a corrugated steel arch supported on piled foundations.
- Option 4: Widening the structure with reinforced concrete slab supported on reinforced concrete wall abutments.
- Option 5: Widening the structure with a precast concrete arch supported on kicker walls on piled foundations.

Preferred option

7.2.55 Option 2 is the Preferred option which involves realigning the carriageway to the east and widening the structure by 36.4m and resurface works will be undertaken to achieve a widened carriageway, central reserve, and verges.

7.2.56 The widened structure will consist of a precast concrete arch seated on in situ reinforced concrete kicker walls on piled foundations. A flexible stone mattress along the watercourse bed will provide the foundations with scour protection.

7.2.57 All options require the demolition of the commercial buildings of Barconn Ltd.

7.3 Overbridge Design

All overbridges were designed to create a 'family' of overbridges which are similar in appearance, all single span with clear lines and making use of precast profiled edge beams to create a smooth finish and have minimal impact on their surrounding environments.

Within the proposed scheme the following overbridge widening and upgrades are required:

Boreham Bridge (O1)

Site specific considerations

7.3.1 There is a Grade II listed building (Generals) approximately 100m east of the bridge on the B1137. The footprint of the widened bridge is within an area of archaeological remains of 'New or Little Park, New Hall, Boreham', 'Cropmarks SW of Genfield' and Roman Road approximately 60m south-east of the bridge.

7.3.2 The bridge is surrounded by tree groups which are part of the existing A12 verges. These trees currently provide screening of the existing bridge and the A12 to nearby residential and commercial properties. Trees adjacent to the Grade II listed building, within the grounds of Boreham House and along the road to Boss Hoggs takeaway, have preservation order status.

7.3.3 Two priority habitats of deciduous woodland are within the footprint of the bridge. These woodlands along with other tree groups within the A12 verges and surrounding agricultural land provide habitats for protected species such as badgers, bats, breeding birds, including barn owls, and reptiles.

7.3.4 Springfield business park boundary is approximately 28m south west of the bridge. Other commercial properties within the 250m buffer zone include the Grange pub and Premier Inn Chelmsford (Boreham) hotel approximately 75m and 119m to the north-east of the bridge respectively.

7.3.5 A PRoW (213) is approximately 222m east of the bridge and is a footpath which connects Boreham to the B1137.

7.3.6 Part of the proposed bridge footprint is within the Beaulieu Park planning application (10/00021/EIA) boundary that was approved on the 29th May 2013.

Options considered

7.3.7 Two options were considered in response to the Site specific considerations:

- Option 1: Widen deck with precast concrete beams, supported on reinforced concrete substructure to match existing.
- Option 2: Widen deck with in-situ reinforced concrete deck to match existing, supported on reinforced concrete substructure to match existing.

Preferred option

7.3.8 Option 1 is the Preferred option involving realigning and widening the carriageway on the widened deck. This provides a cost-effective solution where construction times, costs and disruption to traffic are significantly reduced in comparison to Option 2. Any new ducts and the existing utilities in the verges would be relocated to the new verges.

7.3.9 Live loading on the existing superstructure, substructure and foundations will be increased due to the additional traffic lanes therefore some strengthening works may be required, the outcome of which will be known following completion of the structural assessment.

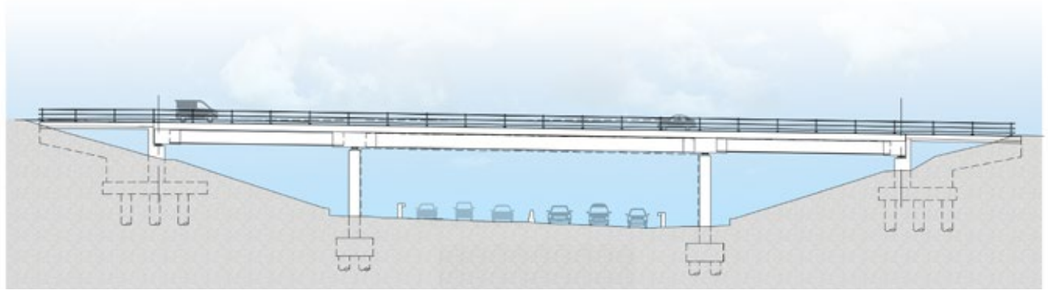


Image 7.4 Boreham Bridge Elevation

River Ter Bridge (O2)

Site specific considerations

7.3.10 There is one Grade II* (Hatfield Place) listed building on The Street (B1137) approximately 150 m south-east of the bridge.

7.3.11 The bridge is surrounded by woodland (conifer to the north and broadleaved to the south) which provides screening to the surrounding area including Hatfield Place and Millfield cottages to the south. There is good foraging and commuting potential for bats along the River Ter corridor, which is well wooded.

7.3.12 A PRoW passes beneath the bridge connecting Main Road to the south to Terling Hall Road to the north.

7.3.13 The River Ter beneath the bridge is classified as a WFD water body (GB105037033940). For options that require physical widening the substructure shall not be located within the 1 in 2-year flood channel.

Options considered

7.3.14 Three options were considered in response to the Site specific considerations:

- Option 1: Existing structure extents to be maintained. South edge cantilever to be demolished and reconstructed to accommodate proposed narrow southern verge.
- Option 2: Widen structure to the south with precast prestressed concrete beams supported on reinforced concrete abutments, founded on piles.
- Option 3: Widen structure to the south with weathering steel I girders, supported on concrete abutments, founded on piles.

Preferred option

7.3.15 Option 1 is the Preferred option involving realigning the carriageway and resurfacing works to achieve a widened carriageway within the extents of the existing superstructure. This provides a cost-effective solution where construction times, costs and adverse effects on the environment are significantly reduced in comparison to Options 2 and 3.

7.3.16 The form of the superstructure will remain unchanged however, there are some modifications to the existing superstructure that are required as part of the proposed carriageway widening works. These would include hydro-demolishing the central reserve and stitching the two decks together along the longitudinal joint and hydro-demolishing and re-building the south cantilever.

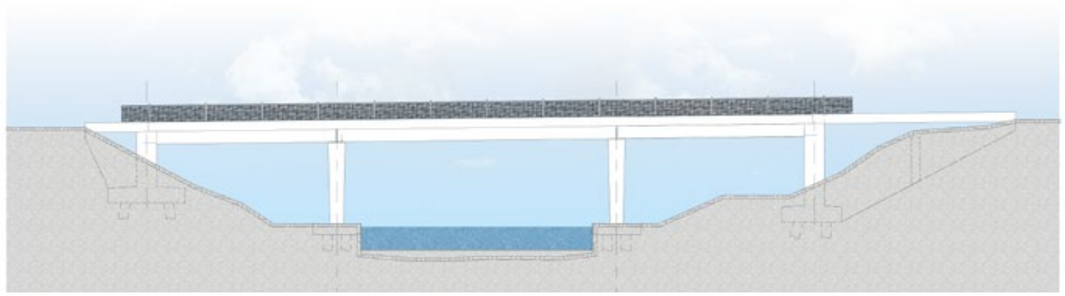


Image 7.5 River Ter Bridge Elevation

Bury Lane Bridge (O3) and Station Road Bridge (O4)
Site specific considerations (Bury Lane Bridge - O3)

7.3.17 There are seven Grade II and one Grade II* (The Crown Public House) listed buildings located along the street at a distance of approximately 80-110m south of the proposed bridge.

7.3.18 Vegetation along the existing A12 verges currently provides screening of the existing bridge to the adjacent residential properties.

7.3.19 Vegetation along the existing A12 verges currently provides habitats potentially suitable for protected species such as badgers, bats, breeding birds and reptiles.

7.3.20 The proposed bridge is within Defra's Noise Important Area 5413. The close proximity of residential properties means that specific noise control procedures may be required during construction.

7.3.21 Bury Lane, including the overbridge, provides local road access across the A12 allowing residents of Hatfield Peverel to cross between the north and south of the village. The road is also regularly used by runners and cyclists. There are private residential properties immediately adjacent to both ends of the existing bridge.

7.3.22 There are three approved housing development planning applications (19/00494/REM, 17/00973/FUL and 17/00341/OUT) to the north of the proposed bridge on Bury Lane. The closest is approximately 10m from the proposed bridge. In total, 146 dwellings are proposed by these applications.

Site specific considerations (Station road Bridge - O4)

7.3.23 There are two Grade II listed buildings (The Limes and Peppercorn) on The Street approximately 70m and 65m south of the proposed bridge, respectively.

7.3.24 Vegetation along the existing A12 verges currently provides screening to the adjacent residential properties. There are three Tree Preservation Order areas within 200m of the proposed bridge, a large area north of the proposed bridge on The Pines and two small linear areas to the south on Swan Close.

7.3.25 Vegetation along the existing A12 verges currently provides habitats potentially suitable for protected species such as badgers, bats, breeding birds and reptiles.

7.3.26 The proposed bridge is within Defra's Noise Important Area 5413. The close proximity of residential properties means that specific noise control procedures may be required during construction.

7.3.27 Station Road, including the overbridge, provides local road access across the A12 allowing residents of Hatfield Peverel to cross between the north and south of the village. Hatfield Peverel train station is on the north side of the village on Station Road and the road is regularly used by runners and cyclists. There are private residential properties immediately adjacent to both ends of the existing bridge.

7.3.28 There are three approved housing development planning applications (19/00494/REM, 17/00973/FUL and 17/00341/OUT) to the north-west of the proposed bridge on Bury Lane. The closest is approximately 140m from the proposed bridge. In total, 146 dwellings are proposed by these applications.

Options considered

7.3.29 Five options were considered in response to the Site specific considerations:

- Option 1: Single span semi-integral (simply supported) composite weathering steel multi I girders with a reinforced concrete deck slab. Deck proposed to be constructed adjacent to existing or in another location and then jacked across or transported onto new substructure.
- Option 2: Single span fully integral composite weathering steel multi I girders with a reinforced concrete deck slab. Deck proposed to be constructed adjacent to existing or in another location and then jacked across or transported onto new substructure.
- Option 3: Single span semi-integral (simply supported) precast prestressed concrete beams with a reinforced concrete deck slab. Deck proposed to be constructed adjacent to existing or in another location and then jacked across or transported onto new substructure.
- Option 4: Two span semi-integral (continuous) composite weathering steel multi I girders with a reinforced concrete deck slab. Deck proposed to be constructed adjacent to existing or in another location and then jacked across or transported onto new substructure.
- Option 5: Two span semi-integral (simply supported) precast prestressed concrete beams with a reinforced concrete deck slab. Deck proposed to be constructed adjacent to existing or in another location and then jacked across or transported onto new substructure.

Preferred option

7.3.30 Option 2 is the Preferred option compromising a single-span fully integral steel plate girder composite bridges. The span of both bridges will be approximately 39m. The overall width of both bridges will be 13.3m along its whole length.

7.3.31 The proposed finish to the faces of the abutments will be determined at the detailed

design stage with options including brick facing or a Class F4 finish with vertical rebates.

7.3.32 Proposed containment levels and parapet heights are given according to the requirements of CD 377. The same parapet height is required on both sides of Station Road Bridge.

7.3.33 Option 3 was disregarded as in order to achieve the minimum headroom required, the bridges would need to be significantly raised which would adversely affect the adjacent properties considering the work that would be required to tie the bridges back into the existing roads. Similarly,options 4 and 5 are not considered the most preferable options as they include a central reserve pier which would introduce health and safety risks during construction, operation and maintenance.

Image 7.6 Visual of Bury Lane Bridge

Image 7.7 Visual of Station Road Bridge

Wellington Road (O5)

Site specific considerations

7.3.34 There are three Grade II listed buildings within 250 m south of the bridge: “The Bakery and Unnamed House adjoining to the east” at approximately 90m; Salvador, Hooks and Sheaves at approximately 110m; and White Hart Cottage at approximately 150m.

7.3.35 There are a number of Tree Preservation Orders within the gardens of residential properties to the south of The Street and east of Maldon Road, including trees along the highway boundary on the south-eastern side of the junction. The closest is at approximately 45m but should not be affected assuming the bridge works would be confined to the northern side of The Street.

7.3.36 There is an area of Priority Habitat of Traditional Orchard approximately 18m northwest at the closest point to the bridge. A building approximately 105m north of the bridge has been identified as having high potential for bats.

7.3.37 The bridge is within a noise important area covering the A12 and in close proximity to a number of residential properties to the north, south and west.

7.3.38 The bridge is located towards the eastern end of Hatfield Peverel. Fenham Lodge Residential Care Home (Hospital) is approximately 165 m south-west of the bridge. A footpath public right of way leads north from the existing B1137, just after the A12 crossing where the replacement bridge will be provided.

7.3.39 An outline planning application (16/02156/OUT) at Gleneagles Way, approximately 150 m south-east of the bridge, for a residential development was submitted to Braintree District Council in July 2017. An area approximately 155 m west of the bridge has been identified in the Emerging Braintree District Council Local Plan 2033 for comprehensive redevelopment.

Options considered

7.3.40 Five options were considered in response to the Site specific considerations:

- Option 1: Single span composite weathering steel multi I girders with a reinforced concrete deck slab.
- Option 2: Single span composite weathering steel multi I girders with a reinforced concrete deck slab.
- Option 3: Single span precast prestressed concrete beams with a reinforced concrete deck slab.
- Option 4: Two span composite weathering steel multi I girders with a reinforced concrete deck slab.
- Option 5: Two span precast prestressed concrete beams with a reinforced concrete deck slab.

Preferred option

7.3.41 Option 2 is preferred, comprising a single-span multi weathering steel plate girder composite bridge supported on reinforced concrete full height embedded type abutments. Weathering steel is proposed due to its aesthetically appealing colour which blends well with the surrounding environment.

7.3.42 The fully integral connections would reduce future maintenance requirements when compared to Option 1; this option is estimated to be the cheapest and because the closure time for the bridge would still be relatively short, only an additional 4 weeks when compared to Option 1. Minimising the closure time of the bridge is important considering the access it provides to the Vineyards and proposed site compound, both north of the structure, and the lack of a suitable diversion route for road users.

7.3.43 Option 2 is not considered the most preferable option because in order to achieve the minimum headroom required, the bridge would need to be significantly raised which would adversely affect the adjacent properties considering the work that would be required to tie the bridge into the existing road. Similarly, options 3 and 4 are not considered the most preferable options as they include a central reserve pier

which would introduce health and safety risks during construction, operation and maintenance.

Hatfield Road Bridge (O6) and Little Braxted Land Bridge (O7)

7.3.44 The following overbridges share similar characteristics, site considerations and WCH requirements and therefore the optioneering and chosen option applies to each bridge.

Site specific considerations (Hatfield Road Bridge - O6)

7.3.45 An area of low value archaeological remains known as the 'North of Sandford's Farm' is also approximately 170m south-east of the proposed bridge.

7.3.46 Vegetation along the existing A12 verges currently provides screening of the A12 from the surrounding landscape.

7.3.47 Vegetation along the existing A12 verges and the surrounding agricultural fields currently provides habitats which are potentially suitable for protected species such as badgers, bats, breeding birds and reptiles.

Site specific considerations (Little Braxted Land Bridge - O7)

7.3.48 The proposed bridge is located in an area classed as having high potential for the presence of unknown archaeological remains.

7.3.49 The bridge is to be located in the middle of an agricultural field with field boundary hedgerows approximately 60m east and 100m west of the structure.

7.3.50 Agricultural land and hedgerows surrounding the proposed bridge provide habitats which are potentially suitable for protected species such as badgers, bats, breeding birds and reptiles.

7.3.51 The proposed structure is approximately 170m south of Defra's Noise Important Area 6144 on the existing A12. The close proximity of residential properties means that specific noise control procedures may be required during construction.

7.3.52 The proposed bridge is approximately 60m from the operational Coleman's Farm Quarry. The site has permission to extract an estimated 2.5 million tonnes of sand and gravel. It also includes the provision of a new access from Little Braxted Lane and the installation and operation of primary processing plant and ancillary facilities comprising: washing and bagging plant; silt lagoons; weighbridge; offices; and workshop. The quarry operators submitted a planning application in 2021 for an extension to enable the sequencing of extraction and restoration to support the future A12 road construction.

Options considered

7.3.53 Three options were considered in response to the Site specific considerations:

- Option 1: Fully integral single-span multi weathering steel plate girder composite bridge supported on reinforced concrete full height wall type abutments, on piled foundations.
- Option 2: Fully integral single-span multi precast prestressed concrete beam bridge supported on reinforced concrete full height wall type abutments, on piled foundations.
- Option 3: Three-span continuous normally articulated multi weathering steel plate girder composite bridge supported on reinforced concrete verge piers and bank seats. The verge piers and bank seats would be supported on piled foundations.

Preferred option

7.3.54 Option 1 is the recommended option, comprising a single-span multi weathering steel plate girder composite bridge supported on reinforced concrete full height wall type abutments. Weathering steel is proposed due to its aesthetically appealing colour which blends well with the surrounding environment.

7.3.55 Option 1 was advantageous due the structures being fully integral to minimise maintenance and having relatively low adverse impact on environment.

7.3.56 Steel and concrete composite construction would be lighter than all-concrete construction which would optimise the foundation design and in turn reduce the effect of construction activities. The use of weathering steel would eliminate the need for future maintenance painting over the carriageway.

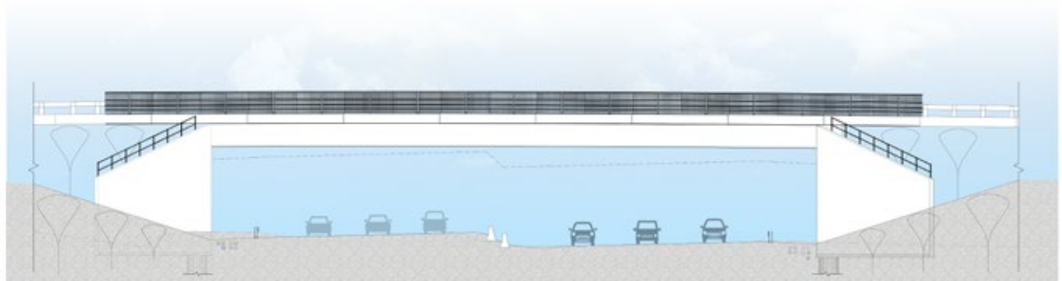


Image 7.8 Hatfield Road Overbridge Elevation

Image 7.9 Weathering Steel Overbridge (A6182 East Coast Mainline)

Highfields Bridge (O9) and Ewell Bridge Chase Bridge (O10)

7.3.57 The following existing overbridges share similar characteristics, site considerations and WCH requirements and therefore the optioneering and chosen option applies to

each bridge.

7.3.58 Both overbridges share the consideration of hedgerows and agriculture fields surrounding the proposed bridges which provide habitats to protected species such as badgers, bats, breeding birds and reptiles. The both have vegetation along the existing A12 verges currently provide screening of the existing bridge from the surrounding landscape.

Site specific considerations (Highfields Bridge - O9)

7.3.59 There is one Grade II listed building within 250m of the proposed bridge. This lies approximately 230m north-east of the proposed bridge and is located within Kelvedon Conservation Area. It is an ancillary building 5m south-east of the Grade II* listed building known as Bridgefoot Farmhouse.

7.3.60 The River Blackwater is approximately 170m north-west of the proposed bridge. Aquatic surveys of the River Blackwater were undertaken in November 2020 which demonstrated that the River supports brown trout and River water dropwort, a rare plant.

7.3.61 There are two public rights of way (PRoW) within 250m of the proposed bridge. PRoW 246 is immediately south of the existing bridge connecting Highfields Lane to Kelvedon Hall and PRoW 92 is approximately 135m east of the proposed bridge running parallel to the ordinary watercourse 21 and connecting Highfields Lane with the Grange Road.

Site specific considerations (Ewell Bridge Chase Bridge - O10)

7.3.62 There are six negligible value heritage assets documented under Essex Historic Environment Record within 250m of the proposed bridge.

7.3.63 The existing bridge is part of the public right of way footpath (PRoW 92) that connects residents of Tiptree to Kelvedon.

Options considered

7.3.64 Three options were considered in response to the Site specific considerations:

- Option 1: Fully integral single-span multi weathering steel plate girder composite bridge supported on reinforced concrete full height wall type abutments. The abutments would be supported on piled foundations.
- Option 2: Fully integral single-span multi weathering steel plate girder composite bridge supported on a full height precast concrete shell abutment modular system on piled foundations.
- Option 3: Fully integral single-span precast prestressed concrete beam bridge supported on reinforced concrete full height wall type abutments. The abutments would be supported on piled foundations.
- Option 4: Three span continuous normally articulated multi weathering steel plate girder composite bridge supported on reinforced concrete verge piers and bank seats. The verge piers and bank seats would be supported on piled foundations.

Preferred option

7.3.65 Option 1 is the Preferred option, compromising single-span fully integral steel plate girder composite bridges. The approximate spans and widths of the bridges will be; Highfields Bridge (45.5 m x 12.75 m) and Ewell Bridge (56.6 m x 7.70 m).

7.3.66 Weathering steel is proposed due to its aesthetically appealing colour which blends well with the surrounding environment. Options for facing of the abutments include brick or a Class F4 finish with vertical rebates. Options for the wingwalls include precast concrete modular facing blocks or panels.

7.3.67 Proposed containment levels and parapet heights are given according to the requirements of CD 377. The same parapet height is required on both sides of Highfields Overbridge Replacement and Ewell Overbridge Replacement.

7.3.68 Existing vegetation within the proposed scheme boundary and within temporary works areas would be retained as far as practicable. Some of the tree groups surrounding Highfields Overbridge will be partially removed and some completely removed. Dense planting will however, be provided surrounding the proposed overbridge for landscape integration and to screen higher level bridge structure to the surrounding area. The proposed planting will be located far enough away from the structures to allow room for maintenance.

Image 7.10 Visual of Ewell Bridge Chase Bridge

Image 7.11 Weathering Steel Overbridge (A1 Wetherby)

Braxted Road Bridge (O8), Prested Hall Bridge (O11), Easthorpe Road Bridge (O12) and Wishing Well Bridge (O13)

7.3.69 The following existing overbridges share similar characteristics, site considerations and WCH requirements and therefore the optioneering and chosen option applies to each bridge.

7.3.70 All overbridges share the consideration of hedgerows and agriculture fields surrounding the proposed bridges which provide habitats to protected species such as badgers, bats, breeding birds and reptiles.

Site specific considerations (Braxted Road Bridge - O8)

7.3.71 The proposed bridge is situated in an agricultural field south of Rivenhall End approximately 200m south of the existing A12. Colemans Reservoir is approximately 230m south of the bridge.

7.3.72 The agricultural fields and hedgerows surrounding the bridge may be lost to Coleman's Farm Quarry (ESS/39/14/BTE and ESS/51/21/BTE) and the proposed bridge will be situated on or adjacent to the quarry restoration site as shown on the restoration plans approved by the local authority at the time of DCO submission.

7.3.73 Deciduous woodlands approximately 50m and 75m to the west and east of the proposed bridge are classified as priority habitats. However, as mentioned above, some of these features may be lost to the Coleman's Farm Quarry planning application.

7.3.74 The proposed bridge is approximately 190m south of Defra's Noise Important Area 6145 on the existing A12 at Rivenhall End.

7.3.75 Ordinary watercourse 13 runs parallel to the proposed bridge approximately 75m to the west. Colemans Reservoir approximately 230m south of the proposed bridge falls within the modelled River Blackwater baseline flood extent (1% AEP + CC); however, the proposed bridge is outside the flood extent.

Site specific considerations (Prested Hall Bridge - O11)

7.3.76 The nearest listing building is Prested Hall, a grade II listed building approximately 460m south-east of the proposed bridge. The grounds of the hall are less than 250m from the proposed bridge.

7.3.77 The proposed bridge is located in an agricultural field approximately 80m east of the existing A12. The field boundary of Prested Hall is approximately 260m south-east of the proposed bridge and its associated grounds and distinctive driveway are key landscape features at this location.

7.3.78 A hedgerow approximately 40m south of the proposed bridge is classed as an important hedgerow. The design of the A12 scheme has taken into account the locations of valuable and priority habitats such as this important hedgerow. The important hedgerow is therefore outside of the order limits and will be preserved. Landscape planting would also be provided north of the hedgerow along the re-aligned Prested Hall access route to replicate the existing avenue feature.

7.3.79 There is a public right of way (PRoW 78) approximately 130m south of the proposed bridge connecting Prested Hall to Kelvedon.

7.3.80 There is a planning application (20/00335/OUT) for the erection of part single/part two-story units of office/light industrial space with associated parking and improved access approximately 250m north-west of the proposed bridge. An area approximately 120m west of the proposed bridge is also allocated as a strategic growth location, for provision of approximately 750 dwellings in Braintree District's draft local plan.

Site specific considerations (Easthorpe Road Bridge - O12)

7.3.81 There are six heritage assets documented under the Essex Historic Environment Record within 250m of the proposed bridge.

7.3.82 The proposed bridge is located in an agricultural field approximately 110m south of the existing A12.

7.3.83 There is a public right of way (PRoW 78) approximately 230m west of the proposed bridge. This footpath connects Elm Lane to the existing A12 eastbound carriageway.

Site specific considerations (Wishing Well Bridge - O13)

7.3.84 The nearest listing building is Easthorpe Green Farmhouse, a grade II listed building approximately 290m south-west of the proposed bridge.

7.3.85 The proposed bridge is located in an agricultural field approximately 200m south of the existing A12.

Options considered

7.3.86 Four options were considered in response to the Site specific considerations:

- Option 1: Fully integral single-span multi weathering steel plate girder composite bridge supported on reinforced concrete full height wall type abutments. The abutments would be supported on piled foundations.
- Option 2: Fully integral single-span multi weathering steel plate girder composite bridge supported on a full height precast concrete shell abutment modular system on piled foundations.
- Option 3: Fully integral single-span precast prestressed concrete beam bridge supported on reinforced concrete full height wall type abutments. The abutments would be supported on piled foundations.
- Option 4: Three span continuous normally articulated multi weathering steel plate girder composite bridge supported on reinforced concrete verge piers and bank seats. The verge piers and bank seats would be supported on piled foundations.

Preferred option

7.3.87 Option 1 is the Preferred option, compromising of single-span multi weathering steel plate girder composite bridge supported on reinforced concrete full height wall type abutments. The structures would be fully integral to minimise maintenance.

7.3.88 This form of construction will provide an efficient solution with the flexibility to minimise deck depth and hence optimise the highway alignment. Weathering steel is proposed due to its aesthetically appealing colour which blends well with the surrounding environment and eliminates the need for future maintenance painting over the carriageway.

7.3.89 Steel and concrete composite construction would be lighter than all-concrete construction which would optimise the foundation design and in turn reduce the effect of construction activities. The use of weathering steel would eliminate the need for future maintenance painting over the carriageway.

7.4 WCH Bridge Design

7.4.1 The following WCH bridges share similar characteristics, site considerations and WCH requirements and therefore the optioneering and chosen option applies to each WCH bridge.

Site specific considerations

Paynes Lane Bridge (W1)

7.4.2 The Great Eastern railway line passes under the north span of the proposed bridge, with the proposed Beaulieu Park and Network Rail development located approximately 90m to the west of the north end of the bridge.

7.4.3 The northern half of the footprint of the bridge is within the boundary of planning application 10/00021/EIA which was approved on the 29th May 2013. See Table 2.4 for impact and mitigation.

7.4.4 An area of deciduous woodland approximately 150m south west of the bridge is classified as a Priority Habitat.

7.4.5 Vegetation along the A12 and rail line verges and surrounding agricultural fields provide habitats for protected species such as badgers, bats, breeding birds and reptiles.

Gershwin Boulevard Bridge (W2) and Little Braxted Bridge (W3)

7.4.6 There are nine Tree Preservation Orders within the residential area to the north, the nearest being just over 100 m from the bridge. The A12 is flanked by tree groups within the existing verges. These trees currently provide screening of the bridge to receptors in Witham to the north.

7.4.7 An area of National Forest, Broadleaved Woodland, Priority Habitat borders the northern verge of the A12. There is an outlier badger sett (surveyed December 2020) within the footprint of the bridge.

7.4.8 The town of Witham is located immediately north of the A12. There is a footpath public right of way (PRoW) linking Maldon Road (B1018) in the south, crossing the A12 and joining Olivers Drive in the north. The proposed bridge is intended to serve this PRoW.

7.4.9 There is a large water body to the west of the bridge on the opposite side of Gershwin Boulevard Bridge. The bridge is within the Chelmer and Blackwater drinking water safeguard zone. The bridge is within an area of moderate to high groundwater flooding susceptibility.

Snivellers Lane Bridge (W4)

7.4.10 Hole Farmhouse, approximately 75 m south-east of the bridge is a Grade II listed building. Prehistoric and post-medieval archaeological remains of Durward's Hall are located approximately 150 m south west of the bridge.

7.4.11 There is an area of National Forest Broadleaved Woodland approximately 215 m to the south-west of the bridge. There is a group of trees within the footprint of the bridge. Vegetation screening will not be affected by the construction works where practicable.

7.4.12 There are two outlier badger setts approximately 125 m and 175m north and south of the bridge. A building approximately 100 m south-east of the bridge was identified as a recent Barn Owl roost site during a survey undertaken in November 2020. The buildings approximately 75 m south-east of the bridge were identified as confirmed bat roosts during a survey in June 2021. All other buildings within 250m of the bridge were considered to have moderate or less potential for bats.

7.4.13 There is a Noise Important Area immediately south of the WCH bridge and Hole Farmhouse is the nearest residential property.

7.4.14 Seven buildings have been identified within 250m south and west of the bridge, the closest being approximately 70 m from the bridge. These include the farm building and Essex Fire and Rescue building.

7.4.15 There are two footpath public rights of way to the north that both join the A12.

7.4.16 The closest watercourse is a drain approximately 150 m south of the bridge. The bridge is within an area of very high groundwater flooding susceptibility.

Potts Green Bridge (W5)

7.4.17 There is one Grade II listed building, called Doggets Hammer Farm, approximately 135 m north of the bridge. Cultural heritage assets will not be affected by the construction works where practicable.

7.4.18 There are some trees within the footprint of and immediately adjacent to the bridge. Vegetation screening will not be affected by the construction works where practicable.

7.4.19 A pond approximately 100 m to the north of the bridge has been confirmed for presence of great crested newt during a 2021 survey. A badger outlier sett has been identified, during a 2020 survey, approximately 160m west of the bridge. Buildings associated with a residential property, approximately 125 m north of the bridge have been confirmed to contain bat roosts.

7.4.20 There are two residential properties to the north of the bridge, the closest being approximately 125m. There is a footpath public right of way crossing the footprint of the bridge joining Doggetts Lane to the north.

Marks Tey Bridge Replacement (W6)

7.4.21 The existing bridge is flanked by trees which are part of the existing A12 verges. These trees currently provide screening of the bridge and the A12 to nearby residential and commercial properties. There is one area with a Tree Preservation Order approximately 125m east of the bridge. There is an area of National Forest Broadleaved Woodland (tree group G762) approximately 25m north west of the bridge.

7.4.22 There are four Priority Habitat areas of deciduous, broadleaved woodland within 250m and to the north of the bridge.

7.4.23 The Marks Tey Bridge Brickpit Site of Special Scientific Interest (SSSI) is within 175m of the bridge.

7.4.24 The WCH bridge is within Defra's Noise Important Area No 4760.

7.4.25 The Laurels care home is located approximately 80m to the north-west of the bridge. There are private residential properties and some commercial properties immediately south of the bridge. The Prince of Wales Industrial Estate is immediately east of the bridge.

Options considered

7.4.26 Four options were considered in response to the site specific considerations:

- Option 1: Warren Truss.
- Option 2: Half through steel I girders.
- Option 3: Vierendeel Truss.
- Option 4: Composite weathering steel box girder with reinforced concrete deck slab (not applicable for Marks Tey Bridge).

7.4.27 Four ramp options were also considered:

- Option A: Multi-span steel ramps.
- Option B: Earthwork ramps.
- Option C (i): Multi span steel ramp and earthwork ramp combination (not applicable for Paynes Lane Bridgenorth ramp or Marks Tey Bridge).
- Option C (ii): Multi span steel ramp and concrete ramp combination (only applicable for Paynes Lane Bridgenorth ramp).
- Option D: Reinforced soil retaining wall ramps with concrete facing panels.

Preferred Structure Option

7.4.28 Warren Truss (Option 1) is the preferred option due it being the lightest structure, with the angled symmetrical truss formation providing the most visually pleasing structure. It will comprise a two-span simply supported Warren Truss formed of multiple welded hollow section members supported on reinforced concrete column piers. This steel truss structure is lighter than other steel or steel concrete composite options which reduces foundation loads and gives it the lowest embodied carbon.

7.4.29 Paynes Lane Bridge surfacing on the bridge decks will be specialised rubber matting designed for equestrian use with waterproofing system beneath and the colour of the proposed painted finish to the steel trusses will be determined at detail design stage.

7.4.30 The width of the bridges are 4.0m between parapets. The spans are as follows:

- Paynes Lane Bridge: Two span (100.7m)
- Gershwin Boulevard Bridge: Single span, (42.3m)
- Little Braxted: Single span (48.5m)
- Snivellers Lane Bridge: Single span (39.9 m)
- Potts Green Bridge: Single span (44.3m)
- Marks Tey Bridge: Single span (36.55m)

7.4.31 Options 2 - 4 are considered less preferable due to required a greater amount of steel which is visually heavy and intrusive for all users. In addition this use of material would increase their carbon footprint.

7.4.32 While weathering steel (Option 4) is aesthetically preferable for overbridges, however was deemed inappropriate for WCH bridges due to the coloured paint of weathering steel being abrasive and transferring onto the WCH users. Option 4 would also require greater in situ works from reinforcement fixing and placing deck concrete which increases risk from a safety perspective.

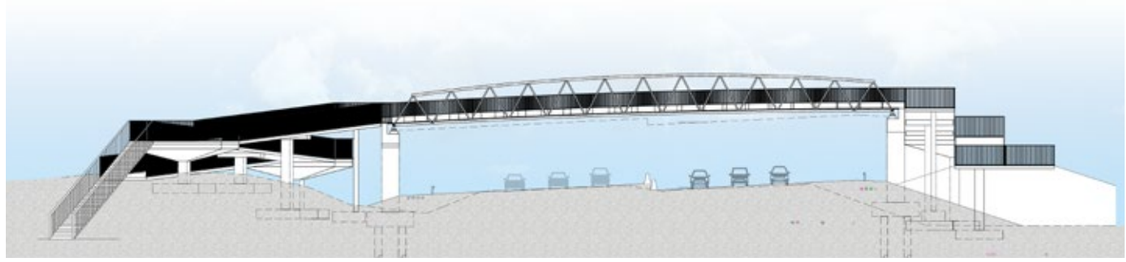


Image 7.12 Gershwin Boulevard Bridge Elevation

Image 7.13 Paynes Lane BridgeBridge Elevation

Image 7.14 Warren Truss

Preferred Ramp Option

7.4.33 For Paynes Lane's proposed south ramp, Option C (i) is recommended and comprises a series of multi span steel hollow section decks supported on reinforced concrete piers on pad foundations forming the upper ramp. The lower ramp comprises an earthwork embankment. For Paynes Lane's north ramp, Option C (ii) is recommended, similar to Option C (i), but with the lower ramp supported on concrete. The surfacing on the ramp decks will be a specialised rubber matting designed for equestrian use.

7.4.34 For WCH bridges 2-5, proposed ramp Option C (i) is preferred and comprises a series of multi span steel hollow section decks supported on reinforced concrete piers on pad foundations forming the upper ramps. The lower ramps comprise earthworks embankments. The surfacing on the ramp decks will be a specialised rubber matting designed for equestrian use.

7.4.35 Marks Tey Bridge proposed ramp Option A is preferred and compromises a series of multi span steel hollow section deck supported on reinforced concrete piers on pad foundations.

7.4.36 In accordance with CD 353 and the Equality Act 2010, the WCH bridges provide ramped access to ensure accessibility to all users. Where ramped access does not provide the most direct route over the WCH bridge for able bodied users, as is the case for WCH bridges 1-3 and 5, stepped access will be provided in addition to ramps on both sides of the structure.

7.4.37 The WCH bridges provide provision for WCH in accordance with CD 143 (Designing for walking, cycling and horse-riding), CD 353 (Design criteria for WCH bridges) and Local Transport Note 1/20 (LTN1/20, Cycle infrastructure design). Provisions for the WCH routes are also in accordance with the requirements agreed through public consultation and consultation with ECC.

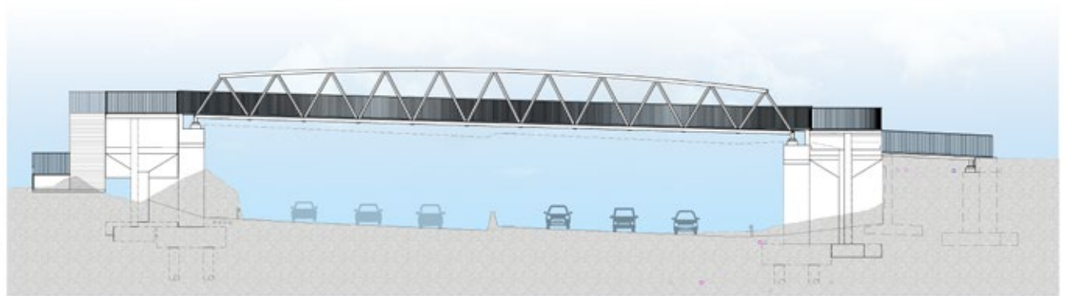


Image 7.15 Marks Tey Bridge ElevationFurori il con tam aut nocullatanum aurbefa cchicae es? Opio tem mis apericem, que vivasdam in st L. Quod C. Seret iu se porei se cris me adductanteri sed ia pata, Catus, con remus consu esci speribus hordi, con sesse et; essilicave, nota, st am.

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7.5 Culvert Design

Within the proposed scheme the following upgraded culverts are required:

Rivenhall Brook Culvert (C1) and Domsey Brook East Culvert (C2)

7.5.1 Concrete box culvert which will have inner dimensions of 3.6m high and 4.5m wide (C1) and 2.6m high and 2.7m wide (C2). The overall length of the culvert will be 45m (C1) and 65m (C2) and it will be square to the A12.

7.5.2 Special finishes and facing to wingwalls and headwalls can be considered where appearance is a significant factor.

7.5.3 A precast box culvert will be used. The box culvert sections are unlikely to be transportable as single units.

7.5.4 Pedestrian guardrails will be provided along all headwalls and wingwalls.

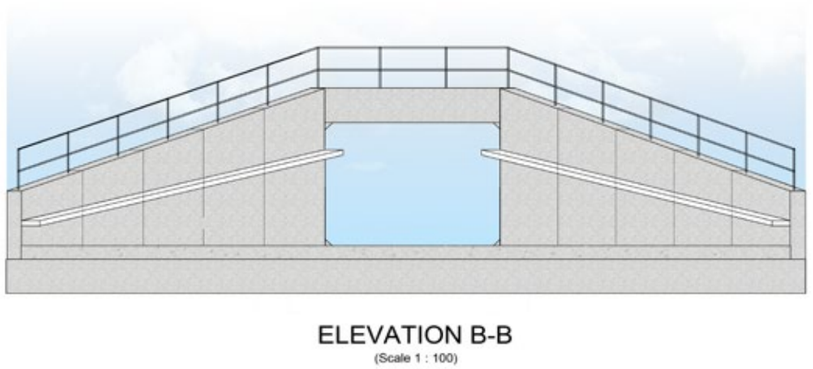

Image 7.17 Rivenhall Brook Culvert Elevation

Roman River Culvert (C3)

7.5.5 It is proposed to extend the structure and slightly modify the existing cover over a short section of the culvert.

7.5.6 Structural modifications are proposed to accommodate the southbound carriageway, diverge, hard strips and verge. The structure will be extended to the south by approximately 12m.

7.5.7 The existing double sided Corrugated Beam safety fencing in the central reserve will be replaced with a Rigid Concrete Barrier (RCB).

08.

Summary

8.1 Summary

8.1.1 This DAS demonstrates how the proposed scheme design complies with the five scheme objectives formulated to address identified problems and take advantage of the opportunities that this new infrastructure would provide. The objectives are:

- Support the growth identified in Local Plans by reducing congestion related delay, improving journey time reliability and increasing the overall transport capacity of the A12
- Private accesses to the strategic road network closed off and alternative access to local roads provided by the proposed scheme
- Improve road user safety
- Improve road worker safety during maintenance and operational use
- Reduce current and forecast congestion-related delays and therefore improves journey time reliability
- Understand the impacts of other Schemes and recognises other RIS Schemes
- Reduce the visual, air and noise quality impacts of the proposed scheme on affected communities on the route
- Reduce the impact of severance of communities along the route
- Improve accessibility for walkers, cyclists, horse riders, and public transport users
- Improve customer satisfaction, and reduce customer impact during construction

8.1.2 In accordance with the proposed scheme's 'free flowing' objectives, the proposed scheme would meet the requirements of technical documents sent out in Design Principles [TR010060/APP/7.10] resulting in a high performance three-lane carriageway between Chelmsford and Marks Tey. The provision of new and upgraded junctions along this route would ensure strategic traffic on the A12 is segregated from local and de-trunked traffic which would improve journey time reliability on the route.

8.1.3 The proposed scheme would provide a safer route than the existing, and would be more resilient to incidents through applying the latest design standards (DMRB).

8.1.4 Stakeholder engagement was entered into early in the design process and has formed an integral part of the design development. The proposed scheme has been developed with input from stakeholders and the wider public through the consultation process. A collaborative approach to design development has been central to bringing the proposed scheme to its current level of development.

8.1.5 The proposed scheme has been designed to facilitate an accessible and connected network. Provision is made for improved and new WCH networks which connect to the wider existing PRoW network, resulting in improvement to accessibility.

8.1.6 Overall, the proposed scheme proposes an appropriately balanced design response to the key opportunities and challenges presented by the site and the challenging landscape through which it travels.